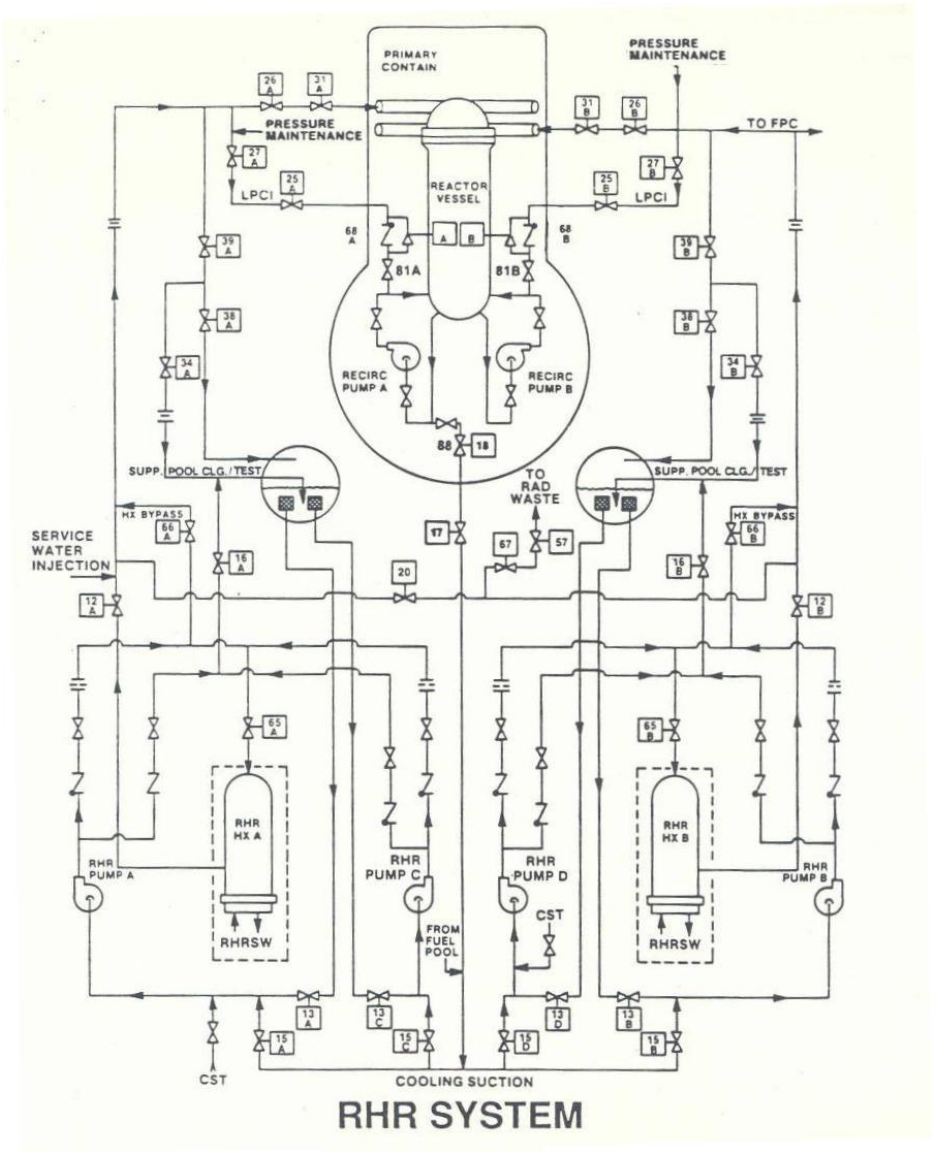
Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions
issue brief

THE LATEST, BUT NOT LAST, HOPE CREEK EVENT

Nuclear Regulatory Commission (NRC) Daily Event Report No. 41753 provided preliminary information about an emergency declared on Tuesday, June 7, 2005 at the Hope Creek Generating Station in New Jersey. Operators manually shut down the Hope Creek reactor from full power after indications that leakage inside the drywell (the name for the inverted lightbulb-shaped concrete structure surrounding the cylindrical reactor vessel) increased above allowable limits. Those indications included a rising level of water in the bottom of the drywell confirmed by increasing pressure of the atmosphere inside the drywell. The operators encountered no complications, this time, in shutting down the reactor.

