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Standard Improved Technical Specifications and Application of Selection Criteria for Fuel Storage Casks

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STANDARD IMPROVED TECHNICAL SPECIFICATIONS

AND

APPLICATION OF SELECTION CRITERIA

FOR

FUEL STORAGE CASKS

Revision A
September 28, 1999

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1. INTRODUCTION

Section 218(a) of the Nuclear Waste Policy Action of 1982, as amended, (NWPA) directs that, "(t)he Secretary (of the Department of Energy (DOE)) shall establish a demonstration program, in cooperation with the private sector, for the dry storage of spent nuclear fuel at civilian nuclear power reactor sites, with the objective of establishing one or more technologies that the (Nuclear Regulatory) Commission may, by rule, approve for use at the sites of civilian nuclear power reactors without, to the maximum extent practicable, the need for additional site-specific approvals by the Commission." Section 133 of the NWPA states, in part, that "[t]he Commission shall, by rule, establish procedures for the licensing of any technology approved by the Commission under section 218(a) for use at the site of any civilian nuclear power reactor."

To implement this mandate, the NRC approved dry storage of spent nuclear fuel in NRC-approved casks under a general license, publishing a final rule on July 18, 1990 in 10 CFR part 72 entitled "General License for Storage of Spent Fuel at Power Reactor Sites" (55 FR 29181, 1990). This rule also established a new Subpart L within 10 CFR part 72 entitled "Approval of Spent Fuel Storage Casks," containing procedures and criteria for obtaining NRC approval of dry storage casks designs. Dry storage cask systems are massive devices designed to provide shielding from direct exposure to radiation, to confine the spent fuel in a safe storage condition, and to prevent releases of radioactive material to the environment. They are designed to perform these tasks by relying on passive heat removal and confinement systems without moving parts and with minimal reliance on human intervention to safely fulfill their function for the term of storage.

Under the requirements of 10 CFR part 72.26, each application under this part (e.g., 10 CFR part 72), is required to include proposed technical specifications in accordance with the requirements of 10 CFR part 72.44 and a summary statement of the bases and justification for these technical specifications.

Technical specification requirements are described in 10 CFR part 72.44(c) and (d), which state, "Each license issued under this part must include technical specifications. Technical specifications must include requirements in the following categories:

(1) Functional and operating limits and monitoring instruments and limiting control settings.

(i) Functional and operating limits for an ISFSI or MRS are limits on fuel or waste handling and storage conditions that are found to be necessary to protect the integrity of the stored fuel or waste container, to protect employees against occupational exposures and to guard against the uncontrolled release of radioactive materials; and

(ii) Monitoring instruments and limiting control settings for an ISFSI or MRS are those related to fuel or waste handling and storage conditions having significant safety functions.

(2) Limiting conditions. Limiting conditions are the lowest functional capability or performance levels of equipment required for safe operation.

(3) Surveillance requirements. Surveillance requirements include:

(i) Inspection and monitoring of spent fuel or high level radioactive waste in storage;

(ii) inspection, test and calibration activities to ensure that the necessary integrity of required systems and components is maintained;

(iii) confirmation that operation of the ISFSI or MRS is within the required functional and operating limits; and

(iv) confirmation that the limiting conditions required for safe storage are met.

(4) Design features. Design features include items that would have a significant effect on safety if altered or modified, such as materials of construction and geometric arrangements.

(5) Administrative controls. Administrative controls include the organization and management procedures, record keeping, review and audit, and reporting necessary to assure that the operations involved in the storage of spent fuel in an ISFSI and the storage of spent fuel and high level radioactive waste in an MRS are performed in a safe manner.

(d) Each license authorizing the receipt, handling, and storage of spent fuel or high level radioactive waste under this part must include technical specifications that, in addition to stating the limits on the release of radioactive materials for compliance with limits of part 20 of this chapter and the "as low as is reasonably achievable" objectives for effluents, require that:

(1) Operating procedures for control of effluents be established and followed, and equipment in the radioactive waste treatment systems be maintained and used, to meet the requirements of § 72.104;

(2) An environmental monitoring program be established to ensure compliance with the technical specifications for effluents; and

(3) An annual report be submitted to the Commission in accordance with 72.4, specifying the quantity of each of the principal radionuclides released to the environment in liquid and in gaseous effluents during the previous 12 months of operation and such other information as may be required by the Commission to estimate maximum potential radiation dose commitment to the public resulting from effluent releases. On the basis of this report and any additional information that the Commission may obtain from the licensee or others, the Commission may from time to time require the licensee to take such action as the Commission deems appropriate. The Report must be submitted within 60 days after the end of the 12-month monitoring period."

Since the issuance of 10 CFR part 72, subpart K, in 1990, seven fuel storage casks have been approved for use under general license and a number of additional cask designs are currently being considered for approval. Each fuel storage cask general license application and Certificate of Compliance (CoC) has included Technical Specifications. However, there was no effort to develop a consistent standard for fuel storage cask technical specifications and the technical specifications for each fuel storage cask design were unique and inconsistent in the level of detail and types of controls applied.

In 1998, the NRC was considering a site-specific ISFSI license request from Virginia Power for their North Anna Power Station. The NRC requested that Virginia Power propose Technical

Specifications for the ISFSI similar to the Improved Technical Specifications (ITS) for nuclear power plants.

Nuclear Power Plant ITS

The ITS for power plants were developed in a joint NRC - Industry effort which resulted in the issuance of 5 NRC NUREGs. These NUREGs, NUREG-1430 through NUREG-1434, contain ITS for the 5 major power plant designs (B&W, Westinghouse, Combustion Engineering, BWR/4, and BWR/6). The ITS NUREGs were developed using NUMARC 93-03, "Writer's Guide for the Restructured Technical Specifications." The Writer's Guide presented detailed information on format, content, and level of detail that was further developed in the creation of the NUREGs. The result was documents which are consistent, and human-factored for maximum efficiency.

A key in developing the ITS for power plants was the development and application of a set of criteria for what controls are appropriate to the Technical Specifications. These criteria were originally published in the NRC's Interim Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors, February 6, 1987, and then codified in 10 CFR 50.36(c)(2)(ii). The criteria are:

> Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.
>
> Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a Design Basis Accident or Transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
>
> Criterion 3: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a Design Basis Accident or Transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
>
> Criterion 4: A structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.

The criteria are applied to the Technical Specifications for a power plant during the development of the plant-specific ITS. Requirements which do not meet the criteria are relocated from the Technical Specifications to the plant's Final Safety Analysis Report.

The power plant ITS was also based on the subjective statement of the purpose of Technical Specifications expressed by the Atomic Safety and Licensing Appeal Board in Portland General Electric Company (Trojan Nuclear Plant), ALAB-531, 9 NRC 263 (1979). There, the Appeal Board interpreted Technical Specifications as being reserved for those conditions or limitations upon reactor operation necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety.

History of Development of ISFSI ITS

In 1998, Virginia Power developed proposed ITS for the North Anna ISFSI. The North Anna ISFSI ITS were based on the Westinghouse power plant ITS (Reference 1) and provided as much consistency with the power plant ITS as the different facility requirements allowed and followed the power plant ITS format, rules, and conventions. Following a number of meetings with the NRC, Virginia Power developed the North Anna ISFSI ITS which were issued by the NRC in June, 1998. Determination of which requirements to maintain in the Technical Specifications or to place under other controls was done through discussion with the NRC, not through the development and application of a set of criteria.

The North Anna ISFSI ITS were provided by the NRC to fuel storage cask vendors as a basis for their design specific fuel storage cask ITS to be issued with the CoC for their design. During the development of the fuel storage casks ITS to each design, it became clear that it would benefit the NRC, the cask vendors, the cask users, and public safety, to develop a standard fuel storage cask ITS for use with each cask design.

The purpose of this document is to propose a single set of Improved Technical Specifications for fuel storage casks approved by general license under 10 CFR part 72, subpart K. Each specification proposed in the current version of the Technical Specifications for each fuel storage cask design is evaluated against the criteria discussed below. A standard set of fuel storage cask ITS is proposed containing the requirements which meet one or more of the criteria. Requirements specific to a fuel storage cask design are bracketed. The requirements are formatted to maximize standardization and consistency and to meet the unique operational needs of a fuel storage system. The specifications which do not meet any of the criteria are discussed, with particular emphasis on the appropriate location for the requirement and what administrative controls should govern revision of the requirement.

2. SELECTION CRITERIA

Power Plant ITS Selection Criteria and Discussion

The selection criteria provided in 10 CFR 50.36(c)(2)(ii) are used to develop the application of selection criteria contained in the fuel storage cask specific analyses. The selection criteria and discussion provided in Reference 2 are as follows:

> Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary:
>
> Discussion of Criterion 1: A basic concept in the adequate protection of the public health and safety is the prevention of accidents. Instrumentation is installed to detect significant abnormal degradation of the reactor coolant pressure boundary so as to allow operator

actions to either correct the condition or to shut down the plant safely, thus reducing the likelihood of a loss-of-coolant accident.

This criterion is intended to ensure that Technical Specifications control those instruments specifically installed to detect excessive reactor coolant system leakage. This criterion should not, however, be interpreted to include instrumentation to detect precursors to reactor coolant pressure boundary leakage or instrumentation to identify the source of actual leakage (e.g., loose parts monitor, seismic instrumentation, valve position indicators).

Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design basis accident (DBA) or transient analyses that either assumes the failure of or presents a challenge to the integrity of a fission product barrier:

Discussion of Criterion 2: Another basic concept in the adequate protection of the public health and safety is that the plant shall be operated within the bounds of the initial conditions assumed in the existing design basis accident and transient analyses and that the plant will be operated to preclude unanalyzed transients and accidents. These analyses consist of postulated events, analyzed in the Updated Final Safety Analysis Report (UFSAR), for which a structure, system, or component must meet specified functional goals. These analyses are contained in Chapters 6 and 15 of the UFSAR (or equivalent chapters) and are identified as Condition II, III, or IV events (ANSI N18.2) (or equivalent) that either assume the failure of or present a challenge to the integrity of a fission product barrier.

As used in Criterion 2, process variables are only those parameters for which specific values or ranges of values have been chosen as reference bounds in the design basis accident or transient analyses and which are monitored and controlled during power operation such that process values remain within the analysis bounds. Process variables captured by Criterion 2 are not, however, limited to only those directly monitored and controlled from the control room. These could also include other features or characteristics that are specifically assumed in Design Basis Accident and Transient analyses even if they cannot be directly observed in the control room (e.g., moderator temperature coefficient and hot channel factors).

The purpose of this criterion is to capture those process variables that have initial values assumed in the design basis accident and transient analyses, and which are monitored and controlled during power operation. As long as these variables are maintained within the established values, risk to the public safety is presumed to be acceptably low. This criterion also includes active design features (e.g., high pressure/low pressure system valves and interlocks) and operating restrictions (pressure/temperature limits) needed to preclude unanalyzed accidents and transients.

Criterion 3: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier:

Discussion of Criterion 3: A third concept in the adequate protection of the public health and safety is that in the event that a postulated design basis accident or transient should occur, structures, systems, and components are available to function or to actuate in order to mitigate the consequences of the design basis accident or transient. Safety sequence analyses or their equivalent have been performed in recent years and provide a method of presenting the plant response to an accident. These can be used to define the primary success paths.

A safety sequence analysis is a systematic examination of the actions required to mitigate the consequences of events considered in the plant's design basis accident and transient analyses, as presented in Chapters 6 and 15 of the plant's Final Safety Analysis Report (or equivalent chapters). Such a safety sequence analysis considers all applicable events, whether explicitly or implicitly presented. The primary success path of a safety sequence analysis consists of the combination and sequences of equipment needed to operate (including consideration of the single failure criteria), so that the plant response to design basis accidents and transients limits the consequences of these events to within the appropriate acceptance criteria.

It is the intent of this criterion to capture into Technical Specifications only those structures, systems, and components that are part of the primary success path of a safety sequence analysis. Also captured by this criterion are those support and actuation systems that are necessary for items in the primary success path to successfully function. The primary success path for a particular mode of operation does not include backup and diverse equipment (e.g., rod withdrawal block which is a backup to the average power range monitor high flux trip in the startup mode, safety valves which are backup to low temperature overpressure relief valves during cold shutdown).

Criterion 4: A structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety:

Discussion of Criterion 4: It is the Commission policy that licensees retain in their Technical Specifications LCOs, action statements and Surveillance Requirements for the following systems (as applicable), which operating experience and PSA have generally shown to be significant to public health and safety and any other structures, systems, or components that meet this criterion:

- Reactor Core Isolation Cooling/Isolation Condenser,
- Residual Heat Removal,
- Standby Liquid Control, and
- Recirculation Pump Trip.

The Commission recognizes that other structures, systems, or components may meet this criterion. Plant and design-specific PSA's have yielded valuable insight to unique plant vulnerabilities not fully recognized in the safety analysis report Design Basis Accident or Transient analyses. It is the intent of this criterion that those requirements that PSA or operating experience exposes as significant to public health and safety, consistent with the Commission's Safety Goal and Severe Accident Policies, be retained or included in Technical Specifications.

Application of the Power Plant Criteria to Fuel Storage Casks

Criterion 1: Obviously, detection of reactor coolant system leakage is not a concern for a fuel storage cask. Consideration was given to applying this criteria to the detection of leakage from a fuel storage cask. However, this was not considered to be appropriate because fuel storage cask leakage is considered in Criteria 2 and 3. Therefore, Criterion 1 will not result in any LCOs being retained in the fuel storage cask ITS.

Criteria 2 and 3: The terms "Design Basis Accidents" and "Transient Analyses" are not generally used in regards to a fuel storage cask. NUREG-1536, Standard Review Plan for Dry Cask Storage Systems (Reference 3), states that design-basis events are the same as "accidents." Also, the use of the term "off-normal" events is equivalent to "Transients." Therefore, the NUREG-1536, fuel storage cask SAR, and NRC Safety Evaluation references to "accidents" and "off-normal events" are assumed to be equivalent to "Design Basis Accidents" and "Transients" as used in Criteria 2 and 3. The fission product barriers for a fuel storage cask are considered to be the fuel pellet, fuel cladding, and the fuel storage cask itself.

Criterion 4: Probabilistic safety assessment is not used in the evaluation of fuel storage casks. The systems listed in the discussion of Criterion 4 are not applicable to a fuel storage cask. However, there has been significant operating experience with fuel storage casks. Therefore, LCOs applying to structures, systems, or components that operating experience has shown to be significant to public health and safety will be retained in the Technical Specifications.

Application of the Criteria to Individual Fuel Storage Cask Technical Specifications

In the attachments, the selection criteria are applied to the Technical Specifications for fuel storage cask designs. The Technical Specifications for each fuel storage cask design are revised, with justifications provided for all technical changes made.

3 - STANDARD IMPROVED TECHNICAL SPECIFICATIONS FOR FUEL STORAGE CASKS

Design Goals

There are several design goals in developing the standard ITS for fuel storage casks:

- Defendable: All requirements presented in the fuel storage cask ITS and proposed for inclusion in the future, should have a defendable regulatory basis in 10 CFR part 72.44, in the application of the criteria, and that is consistent with the general purpose of Technical Specifications determined by the ASLB.

- Easy to Use. The resulting fuel storage cask ITS should be easy for power plant operators familiar with power plant Technical Specifications to use. This is accomplished by following the ITS Writer's Guide, adopting with only minimal changes the ITS NUREG Use and Application section, and the LCO and SR Applicability section. In addition, the ITS conventions are used, such as level of detail and not restating regulatory requirements.

- Standardized The resulting fuel storage cask ITS should be standard across fuel storage cask designs. This will facilitate the use of multiple fuel storage cask designs at a single reactor location. Requirements should be written in a manner to address design differences in terms of the underlying safety function, which should be consistent across designs. When the Technical Specifications must address a design-specific feature, the design-specific information will be presented in brackets.

- Focused on Operational Safety. The resulting fuel storage cask ITS should focus on those requirements necessary to prevent operation which represents an immediate risk to public health and safety. Requirements not directly related to operational safety should be located in other controlled documents. Requirements located in other regulatory documents, such as the CFR, must be eliminated in order to not dilute the importance of the requirements in the Technical Specifications. Requirements related to manufacturing of a fuel storage cask should be located in documents that are applicable to the manufacturer, such as the Topical Safety Analysis Report (SAR) or the NRC's Safety Evaluation Report (SER), not the Technical Specifications which govern operation of the fuel storage cask.

- Consistent with Power Plant ITS Level of Detail and Safety Significance of Requirements. The resulting fuel storage cask ITS should be consistent in terms of level of detail and safety significance of requirements with the Technical Specifications used at power plant ITS. Decades of experience with power plant regulation has established a threshold for the level of detail in the Technical Specifications and the safety significance of the items that are controlled, balancing the oversight requirements of the NRC with the operational flexibility required by the licensee. That threshold should not be different for the Technical Specifications of a fuel storage cask. Items of equivalent safety significance that are represented by a given level of detail in the power plant Technical Specifications should be represented with a comparable level of detail in the fuel storage cask ITS.

Relationship Between the Fuel Storage Cask ITS and the SAR

In developing the power plant ITS, the NRC and the industry recognized that many controls are appropriate for the FSAR instead of the Technical Specifications. Systems which are integral to safe operation of a power plant but not directly credited in the accident analysis, such as soluble boron control, watertight doors, and power distribution monitoring equipment, are relocated from the Technical Specifications to the FSAR. This is not to be construed as a decision that the systems mentioned are not important. It simply means that changes to the requirements on these systems do not have to be reviewed and approved prior to use by the NRC unless the changes represent an unreviewed safety question.

Many of the requirements which would appear in power plant ITS are not needed in fuel storage cask ITS because they are required by the regulations. For example:

- A user of a CoC cask is required by 10 CFR part 72.212, Conditions of general license issued under 72.210(b)(2) to perform written evaluations, prior to use, that establish that (i) conditions set forth in the CoC have been met; (ii) cask storage pads and areas have been designed to adequately support the static load of the stored casks; and (iii) the requirements of 72.104 have been met. Paragraph 72.104 requires verification that offsite dose limits will be met, that operational doses will be ALARA, and that operational limits must be established to verify that the direct radiation from the facility will be within the limits of 10 CFR part 72.104(a).

- Under 10 CFR part 72.212(b)(3), the user must review the SAR referenced in the CoC and the NRC's SER to determine whether or not the reactor site parameters are enveloped the assumptions made in the fuel storage cask design.

- The user is required to review their facility to determine whether activities related to use of the fuel storage cask under the CoC would result in an unreviewed safety question or change to the facility technical specifications.

- The user is required to review the reactor emergency plan, quality assurance program, training program, and radiation protection program and make any necessary changes under Paragraph 72.212(b)(6).

- The user is required to conduct activities related to storage of spent fuel under a CoC in accordance with written procedures by Paragraph 72.212(b)(9). In addition, a standard condition of the CoC is the use of written operating procedures.

4 - CONTROL OF VENDOR-SPECIFIC PROGRAMS AND ITS BASES

Control of Vendor-Specific Programs

The Programs in the proposed Administrative Controls provide the requirements for the minimum content of the described programs. It is anticipated that the vendors will develop model programs containing specific acceptance criteria for each of the described programs. These model programs will present the information, which is located in various locations within the vendor-specific SAR, in one location in a format to facilitate user creation of implementing procedures. These model programs will be located in Chapter 12 of the SAR, following the Technical Specifications and Bases.

Control of ITS Bases

Unlike 10 CFR part 50, 10 CFR part 72 does not contain a discussion of the relationship between the Technical Specifications and the Bases. However, 10 CFR part 72.24 states that each application shall include proposed technical specifications and a summary statement of the bases and justifications for these technical specifications. As the Technical Specifications and Bases are submitted by the vendor in Chapter 12 of the SAR, the proposed Improved Technical Specifications Bases are assumed to remain part of Chapter 12 of the SAR and be controlled under 10 CFR part 72.48.

5 - REFERENCES

1. NUREG-1431, "Standard Technical Specifications, Westinghouse Plants," Revision A, April 1995.

2. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).

3. NUREG-1536, "Standard Review Plan for Dry Cask Storage Systems", January, 1997.

ATTACHMENT A

PROPOSED STANDARD FUEL STORAGE CASK ITS

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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.

Term	Definition
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
CASK	A CASK shall be an integral fuel storage unit, including any fuel container, canister, transfer cask, storage device, overpack or impact limiters approved for storage of spent nuclear fuel under a Certificate of Compliance.
SAR	The SAR is the Safety Analysis Report referenced in the Certificate of Compliance issued for the CASK.

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.

EXAMPLES

The following examples illustrate the use of logical connectors:

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Verify . . . AND 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.

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Stop . . . OR A.2.1 Verify . . . AND A.2.2.1 Reduce . . . OR A.2.2.2 Perform . . OR 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 minimum requirements for ensuring safe operation of the CASK. 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	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 CASK 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 CASK is not within the LCO Applicability. 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.

1.3 Completion Times

EXAMPLES

The following examples illustrate the use of Completion Times:

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.	6 hours
	AND	
	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 6 hours AND to complete Action B.2 within 36 hours. A total of 6 hours is allowed for completing Action B.1 and a total of 36 hours (not 42 hours) is allowed for completing Action B.2 from the time that Condition B was entered. If Action B.1 is completed within 3 hours, the time allowed for completing Action B.2 is the next 33 hours because the total time allowed for completing Action B.2 is 36 hours.

1.3 Completion Times

EXAMPLE 1.3-2

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. AND B.2 Complete Action B.2.	6 hours 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.

If the Completion Time associated with a component in Condition A expires, Condition B is entered for that component. If the Completion Times associated with subsequent components in Condition A expire, Condition B is

1.3 Completion Times

EXAMPLE 1.3-2 (continued)	entered separately for each component and separate Completion Times start and are tracked for each component. If a component that caused entry into Condition B is restored to OPERABLE status, Condition B is exited for that 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	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. 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, as well as certain Notes in the Surveillance column that modify performance requirements.
EXAMPLE	The following example illustrates the way that Frequencies are specified.

1.4 Frequency

EXAMPLE (continued)

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.1 Verify pressure within limit.	12 hours

Example 1.4-1 contains the type of SR most often encountered in the Technical Specifications. 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 stated 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 a variable is outside specified limits, or the CASK is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while the CASK is in a condition in the Applicability of the LCO, then SR 3.0.3 becomes applicable.

If the interval as specified by SR 3.0.2 is exceeded while the CASK is not in a condition 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 condition. Failure to do so would result in a violation of SR 3.0.4.

2.0 FUNCTIONAL AND OPERATING LIMITS

2.1 Functional and Operating Limits

2.1.1 Fuel To Be Stored in the CASK

2.1.1.1 Only contents evaluated in the SAR may be stored in the CASK.

2.2 Functional and Operating Limits Violations

If any Functional and Operating Limits of 2.1 are violated, the following actions shall be completed:

2.2.1 The affected contents shall be placed in a safe condition.

2.2.2 Within 24 hours, notify the NRC Operations Center.

2.2.3 Within 30 days, submit a special report which describes the cause of the violation, and actions taken to restore compliance and prevent recurrence.

3.0 LIMITING CONDITION 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	Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met. 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.
LCO 3.0.3	Not applicable to a CASK.
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 a CASK.
LCO 3.0.5	Not applicable to a CASK
LCO 3.0.6	Not applicable to a CASK.
LCO 3.0.7	Not applicable to a CASK.

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.

Exceptions to this Specification may be 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.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY (continued)

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 a CASK.

3.1 CASK STORAGE INTEGRITY

3.1.1 CASK Storage Integrity

LCO 3.1.1 Each CASK shall have storage integrity.

APPLICABILITY: Whenever a CASK contains fuel and has been declared in storage.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CASK does not have storage integrity.	A.1 Initiate action to restore storage integrity. AND A.2 Restore CASK storage integrity.	Immediately 30 days
B. Required Action and associated Completion Time not met.	B.1 Submit a report in accordance with Specification 5.2.1.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify CASK storage integrity in accordance with the CASK Loading, Unloading, and Preparation Program.	In accordance with the CASK Loading, Unloading, and Preparation Program.
SR 3.1.1.2	Verify CASK storage integrity in accordance with the CASK Storage Integrity Program.	In accordance with the CASK Storage Integrity Program.

4.0 DESIGN FEATURES

There are no Design Features that are applicable to a CASK.

5.0 ADMINISTRATIVE CONTROLS

5.1 Programs

The following programs shall be established, implemented, and maintained:

5.1.1 Radioactive Effluent Control Program

A program shall be established which implements the requirements of 10CFR72.44(d).

a. The CASK does not create any radioactive materials or have any radioactive waste treatment systems. Therefore, specific operating procedures for the control of radioactive effluents are not required.

b. This program includes an environmental monitoring program. The CASK monitoring may be included in the environmental monitoring program for the site.

5.1.2 CASK Loading, Unloading, and Preparation Program

A program shall be established to implement the SAR requirements for loading fuel and components into a CASK, unloading fuel and components from a CASK, and preparing a CASK for storage. The requirements of the program for loading and preparing a CASK shall be met prior to declaring a CASK in storage.

At a minimum, the program shall address the loading, unloading, and preparation requirements in the following areas:

a. Drying;

b. Inerting;

c. Leak testing;

d. Dose rates;

e. Contamination;

f. Fuel temperature, if applicable; and

g. Dissolved boron concentration in the CASK cavity, if applicable, including requirements for independent measurements.

The program shall include compensatory measures and appropriate time limits if a CASK fails to meet the requirements of the program.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the CASK Loading, Unloading, and Preparation Program test frequencies.

5.1 Programs (continued)

5.1.3 CASK Transportation Evaluation Program

A program shall be established providing administrative controls and procedures to ensure that CASK on-site transportation is conducted within the limits assumed in the SAR, such as maximum lifting height, road conditions, and CASK temperature limits.

5.1.4 CASK Storage Integrity Program

A program shall be established to implement the SAR requirements for periodic monitoring of CASK storage integrity. The program shall include the method of monitoring CASK storage integrity, any alternate means of monitoring storage integrity, the frequency for performing such monitoring, and the acceptance criteria for monitoring results. [The program shall include monitoring the temperature of ventilated CASKs.]

5.0 ADMINISTRATIVE CONTROLS

5.2 Reporting Requirements

The following reports shall be submitted:

5.2.1 CASK Storage Integrity Report

When a report is required by Condition B of LCO 3.1.1, "CASK Storage Integrity," a report shall be submitted within the following 30 days. The report shall outline the cause of the failure to meet the LCO, and the plans and schedule for restoring compliance with the LCO. The report shall be submitted to the recipients given in 10 CFR part 72.75.

ATTACHMENT B

PROPOSED STANDARD FUEL STORAGE CASK ITS BASES

BASES TABLE OF CONTENTS

B 2.0 FUNCTIONAL AND OPERATING LIMITS

B 2.1 Functional and Operating Limits

BASES

FUNCTIONAL AND OPERATING LIMITS	The CASK design assumes certain spent fuel characteristics. The thermal, structural, radiological, shielding, and criticality evaluations performed for the CASK are dependent on the spent fuel characteristics. The SAR describes in detail the fuel that can be stored. Actions required to respond to violations of any Functional and Operating Limits are provided in Section 2.2.
FUNCTIONAL AND OPERATING LIMITS VIOLATIONS	The following Functional and Operating Limits violation responses are applicable. <u>2.2.1</u> If Functional and Operating Limit 2.1.1 is violated, the limitations on the fuel assemblies in the CASK have not been met. Actions must be taken to place the affected fuel assemblies in a safe condition. This safe condition may be established by returning the affected fuel assemblies to the spent fuel pool. However, it is acceptable for the affected fuel assemblies to remain in the CASK if that is determined to be a safe condition. <u>2.2.2 & 2.2.3</u> Notification of the violation of a Functional and Operating Limit to the NRC is required within 24 hours. Written reporting of the violation must be accomplished within 30 days. This notification and written report are independent of any reports and notification that may be required by 10 CFR 72.75.

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

BASES

LCOs

LCO 3.0.1, 3.0.2, and 3.0.4 establish the general requirements applicable to all Specifications and apply at all times, unless otherwise stated.

LCO 3.0.1

LCO 3.0.1 establishes the Applicability statement within each individual Specification as the requirement for when the LCO is required to be met (i.e., when the CASK is in the specified conditions of the Applicability statement of each Specification).

LCO 3.0.2

LCO 3.0.2 establishes that upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. The Completion Time of each Required Action for an ACTIONS Condition is applicable from the point in time that an ACTIONS Condition is entered. The Required Actions establish those remedial measures that must be taken within specified Completion Times when the requirements of an LCO are not met. This Specification establishes that:

a. Completion of the Required Actions within the specified Completion Times constitutes compliance with a Specification; and

b. Completion of the Required Actions is not required when an LCO is met within the specified Completion Time, unless otherwise specified.

There are two basic types of Required Actions. The first type of Required Action specifies a time limit in which the LCO must be met. This time limit is the Completion Time to restore a system or component or to restore variables to within specified limits. (Whether stated as a Required Action or not, correction of the entered Condition is an action that may always be considered upon entering ACTIONS.) The second type of Required Action specifies the remedial measures that permit continued operation that is not further restricted by the Completion Time. In this case, compliance

BASES

LCO 3.0.2 (continued)	with the Required Actions provides an acceptable level of safety for continued operation. Completing the Required Actions is not required when an LCO is met or is no longer applicable, unless otherwise stated in the individual Specifications. The Completion Times of the Required Actions are also applicable when an LCO is not met intentionally. The reasons for intentionally relying on the ACTIONS include, but are not limited to, performance of Surveillances, preventive maintenance, corrective maintenance, or investigation of operational problems. Entering ACTIONS for these reasons must be done in a manner that does not compromise safety. Intentional entry into ACTIONS should not be made for operational convenience.
LCO 3.0.3	This specification is not applicable to a CASK. The placeholder is retained for consistency with the power reactor technical specifications.
LCO 3.0.4	LCO 3.0.4 establishes limitations on changes in specified conditions in the Applicability when an LCO is not met. It precludes placing the CASK in a specified condition stated in that Applicability (e.g., Applicability desired to be entered) when the following exist: a. Conditions are such that the requirements of the LCO would not be met in the Applicability desired to be entered; and b. Continued noncompliance with the LCO requirements, if the Applicability were entered, would result in a Requried Action to exit the Applicability desired to be entered. Compliance with Required Actions that permit continued operation in the Condition for an unlimited period of time

BASES

LCO 3.0.4 (continued)	in a specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the CASK. Therefore, in such cases, entry into a specified condition in the Applicability may be made in accordance with the provisions of the Required Actions. The provisions of this Specification should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components before entering an associated specified condition in the Applicability. The provisions of LCO 3.0.4 shall not prevent changes in specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of LCO 3.0.4 shall not prevent changes in specified conditions in the Applicability that are related to the unloading of a CASK.
LCO 3.0.5	This specification is not applicable to a CASK. The placeholder is retained for consistency with the power reactor technical specifications.
LCO 3.0.6	This specification is not applicable to a CASK. The placeholder is retained for consistency with the power reactor technical specifications.
LCO 3.0.7	This specification is not applicable to a CASK. The placeholder is retained for consistency with the power reactor technical specifications.

3.0 SURVEILLANCE REQURIEMENT (SR) APPLICABILITY

BASES

SRs

SR 3.0.1 through SR 3.0.4 establish the general requirements applicable to all Specifications and apply at all times, unless otherwise stated.

SR 3.0.1

SR 3.0.1 establishes the requirement that SRs must be met during the specified conditions in the Applicability for which the requirements of the LCO apply, unless otherwise specified in the individual SRs. This Specification is to ensure that Surveillances are performed to verify the systems, components, and that variables are within specified limits. Failure to meet a Surveillance within the specified Frequency, in accordance with SR 3.0.2, constitutes a failure to meet an LCO.

Systems and components are assumed to meet the LCO when the associated SRs have been met. Nothing in this Specification, however, is to be construed as implying that systems or components meet the associated LCO when:

a. The systems or components are known to not meet the LCO, although still meeting the SRs; or

b. The requirements of the Surveillance(s) are known not to be met between required Surveillance performances.

Surveillances do not have to be performed when the specified condition for which the requirements of the associated LCO are not applicable, unless otherwise specified.

Surveillances, including Surveillances invoked by Required Actions, do not have to be performed on equipment that has been determined to not meet the LCO because the ACTIONS define the remedial measures that apply. Surveillances have to be met and performed in accordance with SR 3.0.2, prior to returning equipment to service.

Upon completion of maintenance, appropriate post maintenance testing is required. This includes ensuring applicable

BASES

SR 3.0.1 (continued)

Surveillances are not failed and their most recent performance is in accordance with SR 3.0.2. Post maintenance testing may not be possible in the current specified conditions in the Applicability due to the necessary conditions not having been established. In these situations, the equipment may be considered to meet the LCO provided testing has been satisfactorily completed to the extent possible and the equipment is not otherwise believed to be incapable of performing its function. This will allow operation to proceed to another specified condition so that the necessary post-maintenance test can be completed.

SR 3.0.2

SR 3.0.2 establishes the requirements for meeting the specified Frequency for Surveillances.

SR 3.0.2 permits a 25% extension of the interval specified in the Frequency. This extension facilitates Surveillance scheduling and considers operating conditions that may not be suitable for conducting the Surveillance (e.g., transient conditions or other ongoing Surveillance or maintenance activities).

