Advanced Passive 1000 (AP1000)
Generic Technical Specification Traveler (GTST)

Title: Changes Related to LCO 3.7.5, Spent Fuel Pool Water Level

I. Technical Specifications Task Force (TSTF) Travelers, Approved Since Revision 2 of STS NUREG-1431, and Used to Develop this GTST

TSTF Number and Title:

TSTF-425-A, Rev 3, Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5b

STS NUREGs Affected:

TSTF-425-A, Rev 3: NUREGs 1430, 1431, 1432, 1433, and 1434

NRC Approval Date:

TSTF-425-A, Rev. 3: 06-Jul-09

TSTF Classification:

TSTF-425-A, Rev 3: Technical Change

II. Reference Combined License (RCOL) Standard Departures (Std. Dep.), RCOL COL Items, and RCOL Plant-Specific Technical Specifications (PTS) Changes Used to Develop this GTST

RCOL Std. Dep. Number and Title:

There are no Vogtle departures applicable to Specification 3.7.5.

RCOL COL Item Number and Title:

There are no Vogtle COL items applicable to Specification 3.7.5.

RCOL PTS Change Number and Title:

VEGP LAR DOC A003:	References to various Chapters and Sections of the Final Safety Analysis Report (FSAR) are revised to include FSAR.
VEGP LAR DOC A098:	TS 3.7.5 Applicability revision
VEGP LAR DOC L05:	TS LCO 3.0.8 is eliminated

III. Comments on Relations Among TSTFs, RCOL Std. Dep., RCOL COL Items, and RCOL PTS Changes

This section discusses the considered changes that are: (1) applicable to operating reactor designs, but not to the AP1000 design; (2) already incorporated in the GTS; or (3) superseded by another change.

TSTF-425-A deferred for future consideration.

IV. Additional Changes Proposed as Part of this GTST (modifications proposed by NRC staff and/or clear editorial changes or deviations identified by preparer of GTST)

Minor corrections were made to correct grammatical errors in the Bases.

APOG Recommended Changes to Improve the Bases

For the spent fuel pool cooling system, which does not have requirements for TS operability, TS 3.7.5 Bases discussion of “inoperable” are replaced with “unavailable” to align with discussions in TS 3.7.9 Bases. There is no change in intent in providing consistent reference to system status. Revise the third sentence of the first paragraph in the “Background” section of the Bases to state:

> The water also provides shielding during the movement of spent fuel, and a large capacity heat sink in the event the spent fuel pool cooling system is ~~inoperable~~**unavailable**.

Revise the third paragraph of the “ASA” section of the Bases to state:

> In addition to mitigation of the effects of a fuel handling accident, the required minimum water level in the spent fuel pool provides a large capacity heat sink for spent fuel pool cooling in the event the spent fuel pool cooling system is ~~inoperable~~**unavailable**.

Revise the first sentence of the first paragraph In the “Actions” section of the Bases, under the heading “A.1” to state:

> When the initial conditions ~~for prevention of an~~**assumed in** accident **analyses** cannot be met, steps should be taken to preclude the accident from occurring.

This non-technical change provides improved clarity, consistency, and operator usability.

Throughout the Bases, references to Sections and Chapters of the FSAR do not include the “FSAR” clarifier. Since these Section and Chapter references are to an external document, it is appropriate to include the “FSAR” modifier. (DOC A003)

V. Applicability

Affected Generic Technical Specifications and Bases:

Section 3.7.5, Spent Fuel Pool Water Level

Changes to the Generic Technical Specifications and Bases:

The LCO Applicability statement is revised to indicate that the LCO only applies when irradiated fuel is stored in the spent fuel pool. (DOC A098)

The Action Note is revised to eliminate reference to AP1000 GTS LCO 3.0.8. (DOC L05)

The third sentence of the first paragraph in the “Background” section of the Bases is revised for consistency with discussions in TS 3.7.9. (APOG Comment)

The third paragraph in the “ASA” section of the Bases is revised for consistency with discussions in TS 3.7.9. (APOG Comment)

The first sentence of the first paragraph in the “Actions” section of the Bases, under the heading “A.1” is revised to improve clarity, consistency, and operator usability. (APOG Comment)

The acronym “FSAR” is added to modify “Section” and “Chapter” in references to the FSAR throughout the Bases. (DOC A003) (APOG Comment)

VI. Traveler Information

Description of TSTF changes:

Not Applicable

Rationale for TSTF changes:

Not Applicable

Description of changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:

DOC A098 Applicability is revised to "When irradiated fuel assemblies are stored in the spent fuel pool."

