

Evaluation of CVCS Soft Parts due to High Temperature Letdown Event

June 28, 2004

Assumptions:

1. Fluid temperature is assumed to lower as letdown line is NOT insulated beyond the letdown heat exchanger.
2. Review of "Soft Parts" in the CVCS Letdown System is only considered from the Letdown Heat Exchanger to the Purification Filter. The in-service Purification Filter was removed and inspected via a camera with NO sign of deformation.
3. The Purification filter media is designed for a Maximum of 180F continuous operation, (Reference Pall Filter Drawing #5ESD10770-F044).
4. The Purification filter O-Rings are designed for a Maximum temperature of 250F, (Reference Pall Filter Drawing #5ESD10770-F044).

Soft Parts to be Considered:

1. Stem Packing in the valves, (as well as the CH201P/Q valves) are the only "Soft Parts" in the CVCS letdown system.
2. The condition of the Pall Purification Filter media is the limiting condition for extent of condition imposed by the higher letdown temperature.

Conclusions:

A stress analysis was performed on the letdown piping as a conservative measure to verify the condition of the piping. The result of the stress analysis resulted in a inspection of a specific location that the stress analysis results showed exceeded the ASME stress allowable. Engineering completed a walk-down of the CVCS letdown system to visually verify that the system was not subjected to water-hammer events or deformation due to the increased stresses resulting from the increased temperatures. The specific location that had exceeded the stress allowable was inspected by a qualified person of the In Service Inspection team. The results were documented on Visual Examination of Welds Report Number 04-250, pg 1 of 2, (note, the results were satisfactory). In the report itself, it is noted that a plastic zip tie was found on the piping near the toe of the weld. The zip tie was found pliable and easy to move. Also noted was that, "it appears the pipe did not see abnormal heat, as the zip tie would have been baked".

An evaluation of the "Soft Parts" of the CVCS letdown system is bounded by the inspection of the Pall Purification Filter media and O-Rings. The filter media is rated for 180F maximum and the O-Rings are rated for 250F maximum. The in-service filter was removed and inspected to ensure the filter did not degrade during the letdown event. The inspection results were as follows:

"We replaced the Purification Filter, CHF36 this morning in Unit 1. Although the video is grainy, pleats were visible on the interior of the removed filter. Looks like the filter media made it through the ~ 1 hour of elevated temperature with no apparent damage. The 2 O-rings on the cartridge were undamaged, and the interior of the housing was clean. Have a video if anyone is interested. Pat"

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The condition of the packing of the valves has been determined to be satisfactory per an walk-down of the system during NOP/NOT conditions. No leakage from the valve packing was identified, which would be indicative of packing damage.

All the valves and components upstream of the CHNF36 purification filter have design temperatures in excess of the 350F. All packing utilized on the CVCS system is a graphite blend, with operating temperature ranges in excess of 350F.

No further analysis of the CVCS "Soft-Parts" is required to complete this action.

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