The 25% extension does not significantly degrade the reliability that results from performing the Surveillance at its specified Frequency. This is based on the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the SRs.

The provisions of SR 3.0.2 are not intended to be used repeatedly merely as an operational convenience to extend Surveillance intervals beyond those specified.

SR 3.0.3

SR 3.0.3 establishes the flexibility to defer declaring affected equipment as not meeting the LCO or an affected variable outside the specified limits when a Surveillance has not been completed within the specified Frequency. A delay period of up to 24 hours or up to the limit of the specified Frequency, whichever is less, applies from the

BASES

SR 3.0.3 (continued)

point in time that it is discovered that the Surveillance has not been performed in accordance with SR 3.0.2, and not at the time that the specified Frequency was not met. This delay period provides adequate time to complete Surveillances that have been missed. This delay period permits the completion of a Surveillance before complying with Required Actions or other remedial measures that might preclude completion of the Surveillance.

The basis for this delay period includes consideration of adequate planning, availability of personnel, the time required to perform the Surveillance, the safety significance of the delay in completing the required Surveillance, and the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the requirements. When a Surveillance with a Frequency based not on time intervals, but upon specified conditions or operational situations, is discovered not to have been performed when specified, SR 3.0.3 allows the full delay period of 24 hours to perform the Surveillance.

SR 3.0.3 also provides a time limit for completion of Surveillances that become applicable as a consequence of changes in the specified conditions in the Applicability imposed by Required Actions.

Failure to comply with specified Frequencies for SRs is expected to be an infrequent occurrence. Use of the delay period established by SR 3.0.3 is a flexibility which is not intended to be used as an operational convenience to extend Surveillance intervals.

If a Surveillance is not completed within the allowed delay period, then the equipment is considered to not meet the LCO or the variable is considered outside the specified limits and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon expiration of the delay period. If a Surveillance is failed within the delay period, then the equipment does not meet the LCO, or the variable is outside the specified limits and the

BASES

SR 3.0.3 (continued)	Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon the failure of the Surveillance. Completion of the Surveillance within the delay period allowed by this Specification, or within the Completion Time of the ACTIONS, restores compliance with SR 3.0.1.
SR 3.0.4	SR 3.0.4 establishes the requirement that all applicable SRs must be met before entry into a specified condition in the Applicability. This Specification ensures that system and component requirements and variable limits are met before entry into specified conditions in the Applicability for which these systems and components are required. The provisions of this Specification should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components before entering an associated specified condition in the Applicability. However, in certain circumstances, failing to meet an SR will not result in SR 3.0.4 restricting a change in specified condition. When a system, subsystem, component, device, or variable is outside its specified limits, the associated SR(s) are not required to be performed, per SR 3.0.1, which states that surveillances do not have to be performed on such equipment. When equipment does not meet the LCO, SR 3.0.4 does not apply to the associated SR(s)since the requirement for the SR(s) to be performed is removed. Therefore, failing to perform the Surveillance(s) within the specified Frequency does not result in an SR 3.0.4 restriction to changing specified conditions of the Applicability. However, since the LCO is not met in this instance, LCO 3.0.4 will govern any restrictions that may (or may not) apply to specified condition changes. The provisions of SR 3.0.4 shall not prevent changes in specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of LCO

BASES

SR 3.0.4 (continued)

3.0.4 shall not prevent changes in specified conditions in the Applicability that are related to the unloading of a CASK.

The precise requirements for performance of SRs are specified such that exceptions to SR 3.0.4 are not necessary. The specific time frames and conditions necessary for meeting the SRs are specified in the Frequency, in the Surveillance, or both. This allows performance of Surveillances when the prerequisite condition(s) specified in a Surveillance procedure require entry into the specified condition in the Applicability of the associated LCO prior to the performance or completion of a Surveillance. A Surveillance that could not be performed until after entering the LCO Applicability, would have its Frequency specified such that it is not "due" until the specific conditions needed are met.

B 3.1 CASK STORAGE INTEGRITY

B 3.1.1 CASK Storage Integrity

BASES

BACKGROUND	A CASK is loaded, dried, and sealed prior to being declared ready for long term storage. The CASK is designed to contain the radioactive material. In addition, 10 CFR 72.122(h)(4) and 10 CFR 72.128(a)(1) state that the CASK must have the capability to be periodically monitored such that the user will be able to determine when corrective action needs to be taken to maintain safe storage conditions. The parameter or parameters to be monitored may vary by CASK design, and may include structural condition and thermal performance. Regardless of the method of monitoring used, it is necessary to verify CASK storage integrity at periodic intervals.
APPLICABLE SAFETY ANALYSIS	The confinement of radioactivity during the storage of spent fuel in a CASK is ensured by the use of multiple confinement barriers and systems. The barriers relied upon are the uranium dioxide fuel pellet matrix, the metallic fuel cladding tubes in which the fuel pellets are contained, and the CASK in which the fuel assemblies are stored. The analyses performed for a CASK during storage assume certain conditions are met. The purpose of this Specification is to periodically verify those assumptions.
LCO	CASK storage integrity ensures that the assumptions made in the SAR analyses for events that occur during CASK storage are met. Verifying CASK storage integrity ensures that the assumptions in the accident analyses and radiological evaluations are maintained. The method of verifying storage integrity varies with CASK design and is specified in the CASK Storage Integrity Program.

BASES

APPLICABILITY

CASK storage integrity verification is performed regularly after the CASK has been loaded with fuel, completed the requirements of the CASK Loading, Unloading, and Preparation Program, and been declared in storage. The verification confirms that the CASK meets the accident analysis assumptions for events which occur during storage.

ACTIONS

A.1

If the CASK storage integrity is not maintained, actions must be initiated immediately to meet the LCO. The requirement for immediate action demonstrates the importance of establishing storage integrity as soon as possible.

A.2 and B.1

If CASK storage integrity cannot be established within 30 days, a report must be submitted to the NRC in accordance with Specification 5.2.1, CASK Storage Integrity Report. The report must describe the cause of not meeting the LCO, and the plans and schedule for establishing compliance with the LCO.

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

CASK storage integrity must be initially verified by the successful performance of the CASK loading and preparation activities in accordance with the CASK Loading, Unloading, and Preparation Program. This program ensures that the CASK initially meets the requirements for storage.

BASES

SURVEILLANCE REQUIREMENTS (continued)	SR 3.1.1.2 CASK storage integrity must be periodically verified in accordance with 10 CFR 72.122(h)(4) and 10 CFR 72.128(a)(1). The method for verifying storage integrity varies with CASK design and is specified in the CASK Storage Integrity Program. The Frequency for monitoring the CASK storage integrity is dependent on the CASK design and is specified in the CASK Storage Integrity Program.
REFERENCES	None.

ATTACHMENT C

HOLTEC INTERNATIONAL HI-STAR 100 CASK SYSTEM

ATTACHMENT C.1 - DISPOSITION MATRIX FOR HOLTEC INTERNATIONAL HI-STAR 100 CASK SYSTEM

The Holtec International Hi-Star 100 cask system Technical Specifications evaluated here are those published with the NRC's CoC Federal Register Notice dated January 11, 1999.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
1.1	DEFINITIONS	Yes	No	No	No	No	Retained for clarity of the ITS.
1.2	Logical Connectors	Yes	No	No	No	No	Retained for clarity of the ITS.
1.3	Completion Times	Yes	No	No	No	No	Retained for clarity of the ITS.
1.4	Frequency	Yes	No	No	No	No	Retained for clarity of the ITS.
2.0	Functional and Operational Limits	Yes	No	Yes	No	No	Retained. This section is required by 72.44. Only sufficient information to determine when the Functional and Operating limits have been violated and the actions to be taken in that circumstance should be in Section 2.0. Detailed description is in the SAR.
3.0	LCO and SR Applicability	Yes	No	No	No	No	Retained for clarity of the ITS.
3.1.1	MPC Cavity Vacuum Drying Procedure	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
3.1.2	OVERPACK Annulus Vacuum Drying Pressure	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.3	MPC Helium Backfill Density	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.4	OVERPACK Annulus Backfill Pressure	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.5	MPC Helium Leak Rate	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.6	OVERPACK Helium Leak Rate	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.7	SFSC Lifting Requirements	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.8	Fuel Cool-Down	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.2.1	OVERPACK Average Surface Dose Rates	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
3.2.2	SFSC Surface Contamination	No	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
Table 3-1	MPC Model-Dependent Limits	No	No	No	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
4.0	Design Features	Yes	No	No	No	No	Retained. A Design Features chapter is required under 10 CFR part 72.44.
4.1	Site	No	No	No	No	No	Deleted. Not applicable to CASKs used under a CoC.
4.2	Storage Features	No	No	No	No	No	Deleted. Not applicable to CASKs used under a CoC. The SAR contains a description of the storage features.
4.3	Codes and Standards	No	No	No	No	No	Deleted. Codes and Standards govern the manufacture of CASKs, not their operation. Codes and Standards are not operational requirements. Furthermore, the Codes and Standards are described in the SAR and subject to regulatory controls.
4.4	Site Specific Parameters and Analyses	No	No	No	No	No	Deleted. Paragraph 72.212(b)(3) requires written evaluation that the site specific parameters envelope the assumptions in the CASK design.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
4.5	Design Specifications	No	No	No	No	No	Deleted. These parameters are under the control of the manufacturer, not the user of the CASK and most cannot be verified in the field. These design specifications are appropriate to the SAR. Fabrication of the cask in accordance with the design is required by the CoC to be performed under an approved Quality Assurance program.
4.6	Training Module	No	No	No	No	No	Deleted. Training is not a design feature. Furthermore, development of a training program is required by Paragraph 72.212(b)(6) and Part 72, Subpart I.
4.7	Pre-Operational Testing and Training Exercise	No	No	No	No	No	Deleted. Pre-Operational Testing and Training Exercises are not design features. This one-time item should be described in Chapter 12 of the SAR.
4.8	Special Requirements for First System in Place	No	No	No	No	No	Deleted. Special requirements for the first system in place are not design features. This one-time item should be described in the SAR, or the NRC's SER, not a Technical Specification.

ATTACHMENT C.2

MARKUP AND DISCUSSIONS OF CHANGE FOR HOLTEC INTERNATIONAL HI-STAR 100 CASK SYSTEM

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.

Term	Definition
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
~~DAMAGED FUEL ASSEMBLY~~	~~DAMAGED FUEL ASSEMBLIES are fuel assemblies with known or suspected cladding defects greater than pinhole leaks or hairline cracks, missing fuel rods that are not replaced with dummy fuel rods, or those that cannot be handled by normal means. Fuel assemblies which cannot be handled by normal means due to fuel cladding damage are considered to be FUEL DEBRIS.~~
~~DAMAGED FUEL CONTAINER~~	~~DFCs are specially designed enclosures for DAMAGED FUEL ASSEMBLIES or FUEL DEBRIS which permit gaseous and liquid media to escape while minimizing dispersal of gross particulates.~~
~~FUEL DEBRIS~~	~~FUEL DEBRIS is fuel with known or suspected defects, such as ruptured fuel rods, severed rods, or loose fuel pellets. Fuel assemblies which cannot be handled by normal means due to fuel cladding damage are considered to be FUEL DEBRIS.~~

A.1

Insert ITS Definitions of CASK, SAR.

A.2

1.1 Definitions

(A.1)

INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)	The facility within the perimeter fence licensed for storage of spent fuel within SFSCs. (see also 10 CFR 72.3)
INTACT FUEL ASSEMBLY	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. Partial fuel assemblies, that is fuel assemblies from which fuel rods are missing, shall not be classified as INTACT FUEL ASSEMBLIES unless dummy fuel rods are used to displace an amount of water equal to that displaced by the original fuel rod(s).
LOADING OPERATIONS	LOADING OPERATIONS include all licensed activities on an SFSC while it is being loaded with fuel assemblies. LOADING OPERATIONS begin when the first fuel assembly is placed in the SFSC and end when the SFSC is suspended from or secured on the transporter.
MULTI-PURPOSE CANISTER (MPC)	MPCs are the sealed spent nuclear fuel canisters which consist of a honeycombed fuel basket contained in a cylindrical canister shell which is welded to a baseplate, lid with welded port cover plates, and closure ring. The MPC provides the confinement boundary for the contained radioactive materials.
OVERPACK	OVERPACKs are the casks which receive and contain the sealed MPCs. They provide the helium retention boundary, gamma and neutron shielding, and a set each of lifting and pocket trunnions for handling.
PLANAR-AVERAGE INITIAL ENRICHMENT	PLANAR-AVERAGE INITIAL ENRICHMENT is the average of the distributed fuel rod initial enrichments within a given axial plane of the assembly lattice.

1.1 Definitions

A.1

SPENT FUEL STORAGE CASKS (SFSCs)	SFSCs are storage containers approved for casks of spent fuel assemblies at the ISFSI. The HI-STAR 100 SFSC System consists of the OVERPACK and its integral MPC.
STORAGE OPERATIONS	STORAGE OPERATIONS include all licensed activities that are performed at the ISFSI while an SFSC containing spent fuel is sitting on a storage pad within the ISFSI perimeter.
TRANSPORT OPERATIONS	TRANSPORT OPERATIONS include all licensed TRANSPORT OPERATIONS begin when the SFSC is first suspended from or secured on the transporter and end when the SFSC is at its destination and no longer suspended from the transporter.
UNLOADING OPERATIONS	UNLOADING OPERATIONS include all licensed activities on an SFSC to be unloaded of the contained fuel assemblies. UNLOADING OPERATIONS begin when the SFSC is no longer suspended from or secured on the transporter and end when the last fuel assembly is removed from the SFSC.

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 <u>AND</u> and <u>OR</u>. 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 indentations 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.

EXAMPLES

The following examples illustrate the use of logical connectors.

Insert ITS 1.2

A.3

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Verify . . . AND 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.

Insert ITS 1.2

A.3

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Stop . . .	
	OR	
	A.2.1 Verify . . .	
	AND	
	A.2.2.1 Reduce . . .	
	OR	
	A.2.2.2 Perform . . .	
	OR	
	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

Insert ITS 1.2

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ITS 1.2

~~1.2 Logical Connectors~~

~~EXAMPLES~~ ~~EXAMPLE 1.2-2 (continued)~~

~~OR indicates that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.~~

Insert ITS 1.2

A.3

~~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 SFSC. 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~~	~~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, provided that the SFCS 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 SFSC is not within the LCO Applicability.~~ ~~Once a Condition has been entered, subsequent subsystems, components, or variables expressed in the Condition, discovered to be not within limits, will not 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.~~

Insert ITS 1.3

A.3

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
	AND	
	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.

Insert ITS 1.3

A.3

1.3 Completion Times

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. AND B.2 Complete action B.2.	12 hours 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.

Insert ITS 1.3

A.3

1.3 Completion Times

Insert ITS 1.3

4.3

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. AND B.2 Complete action B.2	6 hours 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

ITS 1.3

1.3 Completion Times

EXAMPLES	<u>EXAMPLE 1.3-3</u> (continued) 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.

Insert ITS 1.3

A.3

ITS 1.4

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	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. 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. 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.

Insert ITS 1.4

A.3

1.4 Frequency

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

Insert ITS 1.4

A.3

1.4 Frequency

~~EXAMPLE 1.4-2~~

~~SURVEILLANCE REQUIREMENTS~~

SURVEILLANCE	FREQUENCY
~~Verify flow is within limits.~~	~~Once within 12 hours prior to starting activity~~ ~~AND~~ ~~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.~~

Insert ITS 1.4

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A.3

1.4 Frequency

EXAMPLES

EXAMPLE 1.4-2 (continued)

"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.

Insert ITS 1.4

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ITS 2.0

Insert ITS 2.1.1

2.0 FUNCTIONAL AND OPERATING LIMITS

2.1 Functional and Operating Limits

2.1.1 Fuel To Be Stored In The HI-STAR 100 SFSC System

a. INTACT FUEL ASSEMBLIES, DAMAGED FUEL ASSEMBLIES, and FUEL DEBRIS meeting the limits specified in Table 2.1-1 may be stored in the HI-STAR 100 SFSC System.

b. For MPCs partially loaded with stainless steel clad fuel assemblies, all remaining fuel assemblies in the MPC shall meet the maximum decay heat generation limit for the stainless steel clad fuel assemblies.

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c. For MPCs partially loaded with DAMAGED FUEL ASSEMBLIES or FUEL DEBRIS, all remaining Zircaloy clad INTACT FUEL ASSEMBLIES in the MPC shall meet the maximum decay heat generation limits for the DAMAGED FUEL ASSEMBLIES.

d. For MPC-68's partially loaded with array/class 6x6A, 6x6B, 6x6C, or 8x8A fuel assemblies, all remaining Zircaloy clad INTACT FUEL ASSEMBLIES in the MPC shall meet the maximum decay heat generation limits for the 6x6A, 6x6B, 6x6C, and 8x8A fuel assemblies.

2.1.2 Preferential Fuel Loading

Preferential fuel loading shall be used whenever fuel assemblies with significantly different post-irradiation cooling times (zone year) are to be loaded in the same MPC. That is, fuel assemblies with the longest post-irradiation cooling times shall be loaded into fuel storage locations at the periphery of the basket. Fuel assemblies with shorter post-irradiation cooling times shall be placed toward the center of the basket.

2.2 Functional and Operating Limits Violations

If any Functional and Operating Limits of 2.1 are violated, the following actions shall be completed:

contents

2.1

2.2.1 The affected ~~fuel assemblies~~ shall be placed in a safe condition.

2.2.2 Within 24 hours, notify the NRC Operations Center.

2.2.3 Within 30 days, submit a special report which describes the cause of the violation, and actions taken to restore compliance and prevent recurrence.

ITS 2.0

Table 2.1-1
Fuel Assembly Limits

I. MPC MODEL: MPC-24

A. Allowable Contents

1. Uranium oxide, PWR INTACT FUEL ASSEMBLIES listed in Table 2.1-2 and meeting the following specifications:

a. Cladding Type:	Zircaloy (Zr) or Stainless Steel (SS) as specified in Table 2.1-2 for the applicable fuel assembly array/class
b. Initial Enrichment:	As specified in Table 2.1-2 for the applicable fuel assembly array/class.

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ITS 2.0

c. ~~Decay Heat Per Assembly:~~

i. ~~Zr Clad:~~ ~~An assembly decay heat as specified in Table 2.1-4 for the applicable post-irradiation cooling time.~~

ii. ~~SS Clad:~~ ~~≤ 575 Watts~~

d. ~~Post-irradiation Cooling Time and Average Burnup Per Assembly:~~

i. ~~Zr Clad:~~ ~~An assembly post-irradiation cooling time and average burnup as specified in Table 2.1-5.~~

ii. ~~SS Clad:~~ ~~An assembly post-irradiation cooling time ≥ 9 years and an average burnup ≤ 30,000 MWD/MTU.~~

~~OR~~

~~An assembly post-irradiation cooling time ≥ 15 years and an average burnup ≤ 40,000 MWD/MTU.~~

e. ~~Nominal Fuel Assembly Length:~~ ~~≤ 176.8 inches~~

f. ~~Nominal Fuel Assembly Width:~~ ~~≤ 8.54 inches~~

g. ~~Fuel Assembly Weight:~~ ~~≤ 1,680 lbs~~

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ITS 2.0

B. ~~Quantity per MPC: Up to 24 fuel assemblies.~~

C. ~~Fuel assemblies shall not contain control components.~~

D. ~~DAMAGED FUEL ASSEMBLIES and FUEL DEBRIS are not authorized for loading into the MPC-24.~~

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ITS 2.0

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II. MPC MODEL: MPC-68

A. Allowable Contents

1. Uranium oxide, BWR INTACT FUEL ASSEMBLIES listed in Table 2.1-3, with or without Zircaloy channels, and meeting the following specifications:

a. Cladding Type:	Zircaloy (Zr) or Stainless Steel (SS) as specified in Table 2.1-3 for the applicable fuel assembly array/class.
b. Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
c. Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
d. Decay Heat Per Assembly:	
i. Zr Clad:	An assembly decay heat as specified in Table 2.1-4 for the applicable post-irradiation cooling time, except for array/class 6x6A, 6x6C,and 8x8A fuel assemblies, which shall have a decay heat ≤ 115 Watts.
ii. SS Clad:	≤ 95 Watts

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e.	Post-irradiation Cooling Time and Average Burnup Per Assembly:	
	i. Zr Clad:	An assembly post-irradiation cooling time and average burnup as specified in Table 2.1-5, except for array/class 6x6A, 6x6C, and 8x8A fuel assemblies, which shall have a cooling time ≥ 18 years and an average burnup ≤ 30,000 MWD/MTU.
	ii. SS Clad:	An assembly cooling time after discharge ≥ 10 years and an average burnup ≤ 22,500 MWD/MTU.
f.	Nominal Fuel Assembly Length:	≤ 176.2 inches
g.	Nominal Fuel Assembly Width:	≤ 5.85 inches
h.	Fuel Assembly Weight:	≤ 700 lbs, including channels

ITS 2.0

2. ~~Uranium oxide, BWR DAMAGED FUEL ASSEMBLIES, with or without Zircaloy channels, placed in DAMAGED FUEL CONTAINERS. BWR DAMAGED FUEL ASSEMBLIES shall meet the criteria specified in Table 2.1-3 for fuel assembly array/class 6x6A, 6x6C, 7x7A, or 8x8A, and meet the following specifications:~~

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a. Cladding Type:	Zircaloy (Zr)
b. Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
c. Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
d. Decay Heat Per Assembly:	≤ 115 Watts
e. Post-irradiation Cooling Time and Average Burnup Per Assembly:	An assembly post-irradiation cooling time ≥ 18 years and an average burnup ≤ 30,000 MWD/MTU.
f. Nominal Fuel Assembly Length:	≤ 135.0 inches
g. Nominal Fuel Assembly Width:	≤ 4.70 inches
h. Fuel Assembly Weight:	≤ 400 lbs, including channels

ITS 2.0

3. Mixed oxide (MOX), BWR INTACT FUEL ASSEMBLIES, with or without Zircaloy channels. MOX BWR INTACT FUEL ASSEMBLIES shall meet the criteria specified in Table 2.1-3 for fuel assembly array/class 6x6B, and meet the following specifications:

L.1

a. Cladding Type:	Zircaloy (Zr)
b. Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for fuel assembly array/class 6x6B.
c. Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for fuel assembly array/class 6x6B.
d. Decay Heat Per Assembly:	≤ 115 Watts
e. Post-irradiation Cooling Time and Average Burnup Per Assembly:	An assembly post-irradiation cooling time ≥ 18 years and an average burnup ≤ 30,000 MWD/MTIHM.
f. Nominal Fuel Assembly Length:	≤ 135.0 inches
g. Nominal Fuel Assembly Width:	≤ 4.70 inches
h. Fuel Assembly Weight:	≤ 400 lbs, including channels

4. Mixed oxide (MOX), BWR DAMAGED FUEL ASSEMBLIES, with or without Zircaloy channels, placed in DAMAGED FUEL CONTAINERS. MOX BWR DAMAGED FUEL ASSEMBLIES shall meet the criteria specified in Table 2.1-3 for fuel assembly array/class 6x6B, and meet the following specifications:

a. Cladding Type:	Zircaloy (Zr)
b. Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for array/class 6x6B.
c. Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for array/class 6x6B.
d. Decay Heat Per Assembly:	≤ 115 Watts
e. Post-irradiation Cooling Time and Average Burnup Per Assembly:	An assembly post-irradiation cooling time ≥ 18 years and an average burnup ≤ 30,000 MWD/MTIHM.
f. Nominal Fuel Assembly Length:	≤ 135.0 inches
g. Nominal Fuel Assembly Width	≤ 4.70 inches
h. Fuel Assembly Weight:	≤ 400 lbs, including channels

B. Quantity per MPC: Up to 68 INTACT FUEL ASSEMBLIES or DAMAGED FUEL ASSEMBLIES in DAMAGED FUEL CONTAINERS.

C. Fuel assemblies with stainless steel channels are not authorized for loading in the MPC-68.

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ITS 2.0

III. MPC MODEL: MPC-68F

A. Allowable Contents

1. Uranium oxide, BWR INTACT FUEL ASSEMBLIES, with or without Zircaloy channels. BWR INTACT FUEL ASSEMBLIES shall meet the criteria in Table 2.1-3 for fuel assembly array class 6x6A, 6x6C, 7x7A or 8x8A, and meet the following specifications:

a.	Cladding Type:	Zircaloy (Zr)
b.	Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
c.	Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
d.	Decay Heat Per Assembly:	≤ 115 Watts.
e.	Post-irradiation Cooling Time and Average Burnup Per Assembly:	An assembly post-irradiation cooling time ≥ 18 years and an average burnup ≤ 30,000 MWD/MTU.
f.	Nominal Fuel Assembly Length:	≤ 176.2 inches
g.	Nominal Fuel Assembly Width:	≤ 5.85 inches
h.	Fuel Assembly Weight:	≤ 700 lbs, including channels

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ITS 2.0

2. ~~Uranium oxide, BWR DAMAGED FUEL ASSEMBLIES, with or without Zircaloy channels, placed in DAMAGED FUEL CONTAINERS. BWR DAMAGED FUEL ASSEMBLIES shall meet the criteria specified in Table 2.1-3 for fuel assembly array/class 6x6A, 6x6C, 7x7A, or 8x8A, and meet the following specifications:~~

a. Cladding Type:	Zircaloy (Zr)
b. Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
c. Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
d. Decay Heat Per Assembly:	≤ 115 Watts
e. Post-irradiation Cooling Time and Average Burnup Per Assembly:	A post-irradiation cooling time after discharge ≥ 18 years and an average burnup ≤ 30,000 MWD/MTU.
f. Nominal Fuel Assembly Length:	≤ 135.0 inches
g. Nominal Fuel Assembly Width:	≤ 4.70 inches
h. Fuel Assembly Weight:	≤ 400 lbs, including channels

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ITS 2.0

3. Uranium oxide, BWR FUEL DEBRIS, with or without Zircaloy channels, placed in DAMAGED FUEL CONTAINERS. The original fuel assemblies for the BWR FUEL DEBRIS shall meet the criteria specified in Table 2.1-3 for fuel assembly array/class 6x6A, 6x6C, 7x7A, or 8x8A, and meet the following specifications:

a.	Cladding Type:	Zircaloy (Zr)
b.	Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for the applicable original fuel assembly array/class.
c.	Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for the applicable original fuel assembly array/class.
d.	Decay Heat Per DFC:	$\leq$ 115 Watts
e.	Post-irradiation Cooling Time and Average Burnup Per Assembly:	A post-irradiation cooling time after discharge $\geq$ 18 years and an average burnup $\leq$ 30,000 MWD/MTU for the original fuel assembly.
f.	Nominal Original Fuel Assembly Length:	< 135.0 inches
g.	Nominal Original Fuel Assembly Width:	$\leq$ 4.70 inches
h.	Fuel Debris Weight:	$\leq$ 400 lbs, including channels

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ITS 2.0

4. Mixed oxide (MOX) BWR INTACT FUEL ASSEMBLIES, with or without Zircaloy channels. MOX BWR INTACT FUEL ASSEMBLIES shall meet the criteria specified in Table 2.1-3 for fuel assembly array/class 6x6B, and meet the following specifications:

a.	Cladding Type:	Zircaloy (Zr)
b.	Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for fuel assembly array/class 6x6B.
c.	Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for fuel assembly array/class 6x6B.
d.	Decay Heat Per Assembly:	≤ 115 Watts
e.	Post-irradiation Cooling Time and Average Burnup Per Assembly:	An assembly post-irradiation cooling time after discharge ≥ 18 years and an average burnup ≤ 30,000 MWD/MTIHM.
f.	Nominal Fuel Assembly Length:	≤ 135.0 inches
g.	Nominal Fuel Assembly Width:	≤ 4.70 inches
h.	Fuel Assembly Weight:	≤ 400 lbs, including channels

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ITS 2.0

5. Mixed oxide (MOX), BWR DAMAGED FUEL ASSEMBLIES, with or without Zircaloy channels, placed in DAMAGED FUEL CONTAINERS. MOX BWR DAMAGED FUEL ASSEMBLIES shall meet the criteria specified in Table 2.1-3 for fuel assembly array/class 6x6B, and meet the following specifications:

a.	Cladding Type:	Zircaloy (Zr)
b.	Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for fuel assembly array/class 6x6B.
c.	Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for fuel assembly array/class 6x6B.
d.	Decay Heat Per Assembly:	≤ 115 Watts
e.	Post-irradiation Cooling Time and Average Burnup Per Assembly:	A post-irradiation cooling time after discharge ≥ 18 years and an average burnup ≤ 30,000 MWD/MTIHM.
f.	Nominal Fuel Assembly Length:	≤ 135.0 inches
g.	Nominal Fuel Assembly Width:	≤ 4.70 inches
h.	Fuel Assembly Weight:	≤ 400 lbs, including channels

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6. Mixed Oxide (MOX) BWR FUEL DEBRIS, with or without Zircaloy channels, placed in DAMAGED FUEL CONTAINERS. The original fuel assemblies for the MOX BWR FUEL DEBRIS shall meet the criteria specified in Table 2.1-3 for fuel assembly array/class 6x6B, and meet the following specifications:

a.	Cladding Type:	Zircaloy (Zr)
b.	Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for original fuel assembly array/class 6x6B.
c.	Initial Maximum Rod Enrichment:	As specified in Table 2.1-3 for original fuel assembly array/class 6x6B.
d.	Decay Heat Per DFC:	≤ 115 Watts
e.	Post-irradiation Cooling Time and Average Burnup Per Assembly:	A post-irradiation cooling time after discharge ≥ 18 years and an average burnup ≤ 30,000 MWD/MTIHM for the original fuel assembly.
f.	Nominal Original Fuel Assembly Length:	≤ 135.0 inches
g.	Nominal Original Fuel Assembly Width:	≤ 4.70 inches
h.	Fuel Debris Weight:	≤ 400 lbs, including channels

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ITS 2.0

B. Quantity per MPC:

Up to four (4) DFCs containing uranium oxide or MOX BWR FUEL DEBRIS. The remaining MPC-68F fuel storage locations may be filled with array/class 6x6A, 6x6B, 6x6C, 7x7A, and 8x8A fuel assemblies of the following type, as applicable:

a. Uranium oxide BWR INTACT FUEL ASSEMBLIES;

b. MOX BWR INTACT FUEL ASSEMBLIES;

c. Uranium oxide BWR DAMAGED FUEL ASSEMBLIES placed in DFCs; or

d. MOX BWR DAMAGED FUEL ASSEMBLIES placed in DFCs.

C. Fuel assemblies with stainless steel channels are not authorized for loading in the MPC-68F.

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ITS 2.0

(L.1)

Table 2.1-2
PWR FUEL ASSEMBLY CHARACTERISTICS (note 1)

Fuel Assembly Array/Class	14x14A	14x14B	14x14C	14x14D	15x15A
Clad Material (note 2)	Zr	Zr	Zr	SS	Zr
Design Initial U (kg/assy.)	≤ 402	≤ 402	≤ 410	≤ 400	≤ 420
Initial Enrichment (wt % ^{235}U)	≤ 4.6	≤ 4.6	≤ 4.6	≤ 4.0	≤ 4.1
No. of Fuel Rods	179	179	176	180	204
Clad O.D. (in.)	≥ 0.400	≥ 0.417	≥ 0.440	≥ 0.422	≥ 0.418
Clad I.D. (in.)	≤ 0.3514	≤ 0.3734	≤ 0.3840	≤ 0.3890	≤ 0.3660
Pellet Dia. (in.)	≤ 0.3444	≤ 0.3659	≤ 0.3770	≤ 0.3835	≤ 0.3580
Fuel Rod Pitch (in.)	0.556	0.556	0.580	0.556	0.550
Active Fuel Length (in.)	≤ 150	≤ 150	≤ 150	≤ 144	≤ 150
No. of Guide Tubes	17	17	5(note 3)	16	21
Guide Tube Thickness (in.)	≥ 0.017	≥ 0.017	≥ 0.040	≥ 0.0145	≥ 0.0165

Notes:
1. All dimensions are design nominal values. Maximum and minimum values are specified to bound variations within a given assembly class.
2. Zr designates cladding material made of Zirconium or Zirconium alloys.
3. Each guide tube replaces four fuel rods.

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Table 2.1-2 (continued)
PWR FUEL ASSEMBLY CHARACTERISTICS (note 1)

Fuel Assembly Array/Class	15x15B	15x15C	15x15D	15x15E	15x15F
Clad Material (note 2)	Zr	Zr	Zr	Zr	Zr
Design Initial U (Kg/assy.)	≤ 464	≤ 464	≤ 475	≤ 475	≤ 475
Initial Enrichment (wt % ^{235}U)	≤ 4.1	≤ 4.1	≤ 4.1	≤ 4.1	≤ 4.1
No. of Fuel Rods	204	204	208	208	208
Clad O.D. (in.)	≥ 0.420	≥ 0.417	≥ 0.430	≥ 0.428	≥ 0.428
Clad I.D. (in.)	≤ 0.3736	≤ 0.3640	≤ 0.3800	≤ 0.3790	≤ 0.3820
Pellet Dia. (in.)	≤ 0.3671	≤ 0.3570	≤ 0.3735	≤ 0.3707	≤ 0.3742
Fuel Rod Pitch (in.)	0.563	0.563	0.568	0.568	0.568
Active Fuel Length (in.)	≤ 150	≤ 150	≤ 150	≤ 150	≤ 150
No. of Guide Tubes	21	21	17	17	17
Guide Tube Thickness (in.)	≥ 0.015	≥ 0.0165	≥ 0.0150	≥ 0.0140	≥ 0.0140

Notes: 1. All dimensions are design nominal values. Maximum and minimum values are specified to bound variations within a given assembly class.

