Technical Specifications

Trojan Nuclear Plant

Specifications

Inside Cover

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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.
CERTIFIED FUEL HANDLER	A CERTIFIED FUEL HANDLER is an individual who complies with provisions of the CERTIFIED FUEL HANDLER training program required by Technical Specification 5.4.1.

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 may 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 indentations of the logical connectors.

If logical connectors are used to state a Condition, only the first level of logic is used, and the logical connector is left justified with the Condition statement.

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

(continued)

1.2 Logical Connectors (continued)

EXAMPLES

The following examples illustrate the use of logical connectors.

EXAMPLE 1.2-1

ACTIONS

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

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Trip . . . OR A.2.1 Verify . . . AND A.2.2 Reduce . . .	

This example represents a more complicated use of logical connectors. Required Actions A.1, and A.2 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. Either of the 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.

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

LCOs specify minimum requirements for ensuring the safe storage of irradiated fuel. 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., variable not within limits) that requires entering an ACTIONS Condition unless otherwise specified. 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.

EXAMPLES

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

(continued)

EXAMPLES (continued)

EXAMPLE 1.3-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required Action and associated Completion Time not met.	A.1 Verify . . . AND A.2 Restore . . .	6 hours 36 hours

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

The Required Actions of Condition A are to perform the verification required by ACTION A.1 within 6 hours AND to perform the restoration required by ACTION A.2 within 36 hours. A total of 6 hours is allowed for performing ACTION A.1 and a total of 36 hours (not 42 hours) is allowed for performing ACTION A.2 from the time that Condition A was entered. If ACTION A.1 is completed within 3 hours, the time allowed for completing ACTION A.2 is the next 33 hours because the total time allowed for completing ACTION A.2 is 36 hours.

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO limit exceeded.	A.1 Verify . . .	1 hour AND 8 hours thereafter
	AND A.2 Restore . . .	 72 hours

Required Action A.1 has two Completion Times. The 1 hour Completion Time begins at the time the Condition is entered and each "8 hours thereafter" interval begins upon performance of Required Action A.1. The 72 hour completion time for Required Action A.2 also begins at the time the Condition is entered and runs concurrently.

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 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.

EXAMPLES

The following examples illustrate the various ways that Frequencies are specified. In these examples, the Applicability of the LCO (LCO not shown) is when irradiated fuel is stored in the spent fuel pool.

(continued)

EXAMPLES (continued)

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify parameter is within limits.	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 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 facility is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while the facility is in the specified condition in the Applicability of the LCO, and the performance of the Surveillance is not otherwise modified, then SR 3.0.3 becomes applicable.

(continued)

EXAMPLES
(continued)

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify parameter is within limits.	Within 24 hours prior to moving irradiated fuel 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. The use of "prior to" indicates that the surveillance must be performed once before the initiation of fuel handling activities. 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 "prior to" performance in this example).

2.0 SAFETY LIMITS (SLs)

This section is not applicable to defueled facilities.

3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

LCO 3.0.1 LCOs shall be met during the 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.

3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

SR 3.0.1 SRs shall be met during 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 inoperable 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.

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. The Completion Times of the Required Actions begin immediately upon expiration of the delay period.

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. The Completion Times of the Required Actions begin immediately upon failure to meet the Surveillance.

3.1 DEFUELED SYSTEMS

3.1.1 Spent Fuel Pool Water Level

LCO 3.1.1 The spent fuel pool water level shall be $\geq$ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: Whenever irradiated fuel assemblies are stored in the spent fuel pool.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Spent fuel pool water level not within limit.	A.1	Suspend movement of irradiated fuel assemblies and operations involving movement of loads over storage racks containing irradiated fuel.	Immediately
	AND		
	A.2	Initiate makeup flow to the spent fuel pool.	Immediately
	AND		
	A.3	Restore the water level to within limit.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify the spent fuel pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	24 hours

3.1 DEFUELED SYSTEMS

3.1.2 Spent Fuel Pool Boron Concentration

LCO 3.1.2 The spent fuel pool boron concentration shall be ≥ 2000 ppm.

APPLICABILITY: Whenever irradiated fuel assemblies are stored in the spent fuel pool.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Spent fuel pool boron concentration not within limit.	A.1	Suspend movement of irradiated fuel assemblies and operations involving movement of loads over storage racks containing irradiated fuel.	Immediately
	AND		
	A.2	Restore spent fuel pool boron concentration to within limit.	14 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify the spent fuel pool boron concentration is within limit during movement of irradiated fuel or during movement of loads over storage racks containing irradiated fuel.	Prior to movement of irradiated fuel or loads if not performed within the past 7 days. AND 7 days thereafter
SR 3.1.2.2	Verify the spent fuel pool boron concentration is within limit.	31 days

3.1 DEFUELED SYSTEMS

3.1.3 Spent Fuel Pool Temperature

LCO 3.1.3 The spent fuel pool coolant temperature shall be maintained ≤ 140° F.

APPLICABILITY: Whenever irradiated fuel assemblies are stored in the spent fuel pool.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Spent fuel pool coolant temperature not within limit.	A.1	Initiate action to restore the spent fuel pool coolant temperature to within limits.	Immediately
	AND		
	A.2	Verify a spent fuel pool makeup water source is available.	Immediately
	AND		
	A.3	Restore spent fuel pool coolant temperature to within limit.	7 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.3.1	Verify the spent fuel pool coolant temperature is ≤ 140° F.	24 hours

3.1 DEFUELED SYSTEMS

3.1.4 Spent Fuel Pool Load Restrictions

LCO 3.1.4 Loads carried over the spent fuel pool and the heights at which they may be carried over racks containing fuel shall be limited in such a way as to preclude impact energies over 240,000 in.-lbs. if the loads are dropped.

APPLICABILITY: Whenever irradiated fuel assemblies are stored in the spent fuel pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Load restriction not within limit.	A.1 Place the load in a safe position.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify the potential impact energy due to dropping the load is $\leq$ 240,000 in.-lbs.	Prior to moving each load over storage racks containing irradiated fuel.

4.0 DESIGN FEATURES

4.1 Site

4.1.1 Site and Exclusion Area Boundaries

The site and exclusion area boundaries shall be as described or as shown in Figure 4.1-1.

4.2 Fuel Storage

4.2.1 Criticality

4.2.1.1 The spent fuel storage racks are designed and shall be maintained with:

a. Fuel assemblies having a maximum U-235 enrichment of 4.5 weight percent;

b. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 3.1 of PGE-1037, dated July 1983;

c. A nominal 10.5-inch center to center distance between fuel assemblies placed in the fuel storage racks;

4.2.2 Drainage

The spent fuel storage pool is designed and shall be maintained with siphon breakers in the piping extending into the pool which prevent inadvertent draining of the pool below elevation 83'11".