Workers entered the drywell and observed a 20-foot plume of steam jetting from the shutdown cooling testable check valve on the "A" loop. The diagram to the right shows the affected systems for the Cooper Nuclear Station, a plant similar to Hope Creek. The shutdown cooling testable check valve is located above the valve labeld 81A to the left of the reactor vessel in the diagram. The testable check valve allows water to flow through piping in only one direction – in this case, it allows water to flow into the recirculation piping but does not allow water to leave it. The valve is testable so that operators can periodically verify that it can open if required and has not become wedged closed or anything.

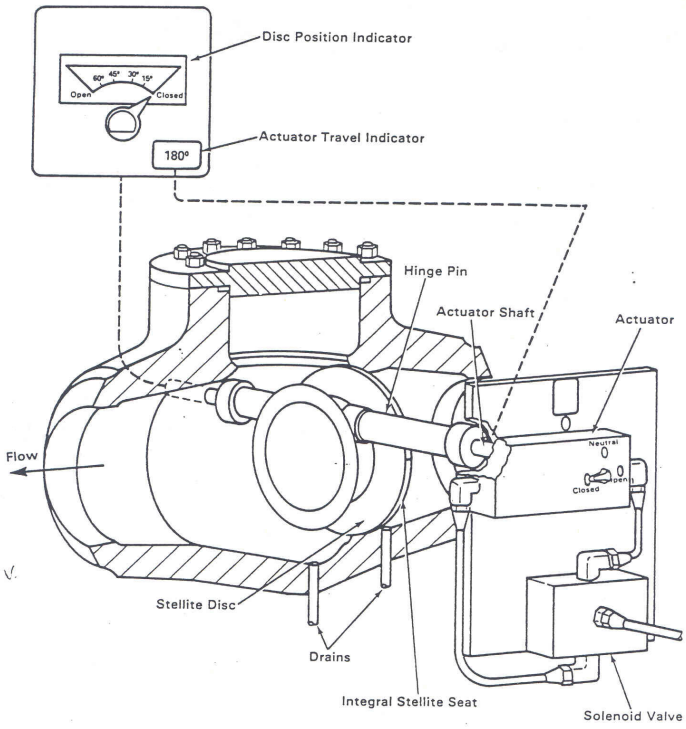


When Hope Creek is operating, the heat produced by the nuclear fuel is removed by the steam leaving the reactor vessel and flowing to the turbine. When the reactor is shut down and the turbine is taken offline, the shutdown cooling (SDC) mode of the Residual Heat Removal (RHR) system can be used to remove the heat emanating from the reactor. In SDC mode, valves 17 and 18 (directly below the reactor vessel in the diagram) are opened. If the "A" train of RHR is used, then RHR pump "A" and/or "C" routes water through RHR heat exchanger "A" and returns the cooled water to the "A" recirculation loop through the testable check valve. If the "B" train of RHR is

Washington Office: 1707 H Street NW Suite 600 • Washington DC 20006-3919 • 202-223-6133 • FAX: 202-223-6162
Cambridge Headquarters: Two Brattle Square • Cambridge MA 02238-9105 • 617-547-5552 • FAX: 617-864-9405
California Office: 2397 Shattuck Avenue Suite 203 • Berkeley CA 94704-1567 • 510-843-1872 • FAX: 510-843-3785

used, RHR pump "B" and/or "D" with RHR heat exchanger "B" returns cooled water to the "B" recirculation loop.

Workers at Hope Creek aligned the "B" train of RHR for shutdown cooling and took steps to close manually operated valves around the testable check valve on the "A" loop to end the leak.



The diagram to the left shows a typical testable check valve. The valve's disc is connected to a hinge pin. Water can swing the disc open in the permitted flow direction. Backflow is not permitted because the disc blocks flow in that direction. An actuator is connected to the hinge pin so the disc can be opened for testing even when there is no water flow in the right direction.

The source of the 20-foot plume of steam from the leaking testable check valve at Hope Creek has not been publicly reported. There are several candidate locations: cracks in the welds joining the valve to the upstream or downstream piping, drain leaks, and cracks in the valve's body to name a few.

Hope Creek has experienced more than its fair share of leaks recently. They are byproducts of years of improper maintenance by PSEG and ineffective oversight by the NRC. As a direct result, safety levels at Hope Creek are lower and operating costs are higher than is necessary. The NRC's present course of inaction seems confined to merely monitoring things at Hope Creek while the "sins of the past" flush themselves out a leak and a break at a time, all the while crossing their fingers hoping that one of these events does not escalate into a Three Mile Island accident. The NRC should drop its Sergeant Schultz behavior and become what the public needs – an aggressive nuclear cop on the beat.

Prepared by: David Lochbaum