2. Zr designates cladding material made of Zirconium or Zirconium alloys.

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Table 2.1-2 (continued)
PWR FUEL ASSEMBLY CHARACTERISTICS (note 1)

Fuel Assembly Array/ Class	15x15G	16x16A	17x17A	17x17B	17x17C
Clad Material (note 2)	SS	Zr	Zr	Zr	Zr
Design Initial U (kg/assy.)	≤ 420	≤ 430	≤ 450	≤ 464	≤ 460
Initial Enrichment (wt % ^{235}U)	≤ 4.0	≤ 4.6	≤ 4.0	≤ 4.0	≤ 4.0
No. of Fuel Rods	204	236	264	264	264
Clad O.D. (in.)	≥ 0.422	≥ 0.382	≥ 0.360	≥ 0.372	≥ 0.377
Clad I.D. (in.)	≤ 0.3890	≤ 0.3320	≤ 0.3150	≤ 0.3310	≤ 0.3330
Pellet Dia. (in.)	≤ 0.3825	≤ 0.3255	≤ 0.3088	≤ 0.3232	≤ 0.3252
Fuel Rod Pitch (in.)	0.563	0.506	0.496	0.496	0.502
Active Fuel Length (in.)	≤ 144	≤ 150	≤ 150	≤ 150	≤ 150
No. of Guide Tubes	21	5 (note 3)	25	25	25
Guide Tube Thickness (in.)	≥ 0.0145	≥ 0.0400	≥ 0.016	≥ 0.014	≥ 0.020

Notes:
1. All dimensions are design nominal values. Maximum and minimum values are specified to bound variations within a given assembly class.
2. Zr designates cladding material made of Zirconium or Zirconium alloys.
3. Each guide tube replaces four fuel rods.

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Table 2.1-3
BWR FUEL ASSEMBLY CHARACTERISTICS (note 1)

Fuel Assembly Array/Class	6x6A	6x6B	6x6C	7x7A	7x7B	8x8A
Clad Material (note 2)	Zr	Zr	Zr	Zr	Zr	Zr
Design Initial U (kg/assy.)	≤ 108	≤ 108	≤ 108	≤ 100	≤ 195	≤ 120
Maximum PLANAR-AVERAGE INITIAL ENRICHMENT (wt.% ^{235}U)	≤ 2.7	≤ 2.7 for the UO_2 rods. See Note 3 for MOX rods	≤ 2.7	≤ 2.7	≤ 4.2	≤ 2.7
Initial Maximum Rod Enrichment (wt.% ^{235}U)	≤ 4.0	≤ 4.0	≤ 4.0	≤ 4.0	≤ 5.0	≤ 4.0
No. of Fuel Rods	36	36 (up to 9 MOX rods)	36	49	49	64
Clad O.D. (in.)	≥ 0.5550	≥ 0.5625	≥ 0.5630	≥ 0.4860	≥ 0.5630	≥ 0.4120
Clad I.D. (in.)	≤ 0.4945	≤ 0.4945	≤ 0.4990	≤ 0.4200	≤ 0.4990	≤ 0.3620
Pellet Dia. (in.)	≤ 0.4940	≤ 0.4820	≤ 0.4880	≤ 0.4110	≤ 0.4880	≤ 0.3580
Fuel Rod Pitch (in.)	0.694	0.694	0.740	0.631	0.738	0.523
Active Fuel Length (in.)	≤ 110	≤ 110	≤ 77.5	≤ 79	≤ 150	≤ 110
No. of Water Rods	0	0	0	0	0	0
Water Rod Thickness (in.)	N/A	N/A	N/A	N/A	N/A	N/A
Channel Thickness (in.)	≤ 0.060	≤ 0.060	≤ 0.060	≤ 0.060	≤ 0.120	≤ 0.100

Notes:
1. All dimensions are design nominal values. Maximum and minimum values are specified to bound variations within a given assembly class.
2. Zr designates cladding material made of Zirconium or Zirconium alloys.
3. ≤ 0.612 wt. % ^{235}U and ≤ 1.578 wt. % total fissile plutonium (^{239}Pu and ^{241}Pu).

Table 2.1-3 (continued)
BWR FUEL ASSEMBLY CHARACTERISTICS (note 1)

Fuel Assembly Array/Class	8x8B	8x8C	8x8D	8x8E	9x9A (Note 3)	9x9B
Clad Material (note 2)	Zr	Zr	Zr	Zr	Zr	Zr
Design Initial U (kg/assy.)	≤ 185	≤ 185	≤ 185	≤ 180	≤ 173	≤ 173
Maximum PLANAR-AVERAGE INITIAL ENRICHMENT (wt.% ^{235}U)	≤ 4.2	≤ 4.2	≤ 4.2	≤ 4.2	≤ 4.2	≤ 4.2
Initial Maximum Rod Enrichment (wt.% ^{235}U)	≤ 5.0	≤ 5.0	≤ 5.0	≤ 5.0	≤ 5.0	≤ 5.0
No. of Fuel Rods	63	62	60	59	74/66 (note 3)	72
Clad O.D. (in.)	≥ 0.4840	≥ 0.4830	≥ 0.4830	≥ 0.4930	≥ 0.4400	≥ 0.4330
Clad I.D. (in.)	≤ 0.4250	≤ 0.4250	≤ 0.4190	≤ 0.4250	≤ 0.3840	≤ 0.3810
Pellet Dia. (in.)	≤ 0.4160	≤ 0.4160	≤ 0.4110	≤ 0.4160	≤ 0.3760	≤ 0.3740
Fuel Rod Pitch (in.)	0.636 - 0.641	0.636 - 0.641	0.640	0.640	0.566	0.569
Design Active Fuel Length (in.)	≤ 150	≤ 150	≤ 150	≤ 150	≤ 150	≤ 150
No. of Water Rods	1	2	1 - 4 (note 5)	5	2	1 (Note 4)
Water Rod Thickness (in.)	≥ 0.034	> 0.00	> 0.00	≥ 0.034	> 0.00	> 0.00
Channel Thickness (in.)	≤ 0.120	≤ 0.120	≤ 0.120	≤ 0.100	≤ 0.120	≤ 0.120

Notes:
1. All dimensions are design nominal values. Maximum values are specified to bound variations within a given array type.
2. Zr designates cladding material made of Zirconium or Zirconium alloys.
3. This assembly class contains 74 total rods; 66 full length rods and 8 partial length rods.
4. Square, replacing nine fuel rods.
5. Variable.

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Table 2.1-3 (continued)
BWR FUEL ASSEMBLY CHARACTERISTICS (note 1)

Fuel Assembly Array/Class	9x9C	9x9D	9x9E	9x9F	10x10A (Note 3)
Clad Material	Zr	Zr	Zr	Zr	Zr
Design Initial U (kg/assy.)	≤ 173	≤ 170	≤ 170	≤ 170	≤ 182
Maximum PLANAR-AVERAGE INITIAL ENRICHMENT (wt.% ^{235}U)	≤ 4.2	≤ 4.2	≤ 4.2	≤ 4.2	≤ 4.2
Initial Maximum Rod Enrichment (wt.% ^{235}U)	≤ 5.0	≤ 5.0	≤ 5.0	≤ 5.0	≤ 5.0
No. of Fuel Rods	80	79	76	76	92/78
Clad O.D. (in.)	≥ 0.4230	≥ 0.4240	≥ 0.4170	≥ 0.4430	≥ 0.4040
Clad I.D. (in.)	≤ 0.3640	≤ 0.3640	≤ 0.3590	≤ 0.3810	≤ 0.3520
Pellet Dia. (in.)	≤ 0.3565	≤ 0.3565	≤ 0.3525	≤ 0.3745	≤ 0.3455
Fuel Rod Pitch (in.)	0.572	0.572	0.572	0.572	0.510
Design Active Fuel Length (in.)	≤ 150	≤ 150	≤ 150	≤ 150	≤ 150
No. of Water Rods	1	2	5	5	2
Water Rod Thickness (in.)	0.020	≥ 0.0305	≥ 0.0305	≥ 0.0305	≥ 0.0300
Channel Thickness (in.)	≤ 0.100	≤ 0.100	≤ 0.100	≤ 0.100	≤ 0.120

Notes:
1. All dimensions are design nominal values. Maximum values are specified to bound variations within a given array type.
2. Zr designates cladding material made of Zirconium or Zirconium alloys.
3. This assembly class contains 92 total fuel rods; 78 full length rods and 14 partial length rods.

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Table 2.1-3 (continued)
BWR FUEL ASSEMBLY CHARACTERISTICS (note 1)

Fuel Assembly Array/Class	10x10B	10x10C	10x10D	10x10E
Clad Material (note 2)	Zr	Zr	SS	SS
Design Initial U (kg/assy.)	≤ 182	≤ 180	≤ 125	≤ 125
Maximum PLANAR-AVERAGE INITIAL ENRICHMENT (wt.% ^{235}U)	≤ 4.2	≤ 4.2	≤ 4.0	≤ 4.0
Initial Maximum Rod Enrichment (wt.% ^{235}U)	≤ 5.0	≤ 5.0	≤ 5.0	≤ 5.0
No. of Fuel Rods	91/83 (note 3)	96	100	96
Clad O.D. (in.)	≥ 0.3957	≥ 0.3790	≥ 0.3960	≥ 0.3940
Clad I.D. (in.)	≤ 0.3480	≤ 0.3294	≤ 0.3560	≤ 0.3500
Pellet Dia. (in.)	≤ 0.3420	≤ 0.3224	≤ 0.3500	≤ 0.3430
Fuel Rod Pitch (in.)	0.510	0.488	0.565	0.557
Design Active Fuel Length (in.)	≤ 150	≤ 150	≤ 83	≤ 83
No. of Water Rods	1 (Note 4)	5 (Note 5)	0	4
Water Rod Thickness (in.)	> 0.00	≥ 0.034	N/A	≥ 0.022
Channel Thickness (in.)	≤ 0.120	≤ 0.055	≤ 0.080	≤ 0.080

Notes:

1. All dimensions are design nominal values. Maximum values are specified to bound variations within a given array type.
2. Zr designates cladding material made of Zirconium or Zirconium alloys.
3. This assembly class contains 91total fuel rods; 83 full length rods and 8 partial length rods.
4. Square, replacing nine fuel rods.
5. One diamond shaped water rod replacing the four center fuel rods and four rectangular water rods dividing the assembly into four quadrants.

Table 2.1-4
FUEL ASSEMBLY COOLING AND DECAY HEAT GENERATION

Post-irradiation Cooling Time (years)	MPC-24 PWR Assembly Decay Heat (Watts)	MPC-68 BWR Assembly Decay Heat (Watts)
5	≤ 792	≤ 272
≤ 6	≤ 773	≤ 261
≤ 7	≤ 703	≤ 238
≤ 8	≤ 698	≤ 236
≤ 9	≤ 692	≤ 234
≤ 10	≤ 687	≤ 232
≤ 11	≤ 683	≤ 231
≤ 12	≤ 678	≤ 229
≤ 13	≤ 674	≤ 228
≤ 14	≤ 669	≤ 227
> 14	≤ 665	≤ 226

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Table 2.1-5
FUEL ASSEMBLY COOLING AND AVERAGE BURNUP

Post-irradiation Cooling Time (years)	MPC-24 PWR Assembly Burnup (MWD/MTU)	MPC-68 BWR Assembly Burnup (MWD/MTU)
≥ 5	≤ 28,700	≤ 26,000
≥ 6	≤ 32,800	≤ 29,100
≥ 7	≤ 33,300	≤ 29,600
≥ 8	≤ 35,600	≤ 31,400
≥ 9	≤ 37,000	≤ 32,800
≥ 10	≤ 38,300	≤ 33,800
≥ 11	≤ 39,300	≤ 34,800
≥ 12	≤ 40,200	≤ 35,500
≥ 13	≤ 40,900	≤ 36,200
≥ 14	≤ 41,500	≤ 36,900
≥ 15	≤ 42,100	≤ 37,600

3.0 LIMITING CONDITION 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 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.~~ A.4

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.

LCO 3.0.3 Not applicable to ~~an SFSC system~~ a CASK A.2

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 a~~n SFSC~~ CASK A.2

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.~~ A.4

Not applicable to a CASK.

LCO 3.0.6 Not applicable to a~~n SFSC system~~ CASK A.2

LCO 3.0.7 Not applicable to a~~n SFSC system~~ CASK A.2

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.~~ A.5

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

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SR 3.0.3 (continued)

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 ~~SFSC~~ CASK A.2

Insert ITS 3.1.1 M.1

There are no Design Features applicable to a CASK

A.6

4.0 DESIGN FEATURES

4.1 Site

4.1.1 Site Location

Not applicable.

4.2 Storage Features

4.2.1 Storage Cask

The HI-STAR 100 System consists of the OVERPACK and its integral multi-purpose canister (MPC).

4.2.2 Storage Capacity

The total storage capacity of the ISFSI is limited by plant-specific license conditions.

4.2.3 Storage Pad(s)

Not applicable.

4.3 Codes and Standards

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The American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), 1995 Edition with Addenda through 1997, is the governing Code for the HI-STAR 100 cask system.

4.3.1 Exceptions to Codes, Standards, and Criteria

Table 4-1 lists all approved exceptions.

LIST OF ASME CODE EXCEPTIONS FOR HI-STAR 100 SYSTEM

Table 4-1

Component	Reference ASME Code Section/Article	Code Requirement	Exception, Justification & Compensatory Measures
MPC	NB-1100	Statement of requirements for Code stamping of components.	MPC enclosure vessel is designed and will be fabricated in accordance with ASME Code, Section III, Subsection NB to the maximum practical extent, but Code stamping is not required.
MPC	NB-2000	Requires materials to be supplied by ASME-approved material supplier.	Materials will be supplied by Holtec approved suppliers with Certified Material Test Reports (CMTRs) in accordance with NB-2000 requirements.
MPC Lid and Closure Ring Welds	NB-4243	Full penetration welds required for Category C Joints (flat head to main shell per NB-3352.3)	MPC lid and closure ring are not full penetration welds. They are welded independently to provide a redundant seal. Additionally, a weld efficiency factor of 0.45 has been applied to the analyses of these welds.
MPC Closure Ring, Vent and Drain Cover Plate Welds	NB-5230	Radiographic (RT) or ultrasonic (UT) examination required.	Root and final liquid penetrant examination to be performed in accordance with NB-5245. The MPC vent and drain cover plate welds are leak tested. The closure ring provides independent redundant closure for vent and drain cover plates.

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Component	Reference ASME Code Section/Article	Code Requirement	Exception, Justification & Compensatory Measures
MPC Enclosure Vessel and Lid	NB-6111	All completed pressure retaining systems shall be pressure tested. **Exception, Justification & Compensatory Measures (cont'd)** (cont'd from bottom of fourth column) bead. The inspection process, including findings, (indications) shall be made a permanent part of the certificate holder's records by video, photographic, or other means which provide an equivalent retrievable record of weld integrity. The video or photographic records should be taken during the final interpretation period described in ASME Section V, Article 6, T-676. The vent/drain cover plate weld is confirmed by leakage testing and liquid penetrant examination and the closure ring weld is confirmed by liquid penetrant examination. The inspection of the weld must be performed by qualified personnel and shall meet the acceptance requirements of ASME Code Section III, NB-5350 for PT or NB-5332 for UT.	The MPC enclosure vessel is seal welded in the field following fuel assembly loading. The MPC enclosure vessel shall then be hydrostatically tested as defined in Chapter 9. Accessibility for leakage inspections preclude a Code compliant hydrostatic test. All MPC enclosure vessel welds (except closure ring and vent/drain cover plate) are inspected by volumetric examination, except the MPC lid-to-shell weld shall be verified by either volumetric or multi layer PT examination. If , PT alone is used, at a minimum, it must include the root and final layers and sufficient intermediate layers to detect critical flaws. For either UT or PT, the maximum undetectable flaw size must be demonstrated to be less than the critical flaw size. The critical flaw size must be determined in accordance with ASME Section XI methods. The critical flaw size shall not cause the primary stress limits of NB-3000 to be exceeded. Flaws in austenitic stainless are not expected to exceed the

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Component	Reference ASME Code Section/Article	Code Requirement	Exception, Justification & Compensatory Measures
MPC Enclosure Vessel	NB-7000	Vessels are required to have overpressure protection.	No overpressure protection is provided. Function of MPC enclosure vessel is to contain radioactive contents under normal, off-normal, and accident conditions of storage. MPC vessel is designed to withstand maximum internal pressure considering 100% fuel rod failure and maximum accident temperatures.
MPC Enclosure Vessel	NB-8000	States requirements for nameplates, stamping and reports per NCA-8000.	HI-STAR 100 System to be marked and identified in accordance with 10CFR71 and 10CFR72 requirements. Code stamping is not required. QA data package to be in accordance with Holtec approved QA program.
Overpack Helium Retention Boundary	NB-1100	Statement of requirements for Code stamping of components.	Overpack helium retention boundary is designed, and will be fabricated in accordance with ASME Code, Section III, Subsection NB to the maximum practical extent, but Code stamping is not required.
Overpack Helium Retention Boundary	NB-2000	Requires materials to be supplied by ASME approved Material Supplier.	Materials will be supplied by Holtec approved suppliers with CMTRs per NB-2000.

Component	Reference ASME Code Section/Article	Code Requirement	Exception, Justification & Compensatory Measures
Overpack Helium Retention Boundary	NB-7000	Vessels are required to have overpressure protection.	No overpressure protection is provided. Function of overpack vessel is to contain helium contents under normal, off-normal, and accident conditions. Overpack vessel is designed to withstand maximum internal pressure and maximum accident temperatures.
Overpack Helium Retention Boundary	NB-8000	Statement of Requirements for nameplates, stamping and reports per NCA-8000.	HI-STAR 100 System to be marked and identified in accordance with 10CFR71 and 10CFR72 requirements. Code stamping is not required. QA data package to be in accordance with Holtec's approved QA program.
MPC Basket Assembly	NG-2000	Requires materials to be supplied by ASME approved Material Supplier.	Materials will be supplied by Holtec approved supplier with CMTRs in accordance with NG-2000 requirements.
MPC Basket Assembly	NG-8000	States requirements for nameplates, stamping and reports per NCA-8000.	The HI-STAR 100 System will be marked and identified in accordance with 10CFR71 and 10CFR72 requirements. No Code stamping is required. The MPC basket data package will be in conformance with Holtec's QA program.

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Component	Reference ASME Code Section/Article	Code Requirement	Exception, Justification & Compensatory Measures
Overpack Intermediate Shells	NF-2000	Requires materials to be supplied by ASME approved Material Supplier.	Materials will be supplied by Holtec approved supplier with CMTRs in accordance with NF-2000 requirements.
Overpack Helium Retention Boundary	NB-2330	Defines the methods for determining the T_{NDT} for impact testing of materials.	T_{NDT} shall be defined in accordance with Regulatory Guides 7.11 and 7.12 for the helium retention boundary components.

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2.3

4.4 Site Specific Parameters and Analyses

Site-specific parameters and analyses that will need verification by the system user, are as a minimum, as follows:

1. The temperature of 80°F is the maximum average yearly temperature. The average daily ambient temperature shall be 100°F or less.

2. The temperature extremes of 125°F with incident solar radiation and -40°F for storage of the MPC inside the cask.

3. The horizontal and vertical seismic acceleration levels are bounded by the values listed below in Table 4-2.

Table 4-2
Design-Basis Earthquake Input on the Top Surface of an ISFSI Pad

Horizontal g-level in each of two orthogonal directions	Horizontal g-level Vector Sum	Corresponding Vertical g-level (upward)
0.222 g	0.314 g	1.00 x 0.222 g = 0.222 g
0.235 g	0.332 g	0.75 x 0.235 g = 0.176 g
0.24 g	0.339 g	0.667 x 0.24 g = 0.160 g
0.25 g	0.354 g	0.500 x 0.25 g = 0.125 g

4. The analyzed flood condition of 13 fps water velocity and a height of 656 feet of water (full submergence of the loaded cask) are not exceeded.

5. The potential for fire and explosion shall be addressed, based on site-specific considerations. This includes the condition that the on-site transporter fuel tank will contain no more than 50 gallons of fuel.

6. In addition to the requirement of 10 CFR 72.212(b)(2)(ii), the cask storage pads and foundation shall include the following characteristics as applicable to the drop and tipover analyses:

   a. Concrete thickness: ≤ 36 inches

   b. Concrete compressive strength: ≤ 4,200 psi

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c. Reinforcement top and bottom (Both Directions):

Reinforcement area and spacing determined by analysis

Reinforcement yield strength: ≤ 60,000 psi

d. Soil effective modulus of elasticity: ≤ 6,000 psi

7. In cases where engineered features (i.e., berms, shield walls) are used to ensure that the requirements of 10 CFR 72.104(a) are met, such features are to be considered important to safety and must be evaluated to determine the applicable Quality Assurance Category.

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4.5 Design Specifications

4.5.1 Specifications Important for Criticality Control

4.5.1.1 MPC-24

1. Minimum flux trap size: 1.09 in
2. Minimum ^{10}B loading in the Boral neutron absorbers: 0.0267 g/cm^2

4.5.1.2 MPC-68 and MPC-68F

1. Minimum fuel cell pitch: 6.43 in
2. Minimum ^{10}B loading in the Boral neutron absorbers: 0.0372 g/cm^2 in the MPC 68, and .01g/cm^2 in the MPC-68F.

4.5.2. Specifications Important for Thermal Performance

4.5.2.1 OVERPACK

The painted surface of the HI-STAR 100 OVERPACK must have an emissivity no less than 0.85.

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4.6 Training Module

Training modules shall be developed under the general licensee's training program as required by 10 CFR 72.212(b)(6). Training modules shall require a comprehensive program for the operation and maintenance of the HI-STAR 100 spent fuel storage cask system and the independent spent fuel storage installation (ISFSI). The training modules shall include the following elements, at a minimum:

HI-STAR 100 Cask System Design (overview)

ISFSI Facility Design (overview)

Systems, Structures, And Components Important To Safety (overview)

HI-STAR 100 Cask System Topical Safety Analysis Report (overview)

NRC Safety Evaluation Report (overview)

Certificate of Compliance conditions

HI-STAR 100 Cask System Technical Specifications and other conditions for use

HI-STAR 100 Cask System Regulatory Requirements (e.g., 10 CFR Part 72, Subpart K, 10 CFR Part 20, 10 CFR Part 73)

Required Instrumentation and Use

Operating Experience Reviews

HI-STAR 100 Cask System and ISFSI procedures, including:

Procedural overview
Fuel qualification and loading
MPC/OVERPACK rigging and handling, including safe load pathways
MPC welding operations
OVERPACK closure
Auxiliary equipment operation and maintenance (e.g., draining, vacuum drying, helium backfilling, and cooldown)
MPC/OVERPACK pre-operational and in-service inspections and tests
Transfer and securing of the loaded OVERPACK onto the transport vehicle
Transfer and offloading of the OVERPACK at the ISFSI
Preparation of MPC/OVERPACK for fuel unloading
Unloading fuel from the MPC/OVERPACK
Surveillance

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Radiation protection
Maintenance
Security
Off-normal and accident conditions, responses, and corrective actions

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4.7 Pre-Operational Testing and Training Exercise

A dry run training exercise of the loading, closure, handling, unloading, and transfer of the HI-STAR 100 system shall be conducted by the licensee prior to the first use of the system to load spent fuel assemblies. The dry run may be performed in an alternate step sequence from the actual procedures, but all steps must be performed. The dry run shall include but is not limited to the following:

Moving the HI-STAR 100 MPC/OVERPACK into the spent fuel pool.

Preparation of the HI-STAR 100 Cask System for fuel loading.

Selection and verification of specific fuel assemblies to ensure type conformance..

Locating specific assemblies and placing assemblies into the MPC (using a dummy fuel assembly), including appropriate independent verification.

Remote installation of the MPC lid and removal of HI-STAR 100 MPC/OVERRPACK from the spent fuel pool.

MPC welding, NDE inspections, hydrostatic testing, draining, vacuum drying, helium backfilling, and leakage testing.

HI-STAR 100 OVERPACK closure, draining, vacuum drying, helium backfilling and leakage testing.

HI-STAR 100 OVERPACK upending/downending on the horizontal transfer trailer or other transfer device, as applicable to the site's cask handling arrangement.

Placement of the HI-STAR 100 Cask System at the ISFSI.

HI-STAR 100 Cask System unloading, including cooling fuel assemblies, flooding MPC cavity, removing MPC lid welds (for which a mock-up may be used).

L.7

4.8 Special Requirements For First System In Place

~~The heat transfer characteristics of the cask system will be recorded by temperature measurements of the first HI-STAR 100 system placed in service with a heat load equal to or greater than 10 kW.~~

~~A letter report summarizing the results of the measurements shall be submitted to the NRC for each cask subsequently loaded with a higher heatload, up to the 19 kW heat load for the MPC-24 basket or 18.5 kW heat load for the MPC-68 basket. The calculation and the measured temperature data shall be reported to the NRC in accordance with 10 CFR 72.4. The calculation and comparison need not be reported to the NRC for MPCs that are subsequently loaded with lesser loads than the latest reported case.~~

Insert ITS 5.1.1

M.3

ITS 5.1.2

Insert ITS 5.1.2

L.8

~~3.1 SFSC INTEGRITY~~

~~3.1.1 MPC Cavity Vacuum Drying Pressure~~

~~LCO 3.1.1 The MPC cavity vacuum drying pressure shall meet the limit specified in Table 3-1 for the applicable MPC model.~~

~~APPLICABILITY: During LOADING OPERATIONS.~~

~~ACTIONS~~

~~NOTE~~

~~Separate Condition entry is allowed for each SFSC.~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. MPC cavity vacuum drying pressure limit not met.~~	~~A.1 Establish MPC cavity vacuum drying pressure within limit.~~	~~48 hours~~
~~B. Required Action and Associated Completion Time not met.~~	~~B.1 Remove all fuel assemblies from the SFSC.~~	~~30 days~~

~~SURVEILLANCE REQUIREMENTS~~

SURVEILLANCE		FREQUENCY
~~SR 3.1.1.1~~	~~Verify MPC cavity vacuum drying pressure is within limit.~~	~~Within 48 hours after completion of MPC draining.~~

ITS 5.1.2

L.8

3.1 SFSC INTEGRITY

3.1.2 OVERPACK Annulus Vacuum Drying Pressure

LCO 3.1.2 The OVERPACK annulus vacuum drying pressure shall meet the limit specified in Table 3-1 for the applicable MPC model.

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. OVERPACK annulus vacuum drying pressure limit not met.	A.1 Establish OVERPACK annulus vacuum drying pressure within limit.	48 hours
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the SFSC.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify OVERPACK annulus vacuum drying pressure is within limit.	Within 48 hours after completion of OVERPACK annulus draining.

ITS 5.1.2

L.8

3.1 SFSC INTEGRITY

3.1.3 MPC Helium Backfill Density

LCO 3.1.3 The MPC helium backfill density shall meet the limit specified in Table 3-1 for the applicable MPC model.

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

NOTE

Separate Condition entry is allowed for each SFSC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. MPC helium backfill density limit not met.	A.1 Establish MPC helium backfill density within limit.	48 hours
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the SFSC.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Verify MPC helium backfill density is within limit.	Within 24 hours after verifying MPC cavity vacuum drying pressure is within limit.

ITS 5.1.2

L.8

3.1 SFSC INTEGRITY

3.1.4 OVERPACK Annulus Helium Backfill Pressure

LCO 3.1.4 The OVERPACK annulus helium backfill pressure shall meet the limit specified in Table 3-1 for the applicable MPC model.

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. OVERPACK annulus helium backfill pressure limit not met.	A.1 Establish OVERPACK annulus helium backfill pressure within limit.	48 hours
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the SFSC.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify OVERPACK annulus helium backfill pressure is within limit.	Within 24 hours after verifying OVERPACK annulus vacuum drying pressure is within limit

ITS 5.1.2

L.8

3.1 SFSC INTEGRITY

3.1.5 MPC Helium Leak Rate

LCO 3.1.5	The total helium leak rate through the MPC lid confinement weld and the drain and vent port confinement welds shall not exceed the limit specified in Table 3-1 for the applicable MPC model.
APPLICABILITY:	During LOADING OPERATIONS.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. MPC helium leak rate limit not met.	A.1 Establish MPC helium leak rate within limit.	48 hours
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the SFSC.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify MPC helium leak rate is within limit.	Within 48 hours after completion of MPC hydrostatic testing.

ITS 5.1.2

L.8

3.1 SFSC INTEGRITY

3.1.6 OVERPACK Helium Leak Rate

LCO 3.1.6 The total helium leak rate through the following OVERPACK penetration mechanical seals shall meet the limit specified in Table 3-1 for the applicable MPC model.

a. Closure plate inner mechanical seal;

b. Vent port plug seal; and

c. Drain port plug seal

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

NOTE

Separate Condition entry is allowed for each SFSC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. OVERPACK helium leak rate limit not met.	A.1 Establish OVERPACK helium leak rate within limit.	48 hours
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the SFSC.	30 days

ITS 5.1.2

L.8

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify OVERPACK helium leak rate is within limit.	Within 48 hours after verifying OVERPACK annulus helium backfill pressure is within limit.

ITS 5.1.2

L.8

3.1 SFSC INTEGRITY

3.1.8 Fuel Cool-Down

LCO 3.1.8 The MPC exit gas temperature shall be ≤ 200° F prior to initiatation of MPC re-flooding operations.

-----NOTE-----
The LCO is only applicable to wet UNLOADING OPERATIONS.

APPLICABILITY: During UNLOADING OPERATIONS.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. MPC exit temperature not within limit.	A.1 Establish MPC exit gas temperature.	Prior to initiating MPC re-flooding operations

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Verify exit gas temperature.	Prior to initiation of MPC re-flooding operations.

ITS 5.1.2

L.8

Table 3-1
MPC Model-Dependent Limits

MPC MODEL	LIMITS
1. MPC-24	
a. MPC Cavity Vacuum Drying Pressure	≤ 3 torr for ≥ 30 min
b. OVERPACK Annulus Vacuum Drying Pressure	≤ 3 torr for ≥ 30 min
c. MPC Helium Backfill Density[1]	0.1212 g-moles/liter +0% and -5%
d. OVERPACK Annulus Helium Backfill Pressure	≥ 10 psig and ≤ 14 psig
e. MPC Helium Leak Rate	≤ 5.0E-6 std cc/sec (He)
f. OVERPACK Helium Leak Rate	≤ 4.3E-6 std cc/sec (He)
2. MPC-68	
a. MPC Cavity Vacuum Drying Pressure	≤ 3 torr for ≥ 30 min
b. OVERPACK Annulus Vacuum Drying Pressure	≤ 3 torr for ≥ 30 min
c. MPC Helium Backfill Density[1]	0.1218 g-moles/liter +0% and -10%
d. OVERPACK Annulus Helium Backfill Pressure	≥ 10 psig and ≤ 14 psig
e. MPC Helium Leak Rate	≤ 5.0E-6 std cc/sec (He)
f. OVERPACK Helium Leak Rate	≤ 4.3E-6 std cc/sec (He)
3. MPC-68F	
a. MPC Cavity Vacuum Drying Pressure	≤ 3 torr for ≥ 30 min
b. OVERPACK Annulus Vacuum Drying Pressure	≤ 3 torr for ≥ 30 min
c. MPC Helium Backfill Density[1]	0.1218 g-moles/liter +0% and -10%
d. OVERPACK Annulus Helium Backfill Pressure	≥ 10 psig and ≤ 14 psig
e. MPC Helium Leak Rate	≤ 5.0E-6 std cc/sec (He)
f. OVERPACK Helium Leak Rate	≤ 4.3E-6 std cc/sec (He)

[1]Helium used for backfill of MPC shall have a purity of ≥ 99.995%.