4.2.3 Capacity

The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 1408 fuel assemblies.

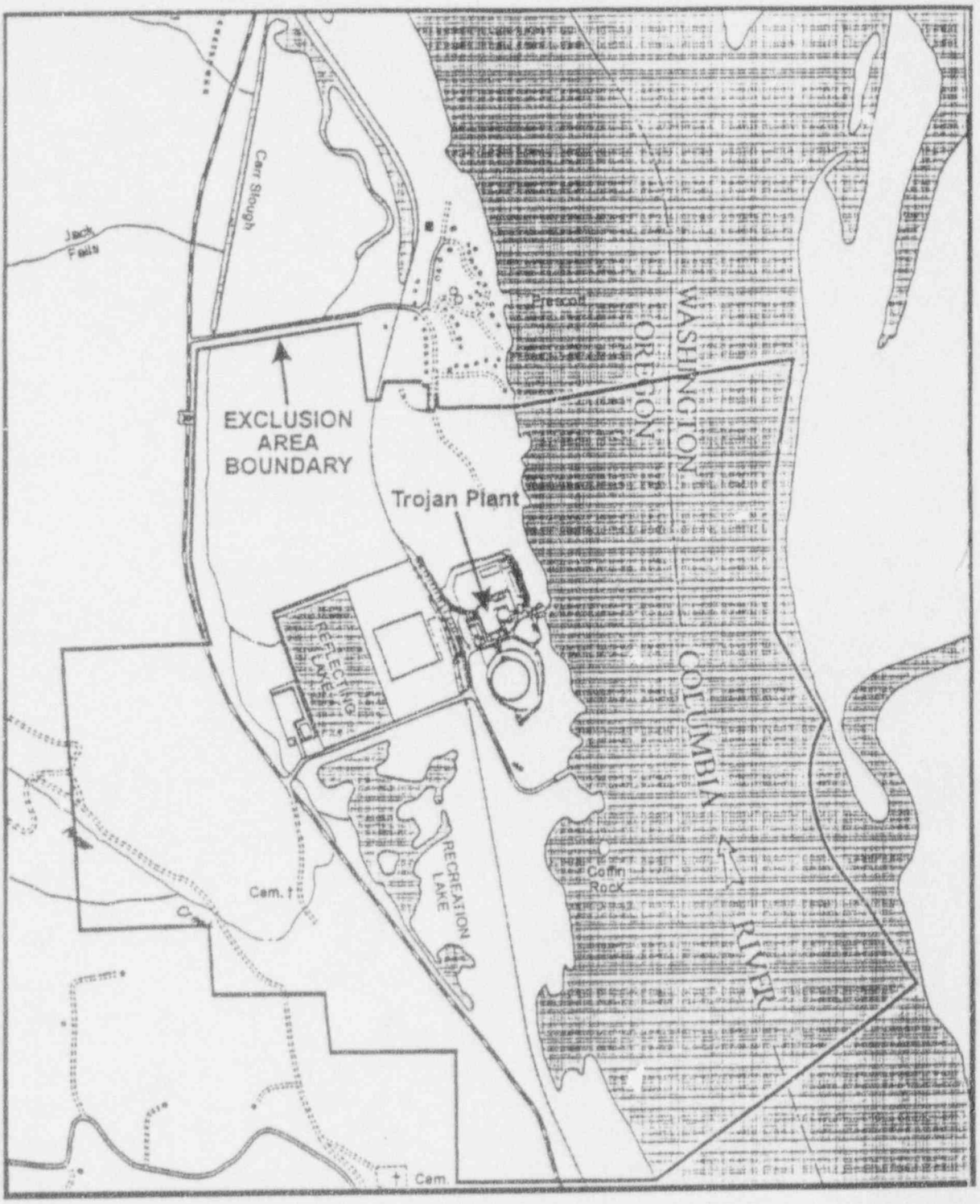

Figure 4.1-1 (page 1 of 1)
Site and Exclusion Area Boundaries

5.0 ADMINISTRATIVE CONTROLS

5.1 Responsibility

5.1.1 The General Manager, Trojan Plant shall have overall responsibility for the facility and shall delegate in writing the succession to this responsibility during his absence.

The General Manager, Trojan Plant or his designee, in accordance with approved administrative procedures, shall approve prior to implementation, each proposed test or experiment related to the safe storage of irradiated fuel and proposed changes and modifications to structures, systems or equipment that affect the safe storage of irradiated fuel.

5.1.2 The Shift Manager shall be responsible for the operational command function. During any absence of the Shift Manager from the Control Room, another operator qualified to stand watch in the Control Room shall be designated to assume the command function. The individual maintaining the command function shall remain in the Control Room.

5.0 ADMINISTRATIVE CONTROLS

5.2 Organization

5.2.1 General Organizational Requirements

Facility and corporate organizations shall be established for the facility staff and corporate management, respectively. These organizations shall include the positions for activities affecting the safe storage of irradiated fuel.

a. Lines of authority, responsibility, and communication shall be defined and established throughout highest management levels, intermediate levels, and all operating organization positions. These relationships shall be documented and updated, as appropriate, in organization charts, functional descriptions of departmental responsibilities and relationships, and job descriptions for key personnel positions, or in equivalent forms of documentation;

b. The General Manager, Trojan Plant shall have overall responsibility for the facility and shall have control over those facility activities necessary for operation and maintenance of structures and systems necessary for the safe storage of irradiated fuel;

c. The Vice President and Chief Nuclear Officer shall have corporate responsibility for overall nuclear safety and shall take any measures needed to ensure acceptable performance of the staff in operating, maintaining, and providing technical support to ensure the safe storage of irradiated fuel; and

d. The individuals who train the CERTIFIED FUEL HANDLERS, carry out radiation protection functions, or perform quality assurance functions may report to the appropriate line manager; however, these individuals shall have sufficient organizational freedom to ensure the ability to perform their assigned functions.

(continued)

5.2 Organization (continued)

5.2.2 Facility Staff

The facility staff organization shall be as follows:

a. Each on duty shift shall be composed of at least the minimum shift crew composition shown in Table 5.2.2-1.

b. At least one person qualified to stand watch in the control room (non-certified operator or CERTIFIED FUEL HANDLER) shall be present in the control room when irradiated fuel is stored in the spent fuel pool.

c. An individual qualified in radiation protection procedures shall be on-site during fuel handling operations.

d. All fuel handling operations shall be directly supervised by a CERTIFIED FUEL HANDLER.

e. Administrative procedures shall be developed and implemented to limit the working hours of shift personnel who perform functions important to the safe storage of irradiated fuel assemblies (e.g., CERTIFIED FUEL HANDLERS, non-certified operators, and radiation protection personnel,) and key maintenance personnel of the facility staff.

