

September 14, 2017

Docket No. 52-048

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

**SUBJECT:** NuScale Power, LLC Response to NRC Request for Additional Information No. 157 (eRAI No. 9033) on the NuScale Design Certification Application

**REFERENCE:** U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 157 (eRAI No. 9033)," dated August 08, 2017

The purpose of this letter is to provide the NuScale Power, LLC (NuScale) response to the referenced NRC Request for Additional Information (RAI).

The Enclosure to this letter contains NuScale's response to the following RAI Questions from NRC eRAI No. 9033:

- 16-7
- 16-8
- 16-9
- 16-10
- 16-11
- 16-12
- 16-13
- 16-14
- 16-15

This letter and the enclosed response make no new regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions on this response, please contact Steven Mirsky at 240-833-3001 or at [smirsky@nuscalepower.com](mailto:smirsky@nuscalepower.com)



Sincerely,

A handwritten signature in black ink, appearing to read "Zackary W. Rad", written over a horizontal line.

Zackary W. Rad  
Director, Regulatory Affairs  
NuScale Power, LLC

Distribution: Gregory Cranston, NRC, OWFN-8G9A  
Samuel Lee, NRC, OWFN-8G9A  
Anthony Markley, NRC, OWFN-8G9A

Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 9033



RAIO-0917-55987

**Enclosure 1:**

NuScale Response to NRC Request for Additional Information eRAI No. 9033

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## **Response to Request for Additional Information Docket No. 52-048**

**eRAI No.:** 9033

**Date of RAI Issue:** 08/08/2017

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**NRC Question No.:** 16-7

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a.

10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility. The model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

- NUREG-1431, “STS Westinghouse Plants,” Revision 4 (ADAMS Accession Nos. ML12100A222 and ML12100A228)
- NUREG-1432, “STS Combustion Engineering Plants,” Revision 4 (ADAMS Accession Nos. ML12102A165 and ML12102A169)
- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.

The LCO 3.0.3 shutdown sequence is:

... Action shall be initiated within 1 hour to place the MODULE, as applicable, in:

- a. MODE 2 within 7 hours; and
- b. MODE 3 and PASSIVELY COOLED within 37 hours.

While this closely follows the typical shutdown sequence in the STS LCO 3.0.3 for pressurized

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water reactors (PWRs), the completion times of 7 hours to be in MODE 2, and 37 hours to be in MODE 3 and PASSIVELY COOLED, appear to match the Completion Times of the STS, but without justification. The PWR STS shutdown sequence is:

... Action shall be initiated within 1 hour to place the unit, as applicable, in:

- a. MODE 3 within 7 hours; and
- b. MODE 4 within 13 hours; and
- c. MODE 5 within 37 hours.

The applicant is requested to update the application by providing the reasons the proposed shutdown sequence Completion Times are appropriate.

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#### **NuScale Response:**

Completion Times in the proposed NuScale Generic Technical Specifications are based on

- the details of the plant design,
- table-top consideration of the operational processes required to perform the associated evolutions, and
- staff operating experience in legacy nuclear power plants.

Additionally, consideration of the relative significance of function and availability of alternative means to satisfy function, and industry standard times contributed to the determination of Completion Times.

NuScale is modifying LCO 3.0.3 Bases by adding a paragraph describing the reasons the shutdown sequence Completion Times are appropriate as follows:

*“The Completion Times are established considering the limited likelihood of a design basis event during the 37 hours allowed to reach MODE 3 and be PASSIVELY COOLED. They also provide adequate time to permit evaluation of conditions and restoration of OPERABILITY without unnecessarily challenging plant systems during a shutdown. Analysis shows that 37 hours from entry into 3.0.3 is a reasonable time to reach MODE 3 and be PASSIVELY COOLED using normal plant systems and procedures.”*

The Bases for LCO 3.0.3 are being modified as described above.

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**Impact on DCA:**

The Technical Specifications have been revised as described in the response above and as shown in the markup provided in this response.

## BASES

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### LCO 3.0.3 (continued)

- c. A Condition exists for which the Required Actions have now been performed, or
- d. ACTIONS exist that do not have expired Completion Times. These Completion Times are applicable from the point in time that the Condition was initially entered and not from the time LCO 3.0.3 is exited.

The time limits of LCO 3.0.3 allow 37 hours for the unitMODULE to be in MODE 3 and PASSIVELY COOLED when a shutdown is required during MODE 1 operation. If the unitMODULE is in MODE 2 when a shutdown is required, the time limit for entering MODE 3 and PASSIVE COOLING applies. If MODE 2 is entered in less time than allowed, however, the total allowable time to enter MODE 3 and be PASSIVELY COOLED is not reduced. For example, if MODE 2 is entered in 2 hours, then the time allowed for entering MODE 3 and to establish PASSIVE COOLING is the next 35 hours, because the total time for entering MODE 3 and to be PASSIVELY COOLED is not reduced from the allowable limit of 37 hours. Therefore, if remedial measures are completed that would permit a return to MODE 1, a penalty is not incurred by having to enterreach a lower MODE of operation in less than the total time allowed.

The Completion Times are established considering the limited likelihood of a design basis event during the 37 hours allowed to enter MODE 3 and be PASSIVELY COOLED. They also provide adequate time to permit evaluation of conditions and restoration of OPERABILITY without unnecessarily challenging plant systems during a shutdown. Analysis shows that 37 hours from entry into 3.0.3 is a reasonable time to enter MODE 3 and be PASSIVELY COOLED using normal plant systems and procedures.

In MODES 1, 2, and MODE 3 when not PASSIVELY COOLED, LCO 3.0.3 provides actions for Conditions not covered in other Specifications. The requirements of LCO 3.0.3 do not apply in MODE 3 when PASSIVELY COOLED, and MODES 4 and 5 because the unitMODULE is already in the most restrictive condition required by LCO 3.0.3. The requirements of LCO 3.0.3 do not apply in other specified conditions of the Applicability (unless in MODE 1, 2, or MODE 3 when not PASSIVELY COOLED) because the ACTIONS of individual Specifications sufficiently define the remedial measures to be taken.

Exceptions to 3.0.3 are provided in instances where requiring a unitMODULE shutdown in accordance with LCO 3.0.3, would not

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## **Response to Request for Additional Information Docket No. 52-048**

**eRAI No.:** 9033

**Date of RAI Issue:** 08/08/2017

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**NRC Question No.:** 16-8

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility. The model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

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- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.

Proposed LCO 3.0.8 establishes conditions under which systems described in the technical specifications are considered to remain OPERABLE when required barriers are not capable of providing their related support function(s). Including this risk informed technical specification initiative in the generic technical specifications requires the applicant to have completed and submitted a bounding risk assessment for the NuScale design that is consistent with the bounding generic risk assessment provided in TSTF-427, “Allowance for Non-Technical Specification Barrier Degradation on Supported System OPERABILITY.” The applicant is requested to provide such a bounding risk assessment in support of proposed LCO 3.0.8 as part of the application.



**NuScale Response:**

This response addresses the issues presented in RAIs 16-8, 16-11, and 16-13 due to their inter-relationships.

16-11, Sub-issue 1

The requested paragraph break has been inserted into the LCO 3.0.4 Bases as shown below.