ITS 5.1.2

L.8

3.2 SFSC RADIATION PROTECTION

3.2.1 Overpack Average Surface Dose Rates

LCO 3.2.1 Overpack dose rates shall be measured at the locations shown in Figure 3.2.1-1. The average surface dose rates of each overpack shall not exceed:

a. 125 mrem/hour (neutron + gamma) on the side;

b. 80 mrem/hour (neutron + gamma) on the top;

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

NOTE

Separate Condition entry is allowed for each SFSC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Overpack average surface dose rate limits not met.	A.1 Administratively verify correct fuel loading. AND A.2 Perform analysis to verify compliance with the ISFSI offsite radiation protection requirements of 10 CFR Part 20 and 10 CFR Part 72.	24 hours Prior to TRANSPORT OPERATIONS
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the SFSC.	30 days

ITS 5.1.2

L.8

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify average surface dose rates of overpack containing fuel assemblies are within limits.	Prior to TRANSPORT OPERATIONS

ITS 5.1.2

L.8

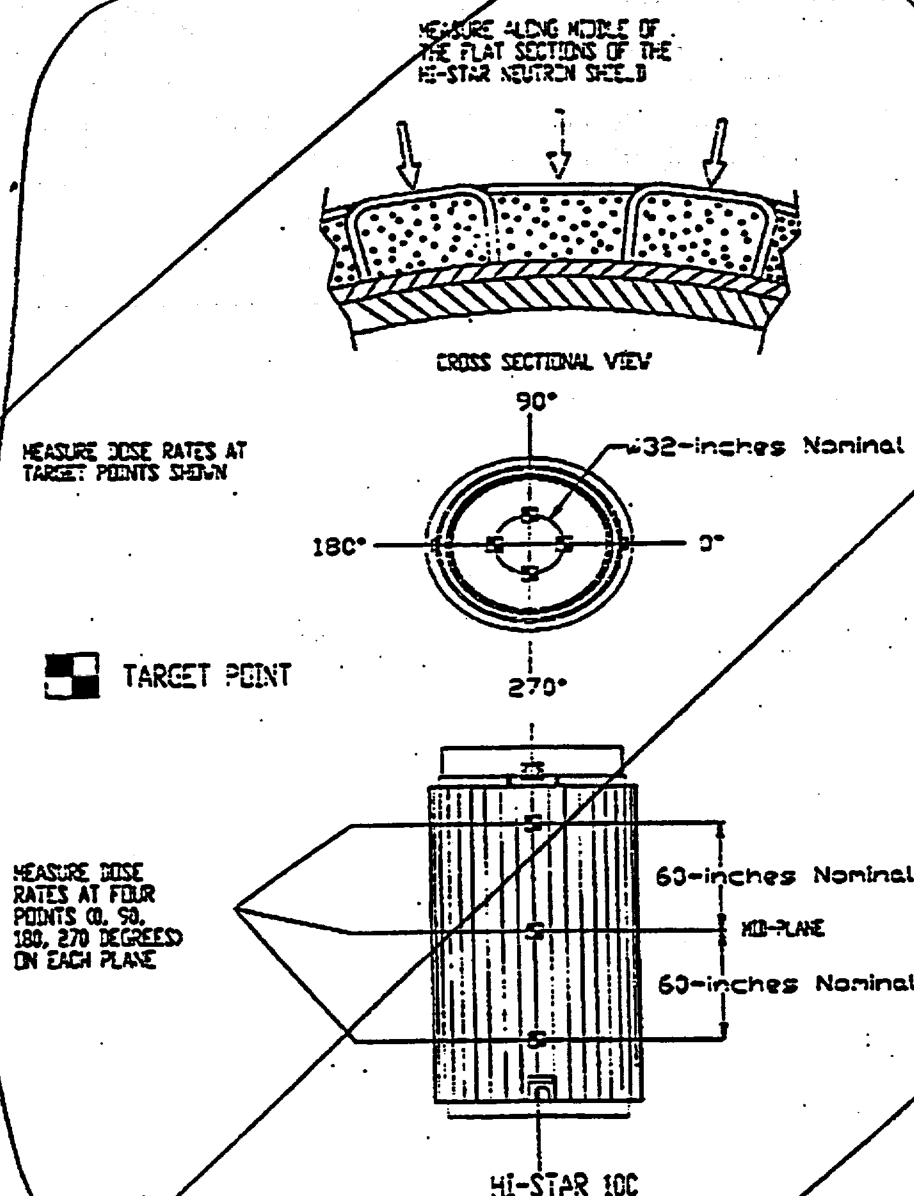

Figure 3.2.1-1
OVERPACK Surface Dose Rate Measurement Locations

ITS 5.1.2

L.8

3.2 SFSC RADIATION PROTECTION

3.2.2 SFSC Surface Contamination

LCO 3.2.2 Removable contamination on the exterior surfaces of the OVERPACK and accessible portions of the MPC shall each not exceed:

a. 1000 dpm/100 cm^2 from beta and gamma sources; and

b. 20 dpm/100 cm^2 from alpha sources.

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

NOTE

Separate Condition entry is allowed for each SFSC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SFSC removable surface contamination limits not met.	A.1 Restore SFSC removable surface contamination to within limits.	Prior to TRANSPORT OPERATIONS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify that the removable contamination on the exterior surfaces of the OVERPACK and accessible portions of the MPC containing fuel is within limits.	Prior to TRANSPORT OPERATIONS

ITS 5.1.3

Insert ITS 5.1.3

L.9

~~3.1 SFSC INTEGRITY~~

~~3.1.7 SFSC Lifting Requirements~~

~~LCO 3.1.7~~ ~~An OVERPACK loaded with spent fuel shall be lifted in accordance with either of the following requirements:~~

~~a. i A lift height ≤ 21 inches when oriented vertically.~~

~~AND~~

~~ii A lift height ≤ 72 inches when oriented horizontally.~~

~~OR~~

~~b. The OVERPACK is lifted with lifting devices designed in accordance with ANSI N14.6 and having redundant drop prevention design features.~~

~~APPLICABILITY: During TRANSPORT OPERATIONS.~~

~~ACTIONS~~

~~NOTE~~

~~Separate Condition entry is allowed for each SFSC.~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. SFSC lifting requirements not met.~~	~~A.1 Initiate actions to meet SFSC lifting requirements.~~	~~Immediately~~

TTS 5.1.3

L.9

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Verify SFSC lifting requirements are met.	After the SFSC is suspended from, or secured in the transporter and prior to the transporter beginning to move the SFSC to/from the ISFSI

Insert ITS 5.1.4

M.1

Insert ITS 5.2.1

L.8

ADMINISTRATIVE CHANGES

A.1 Definitions in the CTS which do not appear in the generic CASK ITS have been eliminated. This change is administrative because the deletion of definitions does not, in itself, change requirements. The deletion of the definitions in other Specifications will be justified in different DOCs.

A.2 Two defined terms are added to the CTS. The term CASK is used throughout the generic fuel storage ITS as a non-vendor specific term to refer to a fuel storage system. The term "SAR" is defined to provide an unambiguous reference to the Safety Analysis Report referenced in the Certificate of Compliance issued for the CASK. The addition of these terms is administrative as they do not create, modify, or remove requirements and represent an editorial preference.

A.3 The Use and Application rules in Section 1.2, Logical Connectors, Section 1.3, Completion Times, and Section 1.4, Frequency, are revised to be consistent with the generic fuel storage ITS and to eliminate those features which do not apply to the fuel storage generic ITS. The revisions are administrative because they do not create, modify, or eliminate requirements, but describe the conventions used in the fuel storage ITS.

A.4 LCO 3.0.5 is not applicable to a CASK and is removed. The CASK ITS does not direct equipment to be removed from service in ACTIONS. Therefore, the LCO 3.0.5 allowance to return such equipment to service for testing is not required. This change is designated as administrative because elimination of an unused provision does not result in a technical change to the specifications.

A.5 The portion of SR 3.0.2 which discusses Frequencies specified as "once" and "once per" is deleted as it is not applicable. The CASK ITS does not use these Frequency specifications. This change is designated as administrative because elimination of an unused feature does not result in a technical change to the specifications.

A.6 The Design Features Sections 4.1, Site, and 4.2, Storage Features, are deleted. These sections contain no requirements. This change is designated administrative because it does not result in a technical change to the specifications.

MORE RESTRICTIVE CHANGES

M.1 The CTS does not contain a requirement to periodically verify CASK storage integrity. ITS 3.1.1 provides a periodic test for CASK storage integrity. In addition, should the LCO not be met, Actions require immediate action to restore storage integrity. If storage integrity is not restored with 30 days, a special report must be provided to the NRC describing the cause of the loss of storage integrity and the plans and schedule for restoring storage integrity.

The capability of a CASK to be periodically monitored such that the licensee will be able to determine when corrective action needs to be taken to maintain safe store conditions is required by 10 CFR part 72.122(h)(4). Methods of monitoring storage integrity vary by CASK design. Therefore, the details of the monitoring and the Frequency by which the CASK must be monitored are located in a CASK Storage Integrity Program. The CASK Storage Integrity Program is required by the Administrative Controls. The details of the CASK Storage Integrity Program will be located in the SAR for the CASK design. The details of the special report that must be filed with the NRC if CASK storage integrity is lost and not restored within 30 days are located in the CASK Storage Integrity Report described in the Administrative Controls. This change is designated as more restrictive because it adds additional controls to the Technical Specifications.

M.2 The CTS does not contain an Administrative Control section of the Technical Specifications. The ITS adds Chapter 5, Administrative Controls.

This change is acceptable because it is required by the regulations. Administrative Controls are required in all Technical Specifications in accordance with 10 CFR 72.44(c) and 10 CFR 72.44(c)(5). This change is designated as more restrictive because it adds additional controls to the Technical Specifications.

M.3 The CTS does not contain requirements on the radioactive effluent control program. The ITS addresses the radioactive effluent control program.

The Technical Specifications must state how the requirements in 10 CFR 72.44(d) are met. 10 CFR 72.44(d) requires that there be Technical Specifications on radioactive effluents. This is satisfied by the Radioactive Effluent Control Program. Without such a section, the proposed Technical Specifications would not satisfy the requirements of 10 CFR 72.44(d).

LESS RESTRICTIVE CHANGES

L.1 The CTS contains detailed descriptions of the fuel which can be stored in the fuel storage CASK. The fuel storage generic ITS does not contain these descriptions and substitutes the requirement, "Only components evaluated in the SAR may be stored in the CASK."

The change is acceptable because the detailed descriptions of the fuel and components to be stored are more appropriate for the SAR. 10 CFR part 72.236 requires the cask vendor to provide specifications for the spent fuel to be stored in the CASK, such as type of spent fuel, maximum allowable enrichment of the fuel prior to any irradiation, burnup, minimum cooling time, maximum heat to be dissipated, spent fuel loading limit, and condition of the spent fuel. This information is an integral part of the evaluations performed on the CASK as documented in the SAR. The CoC, which states the conditions for use of the CASK, states that the CASK is described in the SAR and NRC's SER. Therefore, the user of the CASK must verify that their fuel is authorized to be stored in the CASK. Because the information must appear in the SAR to support the required analyses, duplicating the information in the Technical Specifications provides no advantages and has the disadvantage of duplication, lack of standardization, and retaining a level of detail far outside that appearing in the power plant ITS for items of similar safety significance. This change is designated as less restrictive because it eliminates information which appears in the Technical Specifications.

L.2 CTS Design Features Section 4.3 contains a statement of the governing Code for the CASK and a list of exceptions to Codes, Standards and Criteria. The ITS does not contain this information.

Section 4.3, Codes and Standards, is inappropriate for the Technical Specifications and is eliminated. 10 CFR 72.44(c)(4) defines Design Features. It states, "Design Features include items that would have a significant effect on safety if altered or modified, such materials of construction and geometric arrangements." The Technical Specifications contain operating limits, not manufacturing directions, such as Codes and Standards. This information is appropriate to the SAR, not the operating limits applied in the Technical Specifications. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.3 CTS Design Features Section 4.4 contains a list of site specific parameters and analyses that must be verified by the system user. The ITS does not contain this information.

This section is eliminated because it is unnecessary and could lead a CASK user to not follow the applicable regulations. 10 CFR 72.212(b)(3) requires the user of the CASK to review the SAR and the NRC Safety Evaluation Report to determine whether or not the reactor site parameters envelope the cask design bases. 10 CFR 72.212(b)(2) requires written evaluation of the storage pads and areas. The information in Section 4.4 is a duplication of these existing regulatory requirements and the values listed are only a subset of the complete set of parameters that must be evaluated by the CASK user. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.4 CTS Design Features Section 4.5 provides design specifications for the CASK. The ITS does not contain this information.

This section is inappropriate for the Technical Specifications and is eliminated. These parameters are under the control of the manufacturer, not the operator of the cask and most cannot be verified in the field. These design parameters are appropriate for the SAR, not the operational limitations in the Technical Specifications. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.5 CTS Design Features Section 4.6 contains requirements for a training module to be developed by the user of the CASK. The ITS does not contain this information.

The section is inappropriate for the CASK Technical Specifications and is eliminated. This information is not a Design Feature, but an administrative requirement appropriate for an Administrative Controls chapter. Nevertheless, as stated in the first sentence of the section, a training program is required under 10 CFR 72.212(b)(6). It is also required by 10 CFR Part 72, Subpart I. Repeating that information in the Technical Specifications adds no value and it is unclear why only training was selected for detailed description in the Technical Specifications when 10 CFR 72.212(b)(6) also describes the emergency plan, quality assurance program, and radiation protection program. Chapter 8 of the SAR also contains a description of operational procedures. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.6 CTS Design Features Section 4.7 contains a description of the pre-operational testing and training exercise. This information is not contained in the ITS.

This section is inappropriate for the CASK Technical Specifications and is eliminated. This information is not a Design Feature, but an administrative requirement appropriate for an Administrative Controls chapter. In addition, these one-time tasks are appropriate to the SAR, not the operational restrictions of the Technical Specifications. Pre-operational testing and training exercises do not have a direct effect on safety, as the cask used does not contain fuel. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.7 CTS Design Features Section 4.8 contains special requires for the first system in place. These requirements are not contained in the ITS.

This section is inappropriate for the CASK Technical Specification and is eliminated. This first-use testing is only applicable to the first CASK of the type place in service. Therefore, the requirements will not apply to the majority of CASKs or users of the CASK. This requirement, which is really a requirement on the CASK vendor, not the CASK user, should be relocated the SAR, or the NRC's SER

L.8 The CTS contains CASK-specific requirements on process variables monitored during preparation of a CASK for storage, such as vacuum drying pressure, helium backfill pressure, leak rate testing acceptance criteria, surface dose rates, surface contamination, fuel temperature, and spent fuel pool dissolved boron concentration. These CASK-specific parameters do not appear in the CASK Technical Specifications and a generic CASK Loading, Unloading, and Preparation Program is implemented. This program requires that the SAR requirements for loading fuel into a CASK, unloading fuel from a CASK, and preparing a CASK for storage be implemented.

This change is appropriate because it establishes a generic requirement for control of CASK loading, unloading, and preparation while allowing the CASK-specific methods and parameters to be specified in the SAR. The program replaces the CTS LCOs with CASK-specific parameters and methods, the specific Actions, and the specific Surveillance

Requirements with the requirement that the program include compensatory measures to be taken if a CASK fails to meet the requirements of the program and limits on the length of time that fuel assemblies may remain within the CASK with the requirements of the program not met. This change is designated as less restrictive because requirements that are specified in the CTS are being moved to a program.

L.9 The CTS provides CASK-specific parameters and requirements governing the movement of a CASK, such as maximum lifting height. These CASK-specific parameters do not appear in the CASK Technical Specifications and a generic CASK Transportation Evaluation Program is implemented. This program requires that administrative controls and procedures be established to ensure that CASK transportation is conducted within the limits assumed in the SAR, including maximum lifting height, road conditions, and CASK temperature limits.

This change is appropriate because it establishes a generic requirement for control of CASK transportation while allowing the CASK-specific controls and parameters to be specified in the SAR. The program replaces the CTS LCOs with CASK-specific controls and methods, the specific Actions, and the specific Surveillance Requirements with the requirement that the program include administrative controls and procedures. This change is designated as less restrictive because requirements that are specified in the CTS are being moved to a program.

ATTACHMENT D

TN-32 CASK

ATTACHMENT D.1 - DISPOSITION MATRIX FOR TN-32 CASK

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
1.1	DEFINITIONS	Yes	No	No	No	No	Retained for clarity of the ITS.
1.2	Logical Connectors	Yes	No	No	No	No	Retained for clarity of the ITS.
1.3	Completion Times	Yes	No	No	No	No	Retained for clarity of the ITS.
1.4	Frequency	Yes	No	No	No	No	Retained for clarity of the ITS.
2.0	Functional and Operational Limits	Yes	No	Yes	No	No	This section is required by 72.44. Only sufficient information to determine when the Functional and Operating limits have been violated and the actions to be taken in that circumstance should be in Section 2.0. Detailed description is in the SAR.
3.0	LCO and SR Applicability	Yes	No	No	No	No	Retained for clarity of the ITS.
3.1.1	Cask Cavity Vacuum Drying	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.2	Cask Helium Backfill Pressure	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
3.1.3	Cask Helium Leak Rate	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.4	Combined Helium Leak Rate	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.5	Cask Interseal Pressure	Yes	No	Yes	No	No	Renamed "CASK Storage Integrity." Details relocated to CASK Storage Integrity Program
3.1.6	Cask Minimum Lifting Temperature	Yes	No	Yes	No	No	Details relocated to CASK Transportation Evaluation Program.
3.2.1	Cask Surface Contamination	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.3.1	Dissolved Boron Concentration	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
4.0	Design Features	Yes	No	No	No	No	A Design Features chapter is required under 10 CFR part 72.44.
4.1.1	Criticality	No	No	No	No	No	Deleted. This information is located in the SAR.
4.1.2	Structural Performance	No	No	No	No	No	Deleted. This section does not contain any requirements, just a statement of fact.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
4.1.3	Codes and Standards	No	No	No	No	No	Deleted. Codes and Standards govern the manufacture of fuel storage casks, not their operation. Codes and Standards are not operational requirements. Furthermore, the Codes and Standards are described in the SAR and subject to regulatory control.
4.1.4	Helium Purity	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
4.2	Storage Pad	No	No	No	No	No	Deleted. This storage pad information falls under the site-specific parameters which must be verified prior to use by 72.212(b)(3).
4.3	Site Specific Parameters and Analyses	No	No	No	No	No	Deleted. Paragraph 72.212(b)(3) requires written evaluation that the site specific parameters envelope the assumptions in the CASK design.
5.1	Training Module	No	No	No	No	No	Deleted. Development of a training program is required by Paragraph 72.212(b)(6) and Part 72, Subpart I.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
5.2.1	Cask Sliding Evaluation	No	No	No	No	No	Deleted. Paragraph 72.212(b)(3) requires written evaluation that the site specific parameters envelope the assumptions in the fuel storage cask design.
5.2.2	Cask Transport Evaluation Program	Yes	No	No	No	No	This program is retained as the Cask Transportation Evaluation Program. CASK specific information is relocated to the SAR.
5.2.3	Cask Surface Dose Rate Evaluation Program	No	No	No	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.

ATTACHMENT D.2

MARKUP AND DISCUSSIONS OF CHANGE FOR TN-32 CASK

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.

A.1

Term	Definition
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
CHANNEL OPERATIONAL TEST (COT)	A CHANNEL OPERATIONAL TEST (COT) shall be the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify the operability of required alarm functions. The COT shall include adjustments, as necessary, of the required alarm setpoint so that the setpoint is within the required range and accuracy.
INTACT FUEL ASSEMBLY	Spent Nuclear Fuel Assemblies without known or suspected cladding defects greater than pinhole leaks or hairline cracks and which can be handled by normal means. Partial fuel assemblies, that is fuel assemblies from which fuel rods are missing, shall not be classified as INTACT FUEL ASSEMBLIES unless dummy fuel rods are used to displace an amount of water equal to that displaced by the original fuel rod(s).
LOADING OPERATIONS	LOADING OPERATIONS include all licensed activities on a cask while it is being loaded with fuel assemblies. LOADING OPERATIONS begin when the first fuel assembly is placed in the cask and end when the cask is supported by the transporter.
STORAGE OPERATIONS	STORAGE OPERATIONS include all licensed activities that are performed at the Independent Spent Fuel Storage Installation (ISFSI) while a cask containing spent fuel is sitting on a storage pad within the ISFSI.
TRANSPORT OPERATIONS	TRANSPORT OPERATIONS include all licensed activities performed on a cask loaded with one or more fuel assemblies when it is being moved to and from the ISFSI. TRANSPORT OPERATIONS begin when the cask is first suspended from the transporter and end when the cask is at its destination and no longer supported by the transporter.
UNLOADING OPERATIONS	UNLOADING OPERATIONS include all licensed activities on a cask while fuel assemblies are being unloaded. UNLOADING OPERATIONS begin when the cask is no longer supported by the

ITS 1.1

~~transporter and end when the last fuel assembly is removed from the cask.~~

A.1

Insert ITS definitions of CASK, SAR

A.2

A.3

Insert ITS 1.2

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.

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 . . . AND 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.

ITS 1.2

1.2 Logical Connectors

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 <u>OR</u> 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 <u>AND</u>. 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 <u>OR</u> indicates that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.

Insert ITS 1.2

A.3

ITS 1.3

~~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 minimum requirements for ensuring safe operation of the cask. 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~~	~~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 cask 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 cask is not within the LCO Applicability.~~ ~~Once a Condition has been entered, subsequent subsystems, components, or variables expressed in the Condition, discovered to be not within limits, will not 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.~~

Insert ITS 1.3

A.3

1.3 Completion Times

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. AND B.2 Perform Action B.2	12 hours 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 to 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.

Insert ITS 1.3

A.3

ITS 1.3

1.3 Completion Times

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 Perform Action B.1. AND B.2 Perform Action B.2.	12 hours 36 hours

When a system is determined to not 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, Condition A and B are exited, and therefore, the Required Actions of Condition B may be terminated.

A.3

Insert ITS 1.3

1.3 Completion Times

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 Perform Action B.1. AND B.2 Perform Action B.2.	12 hours 36 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 does not meet the LCO, Condition A is entered and its Completion Time starts. If subsequent components are determined Not to meet the LCO, Condition A is entered for each component and separate Completion Times start and are tracked for each component.

IMMEDIATE

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

Insert ITS 1.3

A.3

ITS 1.4

~~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~~	~~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.~~ ~~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, as well as certain Notes in the Surveillance column that modify performance requirements.~~ ~~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.~~ ~~The use of "met" or "performed" in these instances conveys specific meanings. A Surveillance is "met" only when the acceptance criteria are satisfied. Known failure of the requirements of a Surveillance, even without a Surveillance specifically being "performed," constitutes a Surveillance not "met."~~

Insert ITS 1.4

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ITS 1.4

1.4 Frequency

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 is determined to not meet the LCO, a variable is outside specified limits, or the unit is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while the cask 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 unit 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.

Insert ITS 1.4

A.3

1.4 Frequency

EXAMPLES
(continued)

EXAMPLE 1.4-2:

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify flow is within limits.	Once within 12 hours prior to starting activity AND 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 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.

A.3

Insert ITS 1.4

ITS 2.0

Insert ITS 2.1.1

2.0 Functional and Operating Limits

2.1 Fuel To Be Stored In The TN-32 Cask

The spent nuclear fuel to be stored in the TN-32 cask shall meet the following requirements:

a. Fuel shall be unconsolidated INTACT FUEL ASSEMBLIES.

b. Fuel shall be limited to fuel with zircaloy cladding.

c. Fuel types shall be limited to the fuel types below with maximum uranium content as follows:

Westinghouse 14x14 Std ZCA and ZCB:	0.4144 MTU/assy.
Westinghouse 15x15:	0.4671 MTU/assy.
Westinghouse 17x17 Std:	0.4671 MTU/assy.
Westinghouse 14x14 OFA:	0.3611 MTU/assy.
Westinghouse 17x17 OFA:	0.4282 MTU/assy.

L.1

d. Fuel may include burnable poison rod assemblies (BPRA's) having the acceptable combination of burnup and cooling time described by Figure 2.1.1-1.

e. Fuel may include thimble plug assemblies (TPA's) having the acceptable combination of burnup and cooling time described by Figure 2.1.1-2.

f. Fuel assemblies shall have the following bounding characteristics:

i. The maximum initial enrichment shall not exceed 4.05 weight percent.
ii. The maximum assembly average burnup shall not exceed 45,000 MWD/MTU
iii. The minimum cooling time prior to loading shall be as specified in Table 2.1.1-1.
iv. The maximum heat load per assembly shall not exceed 1.02 kW.

2.2 Functional and Operating Limits Violations

If any Functional and Operating Limit of 2.1 is violated, the following actions shall be completed: L.1

2.2.1 The affected ~~fuel assemblies~~ shall be ~~removed from the cask and~~ placed in a safe condition. L.10

2.2.2 Within 24 hours, notify the NRC Operations Center.

2.2.3 Within 30 days, submit a special report which describes the cause of the violation and the actions taken to restore compliance and prevent recurrence.

ITS 2.0

Table 2.1.1-1
Minimum Acceptable Cooling Time as a Function of Burnup and Initial Enrichment

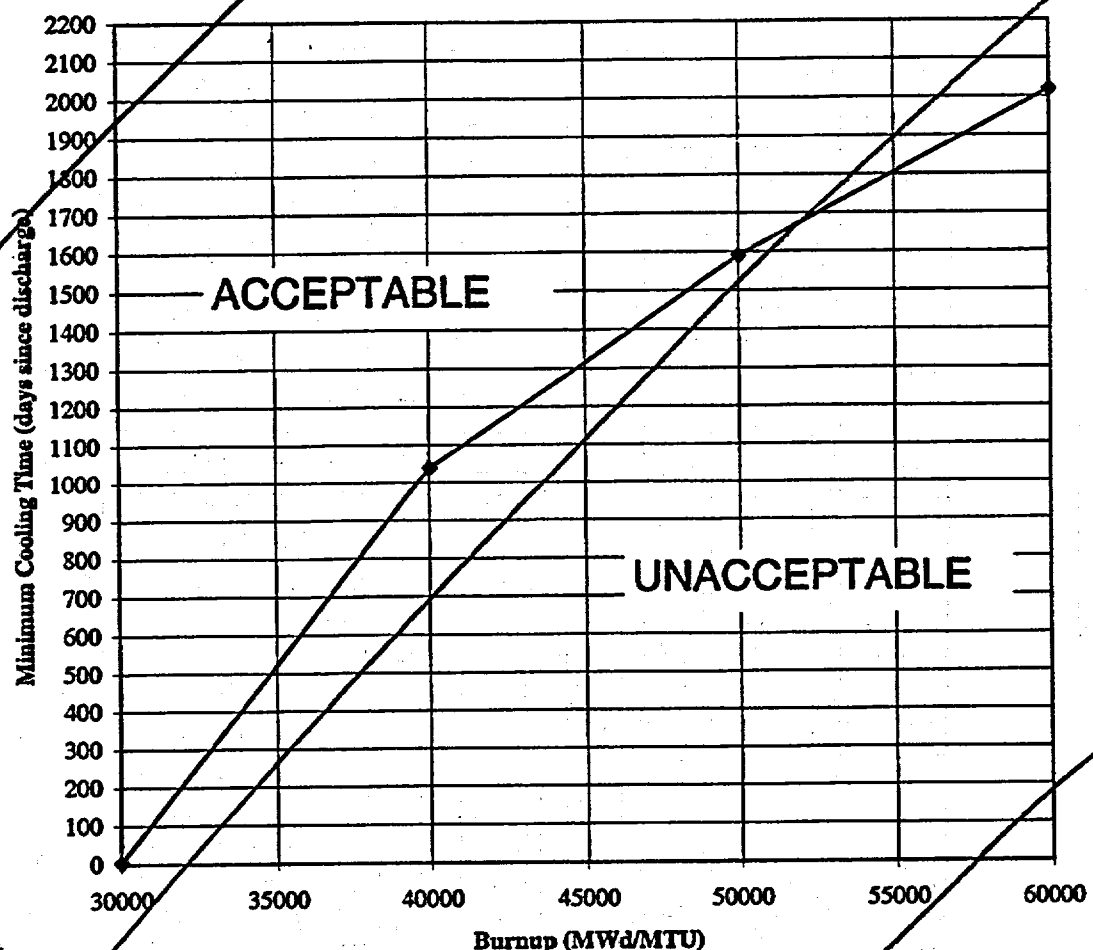
Initial Enrichment (% wt)	Burnup (GWd/MTU)																
	15	20	30	32	33	34	35	36	37	38	39	40	41	42	43	44	45
1.2	7	7															
1.3	7	7															
1.4	7	7															
1.5	7	7	7	8	8	8	8	9									
1.6	7	7	7	7	8	8	8	9	9	9	9						
1.7	7	7	7	7	8	8	8	8	9	9	9	10					
1.8	7	7	7	7	7	8	8	8	9	9	9	10					
1.9	7	7	7	7	7	7	8	8	8	9	9	9	10	10			
2.0	7	7	7	7	7	7	8	8	8	8	9	9	9	10	10		
2.1	7	7	7	7	7	7	7	8	8	8	9	9	9	10	10		
2.2	7	7	7	7	7	7	7	7	8	8	8	9	9	9	10	10	
2.3	7	7	7	7	7	7	7	7	8	8	8	9	9	9	10	10	
2.4	7	7	7	7	7	7	7	7	8	8	8	8	9	9	9	10	10
2.5	7	7	7	7	7	7	7	7	7	8	8	8	8	9	9	9	10
2.6	7	7	7	7	7	7	7	7	7	7	8	8	8	8	9	9	10
2.7	7	7	7	7	7	7	7	7	7	7	8	8	8	8	9	9	9
2.8	7	7	7	7	7	7	7	7	7	7	8	8	8	8	9	9	9
2.9	7	7	7	7	7	7	7	7	7	7	7	8	8	8	8	9	9
3.0	7	7	7	7	7	7	7	7	7	7	7	7	8	8	8	9	9
3.1	7	7	7	7	7	7	7	7	7	7	7	7	8	8	8	9	9
3.2	7	7	7	7	7	7	7	7	7	7	7	7	7	8	8	8	8
3.3	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8	8	8
3.4	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8	8	8
3.5	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
3.6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
3.7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
3.8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
3.9	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
4.05	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

■ - not evaluated

Units in years

L.1

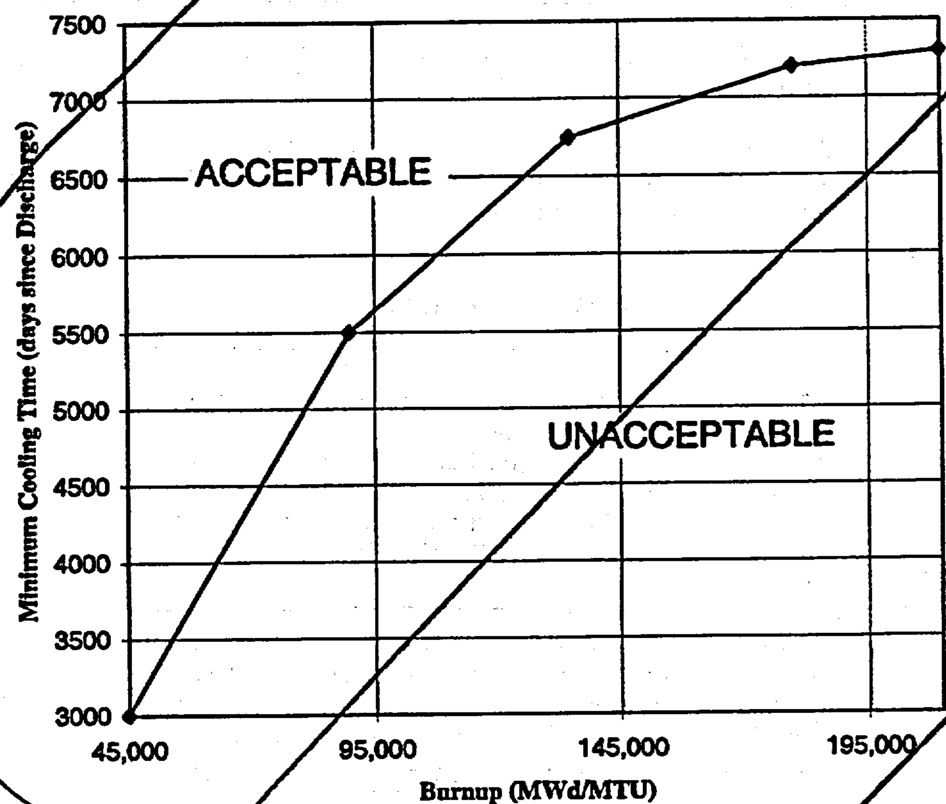
Figure 2.1.1-1
Burnable Poison Rod Assemblies (BPRAs)
Minimum Acceptable Cooling Time as a Function of Burnup



2.1

ITS 2.0

Figure 2.1.1-2
Thimble Plug Assemblies (TPAs)
Minimum Acceptable Cooling Time as a Function of Burnup



L.1

ITS 3.0

3.0 LIMITING CONDITION 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	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~~. (A.4) 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.
LCO 3.0.3	Not applicable to a ~~cask~~ CASK (A.2)
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 a ~~cask~~ CASK. (A.2) ~~Exceptions to this Specification are stated in the individual Specifications. These exceptions allow entry into specified conditions in the Applicability when the associated ACTIONS to be entered allow operation in the specified condition in the Applicability only for a limited period of time.~~ (A8)
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 required to demonstrate that the LCO is met.~~ (A.4) Not applicable to a CASK
LCO 3.0.6	Not applicable to a ~~cask~~ CASK (A.2)
LCO 3.0.7	Not applicable to a ~~cask~~ CASK (A.2)

ITS SR 3.0

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.~~ A.5

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 a ~~cask~~ CASK. A.2

ITS 3.1.1

Storage

M.1

STORAGE

3.1 CASK INTEGRITY

3.1.5 Cask Interseal Pressure

LCO 3.1.5 Cask interseal pressure shall be maintained at a pressure of at least 3.2 atm abs

APPLICABILITY: During STORAGE OPERATIONS.

ACTIONS

NOTE

Separate Condition entry is allowed for each cask.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Cask interseal pressure below limit.	A.1 Reestablish cask interseal pressure above limit.	7 days
B. Required Action A.1 and associated Completion Time not met.	B.1 Remove all fuel assemblies from cask.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify cask interseal helium pressure above limit.	7 days
SR 3.1.5.2	Perform a CHANNEL OPERATIONAL TEST (COT) to verify proper functioning of pressure switch / transducer on cask overpressure system.	Once, within 7 days of commencing STORAGE OPERATIONS and every 36 months thereafter

M.1

Insert ITS 3.1.1

ITS 3.1.1

M.1

3.1 CASK INTEGRITY

3.1.4 Combined Helium Leak Rate

LCO 3.1.4 The combined helium leak rate for all closure seals and the overpressure system shall not exceed 1.0 E-5 std cc/sec.

