

DATE: 09/04/01
TIME: 14:31:14

AMEREN/UE
DOCUMENT CONTROL SYSTEM
DOCUMENT TRANSMITTAL

50-483

PAGE: 73
ARDC8801

TRANSMITTAL NUMBER: 474589
TO CONTROL NUMBER: 423U
TITLE: OTHER
DEPT: NUCLEAR REGULATORY COMM.
LOCATION: USNRC-ROCKVILLE
TRANSMITTAL DATE: 20010904

RETURN ACKNOWLEDGED TRANSMITTAL AND
SUPERSEDED DOCUMENTS (IF APPLICABLE) TO:
ADMINISTRATION RECORDS
AMEREN/UE
CALLAWAY PLANT
P.O. BOX 620
FULTON, MO 65251

TRAN	DOC	CODE	TYPE	DOCUMENT	NUMBER	RET	REV	MED	COPY	ALT	ALT	AFFECTED	DOCUMENT
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
R		OTHR	OP	LICENSE		023	022	C	1				
A		CNOT		01-001	TSB			C	1				TECH SPEC BASES

ACKNOWLEDGED BY:

DATE:

A001

September 4, 2001

DIRECTIONS FOR INSERTING AMENDMENT 146 TO TECH. SPEC.

Remove and insert pages as listed below. Dashes (---) in the remove or insert column of the directions indicate no actions required.

REMOVE

OPERATING LICENSE

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(Total Pages 25)~~

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AMENDMENT INDEX**

~~REVISION 99
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(total pages 5)

SPECIFICATION

3.5-10, Amendment 133
3.5-11, Amendment 133

INSERT

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~~REVISION 100
(Total Pages 28)~~

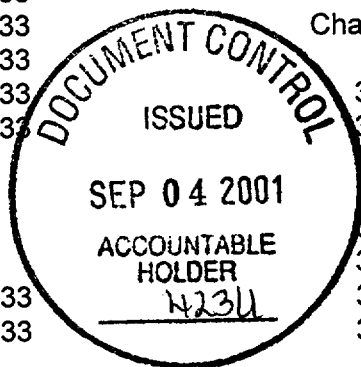
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3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Seal Injection Flow

LCO 3.5.5 Reactor coolant pump seal injection flow to each RCP seal shall be 7.5 ± 0.5 gpm with a 105 (+5, -2) psi differential between the charging header and RCS pressure.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Seal injection flow not within limit.	A.1 Adjust manual seal injection throttle valves to give a flow within limit with a 105 (+5, -2) psi differential between the charging header and RCS pressure.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.5.5.1</p> <p>-----NOTE----- Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at ≥ 2215 psig and ≤ 2255 psig.</p> <p>-----</p> <p>Verify manual seal injection throttle valves are adjusted to give a flow within limit with a 105 (+5, -2) psi differential between the charging header and RCS pressure.</p>	<p>18 months</p>

September 4, 2001

DIRECTIONS FOR INSERTING CN 01-001 REVISION TO TS BASES

Remove and insert pages as listed below. Dashes (---) in the remove or insert column of the directions indicate no actions required.

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INSERT

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SEP 2001
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DOCUMENT CONTROL
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ACCOUNTABLE
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42311

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**SURVEILLANCE
REQUIREMENTS**

SR 3.5.4.2 (continued)

is normally stable and is protected by a low level alarm set above the required water volume, a 7 day Frequency is appropriate and has been shown to be acceptable through operating experience.

SR 3.5.4.3

The boron concentration of the RWST should be verified every 7 days to be within the required limits. This SR ensures that the reactor will remain subcritical following a LOCA. Further, it assures that the resulting sump pH will be maintained in an acceptable range so that boron precipitation in the core will not occur and the effect of chloride and caustic stress corrosion on mechanical systems and components will be minimized. Since the RWST volume is normally stable, a 7 day sampling Frequency to verify boron concentration is appropriate and has been shown to be acceptable through operating experience.

REFERENCES

1. FSAR, Chapter 6 and Chapter 15.
 2. RFR-17070A.
 3. FSAR Section 6.2.1.5 and Table 15.6-11.
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B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 3.5.5 Seal Injection Flow

BASES

BACKGROUND This LCO is applicable to Callaway since the plant utilizes the centrifugal charging pumps for safety injection (SI). The function of the seal injection throttle valves during an accident is similar to the function of the ECCS throttle valves in that each restricts flow from the centrifugal charging pump header to the Reactor Coolant System (RCS).

The restriction on reactor coolant pump (RCP) seal injection flow limits the amount of ECCS flow that would be diverted from the injection path following an accident. This limit is based on safety analysis assumptions that are required because RCP seal injection flow is not isolated during SI.

APPLICABLE SAFETY ANALYSES

All ECCS subsystems are taken credit for in the large break loss of coolant accident (LOCA) at full power (Ref. 1). The LOCA analysis establishes the minimum flow for the ECCS pumps. The centrifugal charging pumps are also credited in the small break LOCA analysis. This analysis establishes the flow and discharge head at the design point for the centrifugal charging pumps. The safety analyses make assumptions with respect to: (1) both the maximum and minimum total system resistance; (2) both the maximum and minimum branch injection line resistance; and (3) the maximum and minimum ranges of potential pump performance. These resistances and ranges of pump performance are used to calculate the maximum and minimum ECCS flows assumed in the safety analyses. The CCP maximum total pump flow SR in FSAR Section 16.5 ensures the maximum injection flow limit of 550 gpm is not exceeded. This value of flow is comprised of the total flow to the four branch lines of 469 gpm and a seal injection flow of 79 gpm plus 2 gpm for instrument uncertainties. The Bases for LCO 3.5.2, "ECCS - Operating," contain additional discussion on the safety analyses. The steam generator tube rupture and main steam line break event analyses also credit the centrifugal charging pumps, but are not limiting in their design. Reference to these analyses is made in assessing changes to the Seal Injection System for evaluation of their effects in relation to the acceptance limits in these analyses.

