



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

February 13, 2004

Mr. James K. Heller
United States Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60532-4351

SUBJECT: ALLEGATION OF SERVICE WATER SYSTEM DESIGN ERROR AT THE DAVIS-BESSE NUCLEAR POWER STATION

Dear Mr. Heller:

On February 10, 2004, I received a report about a design problem at Davis-Besse that may not yet have been corrected. I made an effort to search the publicly available documents to determine if this design problem had been corrected. Unfortunately, the public record is more sufficiently detailed to allow me to ascertain its current status. Because this design problem, if it still exists, adversely affects safety margins at Davis-Besse, I have little choice but to exercise the allegations process to resolve the concern.

The design problem is in the service water system. According to the information in Revision 22 (November 2000) to the Davis-Besse Updated Final Safety Analysis Report:

The Service Water System takes Lake Erie water from the intake structure pump suction pit after the traveling screens. It supplies normal and emergency cooling water makeup as described in Section 9.2.1. When the Control Room Emergency Ventilation System (CREVS) is in service, the Service Water System provides a source of cooling via the CREVS water-cooled condensers. The system consists of 3 pumps, heat exchangers and air coolers, associated valves, piping, instrumentation and controls. Additionally, the dilution pump can supply water to the service water system in the event of a fire disabling the service water pumps.

During normal operation, not all of the pumps are running. Upon indication of an accident or loss of offsite power, all three of the service water pumps automatically start. The potential problem is that the pressure inside the piping when all of the pumps are running exceeds the setpoint for the relief valves installed in the piping to protect it from failure by overpressure. When the water pressure inside the piping exceeds the setpoint, the relief valves open and water leaves the piping. This design feature protects the piping from failure caused by over-pressurization. It is common for piping systems to have this protection feature.

What is unique about the design at Davis-Besse is having the setpoint below the pressure inside the piping when all of the pumps are operating, as they would be during an accident. The common design has the relief valve setpoint between the operating pressure and the design pressure of the piping.

The problem with the Davis-Besse design is that while the piping is protected when the relief valves open, insufficient cooling water flow may reach equipment supplied by the service water system. That needed water is going out the relief valve instead of through the emergency diesel generator coolers and other important equipment. In addition, the protracted flow of water through the relief valves (i.e., if all pumps continue to operate and/or if a relief valve sticks open as relief valves have been known to do) represents a potential internal flooding threat.

I have been told that this design problem was identified at Davis-Besse nearly ten years ago during a Service Water System Operational Performance Inspection (SWSOPI) type inspection. I don't know whether this inspection was a self-assessment or an NRC-assessment. I am told the problem was entered into the corrective action process, but never resolved.

I have been told that the design problem was identified more recently during a Latent Issues Review of the service water system. I am told that the problem was re-entered into the corrective action process. I am unable to determine from the public record if the problem has been resolved.

Specifically, my allegations are:

1. The setpoints for pressure relief valves in the service water system piping do not prevent the valves from opening during system response to a design basis accident signal.
2. As a result of pressure relief valve(s) opening, the service water system may not provide sufficient flow to all essential equipment and components.
3. As a result of pressure relief valve(s) opening, there's an unanalyzed internal flooding hazard.

Sincerely,

<ORIGINAL SIGNED BY>

David Lochbaum
Nuclear Safety Engineer
Washington Office