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To: Franke, Mark
Cc: Walker, Shakur; Suggs, LaDonna
Subject: EDG new info (fuel oil line rub) discovered last night
Date: Friday, September 02, 2011 1:13:02 PM

Not sure if this could be result of seismic

CR441069 - 2J EDG Fuel Oil Return Line Rub:

During the 1H EDG run late on night shift, one of the fuel oil return lines was found vibrating during engine operation (CR 441058). This was due to a missing clamp that the FIN team has replaced this morning (1H EDG issue is now resolved). A comparative walkdown was performed on the other engines and the 2J EDG fuel return line in this location was found rubbing slightly. This line has visible wall loss as indicated in the CR.

This fuel oil return line begins in the #1 opposite control side (OCS) injection compartment and pulls fuel off of the engine supply header. It has a restricting orifice that maintains fuel oil header pressure at approximately 15 psi by flowing fuel back to the day tank. This line runs through all 12 OCS injection compartments, down the side of the block, and along the block/crankcase mating flange to the front of the engine before it drops below the deck and returns to the day tank. This length of tubing consists of a combination of ¼" bundy tubing, 3/8" stainless tubing, 3/8" carbon steel tubing, and carbon steel pipe. The thinned section is carbon steel tubing.

The wall thickness in the area of wear was measured with NQC calipers at a value of .346" (nominal OD is .375"). This comes to a wall loss of .028" or 45% on one side. While carbon steel data is not in our piping specification (STD-MEN-0029), stainless steel is and a reasonable assumption of comparable strength can be made between them. 3/8" stainless steel tubing has a wall thickness of .065" and a design pressure of 2500 psi up to temperatures of 640 deg F. This application is 15 psi at <100 deg F.

Based on this information, there is ample margin before any risk of tubing failure occurs and this condition does not challenge the design function or mission time of the engine. The current fretting visually appears to have occurred over a long period of time--this section of tubing is original and the current supports are creating hard contact against the adjacent pipe. However, this wall loss represents a degraded condition that should be corrected prior to restarting Unit 2 (mode 4 hold). Recommend replacing and supporting the degraded section of this tubing IAW specification NAI-0001. This carbon steel line can be replaced with stainless steel tubing, which is used throughout the fuel oil system.

Log entry peer checked by Component Engineering (J. Chapman).

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