APPLICABILITY: During STORAGE.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
-----NOTE----- Not applicable until SR 3.1.4.1 is performed. A. Combined helium leak rate not met.	A.1 Establish combined helium leak rate within limit.	48 hours
B. Required Action A.1 and associated Completion Time are not met.	B.1 Remove all fuel assemblies from cask.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
-----NOTE----- This surveillance may be combined with SR 3.1.3.1. SR 3.1.4.1 Verify the combined helium leak rate is within the limit.	Once prior to transport OR Once within 48 hours of TRANSPORT to ISFSI.

ITS 4.0

There are no Design Features applicable to a CASK.

A.6

4.0 DESIGN FEATURES

~~The specifications in this section include the design characteristics of special importance to each of the physical barriers and to maintenance of safety margins in the cask design. The principal objective of this category is to describe the design envelope which might constrain any physical changes to essential equipment. Included in this category are the site environmental parameters which provide the bases for design, but are not inherently suited for description as LCOs.~~

4.1 Storage Cask

L.4

4.1.1 Criticality

~~The design of the storage cask, including spatial constraints on adjacent assemblies (minimum basket cell opening of 8.64 in. sq.) and the boron content of the basket material (minimum areal density equal to 10 mg B^{10}/cm^2) shall ensure that fuel assemblies are maintained in a subcritical condition with a k_{eff} of less than 0.95 under all conditions of operation.~~

4.1.2 Structural Performance

~~The cask has been evaluated for a cask tipover (equivalent to a side drop of 67 g's) and a bottom end drop resulting in an axial gravitational (g) loading of 50 g's.~~

A.7

4.1.3 Codes and Standards

~~The TN-32 cask confinement boundary is designed and fabricated in accordance with Subsection NB of the ASME Code. Exceptions to the code are listed in Table 4.1-1. The cask gamma shielding has been evaluated in accordance with Subsection NB of the ASME code with the exceptions listed in Table 4.1-1. The basket is designed in accordance with Subsection NB of the ASME Code. The basket is inspected as shown in Table 4.1-1.~~

L.2

~~Proposed alternatives to ASME Code Section III, 1992 Edition including exceptions allowed by Table 4.1-1 may be used when authorized by the Director of the Office of Nuclear Material Safety and Safeguards or Designee. The applicant should demonstrate that:~~

1. ~~The Proposed alternatives would provide an acceptable level of quality and safety, or~~

2. ~~Compliance with the specified requirements of ASME Code, Section III, 1992 Edition would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.~~

~~Requests for exceptions in accordance with this section should be submitted in accordance with 10 CFR 72.4.~~

4.1.4 Helium Purity

~~The cask shall be filled with helium with a purity of at least 99.99%. This level of purity will ensure that the residual impurities in the cask cavity will be less than 1 mole.~~

L.8

ITS 4.0

4.3

4.2 Storage Pad

4.2.1 Storage Locations for Casks

Casks shall be spaced a minimum of 16 feet apart, center-to-center. This minimum spacing will ensure the proper dissipation of radiant heat energy from an array of casks as assumed in the TN-32 Safety Analysis Report.

4.2.2 Pad Properties to Limit Cask Gravitational Loadings Due to Postulated Drops

The TN-32 cask has been evaluated for cask drops onto a reinforced concrete pad. The evaluations are based on the following parameters:

Concrete thickness	36 inches (max)
Nominal concrete compressive strength	6000 psi (max)
Reinforcement Yield Strength	60,000 psi (min)
Soil Effective Modulus of Elasticity	32,600 psi (max)
Maximum drop height	18 inches

This set of limits will ensure that the g loading imposed on the cask is no more than 50 g's (cask bottom end drop).

4.3 Site Specific Parameters and Analyses

Site specific parameters and analyses that shall need verification by the system user are, as a minimum, as follows:

1. Tornado maximum wind speeds: 290 mph rotational
   70 mph translational

2. Flood levels up to 57 ft. and drag forces up to 57,160 lbs.

3. Seismic loads of up to 0.26g horizontal and 0.17g vertical.

4. Average daily ambient temperatures: ≥ -20°F minimum
   ≤ 100°F maximum

5. The potential for fires and explosions shall be addressed, based on site-specific considerations. Fires and explosions should be bounded by the cask design bases parameters of 200 gallons of fuel (in the tank of the transporter vehicle) and an external pressure of 25 psig.

6. Supplemental Shielding: In cases where engineered features (i.e. berms, shield walls) are used to ensure that the requirements of 10 CFR 72.104(a) are met, such features are to be considered important to safety and must be evaluated to determine the applicable Quality Assurance Category.

ITS 5.0

5.0 ADMINISTRATIVE CONTROLS

L.5

5.1 Training Module

~~Training modules shall be developed under the general licensee's training program as required by 10 CFR 72.212(b)(6). Training modules shall require a comprehensive program for the operation and maintenance of the TN-32 spent fuel storage cask and the independent spent fuel storage installation (ISFSI). The training modules shall include the following elements, at a minimum:~~

- ~~TN-32 cask design (overview)~~
- ~~ISFSI Facility design (overview)~~
- ~~Systems, Structures, and Components Important to Safety (overview)~~
- ~~TN-32 Dry Storage Cask Safety Analysis Report (overview)~~
- ~~NRC Safety Evaluation Report (overview)~~
- ~~Certificate of Compliance conditions~~
- ~~TN-32 Technical Specifications~~
- ~~Applicable Regulatory Requirements (e.g.,10 CFR72, Subpart K, 10 CFR 20, 10 CFR Part 73)~~
- ~~Required Instrumentation and Use~~
- ~~Operating Experience Reviews~~
- ~~TN-32 Cask Operating and Maintenance procedures, including:~~

~~Fuel qualification and loading~~
~~Rigging and handling~~
~~Loading Operations as described in Chapter 8 of the SAR~~
~~Unloading Operations including reflooding as described in Chapter 8 of the SAR~~
~~Auxiliary equipment operations and maintenance (i.e. vacuum drying, helium backfilling and leak testing, reflooding)~~
~~Transfer operations including loading and unloading of the Transport Vehicle~~
~~ISFSI Surveillance operations~~
~~Radiation Protection~~
~~Maintenance~~
~~Security~~
~~Off-normal and accident conditions, responses and corrective actions.~~

5.2 Programs

The following ~~programs shall be established~~, implemented, and maintained:

Insert ITS 5.1.1 M.2

Insert ITS 5.1.2 L.8

ITS 5.0

L.3

5.2.1 Cask Sliding Evaluation

The TN-32 cask has been evaluated for sliding in the unlikely events of a seismic event. A static coefficient of friction of 0.35 is used in these analyses. This program provides a means for evaluating the coefficient of friction to ensure that the cask will not slide during the seismic event.

a. Pursuant to 10 CFR 72.212, this program shall evaluate the site-specific ISFSI pad configurations/conditions to ensure that the cask would not slide during the postulated design basis earthquake. The program shall conclude that the surface static friction coefficient of friction is greater than or equal to 0.35.

b. Alternatively, for site-specific ISFSI pad configurations/conditions with a lower coefficient of friction than 0.35, the program shall evaluate the site specific conditions to ensure that the TN-32 cask will not slide during the postulated design basis earthquake. The program shall also evaluate storm winds, missile impacts and flood forces to ensure that the cask will not slide such that it could result in impact with other casks or structures at the ISFSI. The program shall ensure that these alternative analyses are documented and controlled.

5.2.2 Cask Transport Evaluation Program

This program provides a means for evaluating various transport configurations and transport route conditions to ensure that the design basis drop limits are met.

Insert ITS 5.1.3

a. Pursuant to 10 CFR 72.212, this program shall evaluate the site-specific transport conditions. To demonstrate compliance with Technical Specification 4.2.2, the program shall conclude that the expected lift height above the transport surface shall be less than or equal to that described by Technical Specification 4.2.2. Also, the program shall conclude that the transport route conditions (e.g., surface hardness and pad thickness) are equivalent to or less limiting than those prescribed for the typical pad surface which forms the basis for Technical Specification 4.2.2.

b. Alternatively, for site-specific transport conditions which are not encompassed by those of Technical Specification 4.2.2, the program shall evaluate the site-specific conditions to ensure that the end-drop loading does not exceed 50 g. This alternative analysis shall be commensurate with the analysis which forms the basis of Technical Specification 4.2.2 (Reference TN-32 SAR Appendix 3A). The program shall ensure that these alternative analyses are documented and controlled. L.9

c. This program shall establish administrative controls and procedures to ensure that cask TRANSPORT OPERATIONS are conducted within the limits imposed by the Technical Specifications or the alternative analysis described above.

5.2.3 Cask Surface Dose Rate Evaluation Program

L.8

This program provides a means for ensuring that ISFSI's using TN-32 casks do not violate the requirements of 10 CFR 72 and Part 20 regarding radiation doses and dose rates.

1. As part of its evaluation pursuant to 10 CFR 72.212, the licensee shall perform an analysis to confirm that the limits of 10 CFR Part 20 and 10 CFR Part 72.104 will be

ITS 5.0

satisfied under the actual site conditions and configurations considering the planned number of casks to be used and the planned fuel loading conditions.

2. On the basis of the analysis in TS 5.2.3.1, the licensee shall establish a set of cask surface dose rate limits which are to be applied to TN-32 casks used at the site. Limits shall establish average gamma-ray and neutron dose rates for:

   A. The top of the TN-32 cask (protective cover)
   B. The sides of the radial neutron shield,
   C. The side of the cask above the neutron shield, and
   D. The side of the cask below the neutron shield.

L8

3. Not withstanding the limits established in TS 5.2.3.2, the dose rate limits may not exceed the values calculated in the SAR for a content of design basis fuel as follows:

   A. 60 mr/hr gamma and 10 mr/hr neutron on the top (protective cover)
   B. 170 mr/hr gamma and 20 mr/hr neutron on the sides of the radial neutron shield
   C. 280 mr/hr gamma and 140 mr/hr neutron on the side surfaces of the cask above the neutron shield region.
   D. 110 mr/hr gamma and 200 mr/hr neutron on the side surfaces of the cask below the neutron shield region.

4. Prior to transport of a TN-32 containing spent fuel to the ISFSI, the licensee shall measure the cask surface dose rates and calculate average values as described in 5.2.3.7 and 5.2.3.8.

   The measured average dose rates shall be compared to the limits established in TS 5.2.3.2 or the limits in TS 5.2.3.3, whichever are lower.

5. If the measured average surface dose rates do not meet the limits of TS 5.2.3.2 or TS 5.2.3.3, whichever are lower, the licensee shall take the following actions:

   A. Notify the U.S. Nuclear Regulatory Commission (Director of the Office of Nuclear Material Safety and Safeguards) within 30 days.
   B. Administratively verify that the correct fuel was loaded, and
   C. Perform an analysis to determine that placement of the as-loaded cask at the ISFSI will not cause the ISFSI to exceed the radiation exposure limits of 10 CFR Parts 20 and 72.

6. If the analysis in 5.2.3.5.C shows that placement of the as-loaded cask at the ISFSI will cause the ISFSI to exceed the radiation exposure limits of 10 CFR Parts 20 and 72, the licensee shall remove all fuel assemblies from the cask within 30 days of the time of cask loading.

7. The surface dose rates shall be measured at the following points (see also Figure 5.2.3-1).

   A. Above the Neutron Shield (A): Midway between the top of the cask body flange and the top of the neutron shield. At least six measurements equally spaced circumferentially.

B. Sides of Radial Neutron Shield (B, C and D): one sixth, one half and five sixths of the distance from the top of the neutron shield. At least six measurements equally spaced circumferentially at each elevation, two of which shall be at the circumferential location of the cask trunnions. However, no measurement shall be taken directly over the trunnion.

L,8

C. Below Radial Neutron Shield (E): Midway between the bottom of the neutron shield and the bottom of the cask. At least six measurements equally spaced circumferentially.

D. Top of Cask (F, G and H): At the center of the protective cover, one measurement (F). Half way between the center and the knuckle at least four measurements equally spaced circumferentially. At the knuckle at least four measurements equally spaced circumferentially (H).

8. The average dose rates shall be determined as follows.

In each of the four measurement zones in TS 5.2.3.7, the sum of the dose rate measurements is divided by the number of measurements to determine the average for that zone. The neutron and gamma-ray dose rates are averaged separately. Uniformly spaced dose rate measurement locations are chosen such that each point in a given zone represents approximately the same surface area.

L.8

3.1 CASK INTEGRITY

3.1.1 Cask Cavity Vacuum Drying

LCO 3.1.1 The cask cavity vacuum drying pressure shall be sustained at or below 4 mbar absolute for a period of at least 30 minutes after isolation from the pumping system.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
----NOTE---- Not applicable until SR 3.1.1.1 is performed. A. Cask cavity vacuum drying pressure limit not met.	----NOTE---- Action A.1 applies until helium is removed for subsequent operations. A.1 Achieve or maintain a nominal helium environment in the cask AND A.2 Establish cask cavity drying pressure within limits.	 12 hours 96 hours
B. Required Action A.1 and associated Completion Time not met.	B.1 Remove all fuel assemblies from the cask.	7 days

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C. Required Action A.2 and associated Completion Time not met.	C.1 Remove all fuel assemblies from the cask.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify that the equilibrium cask cavity vacuum drying pressure is brought to ≤ 4 mbar absolute for at least 30 minutes.	Once, within 24 hours of completion of cask draining.

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3.1 CASK INTEGRITY

3.1.2 Cask Helium Backfill Pressure

LCO 3.1.2 The cask cavity shall be filled with helium to a pressure of 2230 mbar absolute (± 100 mbar).

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
-----NOTE----- Not applicable until SR 3.1.2.1 is performed. A. Cask initial helium backfill pressure limit not met.	-----NOTE----- Action A.1 applies until helium is removed for subsequent operations A.1 Achieve or maintain a nominal helium environment in the cask AND A.2 Establish cask cavity backfill pressure within limits.	6 hours 48 hours
B. Required Action A.1 and associated Completion Time not met.	B.1 Remove all fuel assemblies from the cask.	7 days
C. Required Action A.2 and associated Completion Time not met.	C.1 Remove all fuel assemblies from the cask.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify that the cask cavity helium pressure is 2230 mbar absolute (± 100 mbar).	Once, within 30 hours of completion of cask draining.

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L.8

3.1 CASK INTEGRITY

3.1.3 Cask Helium Leak Rate

LCO 3.1.3 The combined helium leak rate for all closure seals shall not exceed 1.0 E-5 std cc/sec.

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

NOTE

Separate Condition entry is allowed for each cask.

CONDITION	REQUIRED ACTION	COMPLETION TIME
NOTE Not applicable until SR 3.1.3.1 is performed. A. Cask helium leak rate not met.	A.1 Establish cask helium leak rate within limit.	48 hours
B. Required Action A.1 and associated Completion Time are not met.	B.1 Remove all fuel assemblies from cask.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.3.1 Verify the cask helium leak rate is within the limit.	Once, prior to TRANSPORT.

ITS 5.0

L.8

3.2 CASK RADIATION PROTECTION

3.2.1 Cask Surface Contamination

LCO 3.2.1 Removable contamination on the cask exterior surfaces shall not exceed:
a. 1000 dpm / 100 cm² (0.2 Bq / cm²) from beta and gamma sources, and
b. 20 dpm / 100 cm² (0.003 Bq / cm²) from alpha sources.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

NOTE

Separate Condition entry is allowed for each cask.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Removable contamination on the cask exterior surface exceeds either limit.	A.1 Decontaminate cask surfaces to below required levels.	Prior to TRANSPORT OPERATIONS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify that the removable contamination on the exterior surface of the cask does not exceed the specified limits.	Once, prior to TRANSPORT OPERATIONS.

ITS 5.0

L.8

3.3 CASK CRITICALITY CONTROL

3.3.1 Dissolved Boron Concentration

LCO 3.3.1 The dissolved boron concentration of the water in the spent fuel pool and the water added to the cavity of a loaded cask shall be at least 2300 ppm.

APPLICABILITY: During LOADING and UNLOADING OPERATIONS

ACTIONS

NOTE

Separate Condition entry is allowed for each cask.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Dissolved boron concentration limit not met.	A.1 Suspend loading of fuel assemblies into cask.	Immediately
	AND	
	A.2 Remove all fuel assemblies from cask.	24 hours

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(L.8)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Verify dissolved boron concentration limit in spent fuel pool water and water to be added to the cask cavity is met using two independent measurements.	Within 4 hours prior to commencing LOADING OPERATIONS AND 48 hours thereafter while the cask is in the spent fuel pool or while water is in cask.
SR 3.3.1.2	Verify dissolved boron concentration limit in spent fuel pool water and water to be added to the cask cavity is met using two independent measurements.	Once, within 4 hours prior to flooding cask during UNLOADING OPERATIONS AND 48 hours thereafter while the cask is in the spent fuel pool or while water is in cask.

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3.1 CASK INTEGRITY

3.1.6 Cask Minimum Lifting Temperature

LCO 3.1.6 The loaded cask shall not be lifted if the outer surface of the cask is below -20°F.

APPLICABILITY: During TRANSPORT OPERATIONS

ACTIONS

NOTE
Separate Condition entry is allowed for each cask.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Cask surface temperature below limit.	A.1 Lower cask to safe position	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify outer surface temperature is above limit.	Once, after lifting cask and prior to cask transfer to or from ISFSI.

L.9

Insert ITS 5.1.4 M.1

Insert ITS 5.2.1 L.8

ADMINISTRATIVE CHANGES

A.1 Definitions in the CTS which do not appear in the generic CASK ITS have been eliminated. This change is administrative because the deletion of definitions does not, in itself, change requirements. The deletion of the definitions in other Specifications will be justified in different DOCs.

A.2 Two defined terms are added to the CTS. The term CASK is used throughout the generic fuel storage ITS as a non-vendor specific term to refer to a fuel storage system. The term "SAR" is defined to provide an unambiguous reference to the Safety Analysis Report referenced in the Certificate of Compliance issued for the CASK. The addition of these terms is administrative as they do not create, modify, or remove requirements and represent an editorial preference.

A.3 The Use and Application rules in Section 1.2, Logical Connectors, Section 1.3, Completion Times, and Section 1.4, Frequency, are revised to be consistent with the generic fuel storage ITS and to eliminate those features which do not apply to the fuel storage generic ITS. The revisions are administrative because they do not create, modify, or eliminate requirements, but describe the conventions used in the fuel storage ITS.

A.4 LCO 3.0.5 is not applicable to a CASK and is removed. The CASK ITS does not direct equipment to be removed from service in ACTIONS. Therefore, the LCO 3.0.5 allowance to return such equipment to service for testing is not required. This change is designated as administrative because elimination of an unused provision does not result in a technical change to the specifications.

A.5 The portion of SR 3.0.2 which discusses Frequencies specified as "once" and "once per" is deleted as it is not applicable. The CASK ITS does not use these Frequency specifications. This change is designated as administrative because elimination of an unused feature does not result in a technical change to the specifications.

A.6 The introductory paragraph for the Design Features section is deleted. This paragraph contains no requirements. This change is designated administrative because it does not result in a technical change to the specifications.

A.7 The Design Features section 4.1.2, Structural Performance, is deleted. This section contains no requirements but simply states the conditions for which the CASK has been evaluated. This change is designated administrative because it does not result in a technical change to the specifications.

A.8 CTS LCO 3.0.4 describes that exception to LCO 3.0.4 are stated in individual Specifications. The CASK ITS does not use LCO 3.0.4 exceptions. This change is designated as administrative because elimination of an unused feature does not result in a technical change to the specifications.

MORE RESTRICTIVE CHANGES

M.1 CTS LCO 3.1.5 requires cask interseal pressure to be maintained at a pressure of at least 3.2 atm abs during STORAGE OPERATIONS and for interseal pressure to be verified every 7 days. CTS LCO 3.1.4 requires the combined helium leak rate for all closure seals and the overpressure system to not exceed 1.0 E-5 std cc/sec. ITS 3.1.1 provides a periodic test for CASK storage integrity. In addition, should the LCO not be met, Actions require immediate action to restore storage integrity. If storage integrity is not restored within 30 days, a special report must be provided to the NRC describing the cause of the loss of storage integrity and the plans and schedule for restoring storage integrity.

The capability of a CASK to be periodically monitored such that the licensee will be able to determine when corrective action needs to be taken to maintain safe store conditions is required by 10 CFR part 72.122(h)(4). Methods of monitoring storage integrity vary by CASK design. Therefore, the details of the monitoring and the Frequency by which the CASK must be monitored in located in a CASK Storage Integrity Program. The CASK Storage Integrity Program is required by the Administrative Controls. The details of the CASK Storage Integrity Program will be located in the SAR for the CASK design. The details of the special report that must be filed with the NRC if CASK storage integrity is lost and not restored within 30 days are located in the CASK Storage Integrity Report described in the Administrative Controls. This change is designated as more restrictive because it adds additional controls to the Technical Specifications.

M.2 The CTS does not contain requirements on the radioactive effluent control program. The ITS addresses the radioactive effluent control program.

The Technical Specifications must state how the requirements in 10 CFR 72.44(d) are met. 10 CFR 72.44(d) requires that there be Technical Specifications on radioactive effluents. This is satisfied by the Radioactive Effluent Control Program. Without such a section, the proposed Technical Specifications would not satisfy the requirements of 10 CFR 72.44(d).

LESS RESTRICTIVE CHANGES

L.1 The CTS contains detailed descriptions of the fuel which can be stored in the fuel storage CASK. The fuel storage generic ITS does not contain these descriptions and substitutes the requirement, "Only components evaluated in the SAR may be stored in the CASK."

The change is acceptable because the detailed descriptions of the fuel and components to be stored are more appropriate for the SAR. 10 CFR part 72.236 requires the cask vendor to provide specifications for the spent fuel to be stored in the CASK, such as type of spent fuel, maximum allowable enrichment of the fuel prior to any irradiation, burnup, minimum cooling time, maximum heat to be dissipated, spent fuel loading limit, and condition of the spent fuel. This information is an integral part of the evaluations performed on the CASK as documented in the SAR. The CoC, which states the conditions for use of the CASK, states that the CASK is described in the SAR and NRC's SER. Therefore, the user of the CASK must verify that their fuel is authorized to be stored in the CASK. Because the information must appear in the SAR to support the required analyses, duplicating the information in the Technical Specifications provides no advantages and has the disadvantage of duplication, lack of standardization, and retaining a level of detail far outside that appearing in the power plant ITS for items of similar safety significance. This change is designated as less restrictive because it eliminates information which appears in the Technical Specifications.

L.2 CTS Design Features Section 4.1.3 describes the Codes and Standards governing the manufacture of the CASK. The ITS does not contain this information.

Section 4.1.3, Codes and Standards, is inappropriate for the Technical Specifications and is eliminated. 10 CFR 72.44(c)(4) defines Design Features. It states, "Design Features include items that would have a significant effect on safety if altered or modified, such as materials of construction and geometric arrangements." The Technical Specifications contain operating limits, not manufacturing directions, such as Codes and Standards. This information is appropriate to the SAR, not the operating limits applied in the Technical Specifications. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.3 CTS Design Features Sections 4.2 and 4.3, and Administrative Controls section 5.2.1 contain site specific parameters and analyses that must be verified by the system user. The ITS does not contain this information.

These sections are eliminated because they are unnecessary and could lead a CASK user to not follow the applicable regulations. 10 CFR 72.212(b)(3) requires the user of the CASK to review the SAR and the NRC Safety Evaluation Report to determine whether or not the reactor site parameters envelope the cask design bases. 10 CFR 72.212(b)(2) requires written evaluation of the storage pads and areas. The information in these sections is a duplication of these existing regulatory requirements and the values listed are only a subset of the complete set of parameters that must be evaluated by the CASK user. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.4 CTS Design Features Section 4.1.1 provides design specifications for the CASK. The ITS does not contain this information.

This section is inappropriate for the Technical Specifications and is eliminated. These parameters are under the control of the manufacturer, not the operator of the cask and most cannot be verified in the field. These design parameters are appropriate for the SAR, not the operational limitations in the Technical Specifications. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.5 CTS Administrative Controls 5.1 contains requirements for a training module to be developed by the user of the CASK. The ITS does not contain this information.

The section is inappropriate for the CASK Technical Specifications and is eliminated. As stated in the first sentence of the section, a training program is required under 10 CFR 72.212(b)(6). It is also required by 10 CFR Part 72, Subpart I. Repeating that information in the Technical Specifications adds no value and it is unclear why only training was selected for detailed description in the Technical Specifications when 10 CFR 72.212(b)(6) also describes the emergency plan, quality assurance program, and radiation protection program. Chapter 8 of the SAR also contains a description of operational procedures. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.6 Not used.

L.7 Not used.

L.8 The CTS contains CASK-specific requirements on process variables monitored during preparation of a CASK for storage, such as vacuum drying pressure, helium backfill pressure, leak rate testing acceptance criteria, surface dose rates, surface contamination, spent fuel pool dissolved boron concentration, and helium purity. These CASK-specific parameters do not appear in the CASK Technical Specifications and a generic CASK Loading, Unloading, and Preparation Program is implemented. This program requires that the SAR requirements for loading fuel into a CASK, unloading fuel from a CASK, and preparing a CASK for storage be implemented.

This change is appropriate because it establishes a generic requirement for control of CASK loading, unloading, and preparation while allowing the CASK-specific methods and parameters to be specified in the SAR. The program replaces the CTS LCOs with CASK-specific parameters and methods, the specific Actions, and the specific Surveillance Requirements with the requirement that the program include compensatory measures to be taken if a CASK fails to meet the requirements of the program and limits on the length of time that fuel assemblies may remain within the CASK with the requirements of the program not met. This change is designated as less restrictive because requirements that are specified in the CTS are being moved to a program.

L.9 The CTS provides CASK-specific parameters and requirements governing the movement of a CASK, such as maximum lifting height and minimum lifting temperature. These CASK-specific parameters do not appear in the CASK Technical Specifications and a generic CASK Transportation Evaluation Program is implemented. This program requires that administrative controls and procedures be established to ensure that CASK transportation is conducted within the limits assumed in the SAR, including maximum lifting height, road conditions, and CASK temperature limits.

This change is appropriate because it establishes a generic requirement for control of CASK transportation while allowing the CASK-specific controls and parameters to be specified in the SAR. The program replaces the CTS CASK-specific controls and methods, the specific Actions, and the specific Surveillance Requirements with the requirement that the program include administrative controls and procedures. This change is designated as less restrictive because requirements that are specified in the CTS are being moved to a program.

L.10 The CTS requires that when any Functional and Operating Limit is violated, the affected fuel assemblies shall be removed from the cask and placed in a safe condition. The ITS requires that when any Functional and Operating Limit is violated, the affected fuel assemblies shall placed in a safe condition. This changes the CTS by eliminating the requirement that the affected fuel assemblies be removed from the cask.

This change is acceptable because removal of the fuel assemblies may not always be the safest action to take. Simply specifying that the affected assemblies be placed in a safe condition, whether in the cask or outside of the cask, is sufficient to protect the public. Requiring the assemblies to be unnecessarily unloaded, especially if the cask has already been sealed when the error is discovered may be adverse to safety. This change is designated as less restrictive because a requirement in the CTS does not appear in the ITS.

ATTACHMENT E

NAC-MPC CASK

ATTACHMENT E.1 - DISPOSITION MATRIX FOR NAC-MPC CASK

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
1.1	DEFINITIONS	Yes	No	No	No	No	Retained for clarity of the ITS.
1.2	Logical Connectors	Yes	No	No	No	No	Retained for clarity of the ITS.
1.3	Completion Times	Yes	No	No	No	No	Retained for clarity of the ITS.
1.4	Frequency	Yes	No	No	No	No	Retained for clarity of the ITS.
2.0	Functional and Operational Limits	Yes	No	Yes	No	No	Retained. This section is required by 72.44. Only sufficient information to determine when the Functional and Operating limits have been violated and the actions to be taken in that circumstance should be in Section 2.0. Detailed description is in the SAR.
3.0	LCO and SR Applicability	Yes	No	No	No	No	Retained for clarity of the ITS.
3.1.1	CANISTER Water Temperature	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
3.1.2	CANISTER Vacuum Drying Pressure	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.3	CANISTER Helium Backfill Pressure	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.4	CANISTER Helium Leak Rate	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.5	CANISTER Maximum Time in Vacuum Drying	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.6	CANISTER Maximum Time in TRANSFER CASK	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.7	Fuel Cooldown Requirements	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.8	CONCRETE CASK Maximum Lifting Height	Yes	No	Yes	No	No	Details relocated to CASK Transportation Evaluation Program.
3.1.9	TRANSFER CASK Minimum Operating Temperature	Yes	No	Yes	No	No	Details relocated to CASK Transportation Evaluation Program.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
Table 3-1	CANISTER Limits	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.2.1	NAC-MPC Average Surface Dose Rates	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.2.2	CANISTER Surface Contamination	No	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
4.0	Design Features	Yes	No	No	No	No	Retained. A Design Features chapter is required under 10 CFR part 72.44.
4.1	Site	No	No	No	No	No	Deleted. Not applicable to CASKs used under a CoC.
4.2	Storage Features	No	No	No	No	No	Deleted. Not applicable to CASKs used under a CoC. The SAR contains a description of the storage features.
4.3	Codes and Standards	No	No	No	No	No	Deleted. Codes and Standards govern the manufacture of CASKs, not their operation. Codes and Standards are not operational requirements. Furthermore, the Codes and Standards are described in the SAR and subject to regulatory controls.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
4.4	Site Specific Parameters and Analyses	No	No	No	No	No	Deleted. Paragraph 72.212(b)(3) requires written evaluation that the site specific parameters envelope the assumptions in the CASK design.
4.5	Design Specifications	No	No	No	No	No	Deleted. These parameters are under the control of the manufacturer, not the user of the CASK and most cannot be verified in the field. These design specifications are appropriate to the SAR. Fabrication of the cask in accordance with the design is required by the CoC to be performed under an approved Quality Assurance program.
5.1	NAC-MPC SYSTEM Training	No	No	No	No	No	Deleted. Development of a training program is required by Paragraph 72.212(b)(6) and Part 72, Subpart I.
5.2	Dry Run Training	No	No	No	No	No	Deleted. This one-time item should be a condition of the SAR or the NRC's SER, not a Technical Specification.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
5.3	Special Requirements for First NAC-MPC SYSTEM Placed in Service	No	No	No	No	No	Deleted. Special requirements for the first system in place should be described in the SAR, or the NRC's SER, not a Technical Specification.
5.4	CONCRETE CASK Thermal Monitoring Program	Yes	No	No	No	No	Retained. This program is incorporated into the CASK Storage Integrity Monitoring Program. The details are relocated to the SAR.

ATTACHMENT E.2

MARKUP AND DISCUSSIONS OF CHANGE FOR NAC-MPC CASK

ITS 1.1

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.

Term	Definition
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
CANISTER	See TRANSPORTABLE STORAGE CANISTER
CONCRETE CASK	See VERTICAL CONCRETE CASK
DAMAGED FUEL ASSEMBLY	DAMAGED FUEL ASSEMBLY is a fuel assembly having individual fuel rods with known or suspected cladding defects greater than a hairline crack or a pinhole leak.
DAMAGED FUEL ROD	DAMAGED FUEL ROD is a fuel rod with known or suspected cladding defects greater than a hairline crack or a pinhole leak.
FUEL DEBRIS	FUEL DEBRIS is fuel in the form of particles, loose pellets, and fragmented rods or assemblies.
INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)	The facility within the perimeter fence licensed for storage of spent fuel within NAC-MPC SYSTEMs (see also 10 CFR 72.3).

