

Ex. 4  
From: <Dodd@~~\_\_\_\_\_~~>  
To: <WLS@nrc.gov> W Schmidt  
Date: Tue, Jul 18, 2000 4:21 PM  
Subject: Missed tubes

Wayne:

Here are the graphics for each of the tubes that could have been called in 1997, if the setup had been correct and the analyst encouraged to use the circumferential filter. They are listed in varying degrees of difficulty. Let me know if you need anything else.

Caius

CC: <smc1@nrc.gov>, Ian Barnes <tees@~~\_\_\_\_\_~~> <elm@nrc.gov>  
Ex 6

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 6  
FOIA- 2001-0256

ITEM #

18'8"

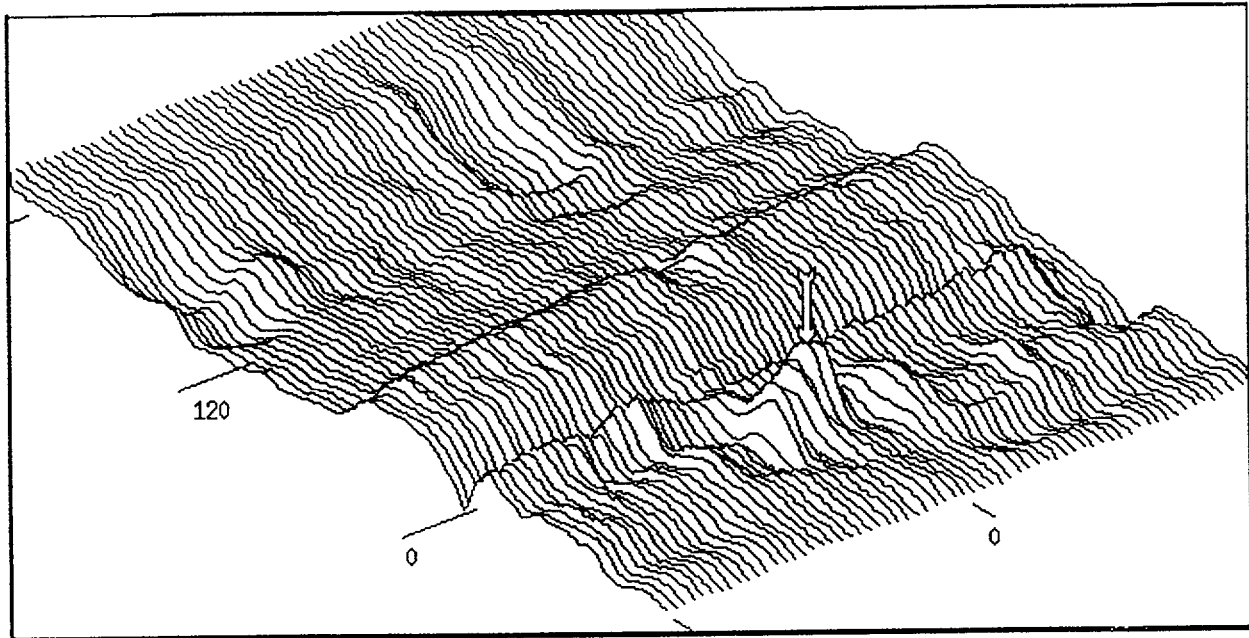
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## Review of 1997 inspection of U-bend tubes at Indian Point2

### Tube 2-69 of steam generator 24

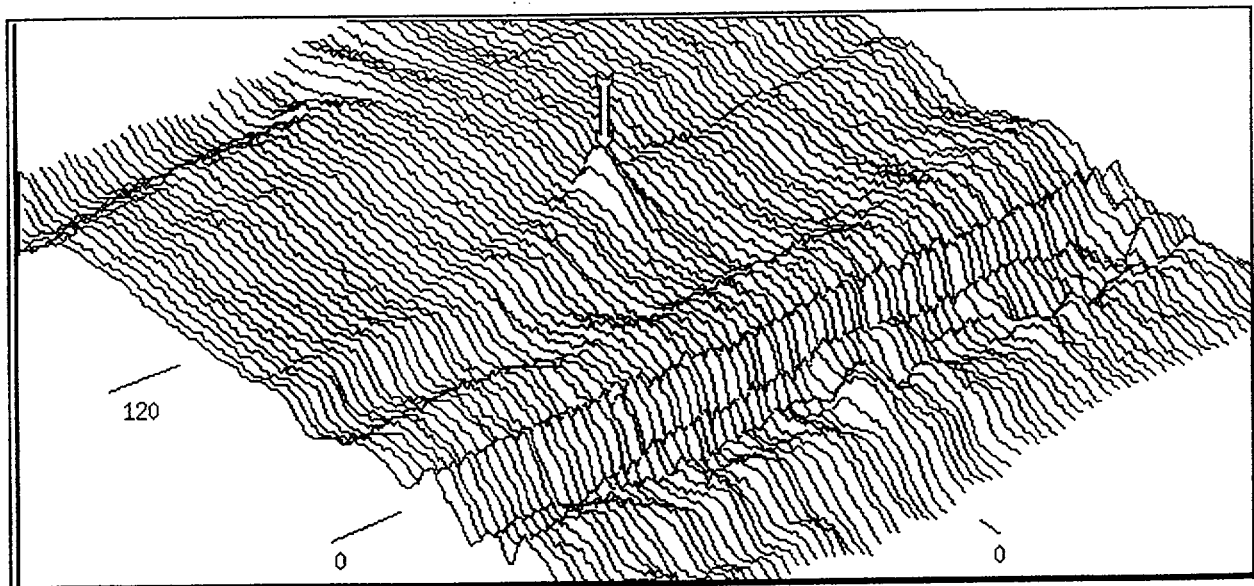
The 400 kHz C-scan of tube 2-69 of steam generator 24, made in 1997, is shown in Figure 1. While the amplitude of this signal is small (1.2-volts), it does stand up above the noise, enough at



