

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

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**Title: Changes Related to LCO 3.4.12, Automatic Depressurization System (ADS) – Shutdown, RCS Intact**

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**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:**

None

**STS NUREGs Affected:**

Not Applicable

**NRC Approval Date:**

Not Applicable

**TSTF Classification:**

Not Applicable

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**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 GTS 3.4.12.

**RCOL COL Item Number and Title:**

There are no Vogtle COL items applicable to GTS 3.4.12.

**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 A031: TS 3.4.12, Required Action D.1 is revised  
VEGP LAR DOC A054: TS 3.4.12, LCO statement; Required Actions A.1, B.1, and C.1; and Condition D are revised  
VEGP LAR DOC A055: TS 3.4.12, Required Action D.1 is revised

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**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(1) applicable to operating reactor designs, but not to the AP1000 design; (2) already incorporated in the GTS; or (3) superseded by another change.

None

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**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)**

Revise the GTS 3.4.12 “Actions” section of the Bases by moving the heading “D.1” to before the preceding paragraph. (NRC Staff Comment). This non-technical change corrects an error and provides improved clarity, consistency, and operator usability.

**APOG Recommended Changes to Improve the Bases**

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)

Revise the GTS 3.4.12 “Actions” section of the Bases, under heading “C.1,” to make the list of combinations of three inoperable flow paths be a bulleted list. This non-technical change provides improved clarity, consistency, and operator usability.

Revise the GTS 3.4.12 “Actions” section of the Bases, under heading “D.1,” to make “Conditions” be “Condition,” consistent with the Writer's Guide.

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## **V. Applicability**

### **Affected Generic Technical Specifications and Bases:**

Section 3.4.12, Automatic Depressurization System (ADS) – Shutdown, RCS Intact

### **Changes to the Generic Technical Specifications and Bases:**

The statement of the LCO Specification is revised. This is an editorial change for clarity. (DOC A054)

The word “required” is added in front of flow paths in Required Actions A.1, B.1, and C.1. This is an editorial change for clarity. (DOC A054)

Condition D is revised to include “of Condition A, B, or C.” This is an editorial change for clarity. (DOC A054)

Condition D revised to delete “Requirements of.” This is an editorial change for clarity. (DOC A054)

Required Action D.1 is revised. The reference to MODE 5 is not necessary because that is part of the LCO Applicability statement. (DOC A031 and A055)

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

The “Actions” section of the Bases, under heading “D.1,” is revised to improve clarity, consistency with the Writer's Guide, and operator usability. (APOG Comment and NRC Staff Edit)

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

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**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:**

VEGP LAR DOC A031 revises Required Action D.1 from "Initiate action to be in MODE 5, with RCS open" to "Initiate action to open the RCS pressure boundary."

VEGP LAR DOC A054 revises the LCO statement from "The ADS, including 9 flow paths, shall be OPERABLE," to "Nine ADS flow paths shall be OPERABLE." Required Actions A.1, B.1 and C.1 are revised from "Restore flow path ..." to "Restore required flow path..." The first entry condition of Condition D is revised by addition of "of Condition A, B, or C" to the condition statement. The second entry condition of Condition D is revised by deletion of "Requirements of" from the condition statement.

VEGP LAR DOC A055 revises Required Action D.1 from "Initiate action to be in MODE 5, with RCS open and  $\geq 20\%$  pressurizer level," to "Initiate action to open the RCS pressure boundary."

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:**

Editorial changes per VEGP LAR DOC A054 are consistent with the guidance provided in the TS Writer's Guide (Reference 4).

VEGP LAR DOC A031 and A055 note that there is no need to specify the pressurizer level in Required Action D.1. In the event the pressurizer level is  $< 20\%$  with the RCS open in Mode 5, TS 3.4.13, "Automatic Depressurization System (ADS) - Shutdown, RCS Open," applies. Therefore, specifying a pressurizer level in TS 3.4.12, Required Action D.1 is not required, as TS 3.4.13 provides the necessary actions required to be taken in the event sufficient ADS capability is not Operable in Mode 5 with the RCS pressure boundary open and pressurizer level  $< 20\%$ . The change deleting the phrase "be in MODE 5," is addressed in DOC A031.