Key maintenance personnel of the facility staff are those personnel who are responsible for the correct performance of maintenance, repair, modification or calibration of structures, systems or components important to the safe storage of irradiated fuel assemblies, and who are personnel performing or immediately supervising the performance of such activities. This applies to key maintenance personnel whether on shift or not.

Adequate shift coverage shall be maintained without routine heavy use of overtime. The baseline for determining overtime use will be a 40 hour week. However, in the event that unforeseen problems require substantial amounts of overtime to be used; or during major maintenance or

(continued)

5.2 Organization

5.2.2 Facility Staff (continued)

modifications (including decommissioning activities) the following guidelines shall be followed on a temporary basis:

1. An individual should not be permitted to work more than 16 hours straight, excluding shift turnover time;

2. An individual should not be permitted to work more than 16 hours in any 24 hour period, nor more than 24 hours in any 48 hour period, nor more than 72 hours in any 7 day period, all excluding shift turnover time;

3. A break of at least 8 hours should be allowed between work periods, including shift turnover time;

4. The use of overtime should be considered on an individual basis and not for the entire staff on a shift.

Any deviation from the above guidelines shall be authorized in advance by the General Manager, Trojan Plant or, in his absence, Shift Manager, or by higher levels of management, in accordance with established procedures and with documentation of the basis for granting the deviation. Routine deviation from the above guidelines is not authorized.

f. The Shift Manager shall be a CERTIFIED FUEL HANDLER.

g. The Shift Managers shall report to an individual who is a CERTIFIED FUEL HANDLER.

Table 5.2.2-1
Minimum Shift Crew Composition[a]

Position	Minimum Crew Number
Shift Manager	1
non-certified operator	1
Total	2

[a] The shift crew composition may be one less than the minimum requirements of Table 5.2.2-1 for not more than 2 hours to accommodate unexpected absences of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements of Table 5.2.2-1. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crew member being late or absent.

5.0 ADMINISTRATIVE CONTROLS

5.3 Facility Staff Qualifications

5.3.1 Each member of the facility staff shall meet or exceed the minimum qualifications of ANSI N18.1-1971 for comparable positions unless otherwise noted in the Technical Specifications. The Radiation Protection Manager shall meet or exceed the qualifications of Regulatory Guide 1.8, Rev. 2, April 1987.

5.0 ADMINISTRATIVE CONTROLS

5.4 Training

5.4.1 An NRC-approved retraining and replacement training program for the CERTIFIED FUEL HANDLERS shall be maintained under the direction of the General Manager, Trojan Plant

5.0 ADMINISTRATIVE CONTROLS

5.5 Reviews and Audits

5.5.1 Independent Safety Review

Independent Safety Reviews shall be a thorough review by a qualified Independent Safety Reviewer. Persons performing these reviews shall be knowledgeable in the subject area being reviewed. These independent Safety Reviews are completed prior to implementation of proposed activities.

5.5.1.1 Composition

5.5.1.1.1 Reviewers

Independent safety reviewers shall be an individual not having direct responsibility for the performance of the activities under review, but who may be from the same functionally cognizant organization as the individual or group performing the original work.

5.5.1.1.2 Qualifications

The Independent Safety Reviewers shall have five years of professional level experience and either a Bachelor's Degree in Engineering or the Physical Sciences or equivalent in accordance with in ANSI/ANS-3.1-1981.

The Chairman of the Independent Review and Audit Committee shall designate the Independent Safety Reviewers in writing.

5.5.1.1.3 Responsibilities

The following subjects shall be independently reviewed by a qualified Independent Safety Reviewer:

a. Safety evaluations for changes in the facility as described in the Safety Analysis Report, changes in procedures as described in the Safety Analysis Report, and tests or experiments not described in the Safety Analysis Report to

(continued)

5.5 Review and Audits

5.5.1.1.3 Responsibilities (continued)

verify that such actions do not involve a change to the Technical Specifications or constitute an unreviewed safety question as defined in 10 CFR 50.59.

b. Proposed changes to the programs required by specification 5.7.2, to verify such changes do not involve a change to the Technical Specifications and will not constitute an unreviewed safety question as defined in 10 CFR 50.59.

c. Proposed changes to the Technical Specification Bases.

The Independent Review and Audit Committee (IRAC) is responsible for reviewing and advising the Vice President and Chief Nuclear Officer on matters relating to safe storage of irradiated fuel. This review and audit function is independent of the line organization responsibilities.

5.5.2.1 Composition

5.5.2.1.1 The IRAC shall be composed of a minimum of 5 members. Alternates may be substituted for regular members. The Vice President and Chief Nuclear Officer shall designate in writing the chairman, the members, and alternates for the IRAC. The chairman shall not have management responsibilities for, or report to, the line organizations responsible for operation or maintenance of th facility.

5.5.2.1.2 The IRAC shall collectively have experience and knowledge in the following functional areas:

1. Fuel Handling & Storage
2. Chemistry and Radiochemistry
3. Engineering
4. Radiation Protection
5. Quality Assurance

5.5.2.1.3 Meeting Frequency

The IRAC shall hold meetings as required, with at least one meeting per quarter.

(continued)

5.5 Review and Audits (continued)

5.5.2.1.4 Quorum

A quorum shall consists of 3 regular members or duly appointed alternates. Those members representing the line organizations responsible for the operation and maintenance of the facility shall not constitute a majority of the quorum. At least one member of the quorum shall be the chairman or the chairman's designated alternate.

5.5.2.1.5 Functions

The IRAC shall, as a minimum, incorporate the following functions that:

a. Advise the Vice President And Chief Nuclear Officer on all matters related to safe storage of irradiated fuel;

b. Advise the management of the audited organization and the Vice President And Chief Nuclear Officer, of audit results as they relate to safe storage of irradiated fuel;

c. Recommend to the management of the audited organization, and its management, any corrective action to improve the safe storage of irradiated fuel; and

d. Notify the Vice President And Chief Nuclear Officer of any safety significant disagreement between the IRAC and the General Manager, Trojan Plant within 24 hours.

