

From: "Williams, Dennie" <dwilliam@Courant.com>
To: <NAS@nrc.gov>
Date: 4/19/05 12:53PM
Subject: Dear Neil,

Dear Neil,

Does the NRC inquiry plan to cover these issues set out below? Has the NRC asked for any of this information yet? If so, what items? Do they show anything of significance to the health and safety of the workers in the plant or the neighborhoods surrounding the plant?

These are the items:

The computer printout of continuous stack monitoring prior to and during the event and up to the present.

Any presently identified degraded or inoperable radiation monitoring equipment or systems on or offsite and to identify them.

ALL radiation release data prior to, during and after the event.

The strontium-90 readings.

The noble gas readings (xenon, krypton, etc.). These are not measured nor regulated and decay into highly dangerous byproducts.

All radiation monitoring calibration records (when were the monitors most recently calibrated).

Station meteorological data prior to, during and after the incident.

Best,
Dennie Williams
Staff reporter
Hartford Courant
<mailto:NAS@nrc.gov>

A/48

The "Tin Whisker Event"

By Bob Meyer

This event might sound a little far fetched, it may even read like a simulator set you saw at one time. This is an actual recent event. What is a tin whisker? Read on.

Millstone was at 100% Reactor Power. A tin whisker on a logic card shorted the card to ground causing one train of Safety Injection and Main Steam Isolation (MSI) on Sunday morning 4-17-05.

It appeared from the first out annunciator, Steam Line Lo Pressure SI, that they might have a Steam Generator Safety stuck open. The operators entered their emergency procedures. EP-0, Reactor Trip or Safety Injection (SI) step 4 directed the operators to initiate a manual actuation of SI if other SI equipment that was automatically actuated, and it was. The operators being trained on the Salem event, initiated Safety Injection. Now the operators have a full blown inadvertent SI.

What can go wrong will go wrong.

The Auxiliary Feedwater (AFW) pumps auto started on Steam Generator (SG) Lo Level. The Turbine driven pump tripped. Later the pump was started and ran flawlessly. The Chemical Volume Control System (CVCS) Charging pumps were injecting. A report came from the field operator that there was a leak on the discharge flow path. The repositioning of valves in the discharge of the CV pumps caused a pressure surge resulting in two valves blowing out their packing and leaking Refueling Water Storage Tank (RWST) water into the Auxiliary Building (AB). This leak contaminated a large area of about 2000 sq ft on each of the two levels of the AB. A total of about 1000 gallons leaked into the AB.

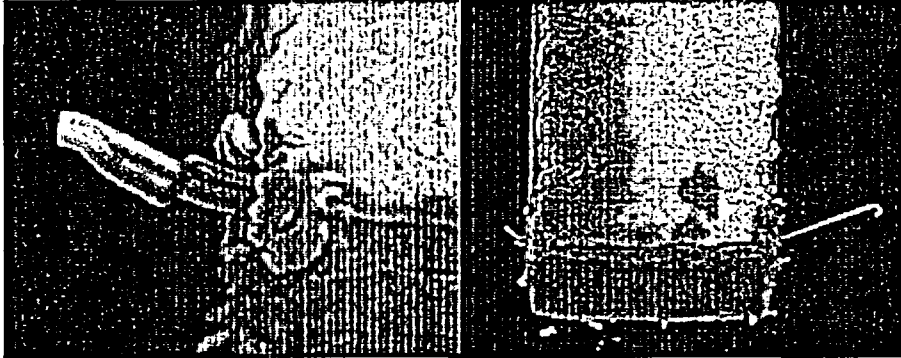
The half MSI caused all 4 steam generator MSIVs to close and 2/4 Steam Generators PORVs to isolate. (Millstone has a motor operated PORV B-P that is used for cooldown under certain conditions.) That caused two Steam Generators to rely on SG safety valves. When the safeties opened on the Generators with the PORVs isolated, the open indication for the safety relief valve(s) stayed on. This, at first gave an appearance of an unisolatable steam path, a stuck open SG safety. The SM sent out the Alert Classification in about 22 minutes of the initiating event. The operators soon diagnosed the faulty indication and did not transition to a faulted SG procedure, EP-2 thanks to recent training. This allowed the operators to mitigate the event by addressing the inadvertent SI and not initiating EP-2. This was a good application of an operating fundamental to use alternate indications and critical decision making with impact on Nuclear Safety. The pressurizer went solid and relieved water through both relief valves. Later the crew used addressed the Pressurizer high level by entering a yellow path on the Functional Restoration procedures. This allowed them to quickly get letdown on and reduce Pressurizer level.

The Pressurizer Relief Tank was pressurized to about 70 psig from due to pressurizer relief valves. The tank did not rupture either of the two rupture disks that are designed for 90 to 100 psig. One interesting observation is that when the pressurizer went completely solid, the cycling frequency of the Pressurizer PORVs doubled.

The Cause

The tin whisker was first identified in electroplated cadmium components during the late 1940's, appear to essentially be an extrusion, or hairlike growth emanating from the surface of the tin plate. They can sometimes grow long enough to cause a short circuit between leads, or may break off and cause damage elsewhere in the device. It is

generally agreed that pure tin finishes (and other high-tin content lead-free alloy finishes) present a risk of tin-whisker failures in electronics, particularly those demanding high reliability.



The tin whisker caused the shutdown of the \$250 million Galaxy 4 communications satellite. Engineers diagnosed the cause as a tin whisker growing under the extreme pressures of space. When the whisker grows long enough or heavy enough, it can break off and create a short circuit.