A.1

1.1 Definitions (continued)

~~INTACT FUEL ASSEMBLY~~	~~INTACT FUEL ASSEMBLY is a fuel assembly without known or suspected cladding defects greater than a pinhole leak or a hairline crack and which can be handled by normal means. A fuel assembly shall not be classified as an INTACT FUEL ASSEMBLY unless solid Zircaloy or stainless steel rods are used to replace missing fuel rods and which displaces an amount of water equal to that displaced by the original fuel rod(s).~~
~~INTACT FUEL ROD~~	~~INTACT FUEL ROD is a fuel rod without known or suspected cladding defects greater than a pinhole leak or a hairline crack.~~
~~LOADING OPERATIONS~~	~~LOADING OPERATIONS include all licensed activities on an NAC-MPC SYSTEM while it is being loaded with fuel assemblies. LOADING OPERATIONS begin when the first fuel assembly is placed in the CANISTER and end when the NAC-MPC SYSTEM is secured on the transporter.~~
~~RECONFIGURED FUEL ASSEMBLY (RFA)~~	~~A stainless steel canister having the same external dimensions as a standard Yankee Class spent fuel assembly that ensures criticality control geometry and which permits gaseous and liquid media to escape while minimizing dispersal of gross particulates. The RECONFIGURED FUEL ASSEMBLY may contain a maximum of 64 INTACT FUEL RODS, DAMAGED FUEL RODS or FUEL DEBRIS from any type of Yankee Class spent fuel assembly.~~

A.1

Insert ITS Definitions of CASK, SAR

A.2

ITS 1.1

A.1

1.1 Definitions (continued)

NAC-MPC SYSTEM	NAC-MPC SYSTEM includes the components approved for loading and storage of spent fuel assemblies at the ISFSI. The NAC-MPC SYSTEM consists of a CONCRETE CASK, a TRANSFER CASK and a CANISTER.
STORAGE OPERATIONS	STORAGE OPERATIONS include all licensed activities that are performed at the ISFSI, while an NAC-MPC SYSTEM containing spent fuel is located on the storage pad within the ISFSI perimeter.
TRANSPORT OPERATIONS	TRANSPORT OPERATIONS include all licensed activities involved in moving a loaded NAC-MPC CONCRETE CASK AND CANISTER to and from the ISFSI. TRANSPORT OPERATIONS begin when the NAC-MPC SYSTEM is first secured on the transporter and end when the NAC-MPC SYSTEM is at its destination and no longer secured on the transporter.
TRANSPORTABLE STORAGE CANISTER (CANISTER)	TRANSPORTABLE STORAGE CANISTER is the sealed container that consists of a tube and disk fuel basket in a cylindrical canister shell that is welded to a baseplate, shield lid with welded port covers, and structural lid. The CANISTER provides the confinement boundary for the confined spent fuel.
TRANSFER CASK	TRANSFER CASK is a shielded lifting device that holds the CANISTER during LOADING and UNLOADING OPERATIONS and during closure welding, vacuum drying, leak testing, and non-destructive examination of the CANISTER closure welds. The TRANSFER CASK is also used to transfer the CANISTER into and from the CONCRETE CASK, and into the transport cask.

ITS 1.1

1.1 Definitions (continued)

UNLOADING OPERATIONS	UNLOADING OPERATIONS include all licensed activities on an NAC-MPC SYSTEM to be unloaded of the contained fuel assemblies. UNLOADING OPERATIONS begin when the NAC-MPC SYSTEM is no longer secured on the transporter and end when the last fuel assembly is removed from the NAC-MPC SYSTEM. UNLOADING OPERATIONS may include transfer of a loaded CANISTER from the CONCRETE CASK to the transport cask.
VERTICAL CONCRETE CASK (CONCRETE CASK)	CONCRETE CASK is the cask that receives and holds the sealed CANISTER. It provides the gamma and neutron shielding and convective cooling of the spent fuel confined in the CANISTER.

A.1

ITS 1.2

~~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 Technical Specifications 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 indentations 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; the logical connector is left justified with the statement of the Condition, Completion Time, Surveillance, or Frequency.~~

Insert ITS 1.2

A.3

ITS 1.2

~~1.2 Logical Connectors (continued)~~

~~EXAMPLES The following examples illustrate the use of logical connectors.~~

~~EXAMPLES~~

~~EXAMPLE 1.2-1~~
~~ACTIONS~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met	A.1 Verify. . . AND 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.~~

Insert ITS 1.2

A.3

ITS 1.2

1.2 Logical Connectors (continued)

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met	A.1 Stop. . . OR A.2.1 Verify. . . AND A.2.2 A.2.2.1 Reduce. . . OR A.2.2.2 Perform. . . OR 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" indicated that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.

Insert ITS 1.2

A.3

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 Operations (LCOs) specify the lowest functional capability or performance levels of equipment required for safe operation of the NAC-MPC SYSTEM. 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 Time(s).
DESCRIPTION	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, provided that the NAC-MPC SYSTEM is in a specified condition stated in the Applicability of the LCO. Prior to the expiration of the specified Completion Time, Required Actions must be completed. An ACTIONS Condition remains in effect and the Required Actions apply until the Condition no longer exists or the NAC-MPC SYSTEM is not within the LCO Applicability. Once a Condition has been entered, subsequent subsystems, components, or variables expressed in the Condition, discovered to be not within limits, will not 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.

Insert ITS 1.3

A.3

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
	AND	
	B.2 Perform Action B.2	36 hours

Condition B has two Required Actions. Each Required Action has its own 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 six 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.

Insert ITS 1.3

A.3

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
	AND		
	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 seven 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; therefore, the Required Actions of Condition B may be terminated.

Insert ITS 1.3

A.3

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
	AND		
	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 to be 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 are tracked for each component.

Insert ITS 1.3

A.3

ITS 1.3

1.3 Completion Times (continued)

EXAMPLES	EXAMPLE 1.3-3 (continued)
IMMEDIATE COMPLETION TIME	When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.

Insert ITS 1.3

A.3

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

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.

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 requirements of the Frequency column of each SR.

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.

The use of "met" or "performed" in these instances conveys specific meanings. A Surveillance is "met" only after the acceptance criteria are satisfied. Known failure of the requirements of a Surveillance, even without a Surveillance specifically being "performed", constitutes a Surveillance not "met."

Insert ITS 1.4

A.3

1.4 Frequency

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, SR 3.0.2 allows an extension of the time interval to 1.25 times the interval specified in the Frequency 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.

Insert ITS 1.4

A.3

ITS 1.4

Insert ITS 1.4

A.3

1.4 Frequency (continued)

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify flow is within limits	Once within 12 hours prior to starting activity AND 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.

ITS 2.0

2.0 FUNCTIONAL AND OPERATING LIMITS

2.1 Functional and Operating Limits

2.1.1 ~~Fuel to be Stored in the NAC-MPC SYSTEM~~

~~INTACT FUEL ASSEMBLIES, INTACT FUEL RODS, DAMAGED FUEL RODS and FUEL DEBRIS placed in a RECONFIGURED FUEL ASSEMBLY meeting the limits specified in Table 2-1 may be stored in the NAC-MPC SYSTEM.~~

~~The values shown in Tables 2-1 and 2-2 are design nominal record values.~~

Insert ITS 2.1.1

2.1

2.2 Functional and Operating Limit Violations

If any Functional and Operating Limits of Table 2-1 are violated, the following actions shall be completed:

Contents

2.2.1 The affected ~~fuel assemblies~~ shall be placed in a safe condition. L.1

2.2.2 Within 24 hours, notify the NRC Operations Center.

2.2.3 Within 30 days, submit a special report that describes the cause of the violation and actions taken to restore compliance and prevent recurrence.

ITS 2.0

L.1

Table 2-1
Fuel Assembly Limits

I. NAC-MPC CANISTER

A. Allowable Contents

1. Uranium oxide Yankee Class INTACT FUEL ASSEMBLIES listed in Table 2-2 and meet the following specifications:

a. Cladding Type:	Zircaloy or Stainless Steel as specified in Table 2-2 for the applicable fuel assembly class (Note: Type A and Type B configurations in Table 2-2 identify variations in the arrangement of the outer row of fuel rods that accommodate the insertion of control blades in the reactor.)
b. Enrichment:	As specified in Table 2-2 for the applicable fuel assembly type.
c. Decay Heat Per Assembly:	
i. Zircaloy-Clad Fuel:	$\leq$ 347 Watts
ii. Stainless Steel-Clad Fuel:	$\leq$ 264 Watts
d. Post-irradiation Cooling Time and Average Burnup Per Assembly:	
i. Zircaloy-Clad Fuel:	As specified in Table 2-2 for the applicable fuel assembly type.
ii. Stainless Steel-Clad Fuel:	As specified in Table 2-2 for the applicable fuel assembly type.

ITS 2.0

L.1

Table 2-1
Fuel Assembly Limits (Continued)

f. Nominal Fuel Assembly Length:	Maximum = 111.8 inches Minimum = 109.0 inches
g. Nominal Fuel Assembly Width:	≤ 7.64 inches
h. Fuel Assembly Weight:	
i. Zircaloy-Clad Fuel:	≤ 850 lbs
ii. Stainless Steel-Clad Fuel:	≤ 900 lbs
i. Minimum Length of Bottom Fuel Nozzle:	6.7 inches (17.0 cm)

2. Uranium oxide Yankee Class INTACT FUEL RODS, DAMAGED FUEL RODS or FUEL DEBRIS placed in RECONFIGURED FUEL ASSEMBLIES (RFA). The original fuel assemblies for the INTACT FUEL RODS, DAMAGED FUEL RODS and FUEL DEBRIS shall meet the criteria specified in Table 2-2 for the fuel assembly class, and meet the following additional specifications:

a. Cladding Type:	Zircaloy or Stainless Steel as specified in Table 2-2 for the applicable fuel assembly type.
b. Enrichment:	As specified in Table 2-2 for the applicable fuel assembly type.
c. Decay Heat Per RFA:	≤ 102 Watts
d. Post-irradiation Cooling Time and Average Burnup Per Original Assembly:	
i. Zircaloy-Clad Fuel:	As specified in Table 2-2 for the applicable fuel assembly type.

ITS 2.0

L.1

Table 2-1
Fuel Assembly Limits (Continued)

ii. Stainless Steel-Clad Fuel:	As specified in Table 2-2 for the applicable fuel assembly type.
e. Nominal Original Fuel Assembly Length:	≤ 111.8 inches
f. Nominal Original Fuel Assembly Width:	≤ 7.64 inches
g. Maximum Weight:	≤ 850 lbs, including RFA
h. Maximum mass U per RFA:	66.33 kg

B. Quantity per CANISTER:
Up to 36 INTACT FUEL ASSEMBLIES and RFAs to the maximum content weight limit of 30,600 pounds.

C. INTACT FUEL ASSEMBLIES and RFAs shall not contain control components.

D. INTACT FUEL ASSEMBLIES shall not contain empty fuel rod positions. A solid Zircaloy or stainless steel rod that would displace an equivalent amount of water as an intact fuel rod shall replace any missing fuel rods.

ITS 2.0

2.1

Table 2-2 INTACT FUEL ASSEMBLY Characteristics

Fuel Assembly Type	Combustion Engineering Type A	Combustion Engineering Type B	Exxon Type A	Exxon Type B	Exxon Type A	Exxon Type B	Westinghouse Type A	Westinghouse Type B	United Nuclear Type A	United Nuclear Type B
ASSEMBLY CONFIGURATION[2]										
Assembly Length (cm)	283.9	283.9	283.3	283.3	283.9	283.9	282.6	282.6	282.4	282.4
Assembly Width (cm)	19.2	19.2	19.3	19.3	19.3	19.3	19.3	19.3	19.4	19.4
Assembly Weight (kg)	352	350.6	372	372	372	372	408.2	408.2	385.5	385.5
Enrichment-wt. % ^{235}U										
Maximum	3.90	3.90	4.00	4.00	4.00	4.00	4.94	4.94	4.00	4.00
Minimum	3.70	3.70	3.50	3.50	3.50	3.50	4.94	4.94	4.00	4.00
Max. Burnup (MWD/MTU)	36,000[1]	36,000[1]	36,000	36,000	36,000	36,000	32,000	32,000	32,000	32,000
Max. Initial Heavy Metal KgU/assembly	239.4	238.4	239.4	238.4	239.4	238.4	286.9	286.0	245.6	244.6
Min. Cool Time (yr)	8.1[1]	8.1[1]	16.0	16.0	9.0	9.0	21.0	21.0	13.0	13.0
Max. Decay Heat (kW)	0.347[1]	0.347[1]	0.269	0.269	0.331	0.331	0.264	0.264	0.257	0.257
FUEL ROD CONFIGURATION										
Fuel Rod Pitch (cm)	1.20	1.20	1.20	1.20	1.20	1.20	1.07	1.07	1.19	1.19
Active Fuel Length (cm)	231.1	231.1	231.1	231.1	231.1	231.1	234.0	234.0	231.1	231.1
Rod OD (cm)	0.93	0.93	0.93	0.93	0.93	0.93	0.86	0.86	0.93	0.93
Clad ID (cm)	0.81	0.81	0.81	0.81	0.81	0.81	0.76	0.76	0.81	0.81
Clad Material	Zircaloy	Zircaloy	Zircaloy	Zircaloy	Zircaloy	Zircaloy	SS	SS	Zircaloy	Zircaloy
Pellet OD (cm)	0.79	0.79	0.79	0.79	0.79	0.79	0.75	0.75	0.79	0.79
Rods per Assembly	231	230	231	230	231	230	305	304	237	236

1. Combustion Engineering fuel may be loaded at a maximum burnup of 32,000 MWD/MTU, a minimum enrichment of 3.5 wt% ^{235}U and cool time of 8.0 years. The maximum decay heat for this assembly is 0.304 kW.

2. Type A and Type B configurations identify variations in the arrangement of the outer row of fuel rods that accommodate the insertion of control blades in the reactor.

ITS LCO 3.0

3.0 LIMITING CONDITION 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 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.~~ A.4

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.

LCO 3.0.3 Not applicable to ~~an NAC-MPC SYSTEM~~. CASK A.2

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 NAC-MPC SYSTEM~~ CASK. A.2

~~Exceptions to this Specification are stated in the individual Specifications. These exceptions allow entry into specified conditions in the Applicability where the associated ACTIONS to be entered allow operation in the specified conditions in the Applicability only for a limited period of time.~~ A.8

~~**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 to return to service under administrative control to perform the testing.~~

Not applicable to a CASK. A.4

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY (Continued)

LCO 3.0.6	Not applicable to a~~n NAC-MPC SYSTEM~~ CASK.	A.2
LCO 3.0.7	Not applicable to a~~n NAC-MPC SYSTEM~~.	A2

ITS SR 3.0

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 a 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.

A.5

~~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.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY (Continued)

SR 3.0.3 (continued)	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 a~~n~~ ~~NAC-MPC SYSTEM~~ CASK. A.2

Insert ITS 3.1.1 M.1

There are no Design Features applicable to a CASK.

ITS 4.0

A.6

4.0 DESIGN FEATURES

4.1 Site

4.1.1 Site Location

Not applicable

4.2 Storage Features

4.2.1 Storage Cask

The NAC-MPC SYSTEM consists of the VERTICAL CONCRETE CASK (CONCRETE CASK) and its integral TRANSPORTABLE STORAGE CANISTER (CANISTER).

4.2.2 Storage Capacity

The total storage capacity of the ISFSI is limited by plant-specific license conditions.

4.2.3 Storage Pad(s)

Not applicable

4.3 Codes and Standards

The American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), 1995 Edition with Addenda, is the governing Code for the NAC-MPC CANISTER.

The American Concrete Institute Specifications ACI-349 and ACI-318 govern the NAC-MPC Vertical Concrete Cask design and construction, respectively.

The American National Standards Institute ANSI N14.6 and NUREG-0612 govern the NAC-MPC Transfer Cask design and construction.

L.2

ITS 4.0

4.3.1 Exceptions to the ASME Code

<u>Codes and Standards</u>

The NAC-MPC CANISTER and fuel basket structure are designed and fabricated in accordance with the ASME Code, Section III, Division 1, Subsections NB and NG, respectively. Exceptions to the applicable ASME Code requirements are listed in Table 4-1.

Proposed alternatives to ASME Code Section III, 1995 Edition with Addenda, including exceptions allowed by Table 4-1 may be used as authorized by the Director of the Office of Nuclear Material Safety and Safeguards or Designee. The justification in Table 4-1 demonstrates that:

1. The proposed alternatives will provide an acceptable level of quality and safety, or
2. Compliance with the specified requirements of ASME Code, Section III, 1995 Edition with Addenda would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

L.2

Table 4-1

List of ASME Code Exceptions for the NAC-MPC CANISTER

Component	Reference ASME Code Section/Article	Code Requirement	Exception, Justification and Compensatory Measures
CANISTER	NB-1100	Statement of requirements for Code stamping of components.	CANISTER is designed and will be fabricated in accordance with ASME Code, Section III, Subsection NB to the maximum practical extent, but Code stamping is not required.
CANISTER Shield Lid and Structural Lid Welds	NB-4243	Full penetration welds required for Category C joints (flat head to main shell per NB-3352.3).	Shield lid and structural lid to canister shell welds are not full penetration welds. These field welds are performed independently to provide a redundant closure. Leaktightness of the canister is verified by testing.
CANISTER Structural Lid Weld	NB-4421	Requires removal of backing ring.	Structural lid to canister shell weld uses a backing ring that is not removed. The backing ring permits completion of the groove weld; it is not considered in any analyses; it has no detrimental effect on the canisters function.
CANISTER Vent Port Cover and Drain Port Cover to Shield Lid Welds; Shield Lid to Canister Shell Weld	NB-5230	Radiographic (RT) or ultrasonic (UT) examination required.	Root and final surface liquid penetrant examination to be performed per ASME Code Section V, Article 6, with acceptance in accordance with NB-5350.

ITS 4.0

L.2

Table 4-1

List of ASME Code Exceptions for the NAC-MPC CANISTER (Continued)

Component	Reference ASME Code Section/Article	Code Requirement	Exception, Justification and Compensatory Measures
CANISTER Structural Lid to Shell Weld	NB-5230	Radiographic (RT) or ultrasonic (UT) examination required.	The CANISTER structural lid to canister shell closure weld is performed in the field following fuel assembly loading. The structural lid-to-shell weld will be verified by either ultrasonic (UT) or progressive liquid penetrant (PT) examination. If progressive PT examination is used, at a minimum, it will include the root and final surfaces and sufficient intermediate layers to detect critical flaws. If UT examination is used, it will be followed by a final surface PT examination. For either UT or PT examination, the maximum, undetectable flaw size is demonstrated to be smaller than the critical flaw size. The critical flaw size is determined in accordance with ASME Section XI methods. The examination of the weld will be performed by qualified personnel per ASME Code Section V, Articles 5 (UT) and 6 (PT) with acceptance per ASME Code Section III, NB-5330 (UT) and NB-5350 for (PT).

ITS 4.0

2.2

Table 4-1

List of ASME Code Exceptions for the NAC-MPC CANISTER (Continued)

Component	Reference ASME Code Section/Article	Code Requirement	Exception, Justification and Compensatory Measures
CANISTER Vessel and Shield Lid	NB-6111	All completed pressure retaining systems shall be pressure tested.	The CANISTER shield lid to shell weld is performed in the field following fuel assembly loading. The CANISTER, including the shield lid weld, is then pneumatically (air-over-water) pressure tested as defined in Chapter 9 and described in Chapter 8. Accessibility for leakage inspections precludes a Code compliant hydrostatic test. The shield lid-to-shell weld is re-examined by liquid penetrant (PT) examination following the pneumatic pressure test. The shield lid weld is also leak tested to leak-tight criteria of ANSI N14.5. The vent port and drain port cover welds are examined by root and final PT examination. The structural lid secondary enclosure weld is not pressure tested, but is examined by UT and final surface PT or progressive PT.
CANISTER Vessel	NB-7000	Vessels are required to have overpressure protection.	No overpressure protection is provided. The function of the CANISTER is to confine radioactive contents under normal, off-normal, and accident conditions of storage. The CANISTER vessel is designed to withstand a maximum internal pressure considering 100% fuel rod failure and maximum accident temperatures.

TS 4.0

(2.7)

Table 4-1

List of ASME Code Exceptions for the NAC-MPC CANISTER (Continued)

Component	Reference ASME Code Section/Article	Code Requirement	Exception, Justification and Compensatory Measures
CANISTER Vessel	NB-8000	States requirements for nameplates, stamping and reports per NCA-8000.	The NAC-MPC SYSTEM is marked and identified in accordance with 10 CFR 72 requirements. Code stamping is not required. The QA data package will be in accordance with NACś approved QA program.
CANISTER Basket Assembly	NG-8000	States requirements for nameplates, stamping and reports per NCA-8000.	The NAC-MPC SYSTEM will be marked and identified in accordance with 10 CFR 72 requirements. No Code stamping is required. The CANISTER basket data package will be in conformance with NACś approved QA program.
CANISTER Vessel and Basket Assembly Material	NB-2130/ NG-2130	States requirements for certification of material to NCA-3861 and NCA-3862	The NAC-MPC CANISTER Vessel and Basket Assembly component materials are procured in accordance with the specifications for materials in ASME Code Section II. The component materials will be obtained from NAC approved Suppliers in accordance with NACś approved QA program.

ITS 4.0

4.4 Site Specific Parameters and Analyses

Site-specific parameters and analyses that will need verification by the NAC-MPC SYSTEM user, are as a minimum, as follows:

1. The temperature of 75°F is the maximum average yearly temperature. The average daily ambient temperature shall be 100°F or less.

2. The temperature extremes of 125°F with incident solar radiation and -40°F for storage of the CANISTER inside the CONCRETE CASK.

3. The design basis earthquake horizontal and vertical seismic acceleration levels are bounded by the values shown below:

Design-Basis Earthquake Input on the Top Surface of an ISFSI Pad

Horizontal g-level in each of Two Orthogonal Directions	Corresponding Vertical g-level (upward)
0.25g	0.25 x 0.667 = 0.167g

4. The analyzed flood condition of 15 fps water velocity and a height of 50 feet of water (full submergence of the loaded cask) are not exceeded.

5. The potential for fire and explosion shall be addressed, based on site-specific considerations. This includes the condition that the fuel tank of the cask handling equipment used to move the loaded CONCRETE CASK onto the ISFSI site contains no more than 50 gallons of fuel.

L.3

ITS 4.0

4.4 Site Specific Parameters and Analyses (continued)

6. In addition to the requirement of 10 CFR 72.212(b)(2)(ii), the ISFSI pad and foundation shall include the following characteristics as applicable to the end drop and tip-over analyses:

a.	Concrete thickness	36 inch maximum
b.	Pad Subsoil thickness	72 inch minimum
c.	Concrete compressive strength	≤3,000 psi at 28 days
d.	Concrete density (ρ)	$125 \leq \rho \leq 140$ lbs/ft^3
e.	Soil density (ρ)	$85 \leq \rho \leq 115$ lbs/ft^3
f.	Soil Stiffness	≤ 250 psi/in.

The concrete pad maximum thickness excludes the ISFSI pad footer. The compressive strength of concrete should be determined according to the test method given in Section 5.6 of ACI 318. Steel reinforcement is used in the pad. The placement of the reinforcement, including its area and spacing, are determined by analysis and installed in accordance with ACI 318. The soil stiffness should be determined according to the test method described in Chapter 9 of the Civil Engineering Reference Manual, 6th Edition.

7. In cases where engineered features (i.e., berms, shield walls) are used to ensure that requirements of 10 CFR 72.104(a) are met, such features are to be considered important to safety and must be evaluated to determine the applicable Quality Assessment Category on a site specific basis.

L.3 4

ITS 4.0

4.5 Design Specifications

4.5.1 Specification Important for Thermal Performance

1. The spacing of the NAC-MPC SYSTEM shall be a minimum of 15 feet (center-to-center).
2. Helium shall have a minimum purity of 99.9%.

4.5.2 Specification Important to CANISTER Lifting

The minimum distance from the master link of the CANISTER lifting slings to the top of the CANISTER shall be 67 inches.

2.3

ITS 5.0

5.0 ADMINISTRATIVE CONTROLS

L5

5.1 NAC-MPC SYSTEM Training

Training modules shall be developed under the general licensees training program as required by 10 CFR 72.212(b)(6). Training modules shall require a comprehensive, program for the operation and maintenance of the NAC-MPC SYSTEM and the Independent Spent Fuel Storage Installation (ISFSI). The training modules shall include the following elements, at a minimum:

- Regulatory Requirements Overview
- NAC-MPC SYSTEM Design and Operational Features
- ISFSI Facility Design (overview)
- Certificate of Compliance Conditions
- Technical Specifications, Controls, Limits and Conditions of Use
- Identification of Components and Equipment Important to Safety
- Surveillance Requirements
- NAC-MPC SYSTEM and ISFSI procedures, including:
  - Documentation, Inspection and Compliance Requirements
  - Handling the CONCRETE CASK and Empty CANISTER
  - Handling the Transfer Cask
  - Loading and Closing the CANISTER
  - Loading the CONCRETE CASK
  - Moving the CONCRETE CASK and CANISTER and Placement on the ISFSI
- Special Processes and Equipment, including Leak Testing, Welding and Weld Examination
- Auxiliary Equipment, including Lifting Yokes and Slings
- Off-Normal and Accident Conditions, Response and Corrective Actions
- Radiological Safety and ALARA
- Operating Experience

Training session participation should be documented as required to establish qualification to performed the designated tasks.

ITS 5.0

L.6

5.2 Dry Run Training

A dry run training exercise of the loading, closure, handling, unloading, and transfer of the NAC-MPC Storage System shall be conducted by the licensee before the system is initially loaded. This demonstrates equipment fit-up and interfacing, provides the opportunity to illustrate key features, operations, inspections and test conditions. It also allows comparison of procedural steps to component handling requirements. The dry run may be performed in an alternate step sequence from the actual procedures, but all steps must be performed. The dry run shall include, but is not limited to, the following:

- Moving the Concrete Cask into its Designated Loading Area
- Moving the Transfer Cask Holding the Empty Canister into the Spent Fuel Pool
- Loading One or More Dummy Fuel Assemblies into the Canister, Including Independent Verification
- Installing the Shield Lid
- Removal of the Transfer Cask from the Spent Fuel Pool
- Closing and Sealing of the Canister to Demonstrate Pressure Testing, Vacuum Drying, Helium Backfilling, Welding, Weld Inspection and Documentation, and Leak Testing
- Transfer Cask Movement Through the Designated Load Path
- Transfer Cask Installation on the Concrete Cask
- Placement of the Canister in the Concrete Cask
- Transport of the Concrete Cask to the ISFSI
- Canister Unloading, Including Reflooding and Weld Removal or Cutting

Demonstration of closing and sealing the canister may be performed using a mockup of the canister. The mockup should closely approximate the actual canister to allow qualification of personnel in the welding and testing tasks as required. The closed mockup is also used to demonstrate the activities necessary to open and unload the canister.

Participation in dry run training should be documented as required to establish qualification to perform designated tasks.

ITS 4.0

~~5.3 Special Requirements for First NAC-MPC SYSTEM Placed in Service~~

~~The heat transfer characteristics of the NAC-MPC SYSTEM will be recorded by temperature measurements of the first NAC-MPC SYSTEM placed in service with a heat load equal to or greater than 7.5 kW.~~

L.7

Insert ITS 5.1.1

M.3

ITS 5.1.2

3.1 NAC-MPC SYSTEM Integrity

3.1.1 CANISTER Water Temperature

LCO 3.1.1 The temperature of the water in the CANISTER shall be maintained to be less than 200°F.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

---NOTE---

Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CANISTER water temperature limit not met.	A.1 Establish water circulation in the CANISTER to restore CANISTER water temperature to less than 200°F.	2 hours
B. Required Action and Associated Completion Time not met.	B.1 Place the CANISTER in a safe condition. AND B.2 Remove all fuel assemblies from the NAC-MPC SYSTEM.	Immediately 30 days

Insert ITS 5.1.1

L.8

ITS 5.1.2

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.1.1	Verify water temperature in CANISTER is less than 200°F.	Once within 18 hours after TRANSFER CASK with loaded CANISTER is removed from the fuel pool **AND** 30 minutes thereafter.

L.8

ITS 5.1.2

2.8

3.1 NAC-MPC SYSTEM Integrity

3.1.2 CANISTER Vacuum Drying Pressure

LCO 3.1.2 The CANISTER vacuum drying pressure shall meet the limit specified in Table 3-1.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

NOTE

Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CANISTER vacuum drying pressure limit not met.	A.1 Establish CANISTER cavity vacuum drying pressure within limit.	25 days
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the NAC-MPC SYSTEM.	5 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify CANISTER cavity vacuum drying pressure is within limit	Within 24 hours after completion of CANISTER draining.

ITS 5.1.2

L.9

3.1 NAC-MPC SYSTEM Integrity

3.1.3 CANISTER Helium Backfill Pressure

LCO 3.1.3 The CANISTER helium backfill pressure shall meet the limit specified in Table 3-1.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

-----NOTE-----

Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CANISTER helium backfill pressure limit not met.	A.1 Establish CANISTER helium backfill pressure within limit.	25 days
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the NAC-MPC SYSTEM.	5 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Verify CANISTER helium backfill pressure is within limit	Within 24 hours after completion of CANISTER draining.

ITS 5.1.2

(L.8)

3.1 NAC-MPC SYSTEM Integrity

3.1.4 CANISTER Helium Leak Rate

LCO 3.1.4 There shall be no indication of a helium leak at a test sensitivity of 4×10^{-8} cm^3/sec (helium) through the CANISTER shield lid to CANISTER shell confinement weld to demonstrate a helium leak rate less than 8×10^{-8} cm^3/sec (helium) as specified in Table 3-1.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

-----NOTE-----

Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CANISTER helium leak rate limit not met.	A.1 Establish CANISTER helium leak rate within limit.	25 days
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the NAC-MPC SYSTEM.	5 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify CANISTER helium leak rate is within limit	Prior to TRANSPORT OPERATIONS.

L.8

3.1 NAC-MPC SYSTEM Integrity

3.1.5 CANISTER Maximum Time in Vacuum Drying

LCO 3.1.5 The following limits for vacuum drying time shall be met, as appropriate:

1. The time duration from completion of draining the CANISTER through completion of vacuum dryness testing and the introduction of helium backfill shall not exceed 16 hours.
2. The time duration from end of external forced air cooling of the CANISTER through completion of vacuum dryness testing and the introduction of helium backfill shall not exceed 10 hours.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

-NOTE-

Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO time limits not met	A.1 Commence filling CANISTER with helium	2 hours
	AND	
	A.2 Place TRANSFER CASK with helium filled loaded CANISTER in spent fuel pool.	2 hours
	AND	
	A.3 Maintain TRANSFER CASK and CANISTER in spent fuel pool for a minimum of 24 hours.	Prior to restart of LOADING OPERATIONS

L.8

3.1 NAC-MPC SYSTEM Integrity

3.1.5 CANISTER Maximum Time in Vacuum Drying (Continued)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.5.1	Monitor elapsed time from start of vacuum drying operations until start of helium backfill.	Once at start of vacuum drying operations AND 3 hours thereafter.
SR 3.1.5.2	Monitor elapsed time from start of vacuum drying operations following in-pool cooling until start of helium backfill.	Once at start of vacuum drying operations AND 2 hours thereafter.

ITS 5.1.2

L.8

3.1 NAC-MPC SYSTEM Integrity

3.1.6 CANISTER Maximum Time in TRANSFER CASK

LCO 3.1.6 The following limits for CANISTER time in TRANSFER CASK shall be met, as appropriate:

1. The time duration from completion of backfilling the CANISTER with helium through completion of the CANISTER transfer operation from the TRANSFER CASK to the CONCRETE CASK shall not exceed 26 hours.
2. The time duration from completion of in-pool or external forced air cooling of the CANISTER through completion of the CANISTER transfer operation from the TRANSFER CASK to the CONCRETE CASK shall not exceed 15 hours. This LCO time limit is also applicable if LCO 3.1.5.1 was not met during vacuum drying operations.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

NOTE

Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO time limits not met	A.1 A1.1. Place TRANSFER CASK with helium filled loaded CANISTER in spent fuel pool	2 hours
	AND A.1.2 Maintain TRANSFER CASK and CANISTER in spent fuel pool for a minimum of 24 hours	Prior to restart of LOADING OPERATIONS
	OR	

ITS 5.1.2

L.8

3.1 NAC-MPC SYSTEM Integrity

3.1.6 CANISTER Maximum Time in TRANSFER CASK (Continued)

	A.2 A.2.1 Commence supplying air to the TRANSFER CASK bottom two fill/drain lines at a rate of 1,000 CFM and a maximum temperature of 75°F AND A.2.2 Maintain airflow for a minimum of 24 hours	2 hours Prior to restart of LOADING OPERATIONS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Monitor elapsed time from start of helium backfill until completion of transfer of loaded CANISTER into CONCRETE CASK.	Once at completion of vacuum dryness verification test AND 3 hours thereafter.
SR 3.1.6.2	Monitor elapsed time from completion of in-pool or forced air cooling until completion of transfer of loaded CANISTER into CONCRETE CASK	Once at completion of cooling operations AND 3 hours thereafter.

ITS 5.1.2

L.8

3.1 NAC-MPC SYSTEM Integrity

3.1.7 Fuel Cooldown Requirements

LCO 3.1.7 A loaded CANISTER and its fuel contents shall be cooled down in accordance with the following specifications:

a. Nitrogen gas flush for a minimum of 10 minutes

b. Minimum cooling water temperature of 70 °F

c. Cooling water flow rate of 5 (+3, -0) gallons per minute at inlet pressure of 25 (+10, -0) psig

d. Maintain cooling water flow through CANISTER until outlet water temperature ≤ 200 °F

e. Maximum canister pressure ≤ 50 psig

APPLICABILITY: During UNLOADING OPERATIONS

NOTE

The LCO is only applicable to wet UNLOADING OPERATIONS.

ACTIONS

NOTE

Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CANISTER cooldown requirements not met.	A.1 Initiate actions to meet CANISTER cooldown requirements.	Immediately

ITS 5.1.2

L.9

3.1 NAC-MPC SYSTEM Integrity

3.1.7 Fuel Cooldown Requirements (Continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Initiate CANISTER cooldown flow to loaded CANISTER.	Within 30 hours after removal of CANISTER from CONCRETE CASK and placement in Transfer Cask.
SR 3.1.7.2	Verify that the cooldown water temperature and flow rate are within limits.	Once within 1 hour prior to initiating cooldown AND 1 hour thereafter.

