

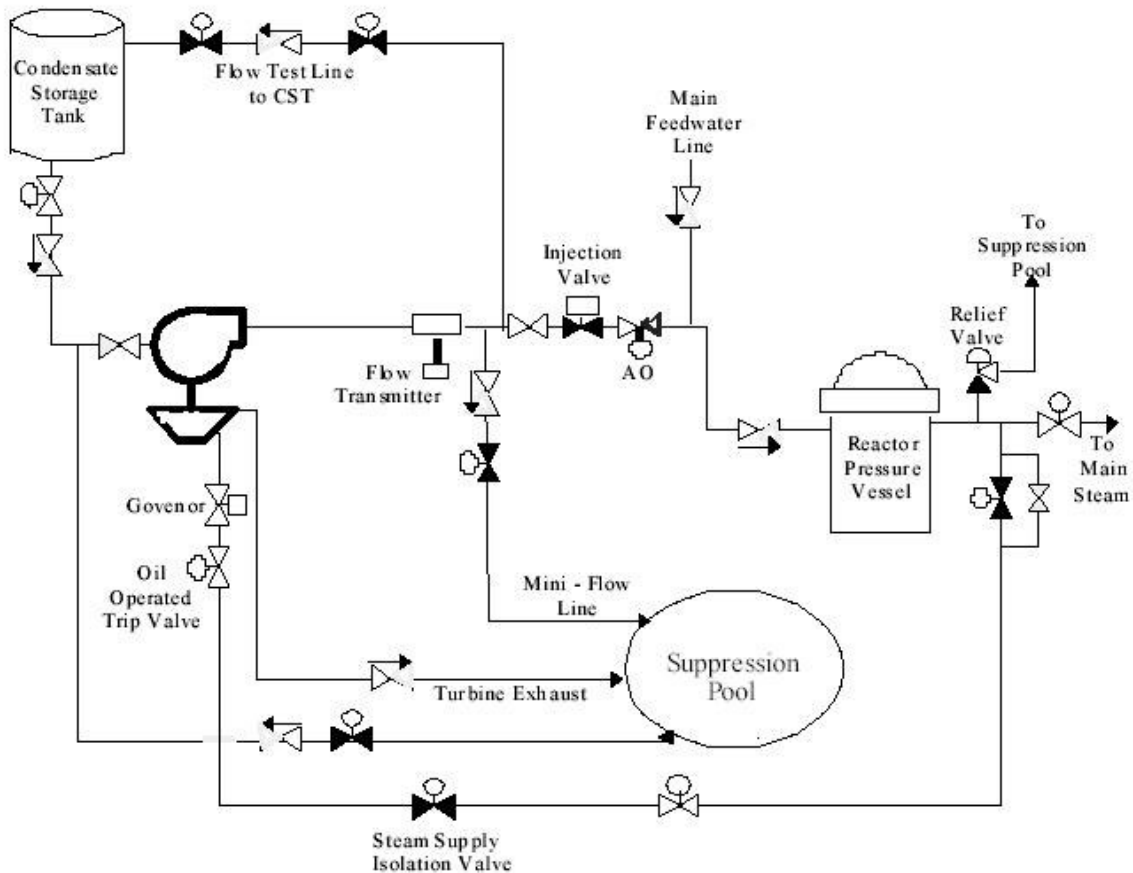


## Pipe Leak at Dresden

### Background

The high pressure coolant injection (HPCI) system for boiling water reactors like the Dresden nuclear plant in Illinois provides makeup water to the reactor vessel to cool the nuclear fuel in event of an accident. The HPCI system has a steam-driven pump. As indicated in the graphic, steam produced by the heat from the reactor core spins a turbine connected to the pump. Steam leaving the turbine flows to the suppression pool. The HPCI pump normally transfers water from the condensate storage tank – an outdoor tank containing over 100,000 gallons of water – to the reactor vessel. If the condensate storage tank empties or the suppression pool level gets too high, the HPCI pump will swap over to get its water from the suppression pool instead of the condensate storage tank. The suppression pool contains over 1,000,000 gallons of water.

The supply piping for the HPCI system is buried underground as it transits between the condensate storage tank located outdoors and the reactor building. Consolidated Edison, the former owner of the Dresden nuclear plant, periodically sampled the water in wells drilled onsite to verify that radioactive water had not leaked from this buried pipe and other sources. But UCS has been told that this sampling was discontinued in 1993.



### **Discovery**

In summer 2004, an earthquake shook the Midwest. The earthquake was detected at the Dresden nuclear plant. In response, workers took samples of water from onsite wells and storm drains to check for water leaking from components damaged by the earthquake. Tritium, a radioactive isotope of water, was detected in the samples on August 30, 2004. On September 3, 2004, workers excavated the area around part of the HPCI supply piping but were unable to locate the leaking section. Exelon, the current owner of Dresden, plans to reroute the piping and abandon part of it in place.

### **Problems**

The good news is a pathway for radioactive water to reach the environment without being monitored or controlled has been finally found. Had the earthquake not prompted a look, the leaks may have continued undetected for many years.

The bad news is that the pathway has not yet been fixed. Because sampling of water in onsite wells and storm drains was reportedly discontinued in 1993, no one knows when the HPCI piping began leaking. Without knowing when the leakage began, no one knows if the ground around Dresden was contaminated by radioactive water leaking from one spot for up to 11 years or from many spots for a shorter period.

The bad news is compounded by equipment problems at Dresden. The isolation valves in the HPCI pipe do not close tightly. If they did (as isolation valves typically do), workers at Dresden could pressurize the pipe and monitor it. If the pressure remained constant, it would signify the piping was intact. If, however, the pressure dropped, it would signify that the piping was leaking and the rate of the pressure drop would indicate the size of the pipe leak(s).

The worst news is that Dresden's owners discontinued a sampling program in 1993 and the NRC allowed them to do it. The easiest way to miss signs of an emerging problem is not to look for them. The NRC must re-evaluate its reasons for allowing Dresden and other sites to stop sampling programs.

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