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

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

The “Actions” section of the Bases, under heading “C.1,” is revised to make the list of combinations of three inoperable flow paths be a bulleted list. (APOG Comment)

The “Actions” section of the Bases under the heading “D.1” is revised by moving the heading “D.1” to before the preceding paragraph and, in the next paragraph under the heading “D.1,” the first sentence is revised to make “Conditions” be “Condition”, consistent with the Writer's Guide.

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

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

The revisions to the “Actions” section of the Bases are non-technical changes that correct an error and provide improved clarity, consistency, and operator usability.

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**VII. GTST Safety Evaluation****Technical Analysis:**

VEGP LAR DOC A031 revises Required Action D.1 from “Initiate action to be in MODE 5, with RCS open” to “Initiate action to open the RCS pressure boundary.” VEGP LAR DOC A055 revises Required Action D.1 from “Initiate action to be in MODE 5, with RCS open and  $\geq$  20% pressurizer level,” to “Initiate action to open the RCS pressure boundary.”

The phrase “to be in MODE 5” is rhetorical because this is a requirement of the Applicability statement for TS 3.4.12. As soon as the RCS is open in Mode 5, TS 3.4.12 no longer applies. Therefore, there is no need to specify the pressurizer level in Required Action D.1. In the event the pressurizer level is  $<$  20% with the RCS open in Mode 5, TS 3.4.13, “Automatic Depressurization System (ADS) - Shutdown, RCS Open,” applies.

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 3.4.12 is an acceptable model Specification for the AP1000 standard reactor design.

**References to Previous NRC Safety Evaluation Reports (SERs):**

None

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## 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 5/16/2014.

### 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 #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.
3. (Internal # 271) Revise the GTS 3.4.12 "Actions" section of the Bases by moving the heading "D.1" to before the preceding paragraph (NRC Staff Edit consistent with internal comment # 267). In the next paragraph under the heading "D.1," revise the first sentence to make "Conditions" be "Condition", consistent with the Writer's Guide. This non-technical change provides improved clarity, consistency, and operator usability. This is resolved by making the recommended change.
4. (Internal # 272) In the GTS 3.4.12 "Actions" section of the Bases, under heading "C.1," make the list of combinations of three inoperable flow paths to be a bulleted list with spaces. This non-technical change corrects an error and provides improved clarity, consistency, and operator usability. This is resolved by making the recommended change.

**NRC Final Approval Date:** 5/27/2015

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

None

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**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).
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**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.

## 3.4 REACTOR COOLANT SYSTEM (RCS)

## 3.4.12 Automatic Depressurization System (ADS) – Shutdown, RCS Intact

LCO 3.4.12        **Nine** ~~The ADS, including 9~~ flow paths, shall be OPERABLE.

APPLICABILITY:    MODE 5 with RCS pressure boundary intact.

## ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required stage 1, 2, or 3 ADS flow path inoperable.	A.1 Restore <b>required</b> flow path to OPERABLE status.	7 days
B. One required stage 4 ADS flow path inoperable.	B.1 Restore <b>required</b> flow path to OPERABLE status.	72 hours
C. Two or three required ADS flow paths inoperable with a combined inoperable flow capacity less than or equal to that of a division with the largest ADS flow capacity.	C.1 Restore <b>required</b> flow paths to OPERABLE status.	72 hours

## ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>D. Required Action and associated Completion Time <b>of Condition A, B, or C</b> not met.</p> <p><u>OR</u></p> <p><del>Requirements of LCO</del> not met for reasons other than Condition A, B, or C.</p>	<p>D.1 Initiate action to <b>open the RCS pressure boundary</b> <del>be in MODE 5, with RCS open and <math>\geq</math> 20% pressurizer level.</del></p>	Immediately

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.4.12.1 For flow paths required to be OPERABLE, the SRs of LCO 3.4.11, "Automatic Depressurization System (ADS) - Operating" are applicable.</p>	In accordance with applicable SRs