**Figure 1** 400 kHz C-scan of tube 2-69 of steam generator 24 made in 1997

least for the analyst to look at the Lissajous of the signal.

### Tube 2-87 of steam generator 21

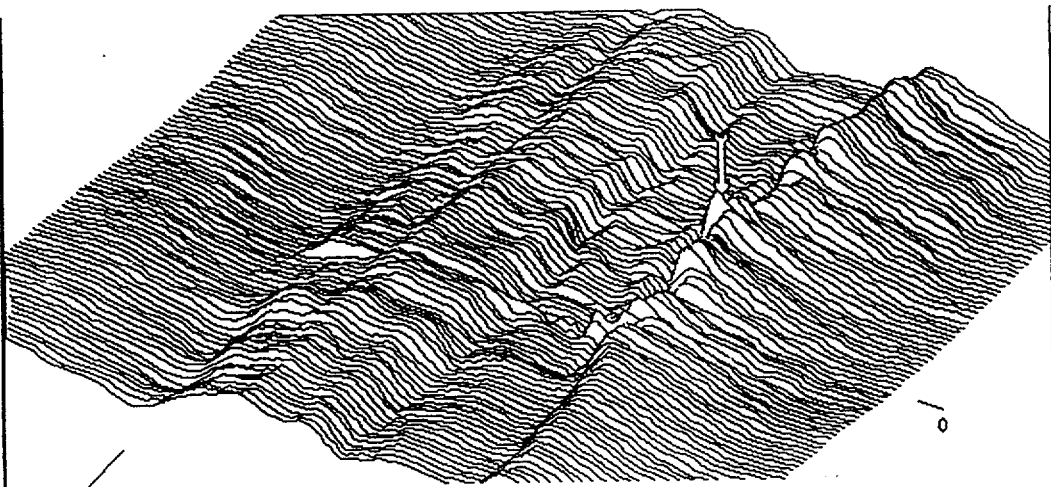


**Figure 2** 400 kHz C-scan of tube 2-87 of steam generator 21 made in 1997

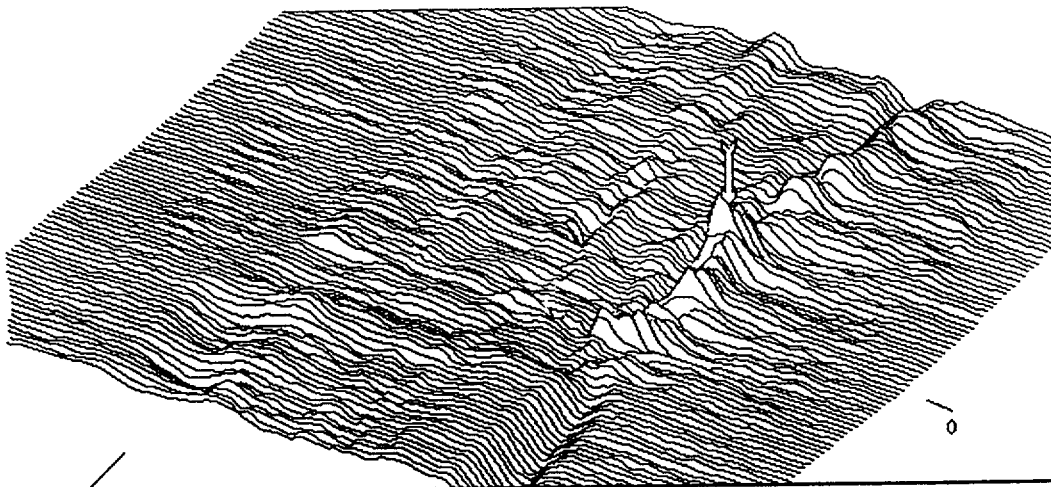
The C-scan of tube 2-87 of steam generator 21 is shown in Figure 2. This tube has a defect signals of about 1-volt in a relatively clear part of the tube. This signal looks very much like the one found in tube 2-67 during the 1997 outage. A careful examination of the C-scan of this tube will show enough of a signal for the analyst to look at the Lissajous signal. This tube also has several long cracks at about the same axial location as the defect that is in the clean section. They are partially obscured by a noise ridge.