16-8

NuScale is modifying LCO 3.0.8 and associated Bases, and adding a Reviewers Note that requires a COL applicant who wants to adopt LCO 3.0.8 to perform or reference a risk assessment for the NuScale design that has been submitted to the NRC that was prepared consistent with the bounding generic risk assessment provided in TSTF-427, "Allowance for Non Technical Specification Barrier Degradation on Supported System OPERABILITY," Revision 2-A.

16-11, Sub-issues 2 and 316-13

With regard to these comments and as described in Federal Register 77 FR 70846, Regulatory Guide 1.182 was withdrawn from use in November 2012. The notice there includes a description of the revised version of Regulatory Guide 1.160

*...to include the guidance in RG 1.182 on acceptable methods to meet the provision of 10 CFR 50.65(a)(4) associated with managing and assessing risk. RG 1.160 Rev. 3 was issued on May 21, 2012 (77 FR 30030). Therefore, RG 1.182 is no longer needed, as the guidance in Regulatory Guide 1.182 is already contained in Regulatory Guide 1.160.*

Table 1.9-2, "Conformance with Regulatory Guides," of the FSAR describes Conformance with RG 1.160, Revision 3 as "the responsibility of the COL applicant" and refers to Section 17.6 of the FSAR. FSAR Section 17.6, "Maintenance Rule" provides COL Item 17.6-1 that states

*A COL applicant that references the NuScale Power Plant design certification will describe the program for monitoring the effectiveness of maintenance required by 10 CFR 50.65.*

As described in this COL item, an applicant referring to the NuScale DCA will be required to address conformance with the requirements of the 10 CFR 50.65. At this time the NRC-specified acceptable method for meeting the applicable provisions is that described in



RG 1.160, Revision 3. NuScale believes no changes to these references are appropriate.

Furthermore, the requested first Reviewers Note to commit to the guidance in NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 3 is inappropriate and no longer needed. The NRC endorsed the guidance in Revision 4A of NUMARC 93-01 in Revision 3 of RG 1.160. The Bases include reference to NUMARC 93-01 and the endorsing regulatory guidance. Therefore NuScale does not believe this portion of the Reviewers Note is required.

The second portion of the proposed Reviewers Note requests a commitment be added

*...to the guidance of NEI 04-08, "Allowance for Non Technical Specification Barrier Degradation on Supported System OPERABILITY (TSTF-427) Industry Implementation Guidance," March 2006.*

This Reviewers Note has been added to the bracketed Bases as shown below.

Additionally the Reviewer's Note immediately before the bulleted list in TSTF-427, Revision 2 related to expanding the initiating event categories has been added to the bracketed Bases for LCO 3.0.8.

**Impact on DCA:**

The Technical Specifications have been revised as described in the response above and as shown in the markup provided in this response.

3.0 LCO APPLICABILITY

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LCO 3.0.7 Test Exception LCO 3.1.8 allows specified Technical Specification (TS) requirements to be changed to permit performance of special tests and operations. Unless otherwise specified, all other TS requirements remain unchanged. Compliance with Test Exception LCOs is optional. When a Test Exception LCO is desired to be met but is not met, the ACTIONS of the Test Exception LCO shall be met. When a Test Exception LCO is not desired to be met, entry into a MODE or other specified condition in the Applicability shall be made in accordance with the other applicable Specifications.

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[----- REVIEWER'S NOTE -----]  
A COL applicant who wants to adopt LCO 3.0.8 must perform or reference a risk assessment for the NuScale design that has been submitted to the NRC, and that was prepared consistent with the bounding generic risk assessment provided in TSTF-427, "Allowance for Non-Technical Specification Barrier Degradation on Supported System OPERABILITY," Revision 2-A.  
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[LCO 3.0.8 When one or more required barriers are unable to perform their related support function(s), any supported system LCO(s) are not required to be declared not met solely for this reason for up to 30 days provided that at least one train or subsystem of the supported system is OPERABLE and supported by barriers capable of providing their related support function(s), and risk is assessed and managed. This Specification may be concurrently applied to more than one train or subsystem of a multiple train or subsystem supported system provided at least one train or subsystem of the supported system is OPERABLE and the barriers supporting each of these trains or subsystems provide their related support function(s) for different categories of initiating events.

If the required OPERABLE train or subsystem becomes inoperable while this Specification is in use, it must be restored to OPERABLE status within 24 hours or the provisions of this Specification cannot be applied to the trains or subsystems supported by the barriers that cannot perform their related support function(s).

At the end of the specified period, the required barriers must be able to perform their related support function(s) or the supported system LCO(s) shall be declared not met.]

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## LCO 3.0.4 (continued)

For example, LCO 3.0.4.a may be used when the Required Action to be entered states that an inoperable instrument channel must be placed in the tripped condition within the Completion Time. Transition into a MODE or other specified condition in the Applicability may be made in accordance with LCO 3.0.4 and the channel is subsequently placed in the tripped condition within the Completion Time, which begins when the Applicability is entered. If the instrument channel cannot be placed in the tripped condition and the subsequent default ACTION ("Required Action and associated Completion Time not met") allows the OPERABLE train to be placed in operation, use of LCO 3.0.4.a is acceptable because the subsequent ACTIONS to be entered following entry into the MODE include ACTIONS (place the OPERABLE train in operation) that permit safe ~~unit~~plant operation for an unlimited period of time in the MODE or other specified condition to be entered.

LCO 3.0.4.b allows entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate.

The risk assessment may use quantitative, qualitative, or blended approaches, and the risk assessment will be conducted using the plant program, procedures, and criteria in place to implement 10 CFR 50.65(a)(4), which requires that risk impacts of maintenance activities to be assessed and managed. The risk assessment, for the purposes of LCO 3.0.4.b, must take into account all inoperable Technical Specification equipment regardless of whether the equipment is included in the normal 10 CFR 50.65(a)(4) risk assessment scope. The risk assessments will be conducted using the procedures and guidance endorsed by Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 3. Regulatory Guide 1.160 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." These documents address general guidance for conduct of the risk assessment, quantitative and qualitative guidelines for establishing risk management actions, and example risk management actions. These include actions to plan and conduct other activities in a manner that controls overall risk, increased risk awareness by shift and management personnel, actions to reduce the duration of the condition, actions to minimize the magnitude of risk increases (establishment of backup success paths or compensatory measures), and determination that the proposed MODE or other specified condition change is acceptable. Consideration should also be

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LCO 3.0.6 (continued)

(e.g., loss of automatic actuation capability due to inoperable instrumentation) the appropriate LCO is the LCO for the support system.

The ACTIONS for a support system LCO adequately address the inoperabilities of that system without reliance on entering its supported system LCO. When the loss of function is the result of multiple support systems, the appropriate LCO is the LCO for the supported system.

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LCO 3.0.7

There are certain special tests and operations required to be performed at various times over the life of the unitMODULE. These special tests and operations are necessary to demonstrate select unitMODULE performance characteristics, to perform special maintenance activities, and to perform special evolutions. Test Exception LCO 3.1.8 allows specified Technical Specification (TS) requirements to be changed to permit performance of these special tests and operations, which otherwise could not be performed if required to comply with the requirements of these TS. Unless otherwise specified, all the other TS requirements remain unchanged. This will ensure all appropriate requirements of the MODE or other specified condition not directly associated with or required to be changed to perform the special test or operation will remain in effect.

