Revised Pages

for

Safeguards Report for the
Supercritical Technology Program

These revised pages incorporate modifications to the Supercritical Loop as described in the Safeguards Report

A. Safeguards Report for the Supercritical Technology Program

1. Revised page II-2: 1

   The high pressure gas compressor has been relocated to the C&A building to allow accessability for maintenance.

2. Revised page II-4: 13

   The coolant leakage is piped through a filter to the deaerator via the system collection header for return to the loop. This provides for chemistry control of the returned water by the deaerator.

3. Revised page II-5: 2

   LI-X4 has been deleted.

4. Revised pages II-5: 3 and added page II-5: 4a

   This reflects the addition of a coolant reservoir refill tank. The addition of this tank permits remote refilling of the coolant reservoir while the loop is in operation and access to the containment is restricted.

5. Revised page II-5: 5

   Reflects change in relief valves set pressures per Change No. 26.

6. Revised page II-5: 7

   Each sample stream flows through a sample cooler, then through a pressure reducing restriction into a mixed bed sample ion exchanger. The sample pressure reducing valves have been replaced by capillary tubing restrictions to eliminate the uncertainity of letdown valve operational reliability for such low volume flows.

7. Revised page II-6: 1

   Changed the vacuum pump seal water reservoir drain from the deaerator to the discharge tank.

8. Revised page II-6: 2

A low pressure supply of air is provided, as required, to provide an excess of oxygen for recombination of any excess hydrogen produced. In addition, a sample point is provided in the discharge line from the vapor container to periodically sample the off-gases from the loop.

9. Revised page II-7: 1

Reflects changes to heater controller, QC-X1. The signals from flow controller, FRC-X1; heater inlet temperature recorder, TRC-X10; and the heater power recorder, QRC-X3 have been eliminated. This leaves the temperature control system dependent only on the output temperature of the heater and is not affected by variations from flow recorder-controller, FRC-X1. The comparison part of the control which compared thermal output of the heater with electrical power used by the heater has been eliminated. It served no useful purpose and was a unnecessary part of the control system.

10. Revised page II-7: 2

Reflects a change in the control function of flow controller, FRC-X1. Flow is no longer automatically controlled by temperature variations in the pressure tube, but is an independent variable controlled by a set point value in the controller. The total heat generated in the fuel assembly, compared to the total in the loop, is so small that adjusting flow to vary with fuel outlet temperature serves no useful function.

11. Revised page II-7: 3

Reflects change in the control function of flow controller, FRC-X1, during partial loss-of-flow accident. The flow set points that define the accident are intended to protect the experiment. Flow is now independent of temperature variations and will be set by design calculations prior to operation.

12. Revised page II-7: 4

Reflects change in control function of loop flow controller FRC-X1 during total loss of flow accident. The loop flow controller now functions as an independent variable as does temperature and pressure. In the loss-of-flow accident the pressure control valve PRC-X6 continues to act as a pressure control valve. As soon as the flow is stopped, the loop starts to depressurize and PRC-X6 begins to close

while the loop flow controller, FRC-X1 continues to act as a flow controller. The loop pump by-pass valve therefore continues to receive a control signal. A total flow blockage is prevented by a mechanical limit on the pressure control valve PRC-X6. This prevents the valve from closing beyond the minimum flow requirement for cooling of the experimental fuel.

13. Revised page II-7: 5

Reflects change in the control function of loop pressure controller, PRC-X6. The pressure controller, PRC-X6, maintains pressure control of the loop during a loss-of-flow emergency. The flow controller, FRC-X1, no longer takes over this function as previously described. The purpose of this change is to maintain control of both flow and pressure during the emergency and not increase the rate at which the loop would tend to depressurize. Operating PRC-X6V as a flow control would increase the rate of depressurization by opening the valve in attempting to maintain flow.

14. Revised page II-7: 6

Control function of TRC-X4 has been deleted.

15. Revised page II-7: 9

A burnout feature has been added temperature recorder TR-X1-12.

16. Revised page II-7: 15

Reflects changes in the control function of deaerator level controller, LIC-X3.

17. Revised page II-7: 16

The by-pass valves HC-X21 and HC-X22 have been removed from the system to reduce potential loop operational difficulties such as leakage of split body valves at supercritical conditions.

18. Revised pages III-1: 1 and III-1: 2

Reflects changes in the loop startup procedure.