(L.8)

Table 3-1
CANISTER Limits

CANISTER	LIMITS
NAC-MPC CANISTER	
a. CANISTER Vacuum Drying Pressure	≤ 3 mm of Mercury for ≥ 30 min
b. CANISTER Helium Leak Rate	≤ 8x10^{-8} std cc/sec (helium)
c. CANISTER Helium Backfill Pressure	0 (+1, -0) psig
d. CANISTER Pressure Test	15.0 (+2,-0) psig for ≥ 10 min

ITS 5.12

L.8

3.2 NAC-MPC SYSTEM Radiation Protection

3.2.1 <u>NAC-MPC SYSTEM Average Surface Dose Rates</u>

LCO 3.2.1 CONCRETE CASK dose rates shall be measured at the locations shown in Figure 3-1. The average surface dose rates of each CONCRETE CASK shall not exceed:

a. 50 mrem/hour (neutron + gamma) on the side (on the concrete surfaces)

b. 35 mrem/hour (neutron + gamma) on the top;

c. 100 mrem/hour (neutron + gamma) at air inlet and outlet vents.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

-----------------------------------NOTE-----------------------------------

Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CONCRETE CASK average surface dose rate limits not met.	A.1 Administratively verify correct fuel loading. <u>AND</u>	24 hours

ITS 5.1.2

(L.8)

3.2 NAC-MPC SYSTEM Radiation Protection

3.2.1 CONCRETE CASK Average Surface Dose Rates (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2 Verify that the dose rate from the cask will not cause the ISFSI to exceed the offsite radiation protection requirements of 10 CFR 20 and 10 CFR 72.	Prior to TRANSPORT OPERATIONS
B. Required Action and Associated Completion Time not met.	B.1 Remove all fuel assemblies from the NAC-MPC SYSTEM.	30 days

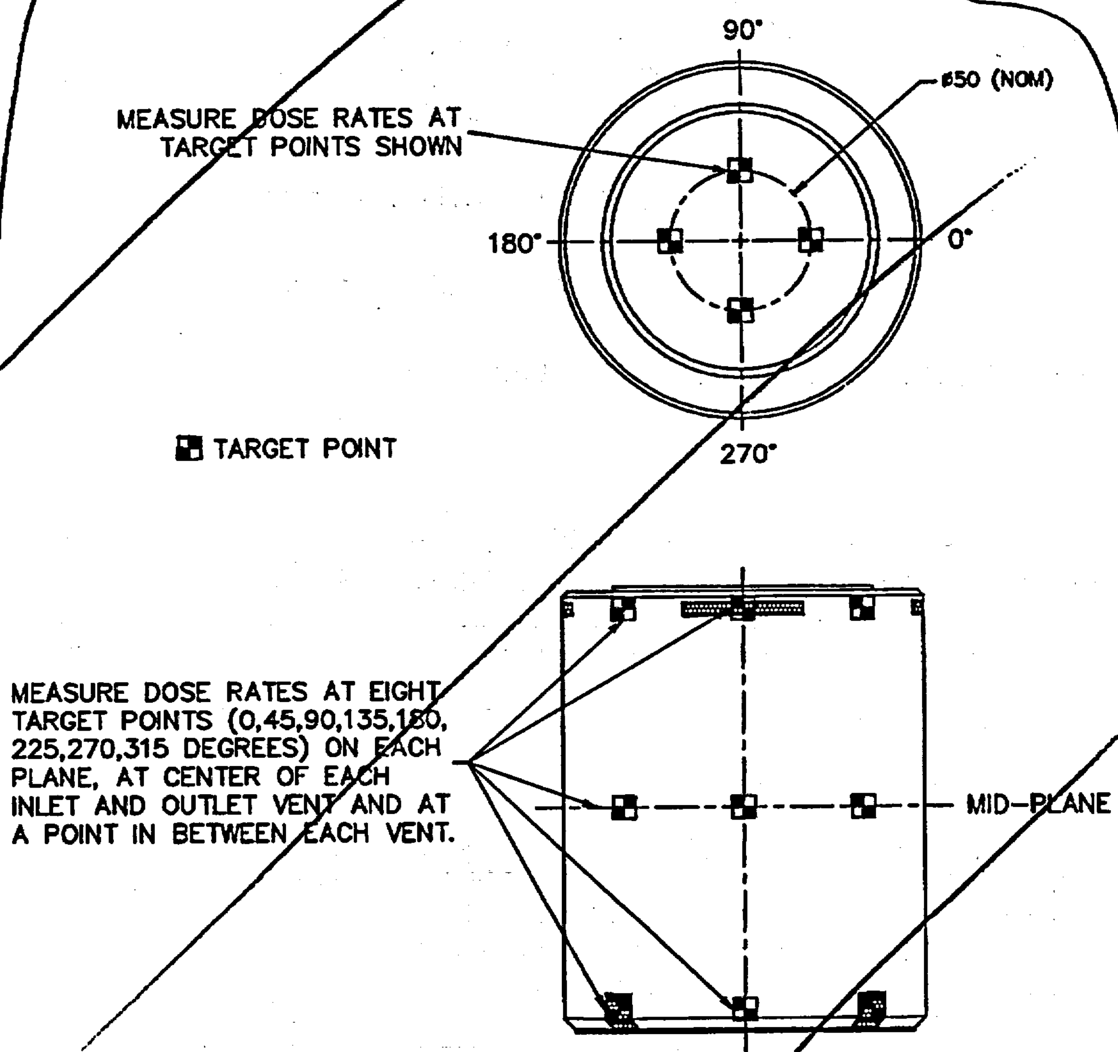
SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify average surface dose rates of CONCRETE CASK containing fuel assemblies are within limits.	Prior to TRANSPORT OPERATIONS

ITS 5.1.2

L.8

Figure 3-1
CONCRETE CASK Surface Dose Rate Measurement



ITS 5.1.2

L8

3.2 NAC-MPC SYSTEM Radiation Protection
3.2.2 CANISTER Surface Contamination

LCO 3.2.2 Removable contamination on the accessible exterior surfaces of the CANISTER or accessible interior surfaces of the TRANSFER CASK shall each not exceed:

a. 1000 dpm/100 cm^2 from beta and gamma sources and

b. 20 dpm/100 cm^2 from alpha sources.

APPLICABILITY: During LOADING OPERATIONS

ACTIONS

NOTE

Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CANISTER or TRANSFER CASK removable surface contamination limits not met.	A.1 Restore CANISTER and TRANSFER CASK removable surface contamination to within limits.	Prior to TRANSPORT OPERATIONS

ITS 5.1.2

L.8

3.2 NAC-MPC SYSTEM Radiation Protection

3.2.2 CANISTER Surface Contamination (Continued)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.2.1	Verify that the removable contamination on the accessible exterior surfaces of the CANISTER containing fuel is within limits.	Prior to TRANSPORT OPERATIONS
SR 3.2.2.2	Verify that the removable contamination on the accessible interior surfaces of the TRANSFER CASK do not exceed limits.	Prior to TRANSPORT OPERATIONS

ITS 5.1.3

Insert ITS 5.1.3

L.9

3.1 NAC-MPC SYSTEM Integrity

3.1.8 CONCRETE CASK Maximum Lifting Height

LCO 3.1.8 A CONCRETE CASK containing a CANISTER loaded with INTACT FUEL ASSEMBLYs or RECONFIGURED FUEL ASSEMBLYs shall be lifted in accordance with the following requirement

a. A lift height ≤ 6 inches

APPLICABILITY: During TRANSPORT OPERATIONS

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. NAC-MPC SYSTEM lifting requirements not met.	A.1 Initiate actions to meet CONCRETE CASK maximum lifting height.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Verify CONCRETE CASK lifting requirements are met.	After the CONCRETE CASK is raised to install or remove air pad and prior to TRANSPORT OPERATIONS

ITS 5.1.3

L.9

3.1 NAC-MPC SYSTEM Integrity

3.1.9 TRANSFER CASK Minimum Operating Temperature

LCO 3.1.9 The TRANSFER CASK shall not be used for loaded CANISTER transfer operations outside of the fuel handling facility when the external ambient temperature is ≤ 0°F.

APPLICABILITY: During LOADING or UNLOADING OPERATIONS

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. External ambient temperature below LCO limit	A.1 Do not perform TRANSFER CASK operations external to the facility.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.9.1	Measure external ambient temperature.	Prior to start of LOADING or UNLOADING OPERATIONS AND 1 hour thereafter.

Insert ITS 5.14

M.1

ITS 5.1.6

L.10

5.4 Programs
5.4.1 CONCRETE CASK Thermal Monitoring Program

The following programs shall be established, implemented, and maintained.

This program provides guidance for the temperature measurement and visual inspection activities that are used to monitor the thermal performance of each CONCRETE CASK.

a. The ambient air temperature and the air outlet temperatures are measured and compared every 24 hours. The temperature difference between the air outlet temperatures and the ambient air temperature is calculated and recorded. The air inlets and outlets are inspected and verified to be free of blockage every 24 hours.

b. If any air outlet temperature, or temperature difference between air outlet and ambient temperature shows an unexplained reading, appropriate actions are taken to determine the cause and to return the outlet temperatures to acceptable values. One of the immediate actions will be to increase the frequency of temperature monitoring until normal conditions are returned.

c. If an air outlet temperature exceeds the ambient air temperature by 92°F, the NRC will be notified and actions will be taken to evaluate the effects and impact of the elevated temperature on the CONCRETE CASK and CANISTER. A temperature differential of 92°F corresponds to a concrete temperature of 165°F. The long-term normal concrete temperature limit for the CONCRETE CASK is 200°F and the short-term bulk concrete temperature limit is 350°F.

Insert ITS 5.2.1

L.8

ADMINISTRATIVE CHANGES

A.1 Definitions in the CTS which do not appear in the generic CASK ITS have been eliminated. This change is administrative because the deletion of definitions does not, in itself, change requirements. The deletion of the definitions in other Specifications will be justified in different DOCs.

A.2 Two defined terms are added to the CTS. The term CASK is used throughout the generic fuel storage ITS as a non-vendor specific term to refer to a fuel storage system. The term "SAR" is defined to provide an unambiguous reference to the Safety Analysis Report referenced in the Certificate of Compliance issued for the CASK. The addition of these terms is administrative as they do not create, modify, or remove requirements and represent an editorial preference.

A.3 The Use and Application rules in Section 1.2, Logical Connectors, Section 1.3, Completion Times, and Section 1.4, Frequency, are revised to be consistent with the generic fuel storage ITS and to eliminate those features which do not apply to the fuel storage generic ITS. The revisions are administrative because they do not create, modify, or eliminate requirements, but describe the conventions used in the fuel storage ITS.

A.4 LCO 3.0.5 is not applicable to a CASK and is removed. The CASK ITS does not direct equipment to be removed from service in ACTIONS. Therefore, the LCO 3.0.5 allowance to return such equipment to service for testing is not required. This change is designated as administrative because elimination of an unused provision does not result in a technical change to the specifications.

A.5 The portion of SR 3.0.2 which discusses Frequencies specified as "once" and "once per" is deleted as it is not applicable. The CASK ITS does not use the Frequency specifications. This change is designated as administrative because elimination of an unused feature does not result in a technical change to the specifications.

A.6 The Design Features sections 4.1.1, Site, and 4.2, Storage Features, are deleted. These sections contain no requirements. This change is designated administrative because it does not result in a technical change to the specifications.

A.7 Not used.

A.8 CTS LCO 3.0.4 describes that exception to LCO 3.0.4 are stated in individual Specifications. The CASK ITS does not use LCO 3.0.4 exceptions. This change is designated as administrative because elimination of an unused feature does not result in a technical change to the specifications.

MORE RESTRICTIVE CHANGES

M.1 The CTS does not contain a requirement to periodically verify CASK storage integrity. ITS 3.1.1 provides a periodic test for CASK storage integrity. In addition, should the LCO not be met, Actions require immediate action to restore storage integrity. If storage integrity is not restored with 30 days, a special report must be provided to the NRC describing the cause of the loss of storage integrity and the plans and schedule for restoring storage integrity.

The capability of a CASK to be periodically monitored such that the licensee will be able to determine when corrective action needs to be taken to maintain safe store conditions is required by 10 CFR part 72.122(h)(4). Methods of monitoring storage integrity vary by CASK design. Therefore, the details of the monitoring and the Frequency by which the CASK must be monitored in located in a CASK Storage Integrity Program. The CASK Storage Integrity Program is required by the Administrative Controls. The details of the CASK Storage Integrity Program will be located in the SAR for the CASK design. The details of the special report that must be filed with the NRC if CASK storage integrity is lost and not restored within 30 days are located in the CASK Storage Integrity Report described in the Administrative Controls. This change is designated as more restrictive because it adds additional controls to the Technical Specifications.

M.3 The CTS does not contain requirements on the radioactive effluent control program. The ITS addresses the radioactive effluent control program.

The Technical Specifications must state how the requirements in 10 CFR 72.44(d) are met. 10 CFR 72.44(d) requires that there be Technical Specifications on radioactive effluents. This is satisfied by the Radioactive Effluent Control Program. Without such a section, the proposed Technical Specifications would not satisfy the requirements of 10 CFR 72.44(d).

LESS RESTRICTIVE CHANGES

L.1 The CTS contains detailed descriptions of the fuel which can be stored in the fuel storage CASK. The fuel storage generic ITS does not contain these descriptions and substitutes the requirement, "Only components evaluated in the SAR may be stored in the CASK."

The change is acceptable because the detailed descriptions of the fuel and components to be stored are more appropriate for the SAR. 10 CFR part 72.236 requires the cask vendor to provide specifications for the spent fuel to be stored in the CASK, such as type of spent fuel, maximum allowable enrichment of the fuel prior to any irradiation, burnup, minimum cooling time, maximum heat to be dissipated, spent fuel loading limit, and condition of the spent fuel. This information is an integral part of the evaluations performed on the CASK as documented in the SAR. The CoC, which states the conditions for use of the CASK, states that the CASK is described in the SAR and NRC's SER. Therefore, the user of the CASK must verify that their fuel is authorized to be stored in the CASK. Because the information must appear in the SAR to support the required analyses, duplicating the information in the Technical Specifications provides no advantages and has the disadvantage of duplication, lack of standardization, and retaining a level of detail far outside that appearing in the power plant ITS for items of similar safety significance. This change is designated as less restrictive because it eliminates information which appears in the Technical Specifications.

L.2 CTS Design Features Section 4.3 contains a statement of the governing Code for the CASK and a list of exceptions to Codes, Standards and Criteria. The ITS does not contain this information.

Section 4.3, Codes and Standards, is inappropriate for the Technical Specifications and is eliminated. 10 CFR 72.44(c)(4) defines Design Features. It states, "Design Features include items that would have a significant effect on safety if altered or modified, such as materials of construction and geometric arrangements." The Technical Specifications contain operating limits, not manufacturing directions, such as Codes and Standards. This information is appropriate to the SAR, not the operating limits applied in the Technical Specifications. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.3 CTS Design Features Section 4.4 contains a list of site specific parameters and analyses that must be verified by the system user. The ITS does not contain this information.

This section is eliminated because it is unnecessary and could lead a CASK user to not follow the applicable regulations. 10 CFR 72.212(b)(3) requires the user of the CASK to review the SAR and the NRC Safety Evaluation Report to determine whether or not the reactor site parameters envelope the cask design bases. 10 CFR 72.212(b)(2) requires written evaluation of the storage pads and areas. The information in Section 4.4 is a duplication of these existing regulatory requirements and the values listed are only a subset of the complete set of parameters that must be evaluated by the CASK user. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.4 Not used.

L.5 CTS Administrative Controls section 5.1 contains requirements for a training module to be developed by the user of the CASK. The ITS does not contain this information.

The section is inappropriate for the CASK Technical Specifications and is eliminated. As stated in the first sentence of the section, a training program is required under 10 CFR 72.212(b)(6). Repeating that information in the Technical Specifications adds no value and it is unclear why only training was selected for detailed description in the Technical Specifications when 10 CFR 72.212(b)(6) also describes the emergency plan, quality assurance program, and radiation protection program. Chapter 8 of the SAR also contains a description of operational procedures. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.6 CTS Administrative Controls section 5.2 contains a description of dry run testing. This information is not contained in the ITS.

This section is inappropriate for the CASK Technical Specifications and is eliminated. These one-time tasks are appropriate to the SAR, not the operational restrictions of the Technical Specifications. Dry run training does not have a direct effect on safety, as the cask used does not contain fuel. This change is designated as less restrictive because information contained in the Technical Specifications is being removed.

L.7 CTS Administrative Controls section 5.3 contains special requires for the first system in place. These requirements are not contained in the ITS.

This section is inappropriate for the CASK Technical Specification and is eliminated. This first-use testing is only applicable to the first CASK of the type place in service. Therefore, the requirements will not apply to the majority of CASKs or users of the CASK. This requirement, which is really a requirement on the CASK vendor, not the CASK user, should be relocated the SAR, or the NRC's SER.

L.8 The CTS contains CASK-specific requirements on process variables monitored during preparation of a CASK for storage, such as vacuum drying pressure, helium backfill pressure, leak rate testing acceptance criteria, surface dose rates, surface contamination, fuel temperature, and spent fuel pool dissolved boron concentration. These CASK-specific parameters do not appear in the CASK Technical Specifications and a generic CASK Loading, Unloading, and Preparation Program is implemented. This program requires that the SAR requirements for loading fuel into a CASK, unloading fuel from a CASK, and preparing a CASK for storage be implemented.

This change is appropriate because it establishes a generic requirement for control of CASK loading, unloading, and preparation while allowing the CASK-specific methods and parameters to be specified in the SAR. The program replaces the CTS LCOs with CASK-specific parameters and methods, the specific Actions, and the specific Surveillance Requirements with the requirement that the program include compensatory measures to be taken if a CASK fails to meet the requirements of the program and limits on the length of time that fuel assemblies may remain within the CASK with the requirements of the program not met. This change is designated as less restrictive because requirements that are specified in the CTS are being moved to a program.

L.9 The CTS provides CASK-specific parameters and requirements governing the movement of a CASK, such as maximum lifting height. These CASK-specific parameters do not appear in the CASK Technical Specifications and a generic CASK Transportation Evaluation Program is implemented. This program requires that administrative controls and procedures be established to ensure that CASK transportation is conducted within the limits assumed in the SAR, including maximum lifting height, road conditions, and CASK temperature limits.

This change is appropriate because it establishes a generic requirement for control of CASK transportation while allowing the CASK-specific controls and parameters to be specified in the SAR. The program replaces the CTS LCOs with CASK-specific controls and methods, the specific Actions, and the specific Surveillance Requirements with the requirement that the program include administrative controls and procedures. This change is designated as less restrictive because requirements that are specified in the CTS are being moved to a program.

L.10 The CTS provides a detailed CONCRETE CASK Thermal Monitoring Program, including specific tests and measurements to be performed. This CASK-specific requirement does not appear in the CASK Technical Specifications and a generic CASK Storage Integrity Monitoring Program is implemented.

The capability of a CASK to be periodically monitored such that the licensee will be able to determine when corrective action needs to be taken to maintain safe store conditions is required by 10 CFR part 72.122(h)(4). Thermal monitoring of concrete and other ventilated CASKS is one aspect of this periodic monitoring. The program replaces the CTS Administrative Program containing CASK-specific acceptance criteria and methods, and the specific actions to be taken with the requirement that the program include administrative controls and procedures. This change is designated as less restrictive because requirements that are specified in the CTS are being moved to a program.

ATTACHMENT F

WESFLEX STORAGE SYSTEM AND WESFLEX W74 CANISTER

ATTACHMENT F.1 - DISPOSITION MATRIX FOR THE WESFLEX STORAGE SYSTEM AND WESFLEX W74 CANISTER

Note: The Wesflex Storage System and the Wesflex W74 Canister have separate Technical Specifications which reference each other. Because of the amount of duplication, the documents have been combined for the purpose of this evaluation.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
1.1	DEFINITIONS	Yes	No	No	No	No	Retained for clarity of the ITS.
1.2	Logical Connectors	Yes	No	No	No	No	Retained for clarity of the ITS.
1.3	Completion Times	Yes	No	No	No	No	Retained for clarity of the ITS.
1.4	Frequency	Yes	No	No	No	No	Retained for clarity of the ITS.
2.0	Functional and Operational Limits	Yes	No	Yes	No	No	This section is required by 72.44. Only sufficient information to determine when the Functional and Operating limits have been violated and the actions to be taken in that circumstance should be in Section 2.0. Detailed description is in the SAR.
3.0	LCO and SR Applicability	Yes	No	No	No	No	Retained for clarity of the ITS.
3.1.1	Canister Helium Backfill Density	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
3.1.2	Canister Vacuum Drying Pressure	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.3	Canister Leak Rate	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.1.4	Hydraulic Ram Force During Horizontal Canister Transfer	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.15	Canister Vertical Time Limit in Transfer Cask	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.2.1	Cask Surface Contamination	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.3.1	Storage Cask Air Inlet and Outlet Openings	Yes	No	Yes	No	No	Details relocated to the CASK Storage Integrity Monitoring Program.
3.3.2	Storage Cask Temperatures During Storage	Yes	No	Yes	No	No	Details relocated to the CASK Storage Integrity Monitoring Program.
3.3.1	Storage Temperatures During Horizontal Transfer	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
3.4.1	Storage Cask Dose Rates	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
3.5.1	Transfer Cask Structural Shell Temperature	Yes	No	Yes	No	No	Details relocated to CASK Transportation Evaluation Program.
3.6.1	Transfer Cask Surface Contamination	Yes	No	Yes	No	No	Details relocated to the CASK Loading, Unloading, and Preparation Program in the Administrative Controls.
4.0	Design Features	Yes	No	No	No	No	A Design Features chapter is required under 10 CFR part 72.44.
4.1.1.1 4.1.2.1 4.1.3.1	Structural Performance	No	No	No	No	No	Deleted. This section does not contain any requirements, just a statement of fact.
4.1.1.2 4.1.1.3 4.1.2.2 4.1.2.3 4.1.3.3 4.1.3.4	Codes and Standards	No	No	No	No	No	Deleted. Codes and Standards govern the manufacture of fuel storage casks, not their operation. Codes and Standards are not operational requirements. Furthermore, the Codes and Standards are described in the SAR and subject to regulatory control.
4.2	Storage Pad	No	No	No	No	No	Deleted. This storage pad information falls under the site-specific parameters which must be verified prior to use by 72.212(b)(3).
5.1	Training Modules	No	No	No	No	No	Deleted. Development of a training program is required by Paragraph 72.212(b)(6) and Part 72, Subpart I.

CURRENT TS	TITLE	RETAINED	CRITERION 1	CRITERION 2	CRITERION 3	CRITERION 4	NOTES
5.2.1	Cask Sliding Evaluation	No	No	No	No	No	Deleted. Paragraph 72.212(b)(3) requires written evaluation that the site specific parameters envelope the assumptions in the fuel storage cask design.
5.2.2	Cask Transport Evaluation Program	Yes	No	No	No	No	This program is retained as the Cask Transportation Evaluation Program. CASK specific information is relocated to the SAR.
5.2.3	Technical Specifications Bases Control Program	No	No	No	No	No	Deleted. The Technical Specifications Bases are retained in Chapter 12 of the SAR and controlled under 72.48.
5.2.4	Radioactive Effluent Control Program	Yes	No	No	No	No	Retained to satisfy the requirements of 10 CFR 72.44(d).

ATTACHMENT F.2

MARKUP AND DISCUSSIONS OF CHANGE FOR THE WESFLEX STORAGE SYSTEM AND WESFLEX W74 CANISTER

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.

Term	Definition
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
CANISTER	The CANISTER is the storage container for SFAs approved for use at the ISFSI.
INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)	The facility within the perimeter fence licensed for storage of spent fuel within CANISTERs.
LOADING OPERATIONS	LOADING OPERATIONS include all licensed activities on a CANISTER while it is being loaded with fuel assemblies. LOADING OPERATIONS begin when the first fuel assembly is placed in the CANISTER and end when the CANISTER outer closure plate to shell weld examination is complete.
SPENT FUEL ASSEMBLIES (SFAs)	Irradiated nuclear fuel assemblies that are to be placed in a CANISTER for dry storage.
SPENT FUEL STORAGE SYSTEM (SFSS)	The storage components including the CANISTER, STORAGE CASK, and TRANSFER CASK.
STORAGE CASK	The cask that provides a shielded, ventilated storage environment for the loaded CANISTER. This cask is used for TRANSFER OPERATIONS.
STORAGE OPERATIONS	STORAGE OPERATIONS include all licensed activities that are performed at the ISFSI while a CANISTER containing spent fuel is sitting inside a STORAGE CASK on a storage pad within the ISFSI.
TRANSFER CASK	The cask that is used for SFA LOADING OPERATIONS and UNLOADING OPERATIONS, and for TRANSFER OPERATIONS.

4.1

ITS 1.1

1.1 Definitions

Term	Definition
~~TRANSFER OPERATIONS~~	~~TRANSFER OPERATIONS include all licensed activities that are performed on a CANISTER loaded with one or more fuel assemblies when it is being moved to and from the ISFSI. TRANSFER OPERATIONS begin when the CANISTER outer closure plate to shell weld inspection is complete and end when the CANISTER is in the STORAGE CASK in its storage position on the storage pad within the ISFSI.~~
~~UNLOADING OPERATIONS~~	~~UNLOADING OPERATIONS include all licensed activities on a CANISTER to be unloaded of the contained fuel assemblies. UNLOADING OPERATIONS begin when the CANISTER is ready to initiate removal of the CANISTER outer closure plate and end when the last fuel assembly is removed from the CANISTER.~~

A.1

Insert ITS Definition of CASK, SAR

A.2

ITS 1.2

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 Require 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 indentations of the logical connectors.

When logical connectors are used to state a Condition, Completion Time, Surveillance, or Frequency.

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... AND 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.

Insert ITS 1.2

A.3

ITS 1.2

1.2 Logical Connectors

EXAMPLES
(continued)

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met	A.1 Stop... OR A.2.1 Verify... AND A.2.2.1 Reduce... OR A.2.2.2 Perform... OR 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.

Insert ITS 1.2

A.3

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 Time(s).
DESCRIPTION	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 facility 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 facility is not within the LCO Applicability. 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.

Insert ITS 1.3

A.3

1.3 Completion Times

EXAMPLES

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

<u>EXAMPLE 1.3-1</u>

ACTIONS

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

Insert ITS 1.3

A.3

ITS 1.3

1.3 Completion Times

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 Perform Action B.1.	12 hours
	AND	
	B.2 Perform Action B.2.	36 hours

When it is determined that a system does not 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, Condition A and B are exited, and therefore, the Required Actions of Condition B may be terminated.

Insert ITS 1.3

A.3

1.3 Completion Times

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 Perform Action B.1. AND B.2 Perform Action B.2.	12 hours 36 hours

The Note above the ACTIONS Table is a method of modifying the Completion Time tracking. If this method of modifying the Completion Time tracking were only applicable 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 does not meet the LCO, Condition A is entered and its Completion Time starts. If it is determined that subsequent components do 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.

Insert ITS 1.3

A.3

ITS 1.4

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	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. 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, as well as certain Notes in the Surveillance column that modify performance requirements. 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. The use of "met" or "performed" in these instances conveys specific meaning. A Surveillance is "met" only when the acceptance criteria are satisfied. Known failure of the requirements of a Surveillance, even without a Surveillance specifically being "performed," constitutes a Surveillance not "met".

Insert ITS 1.4

A.3

1.4 Frequency

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 it is determined the equipment does not meet the LCO, a variable is outside specified limits, or the unit is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while the cask 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 unit 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.

Insert ITS 1.4

A.3

1.4 Frequency

~~EXAMPLES (continued)~~

~~EXAMPLE 1.4-2~~

~~SURVEILLANCE REQUIREMENTS~~

SURVEILLANCE	FREQUENCY
Verify flow is within limits.	Once within 12 hours prior to starting activity AND 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 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.~~

Insert ITS 1.4

A3

2.0 FUNCTIONAL AND OPERATING LIMITS

2.1 Functional and Operating Limits

2.1.1 Fuel to be Stored in the Wesflex™ W74 Canister

SFAs meeting the limits specified in Table 2.1-1 may be stored in a W74 CANISTER.

Insert ITS 2.1.1

2.2 Functional and Operating Limits Violations

If any Functional and Operating Limits are violated, the following actions shall be completed:

2.2.1 The affected fuel assemblies shall be placed in a safe condition. Contents L.1

2.2.2 The NRC Operations Center shall be notified within 24 hours.

2.2.3 A special report will be provided to NRC within 30 days that describes the cause of the violation, the actions to restore compliance, and the actions to prevent recurrence.

L.1

ITS 2.0

2.0 Functional and Operating Limits

Table 2.1-1
Wesflex™ W74 Loading Specification W74-1

W74-1 Payload Configuration Parameter	Full Loading of 64 Intact Fuel Assemblies Limit/Specification
Payload Description:	≤ 64 Big Rock Point BWR fuel assemblies, as defined in Table 2.1-2. If less than 64 fuel assemblies are loaded, a dummy fuel assembly shall be placed into each empty CANISTER basket guide tube. Each dummy fuel assembly shall be the approximate weight and size of the actual fuel being loaded.
Cladding Material/Condition:	Intact zircaloy-clad fuel assemblies with no known or suspected cladding defects greater than hairline cracks or pinhole leaks. Partial fuel assemblies, i.e., fuel assemblies from which fuel rods are missing, must not be loaded into the CANISTER unless dummy fuel rods are inserted into the assembly in the locations of the missing rods. The dummy fuel rods shall displace an amount of water equal to that displaced by the original fuel rods.
Initial Enrichment:	≤ 4.10 w/o ^{235}U. The maximum acceptable enrichments shall not exceed the enrichments defined in Table 2.1-2.
Burnup:	≤ 40,000 MWd/MTU.
Cooling Time:	≥ 3.0 years. The minimum acceptable cooling time varies by fuel assembly class and enrichment, as a function of burnup; and is also dependent on the total cobalt content of the fuel and control components. The effects of the maximum acceptable decay heat, initial uranium content, and gamma and neutron sources are incorporated into the minimum cooling time determination. Fuel assemblies shall not be stored with less than the minimum acceptable cooling time indicated in Table 2.1-3.

2.1

ITS 2.0

2.0 Functional and Operating Limits

Table 2.1-2
Fuel Assemblies Acceptable for Storage in the Wesflex™ W74 Canister

Assembly Class(1)	Assembly Type	Maximum Uranium Loading (kg)	Linear Uranium Loading (kg/in)	W74-1 Initial Enrichment (w/o ^{235}U)	Applicable Cooling Table
Big Rock Point	9x9 GE	138	1.97	≤4.1	W74-1-A
	9x9 ANF	138	1.97	≤4.1	W74-1-A
	11x11 ANF	138	1.97	≤4.1	W74-1-A
	Other(2)				

Notes
(1) Assembly Class is defined per EIA Spent Fuel Discharge Report.[1]
(2) Other fuel assemblies that meet the defined parameters are qualified for storage.

L.1

L.1

[1]Energy Information Administration, *Spent Nuclear Fuel Discharges from U.S. Reactors 1993*, U.S. Department of Energy, 1995.

ITS 2.0
(L.1)

2.0 Functional and Operating Limits

Table 2.1-3
Fuel Cooling Table W74-1-A

APPLICABILITY:

Canister:	Wesflex™ W74-M and W74-T Canisters
Loading Specification:	W74-1-A
Description:	Up to 64 fuel assemblies
SNF Assemblies:	Valid for all BRP assemblies as indicated in Table 2.1-2.

QUALIFICATION BASES:

Storage Cask Dose Rate	≤ 50 mrem/hr
Canister Heat Load	≤ 26.4 kW/Canister, and ≤ 0.230 kW/inch-Canister

Maximum Burnup (MWd/MTU)[1]	Required Minimum Cooling Time (yr.)[1,2]					
	Minimum Initial Enrichment (w/o ^{235}U)					
	1.5	2.0	2.5	3.0	3.5	4.0
15,000	3.2	3.1	3.1	3.0	3.0	3.0
20,000	3.4	3.3	3.2	3.2	3.1	3.1
25,000	3.6	3.5	3.4	3.4	3.3	3.3
30,000	3.8	3.7	3.6	3.5	3.5	3.4
32,000	3.9	3.8	3.7	3.6	3.5	3.5
34,000	4.0	3.9	3.8	3.7	3.6	3.5
36,000	4.2	4.0	3.9	3.8	3.7	3.7
38,000	4.7	4.3	4.0	3.9	3.8	3.7
40,000	5.1	4.7	4.4	4.1	3.9	3.8

Notes:
(1) Rounding: round up to next highest burnup, round down to next lowest enrichment.
(2) Enrichments less than 1.5% or greater than the criticality limit presented in Section 6.1 of the Wesflex™ W74 Canister Storage SAR are not qualified.

3.0 LIMITING CONDITION 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	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~~. (A.4) 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.
LCO 3.0.3	Not applicable to ~~an SFSS~~. CASK (A.2)
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 a ~~CANISTER~~. CASK (A.2) ~~Exceptions to this Specification are stated in the individual Specifications. These exceptions allow entry into specified conditions in the Applicability when the associated ACTIONS to be entered allow operation in the specified condition in the Applicability only for a limited period of time.~~ (A.8)
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.~~ (A.4) Not applicable to a CASK
LCO 3.0.6	Not applicable to ~~an SFSS~~. CASK (A.2)
LCO 3.0.7	Not applicable to ~~an SFSS~~. CASK (A.2)

ITS SR 3.0

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 a 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.~~

A.5

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 a ~~CANISTER~~ CASK.