The Applicability of a Test Exception LCO represents a condition not necessarily in compliance with the normal requirements of the TS. Compliance with Test Exception LCOs is optional. A special operation may be performed either under the provisions of the appropriate Test Exception LCO or under the other applicable TS requirements. If it is desired to perform the special operation under the provisions of the Test Exception LCO, the requirements of the Test Exception LCO shall be followed.

[ -----REVIEWER'S NOTE -----  
A COL applicant who wants to adopt LCO 3.0.8 must perform or  
reference a risk assessment for the NuScale design that has been  
submitted to the NRC, and that was prepared consistent with the  
bounding generic risk assessment provided in TSTF-427, "Allowance for  
Non-Technical Specification Barrier Degradation on Supported System  
OPERABILITY," Revision 2-A.  
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LCO 3.0.8

LCO 3.0.8 establishes conditions under which systems described in the Technical Specifications are considered to remain OPERABLE when required barriers are not capable of providing their related support function(s).

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### LCO 3.0.8 (continued)

Barriers are doors, walls, floor plugs, curbs, hatches, installed structures or components, or other devices, not explicitly described in Technical Specifications that support the performance of the safety function of systems described in the Technical Specifications. This LCO states that the supported system is not considered to be inoperable solely due to required barriers not capable of performing their related support function(s) under the described conditions. LCO 3.0.8 allows 30 days before declaring the supported system(s) inoperable and the LCO(s) associated with the supported system(s) not met. A maximum time is placed on each use of this allowance to ensure that as required barriers are found or are otherwise made unavailable, they are restored.

However, the allowable duration may be less than the specified maximum time based on the risk assessment.

If the allowed time expires and the barriers are unable to perform their related support function(s), the supported system's LCO(s) must be declared not met and the Conditions and Required Actions entered in accordance with LCO 3.0.2.

This provision does not apply to barriers which support ventilation systems or to fire barriers. Ventilation system barriers and fire barriers are addressed by other regulatory requirements and associated plant programs. This provision does not apply to barriers which are not required to support system OPERABILITY (see NRC Regulatory Issue Summary 2001-09, "Control of Hazard Barriers," dated April 2, 2001).

The provisions of LCO 3.0.8 are justified because of the low risk associated with required barriers not being capable of performing their related support function. This provision is based on consideration of the following initiating event categories:

[----- REVIEWER'S NOTE -----  
LCO 3.0.8 may be expanded to other initiating event categories provided plant-specific analysis demonstrates that the frequency of the additional initiating events is bounded by the generic analysis or if plant-specific approval is obtained from the NRC.  
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- Loss of coolant accidents;
- High energy line breaks;
- Feedwater line breaks;

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LCO 3.0.8 (continued)

- Internal flooding;
- External flooding;
- Turbine missile ejection; and
- Tornado or high wind.

The risk impact of the barriers which cannot perform their related support function(s) must be addressed pursuant to the risk assessment and management provision of the Maintenance Rule, 10 CFR 50.65 (a)(4), and the associated implementation guidance, Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 3. Regulatory Guide 1.160 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

This guidance provides for the consideration of dynamic plant configuration issues, emergent conditions, and other aspects pertinent to plant operation with the barriers unable to perform their related support function(s). These considerations may result in risk management and other compensatory actions being required during the period that barriers are unable to perform their related support function(s).

[ -----REVIEWER'S NOTE -----  
Adoption of LCO 3.0.8 requires the licensee to make the following  
commitment:  
  
[LICENSEE] commits to the guidance of NEI 04-08, "Allowance for Non  
Technical Specification Barrier Degradation on Supported System  
OPERABILITY (TSTF-427) Industry Implementation Guidance," March  
2006.  
-----]

LCO 3.0.8 may be applied to one or more trains or subsystems of a system supported by barriers that cannot provide their related support function(s), provided that risk is assessed and managed (including consideration of the effects on Large Early Release and from external events). If applied concurrently to more than one train or subsystem of a multiple train or subsystem supported system, the barriers supporting each of these trains or subsystems must provide their related support function(s) for different categories of initiating events. For example, LCO 3.0.8 may be applied for up to 30 days for more than one train of a multiple train supported system if the affected barrier for one train

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### LCO 3.0.8 (continued)

protects against internal flooding and the affected barrier for the other train protects against tornado missiles. In this example, the affected barrier may be the same physical barrier but serve different protection functions for each train.

If during the time that LCO 3.0.8 is being used, the required OPERABLE train or subsystem becomes inoperable, it must be restored to OPERABLE status within 24 hours. Otherwise, the train(s) or subsystem(s) supported by barriers that cannot perform their related support function(s) must be declared inoperable and the associated LCOs declared not met. This 24 hour period provides time to respond to emergent conditions that would otherwise likely lead to entry into LCO 3.0.3 and a rapid unitplant shutdown, which is not justified given the low probability of an initiating event which would require the barrier(s) not capable of performing their related support function(s). During this 24 hour period, the unitplant risk associated with the existing conditions is assessed and managed in accordance with 10 CFR 50.65(a)(4).]

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## Response to Request for Additional Information Docket No. 52-048

**eRAI No.:** 9033

**Date of RAI Issue:** 08/08/2017

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### **NRC Question No.:** 16-9

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility. The model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

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- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.

In the Bases for proposed LCO 3.0.2, the fifth and sixth paragraphs should be combined, as presented in the markup of NUREG-1431 in TSTF-529-A, “Clarify Use and Application Rules,” Revision 4, dated February 29, 2016 (ADAMS Accession No. ML16060A455).

In addition, the staff considers the proposed sentence “Alternatives that would not result in redundant equipment being inoperable should be used instead,” to be less clear than the STS sentence it replaced, that says, “Additionally, if intentional entry into ACTIONS would result in redundant equipment being inoperable, alternatives should be used instead.” Therefore, with suggested changes indicated by markup to match TSTF-529, the fourth, fifth, and sixth paragraphs should say:



*Fourth paragraph (no change):*

The nature of some Required Actions of some Conditions necessitates that, once the Condition is entered, the Required Actions must be completed even though the associated Conditions no longer exist. The individual LCO's ACTIONS specify the Required Actions where this is the case. An example of this is in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits."

*Fifth and sixth paragraphs combined:*

The Completion Times of the Required Actions are also applicable when a system or component is removed from service intentionally. The reasons for intentionally relying on the ACTIONS include, but are not limited to, performance of Surveillances, preventive maintenance, corrective maintenance, or investigation of operational problems.

[Remove paragraph break.]

Entering ACTIONS for these reasons must be done in a manner that does not compromise safety. Intentional entry into ACTIONS should not be made for operational convenience. Additionally, Alternatives that would not if intentional entry into ACTIONS would result in redundant equipment being inoperable, alternatives should be used instead. Doing so limits the time both subsystems/trains of a safety function are inoperable and limits the time conditions exist which may result in LCO 3.0.3 being entered. Individual Specifications may specify a time limit for performing an SR when equipment is removed from service or bypassed for testing. In this case, the Completion Times of the

Required Actions are applicable when this time limit expires, if the equipment remains removed from service or bypassed.

