

Duke Power Company
McGuire Nuclear Station
Units 1 & 2

Report Number: SD 369-370/79-07

Report Date: September 7, 1979

Facility: McGuire Nuclear Station, Units 1 & 2

Description of Deficiency:

The present Auxiliary Feedwater System (AFS) is a safety related ASME Section III Class 3 system with the exception of the non-safety related condensate quality suction sources which are ANSI B31.1. The AFS pumps are normally aligned to the condensate quality sources with automatic switchover to the safety related Nuclear Service Water (NSW) source.

Recent review of the Auxiliary Feedwater System has identified depressurization cases of multiple steam generators which combined with the most limiting single failure will cause AFS flow increases to the extent that pump runout occurs. The increased flow creates negative suction pressures in the pump suction headers which could lead to air ingestion from the normal non-safety grade source of water.

Analysis of Safety Implications:

Worst case safety consequence is the loss of all AFS Pumps following a multiple steam generator depressurization event combined with the most limiting single failure. This, in combination with loss of normal feedwater, would result in loss of all feedwater.

Corrective Action:

Travel stops will be set on flow control valves to prevent unacceptable pump run-out with all steam generators completely depressurized. The turbine driven AFS pump, rated at 200% design, will be throttled to supply 1/3 design flow to each of three intact steam generators at lowest safety valve set pressure plus 3% accumulation with the fourth steam generator completely depressurized. The two motor driven AFS pumps, rated at 100% design each, together will be throttled to supply 3/8 design flow to each of two steam generators and remaining 1/4 design flow to the third steam generator at lowest safety valve set pressure plus 3% accumulation with the fourth steam generator completely depressurized.

To prevent negative suction pressures, the suction piping will be revised to allow each motor driven AFS pump to be supplied from the corresponding train of NSW with the turbine driven AFS pump supplied from either train. Adequate suction pressure will be available under the most limiting cases of multiple steam generator depressurization and single failure.

Potential AFS pump runout problems resulting from multiple steam generator depressurization will be considered in the design of future plants.

1026 337

7909260 375