5.5.2.2 Review Responsibilities

The IRAC shall be responsible for the review of:

a. The safety evaluations for procedures, and changes thereto, completed under the provisions of 10 CFR 50.59, to verify that such actions do not constitute an unreviewed safety question as defined in 10 CFR 50.59. This review may be completed after implementation of the affected procedure;

b. Changes to structures, systems, or components important to the safe storage of irradiated fuel to verify that such changes do not constitute an unreviewed safety question as

(continued)

5.5.2.2 Review Responsibilities (continued)

defined in 10 CFR 50.59. This review may be completed after implementation of the change;

c. Tests or experiments involving the safe storage of irradiated fuel to verify that such tests or experiments do not constitute an unreviewed safety question as defined in 10 CFR 50.59. This review may be completed after performance of the test or experiment;

d. d. Proposed changes to these Technical Specifications or the License;

e. Violations of codes, regulations, orders, license requirements, or internal procedures/instructions having nuclear safety significance;

f. Indications of unanticipated deficiencies in any aspect of design or operation of structures, systems, or components that could affect safe storage of irradiated fuel;

g. Significant accidental, unplanned, or uncontrolled radioactive releases, including corrective action to prevent recurrence;

h. Significant operating abnormalities or deviations from normal and expected performance of equipment that affect safe storage of irradiated fuel;

i. The performance of the corrective action system; and

j. Internal and external experience information related to the safe storage of irradiated fuel that may indicate areas for improving facility safety.

Reports or records of these reviews shall be forwarded to the Vice President And Chief Nuclear Officer within 30 days following completion of the review.

(continued)

5.5 Reviews and Audits (continued)

5.5.2.3 Audit Responsibilities

The audit responsibilities shall encompass:

a. The conformance of irradiated fuel storage to provisions contained within the TS and applicable license conditions·

b. The training and qualifications of the facility staff;

c. The implementation of all programs required by Specification 5.7.2;

d. Actions taken to correct deficiencies occurring in structures, systems, components, or method of operation that affect safe storage of irradiated fuel;

e. Facility operations, modifications, maintenance, and surveillance related to the safe storage of irradiated fuel to verify independently that these activities are performed safely and correctly; and

f. Other activities and documents as requested by the Vice President and Chief Nuclear Officer.

Reports or records of these audits, including any recommendations for improving the safe storage of irradiated fuel, shall be forwarded to the Vice President And Chief Nuclear Officer within 30 days following completion of the audit.

5.5.3 Records

Written records of reviews and audits shall be maintained. As a minimum these records shall include:

a. Results of the activities conducted under the provisions of Section 5.5.1 and 5.5.2;

b. Recommendations to the management of the organization being audited;

(continued)

5.5 Review and Audits

5.5.3 Records (continued)

c. An assessment of the safety significance of the review or audit findings;

d. Documentation of the reviews conducted per Specification 5.5.1.1.3.; and

e. Determination whether each item considered under Specifications 5.5.2.2.a through 5.5.2.2.c constitutes an unreviewed safety question as defined in 10 CFR 50.59.

5.0 ADMINISTRATIVE CONTROLS

5.6 Technical Specifications (TS) Bases Control

5.6.1 Changes to the Bases of the TS shall be made under appropriate administrative controls and reviewed according to Specification 5.5.1.

5.6.2 Licensees may make changes to Bases without prior NRC approval provided the changes do not involve either of the following:

a. A change in the TS incorporated in the license; or

b. An unreviewed safety question as defined in 10 CFR 50.59.

5.6.3 The Bases Control Program shall contain provisions to ensure that the Bases are properly maintained.

5.6.4 Proposed changes that meet the criteria of 5.6.2(a) or (b) above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on an annual basis.

5.0 ADMINISTRATIVE CONTROLS

5.7 Procedures, Programs, and Manuals

5.7.1 Procedures

5.7.1.1 Scope

Written procedures shall be established, implemented, and maintained covering the following activities:

a. The procedures applicable to the safe storage of irradiated fuel recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978;

b. Defueled security plan implementation;

c. Defueled emergency plan implementation;

d. Quality assurance for radiological effluent and environmental monitoring;

e. Fire protection program implementation

f. All programs specified in Specification 5.7.2.

5.7.1.2 Review and Approval

Each procedure of Specification 5.7.1.1, and changes thereto, shall be independently reviewed in accordance with established administrative procedures and approved by the General Manager, Trojan Plant or his designee prior to implementation.

5.7.1.3 Temporary Changes

Temporary changes to procedures of Specification 5.7.1.1 may be made provided:

a. The intent of the existing procedure is not altered;

b. The change is approved by a member of the facility management staff and by a CERTIFIED FUEL HANDLER; and

(continued)

5.7 Procedures, Programs, and Manuals

5.7.1.3 Temporary Changes (continued)

c. The change is documented, reviewed and approved by the responsible manager, in accordance with approved administrative procedures within 14 days of implementation.

5.7.2 Programs and Manuals

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

5.7.2.1 Radiation Protection Program

Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

5.7.2.2 Process Control Program (PCP)

The PCP shall contain the current formulas, sampling, analyses, tests, and determinations to be made to ensure that processing and packaging of solid radioactive wastes will be accomplished to ensure compliance with 10 CFR 20, 10 CFR 61, and 10 CFR 71; state regulations; burial ground requirements; and other requirements governing the disposal of solid radioactive waste.

Licensee initiated changes to the PCP:

a. Shall be documented and records of reviews performed shall be retained. This documentation shall contain:

1. sufficient information to support the change(s) and appropriate analyses or evaluations justifying the change(s), and
2. a determination that the change(s) maintain the overall conformance of the solidified waste product to the existing requirements of Federal, State, or other applicable regulations.

(continued)

5.7 Procedures, Programs, and Manuals

5.7.2.2 Process Control Program (PCP) (continued)

b. Shall be effective after review and approvalby an Independent Safety Reviewer and the approval of the General Manager, Trojan Plant .

5.7.2.3 Offsite Dose Calculation Manual (ODCM)

5.7.2.3.1 Content

a. The ODCM shall contain the methodology and parameters used in the calculation of off-site doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm and trip setpoints, and in the conduct of the Radiological Environmental Monitoring Program; and

b. The ODCM shall also contain the Radioactive Effluent Controls Program and the Radiological Environmental Monitoring Program required by Specifications 5.7.2.4 and 5.7.2.5 respectively, and descriptions of the information that should be included in the Annual Radiological Environmental Monitoring Report required by Specification 5.8.1.2.