The applicant is requested to revise the fifth and sixth paragraphs, as indicated above, to match the presentation of TSTF-529.

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**NuScale Response:**

NuScale has modified former paragraphs 5 and 6 of the Bases of LCO 3.0.2 consistent with the industry traveler TSTF-565, Rev. 0.

TSTF 565 addressed LCO 3.0.2 by modifying the content previously described in TSTF 529. An evaluation of TSTF-565, Rev. 0 indicated that it would be appropriate for incorporation into the NuScale Technical Specifications and Bases.

The paragraph break described in the RAI between paragraph 5 and 6 was eliminated.



**Impact on DCA:**

The Technical Specifications have been revised as described in the response above and as shown in the markup provided in this response.

BASES

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LCO 3.0.2 (continued)

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

The nature of some Required Actions of some Conditions necessitates that, once the Condition is entered, the Required Actions must be completed even though the associated Conditions no longer exist. The individual LCO's ACTIONS specify the Required Actions where this is the case. An example of this is in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits."

The Completion Times of the Required Actions are also applicable when a system or component is removed from service intentionally. Intentional entry into ACTIONS should not be made for operational convenience that permits routine voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable. ~~The reasons for intentionally relying on the ACTIONS include, but are not limited to, performance of Surveillances, preventive maintenance, corrective maintenance, or investigation of operational problems. Entering ACTIONS for these reasons must be done in a manner that does not compromise safety. Intentional entry into ACTIONS should not be made for operational convenience. Alternatives that would not result in redundant equipment being inoperable should be used instead. Doing so limits the time both subsystems/trains of a safety function are inoperable and limits the time other conditions could exist which result in LCO 3.0.3 being entered.~~ Individual Specifications may specify a time limit for performing an SR when equipment is removed from service or bypassed for testing. In this case, the Completion Times of the Required Actions are applicable when this time limit expires, if the equipment remains removed from service or bypassed.

When a change in MODE or other specified condition is required to comply with Required Actions, the unit ~~MODULE~~ may enter a MODE or other specified condition in which another Specification becomes applicable. In this case, the Completion Times of the associated Required Actions would apply from the point in time that the new Specification becomes applicable, and the ACTIONS Condition(s) are entered.

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## **Response to Request for Additional Information Docket No. 52-048**

**eRAI No.:** 9033

**Date of RAI Issue:** 08/08/2017

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**NRC Question No.:** 16-10

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility. The model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

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- NUREG-1432, “STS Combustion Engineering Plants,” Revision 4 (ADAMS Accession Nos. ML12102A165 and ML12102A169)
- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.

In the Bases for LCO 3.0.3, the first paragraph’s ordered list paragraphs, and the second paragraph are mislabeled. The correct labeling is:

*First paragraph*

LCO 3.0.3 establishes the actions that must be implemented when an LCO is not met and either:

- a. An associated Required Action and Completion Time is not met and no other Condition applies or



- b. The condition of the unit is not specifically addressed by the associated ACTIONS. This means that no combination of Conditions stated in the ACTIONS can be made that exactly corresponds to the actual condition of the unit. Sometimes, possible combinations of Conditions are such that entering LCO 3.0.3 is warranted; in such cases, the ACTIONS specifically state a Condition corresponding to such combinations and also that LCO 3.0.3 be entered immediately.

### *Second paragraph*

This Specification delineates the time limits for placing the unit in a safe MODE or other specified condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its ACTIONS. It is not intended to be used as an operational convenience that permits routine voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable.

The eighth and ninth paragraphs should be merged to match the STS LCO 3.0.3 Bases presentation. The applicant is requested to revise the LCO 3.0.3 Bases to conform to the STS LCO 3.0.3 Bases.

The applicant is also requested to conform to TSTF-529 by replacing the word “reach(ing)” with the word “enter(ing)”, in

- Third paragraph, third sentence (“The time limits specified to enter ~~reach~~-lower MODES of operation permit the shutdown to proceed in a controlled and orderly manner that is well within the specified maximum cooldown rate and within the capabilities of the unit, assuming that only the minimum required equipment is OPERABLE.”)
- Fifth paragraph (“...If the unit is in a lower MODE of operation when a shutdown is required, the time limit for ~~reach~~-entering the next lower MODE applies. If a lower MODE is ~~reach~~-entered in less time than allowed, however, the total allowable time to ~~reach~~ enter MODE 5, or other applicable MODE, is not reduced. For example, if MODE 3 is ~~reach~~ entered in 2 hours, then the time allowed for ~~reach~~-entering MODE 4 is the next 11 hours, because the total time for ~~reach~~-entering MODE 4 is not reduced from the allowable limit of 13 hours. Therefore, if remedial measures are completed that would permit a return to MODE 1, a penalty is not incurred by having to ~~reach~~-enter a lower MODE of operation in less than the total time allowed.”)

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### **NuScale Response:**

NuScale will more closely align with the industry standard for the LCO 3.0.3 Specification by modifying the Bases of LCO 3.0.3 to

1. label the first and second paragraph as described in RAI,
2. remove space between 8<sup>th</sup> and 9<sup>th</sup> paragraph as described in RAI, and



3. fully incorporate TSTF-529 into the third and fifth paragraph.

**Impact on DCA:**

The Technical Specifications have been revised as described in the response above and as shown in the markup provided in this response.

## BASES

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### LCO 3.0.3

LCO 3.0.3 establishes the actions that must be implemented when an LCO is not met; and:

a. An associated Required Action and Completion Time is not met and no other Condition applies; or

ba. The condition of the unitMODULE is not specifically addressed by the associated ACTIONS. This means that no combination of Conditions stated in the ACTIONS can be made that exactly corresponds to the actual condition of the unitMODULE. Sometimes, possible combinations of Conditions are such that entering LCO 3.0.3 is warranted; in such cases, the ACTIONS specifically state a Condition corresponding to such combinations and also that LCO 3.0.3 be entered immediately.

This Specification delineates the time limits for placing the unitMODULE in a safe MODE or other specified condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its ACTIONS. It is not intended to be used as an operational convenience that permits routine voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable.

Upon entering into LCO 3.0.3, 1 hour is allowed to prepare for an orderly shutdown before initiating a change in unitMODULE operation. This includes time to permit the operator to coordinate the reduction in electrical generation with the load dispatcher to ensure the stability and availability of the electrical grid. The time limits specified to enter lower MODES of operation permit the shutdown to proceed in a controlled and orderly manner that is well within the specified maximum cooldown rate and within the capabilities of the unitMODULE, assuming that only the minimum required equipment is OPERABLE. This reduces thermal stresses on components of the Reactor Coolant System and the potential for a plant upset that could challenge safety systems under conditions to which this Specification applies. The use and interpretation of specified times to complete the actions of LCO 3.0.3 are consistent with the discussion of Section 1.3, "Completion Times."

A unitMODULE shutdown required in accordance with LCO 3.0.3 may be terminated, and LCO 3.0.3 exited if any of the following occurs:

- a. The LCO is now met,
- b. The LCO is no longer applicable,



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### LCO 3.0.3 (continued)

- c. A Condition exists for which the Required Actions have now been performed, or
- d. ACTIONS exist that do not have expired Completion Times. These Completion Times are applicable from the point in time that the Condition was initially entered and not from the time LCO 3.0.3 is exited.