DOC L05 removes reference to AP1000 GTS LCO 3.0.8, which is eliminated.

A more detailed description of each DOC can be found in Reference 2, VEGP TSU LAR Enclosure 1, and the NRC staff safety evaluation can be found in Reference 3, VEGP LAR SER. The VEGP TSU LAR was modified in response to NRC staff RAIs in Reference 5 and the Southern Nuclear Operating Company RAI Response in Reference 6.

Rationale for changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:

DOC A098 revises the Applicability because it is not consistent with the GTS 3.7.5 requirement.

DOC L05 notes that considerations of AP1000 GTS LCO 3.0.8 are adequately addressed within individual LCO referencing LCO 3.0.8 or by TS 5.4.1.b to Monitor Safety System Shutdown Monitoring Trees parameters. AP1000 GTS LCO 3.0.8 is eliminated.

Description of additional changes proposed by NRC staff/preparer of GTST:

The third sentence of the first paragraph in the "Background" section of the Bases is revised to state (APOG Comment):

> The water also provides shielding during the movement of spent fuel, and a large capacity heat sink in the event the spent fuel pool cooling system is ~~inoperable~~**unavailable**.

The third paragraph of the "ASA" section of the Bases is revised to state (APOG Comment):

> In addition to mitigation of the effects of a fuel handling accident, the required minimum water level in the spent fuel pool provides a large capacity heat sink for spent fuel pool cooling in the event the spent fuel pool cooling system is ~~inoperable~~**unavailable**.

The first sentence of the first paragraph in the "Actions" section of the Bases, under the heading "A.1" is revised to state (APOG Comment):

When the initial conditions ~~for prevention of an~~**assumed in** accident **analyses** cannot be met, steps should be taken to preclude the accident from occurring.

The acronym “FSAR” is added to modify “Section” and “Chapter” in references to the FSAR throughout the Bases. (DOC A003) (APOG Comment)

Rationale for additional changes proposed by NRC staff/preparer of GTST:

These changes are to correct grammatical errors in the bases.

For the spent fuel pool cooling system, which does not have requirements for TS operability, TS 3.7.5 Bases discussion of “inoperable” are replaced with “unavailable” to align with discussions in TS 3.7.9 Bases. There is no change in intent in providing consistent reference to system status.

The non-technical change to the “Actions” section of the Bases under the heading “A.1” provides improved clarity, consistency, and operator usability.

Since Bases references to FSAR Sections and Chapters are to an external document, it is appropriate to include the “FSAR” modifier.

VII. GTST Safety Evaluation

Technical Analysis:

DOC A098 notes that GTS LCO 3.7.5 requires the spent fuel pool water level to be > 23 ft above the top of irradiated fuel assemblies seated in the storage racks. However, the GTS 3.7.5 Applicability is not consistent with this requirement, in that the Applicability states “At all times.” This implies that when there is no fuel or only new fuel in the spent fuel pool, the LCO is applicable. Since the GTS 3.7.5 LCO statement references irradiated fuel assemblies, if there are no irradiated fuel assemblies in the spent fuel pool, then the LCO is not applicable. For clarity and consistency, the Applicability is changed to be consistent with the actual LCO requirement; “When irradiated fuel assemblies are stored in the spent fuel pool.”

DOC L05 eliminates GTS LCO 3.0.8. In conjunction with the change to eliminate LCO 3.0.8, all Notes and references are no longer necessary and are administratively eliminated. The elimination of GTS LCO 3.0.8 is discussed in detail in GTS O01-LCO 3.0.

The remaining changes are editorial, clarifying, grammatical, or otherwise considered administrative. These changes do not affect the technical content, but improve the readability, implementation, and understanding of the requirements, and are therefore acceptable.

Having found that this GTST’s proposed changes to the GTS and Bases are acceptable, the NRC staff concludes that AP1000 STS Subsection 3.7.5 is an acceptable model Specification for the AP1000 standard reactor design.

References to Previous NRC Safety Evaluation Reports (SERs):

None

VIII. Review Information

Evaluator Comments:

None

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Review Information:

Availability for public review and comment on Revision 0 of this traveler approved by NRC staff on 5/19/2014.