19. Revised page III-2: 1

Reflects changes in loop operation at supercritical pressure and temperature. The loop flow is now preset at a fixed value and the heater power is varied according to the fuel outlet temperature. With only one variable, temperature control will be easier and less subject to instruments hunting for a control point. In addition, power calculations for the fuel will be much simpler with a fixed flow. To prevent starving the fuel, preset set points turn off the heater on low flow and scram the reactor on loss-of-flow.

20. Revised page III-3: 1

Reflects changes in the loop shutdown procedures.

21. Revised page III-4: 3

Reflects changes to the loop cleanup and decontamination procedures.

22. Revised page III-5: 1

Reflects change in the function of loop pressure control valve, PRC-X6V on loss of flow.

23. Revised Figures 1 and 2.

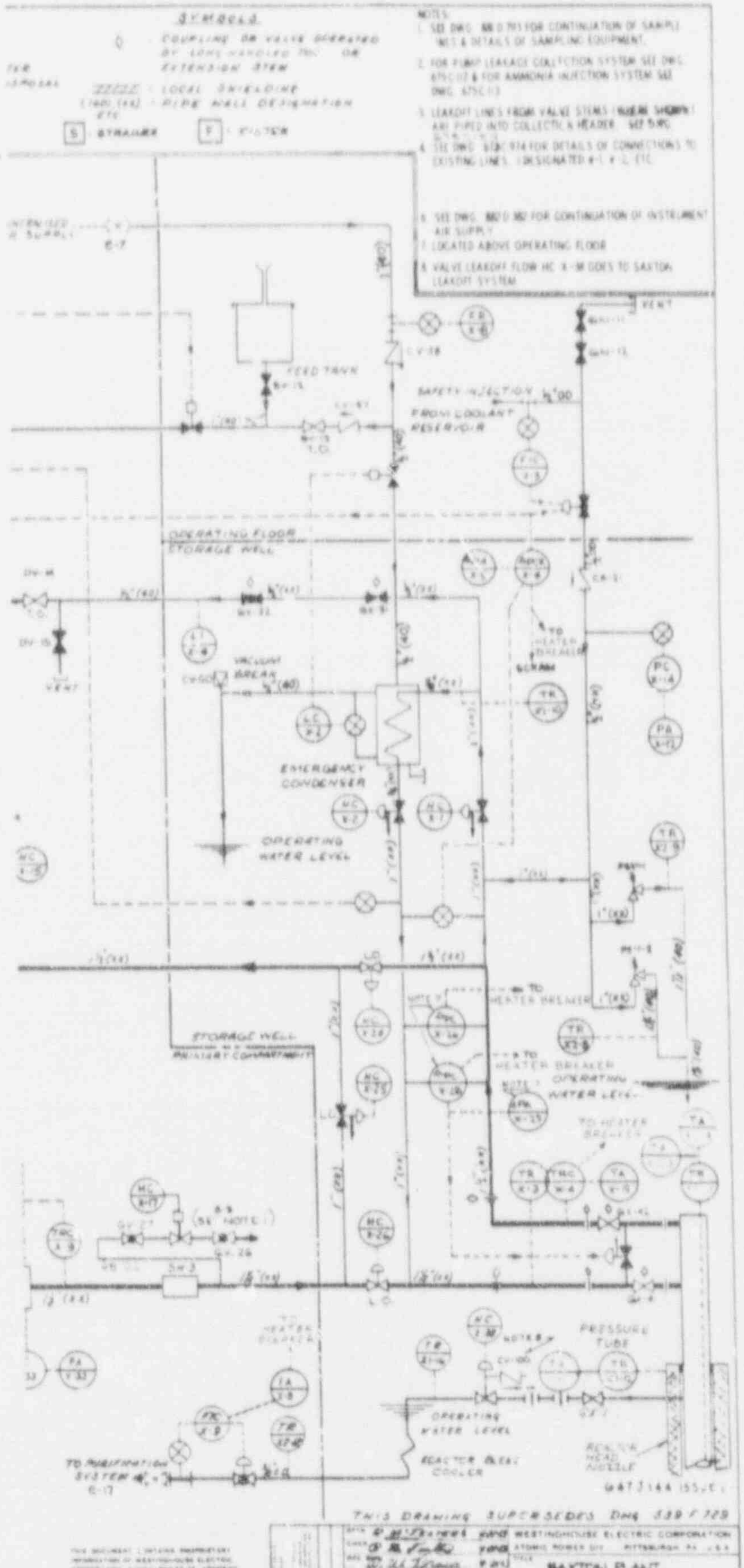
SYMBOLS
NOTES:
7. LOCATED ABOVE OPERATING FLOOR
FEED TANK
SAFETY INJECTION
FROM COOLANT RESERVOIR
OPERATING FLOOR
STORAGE WELL
VACUUM BREAK
EMERGENCY CONDENSER
OPERATING WATER LEVEL
VENT
TO HEATER BREAKER
PRESSURE TUBE
REACTOR HEAT COOLER
THIS DRAWING SUPERSEDES DWG 539 F 729
WESTINGHOUSE ELECTRIC CORPORATION
SAXTON PLANT
PROCESS FLOW DIAGRAM
647 J 144