The time limits of LCO 3.0.3 allow 37 hours for the unitMODULE to be in MODE 3 and PASSIVELY COOLED when a shutdown is required during MODE 1 operation. If the unitMODULE is in MODE 2 when a shutdown is required, the time limit for entering MODE 3 and PASSIVE COOLING applies. If MODE 2 is entered in less time than allowed, however, the total allowable time to enter MODE 3 and be PASSIVELY COOLED is not reduced. For example, if MODE 2 is entered in 2 hours, then the time allowed for entering MODE 3 and to establish PASSIVE COOLING is the next 35 hours, because the total time for entering MODE 3 and to be PASSIVELY COOLED is not reduced from the allowable limit of 37 hours. Therefore, if remedial measures are completed that would permit a return to MODE 1, a penalty is not incurred by having to enterreach a lower MODE of operation in less than the total time allowed.

The Completion Times are established considering the limited likelihood of a design basis event during the 37 hours allowed to enter MODE 3 and be PASSIVELY COOLED. They also provide adequate time to permit evaluation of conditions and restoration of OPERABILITY without unnecessarily challenging plant systems during a shutdown. Analysis shows that 37 hours from entry into 3.0.3 is a reasonable time to enter MODE 3 and be PASSIVELY COOLED using normal plant systems and procedures.

In MODES 1, 2, and MODE 3 when not PASSIVELY COOLED, LCO 3.0.3 provides actions for Conditions not covered in other Specifications. The requirements of LCO 3.0.3 do not apply in MODE 3 when PASSIVELY COOLED, and MODES 4 and 5 because the unitMODULE is already in the most restrictive condition required by LCO 3.0.3. The requirements of LCO 3.0.3 do not apply in other specified conditions of the Applicability (unless in MODE 1, 2, or MODE 3 when not PASSIVELY COOLED) because the ACTIONS of individual Specifications sufficiently define the remedial measures to be taken.

Exceptions to 3.0.3 are provided in instances where requiring a unitMODULE shutdown in accordance with LCO 3.0.3, would not

BASES

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LCO 3.0.3 (continued)

provide appropriate remedial measures for the associated condition of the unitMODULE. An example of this is in LCO 3.5.3, Ultimate Heat Sink. This Specification has an Applicability of "At all times." Therefore, this LCO can be applicable during any or all MODES. If the LCO and the Required Actions of LCO 3.5.3 are not met while in MODE 1 or 2, there is no safety benefit to be gained by placing unitMODULES in a shutdown condition where they are dependent on the reactor pool to perform its safety function to remove decay heat. The Required Action of LCO 3.5.3 for a level not within its normal upper range limits include a requirement to "Suspend movement of irradiated fuel assemblies in spent fuel pool" and to "Suspend moduleMODULE movements" which are the appropriate Required Actions to complete in lieu of the actions of LCO 3.0.3 for those conditions. The Required Action of LCO 3.5.3 at a level, temperature, or boron concentration that could limit the ability to support decay heat removal or containment flooding after a shutdown include a requirement to immediately restore the affected parameters which is the appropriate Required Action to complete in lieu of the actions of LCO 3.0.3 for that condition that could challenge the functions supported by the ultimate heat sink that are inoperable. These exceptions are addressed in the individual Specifications.

LCO 3.0.4

LCO 3.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when an LCO is not met. It allows placing the unitMODULE in a MODE or other specified condition stated in that Applicability (e.g., the Applicability desired to be entered) when unitMODULE conditions are such that the requirements of the LCO would not be met, in accordance with either LCO 3.0.4.a, LCO 3.0.4.b, or LCO 3.0.4.c.

LCO 3.0.4.a allows entry into a MODE or other specified condition in the Applicability with the LCO not met when the associated ACTIONS to be entered following entry into the MODE or other specified condition in the Applicability will permit continued operation within the MODE or other specified condition for an unlimited period of time. Compliance with ACTIONS that permit continued operation of the unitMODULE for an unlimited period of time in a MODE or other specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the unitMODULE before or after the MODE change. Therefore, in such cases, entry into a MODE or other specified condition in the Applicability may be made and the Required Actions followed after entry into the Applicability.

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## Response to Request for Additional Information

**eRAI No.:** 9033

**Date of RAI Issue:** 08/08/2017

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**NRC Question No.:** 16-11

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility. The model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

- NUREG-1431, “STS Westinghouse Plants,” Revision 4 (ADAMS Accession Nos. ML12100A222 and ML12100A228)
- NUREG-1432, “STS Combustion Engineering Plants,” Revision 4 (ADAMS Accession Nos. ML12102A165 and ML12102A169)
- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.

1. The third paragraph of the Bases for LCO 3.0.4 is included apparently based on the markup of the Bases for LCO 3.0.4 in the Westinghouse STS (NUREG-1431, Revision 4) in TSTF-529, Revision 4. To match the markup, this paragraph should be separated into two paragraphs at the sentence that begins with “LCO 3.0.4.b allows entry in a MODE or other specified condition in the Applicability with the LCO not met ....” The applicant is requested to separate the third paragraph into two paragraphs to match the markup in TSTF-529.
2. After accounting for the change requested by Sub-question 1, the staff notes that the *fifth* paragraph of the Bases for LCO 3.0.4 references Regulatory Guide 1.160, “Monitoring the



Effectiveness of Maintenance at Nuclear Power Plants,” Revision 3. However, the markup of the fifth paragraph of the Bases for LCO 3.0.4 in the Westinghouse STS in TSTF-529, Revision 4, refers to Regulatory Guide 1.182, “Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants.” The applicant is requested to change Regulatory Guide 1.160 to Regulatory Guide 1.182 to match the markup of the Westinghouse STS Bases in TSTF-529, as follows:

...The risk assessment, for the purposes of LCO 3.0.4.b, must take into account all inoperable Technical Specification equipment regardless of whether the equipment is included in the normal 10 CFR 50.65(a)(4) risk assessment scope. The risk assessments will be conducted using the procedures and guidance endorsed by Regulatory Guide 1.182, “Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants.” ~~Regulatory Guide 1.160, “Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” Revision 3.~~ Regulatory Guide 1.160 endorses the guidance in Section 11 of NUMARC 93-01, “Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.” These documents address general guidance for conduct of the risk assessment, quantitative and qualitative guidelines for establishing risk management actions, and example risk management actions...

3. In the sixth paragraph of the Bases for LCO 3.0.8, regarding remedial actions for barriers that are not able to perform their functions to support the operability of related LCO-required systems, the staff notes that the references to Regulatory Guide 1.160 should also be changed to Regulatory Guide 1.182, as in Sub-question 2. The applicant is requested to change Regulatory Guide 1.160 to Regulatory Guide 1.182.

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**NuScale Response:**

*See the response to RAI 16-8 which addresses RAIs 16-8, 16-11, and 16-13 due to their inter-relationships.*

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## Response to Request for Additional Information Docket No. 52-048

**eRAI No.:** 9033

**Date of RAI Issue:** 08/08/2017

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### **NRC Question No.:** 16-12

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility. The model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

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- NUREG-1432, “STS Combustion Engineering Plants,” Revision 4 (ADAMS Accession Nos. ML12102A165 and ML12102A169)
- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.

