Westinghouse Technology Systems Manual

Section 11.4

Moisture Separator Reheater Control

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11.4 MOISTURE SEPARATOR REHEATER CONTROL

11.4.1 Introduction

The moisture separator reheater (MSR) control system ensures proper heating of the low pressure turbine during cold startups, ensures a minimum differential between the inlet steam and low pressure turbine metal temperatures during hot startups, and provides a smooth decrease in low pressure turbine inlet steam temperature to 400°F after a large load shed from a high power level. These functions are accomplished through the control of the MSR outlet steam temperature.

11.4.2 System Description

After the exhaust steam from the high pressure turbine passes through the moisture separator section of an MSR, the steam enters a two-stage heater section for the addition of superheat. The first-stage heating medium is extraction steam from the high pressure turbine. This steam supply is not regulated. The second-stage heating medium is high pressure steam from the main steam header. This steam supply is regulated by flow control valves to control the temperature of the steam at the outlet of the MSRs.

Figure 11.4-1 shows the operator's panel for the MSR controls. The top of the panel has a row of pushbuttons. Below that is a row of valve status lights for the flow control valves that regulate the main steam flow to the second-stage heater bundles of the MSRs. At the bottom of the panel are three meters, one meter for each low pressure turbine. Each meter indicates the steam inlet temperature supplied to its associated turbine. A status light illuminates when a preset temperature limit has been exceeded and a knob located in the lower right of the panel is provided for manual control.

The POWER ON pushbutton turns the controller on and off. During the performance of a cold startup, the RAMP pushbutton is pushed at 35% of rated power. After this the ramp pushbutton is depressed the flow control valves are opened over a one-hour period. This provides a uniform temperature increase. For a hot startup, the HOT START pushbutton is pushed; the valves are opened quickly, and maintain a low pressure turbine inlet temperature of 400°F to prevent cooling of the low pressure turbine inlet. The 400°F pushbutton is also used during extended low power operations to prevent overheating of the low pressure turbine exhaust sections. MANUAL transfers control to the knob at the bottom of the panel. RESET clears the controller.

After a large load reduction to 10% power or below, the MSR control system automatically positions the second-stage heating flow control valves to maintain a steam temperature of 400°F at the low pressure turbine inlet.

11.4.3 Summary

The inlet temperature to the low pressure turbines is controlled by regulating the flow of high pressure heating steam to the second-stage heater bundles of the MSRs. Steam flow is controlled by flow control valves. The control system will ramp open the valves automatically or maintain a low pressure turbine inlet temperature of 400°F. The valves can also be controlled manually.

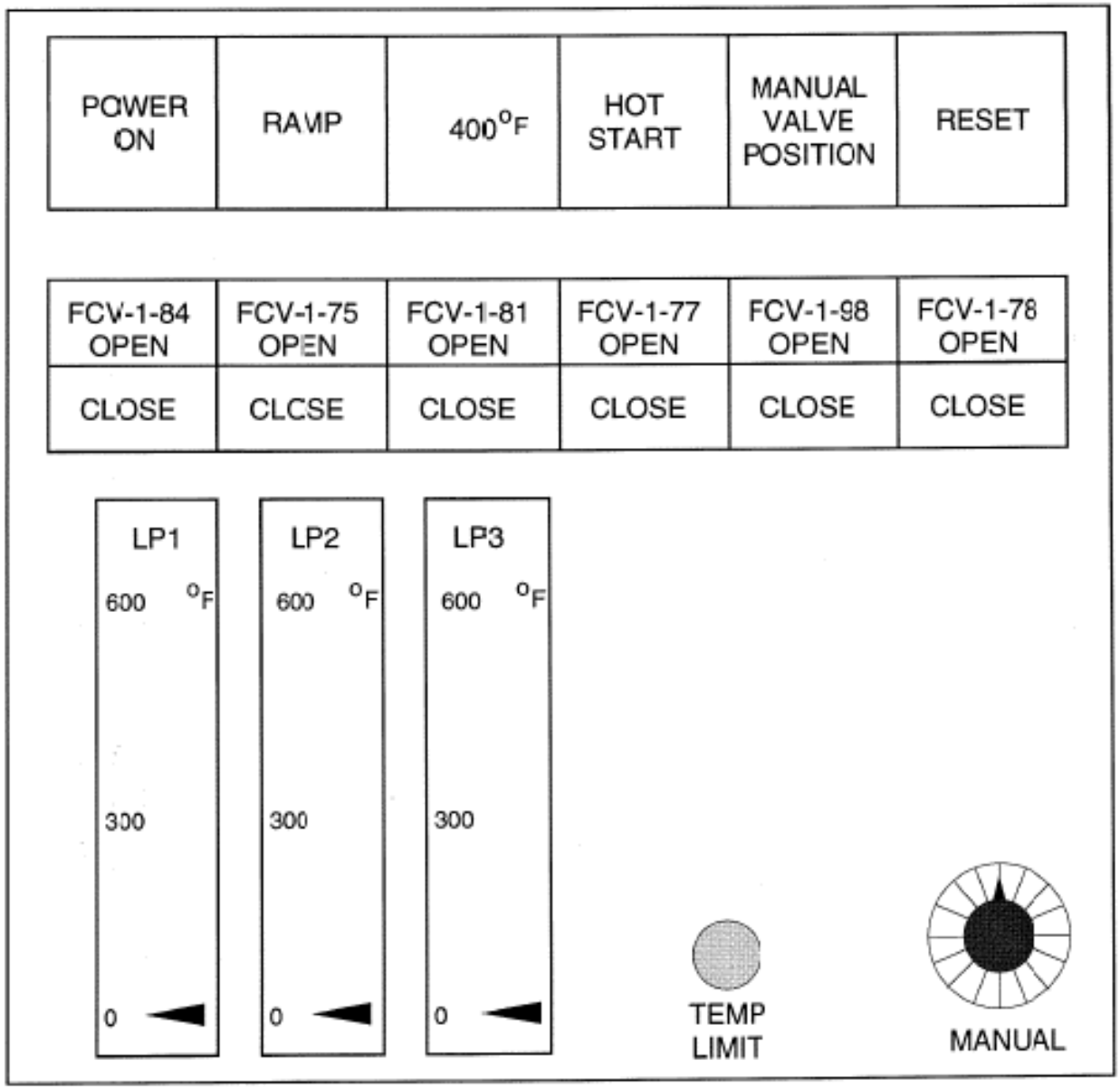

Figure 11.4-1 Reheater Control Panel