Figure 1

Rev. 01

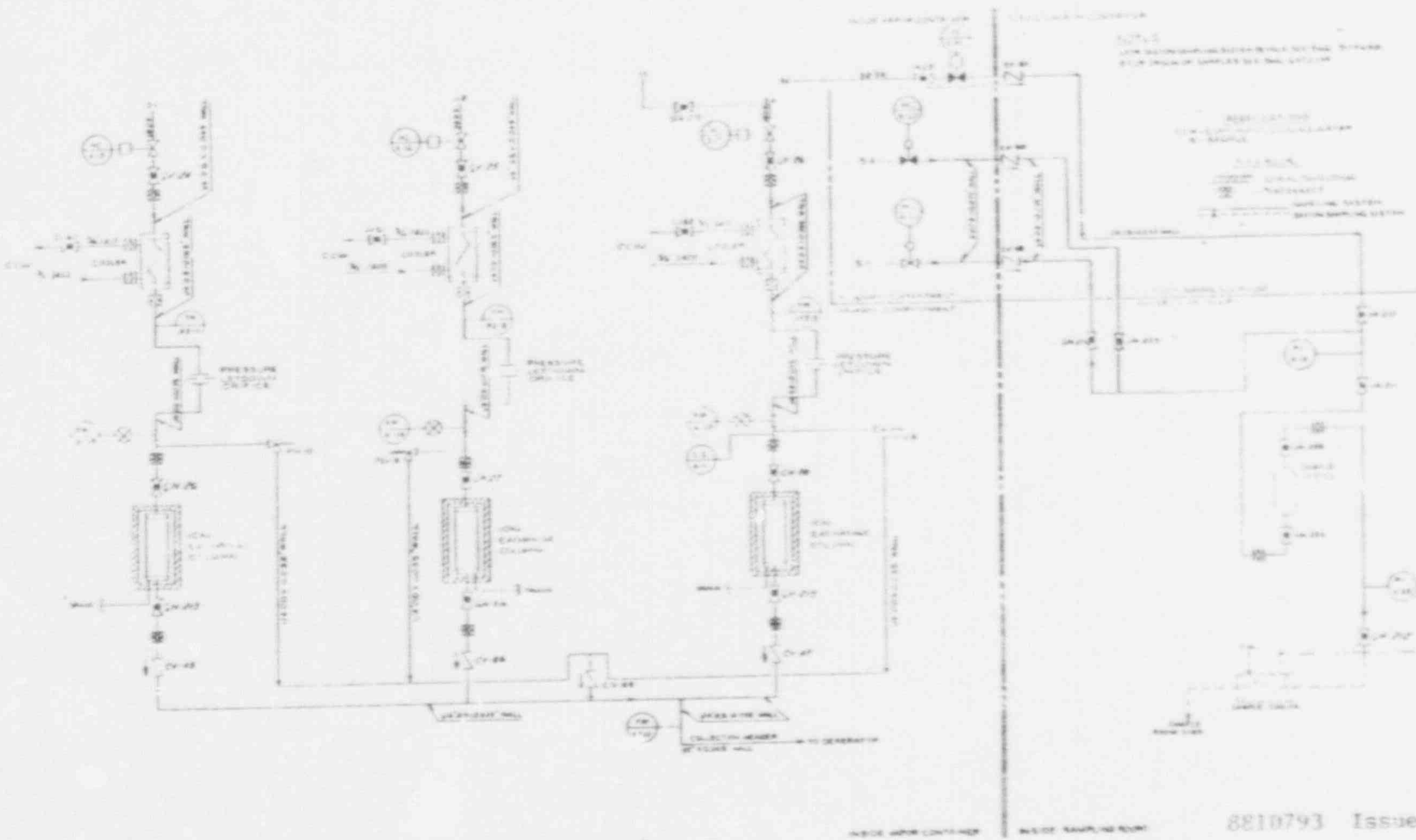

FIGURE 2
SAMPLE SYSTEM FLOW DIAGRAM