APOG Comments (Ref. 7) and Resolutions:

1. (Internal # 3) Throughout the Bases, references to Sections and Chapters of the FSAR do not include the “FSAR” clarifier. Since these Section and Chapter references are to an external document, it is appropriate (DOC A003) to include the “FSAR” modifier. This is resolved by adding the FSAR modifier as appropriate.

2. (Internal # 6) The GTST sections often repeat VEGP LAR DOCs, which reference “existing” and “current” requirements. The inclusion in the GTST of references to “existing” and “current,” are not always valid in the context of the GTS. Each occurrence of “existing” and “current” should be revised to be clear and specific to GTS, MTS, or VEGP COL TS (or other), as appropriate. Noted ambiguities are corrected in the GTST body.

3. (Internal # 7) Section VII, GTST Safety Evaluation, inconsistently completes the subsection “References to Previous NRC Safety Evaluation Reports (SERs)” by citing the associated SE for VEGP 3&4 COL Amendment 13. It is not clear whether there is a substantive intended difference when omitting the SE citation. This is resolved by removing the SE citation in Section VII of the GTST and ensuring that appropriate references to the consistent citation of this reference in Section X of the GTST are made.

4. (Internal #13) Many GTSTs evaluated TSTF-425 with the following note: Risk-informed TS changes will be considered at a later time for application to the AP1000 STS.

   The NRC approval of TSTF-425, and model safety evaluation provided in the CLIIP for TSTF-425, are generically applicable to any design’s Technical Specifications. As such, the replacement of certain Frequencies with a Surveillance Frequency Control Program should be included in the GTST for AP1000 STS NUREG.

   However, implementation in the AP1000 STS should not reflect optional (i.e., bracketed) material showing retention of fixed Surveillance Frequencies where relocation to a Surveillance Frequency Control Program is acceptable. Since each represented AP1000 Utility is committed to maintaining standardization, there is no rationale for an AP1000 STS that includes bracketed options.

Consistent with TSTF-425 criteria, replace applicable Surveillance Frequencies with "In accordance with the Surveillance Frequency control Program" and add that Program as new AP1000 STS Specification 5.5.15.

NRC Staff disagreed with implementing TSTF-425 in the initial version of the STS. Although the APOG thinks the analysis supporting this traveler is general enough to be applicable to AP1000, staff thinks an AP1000-specific proposal from APOG is needed to identify any GTS SRs that should be excluded. Also, with the adoption of a Surveillance Frequency Control Program (SFCP) in the AP1000 STS, bracketed Frequencies, which provide a choice between the GTS Frequency and the SFCP Frequency, are needed because the NRC will use the AP1000 STS as a reference, and to be consistent with NUREG-1431, Rev. 4. APOG was requested to consider proposing an AP1000 version of TSTF-425 for a subsequent revision of the STS.

5. (Internal # 411) For the spent fuel pool cooling system, which does not have requirements for TS operability, TS 3.7.5 Bases discussion of "inoperable" are replaced with "unavailable" to align with discussions in TS 3.7.9 Bases. There is no change in intent in providing consistent reference to system status. In the first paragraph of the "Background" section of the Bases, revise the third sentence as follows:

   > The water also provides shielding during the movement of spent fuel, and a large capacity heat sink in the event the spent fuel pool cooling system is ~~inoperable~~**unavailable**.

   This is resolved by making the recommended change.

6. (Internal # 412) For the spent fuel pool cooling system, which does not have requirements for TS operability, TS 3.7.5 Bases discussion of "inoperable" are replaced with "unavailable" to align with discussions in TS 3.7.9 Bases. There is no change in intent in providing consistent reference to system status. Revise the third paragraph of the "ASA" section of the Bases as follows:

   > In addition to mitigation of the effects of a fuel handling accident, the required minimum water level in the spent fuel pool provides a large capacity heat sink for spent fuel pool cooling in the event the spent fuel pool cooling system is ~~inoperable~~**unavailable**.

   This is resolved by making the recommended change.

7. (Internal # 413) In the "Actions" section of the Bases, under the heading "A.1," revise the first sentence of the first paragraph as follows:

   > When the initial conditions ~~for prevention of an~~**assumed in** accident **analyses** cannot be met, steps should be taken to preclude the accident from occurring.

   This non-technical change provides improved clarity, consistency, and operator usability. This is resolved by making the recommended change.

NRC Final Approval Date: 12/8/2015

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IX. Evaluator Comments for Consideration in Finalizing Technical Specifications and Bases

None

X. References Used in GTST

1. AP1000 DCD, Revision 19, Section 16, “Technical Specifications,” June 2011 (ML11171A500).

2. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Technical Specifications Upgrade License Amendment Request, February 24, 2011 (ML12065A057).