In the Bases for LCO 3.0.5, which are apparently based on the markup of the Bases for LCO 3.0.5 in the Westinghouse STS (NUREG-1431, Revision 4) in TSTF-529, Revision 4, the third and fourth paragraphs are worded differently than the markup of the third and fourth paragraphs of the Bases for LCO 3.0.5 in the Westinghouse STS in TSTF-529, as follows.

- In the third paragraph, the generic TS uses “RCS **pressure boundary** leakage” while the STS uses “RCS **Pressure Isolation Valve (PIV)** leakage,” as follows

*Third paragraph of generic TS LCO 3.0.5 Bases:*

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An example of demonstrating equipment is OPERABLE with the Required Actions not met is opening a manual valve that was closed to comply with Required Actions to isolate a flowpath with excessive Reactor Coolant System (RCS) pressure boundary leakage in order to perform testing to demonstrate that RCS pressure boundary leakage is now within limit.

*Third paragraph of STS LCO 3.0.5 Bases:*

An example of demonstrating equipment is OPERABLE with the Required Actions not met is opening a manual valve that was closed to comply with Required Actions to isolate a flowpath with excessive Reactor Coolant System (RCS) Pressure Isolation Valve (PIV) leakage in order to perform testing to demonstrate that RCS PIV leakage is now within limit.

- In the fourth paragraph, the generic TS Bases omit the STS paragraph's first sentence, which states:

Examples of demonstrating equipment OPERABILITY include instances in which it is necessary to take an inoperable channel or trip system out of a tripped condition that was directed by a Required Action, if there is no Required Action Note for this purpose.

The applicant is requested to provide a justification for each of these differences.

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### **NuScale Response:**

With regard to the first part of the RAI regarding the generic TS use of "RCS pressure boundary leakage" while the STS uses "RCS Pressure Isolation Valve (PIV) leakage":

Although the STS and associated TSTF travelers were considered in development of the generic TS, the extensive and fundamental differences between the NuScale design and legacy PWRs resulted in the need for changes from the wording in TSTF-529, Revision 4.

The NuScale design is significantly different in that the valves located between the high-pressure and low-pressure system portions that are typically addressed by a legacy plant LCO titled "RCS Pressure Isolation Valves (PIV) leakage" do not exist in the NuScale design.

The NuScale design includes RCS pressure isolation valves that perform a similar function and are similarly configured however their OPERABILITY and leakage limits are controlled by other technical specifications, including for example LCO 3.6.2, "Containment Isolation Valves." Based on this design difference, the use of "RCS Pressure Isolation Valve (PIV) leakage" in the Bases of 3.0.5 is not appropriate for the NuScale Technical Specifications.



It is more appropriate to use the phrase “pressure boundary leakage” because the NuScale design does not require and the GTS do not include a separate LCO to address “RCS Pressure Isolation Valve (PIV) leakage.” Therefore it is more reflective of the plant design to use the proposed “pressure boundary leakage.”

For additional information regarding the RCS and the RCS pressure boundary, see FSAR Chapter 5, “Reactor Coolant System and Connecting Systems.” Containment penetrations are described in FSAR Section 6.2, “Containment Systems.”

With regard to the second part of the RAI regarding the omission of the TSTF-529 Revision 4, STS paragraph’s first sentence:

NuScale is modifying LCO 3.0.5 Bases as requested and to remain consistent with the industry standards by restoring the first sentence to the fourth paragraph:

*“Examples of demonstrating equipment OPERABILITY include instances in which it is necessary to take an inoperable channel or trip system out of a tripped condition that was directed by a Required Action, if there is no Required Action Note for this purpose.”*

**Impact on DCA:**

The Technical Specifications have been revised as described in the response above and as shown in the markup provided in this response.

BASES

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LCO 3.0.5 (continued)

Examples of demonstrating equipment OPERABILITY include instances in which it is necessary to take an inoperable channel or trip system out of a tripped condition that was directed by a Required Action, if there is no Required Action Note for this purpose. An example of verifying OPERABILITY of equipment removed from service is taking a tripped channel out of the tripped condition to permit the logic to function and indicate the appropriate response during performance of required testing on the inoperable channel. Examples of demonstrating the OPERABILITY of other equipment are taking an inoperable channel or trip system out of the tripped condition 1) to prevent the trip function from occurring during the performance of required testing on another channel in the other trip system, or 2) to permit the logic to function and indicate the appropriate response during the performance of required testing on another channel in the same trip system.

The administrative controls in LCO 3.0.5 apply in all cases to systems or components in Chapter 3 of the Technical Specifications, as long as the testing could not be conducted while complying with the Required Actions. This includes the realignment or repositioning of redundant or alternate equipment or trains previously manipulated to comply with ACTIONS, as well as equipment removed from service or declared inoperable to comply with ACTIONS.

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LCO 3.0.6

LCO 3.0.6 establishes an exception to LCO 3.0.2 for supported systems that have a support system LCO specified in the Technical Specifications (TS). This exception is provided because LCO 3.0.2 would require that the Conditions and Required Actions of the associated inoperable supported system LCO be entered solely due to the inoperability of the support system. This exception is justified because the actions that are required to ensure the unitMODULE is maintained in a safe condition are specified in the support system LCO's Required Actions. These Required Actions may include entering the supported system's Conditions and Required Actions or may specify other Required Actions.

When a support system is inoperable and there is an LCO specified for it in the TS, the supported system(s) are required to be declared inoperable if determined to be inoperable as a result of the support system inoperability. However it is not necessary to enter into the supported systems' Conditions and Required Actions unless directed to do so by the support system's Required Actions. The potential confusion and inconsistency of requirements related to the entry into multiple support and supported systems' LCOs' Conditions and Required Actions are eliminated by providing all the actions that are necessary to ensure



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## Response to Request for Additional Information

**eRAI No.:** 9033

**Date of RAI Issue:** 08/08/2017

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**NRC Question No.:** 16-13

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility. The model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

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- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.

The Bases for Combustion Engineering (CE) STS LCO 3.0.9, which provides remedial actions for barriers that are not able to perform their functions to support the operability of related LCO-required systems, contains the following Reviewer’s Note (with brackets added):

[-----REVIEWER’S NOTE-----]

Adoption of LCO 3.0.9 requires the licensee to make the following commitments:

1. [LICENSEE] commits to the guidance of NUMARC 93–01, Revision 3, Section 11, which provides guidance and details on the assessment and



- management of risk during maintenance.
2. [LICENSEE] commits to the guidance of NEI 04–08, “Allowance for Non Technical Specification Barrier Degradation on Supported System OPERABILITY (TSTF–427) Industry Implementation Guidance,” March 2006.

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The Bases of corresponding generic TS LCO 3.0.8 omits this Reviewer's Note. The applicant is requested to either add this Reviewer's Note to the Bases of generic TS LCO 3.0.8, or justify omitting it, including an explanation of how a COL applicant would be expected to know that it must make the stated commitments to NUMARC 93-01 and NEI 04-08. In addition, all Reviewer's Notes in the generic TS need to be in square brackets to indicate that they are COL action items.

