

Safety and Relief Valves
3.4.3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY										
SR 3.4.3.1	<p>Verify the safety function lift setpoints of the safety valves are as follows:</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Number of Safety Valves</th> <th style="text-align: center;">Setpoint (psig)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1135 ± 11.3</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">1240 ± 12.4</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">1250 ± 12.5</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">1260 ± 12.6</td> </tr> </tbody> </table>	Number of Safety Valves	Setpoint (psig)	1	1135 ± 11.3	2	1240 ± 12.4	2	1250 ± 12.5	4	1260 ± 12.6	In accordance with the Inservice Testing Program
Number of Safety Valves	Setpoint (psig)											
1	1135 ± 11.3											
2	1240 ± 12.4											
2	1250 ± 12.5											
4	1260 ± 12.6											
SR 3.4.3.2	<p>-----NOTE----- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -----</p> <p>Verify each relief valve is capable of being opened.</p>	24 months										
SR 3.4.3.3	<p>-----NOTE----- Valve actuation may be excluded. -----</p> <p>Verify each relief valve actuates on an actual or simulated automatic initiation signal.</p>	24 months										

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SURVEILLANCE		FREQUENCY
SR 3.5.1.8	<p>-----NOTE----- Vessel injection/spray may be excluded. -----</p> <p>Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.</p>	24 months
SR 3.5.1.9	<p>-----NOTE----- Valve actuation may be excluded. -----</p> <p>Verify the ADS actuates on an actual or simulated automatic initiation signal.</p>	24 months
SR 3.5.1.10	<p>-----NOTE----- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -----</p> <p>Verify each ADS valve is capable of being opened.</p>	24 months
SR 3.5.1.11	Verify automatic transfer capability of the LPCI swing bus power supply from the normal source to the backup source.	24 months
SR 3.5.1.12	Verify ADS pneumatic supply header pressure is ≥ 80 psig.	31 days

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SURVEILLANCE	FREQUENCY
<p>SR 3.6.1.6.1 -----NOTE----- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. -----</p> <p>Verify each low set relief valve is capable of being opened.</p>	<p>24 months</p>
<p>SR 3.6.1.6.2 -----NOTE----- Valve actuation may be excluded. -----</p> <p>Verify each low set relief valve actuates on an actual or simulated automatic initiation signal.</p>	<p>24 months</p>

BASES

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(continued)

SR 3.4.3.2

A manual actuation of each relief valve, including the S/RV, is performed to verify that, mechanically, the valve is functioning properly. This can be demonstrated by the response of the turbine control valves or bypass valves, by a change in the measured steam flow, or by any other method suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the relief valve or the S/RV diverts steam flow upon opening. Sufficient time is therefore allowed after the required pressure and flow are achieved to perform this test. Adequate pressure at which this test is to be performed is 300 psig (the pressure recommended by the valve manufacturer). Adequate steam flow is represented by at least 2 turbine bypass valves open.

This SR can also be met using overlapping tests to confirm valve operability. Under this alternative, a manual valve actuation and valve leakage test is performed at a certified steam test facility. This test is conducted under conditions similar to those in the plant installation, including valve orientation, ambient temperature, valve insulation, and steam conditions. Following valve installation, additional tests are completed to verify proper electrical connection and the functionality of the manual actuation circuitry, without cycling the valve. This alternative provides a complete check of the capability of the valve to open and close.

This SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. Unit startup is allowed prior to performing this test because valve OPERABILITY is verified, per ASME Code requirements (Ref. 5), prior to valve installation. The 12 hours allowed after the required pressure is reached is

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SR 3.4.3.2 (continued)

sufficient to achieve stable conditions for testing and provides a reasonable time to complete the SR. If the S/RV fails to actuate due only to the failure of the solenoid but is capable of opening on overpressure, the safety function of the S/RV is considered OPERABLE.

The 24 month Frequency ensures that each solenoid for each relief valve is tested. The 24 month Frequency was developed based on the relief valve tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 5). Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.4.3.3

The relief valves, including the S/RV, are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify that the mechanical portions (i.e., solenoids) of the relief valve operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TESTs in LCO 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," and LCO 3.3.6.3, "Relief Valve Instrumentation," overlap this SR to provide complete testing of the safety function.

The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note that excludes valve actuation since the valves are individually tested in accordance with SR 3.4.3.2.

(continued)

BASES (continued)

- REFERENCES
1. UFSAR, Section 5.2.2.1.
 2. UFSAR, Section 15.2.3.1.
 3. UFSAR, Section 15.2.2.1.
 4. UFSAR, Chapter 15.
 5. ASME, Boiler and Pressure Vessel Code, Section XI.
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SR 3.5.1.9

The ADS designated valves are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to demonstrate that the mechanical portions of the ADS function (i.e., solenoids) operate as designed when initiated either by an actual or simulated initiation signal, causing proper actuation of all the required components. SR 3.5.1.10 and the LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlap this Surveillance to provide complete testing of the assumed safety function.

The 24 month Frequency is based on the need to perform the Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note that excludes valve actuation since the valves are individually tested in accordance with SR 3.5.1.10.

SR 3.5.1.10

A manual actuation of each ADS valve is performed to verify that the valve and solenoid are functioning properly. This is demonstrated by the response of the turbine control or bypass valve or by a change in the measured flow or by any other method suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the ADS valves divert steam flow upon opening. Sufficient time is therefore allowed after the required pressure and flow are achieved to perform this SR. Adequate pressure at which this SR is to be performed is 300 psig (the pressure

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SR 3.5.1.10 (continued)

recommended by the valve manufacturer). Adequate steam flow is represented by at least 2 turbine bypass valves open. Reactor startup is allowed prior to performing this SR because valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME requirements, prior to valve installation.

