

SECTION 10

STEAM AND POWER CONVERSION SYSTEM

10.1 SUMMARY DESCRIPTION

The Steam and Power Conversion System operates as a closed, condensing cycle with six stages of regenerative feedwater heating. Turbine exhaust steam is condensed in a triple shell, surface-type condenser and returned to the steam generators through two stages of feedwater pumping. The entire system is designed to receive and transfer the heat absorbed from the Reactor Coolant System following an emergency shutdown of the turbine generator from a full load condition. Heat rejection under this condition is accomplished by turbine bypass to the condenser and steam generator pressure relief to the atmosphere.

Means are provided to monitor and restrict the migration of radioactivity to the main condenser or to the environment such that the limits of 10CFR20 are not exceeded under normal operating conditions.

The main steam lines of the power conversion system convey the steam leaving the steam generators to the turbine throttle valves with less than 40 psi pressure drop when the turbine is operating at maximum load.

The Turbine Bypass and Pressure Relief Systems dissipate the heat from the Reactor Coolant System following a full load trip.

A turbine steam bypass system is provided to convey 40 percent of the steam developed in the steam generators to the main surface condenser. The remaining 60 percent can be exhausted to the atmosphere through a pressure relieving system which passes the maximum calculated steam generator output.

The steam generator feed pumps are designed for normal full load operating conditions and are also capable of supplying the required flow of feedwater to the steam generators under transient load rejection conditions. Auxiliary feed pumps are also provided to ensure complete reactor decay heat removal under all fault conditions including loss of power.

The main turbine generator and its component systems are designed to withstand larger instantaneous load changes than the Nuclear Steam Supply System. Because of this, the design capabilities for handling transient conditions such as loss of electrical load are not limited by the Steam and Power Conversion Systems. The exact operating functions are based upon the maximum rate of load change dictated by the Reactor Systems both with and without control rod actuation.