

SPECIAL REPORT

Subject: Operation of Overpressure Protection System

Occurrence Date: April 13, 1979

Facility: H. B. Robinson Steam Electric Plant
Unit No. 2
Hartsville, South Carolina 29550
Docket No. 50-261

Initial Plant Conditions:

Proceeding to cold shutdown prior to refueling.

RCS Pressure = 330 psig.

RCS Temperature = 143°F.

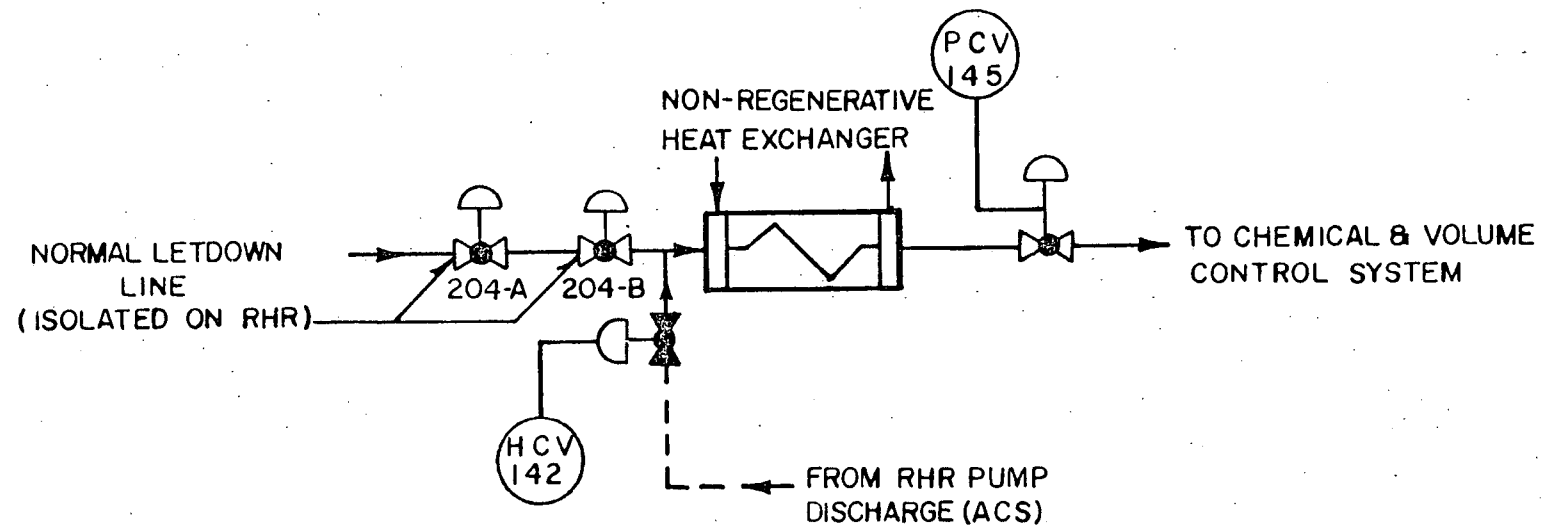
RHR Flowrate - 3100 gpm.

Overpressure Protection System - in service and armed.