A.2

Insert ITS 3.1.1

M.1

There are no Design Features applicable to a CASK.

ITS 4.0

(4.6)

4.0 DESIGN FEATURES

~~The specifications in this section include the design characteristics of special importance to each of the physical barriers and the maintenance of safety margins in the storage system component design. The principal objective of this category is to describe the design envelope which might constrain any physical changes to essential equipment. Included in this category are the site environmental parameters which provide the bases for design, but are not inherently suited for description as LCOs.~~

4.1 Storage System

4.1.1 Storage Cask

~~4.1.1.1 Structural Performance~~

~~The STORAGE CASK has been evaluated for a tip-over during handling (equivalent to a side drop of 28 g) and a bottom end drop resulting in an axial gravitational (g) loading of 89 g.~~

(4.7)

~~4.1.1.2 Codes and Standards~~

~~The Wesflex™ W150 STORAGE CASK is designed in accordance with ACI 349 and fabricated in accordance with ACI 318. Exceptions to these codes are listed in Table 4.1-1.~~

~~4.1.1.3 Fabrication Exceptions to Codes, Standards, and Criteria~~

~~Proposed alternatives to ACI 318, including exceptions allowed by Section 4.1.1.2, may be used when authorized by the Director of the Office of Nuclear Material Safety and Safeguards or Designee. The applicant should demonstrate that:~~

(L.2)

1. ~~The proposed alternatives would provide an acceptable level of quality and safety, or~~
2. ~~Compliance with the specified requirements of ACI 318, would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.~~

~~Requests for exception in accordance with this section should be submitted in accordance with 10CFR72.4.~~

4.1.2 Transfer Cask

~~4.1.2.1 Structural Performance~~

~~The TRANSFER CASK has been evaluated for a side drop resulting in a lateral gravitational loading of 60 g.~~

(4.7)

~~4.1.2.2 Codes and Standards~~

~~The Wesflex™ W100 TRANSFER CASK is designed in accordance with Subsection NF of the ASME Code. Exceptions to the code are listed in Table 4.1-2.~~

(L.2)

ITS 4.0

4.0 Design Features

4.1.2.3 Fabrication Exceptions to Codes, Standards, and Criteria

Proposed alternatives to Subsection NF of the ASME Code, including exceptions allowed by Section 4.1.2.2, may be used when authorized by the Director of the Office of Nuclear Material Safety and Safeguards or Designee. The applicant should demonstrate that: L.2

1. The proposed alternatives would provide an acceptable level of quality and safety, or
2. Compliance with the specified requirements of ASME Code, Section III, would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Requests for exception in accordance with this section should be submitted in accordance with 10CFR72.4.

4.1.3 Canister

4.1.3.1 Criticality

See each individual CANISTER Technical Specification Section 4.1.3.1 for discussion of CANISTER criticality control features. L.4

4.1.3.2 Structural Performance

See each individual CANISTER Technical Specification Section 4.1.3.2 for discussion of CANISTER structural performance features. 4.7

4.1.3.3 Codes and Standards

See each individual CANISTER Technical Specification Section 4.1.3.3 for discussion of codes and standards applicable to the CANISTER. L.2

4.2 Storage Pad

4.2.1 Storage Location for Storage Casks

L.3

Each STORAGE CASK is designed to radiate sufficient heat when placed on the storage pad in the appropriate location. Thermal analyses of normal STORAGE OPERATIONS (Storage System SAR, Section 4.4) assumes that the casks will be stored in an array that places adjacent casks a minimum of 15 feet apart, center-to-center. This minimum spacing is an important parameter to the proper dissipation of radiant heat energy from the cask.

ITS 4.0

4.0 Design Features

4.2.2 Pad Properties to Limit Cask Gravitational Loadings Due to Postulated Drops

4.2.2.1 Storage Cask

The Wesflex™ W150 STORAGE CASK has been evaluated for an end drop onto a reinforced concrete pad. The evaluations are based on the following parameters:

Concrete thickness (inches, max.)	24	30	36
Nominal concrete 28 day compressive strength (psi)	3,000	3,000	3,000
Nominal reinforcement yield strength (psi)	60,000	60,000	60,000
Soil effective modulus of elasticity (psi, max.)	30,000	20,000	10,000
Drop height (inches, max.)	36	36	36

4.2.2.2 Transfer Cask

The Wesflex™ W100 Transfer Cask has been evaluated for a side drop onto a reinforced concrete pad. The evaluations are based on the following parameters:

Concrete thickness (inches, max.)	24
Nominal concrete 28 day compressive strength (psi)	3,000
Nominal reinforcement yield strength (psi)	60,000
Soil effective modulus of elasticity (psi, max.)	25,000
Drop height (inches, max.)	72

2.3

4.0 DESIGN FEATURES

The specifications in this section include the design characteristics of special importance to each of the physical barriers and the maintenance of safety margins in the storage system component design. The principal objective of this category is to describe the design envelope which might constrain any physical changes to essential equipment. Included in this category are the site environmental parameters which provide the bases for design, but are not inherently suited for description as LCOs.

4.6 9

4.1 Storage System

4.1.1 Storage Cask

4.1.1.1 Structural Performance

See the Storage System Technical Specification Section 4.1.1.1 for discussion of STORAGE CASK structural performance features.

4.7

4.1.1.2 Codes and Standards

See the Storage System Technical Specification Section 4.1.1.2 for discussion of codes and standards applicable to the STORAGE CASK.

L.2

4.1.2 Transfer Cask

4.1.2.1 Structural Performance

See the Storage System Technical Specification Section 4.1.2.1 for discussion of TRANSFER CASK structural performance features.

4.7

4.1.2.2 Codes and Standards

See the Storage System Technical Specification Section 4.1.2.2 for discussion of codes and standards applicable to the TRANSFER CASK.

L.2

4.1.3 Canister

4.1.3.1 Criticality

The design of the W74 CANISTER, including spatial constraints on adjacent assemblies (minimum basket cell opening of 6.85 inches square) and the boron content of the basket neutron absorber material (minimum 1.0 weight percent natural boron) shall assure that fuel assemblies are maintained in a subcritical condition with a k_{eff} less than 0.95 under all conditions of operation.

L.4

4.1.3.2 Structural Performance

The CANISTER has been evaluated for a side drop resulting in a lateral gravitational (*g*) loading of 60 *g* and an end drop resulting in an axial gravitational loading of 46 *g*.

4.7

4.1.3.3 Codes and Standards

The Wesflex™ W74 CANISTER shell structural components are designed in accordance with Subsection NB of the ASME Code, and the basket structural components are designed in accordance with Subsection NG of the ASME Code. Exceptions to the code are listed in Table 4.1-1.

L.2

4.0 Design Features

4.1.3.4 Fabrication Exceptions to Codes, Standards, and Criteria

Proposed alternatives to Subsection NB of the ASME Code, including exceptions allowed by Section 4.1.3.3, may be used when authorized by the Director of the Office of Nuclear Material Safety and Safeguards or Designee. The applicant should demonstrate that:

1. The proposed alternatives would provide an acceptable level of quality and safety, or
2. Compliance with the specified requirements of ASME Code, Section III, would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Requests for exception in accordance with this section should be submitted in accordance with 10CFR72.4.

L2

4.2 Storage Pad

Constraints on the storage pad are discussed in Section 4.2 of the Storage System Technical Specification.

L3

Table 4.1-1 - Wesflex™ W150 Storage Cask ACI Code Requirement Compliance Summary (9 Pages)

Item	ACI Requirement	Issue	Alternative Compliance Basis
ACI 349:			
1	General for ACI 349	The use of the term "Owner" does not apply.	Where the term "Owner" is used, the Wesflex™ SFMS licensee, Westinghouse, should be substituted.
2	General for Chapter 1 - "General Requirements"	References to "construction" do not apply.	Refer to ACI 318.
3	1.1 - "Scope:" "This Code provides the minimum requirements for the design and construction of nuclear safety related concrete structures and structural elements for nuclear power generating stations."	The Wesflex™ W150 Storage Cask will not be constructed as a 10CFR50, Appendix B, "safety related" component.	The Wesflex™ W150 Storage Cask will be constructed based on a 10CFR72 "graded quality" approach.

I75 4.0 (2.7)

Table 4.1-1 - Wesflex™ W150 Storage Cask ACI Code Requirement Compliance Summary (9 Pages)

Item	ACI Requirement	Issue	Alternative Compliance Basis
4	**1.2 - "Drawings and Calculations:"** "1.2.1 - Copies of structural drawings, typical details, and specifications for all reinforced concrete construction shall be signed by a licensed engineer and shall be retained by the Owner, or his designee, as a permanent record for the life of the structure. These drawings, details, and specifications shall show . . . provisions for dimensional changes resulting from creep, shrinkage, and temperatures; . . . and loads used in the design."	1. The Wesflex™ W150 Storage Cask drawings, typical details, and specifications will not necessarily be signed by a licensed engineer. 2. Provisions for dimensional changes will not be specifically addressed on structural drawings. 3. Loads used in the design will not be shown on drawings, typical details, or specifications.	1. Licensed engineer certification of drawings, typical details, and specifications is not typically provided for components licensed under 10CFR72. 2. Finished storage cask will meet dimensional inspection requirements provided in this SAR. 3. Loads used in the design are presented in this SAR.
5	1.3 - "Inspection"	This section does not apply.	Refer to ACI 318.

Table 4.1-1 - Wesflex™ W150 Storage Cask ACI Code Requirement Compliance Summary (9 Pages)

Item	ACI Requirement	Issue	Alternative Compliance Basis
6	**1.5 - "Quality Assurance Program:"** "A quality assurance program covering nuclear safety related structures shall be developed prior to starting any work. The general requirements and guidelines for establishing and executing the quality assurance program during the design and construction phases of nuclear power generating stations are established by Title 10 of the Code of Federal Regulations, Part 50 (10CFR50), Appendix B."	The construction of the Wesflex™ W150 Storage Cask will not be governed by a 10CFR50, Appendix B, QA program.	The construction of the Wesflex™ W150 Storage Cask will be governed by a 10CFR72, Subpart G, QA program.
7	Chapter 3 - "Materials"	Sections 3.1, 3.2.3, 3.3.4, 3.5.3.2, 3.6.7, and 3.7 do not apply.	Refer to ACI-318, Sections 3.1 and 3.7. ACI 349 Sections 3.2.3, 3.3.4, 3.5.3.2, and 3.6.7 pertain to testing frequencies that are not provided in ACI 318. These frequencies will be established to be consistent with the graded quality category of the item as addressed under the Westinghouse QA Program.

ITS 4.0 (L3)

Table 4.1-1 - Wesflex™ W150 Storage Cask ACI Code Requirement Compliance Summary (9 Pages)

Item	ACI Requirement	Issue	Alternative Compliance Basis
7 (cont.)	Section 3.8 - "Standards Cited in this Code"	Different editions of the ASTM standards listed may be used in the construction of a Wesflex™ W150 Storage Cask.	Materials and testing will be to the ASTM standard cited in ACI 349 and ACI 318, except that the year of the ASTM standard may be as cited in ACI 318-95 or the latest ASTM standard issued.
8	Chapter 4 - "Concrete Quality"	With the exception of Section 4.1.4, this chapter does not apply.	Refer to ACI 318, Chapter 4.
9	Chapter 5 - "Mixing and Placing Concrete"	This chapter does not apply.	Refer to ACI 318, Chapter 5.
10	Chapter 6 - "Formwork, Embedded Pipes, and Construction Joints"	With the exception of Sections 6.3.7(k) and 6.3.8, this chapter does not apply.	Refer to ACI 318, Chapter 6
11	9.1.1.2 - "Severe Environmental Loads" 9.1.1.3 - "Extreme Environmental Loads"	These load definitions are not used in the design of the Wesflex™ W150 Storage Cask.	Load definitions from NUREG-1536 are used in the design of the Wesflex™ W150 Storage Cask.

Table 4.1-1 - Wesflex™ W150 Storage Cask ACI Code Requirement Compliance Summary (9 Pages)

Item	ACI Requirement	Issue	Alternative Compliance Basis
12	**9.2 - "Required Strength:"** 9.2.1 - "The required strength *U* shall be at least equal to the greatest of the following: ... *(load combination no's. 1 - 11)*"	The Wesflex™ W150 Storage Cask design does not use load combinations from ACI 349.	The Wesflex™ W150 Storage Cask design uses load combinations from ANSI/ANS 57.9, as modified by NUREG-1536.
13	Chapter 13 - "Two-Way Slab Systems"	Not applicable.	
14	Chapter 15 - "Footings"	Not applicable.	
15	**16.2 - "Design:"** "16.2.1 - Design of precast members shall consider loading and restraint conditions from initial fabrication to completion of the structure, including form removal, storage, transportation, and erection."	The Wesflex™ W150 Storage Cask design does not explicitly address transportation loads on precast sections.	Off-normal operating condition transportation loads are assumed to be bounded by postulated accident condition side drop loads.
16	Chapter 17 - "Composite Concrete Flexural Members"	Not applicable.	
17	Chapter 18 - "Prestressed Concrete"	Not applicable.	

ITS 4.0
(2.7)

Table 4.1-1 - Wesflex™ W150 Storage Cask ACI Code Requirement Compliance Summary (9 Pages)

Item	ACI Requirement	Issue	Alternative Compliance Basis
18	Chapter 19 - "Shells and Folded Plate Members"	Not applicable.	
19	Appendix A - "Thermal Considerations"	A Wesflex™ W150 Storage Cask may be exposed to conditions (accident fire) not within the scope of ACI 349.	Short-term material temperature limits for accident fire are defined in this Wesflex™ Storage System SAR.
20	Appendix B - "Steel Embedments"	Load combinations are only required to meet ACI 349 requirements.	Load combinations and variation requirements will meet both ACI 349 and ANSI/ANS 57.9.
21	Appendix C - "Special Provisions for Impulsive ad Impactive Effects"	Load combinations are only required to meet ACI 349 requirements.	Load combinations and variation requirements will meet both ACI 349 and ANSI/ANS 57.9.
ACI 318:			
22	Chapter 1 - "General Requirements"	With the exception of Section 1.3, this chapter does not apply.	Refer to ACI 349.
23	Chapter 2 - "Definitions"	This chapter does not apply.	Refer to ACI 349.

ITS 4.0

4.2

Table 4.1-1 - Wesflex™ W150 Storage Cask ACI Code Requirement Compliance Summary (9 Pages)

Item	ACI Requirement	Issue	Alternative Compliance Basis
24	Chapter 3 - "Materials"	With the exception of Sections 3.1 and 3.7, this chapter does not apply.	See Item 7.
25	Chapter 7 - "Details of Reinforcement"	This chapter does not apply.	Refer to ACI 349.
26	Chapter 8 - "Analysis and Design - General Considerations"	This chapter does not apply.	Refer to ACI 349.
27	Chapter 9 - "Strength and Serviceability Requirements"	This chapter does not apply.	Refer to ACI 349.
28	Chapter 10 - "Flexure and Axial Loads"	This chapter does not apply.	Refer to ACI 349.
29	Chapter 11 - "Shear and Torsion"	This chapter does not apply.	Refer to ACI 349.
30	Chapter 12 - "Development and Splices of Reinforcement"	This chapter does not apply.	Refer to ACI 349.
31	Chapter 13 - "Two-Way Slab Systems"	Not applicable.	
32	Chapter 14 - "Walls"	This chapter does not apply.	Refer to ACI 349.
33	Chapter 15 - "Footings"	Not applicable.	

ITS 4.0

4.0 Design Features

Table 4.1-1 - Wesflex™ W150 Storage Cask ACI Code Requirement Compliance Summary (9 Pages)

Item	ACI Requirement	Issue	Alternative Compliance Basis
34	Chapter 16 - "Precast Concrete"	This chapter does not apply.	Refer to ACI 349.
35	Chapter 17 - "Composite Concrete Flexural Members"	Not applicable.	
36	Chapter 18 - "Prestressed Concrete"	Not applicable.	
37	Chapter 19 - "Shells and Folded Plate Members"	Not applicable.	
38	Chapter 20 - "Strength Evaluation of Existing Structures"	Not applicable.	
39	Chapter 21 - "Special Provisions for Seismic Design"	Not applicable.	
40	Chapter 22 - "Structural Plain Concrete"	Not applicable.	
41	Appendix A - "Alternate Design Method"	This chapter does not apply.	Refer to ACI 349.

ITS 4.0

Table 4.1-1 - Wesflex™ W150 Storage Cask ACI Code Requirement Compliance Summary (9 Pages)

Item	ACI Requirement	Issue	Alternative Compliance Basis
42	**Appendix B - "Unified Design Provisions for Reinforced and Prestressed Concrete Flexural and Compression Members"**	This chapter does not apply.	Refer to ACI 349.
43	**Appendix C - "Alternative Loads and Strength Reduction Factors"**	This chapter does not apply.	Refer to ACI 349.

L2

ITS 4.0

4.0 Design Features

Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
3	NCA-1210, "Components:" "Each component of a nuclear power plant shall require a Design Specification (NCA-3250), Design Report (NCA-3350, NCA-3550), and other design documents specified in NCA-3800. Data Reports and stamping shall be as required in NCA-8000."	The Wesflex™ SFMS documentation does not contain the following ASME Code documents: 1. Design Specification 2. Design Report 3. Owner's Certificate of Authorization 4. Authorized Inspection Agency written agreement 5. Owner's Data Report 6. Overpressure Protection Report	1. See Item 2. 2. The information typically reported in an ASME Code Design Report is contained in this SAR. 3. An Owner's Certificate of Authorization, a written agreement with an Authorized Inspection Agency, an Owner's Data Report, and an Overpressure Protection Report are not typically provided for components licensed under 10CFR72.

(2.2)

ITS 4.0

Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
4	NCA-1220, "Materials"	Not all non-pressure retaining materials specified in the Wesflex™ W100 Transfer Cask SAR are listed as ASME Code Section III materials.	Wesflex™ W100 Transfer Casks will be purchased, identified, controlled, and manufactured using a graded quality approach in accordance with the NRC-approved Westinghouse Electric Company Quality Assurance Program based on NQA-1, NRC Regulatory Guide 7.10, and NUREG/CR-6407 criteria.
5	NCA-1281, "Activities and Requirements:" "... Data Reports and stamping shall be as required in NCA-8000."	See Item 19.	See Item 19.
6	NCA-2000, "Classification of Components"	The classification of components is usually provided in a Design Specification.	See Item 2.

Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
7	**NCA-2142, "Establishment of Design, Service, and Test Loadings and Limits:"** "In the Design Specification, the Owner or his designee shall identify the loadings and combinations of loadings and establish the appropriate Design, Service, and Test Limits for each component or support . . ."	See Item 2.	See Item 2.
8	**NCA-3100, "General"**	ASME Code accreditation does not apply.	See Item 1.
9	**NCA-3200, "Owner's Responsibilities"**	An Owner's responsibilities under ASME Code do not apply.	An Owner's Certificate of Authorization, a Design Specification, a Design Report, an Overpressure Protection Report, and an Owner's Data Report are not typically provided for components licensed under 10CFR72.
10	**NCA-3300, "Responsibilities of a Designer - Division 2"**	See Item 1.	See Item 1.

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Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
11	NCA-3400, "Responsibilities of an N Certificate Holder - Division 2"	See Item 1.	See Item 1.
12	NCA-3500, "Responsibilities of an N Certificate Holder - Division 1"	See Item 1.	See Item 1. Design and fabrication requirements are provided in this SAR and related procurement/fabrication drawings and specifications.
13	NCA-3600, "Responsibilities of an NPT Certificate Holder"	See Item 1.	See Item 12.
14	NCA-3700, "Responsibilities of an NA Certificate Holder"	See Item 1.	See Item 12.
15	NCA-3800, "Metallic Material Organization's Quality System Program"	Materials for a Wesflex™ W100 Transfer Cask may be purchased from suppliers that are not certified per the requirements of NCA-3800.	Material suppliers will be qualified per NCA-3800 or the NRC-approved Westinghouse Electric Company Quality Assurance Program based on the requirements of NQA-1, NRC Regulatory Guide 7.10, and NUREG/CR-6407 criteria.

ITS 4.0

(2)

Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
16	NCA-3900, "Nonmetallic Material Manufacturer's and Constituent Suppliers Quality System Programs"	See Item 1.	See Item 1.
17.	NCA-4000, "Quality Assurance"	These quality assurance requirements do not apply.	See Item 4.
18	NCA-5000, "Authorized Inspection"	The manufacturing or operation of the Wesflex™ SFMS will not use an Authorized Inspection Agency.	An Authorized Inspection Agency is not typically used in the manufacturing or operation of components licensed under 10CFR72.
19	NCA-8000, "Certificates of Authorization, Nameplates, Code Symbol Stamping, and Data Reports"	The Wesflex™ SFMS will not use an ASME Code Certificate of Authorization, Code Symbol Stamping, or a Data Report.	An ASME Code Certificate of Authorization, Code Symbol Stamping, or a Data Report are not typically required for components licensed under 10CFR72. Nameplate information will be provided on each Wesflex™ W100 Transfer Cask.

ITS 4.0

4.0 Design Features

Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
Section III, Subsection NF:			
20	**NF-1111.1, "Design Requirements:"** "In addition to the requirements of NCA-3240, the Owner shall be responsible that loads . . . are adequately transferred without loss of the pressure boundary integrity for the Design or Service Loadings specified in the Design Specification governing the component or piping."	The Wesflex™ SFMS documentation does not contain an ASME Code Design Specification.	The requirements and criteria typically contained in an ASME Code Design Specification are contained in this Wesflex™ Storage System SAR.
21	**NF-1130, "Boundaries of Jurisdiction"**	See Item 6.	See Item 6.

ITS 4.0

Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
22	**NF-2121, "Permitted Material Specifications:"** "... (b) The requirements of this Article do not apply to such as gaskets, seals, . . . Requirements, if any, for these materials shall be stated in the Design Specification (NCA-3850)."	See Item 2.	See Item 2.
23	**NF-2130, "Certification of Material:"** "(a) Material used in construction of component supports shall be certified. Certified Material Test Reports in accordance with NCA-3867.4 shall be provided."	See Item 15.	See Item 15. When CMTRs are required by the Westinghouse Quality Assurance Program, they will be provided per the requirements of NCA-3862.

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Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
24	NF-2160, "Deterioration of Material In Service:" "It is the responsibility of the Owner to select material suitable for the conditions stated in the Design Specifications (NCA-3250), with specific attention being given to the effects of Service Conditions upon the properties of the material."	See Item 6.	See Item 6.
25	NF-2310, "Material to be Impact Tested"	See Item 6.	See Item 6.

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Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
26	NF-2610, "Documentation and Maintenance of Quality System Programs:" "(a) Except as provided in (b) below, Material Manufacturers and Material Suppliers shall have a Quality System Program or an Identification and Verification Program, as applicable, which meets the requirements of NCA-3800. . . ."	See Item 15.	See Item 15.
27	NF-3112.1, "Design Temperature"	The Wesflex™ W100 Transfer Cask may be exposed to conditions (accident fire) not within the scope of the ASME Code.	Short-term material temperature limits for accident fire are defined in this Wesflex™ Storage System SAR.

(2.2)

ITS 4.0

Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
28	NF-3113, "Service Conditions:" "Each service condition to which the piping or component may be subjected shall be categorized in accordance with NCA-2142.2 and Service Limits [NCA-2142.4(b)] designated in the Design Specifications in such detail as will provide a complete basis for design in accordance with this Article."	See Item 6.	See Item 6.
29	NF-3132, "Stress Analysis:" "A detailed stress analysis or Design Report, as required by NCA-3550 for all piping or component supports, shall be prepared in sufficient detail to show that each of the stress limits of NF-3200 or NF-3300 is satisfied when the piping component support is subjected to the loadings of NF-3110."	See Item 3.	See Item 3.

I75 40

(2)

Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
30	NF-3220, "Design by Analysis for Class 1"	See Item 3.	See Item 3.
31	NF-3226.1, "Permissible Types of Welded Joints in Plate- and Shell-Type Supports:" (This section presents permissible weld configurations for butt, corner, and tee joints.)	The inner liner and outer structural shell do not employ 360o circumferential butt weld joints in their attachments to the top and bottom flanges of the cask.	The inner liner and outer structural shell employ modified 360o circumferential "corner joint" welds in their attachments to the top and bottom flanges of the transfer cask. as shown in this Wesflex™ Storage System SAR.
32	NF-4121, "Means of Certification:" "The Certificate Holder for an item shall certify, by application of the appropriate Code Symbol and completion of the appropriate Data Report in accordance with NCA-8000, that materials used comply with the requirements of NB-2000 and that the fabrication or installation complies with the requirements of NF-4000."	The Wesflex™ SFMS will not use an ASME Code Symbol Stamp or a Data Report.	An ASME Code Symbol Stamping or Data Report are not typically required for components licensed under 10CFR72. Also see Item 15.

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Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
33	NF-4213, "Qualification of Forming Processes for Impact Property Requirements"	See Item 2.	See Item 2.
34	NF-4724, "Bolt Tension:" "All high strength structural bolts shall be preloaded to a value not less than that given in the Design Specification . . ."	See Item 2.	See Item 2.
35	"Testing"	1. Though not a Subsection NF requirement, the Wesflex™ W100 Transfer Cask fuel and neutron shield cavities will be hydrostatically tested to determine their leak tightness. 2. Though not a Subsection NF requirement, the Wesflex™ W100 Transfer Cask trunnions will be load tested per ANSI N14.6 requirements.	1. The Wesflex™ W100 Transfer Cask fuel and neutron shield cavity hydrostatic test pressures are presented in this Wesflex™ Storage System SAR. 2. The Wesflex™ W100 Transfer Cask trunnion test load magnitude is presented in this Wesflex™ Storage System SAR.

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Table 4.1-2 - Wesflex™ W100 Transfer Cask ASME Code Requirement Compliance Summary (9 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
36	"Overpressure Protection"	Though not a Subsection NF requirement, the Wesflex™ W100 Transfer Cask neutron shield will employ a pressure relief device. The use of this device will not be documented in an ASME Code Overpressure Protection Report.	The Wesflex™ W100 Transfer Cask neutron shield pressure relief device set pressure is presented in this Wesflex™ Storage System SAR.
37	NF-8000, "Nameplates, Stamping, and Reports"	The Wesflex™ SFMS will not use ASME Code Symbol Stamping, or a Data Report.	ASME Code Symbol Stamping or a Data Report are not typically required for components licensed under 10CFR72. Nameplate information will be provided on the Wesflex™ W100 Transfer Cask.

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Table 4.1-1
Wesflex™ W74 Canister ASME Code Requirements Compliance Summary (15 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
Section III, Subsection NCA (applicable to both Canister and Basket):			
1	**General for Subsection NCA**	1. The terms "Certificate Holder" and "Owner" used throughout this subsection are not applicable for a 10CFR72 system. 2. The Division 2 (concrete) requirement provided throughout this subsection are not applicable for a 10CFR72 system.	1. Westinghouse Electric Company bears the responsibilities associated with a "Certificate Holder" or "Owner" relative to the Wesflex™ SFMS. 2. This compliance summary table only addresses Wesflex™ canisters, which do not contain any concrete.
2	**NCA-1140, "Use of Code Editions, Addenda, and Cases:"** "(a)(1) Under the rules of this Section, the Owner or his designees shall establish the Code Edition and Addenda to be included in the Design Specifications…"	The Wesflex™ SFMS documentation does not include an ASME Code Design Specification.	The requirements and criteria typically contained in an ASME Code Design Specification are contained in this SAR.

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Table 4.1-1
Wesflex™ W74 Canister ASME Code Requirements Compliance Summary (15 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
3	NCA-1210, "Components:" "Each component of a nuclear power plant shall require a Design Specification (NCA-3250), Design Report (NCA-3350, NCA-3550), and other design documents specified in NCA-3800. Data Reports and stamping shall be as required in NCA-8000."	The Wesflex™ SFMS documentation does not contain the following ASME Code documents: 1. Design Specification 2. Design Report 3. Owner's Certificate of Authorization 4. Authorized Inspection Agency Written Agreement 5. Owner's Data Report 6. Overpressure Protection Report.	1. See Item 2. 2. The information typically reported in an ASME Code Design Report is contained in this SAR. 3. An Owner's Certificate of Authorization, a written agreement with an Authorized Inspection Agency, an Owner's Data Report, and an Overpressure Protection Report are not typically provided for components licensed under 10CFR72.

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Table 4.1-1
Wesflex™ W74 Canister ASME Code Requirements Compliance Summary (15 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
4	**NCA-1220, "Materials"**	Not all non-pressure retaining materials specified in this Wesflex™ Canister Storage SAR are listed as ASME Section III materials.	Wesflex™ canisters are purchased, identified, controlled, and manufactured using a graded quality approach in accordance with the NRC-approved Westinghouse Electric Company Quality Assurance Program based on NQA-1, NRC Regulatory Guide 7.10, and NUREG/CR-6407 criteria.
5	**NCA-1281, "Activities and Requirements:"** "... Data Reports and stamping shall be as required in NCA-8000."	See Item 19.	See Item 19.
6	**NCA-2000, "Classification of Components"**	The classification of components is usually provided in a Design Specification.	See Item 2.
7	**NCA-2142, "Establishment of Design, Service, and Test Loadings and Limits:"** "In the Design Specification, the Owner or his designee shall identify the loadings and combinations of loadings and establish the appropriate Design, Service, and Test Limits for each component or support..."	See Item 2.	See Item 2.

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Table 4.1-1
Wesflex™ W74 Canister ASME Code Requirements Compliance Summary (15 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
8	NCA-3100, "General"	ASME Code accreditation does not apply.	See Item 1.
9	NCA-3200, "Owner's Responsibilities"	An Owner's responsibilities under the ASME Code do not apply.	An Owner's Certificate of Authorization, a Design Specification, a Design Report, an Overpressure Protection Report, and an Owner's Data Report are not typically provided for components licensed under 10CFR72.
10	NCA-3300, "Responsibilities of a Designer - Division 2"	See Item 1.	See Item 1.
11	NCA-3400, "Responsibilities of an N Certificate Holder - Division 2"	See Item 1.	See Item 1.
12	NCA-3500, "Responsibilities of an N Certificate Holder - Division 1"	See Item 1.	See Item 1. Design and fabrication requirements are provided in this SAR and related procurement/fabrication drawings and specifications.
13	NCA-3600, "Responsibilities of an NPT Certificate Holder"	See Item 1.	See Item 12.
14	NCA-3700, "Responsibilities of an NA Certificate Holder"	See Item 1.	See Item 12.

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Table 4.1-1
Wesflex™ W74 Canister ASME Code Requirements Compliance Summary (15 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
15	**NCA-3800, "Metallic Material Organization's Quality System Program"**	Materials for a Wesflex™ canister may be purchased from suppliers that are not certified per the requirements of NCA-3800.	Material suppliers are qualified per NCA-3800 or the NRC-approved Westinghouse Electric Company Quality Assurance Program based on the requirements of NQA-1, NRC Regulatory Guide 7.10, and NUREG/CR-6407 criteria.
16	**NCA-3900, "Nonmetallic Material Manufacturer's and Constituent Suppliers Quality System Programs"**	See Item 1.	See Item 1.
17	**NCA-4000, "Quality Assurance"**	These quality assurance requirements do not apply.	See Item 4.
18	**NCA-5000, "Authorized Inspection"**	The manufacturing or operation of the Wesflex™ SFMS does not use an Authorized Inspection Agency.	An Authorized Inspection Agency is not typically used in the manufacturing or operation of components licensed under 10CFR72.
19	**NCA-8000, "Certificates of Authorization, Nameplates, Code Symbol Stamping, and Data Reports"**	The Wesflex™ SFMS does not use an ASME Code Certificate of Authorization, Code Symbol Stamping, or a Data Report.	An ASME Code Certificate of Authorization, Code Symbol Stamping, or a Data Report are not typically required for components licensed under 10CFR72. Nameplate information is provided on each Wesflex™ canister.

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Table 4.1-1
Wesflex™ W74 Canister ASME Code Requirements Compliance Summary (15 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
Section III, Subsection NB (applicable to Canister):			
20	**NB-1130, "Boundary of Components:"** "The Design Specification shall define the boundary of a component to which piping or another component is attached."	See Item 6.	See Item 6.
21	**NB-1132.2, "Jurisdictional Boundary:"** "The jurisdictional boundary between a pressure-retaining component and an attachment defined in the Design Specification shall not be any closer to the pressure-retaining portion of the component than as defined in (a) through (g) below..."	See Item 6.	See Item 6.

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Table 4.1-1
Wesflex™ W74 Canister ASME Code Requirements Compliance Summary (15 Pages)

Item	ASME Code Requirement	Issue	Alternative Compliance Basis
22	**NB-2160, "Deterioration of Material In Service:"** "It is the responsibility of the Owner to select material suitable for the conditions stated in the Design Specifications (NCA-3250), with specific attention being given to the effects of service conditions upon the properties of the material. …Any special requirement shall be specified in the Design Specifications (NCA-3252 and NB-3124)…"	See Item 2.	See Item 2.
23	**NB-2610, "Documentation and Maintenance of Quality System Programs:"** "(a) Except as provided in (b) below, Material Manufacturers and Material Suppliers shall have a Quality System Program or an Identification and Verification Program, as applicable, which meets the requirements of NCA-3800…"	See Item 15.	See Item 15.

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