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TRM2 - TECHNICAL REQUIREMENTS MANUAL UNIT 2

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ADD MANUAL TABLE OF CONTENTS DATE: 02/11/2009

CATEGORY: DOCUMENTS TYPE: TRM2

A001
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ID: TEXT B3.3.10

REPLACE: REV:1

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B 3.3.10 Reactor Recirculation Pump MG Set Stops

BASES

TRO In the case of recirculation control system failures (e.g., transistors, resistors, etc.) causing upscale signal failure, the reactor is protected by high pressure or high flux scram. Such faults have been analyzed in Chapter 15 and include both MG sets going to full speed simultaneously. For this analysis, the master flow controller is assumed to fail such that it causes a speed increase for both recirculation pumps.

Pump overspeed occurs during the course of a LOCA due to blowdown through the broken loop pump. Design studies determined that rotating component failure missiles caused by the overspeed was not sufficient to cause damage to the containment or to vital equipment, consequently no protective or preventative provision is made for this pump overspeed condition.

No credit is taken for electrical or mechanical stops to limit the speed of the recirculation pumps in these analyzed events.

Normally, operator implementation or procedural controls maintains the recirculation system within the system design limits and initial conditions of analyzed events. The reactor recirculation pump MG set stops are set with some operating margin above these limits. As such, the stops serve as backups to the operator control over normal operation. Additionally, in the event of a fault that results in inadvertent MG set speed increases above the normal operating limits, the stops can provide protection from the automatic reactor scram that terminate the analyzed worse case events. Therefore, the MG set stops also serve to provide additional plant reliability protection.

The electrical stop is the primary means for backing up procedural controls and for automatically limiting recirculation flow. The electrical stop is the MG Set Positioner Controller Program Stop. The mechanical stop provides a diverse and redundant automatic backup to the electrical stop flow limiting mechanism.

ACTIONS The Actions are modified by a Note allowing separate Condition entry for each recirculation pump. The Required Actions provide appropriate compensatory measures for each recirculation loop independent of the other loop.

(continued)

B 3.3.10 Reactor Recirculation Pump MG Set Stops

BASESACTIONS
(continued)A.1

Either the electrical or the mechanical stop can provide backup protection to the procedural controls in place to maintain recirculation pump operation within the system design limits and initial conditions of analyzed events. In the event one of these un-credited backup features is inoperable it is reasonable to extend the restoration time (in the event conditions do not permit more timely corrective action) until the next scheduled required calibration. With the backup protection of the electrical or mechanical stop remaining OPERABLE, backup protection remains and allows time to schedule and plan appropriate repairs. Since there is no assumed credit for either backup function, this Completion Time is considered appropriate.

B.1

With both the electrical and mechanical stops inoperable for any recirculation pump MG set, the automatic backup protection is not available. In this case, the scoop tube is locked in place to protect against unintended / inadvertent speed increases. This action conservatively compensates for lack of backup protection and allows continued operation until at least one MG set stop function (electrical or mechanical) is restored to operable status. The Required Action is modified by a Note allowing intermittent unlocking of the scoop tube. This may be required for power reductions or other power level adjustments. The administrative control consists of stationing a dedicated operator at the controls while the scoop tube is unlocked and the duration should be limited to the time necessary to complete the change in core flow.

TRS

The TRS assures that the stops are demonstrated OPERABLE at least once per cycle. Normal scoop tube positioner calibration is performed after each refueling outage. Inoperable stops are detectable on line during scoop tube positioner calibration.

REFERENCES

1. FSAR Section 5.4.1.4.
2. FSAR Section 7.7.2.3.1.
3. FSAR Section 15.4.5.