

item #12 - #1

Subj: Effect of copper plating
Date: 3/18/2000
To: elm@nrc.gov, smc1@nrc.gov

File: C:\MYDOCU~1\INDPTIMP.XLS (15872 bytes)
DL Time (32000 bps): < 1 minute

Emmett:

I have run a computation of the impedance change of adding a copper plate to an Inconel tube for a high-frequency, 0.080-inch diameter coil. The largest change is for 300 kHz, and the signal decreases as we increase frequency in 100 kHz steps. The amplitude of the signal goes to zero and the phase changes as the frequency is increased to 1.5 MHz. The last step is to 2.0 MHz. As you can see, the effects of the copper on the outside of the tube goes to zero impedance change as the frequency increases. At 1.0 MHz, the copper signal has decreased to 17% of the signal at 300 kHz. The signal from a small id defect has probably increased also. I have another longer running program that I will use to model this and the phase setting of the problem. Have a nice weekend and I will talk to you Monday.

Caius

Subj: Noise reduction at Indian Point
Date: 3/20/2000
To: elm@nrc.gov, smc1@nrc.gov

File: C:\WP\FINDIANPT.NRR (44288 bytes)
DL Time (32000 bps): < 1 minute

Emmett and Stephanie:

Here is what I have been able to run for Indian Point over the weekend, and my proposed direction for solving the problem. I have written Hal Sabbagh to get permission to run the VIC-3D codes that I currently have. The file is already in WordPerfect format.

Caius

Subj: Vic3d
Date: 3/20/2000
To: has@pilsner.sabbagh.com
CC: (elm@nrc.gov), (smc1@nrc.gov)

Hal:

I would like your permission to test the Vic3d on a problem that is pertinent to Indian Point, an operating plant. This would be a good demonstration of the power of the Vic3d codes (if it works) and may interest EPRI and the utilities in buying copies of the code. If I cannot get it to work, I will not mention Vic3d. Are you or Elias going to the EPRI NDE meeting in California this summer?

Caius

Subj: High-frequency probe runs

J/165

Date: 3/20/2000
To: smc1@nrc.gov

Stephanie:

Request a copy of the runs that Gary Henry makes on standards with the high-frequency probe. This may show us something new, particularly if he uses copper on the tube OD.

Caius

Subj: Scans with the high frequency plus-point
Date: 3/21/2000
To: henry@eddy2.epri.com
CC: (smc1@nrc.gov)

Gary:

When testing the high-frequency plus-point I believe that it would be helpful to run it at every 100 kHz between 400 kHz and 1 MHz. Sonny Lee at Zetec said that it would work between these frequencies. Also it would be good to have split rings of copper, magnetite and a support plate on the OD of the tube. I have done a calculation of the effect of copper at different frequencies, and the magnitude of the normalized impedance change at 1 MHz is 17.5% of that at 300 kHz. I would like to get a copy of your data when you have completed your runs. Good luck.

Caius Dodd

Subj: Phase setting for Plus-Point Qualification
Date: 3/23/2000
To: mcm@nrc.gov, elm@nrc.gov, smc1@nrc.gov

Mike:

I finally tracked Gary Henry down (he was at Indian Point) and asked him about the calibration of the plus-point for its qualification. He said that the phase was set at 15 degrees for the 40% deep notch in the qualification in 1997 and also today. The utility's guidelines were not using the correct calibration from the plus-point qualification.

Caius Dodd

Subj: IP update
Date: 3/24/2000
To: smc1@nrc.gov

Stephanie:

I got one data disk from Andy Neff that may have the tube scanned with the new probe and will look at that this morning. I talked to both Gary Henry and Andy about the probe yesterday. Andy seemed to like it very much. Gary conceded that it reduced the od noise, but did not think it was necessary since we were seeing everything with the midrange probe. Andy wanted to run it on all of the row 2 U-bends in generator 24, but,

at the time I talked to them, they did not have permission. Let me know if you want me online this morning.

Caius

Subj: Probes
Date: 3/24/2000
To: smc1@nrc.gov

Stephanie:

I called Zetec to see if they could make additional high-frequency probes. They said yes and also that Indian Point had ordered 15 high-frequency probes with 24-inch shafts last night.

Caius

Subj: Indian Point
Date: 3/27/2000
To: smc1@nrc.gov, elm@nrc.gov

File: C:\WP\FINDIAN~1.NRR (253924 bytes)
DL Time (32000 bps): < 2 minutes

Stephanie and Emmett:

I did not finish all that I wanted to get done this weekend. However, here is a start to the report. I want to include noise and signal measurements at different frequencies with the different probes. In particular, with the 0.075, high frequency plus-point probe. Also, I want to compare the c-scan plots and the strip chart plots of the probes so that you can see how much better these probes are. I feel that they will do a much better job in the u-bends, and may give some improvement at the support plates and the sludge piles.

Caius

Subj: Noise reduction
Date: 3/28/2000
To: smc1@nrc.gov

File: C:\ZIP\FINDIAN2.EXE (110027 bytes)
DL Time (32000 bps): < 1 minute

Stephanie:

Here is an example of the noise reduction using the new probe. I reviewed all eight of the "noise tubes" in reel 204 and the probe had the same reduced noise on them.

Caius

Subj: REEL.202
Date: 3/28/2000
To: aneff@prodigy.net

Andy:

I managed to crash my system when I was converting REEL.202 and lost some of the data. Would you please add this reel to the next disk that you send me? The new probe looks quite good thus far. I need to make an assessment for NRC about the detectability of the probe.

Caius

Subj: Distance between support plates

Date: 3/28/2000

To: aneff@prodigy.net

Andy:

What is the center-to-center distance between the 6H and 6C support plates? I have been using 12.5-inches, but am not sure that is correct. Also, do you know why the high frequency probe seems to wander around more in the recent scans?

Thanks, Caius

Subj: Standards

Date: 3/29/2000

To: aneff@prodigy.net

Andy:

The standard serial number is given in the summary file for each cal group. How does this tie back to the drawing number for the standard? What is the drawing number used for this high-frequency probe in SG24? Also, what is the center-to-center spacing for 6H and 6C for row 3?

Caius

Subj: Profilometry

Date: 3/30/2000

To: aneff@prodigy.net

CC: smc1@nrc.gov, elm@nrc.gov

Andy:

There were a number of articles and products for profilometry in steam generators a few years back, when denting was more of a problem. Some used eddy-current to measure lift-off directly, some used eddy-currents to measure the distance to a spring that extended to the tube wall, some used strain gages to measure the deflection of a spring that was sprung against the tube wall, and some were optical. Most measured the tube diameter at eight locations around the tube, but I believe that there may have been a few that made 16 measurements. If I can find any old papers on the subject, I'll let you know.

Several of the tubes seem to have a long, very shallow id indications. It appears that these may be lift-off. For the most part, the depth is zero, but noise fluctuations can indicate a small id depth, which I believe is false. What are your views on this signal?

What is the location of the indication that was called on tube 2-43? Let me know when you have more defect calls in this region.

Caius

Subj: Tubes with defects in SG 24

Date: 3/31/2000

To: aneff@prodigy.net

Andy:

On Monday, I understood the utility reported that 4 new defective tubes were found over the week-end with the new probes. I wrote down 2-4, 2-43, 2-71 and 2-74. However, I could not find anything on 2-43, other than a signal that appeared id but had no depth (possibility lift-off). The old defects in 24 were 2-69, 2-72 and 2-5. In steam generator 21 there was an old defect, 2-87. Were these all the old defects that were found by last Monday, or was there another one?

I received REEL.202 and REEL.210 today. Thanks

Caius