## B 3.4 REACTOR COOLANT SYSTEM (RCS)

## B 3.4.12 Automatic Depressurization System (ADS) – Shutdown, RCS Intact

## BASES

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BACKGROUND	A description of the ADS is provided in the Bases for LCO 3.4.11, “Automatic Depressurization System (ADS) - Operating.”
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APPLICABLE SAFETY ANALYSES	<p>For postulated events in MODE 5 with the RCS pressure boundary intact, the primary protection is the Passive Residual Heat Removal Heat Exchanger (PRHR HX). Use of the ADS is not required and is not anticipated. For these events, injection of borated water into the core from the core makeup tanks (CMTs) may be required for makeup or boration. However, the amount of water necessary will not reduce the level in the CMTs to the point of ADS actuation.</p> <p>No LOCAs are postulated during plant operation in MODE 5, however loss of primary coolant through LEAKAGE or inadvertent draining may occur. For such shutdown events occurring in MODE 5 it is anticipated that the ADS will be actuated, allowing injection from the in-containment refueling water storage tank (IRWST) and the containment recirculation if containment flooding occurs (Ref. 2).</p> <p>The ADS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).</p>
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LCO	<p>The requirement that 9 ADS flow paths be OPERABLE assures that upon actuation, the depressurization of the RCS will proceed smoothly and completely, as assumed in the DBA safety analyses.</p> <p>An ADS stage 1, 2, or 3 flow path is considered OPERABLE if both valves in the line are closed and OPERABLE (capable of opening on an actuation signal). In addition, an ADS stage 4 flow path is OPERABLE if the motor operated isolation valve is open and the squib valve is closed and OPERABLE (capable of opening on an actuation signal).</p>
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APPLICABILITY	In MODE 5 with the reactor coolant pressure boundary (RCPB) intact, 9 flow paths of the ADS must be OPERABLE to mitigate the potential consequences of any event which causes a reduction in the RCS inventory, such as a LOCA.
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**BASES**

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**APPLICABILITY (continued)**

The requirements for the ADS in MODES 1 through 4 are specified in LCO 3.4.11, “Automatic Depressurization System (ADS) - Operating;” and in MODE 5 with the RCS pressure boundary open and MODE 6 in LCO 3.4.13, “Automatic Depressurization System (ADS) - Shutdown, RCS Open.”

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**ACTIONS****A.1**

If any one **required** ADS stage 1, 2, or 3 flow path is determined to be inoperable, the remaining OPERABLE **required** ADS flow paths are more than adequate to perform the required safety function as long as a single failure involving the other **required** flow path of the same stage does not also occur. A flow path is inoperable if one or two of the ADS valves in the flow path are determined to be inoperable. A Completion Time of 7 days is acceptable since the OPERABLE ADS paths can mitigate shutdown events without a single failure.

If more than one **required** ADS stage 1, 2, or 3 flow paths are inoperable, Condition C or D is applicable.

**B.1**

If any one **required** ADS stage 4 flow path is determined to be inoperable, the remaining OPERABLE **required** stage 4 ADS flow paths are adequate to perform the required safety function as long as a single failure of an additional **required** stage 4 ADS flow path does not also occur. A Completion Time of 72 hours is reasonable based on the capability of the remaining ADS valves to perform the required safety functions assumed in the safety analyses and the low probability of a shutdown event during this time period. This Completion Time is the same as is used for two train ECCS systems which are capable of performing their safety function without a single failure.

**C.1**

If two or three **required** flow paths with a combined flow capacity less than or equal to the largest capacity ADS division are determined to be inoperable, the remaining OPERABLE **required** ADS flow paths are adequate to perform the required safety function as long as a single failure does not also occur. Divisions A and B have the largest flow capacity, each consisting of one stage 1 flow path, one stage 2 or 3 flow

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**BASES**

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**ACTIONS (continued)**

path, and one stage 4 flow path. This Condition is equivalent to the worst case single failure of an ADS division.

This Condition is applicable to any combination of two inoperable **required** flow paths, except two stage 4 flow paths. Applicable combinations of three inoperable flow paths include:

- One stage 1, one stage 2 or 3, and one stage 4
- One stage 1 and two stage 2 or 3
- Two stage 1 and one stage 2, 3, or 4
- Two stage 2 or 3 and one stage 4
- Three stage 2 or 3

A Completion Time of 72 hours is reasonable based on the capability of the remaining ADS valves to perform the required safety functions assumed in the safety analyses and the low probability of a shutdown event during this time period. This Completion Time is the same as is used for two train ECCS systems which are capable of performing their safety function without a single failure.

