Burkhardt, Janet

From: David Lochbaum <davelochbaum@gmail.com>
Sent: Monday, August 17, 2020 8:23 PM
To: Paul
Cc: Linda Seeley; Brian Haagensen; Skeen, David; Raspa, Rossana; Jarriel, Lisamarie; Spicher, Terri; Doane, Margaret
Subject: [External_Sender] Re: DCL-20-066.pdf

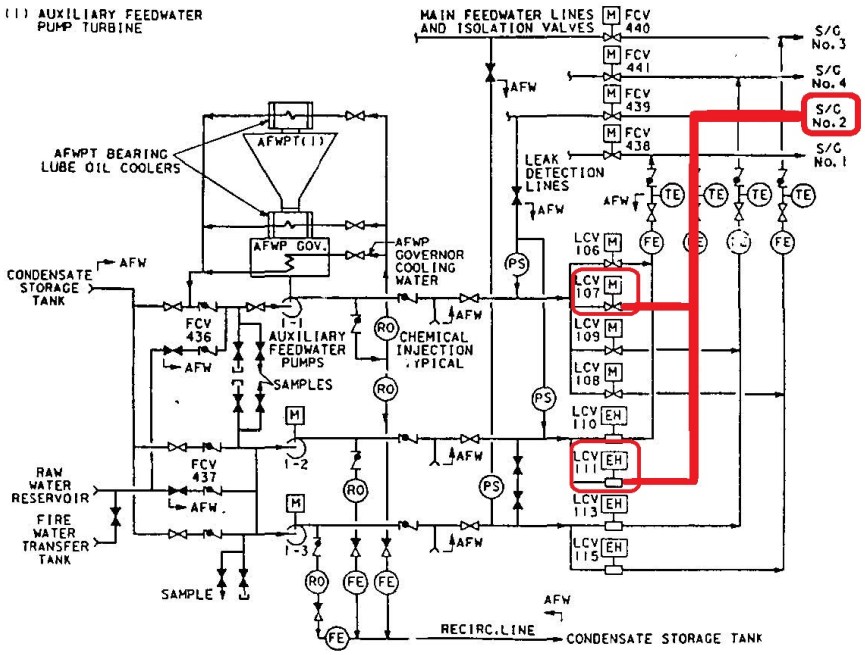
Hello Paul:

This request does not appear to be too unreasonable.

Piping downstream of the LCVs between the AFW pumps and the steam generators on Unit 2 was discovered to have worn to less than the allowable wall thickness, requiring its replacement last month. PG&E assumes, with reason, that the piping on Unit 1 is in a similar condition.

They could wait until the next refueling outage to inspect the piping and replace sections that have thinned. With this amendment, if approved, they can look at the piping while Unit 1 continues to operate and replace thinned sections.

Here's a schematic of the AFW system at Diablo Canyon:



The red lines show the piping downstream of LCVs 107 and 111 that supply flow to Unit 1 Steam Generator No. 2.

The AFW system features three pumps (one turbine-driven and two motor-driven). The turbine-driven pump provides 200% of the flow required to remove decay heat post shutdown. Each motor-driven pump provides 100% of that flow. So, one pump and one flow path to any one of the four steam generators is needed to fulfill the safety function.

The requested amendment will allow PG&E to isolated the flow path to one steam generator for up to seven days. Worst case, there would be the need to individually isolate and replace piping sections in all four pathways (one at a time) for a total outage time of up to 28 days.

When each individual flow path is isolated (i.e., LCVs 107 and 111 closed or comparable valves on the other paths), all three AFW pumps and three other flow paths would remain available.

Suppose LCVs 106 and 110 are closed to replace the piping to steam generator 1-1. If the normal feedwater system is lost, the AFW system will auto-start. The full flow from all three AFW pumps would be routed to three rather than four steam generators. Given that the requested amendment is predicated on expected piping less than the allowable wall thickness, the greater-than-normal flows through the three lines at higher than normal pressure could lead to the common cause rupture of all three flow paths to the non-isolated steam generators. Thus, a complete loss of AFW concurrent with loss of the normal feedwater system.

The operators could remove decay heat using feed and bleed mode until the normal feedwater system, or portions thereof, was restored.

The "safety analysis" by PG&E in support of their amendment request dances around the reality of the situation. They seek this change because they strongly suspect that the piping is thinned to less than allowable levels. But their alleged safety analysis curiously and conveniently assumes that the piping is in pristine condition. That's absurd. I'd not have signed my name to such a bogus and incomplete analysis (and I wouldn't even have signed your name to it).

From page 2 of the attachment to PG&E's amendment request:

> The turbine-driven Pump 1-1 discharge lines include level control valves (LCV) to the SGs; LCV-106 to SG 1-1, LCV-107 to SG 1-2, LCV-108 to SG 1-3, and LCV-109 to SG 1-4 that can be operated from the Control Room. The Unit 1 piping between LCV-107 and SG 1-2 includes Line 570, which contains piping and elbows that potentially may not meet minimum code thickness requirements and could require repair.
>
> The motor-driven Pump 1-2 discharge lines include LCVs LCV-110 to SG 1-1 and LCV-111 to SG 1-2 and motor-driven Pump 1-3 discharge lines include LCVs LCV-113 to SG 1-4 and LCV-115 to SG 1-3 that can be operated from the Control Room. The Unit 1 piping between LCV-111 and SG 1-2 includes Line 576, which contains piping and elbows that potentially may not meet minimum code thickness requirements and could require repair.

PG&E, in writing, concedes that safety-related piping in more than one AFW flow path "may not meet minimum code thickness requirements." Yet, their safety evaluation supporting the amendment implicitly assumes that all piping meets or exceeds the minimum code thickness requirements. No pun intended, but PG&E's safety analysis is thinner than the suspected pipe wall thickness.

But, it seems less risky to allow PG&E to see if the suspected pipes have thinned too much and replace them rather than allow Unit 1 to operate blissfully unaware of this degradation until its next refueling outage, or until its next accident, whichever comes first.

If I was an NRC reviewer, I'd feel more comfortable approving this amendment request had PG&E included in its safety analysis an evaluation of the as-found piping condition on Unit 2 had the AFW system auto-started following a shutdown from full power with one of the three flow paths isolated. If the higher than normal pressure in the three unisolated lines would likely not have failed the as-found thinned piping, there's some reason to believe that Unit 1 would survive such an event as it replaces thinned pipes.

Thanks,
Dave

On Mon, Aug 17, 2020 at 4:53 PM Paul <pmblanch@comcast.net> wrote:

> Linda
> I checked with my NRC safety person and this is an operation that is a high risk. AFW is the only means to cool the reactor the reactor, should it trip. One doesn't even need an accident to damage the reactor core.
> I don't care how many steam generators they have, without the AFW system, they are unable to prevent core damage assuming this is a normal Westinghouse reactor.
> I am copying Brian Holian and others of the NRC and possibly get this immediate concern to someone at the NRC who cares, but I doubt it!
> Luck may be the final barrier left, but I don't know all the details.
>
> Sent from my iPad