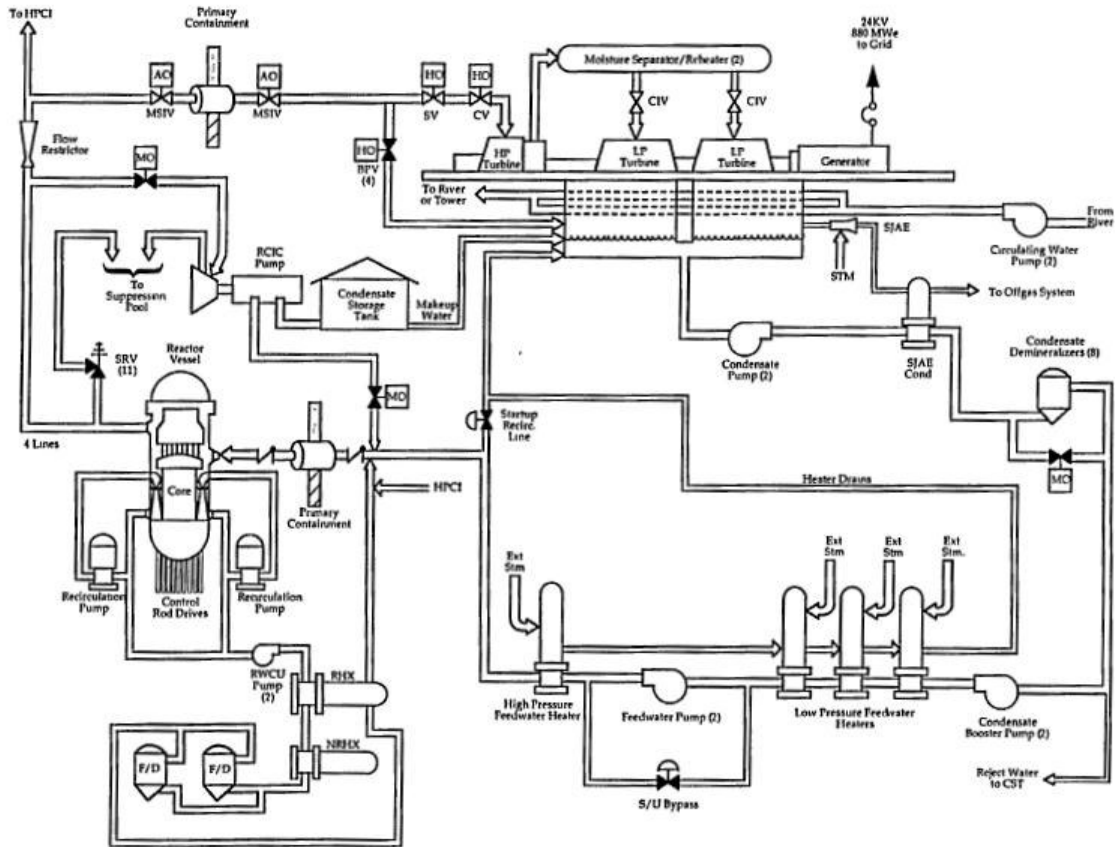




LA SALLE'S SITE AREA EMERGENCY - UPDATE

On February 20, 2006, a Site Area Emergency was declared at the LaSalle Unit 1 nuclear facility when three control rods failed to indicate full insertion after an automatic shut down signal. UCS's first Issue Brief on this event stated that the problem began when the turbine tripped during a planned shut down. Information released by the Nuclear Regulatory Commission after that Issue Brief provides additional insights into what triggered the event. This Issue Brief update provides information on what triggered the sequence of events leading to the Site Area Emergency.



Simplified BWR Primary and Auxiliary Systems

The control room operators at LaSalle had reduced the speed of the two recirculation pumps and inserted many of the control rods into the reactor core to reduce the power level to about six percent of full power. They had manually tripped the turbine earlier during the controlled shut down. The steam being produced by the reactor flowed through four steam pipes from the reactor vessel towards the turbine. With the turbine tripped, the Stop Valve (labeled 'SV' in the diagram) and Control Valves ('CV') were closed and the Bypass Valves ('BPV') were open to enable the steam to bypass the turbine and go straight to the

condenser. The steam was cooled down and converted back into water. Condensate pumps and feedwater pumps returned the water to the reactor vessel.

A malfunction by the electro-hydraulic system (EHC) used to control the turbine valves resulted in the bypass valves ('BPV') fully opening. Normally, the bypass valves are partially open as needed to match the steam flow rate. When they inadvertently fully opened, the pressure inside the reactor vessel dropped. A sensor detected low pressure in the steam pipes and triggered an automatic closure of the main steam isolation valves ('MSIV') between the reactor vessel and the turbine and an automatic shut down of the reactor.

The closure of the main steam isolation valves eliminated the normal destination for the steam produced by the reactor. The backup destination for the steam was the suppression pool – a large body of water inside containment intended to function as a heat sink for the reactor's heat during transients and accidents – via the safety relief valves ('SRV').

The malfunction causing the bypass valves to open has not been identified, or at least not been reported, as of today. LaSalle's owner, Exelon Corporation, may find the answer in a very similar event occurring on December 21, 2002, at another of the Exelon nuclear plants. On that date, the Peach Bottom Unit 2 nuclear facility in Pennsylvania had the bypass valves fully open, the reactor pressure drop too low, and the main steam isolation valves close to trigger an automatic reactor shut down. That event was caused by a failed Steam Line Resonance Compensation Card malfunction (a.k.a. circuit card failure). The circuit card that failed at Peach Bottom had been installed three months earlier *"to enhance overall reliability of the EHC [electro-hydraulic control] system. However, an unknown manufacturing defect caused the failure approximately 3 months after the card was in service."*¹

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¹ Letter dated February 7, 2003, from Gordon L. Johnston, Plant Manager, Exelon Corporation, to Nuclear Regulatory Commission, "Licensee Event Report, Peach Bottom Atomic Power Station Unit 2."