This LCO ensures that seal injection flow will be sufficient for RCP seal integrity but limited so that the ECCS trains will be capable of delivering sufficient water to match boiloff rates soon enough to minimize uncovering of the core following a large LOCA. It also ensures that the centrifugal charging pumps will deliver sufficient water for a small break

(continued)

BASES

APPLICABLE
SAFETY
ANALYSES
(continued)

LOCA and sufficient boron to maintain the core subcritical. For smaller LOCAs, the centrifugal charging pumps alone deliver sufficient fluid to overcome the loss and maintain RCS inventory. Seal injection flow satisfies Criterion 2 of 10CFR50.36(c)(2)(ii).

LCO

The intent of the LCO limit on seal injection flow is to make sure that flow through the RCP seal water injection line is low enough to ensure that sufficient centrifugal charging pump injection flow is directed to the RCS via the injection points (Ref. 2).

The LCO is not strictly a flow limit, but rather a flow limit based on a flow line resistance. In order to establish the proper flow line resistance, a pressure and flow must be known. The flow line resistance is established by adjusting the RCP seal water injection throttle valves such that flow to the RCP seals is limited to 20 gpm per pump in the event of a large break LOCA. This accident analysis limit is met by positioning the valves so that the flow to each RCP seal is 7.5 ± 0.5 gpm with a 105 (+5, -2) psi differential between the charging header and RCS pressure. Once set, these throttle valves are secured with locking devices and mechanical position stops. These devices help to ensure that the following safety analyses assumptions remain valid: (1) both the maximum and minimum total system resistance; (2) both the maximum and minimum branch injection line resistance; and (3) the maximum and minimum ranges of potential pump performance. These resistances and pump performance ranges are used to calculate the maximum and minimum ECCS flows assumed in the LOCA analyses of Reference 1. The centrifugal charging pump discharge header pressure remains essentially constant through all the applicable MODES of this LCO. A reduction in RCS pressure would result in more flow being diverted to the RCP seal injection line than at normal operating pressure. The valve settings established at the prescribed differential pressure result in a conservative valve position should RCS pressure decrease.

The limit on seal injection flow must be met to render the ECCS OPERABLE. If these conditions are not met, the ECCS flow will not be as assumed in the accident analyses.

APPLICABILITY

In MODES 1, 2, and 3, the seal injection flow limit is dictated by ECCS flow requirements, which are specified for MODES 1, 2, 3, and 4. The seal injection flow limit is not applicable for MODE 4 and lower, however, because high seal injection flow is less critical as a result of the lower initial RCS pressure and decay heat removal requirements in these

(continued)

BASES

APPLICABILITY (continued) MODES. Therefore, RCP seal injection flow must be limited in MODES 1, 2, and 3 to ensure adequate ECCS performance.

ACTIONS

A.1

With the seal injection flow exceeding its limit, the amount of charging flow available to the RCS may be reduced. Under this Condition, action must be taken to restore the flow to below its limit. The operator has 4 hours from the time the flow is known to be above the limit to correctly position the manual seal injection throttle valves and thus be in compliance with the accident analysis. The Completion Time minimizes the potential exposure of the plant to a LOCA with insufficient injection flow and provides a reasonable time to restore seal injection flow within limits. This time is conservative with respect to the Completion Times of other ECCS LCOs; it is based on operating experience and is sufficient for taking corrective actions by operations personnel.

B.1 and B.2

When the Required Action cannot be completed within the required Completion Time, a controlled shutdown must be initiated. The Completion Time of 6 hours for reaching MODE 3 from MODE 1 is a reasonable time for a controlled shutdown, based on operating experience and normal cooldown rates, and does not challenge plant safety systems or operators. Continuing the plant shutdown begun in Required Action B.1, an additional 6 hours is a reasonable time, based on operating experience and normal cooldown rates, to reach MODE 4 where this LCO is no longer applicable.

SURVEILLANCE REQUIREMENTS

SR 3.5.5.1

Verification every 18 months that the manual seal injection throttle valves are adjusted to give a flow within the limit ensures that proper manual seal injection throttle valve position, and hence, proper seal injection flow, is maintained. The seal water injection throttle valves are set to ensure proper flow resistance and pressure drop in the piping to each injection point in the event of a LOCA. The seal injection flow line resistance is established by adjusting the RCP seal water injection throttle valves such that flow to the RCP seals is limited to 20 gpm per pump in the event of a large break LOCA. This accident analysis limit is met by positioning the valves so that the flow to each RCP seal is 7.5 ± 0.5 gpm with a 105 (+5, -2) psi differential between the charging header and RCS pressure.

(continued)

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.5.5.1 (continued)

Once set, these throttle valves are secured with locking devices and mechanical position stops. The Frequency of 18 months is based on engineering judgment and the controls placed on the positioning of these valves. The Frequency has proven to be acceptable through operating experience.

As noted, the Surveillance is not required to be performed until 4 hours after the RCS pressure has stabilized within a ± 20 psig range of normal operating pressure. The RCS pressure requirement is specified since this configuration will produce the required pressure conditions necessary to assure that the manual seal injection throttle valves are set correctly. The exception is limited to 4 hours to ensure that the Surveillance is timely.

REFERENCES

1. FSAR, Sections 6.3 and 15.6.5.
 2. 10 CFR 50.46.
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