5.7.2.3.2 Licensee initiated changes to the ODCM:

a. Shall be documented and records of reviews performed shall be retained. This documentation shall contain:

1. sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s),

2. a determination that the change(s) maintain the levels of radioactive effluent control required by 10 CFR 20.1302, and 40 CFR 190, and not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations;

(continued)

5.7 Procedures, Programs, and Manuals

5.7.2.3.2 Licensee initiated changes to the ODCM: (continued)

b. Shall become effective after review and approval by an Independent Safety Reviewer and the approval of the General Manager, Trojan Plant ; and

c. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radiological Environmental Monitoring Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.)

5.7.2.4 Radioactive Effluent Controls Program

This program provides controls for radioactive effluents and for maintaining the doses to members of the public from radioactive effluents as low as reasonably achievable. The program shall be contained in the ODCM, shall be implemented by procedures, and shall include remedial actions to be taken whenever the program limits are exceeded. The program shall include the following elements:

a. Limitations on the functional capability of radioactive liquid and gaseous monitoring instrumentation including surveillance tests and setpoint determination in accordance with the methodology in the ODCM;

b. Limitations on the concentrations of radioactive material released in liquid effluents to unrestricted areas, conforming to 10 CFR 20, Appendix B;

c. Monitoring, sampling, and analysis of radioactive liquid and gaseous effluents in accordance with 10 CFR 20.1302 and with the methodology and parameters in the ODCM;

d. Determination of cumulative and projected dose contributions from radioactive effluents for the current calendar quarter and current calendar year in accordance with the methodology and parameters in the ODCM at least quarterly;

(continued)

5.7 Procedures, Programs, and Manuals

5.7.2.4 Radioactive Effluent Controls Program (continued)

e. Limitations on the dose rate resulting from radioactive material released in gaseous effluents to areas beyond the site boundary conforming to the dose associated with 10 CFR 20, Appendix B; and

f. Limitations on the annual dose or dose commitment to any member of the public due to releases of radioactivity and to radiation from uranium fuel cycle sources, conforming to 40 CFR 190.

g. Limitations on the annual and quarterly doses or dose commitment to a member of the public from radioactive materials in liquid effluents released to unrestricted areas conforming to 10 CFR 50, Appendix I.

h. Limitations on the operability and use of effluent treatment systems to ensure appropriate portions of these systems are used to reduce releases when the projected doses in a 31 day period would exceed 2 percent of the guidelines for the annual dose or dose commitment conforming to 10 CFR 50, Appendix I.

i. Limitations on the annual and quarterly doses to a member of the public from tritium and radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released to areas beyond the site boundary conforming to Appendix I to 10 CFR Part 50.

5.7.2.5 Radiological Environmental Monitoring Program

This program is for monitoring the radiation and radionuclides in the environs of the facility. The program shall provide representative measurements of radioactivity in the highest potential exposure pathways and verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. The program shall be contained in the ODCM and shall include the following:

(continued)

5.7 Procedures, Programs, and Manuals

5.7.2.5 Radiological Environmental Monitoring Program (continued)

a. Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM; and

b. Participation in an Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

5.7.2.6 Storage Tank Radioactivity Monitoring Program

A surveillance program to ensure that the quantity of radioactivity contained in all outdoor liquid radwaste tanks that are not surrounded by liners, dikes, or walls, capable of holding the tanks' contents and that do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system is less than limits of 10 CFR 20, Appendix B at the nearest potable water supply and the nearest surface water supply in an unrestricted area, in the event of an uncontrolled release of the tanks' contents. For temporary storage tanks a limit of 10 curies, excluding tritium and dissolved or entrained noble gasses, may be used in lieu of the above criteria.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Storage Tank Radioactivity Monitoring Program surveillance frequencies.

5.7.2.7 Fire Protection Program

This program provides controls to ensure that appropriate fire protection measures are maintained to protect the facility from fires which could impact the safe storage of irradiated fuel or the release of radioactive materials.

5.7.2.8 Spent Fuel Pool Water Chemistry Program

This program provides controls for monitoring spent fuel pool water chemistry to minimize the potential effects of corrosion which could affect the safe storage of irradiated fuel. The

(continued)

5.7 Procedures, Programs, and Manuals

5.7.2.8 Spent Fuel Pool Water Chemistry Program (continued)

program shall include identification of critical variables and control points for these variables. The program shall also include sampling frequencies and define corrective actions to be taken for off control point chemistry conditions.

5.7.2.9 Control Building Structural Montioring

This program provides controls to monitor the structural adequacy of the through-wall bolts used to tie reinforced concrete and steel plate to the Control Building west and east walls. The program verifies that structural adequacy is maintained consistent with the design. The program contains provisions to ensure that loss of tension or degradation of the bolts will not adversely affect the structural capability of the Control-Auxiliary-Fuel Building.

5.0 ADMINISTRATIVE CONTROLS

5.8 Reporting Requirements

5.8.1 Routine Reports

The following reports shall be submitted in accordance with 10 CFR 50.4.

5.8.1.1 Occupational Radiation Exposure Report

An Occupational Radiation Exposure Report covering the activities of the facility as described below for the previous calendar year shall be submitted by March 31 of each year.

Occupational Radiation Exposure Report shall include a tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures > 100 mrem/yr and their associated man-rem exposure according to work and job functions (e.g., fuel handling, surveillance, maintenance and waste processing). This tabulation supplements the requirements of 10 CFR 20.2206. The dose assignments to various duty functions may be estimated based on pocket dosimeter, thermoluminescent dosimeter (TLD), or film badge measurements. Small exposures totaling < 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole body dose received from external sources should be assigned to specific major work functions.

5.8.1.2 Annual Radiological Environmental Monitoring Report

The Annual Radiological Environmental Monitoring Report covering the activities during the previous calendar year shall be submitted by May 15 of each year. The report shall include summaries, interpretations, and analyses of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in the Offsite Dose Calculation Manual (ODCM).

(continued)

5.8 Reporting Requirements

5.8.1.2 Annual Radiological Environmental Monitoring Report (continued)

The Annual Radiological Environmental Monitoring Report shall include the results of analyses of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the table and figures in the ODCM, as well as summarized and tabulated results of these analyses and measurements. In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted in a supplementary report as soon as possible.

The Annual Radiological Environmental Monitoring Report shall include licensee initiated changes to the ODCM during the period of the report as described in Specification 5.7.2.3.2, or these changes shall be submitted concurrently.

5.8.1.3 Annual Radioactive Effluent Release Report

The Annual Radioactive Effluent Release Report covering the activities of the unit shall be submitted in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODCM and Process Control Program.

5.0 ADMINISTRATIVE CONTROLS

5.9 Record Retention

5.9.1 The following records shall be retained for at least 3 years:

a. All Licensee Event Reports required by 10 CFR 50.73;

b. Records of changes made to the procedures required by Specification 5.7.1.1; and

c. Records of radioactive shipments.