This SR can also be met using overlapping tests to confirm valve operability. Under this alternative, a manual valve actuation and valve leakage test is performed at a certified steam test facility. This test is conducted under conditions similar to those in the plant installation, including valve orientation, ambient temperature, valve insulation, and steam conditions. Following valve installation, additional tests are completed to verify proper electrical connection and the functionality of the manual actuation circuitry, without cycling the valve. This alternative provides a complete check of the capability of the valve to open and close.

This SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. The 12 hours allowed after the required pressure is reached is sufficient to achieve stable conditions and provides adequate time to complete the Surveillance. SR 3.5.1.9 and the LOGIC SYSTEM FUNCTIONAL TEST performed in LCO 3.3.5.1 overlap this Surveillance to provide complete testing of the assumed safety function.

The Frequency of 24 months is based on the need to perform the Surveillance under the conditions that apply just prior to or during a startup from a plant outage. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

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SR 3.5.1.11

The LPCI System injection valves and recirculation pump discharge valves are powered from the LPCI swing bus, which must be energized after a single failure, including loss of power from the normal source to the swing bus. Therefore, the automatic transfer capability from the normal power source to the backup power source must be verified to ensure the automatic capability to detect loss of normal power and initiate an automatic transfer to the swing bus backup power source. Verification of this capability every 24 months ensures that AC electrical power is available for proper operation of the associated LPCI injection valves and recirculation pump valves. The swing bus automatic transfer scheme must be OPERABLE for both LPCI subsystems to be OPERABLE. The Frequency of 24 months is based on the need to perform the Surveillance under the conditions that apply during a startup from a plant outage. Operating experience has shown that the components usually pass the SR when performed at the 24 month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.5.1.12

Verification every 31 days that ADS pneumatic supply header pressure is ≥ 80 psig ensures adequate nitrogen pressure for reliable Target Rock ADS valve operation. The accumulator on the Target Rock ADS valve provides pneumatic pressure for valve actuation. The design pneumatic supply pressure requirements for the accumulator are such that, following a failure of the pneumatic supply to the accumulator, at least two valve actuations can occur with the drywell at 70% of design pressure. The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation of the low pressure ECCS. This minimum required pressure of ≥ 80 psig is provided by the ADS pneumatic supply header. The 31 day Frequency takes into consideration administrative controls over operation of the nitrogen system and alarm for low nitrogen pressure.

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BASES (continued)

- REFERENCES
1. UFSAR, Section 6.3.2.1.
 2. UFSAR, Section 6.3.2.2.
 3. UFSAR, Section 6.3.2.3.
 4. UFSAR, Section 6.3.2.4.
 5. UFSAR, Section 15.6.4.
 6. UFSAR, Section 15.6.5.
 7. 10 CFR 50, Appendix K.
 8. UFSAR, Section 6.3.3.
 9. 10 CFR 50.46.
 10. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC), "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
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BASES (continued)

ACTIONS

A.1

With one low set relief valve inoperable, the remaining OPERABLE low set relief valve is adequate to perform the designed function. However, the overall reliability is reduced. The 14 day Completion Time takes into account the redundant capability afforded by the remaining low set relief valve and the low probability of an event occurring during this period in which the remaining low set relief valve capability would be required.

B.1 and B.2

If two low set relief valves are inoperable or if the inoperable low set relief valve cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

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SR 3.6.1.6.1

A manual actuation of each low set relief valve is performed to verify that the valve and solenoids are functioning properly. This can be demonstrated by the response of the turbine control or bypass valve, by a change in the measured steam flow, or by any other method that is suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the low set relief valves divert steam flow upon opening. Sufficient time is therefore allowed, after the required pressure and flow are achieved, to perform this test. Adequate pressure at which this test is to be performed is ≥ 300 psig (the pressure recommended by the valve manufacturer). Adequate steam flow is represented by at least 2 turbine bypass valves open.

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SR 3.6.1.6.1 (continued)

This SR can also be met using overlapping tests to confirm valve operability. Under this alternative, a manual valve actuation and valve leakage test is performed at a certified steam test facility. This test is conducted under conditions similar to those in the plant installation, including valve orientation, ambient temperature, valve insulation, and steam conditions. Following valve installation, additional tests are completed to verify proper electrical connection and the functionality of the manual actuation circuitry, without cycling the valve. This alternative provides a complete check of the capability of the valve to open and close.

The 24 month Frequency was based on the relief valve tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 2). The Frequency of 24 months ensures that each solenoid for each low set relief valve is tested. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. Unit startup is allowed prior to performing the test because valve OPERABILITY is verified by Reference 2 prior to valve installation. The 12 hours allowed after the required pressure and flow is reached is sufficient to achieve stable conditions for testing and provides a reasonable time to complete the SR.

SR 3.6.1.6.2

The low set relief designated relief valves are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify

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SR 3.6.1.6.2 (continued)

that the mechanical portions (i.e., solenoids) of the low set relief function operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.3, "Low Set Relief Valve Instrumentation," overlaps this SR to provide complete testing of the safety function.

The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note that excludes valve actuation. This prevents a reactor pressure vessel pressure blowdown.

REFERENCES

1. UFSAR, Section 6.2.1.3.4.2.
 2. ASME, Boiler and Pressure Vessel Code, Section XI.
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