3. NRC Safety Evaluation (SE) for Amendment No. 13 to Combined License (COL) No. NPF-91 for Vogtle Electric Generating Plant (VEGP) Unit 3, and Amendment No. 13 to COL No. NPF-92 for VEGP Unit 4, September 9, 2013, ADAMS Package Accession No. ML13238A337, which contains:

ML13238A355	Cover Letter - Issuance of License Amendment No. 13 for Vogtle Units 3 and 4 (LAR 12-002).
ML13238A359	Enclosure 1 - Amendment No. 13 to COL No. NPF-91
ML13239A256	Enclosure 2 - Amendment No. 13 to COL No. NPF-92
ML13239A284	Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13)
ML13239A287	Enclosure 4 - Safety Evaluation (SE), and Attachment 1 - Acronyms
ML13239A288	SE Attachment 2 - Table A - Administrative Changes
ML13239A319	SE Attachment 3 - Table M - More Restrictive Changes
ML13239A333	SE Attachment 4 - Table R - Relocated Specifications
ML13239A331	SE Attachment 5 - Table D - Detail Removed Changes
ML13239A316	SE Attachment 6 - Table L - Less Restrictive Changes

   The following documents were subsequently issued to correct an administrative error in Enclosure 3:

ML13277A616	Letter - Correction To The Attachment (Replacement Pages) - Vogtle Electric Generating Plant Units 3 and 4-Issuance of Amendment Re: Technical Specifications Upgrade (LAR 12-002) (TAC No. RP9402)
ML13277A637	Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13) (corrected)

4. TSTF-GG-05-01, “Writer's Guide for Plant-Specific Improved Technical Specifications,” June 2005.

5. RAI Letter No. 01 Related to License Amendment Request (LAR) 12-002 for the Vogtle Electric Generating Plant Units 3 and 4 Combined Licenses, September 7, 2012 (ML12251A355).

6. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Response to Request for Additional Information Letter No. 01 Related to License Amendment Request LAR-12-002, ND-12-2015, October 04, 2012 (ML12286A363 and ML12286A360)

7. APOG-2014-008, APOG (AP1000 Utilities) Comments on AP1000 Standardized Technical Specifications (STS) Generic Technical Specification Travelers (GTSTs), Docket ID NRC-2014-0147, September 22, 2014 (ML14265A493).

XI. MARKUP of the Applicable GTS Subsection for Preparation of the STS NUREG

The entire section of the Specifications and the Bases associated with this GTST is presented next.

Changes to the Specifications and Bases are denoted as follows: Deleted portions are marked in strikethrough red font, and inserted portions in bold blue font.

3.7 PLANT SYSTEMS

3.7.5 Spent Fuel Pool Water Level

LCO 3.7.5 The spent fuel pool water level shall be ≥ 23 ft above the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: **When irradiated fuel assemblies are stored in the spent fuel pool** ~~At all times~~.

ACTIONS

----------NOTE----------
LCO~~s~~ 3.0.3 **is** ~~and 3.0.8 are~~ not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spent fuel pool water level < 23 ft.	A.1 Suspend movement of irradiated fuel assemblies in the spent fuel pool. AND A.2 Initiate action to restore water level to ≥ 23 ft.	Immediately 1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify the spent fuel pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	7 days

B 3.7 PLANT SYSTEMS

B 3.7.5 Spent Fuel Pool Water Level

BASES

BACKGROUND

The minimum water level in the spent fuel pool meets the assumptions of iodine decontamination factors following a fuel handling accident. The specified water level shields and minimizes the general area dose when the storage racks are at their maximum capacity. The water also provides shielding during the movement of spent fuel, and a large capacity heat sink in the event the spent fuel pool cooling system is **unavailable** ~~inoperable~~.

A general description of the spent fuel pool design is given in **FSAR** Section 9.1.2 (Ref. 1). A description of the Spent Fuel Pool Cooling System is given in **FSAR** Section 9.1.3 (Ref. 2). The assumptions of the fuel handling accident are given in **FSAR** Section 15.7.4 (Ref. 3).

APPLICABLE SAFETY ANALYSES

The minimum water level in the spent fuel pool meets the assumptions of the fuel handling accident described in Regulatory Guide 1.183 (Ref. 4). The design basis radiological consequences resulting from a postulated fuel handling accident are within the dose values provided in **FSAR** Section 15.7.4 (Ref. 3).