5.9.2 The following records shall be retained for at least 5 years:

a. Records and logs of activities related to the safe storage of irradiated fuel;

b. Records and logs of principal maintenance activities, inspections, repair, and replacement of principal items of equipment related to safe storage of irradiated fuel;

c. Records of surveillance activities, inspections, and calibrations required by the Technical Specifications (TS);

d. Records of sealed source and fission detector leak tests and results; and

e. Records of annual physical inventory of all sealed source material of record.

5.9.3 The following records shall be retained for the duration of the Possession Only License:

a. Records and drawing changes reflecting design modifications made to structures, systems and components needed for the safe storage of irradiated fuel as described in the Safety Analysis Report;

(continued)

5.9 Record Retention

5.9.3 (continued)

b. Records of irradiated fuel inventory, fuel transfers, and assembly burnup histories;

c. Records of radiation exposure for all individuals entering radiation control areas;

d. Records of gaseous and liquid radioactive material released to the environs;

e. Records of training and qualification for members of the facility staff;

f. Records of quality assurance activities required by the Trojan Nuclear Quality Assurance (QA) Program and which are classified as permanent records by applicable regulations, codes, and standards;

g. Records of reviews performed for changes made to procedures, equipment, or reviews of tests and experiments pursuant to 10 CFR 50.59;

h. Records of the reviews and audits required by Specifications 5.5.1 and 5.5.2;

i. Records of analyses required by the Radiological Environmental Monitoring Program that would permit evaluation of the accuracy of the analysis at a later date (these records should include procedures effective at specified times and records showing that these procedures were followed); and

j. Records of reviews performed for changes made to the Offsite Dose Calculation Manual and the Process Control Program.

5.0 ADMINISTRATIVE CONTROLS

5.10 High Radiation Area

5.10.1 Pursuant to 10 CFR 20, paragraph 20.1601, in lieu of the requirements of 10 CFR 20.1601, each high radiation area, as defined in 10 CFR 20, in which the intensity of radiation is > 100 mrem/hr but < 1000 mrem/hr, shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Work Permit (RWP). Individuals qualified in radiation protection procedures or personnel continuously escorted by such individuals may be exempt from the RWP issuance requirement during the performance of their assigned duties in high radiation areas with exposure rates ≤ 1000 mrem/hr, provided they are otherwise following facility radiation protection procedures for entry into such high radiation areas.

Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device that continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device that continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel are aware of them.

c. An individual qualified in radiation protection procedures with a radiation dose rate monitoring device, who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the Radiation Protection Manager in the RWP.

(continued)

5.10 High Radiation Area (continued)

5.10.2 In addition to the requirements of Specification 5.10.1, areas with radiation levels ≥ 1000 mrem/hr shall be provided with locked or continuously guarded doors to prevent unauthorized entry and the keys shall be maintained under the administrative control of the Shift Manager on duty or health physics supervision. Doors shall remain locked except during periods of access by personnel under an approved RWP that shall specify the dose rate levels in the immediate work areas and the maximum allowable stay times for individuals in those areas. In lieu of the stay time specification of the RWP, direct or remote (such as closed circuit TV cameras) continuous surveillance may be made by personnel qualified in radiation protection procedures to provide positive exposure control over the activities being performed within the area.

5.10.3 For individual high radiation areas with radiation levels of > 1000 mrem/hr, accessible to personnel, that are located within large areas such as reactor containment, where no enclosure exists for purposes of locking, or that cannot be continuously guarded, and where no enclosure can be reasonably constructed around the individual area, that individual area shall be barricaded and conspicuously posted, and a flashing light shall be activated as a warning device.

Technical Specifications

Trojan Nuclear Plant

Bases

TABLE OF CONTENTS

B 3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

BASES

LCOs

LCO 3.0.1 and 3.0.2 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 facility 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.

Completing the Required Actions is not required when an LCO is met or is no longer applicable, unless otherwise stated in the individual Specifications.

(continued)

BASES

LCO 3.0.2 (continued)

The Completion Times of the Required Actions are also applicable when a specified condition in the Applicability is entered 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 problems. Entering ACTIONS for these reasons must be done in a manner that does not compromise the safe storage of irradiated fuel. Intentional entry into ACTIONS should not be made for convenience.

B 3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

BASES

SRs

SR 3.0 ' through SR 3.0.3 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 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.

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

SR 3.0.2

SR 3.0.2 permits a 25% extension of the interval specified in the Frequency. This extension facilitates Surveillance scheduling and considers facility conditions that may not be suitable for conducting the Surveillance (e.g., 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. Any exceptions to SR 3.0.2 are stated in the individual Specifications.

The provisions of SR 3.0.2 are not intended to be used repeatedly merely as a convenience to extend Surveillance intervals or periodic Completion Time intervals beyond those specified.

(continued)

SR 3.0.3

SR 3.0.3 establishes the flexibility to defer declaring 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 applies from the 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 facility conditions, 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 facility 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.

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 a convenience to extend Surveillance intervals.

(continued)

BASES

SR 3.0.3 (continued)

If a Surveillance is not completed within the allowed delay period, then 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 variable is outside the specified limits and the 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.

B 3.1 DEFUELED SYSTEMS

B 3.1.1 Spent Fuel Pool Water Level

BASES

BACKGROUND

The specified water level shields and minimizes the general area dose when the irradiated fuel is stored in the storage racks and provides shielding during the movement of spent fuel. The minimum water level in the spent fuel pool meets the assumptions of iodine decontamination factors following a fuel handling accident. The minimum water level also ensures that a large volume of water is available to provide a heat sink for the spent fuel in the event that the operation of active cooling systems are interrupted for extended periods.

A general description of the spent fuel pool design and the Spent Fuel Pool Cooling and Demineralizer System is given in the SAR. The assumptions of the fuel handling accident and an analysis of a loss of spent fuel pool forced cooling are also given in SAR.

APPLICABLE SAFETY ANALYSES

The minimum water level in the spent fuel pool meets the assumptions of the fuel handling accident described in Regulatory Guide 1.25, Rev. 0, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors." The resultant 2 hour thyroid dose per person at the exclusion area boundary is an extremely small fraction of the 10 CFR 100 limits.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The Trojan facility is permanently shutdown and the time since the last operation of the reactor has allowed significant decay of fission products (especially the daughter products with short half-lives) contained in the spent fuel. The fuel handling accident conservatively assumes that the fuel assembly with the highest fission product inventory is damaged and that all of the fuel pins in the assembly are damaged. The principal effect of the water level on the calculated offsite doses is to reduce the amount of radioactive iodine reaching the surface of the pool. With 23 ft. of water, the assumptions of Regulatory Guide 1.25, Rev. 0 can be used directly. The resulting calculations indicate offsite doses of less than a tenth of one percent of the limits of 10 CFR 100. The results of these analyses are described in the SAR.