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**NuScale Response:**

*See the response to RAI 16-8 which addresses RAIs 16-8, 16-11, and 16-13 due to their inter-relationships.*

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## **Response to Request for Additional Information Docket No. 52-048**

**eRAI No.:** 9033

**Date of RAI Issue:** 08/08/2017

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### **NRC Question No.:** 16-14

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility. The model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

- NUREG-1431, “STS Westinghouse Plants,” Revision 4 (ADAMS Accession Nos. ML12100A222 and ML12100A228)
- NUREG-1432, “STS Combustion Engineering Plants,” Revision 4 (ADAMS Accession Nos. ML12102A165 and ML12102A169)
- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.

The first paragraph of Section B 3.0, “Surveillance Requirement (SR) Applicability,” includes a sentence about when SR 3.0.2 and SR 3.0.3 would apply in generic TS Chapter 5:

SR 3.0.2 and SR 3.0.3 apply in Chapter 5 only when invoked by a Chapter 5 Specification.

This sentence is not included in any STS NUREG or approved TSTF traveler; neither is it included in any proposed TSTF traveler accepted for NRC staff review. The generic TS Chapter 5.0 only has a statement concerning the applicability of SR 3.0.2 and SR 3.0.3 in each of the following four programmatic specification subsections:



#### 5.5.2, Radioactive Effluent Control Program

- b. The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Radioactive Effluent Controls Program surveillance frequency.

#### 5.5.6, Explosive Gas and Storage Tank Radioactivity Monitoring Program

*(Last paragraph)* The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Explosive Gas and Storage Tank Radioactivity Monitoring Program surveillance frequencies.

#### 5.5.9, Containment Leakage Rate Testing Program

- d. The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

#### 5.5.11, Surveillance Frequency Control Program

- c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

This provision as stated in Specifications 5.5.2.b, 5.5.6, and 5.5.9.d, is consistent with this provision as stated in the Combustion Engineering (CE) STS (NUREG-1432, Revision 4) equivalent Specifications 5.5.4 (*last paragraph*), 5.5.12 (*last paragraph*), and 5.5.16 (paragraph d for Option A, or paragraph e for Option B and Option A/B Combined), respectively. This provision as stated in Specification 5.5.11.c is consistent with equivalent CE STS Specification 5.5.20.c. Therefore, this provision as stated in generic TS Section 5.5 is acceptable.

The applicant is requested to either remove the proposed statement, or explain why the proposed statement is necessary for understanding the SR 3.0.2 and SR 3.0.3 applicability provisions in Specifications 5.5.2.b, 5.5.6, 5.5.9.d, and 5.5.11.c. If the applicant chooses to include this statement, the staff requests that it be modified to reflect the fact that it only affects generic TS Section 5.5 Specifications, as follows:

SR 3.0.2 and SR 3.0.3 **only** apply **in Chapter 5 to administrative control program surveillance or test frequencies as specified in individual Section 5.5 Specifications** ~~only when invoked by a Chapter 5 Specification.~~

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#### **NuScale Response:**

It is NuScale's understanding that TSTF-545-A, Revision 3 was approved by letter dated December 11, 2015, ML15314A365. The NuScale proposed generic Technical Specifications were drafted consistent with the approved TSTF traveler attachments.

Although not presented in the approved TSTF, a paragraph break is being inserted between the two sentences to clarify the Bases subsection as requested in the RAI .



**Impact on DCA:**

The Technical Specifications have been revised as described in the response above and as shown in the markup provided in this response.

## B 3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

### BASES

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

SR 3.0.2 and SR 3.0.3 apply in Chapter 5 only when invoked by a Chapter 5 Specification.

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SR 3.0.1 SR 3.0.1 establishes the requirement that SRs must be met during the MODES or other specified conditions in the Applicability for which the requirements of the LCO apply, unless otherwise specified in the individual SRs. This Specification ensures that Surveillances are performed to verify the OPERABILITY of systems and components, and that variables are within specified limits. Failure to meet a Surveillance within the specified Frequency, in accordance with SR 3.0.2, constitutes a failure to meet an LCO. Surveillances may be performed by means of any series of sequential, overlapping, or total steps provided the entire Surveillance is performed within the specified Frequency. Additionally, the definitions related to instrument testing (e.g., CHANNEL CALIBRATION) specify that these tests are performed by means of any series of sequential, overlapping, or total steps.

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

- a. The systems or components are known to be inoperable, although still meeting the SRs; or
- b. The requirements of the Surveillance(s) are known not to be met between required Surveillance performances.

Surveillances do not have to be performed when the unitMODULE is in a MODE or other specified condition for which the requirements of the associated LCO are not applicable, unless otherwise specified. The SRs associated with a test exception are only applicable when the test exception is used as an allowable exception to the requirements of a Specification.

Unplanned events may satisfy the requirements (including applicable acceptance criteria) for a given SR. In this case, the unplanned event may be credited as fulfilling the performance of the SR. This allowance includes those SRs whose performance is normally precluded in a given MODE or other specified condition.

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## **Response to Request for Additional Information Docket No. 52-048**

**eRAI No.:** 9033

**Date of RAI Issue:** 08/08/2017

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**NRC Question No.:** 16-15

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose technical specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for TS to be included as part of the operating license for a nuclear power facility. The model standard technical specifications (STS) in the following documents provide NRC guidance on format and content of TS as acceptable means to meet 10 CFR 50.36 requirements. These documents may be accessed using the Agencywide Documents Access and Management Systems (ADAMS) by their accession numbers.

- NUREG-1431, “STS Westinghouse Plants,” Revision 4 (ADAMS Accession Nos. ML12100A222 and ML12100A228)
- NUREG-1432, “STS Combustion Engineering Plants,” Revision 4 (ADAMS Accession Nos. ML12102A165 and ML12102A169)
- NUREG-2194, “STS Westinghouse Advanced Passive 1000 (AP1000) Plants,” Revision 0 (ADAMS Accession No. ML16111A132)

The NRC staff needs to evaluate technical differences in the proposed generic TS (GTS) from applicable provisions in these documents, which are referenced by the DC applicant in Design Control Document (DCD) Tier 2, Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the GTS to ensure adequate protection of public health and safety, and the completeness and accuracy of the GTS Bases.

The applicant is requested to remove from GTS surveillance requirement (SR) 3.0.3 and its Bases all changes to SR 3.0.3 and its Bases of NUREG-1431, STS Westinghouse Plants (W-STs), Revision 3.1, which were proposed by unapproved traveler TSTF-530, Revision 0, “Clarify SR 3.0.3 to be Consistent with Generic Letter 87-09,” which was submitted by the TSTF in a letter dated September 16, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112620602). The NRC did not accept for review TSTF-530 in a letter dated October 12, 2012 (ADAMS Accession No. ML12207A564). Accordingly, the applicant is requested to revise GTS SR 3.0.3 and its Bases to match SR 3.0.3 and its Bases in Revision 4 of the W-STs.



**NuScale Response:**

NuScale has removed the described content from proposed traveler TSTF-530, Revision 0.

**Impact on DCA:**

The Technical Specifications have been revised as described in the response above and as shown in the markup provided in this response.



### 3.0 SURVEILLANCE REQUIREMENTS (SR) APPLICABILITY

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

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

For Frequencies specified as “once,” the above interval extension does not apply.