According to Reference 3 there is 23 ft of water between the damaged fuel bundle and the fuel pool surface during a fuel handling accident. In the case of a single bundle dropped and lying horizontally on top of the spent fuel racks, however, there may be < 23 ft of water above the top of the fuel bundle and the surface, indicated by the width of the bundle. This slight reduction in water depth does not adversely affect the margin of conservatism associated with the assumed pool scrubbing factor of 500 for elemental iodine.

In addition to mitigation of the effects of a fuel handling accident, the required minimum water level in the spent fuel pool provides a large capacity heat sink for spent fuel pool cooling in the event the spent fuel pool cooling system is **unavailable** ~~inoperable~~.

The Spent Fuel Pool Water Level satisfies Criteria 2 and 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

The spent fuel pool water level is required to be ≥ 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 (Ref. 3) and loss of spent fuel pool cooling. As such, it is the minimum required for fuel storage and movement within the spent fuel pool.

APPLICABILITY

This LCO applies when irradiated fuel assemblies are stored in the spent fuel pool. Irradiated fuel assemblies generate decay heat and cooling of the irradiated fuel assemblies would be negatively impacted by the loss of spent fuel pool cooling. ~~This LCO applies at all times since the loss of spent fuel pool cooling is not MODE dependent.~~

ACTIONS

LCO 3.0.3 is applicable while in MODE 1, 2, 3, or 4. Since spent fuel pool cooling requirements **apply when irradiated fuel assemblies are stored in the spent fuel pool** ~~apply at all times~~, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. Spent fuel pool cooling requirements are independent of reactor operations. Entering LCO 3.0.3 while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

~~LCO 3.0.8 is applicable while in MODE 5 or 6. Since spent fuel pool cooling requirements apply at all times, the ACTIONS have been modified by a Note stating that LCO 3.0.8 is not applicable. Spent fuel pool cooling requirements are independent of shutdown reactor operations. Entering LCO 3.0.8 while in MODE 5 or 6 would require the optimization of plant safety, unnecessarily.~~

A.1

When the initial conditions **assumed in** ~~for prevention of an~~ accident **analyses** cannot be met, steps should be taken to preclude the accident from occurring. When the spent fuel pool water level is lower than the required level, the movement of irradiated fuel assemblies shall be suspended. This action effectively precludes the occurrence of a fuel handling accident. This does not preclude movement of a fuel assembly to a safe position.

BASES

ACTIONS (continued)

If moving irradiated fuel assemblies while in MODE 4, 5, or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2 and 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not a sufficient reason to require a reactor shutdown.

A.2

If the water level in the spent fuel pool is < 23 ft, the heat capacity of the spent fuel pool will be less than that assumed in the event of a loss of spent fuel pool cooling. In this case, action must be initiated within 1 hour to restore the water level in the spent fuel pool to ≥ 23 ft above the top of the irradiated fuel assemblies. Initiation of this action requires that the action be continued until a water level of ≥ 23 ft is attained.

The Completion Time of 1 hour assures prompt action to compensate for a degraded condition.

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

This SR verifies sufficient spent fuel pool water is available in the event of a fuel handling accident or loss of spent fuel pool cooling. The water level in the spent fuel pool must be checked periodically. The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by plant procedures and are acceptable based on operating experience.

During refueling operations, the level in the spent fuel pool is in equilibrium with the refueling canal, and the level in the refueling canal is checked daily in accordance with SR 3.9.4.1.

REFERENCES

1. **FSAR** Section 9.1.2, “Spent Fuel Storage.”

2. **FSAR** Section 9.1.3, “Spent Fuel Pool Cooling System.”

3. **FSAR** Section 15.7.4, “Fuel Handling Accident.”

4. Regulatory Guide 1.183 Rev. 0, “Alternate Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors.”

XII. Applicable STS Subsection After Incorporation of this GTST's Modifications

The entire subsection of the Specifications and the Bases associated with this GTST, following incorporation of the modifications, is presented next.

3.7 PLANT SYSTEMS

3.7.5 Spent Fuel Pool Water Level

LCO 3.7.5 The spent fuel pool water level shall be ≥ 23 ft above the top of irradiated fuel assemblies seated in the storage racks.