The minimum water level is also consistent with the assumptions of the analysis of a loss of spent fuel pool forced cooling described in the SAR. In the unlikely event of an extended loss of forced cooling, the water temperature in the spent fuel pool could increase to the point that boiling begins. The heat removed by boiling and evaporation provides an adequate heat sink for the irradiated fuel stored in the spent fuel pool as long as the fuel assemblies remain covered with water. The rate of water level decrease due to boiling and evaporation would be low due to the volume of water in the spent fuel pool and the relatively low decay heat load due the time which has elapsed since the facility was shutdown and permanently defueled. Conservative calculations based on a one year decay time indicate that with no remedial action, over 10 days would elapse from the time spent fuel pool temperature exceeded 140 ^{0}F until the water level decreased from 23 feet above the fuel assemblies to 10 feet above the fuel assemblies. A makeup rate of less than 8 gallons per minute is sufficient to offset the loss of water due to boiling and evaporation. A water level 10 feet above the top of the irradiated fuel assemblies would continue to provide an adequate heat sink for the fuel and shielding for personnel working in the area.

(continued)

BASES

LCO

The spent fuel pool water level is required to be $\geq$ 23 ft over the top of irradiated fuel assemblies seated in the storage racks. The specified water level preserves the assumptions of the fuel handling accident analysis and the analyses of a loss of spent fuel pool forced cooling. As such, it is the minimum required for fuel storage and movement within the spent fuel pool.

APPLICABILITY

This LCO applies whenever irradiated fuel assemblies are stored in spent fuel pool, since the potential for a release of fission products exists.

ACTIONS

A.1

When the spent fuel pool water level is lower than the required level, the movement of irradiated fuel assemblies in the spent fuel pool is immediately suspended along with movement of loads over storage racks containing irradiated fuel. This action effectively precludes the occurrence of a fuel handling accident. This does not preclude movement of a fuel assembly or load to a safe position.

A.2

When the initial conditions for spent fuel pool water level assumed in the loss of spent fuel pool forced cooling analysis are not met, steps should be initiated to restore the water level to within limits. A number of sources of water are available to provide the necessary makeup water. Methods of establishing makeup flow to the spent fuel pool are delineated in facility procedures.

(continued)

ACTIONS (continued)

A.3

Action A.3 requires that the spent fuel pool level be restored to within limits within 24 hours. This time period is based on the fact that Action A.1 precludes events such as a fuel handling event which could result in the immediate release of radioactive material in the pool. Action A.3 requires that the level be restored in a reasonable time in order to ensure that the initial conditions assumed in the analysis of a loss of forced cooling are maintained.

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

This SR verifies sufficient spent fuel pool water is available in the event of a fuel handling accident or loss of spent fuel pool forced cooling. The water level in the spent fuel pool must be checked periodically. The 24 hour Frequency is appropriate because the volume in the pool is normally stable and water level changes are controlled by facility procedures.

B 3.1 DEFUELED SYSTEMS

B 3.1.2 Spent Fuel Pool Boron Concentration

BASES

BACKGROUND

The water in the spent fuel pool normally contains soluble boron, which results in large subcriticality margins under normal conditions. However, the design of the spent fuel pool is based on the use of unborated water, which maintains a subcritical condition ($k_{eff} \leq 0.95$) with the spent fuel racks fully loaded in accordance with NRC guidance.

The double contingency principle discussed in ANSI N-16.1-1975 and the April 1978 NRC letter allows credit for soluble boron under abnormal or accident conditions, since only a single accident need be considered at one time. The most severe accident scenario is associated with the drop of an irradiated fuel assembly during fuel handling operations. This could potentially increase the k_{eff} of the spent fuel pool. To mitigate the reactivity increase due to such a postulated accident, boron is dissolved in the pool water.

APPLICABLE SAFETY ANALYSES

Most accident conditions do not result in an increase in the reactivity of the spent fuel pool. However, the analyses performed to evaluate the effects of a postulated drop of an irradiated fuel assembly on the spent fuel racks assumed the presence of 2000 ppm soluble boron in the spent fuel pool water. The presence of soluble boron was also assumed in the evaluation of a spent fuel pool heatup. The negative reactivity effect of the soluble boron compensates for any increased reactivity caused by postulated accident scenarios. The accident analyses are provided in the SAR and in PGE-1037, "Spent Fuel Storage Rack Replacement Report", dated July 1983.

(continued)

BASES

LCO

The spent fuel pool boron concentration is required to be ≥ 2000 ppm. The specified concentration of dissolved boron in the spent fuel pool preserves the assumptions used in the analyses of a potential criticality accident resulting from the drop of an irradiated fuel assembly in the spent fuel pool and for other abnormal conditions. This concentration of dissolved boron is the minimum required concentration when irradiated fuel assemblies are stored in the spent fuel pool.

APPLICABILITY

This LCO applies whenever irradiated fuel assemblies are stored in the spent fuel pool.

ACTIONS

A.1

When the concentration of boron in the spent fuel pool is less than required, immediate action should be taken to preclude the occurrence of an accident involving the drop of an irradiated fuel assembly or other loads over storage racks containing irradiated fuel. This is most efficiently achieved by immediately suspending the movement of fuel assemblies. This does not preclude movement of a fuel assembly or load to a safe position.

A.2

Action A.2 requires that the boron concentration be restored within limits within 14 days. The most significant accident scenario for which the presence of boron is assumed is the drop of an irradiated fuel assembly over storage racks containing irradiated fuel. This postulated accident is precluded by the immediate actions required by Action A.1. The probability of other accident scenarios affecting the reactivity of the spent fuel storage racks are of a much lower order of probability. Action A.2 allows a reasonable time period to restore the boron concentration in the spent fuel pool to within limits.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

This SR verifies that the concentration of boron in the spent fuel pool is within the required limit during the movement of irradiated fuel assemblies or the movement of loads over storage racks containing irradiated fuel. As long as this SR is met, the analyzed accidents are fully addressed. The 7 day Frequency is appropriate because no major replenishment of pool water which could result in a dilution of the boron concentration is expected to take place.