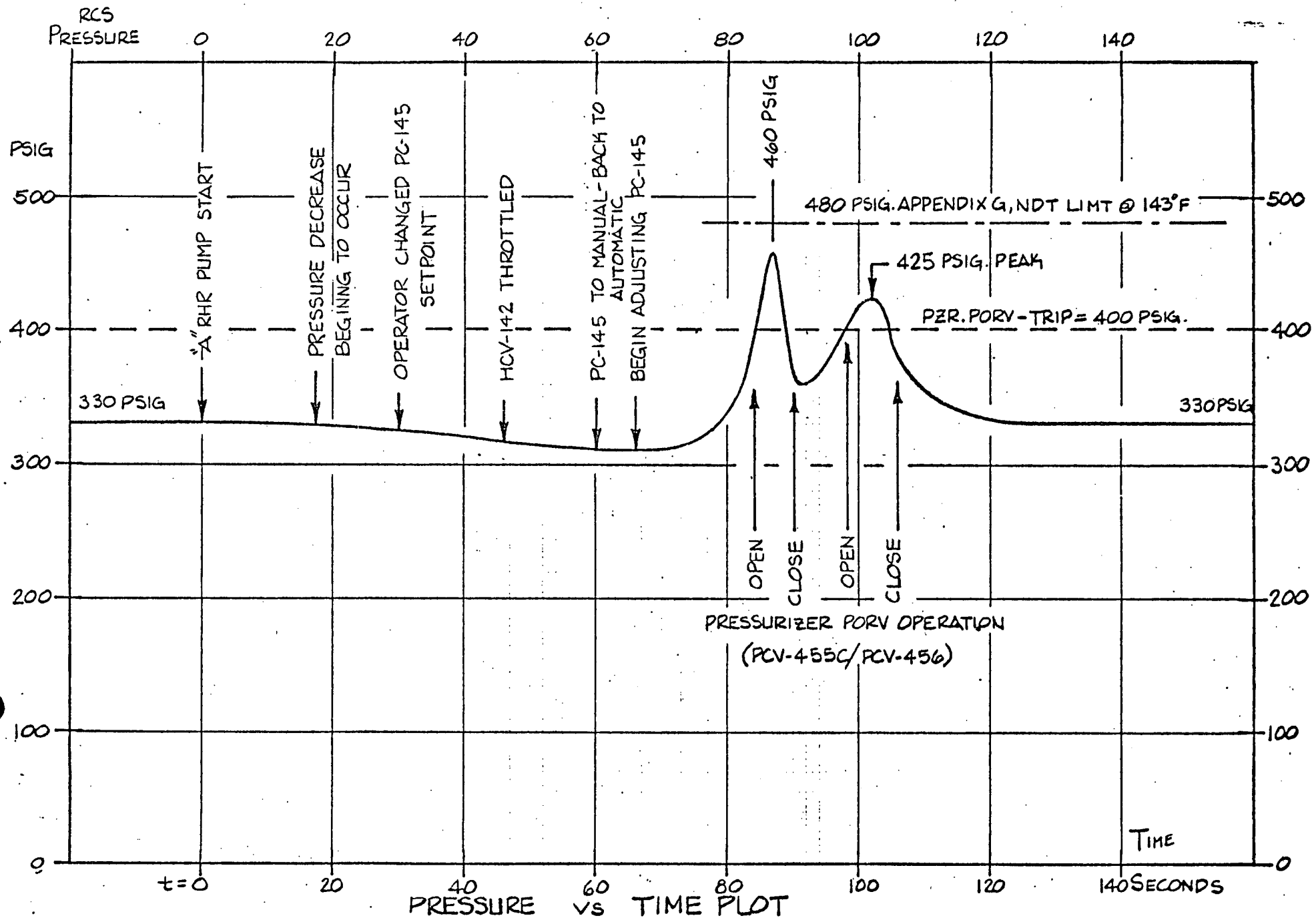
Event: (Reference Attached Drawing)

At 0830 hours, April 13, 1979, it was determined that the cooldown rate had slowed to 4°F per hour or less and that additional RHR flow would assist in maintaining a cooldown rate closer to the 5°F per hour allowed. At 0840 hours, 'A' RHR pump was started to increase the cooldown rate. The RHR pump discharge header experienced a pressure increase resulting in a higher flowrate through HCV-142 and PCV-145. This started a decrease in pressure which PCV-145, the letdown line pressure control valve, was slow to respond to. The operator was concerned about minimum system pressure for reactor coolant pump operation and therefore, increased the controller setpoint for PCV-145 which causes it to close, in an attempt to maintain system pressure. The operator also partially throttled HCV-142, the control valve on the RHR pump discharge to aid in maintaining system pressure. When the pressure began to turn around, PC-145, the controller for PCV-145 valve was electrically saturated closed. The operator then switched PC-145 to manual then back to automatic to unsaturate the controller and then began adjusting it back to its original setting, thereby opening PCV-145 valve. Before PCV-145 valve could travel to the open controlled position, RCS pressure spiked to 460 psig on PR-444 and PI-402, exceeding the 400 psig setpoint of the Overpressure Protection System. The protection system actuated opening the pressurizer PORV's (PCV-455C and PCV-456) to relieve the transient. The operator noted that the valves opened twice in succession after which RCS pressure stabilized by PC-145 at 330 psig, the original setpoint. Cooldown then proceeded in a normal manner. The attached pressure/time plot gives a view of the pressure transient in detail. The Appendix G, NDT curve in effect for Unit No. 2 at this time period reveals a limit at 143°F of 480 psig. Therefore, it should be noted that the Overpressure Protection System performed according to design and prevented the pressure transient from exceeding the Appendix G limit. Instrumentation tolerances were included in the values reported herein in order to obtain the "worst case" margin of peak transient pressure approach to Appendix G limit.

As corrective action, Operations personnel will review the details of this event in an effort to preclude recurrence.



FLOW PATTERN



French Brosius
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