From: "Kay Drey" <tritium@igc.org>
To: <nrcrep@nrc.gov>
Date: Tue, Jul 15, 2003 12:28 AM
Subject: FR Vol. 68, No. 93. 5/14/03. pp. 25909-25912

I apologize for the delay in sending the attached comments to you. My computer or its operator malfunctioned. I believe it's almost still July 14 in Washhington, DC.

Sincerely, Kay Drey

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E-RIDS = ADM-03
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July 14, 2003

Chief, Rules and Directives Branch
Division of Administrative Services
Office of Administration e-mail: nrcrep@nrc.gov
U.S. Nuclear Regulatory Commission

re: Federal Register. May 14, 2003. Volume 68, Number 93, pp. 25909-25912

Dear Sir or Madam:

I appreciate this opportunity to submit comments on the NRC's proposed generic communication regarding steam generator tube inspections. I am writing as a citizen to urge the NRC to require the use of the best available technologies for the inspection of the steam generator tubes in America's nuclear power plants.

When I first began reading about nuclear power plants and pressurized-water reactors (PWRs), about 29 years ago, I learned that cooling water was contained in three discrete, closed-loop systems: the primary (the reactor vessel, pressurizer, and steam generator tubes), the secondary (the steam generator, turbine generator, and condenser), and the tertiary (the cooling tower or once-through cooling system).

It came as a great surprise, therefore, to find out that while the basic PWR design may indeed call for closed systems, in reality various tubes, pipes, valves, pumps, and other parts can corrode, crack, and leak when attacked by radiation, fluctuating temperatures, and steam, and particularly as the power plant ages.

As I understand the history of this Federal Register notice, the NRC power plant licensees have wanted to avoid a license amendment proceeding that would require a licensee to amend his technical specifications to include the use of the more rigorous, more expensive probe technologies for steam generator tube inspections. The licensees also would like to substitute a theoretical "risk assessment" analysis of the tubes instead of having to undertake actual inspections of the actual tubes.

The reason I wanted to submit comments is to try to make certain that the public record will include the fact that **the cooling water inside the steam generator tubes is the same as the highly radioactive cooling water inside the reactor vessel**. And that if one or more of the tubes ruptures or even just leaks, the secondary cooling water becomes radioactive. Furthermore, because the secondary cooling water, steam and gases have direct pathways to the environment, unfiltered radioactivity can be released into the air and water to which the public is exposed.

(The primary coolant within the reactor vessel and the steam generator tubes becomes radioactively contaminated from a combination of: (1) radioactive gases and particulates that escape through pinhole leaks and other defects in the fuel rod cladding and through defective

welds at the top or bottom of the fuel rods; (2) the sloughing off of corrosion products that have been made radioactive by the zapping of neutrons released during fissioning of the uranium fuel, within the reactor coolant pressure boundary, and beyond; (3) the fissioning of "tramp uranium" left on the outside of the fuel rod cladding during the fuel rod manufacturing; (4) the buildup of tritium (radioactive hydrogen) that occurs when boron, which is added to the water to control the rate of fissioning, absorbs neutrons. Tritium is also generated as a fission product.)

Ever since January 1978 when the NRC, responding to a Congressional mandate, issued the "NRC Program for the Resolution of Generic Issues Related to Nuclear Power Plants" (NUREG-0410), information about the degradation of PWR steam generator tube integrity has been one of the unresolved safety issues of greatest concern to the public. And, I believe, to the NRC and the nuclear industry. To quote from the description of Generic Safety Issue A-4, re Combustion Engineering tubes:

> Pressurized water reactor operating experience during the past five years has shown that steam generator tube integrity can be degraded by corrosion induced wastage, cracking, reduction in tube diameter (denting) and vibration induced fatigue cracks. Since the steam generator tubes are an integrated part of the reactor coolant pressure boundary in the PWR system, the primary concern is the capability of degraded tubes to maintain their integrity during normal operation and under accident conditions (LOCA [loss of coolant accident] or a main steam line break) with adequate safety margins. ...
>
> [It] has become evident that condenser cooling water in-leakage resulting from the corrosion of condenser tubes can contaminate the secondary water of PWR steam generators and may be the principle source leading to all types of steam generator tube degradation. (NUREG-0410, p. E-62. Emphases added.)

The NRC's Advisory Committee on Reactor Safeguards also included Steam Generator Tube Leakage as one of its generic unresolved items that warrant "priority attention." (The following quote appears in the ACRS letter of November 15, 1977 --- in NUREG-0410, at p. C-29.)

> Normally the steam generator is not a critical component during a LOCA-ECCS [emergency core cooling system accident]. However, a special case exists where the steam generator tubes have been degraded due to corrosion, wastage, etc. If the shock loads imposed by the LOCA cause a critical number of tubes to fail, say by a double-ended (guillotine) break, the inflow from the secondary side can cause choking of flow during ECCS, preventing adequate cooling of the core. The critical number of tubes is relatively small. A position, such as one specifying a statistically significant level of nondestructive examination (NDE), might resolve this issue. The purpose of NDE would be to confirm that damage is not excessive; such examinations should minimize the possibility of catastrophic failure of a significant number of tubes. (emphases added)

Although nine American nuclear power plants have experienced steam generator tube ruptures (most recently, I believe, at Indian Point 2 near New York City), so far we have been relatively lucky. No core melt has resulted. Not yet.

Sincerely,