SR 3.1.2.2

This SR verifies that the concentration of boron in the spent fuel pool is within the required limit during periods of time when no activities involving the movement of irradiated fuel assemblies or the movement of loads over storage racks occurs. Since there is no potential for a fuel assembly drop or the other drop of a load over irradiated fuel assemblies, a frequency of 31 days is allowed. The Frequency is appropriate because no major replenishment of pool water which could result in a dilution of the boron concentration is expected to take place.

B 3.1 DEFUELED SYSTEMS

B 3.1.3 Spent Fuel Pool Temperature

BASES

BACKGROUND

The water in the spent fuel pool is normally cooled by a spent fuel cooling system. This system is designed to maintain the pool temperature below 140° F. In the unlikely event that the cooling system is interrupted for an extended period of time, the volume of water in the spent fuel pool provides an adequate heat sink for the irradiated fuel. The only requirement for the removal of heat from the irradiated fuel is that the fuel assemblies remain covered with water.

A general description of the spent fuel pool design and the Spent Fuel Pool Cooling and Demineralizer System is given in the SAR. The assumptions and analysis of a loss of spent fuel pool forced cooling are also given in SAR.

APPLICABLE SAFETY ANALYSES

Adequate removal of heat from irradiated fuel assemblies is provided by ensuring that the fuel assemblies remain covered with water. The spent fuel pool cooling system is used to prevent heatup of the water in the pool which could lead to a loss of coolant inventory due to boiling and evaporation. The spent fuel cooling system is designed to maintain the water in the spent fuel pool at less than 140° F. The potential for an extended loss of forced cooling has been evaluated and is described in the SAR. The decay heat loads in the spent fuel pool are relatively low due to the decay time since the plant was permanently shutdown and defueled. Conservative calculations performed for a decay time of one year after shutdown indicate that over 42 hours are required for the temperature of the water in the spent fuel pool to rise from an initial temperature of 140° F to the boiling point of 212° F. Boiling and evaporation at the surface of the spent fuel pool would continue to provide an adequate heat sink for the irradiated fuel assemblies stored in the pool as long as the fuel assemblies remain covered with water. The rate of water loss due to boiling and

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

evaporation is low and approximately 9 days are available from the onset of boiling before the water level in the spent fuel pool drops from an initial level of 23 feet above the top of the irradiated fuel to a level 10 feet above the top of the irradiated fuel. Ten feet of water above the top of the irradiated fuel would continue to provide an adequate heat sink for the fuel and radiation shielding for the protection of personnel working in the area. This time period is more than sufficient to establish makeup flow from a number of facility systems or to arrange for makeup using portable/temporary sources. Methods of establishing spent fuel pool cooling and makeup are established in facility procedures.

LCO

The LCO requires that the coolant temperature in the spent fuel pool be maintained $\leq$ 140° F.

APPLICABILITY

Irradiated fuel stored in the spent fuel pool produces heat due to radioactive decay. Water covering the irradiated fuel provides the required heat sink. This LCO provides an indication of abnormal temperature increase in the spent fuel pool which could eventually lead to a loss of water inventory due to boiling and evaporation. The LCO is applicable whenever irradiated fuel assemblies are stored in the spent fuel pool.

ACTIONS

A.1

An increase in the spent fuel pool coolant temperature above the specified limit could indicate that the cooling system is not in service. Therefore, Action A.1 requires that action be immediately initiated to restore the spent fuel pool temperature to within limit.

(continued)

BASES

ACTIONS (continued)

A.2

Since a continued increase in spent fuel pool temperature could eventually lead to a loss of water inventory due to boiling and evaporation, Action A.2 requires that action be taken to confirm that a source of makeup water is available should it be required.

A.3

Action A.3 requires that the temperature be restored to within limits within 7 days. The seven day time period allows time to make necessary repairs to restore the effectiveness of the spent fuel cooling system. Should the temperature continue to increase to the point that the water level in the spent fuel pool decreases due to boiling and evaporation, LCO 3.1.1 requires that actions be taken in a shorter time frame to initiate makeup flow to the spent fuel pool and restore the water level to within specified limits.

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1

The temperature of the spent fuel pool coolant is verified to be within limits at a specified frequency of 24 hours with an National Institute of Standards Technology (NIST) traceable instrument. The surveillance requirement assures that an abnormal increase in the temperature of the spent fuel pool coolant is detected so that appropriate actions can be initiated. The 24 hour frequency is appropriate since the temperature of the spent fuel pool coolant is not subject to rapid changes. This frequency ensures that an increasing temperature in the spent fuel pool is detected prior to the beginning a loss of coolant inventory due to boiling and evaporation of the coolant.

B 3.1 DEFUELED SYSTEMS

B 3.1.4 Spent Fuel Pool Load Restrictions

BASES

BACKGROUND

The possibility of a fuel handling accident is very remote because of the many administrative controls and physical limitations imposed on the handling of irradiated fuel. However, a potential fuel handling accident involving the dropping of one irradiated fuel assembly onto another such assembly stored in the spent fuel racks has been analyzed in the SAR. This analysis evaluated the potential impact loads due to the dropping of a fuel assembly onto the storage racks during fuel handling operations. The restriction on movement of loads in excess of the nominal weight of a fuel assembly over other fuel assemblies ensures that the analyzed fuel handling accident remains bounding.

APPLICABLE SAFETY ANALYSES

The potential fuel handling accident involving the dropping of one irradiated fuel assembly onto another such assembly stored in the spent fuel racks has been analyzed in the SAR. This analysis evaluated the potential impact loads due to the dropping of a fuel assembly during fuel handling operations. This analysis concluded that the damage to the cladding of all the fuel rods in one fuel assembly would be a conservative bounding assumption for this type of accident. Restricting movement of loads such that impact energies on the storage racks do not exceed 240,000 in.-lbs. ensures that no more than the contents of one fuel assembly will be ruptured in the unlikely event of a load drop event.

LCO

Loads carried over the spent fuel pool and the heights at which they may be carried over racks containing fuel shall be limited in such a way as to preclude impact energies over 240,000 in.-lbs. if the load is dropped.

(continued)

BASES

APPLICABILITY

This LCO is applicable whenever irradiated fuel assemblies are in the spent fuel pool.

ACTIONS

A.1

Should the load limitations of the LCO be violated, Action A.1 requires that the load immediately be placed in a safe condition. This can be accomplished by either reducing the height of the load or moving the load to a location which is not over storage racks containing irradiated fuel. This action results in a condition which is acceptable per the LCO and no further actions are necessary.

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

The SR requires that the potential impact energy of a load be determined to be $\leq$ 240,000 in.-lbs. prior to moving the load over the racks containing irradiated fuel and verifying that the impact energy is below the specified limit.