**D.1**

Condition D is applicable, if two **required** stage 4 flow paths are inoperable, more than three **required** flow paths are inoperable, or a combination of three **required** flow paths not listed above (i.e., with a combined flow capacity greater than the largest capacity ADS division) is inoperable.

~~**D.1**~~

If the Required Actions and associated Completion Times **of Condition A, B, or C** are not met or ~~the requirements of LCO 3.4.12 is~~ are not met for reasons other than Condition A, B, or C, the plant must be placed in a MODE in which this LCO does not apply. Action must be initiated, immediately, to **open the RCS pressure boundary** ~~place the plant in MODE 5 with the RCS pressure boundary open and  $\geq$  20% pressurizer level.~~

**BASES**

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**SURVEILLANCE  
REQUIREMENTS**SR 3.4.12.1

The LCO 3.4.11 Surveillance Requirements are applicable to the ADS valves required to be OPERABLE. The Frequencies associated with each specified SR are applicable. Refer to the corresponding Bases for LCO 3.4.11 for a discussion of each SR.

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**REFERENCES**

1. AP1000 Probabilistic Risk Assessment, Appendix A.
  2. **FSAR** Section 19E.4, "Safety Analyses and Evaluations."
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**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.

## 3.4 REACTOR COOLANT SYSTEM (RCS)

## 3.4.12 Automatic Depressurization System (ADS) – Shutdown, RCS Intact

LCO 3.4.12            Nine ADS flow paths shall be OPERABLE.

APPLICABILITY:    MODE 5 with RCS pressure boundary intact.

## ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required stage 1, 2, or 3 ADS flow path inoperable.	A.1 Restore required flow path to OPERABLE status.	7 days
B. One required stage 4 ADS flow path inoperable.	B.1 Restore required flow path to OPERABLE status.	72 hours
C. Two or three required ADS flow paths inoperable with a combined inoperable flow capacity less than or equal to that of a division with the largest ADS flow capacity.	C.1 Restore required flow paths to OPERABLE status.	72 hours

## ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B, or C not met.  <u>OR</u>  LCO not met for reasons other than Condition A, B, or C.	D.1 Initiate action to open the RCS pressure boundary.	Immediately

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.12.1 For flow paths required to be OPERABLE, the SRs of LCO 3.4.11, "Automatic Depressurization System (ADS) - Operating" are applicable.	In accordance with applicable SRs

## B 3.4 REACTOR COOLANT SYSTEM (RCS)

## B 3.4.12 Automatic Depressurization System (ADS) – Shutdown, RCS Intact

**BASES**

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<b>BACKGROUND</b>	A description of the ADS is provided in the Bases for LCO 3.4.11, “Automatic Depressurization System (ADS) - Operating.”
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<b>APPLICABLE SAFETY ANALYSES</b>	<p>For postulated events in MODE 5 with the RCS pressure boundary intact, the primary protection is the Passive Residual Heat Removal Heat Exchanger (PRHR HX). Use of the ADS is not required and is not anticipated. For these events, injection of borated water into the core from the core makeup tanks (CMTs) may be required for makeup or boration. However, the amount of water necessary will not reduce the level in the CMTs to the point of ADS actuation.</p> <p>No LOCAs are postulated during plant operation in MODE 5, however loss of primary coolant through LEAKAGE or inadvertent draining may occur. For such shutdown events occurring in MODE 5 it is anticipated that the ADS will be actuated, allowing injection from the in-containment refueling water storage tank (IRWST) and the containment recirculation if containment flooding occurs (Ref. 2).</p> <p>The ADS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).</p>
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<b>LCO</b>	<p>The requirement that 9 ADS flow paths be OPERABLE assures that upon actuation, the depressurization of the RCS will proceed smoothly and completely, as assumed in the DBA safety analyses.</p> <p>An ADS stage 1, 2, or 3 flow path is considered OPERABLE if both valves in the line are closed and OPERABLE (capable of opening on an actuation signal). In addition, an ADS stage 4 flow path is OPERABLE if the motor operated isolation valve is open and the squib valve is closed and OPERABLE (capable of opening on an actuation signal).</p>
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<b>APPLICABILITY</b>	In MODE 5 with the reactor coolant pressure boundary (RCPB) intact, 9 flow paths of the ADS must be OPERABLE to mitigate the potential consequences of any event which causes a reduction in the RCS inventory, such as a LOCA.