If a Completion Time requires periodic performance on a “once per...” basis, the above Frequency extension applies to each performance after the initial performance.

Exceptions to this Specification are stated in the individual Specifications.

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SR 3.0.3 ~~From the time that it is discovered that a Surveillance has not been performed~~ 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 greater. This delay period is permitted to allow performance of the Surveillance. The delay period is only applicable when there is a reasonable expectation the Surveillance will be met when performed. A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed.

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

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

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SR 3.0.2 (continued)

particular surveillance being performed is the verification of conformance with the SRs.

The exceptions to SR 3.0.2 are those Surveillances for which the 25% extension of the interval specified in the Frequency does not apply. These exceptions are stated in the individual Specifications. The requirements of regulations take precedence over the TS. Examples of where SR 3.0.2 does not apply are in the Containment Leakage Rate Testing Program required by 10 CFR 50, Appendix J, and the inservice testing of pumps and valves in accordance with applicable American Society of Mechanical Engineers Operation and Maintenance Code, as required by 10 CFR 50.55a. These programs establish testing requirements and Frequencies in accordance with the requirements of regulations. The TS cannot, in and of themselves, extend a test interval specified in the regulations directly or by reference.

As stated in SR 3.0.2, the 25% extension also does not apply to the initial portion of a periodic Completion Time that requires performance on a “once per ...” basis. The 25% extension applies to each performance after the initial performance. The initial performance of the Required Action, whether it is a particular Surveillance or some remedial action, is considered a single action with a single Completion Time. One reason for not allowing the 25% extension to this Completion Time is that such an action usually verifies that no loss of function has occurred by checking the status of redundant or diverse components or accomplishes the function of the inoperable equipment in an alternative manner.

The provisions of SR 3.0.2 are not intended to be used repeatedly to extend Surveillance intervals (other than those consistent with refueling intervals) or periodic Completion Time intervals beyond those specified.

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SR 3.0.3

SR 3.0.3 establishes the flexibility to defer declaring affected equipment inoperable or an affected variable outside the specified limits when a Surveillance has not been ~~performed~~completed within the specified Frequency. A delay period of up to 24 hours or up to the limit of the specified Frequency, whichever is greater, applies from the point in time that it is discovered that the Surveillance has not been performed ~~within its specified Frequency~~ in accordance with SR 3.0.2, and not at the time that the specified Frequency was not met.

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SR 3.0.3 (continued)

~~There are two circumstances in which SR 3.0.3 may be used.~~

- ~~a. If it is not possible to perform a Surveillance within the specified Frequency (for example, due to a scheduling error, adverse operational conditions, or failure of equipment needed to perform the Surveillance), then SR 3.0.3 may be applied at the point the Surveillance is not performed within the specified Frequency (i.e., it may be anticipated that a Surveillance will not be performed within the specified Frequency, but discovery may only occur when the specified Frequency expires); and~~
- ~~b. If it is discovered that a Surveillance was not performed within the specified Frequency in the past, then SR 3.0.3 may be applied at the time of that discovery.~~

When a Section 5.5, "Programs and Manuals," Specification states that the provisions of SR 3.0.3 are applicable, it permits the flexibility to defer declaring the testing requirement not met in accordance with SR 3.0.3 when the testing has not been completed within the testing interval (including the allowance of SR 3.0.2 if invoked by the Section 5.5 Specification).

This delay period provides adequate time to ~~perform the complete~~ perform the complete Surveillances that have been missed. This delay period permits the performance completion of a Surveillance before complying with Required Actions or other remedial measures that might preclude performance completion of the Surveillance.

The basis for this delay period includes consideration of unit~~MODULE~~ Conditions~~conditions~~, adequate planning, availability of personnel, the time required to perform the Surveillance, the safety significance of the delay in performing~~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 unit~~MODULE~~ conditions, operational situations, or requirements of regulations (e.g., prior to entering MODE 1 after each fuel loading, or in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, etc.) is discovered to not have been performed ~~within the specified Frequency~~when specified, SR 3.0.3 allows for the full delay period of up to the specified Frequency to perform the Surveillance. However, since there is not a time interval specified, the missed Surveillance should be performed at the first

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## LCOSR 3.0.3 (continued)

reasonable opportunity.

SR 3.0.3 provides a time limit for, and allowances for the performance of, Surveillances that become applicable as a consequence of MODE changes imposed by Required Actions.

SR 3.0.3 is only applicable if there is a reasonable expectation the associated equipment is OPERABLE or that variables are within limits, and it is expected that the Surveillance will be met when performed. Many factors should be considered, such as the period of time since the Surveillance was last performed, or whether the Surveillance, or a portion thereof, has ever been performed, and any other indications, tests, or activities that might support the expectation that the Surveillance will be met when performed. An example of the use of SR 3.0.3 would be a relay contact that was not tested as required in accordance with a particular SR, but previous successful performances of the SR included the relay contact; the adjacent, physically connected relay contacts were tested during the SR performance; the subject relay contact has been tested by another SR; or historical operation of the subject relay contact has been successful. It is not sufficient to infer the behavior of the associated equipment from the performance of similar equipment. The rigor of determining whether there is a reasonable expectation a Surveillance will be met when performed should increase based on the length of time since the last performance of the Surveillance. If the Surveillance has been performed recently, a review of the Surveillance history and equipment performance may be sufficient to support a reasonable expectation that the Surveillance will be met when performed. For Surveillances that have not been performed for a long period or that have never been performed, a rigorous evaluation based on objective evidence should provide a high degree of confidence that the equipment is OPERABLE. The evaluation should be documented in sufficient detail to allow a knowledgeable individual to understand the basis for the determination.

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 repeatedly to extend Surveillance intervals. While up to 24 hours or ~~up to~~ the limit of the specified Frequency is provided to perform the missed Surveillance, it is expected that the Surveillance will be performed at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying the Surveillance as well as any plant configuration changes required or shutting the unit~~plant~~ down to perform the Surveillance) and impact on any analysis assumptions, in addition to unit~~MODULE~~

BASES

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SR 3.0.3 (continued)

conditions, planning, availability of personnel, and the time required to perform the Surveillance. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and its implementation guidance, NRC Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 3. This Regulatory Guide addresses consideration of temporary and aggregate risk impacts, determination of risk management action thresholds, and risk management action up to and including unitplant shutdown.

The missed Surveillance should be treated as an emergent condition as discussed in the Regulatory Guide. The risk evaluation may use quantitative, qualitative, or blended methods. The degree of depth and rigor of the evaluation should be commensurate with the importance of the component. Missed Surveillances ~~not performed within the specified Frequency~~ for important components should be analyzed quantitatively. If the results of the risk evaluation determine the risk increase is significant, this evaluation should be used to determine the safest course of action. All missed Surveillances ~~not performed within the specified Frequency~~ will be placed in the licensee's Corrective Action Program.

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

~~Performing and meeting~~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.

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SR 3.0.4

SR 3.0.4 establishes the requirement that all applicable SRs must be met before entry into a MODE or other specified condition in the Applicability.

This Specification ensures that system and component OPERABILITY requirements and variable limits are met before entry into MODES or other specified conditions in the Applicability for which these systems and components ensure safe operation of the unitMODULE. The provisions of this Specification should not be interpreted as endorsing