

**From:** Wayne Schmidt  
**To:** David Lew  
**Date:** Fri, Jul 28, 2000 12:11 PM  
**Subject:** Violations

Which ever way they are put together they remain the same.

I made some comments in red. We have to be carefull about how we talk about the engineeirng study of PWSCC (Dominion Engineering). This was nothng more than a mathmatical study done before and way after the fact. There was never an engineering study of PWSCC unitl altran did it after the failure.

4/25

(3)

10 CFR 50, Appendix B, Criteria XVI, requires that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude recurrence.

Contrary to the above:

*I don't think we say licensee in a violation - do we? Also the violations are to parallel with the requirements these statements appear to be the specifics.*

1. During the 1997 refueling outage, the licensee identified primary water stress corrosion cracking (PWSCC) in a low-row tube in one of their steam generators. The PWSCC was located in the apex area of the U-bend of the tube. It was known at the time of this discovery, through generally available literature, that this area of the steam generator is vulnerable to this form of degradation. Although the licensee used an engineering study to evaluate this degradation (*I think this overstates it - the evaluation was done in 1995, there was no evaluation at the time of discovery or prior to restart!! Dominion engineering redid the study after restart using the one PWSCC that they found as a IP2 specific data point.* and performed eddy current of the low row tubes in all the steam generators, the licensee did not take appropriate corrective action to assure the PWSCC was promptly identified and corrected in the steam generator. Specifically the licensee did not implement appropriate measures to determine the extent of the condition in the low row tubes. The licensee did not use available enhanced eddy current techniques to evaluate the condition of the other low row tubes to determine the degree to which they had PWSCC. In addition, the licensee did not inspect other vulnerable areas of the steam generator using eddy current techniques specifically devised to determine the over all extent of this condition.
2. During the 1997 eddy current testing of the low row tubes, including tube R2C5 in SG24 which failed on 2/15/00, the licensee encountered interference in the eddy current data in the form of base line noise. The eddy current data was used to evaluate the condition of the tubes and to detect flaws. The licensee did not identify the possibility the noise could mask signals representing flaws and did not take corrective actions to prevent the noise from masking the flaws that required evaluation. Specifically, the licensee did not adjust the data analysis techniques to compensate for the impact of the noise on the ability to evaluate the data, particularly in areas of the steam generator where there was an increased susceptibility to tube degradation.

10 CFR 50, Appendix B, Criteria IX, requires, in part, that measures be established to assure that special processes, including nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

*Spell hourglassing the same as it is in the TS reporting requirement*

1. At the time of the 1997 outage, the licensee had not established procedures to adequately determine the extent of steam generator flow slot deformation (hour glassing) in the uppermost support plate flow slots. This flow slot deformation is associated with steam generator tube denting and an increase in the stress on the low row tube apex. When the licensee encountered, during eddy current testing of several tubes, numerous eddy current probe restrictions (at the uppermost tube support plate locations) due to tube deformation caused by denting (*We don't know if there was hour glassing*) and ~~hour glassing~~, the licensee did not adequately assess the existence of any flow slot

deformation (hour glassing). This assessment would have provided an indication of increased stresses on the tubes and their enhanced vulnerability to PWSCC.

2. During the 1997 eddy current testing of several tubes, the licensee did not calibrate the eddy current plus point probe in conformance with the previously qualified technique. This enhance eddy current technique is used to detect flaws in the U bend of the low row tubes. Specifically, the licensee did not use the proper calibration standard flaw size and phase rotation setting specified in the applicable Electric Power Research Institute (EPRI) qualification technique sheet *which (I think we should include the ETTS # here)* conforms with the special requirements contained in EPRI TR-106589-V1 "PWR Steam Generator Examination Guidelines: Revision 4" Volume 1.

As a result of these violations, at least four low row tubes had flaws (PWSCC) which were not identified and corrected in 1997, including Tube R2C5 in SG24 which failed on February 15, 2000.