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

ACTIONS

----------NOTE----------
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spent fuel pool water level < 23 ft.	A.1 Suspend movement of irradiated fuel assemblies in the spent fuel pool. AND A.2 Initiate action to restore water level to ≥ 23 ft.	Immediately 1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify the spent fuel pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	7 days

B 3.7 PLANT SYSTEMS

B 3.7.5 Spent Fuel Pool Water Level

BASES

BACKGROUND

The minimum water level in the spent fuel pool meets the assumptions of iodine decontamination factors following a fuel handling accident. The specified water level shields and minimizes the general area dose when the storage racks are at their maximum capacity. The water also provides shielding during the movement of spent fuel, and a large capacity heat sink in the event the spent fuel pool cooling system is unavailable.

A general description of the spent fuel pool design is given in FSAR Section 9.1.2 (Ref. 1). A description of the Spent Fuel Pool Cooling System is given in FSAR Section 9.1.3 (Ref. 2). The assumptions of the fuel handling accident are given in FSAR Section 15.7.4 (Ref. 3).

APPLICABLE SAFETY ANALYSES

The minimum water level in the spent fuel pool meets the assumptions of the fuel handling accident described in Regulatory Guide 1.183 (Ref. 4). The design basis radiological consequences resulting from a postulated fuel handling accident are within the dose values provided in FSAR Section 15.7.4 (Ref. 3).

According to Reference 3 there is 23 ft of water between the damaged fuel bundle and the fuel pool surface during a fuel handling accident. In the case of a single bundle dropped and lying horizontally on top of the spent fuel racks, however, there may be < 23 ft of water above the top of the fuel bundle and the surface, indicated by the width of the bundle. This slight reduction in water depth does not adversely affect the margin of conservatism associated with the assumed pool scrubbing factor of 500 for elemental iodine.

In addition to mitigation of the effects of a fuel handling accident, the required minimum water level in the spent fuel pool provides a large capacity heat sink for spent fuel pool cooling in the event the spent fuel pool cooling system is unavailable.

The Spent Fuel Pool Water Level satisfies Criteria 2 and 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

The spent fuel pool water level is required to be ≥ 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 (Ref. 3) and loss of spent fuel pool cooling. As such, it is the minimum required for fuel storage and movement within the spent fuel pool.

APPLICABILITY

This LCO applies when irradiated fuel assemblies are stored in the spent fuel pool. Irradiated fuel assemblies generate decay heat and cooling of the irradiated fuel assemblies would be negatively impacted by the loss of spent fuel pool cooling.

ACTIONS

LCO 3.0.3 is applicable while in MODE 1, 2, 3, or 4. Since spent fuel pool cooling requirements apply when irradiated fuel assemblies are stored in the spent fuel pool, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. Spent fuel pool cooling requirements are independent of reactor operations. Entering LCO 3.0.3 while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

A.1

When the initial conditions assumed in accident analyses cannot be met, steps should be taken to preclude the accident from occurring. When the spent fuel pool water level is lower than the required level, the movement of irradiated fuel assemblies shall be suspended. This action effectively precludes the occurrence of a fuel handling accident. This does not preclude movement of a fuel assembly to a safe position.

If moving irradiated fuel assemblies while in MODE 4, 5, or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2 and 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not a sufficient reason to require a reactor shutdown.

BASES

ACTIONS (continued)

A.2

If the water level in the spent fuel pool is < 23 ft, the heat capacity of the spent fuel pool will be less than that assumed in the event of a loss of spent fuel pool cooling. In this case, action must be initiated within 1 hour to restore the water level in the spent fuel pool to ≥ 23 ft above the top of the irradiated fuel assemblies. Initiation of this action requires that the action be continued until a water level of ≥ 23 ft is attained.

The Completion Time of 1 hour assures prompt action to compensate for a degraded condition.

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

This SR verifies sufficient spent fuel pool water is available in the event of a fuel handling accident or loss of spent fuel pool cooling. The water level in the spent fuel pool must be checked periodically. The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by plant procedures and are acceptable based on operating experience.

During refueling operations, the level in the spent fuel pool is in equilibrium with the refueling canal, and the level in the refueling canal is checked daily in accordance with SR 3.9.4.1.

REFERENCES

1. FSAR Section 9.1.2, “Spent Fuel Storage.”
2. FSAR Section 9.1.3, “Spent Fuel Pool Cooling System.”
3. FSAR Section 15.7.4, “Fuel Handling Accident.”
4. Regulatory Guide 1.183 Rev. 0, “Alternate Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors.”