**BASES**

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**APPLICABILITY (continued)**

The requirements for the ADS in MODES 1 through 4 are specified in LCO 3.4.11, “Automatic Depressurization System (ADS) - Operating;” and in MODE 5 with the RCS pressure boundary open and MODE 6 in LCO 3.4.13, “Automatic Depressurization System (ADS) - Shutdown, RCS Open.”

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**ACTIONS****A.1**

If any one required ADS stage 1, 2, or 3 flow path is determined to be inoperable, the remaining OPERABLE required ADS flow paths are more than adequate to perform the required safety function as long as a single failure involving the other required flow path of the same stage does not also occur. A flow path is inoperable if one or two of the ADS valves in the flow path are determined to be inoperable. A Completion Time of 7 days is acceptable since the OPERABLE ADS paths can mitigate shutdown events without a single failure.

If more than one required ADS stage 1, 2, or 3 flow paths are inoperable, Condition C or D is applicable.

**B.1**

If any one required ADS stage 4 flow path is determined to be inoperable, the remaining OPERABLE required stage 4 ADS flow paths are adequate to perform the required safety function as long as a single failure of an additional required stage 4 ADS flow path does not also occur. A Completion Time of 72 hours is reasonable based on the capability of the remaining ADS valves to perform the required safety functions assumed in the safety analyses and the low probability of a shutdown event during this time period. This Completion Time is the same as is used for two train ECCS systems which are capable of performing their safety function without a single failure.

**C.1**

If two or three required flow paths with a combined flow capacity less than or equal to the largest capacity ADS division are determined to be inoperable, the remaining OPERABLE required ADS flow paths are adequate to perform the required safety function as long as a single failure does not also occur. Divisions A and B have the largest flow capacity, each consisting of one stage 1 flow path, one stage 2 or 3 flow

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## BASES

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### ACTIONS (continued)

path, and one stage 4 flow path. This Condition is equivalent to the worst case single failure of an ADS division.

This Condition is applicable to any combination of two inoperable required flow paths, except two stage 4 flow paths. Applicable combinations of three inoperable flow paths include:

- One stage 1, one stage 2 or 3, and one stage 4
- One stage 1 and two stage 2 or 3
- Two stage 1 and one stage 2, 3, or 4
- Two stage 2 or 3 and one stage 4
- Three stage 2 or 3

A Completion Time of 72 hours is reasonable based on the capability of the remaining ADS valves to perform the required safety functions assumed in the safety analyses and the low probability of a shutdown event during this time period. This Completion Time is the same as is used for two train ECCS systems which are capable of performing their safety function without a single failure.

#### D.1

Condition D is applicable, if two required stage 4 flow paths are inoperable, more than three required flow paths are inoperable, or a combination of three required flow paths not listed above (i.e., with a combined flow capacity greater than the largest capacity ADS division) is inoperable.

If the Required Actions and associated Completion Times of Condition A, B, or C are not met or LCO 3.4.12 is not met for reasons other than Condition A, B, or C, the plant must be placed in a MODE in which this LCO does not apply. Action must be initiated, immediately, to open the RCS pressure boundary.

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**BASES**

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**SURVEILLANCE  
REQUIREMENTS**SR 3.4.12.1

The LCO 3.4.11 Surveillance Requirements are applicable to the ADS valves required to be OPERABLE. The Frequencies associated with each specified SR are applicable. Refer to the corresponding Bases for LCO 3.4.11 for a discussion of each SR.

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**REFERENCES**

1. AP1000 Probabilistic Risk Assessment, Appendix A.
  2. FSAR Section 19E.4, "Safety Analyses and Evaluations."
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