#### **Tube 2-5 of steam generator 24**

The C-scan of tube 2-5 of steam generator 24, made at 400 kHz in 1997 is shown in Figure 3. The defect is shown riding on top of the deposit ridge. This defect becomes much more apparent if a circumferential average filter is used. The use of this filter on tube 2-5 is shown in Figure 4. This type of filter computes the average value of the vertical



**Figure 3** 400 kHz C-scan of tube 2-5 of steam generator 24 made in 1997

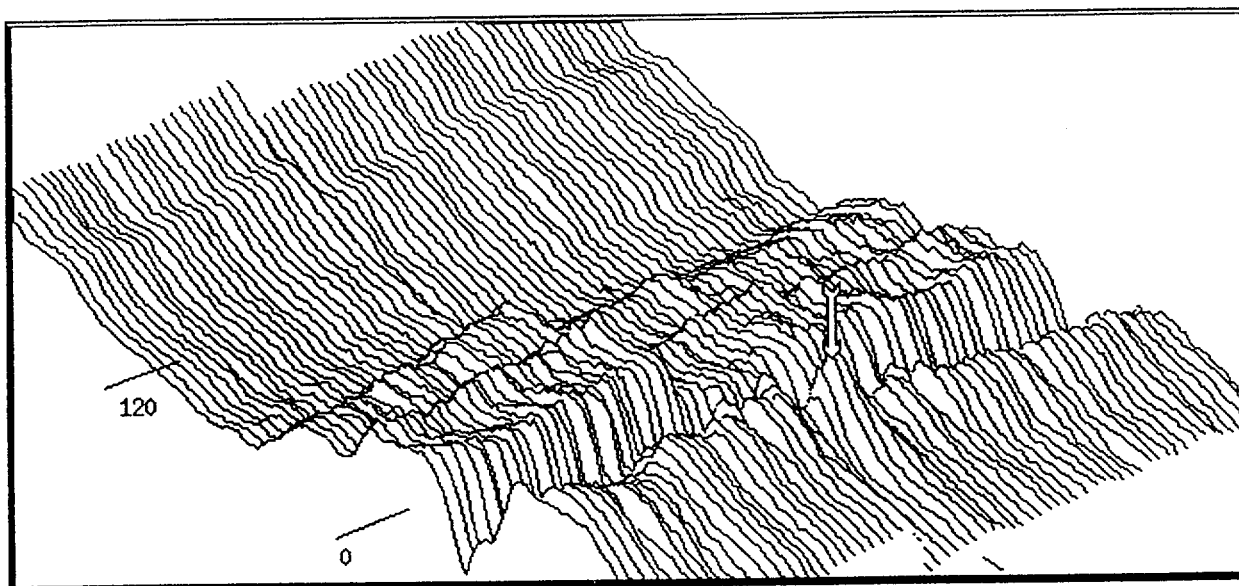


**Figure 4** 400 kHz C-scan of tube 2-5 of steam generator 24 using a circumferential average filter.

component of the signal over all of the axial extent of the scan, for each point around the circumference of the tube. This average value is then subtracted from the scan, and the scan of the difference is re-plotted. This is particularly effective in removing the long ridges of noise from the scans. The differences in the axial direction are then emphasized. The 1997 guidelines state that "Mixing and filters are not required but are optional." In general, Westinghouse does not encourage the use of filters.

### **Tube 2-72 of Steam generator 24**

Tube 2-72 of Steam generator 24 is similar to tube 2-5, and could possibly be detected from the C-scan, without the need of any filter, although a circumferential average filter would have



**Figure 5** 400 kHz C-scan of tube 2-72 of steam generator 24 made in 1997, with no filter applied

helped here also. This tube is shown in Figure 5.

### **Tube 2-71 of steam generator 24**

Tube 2-71, as shown in Figure 6 needs the circumferential average filter applied for detection.

### Tube 2-85 of steam generator 23

Tube 2-85 of steam generator 23 also needs the circumferential filter for detection, as shown in Figure 7.

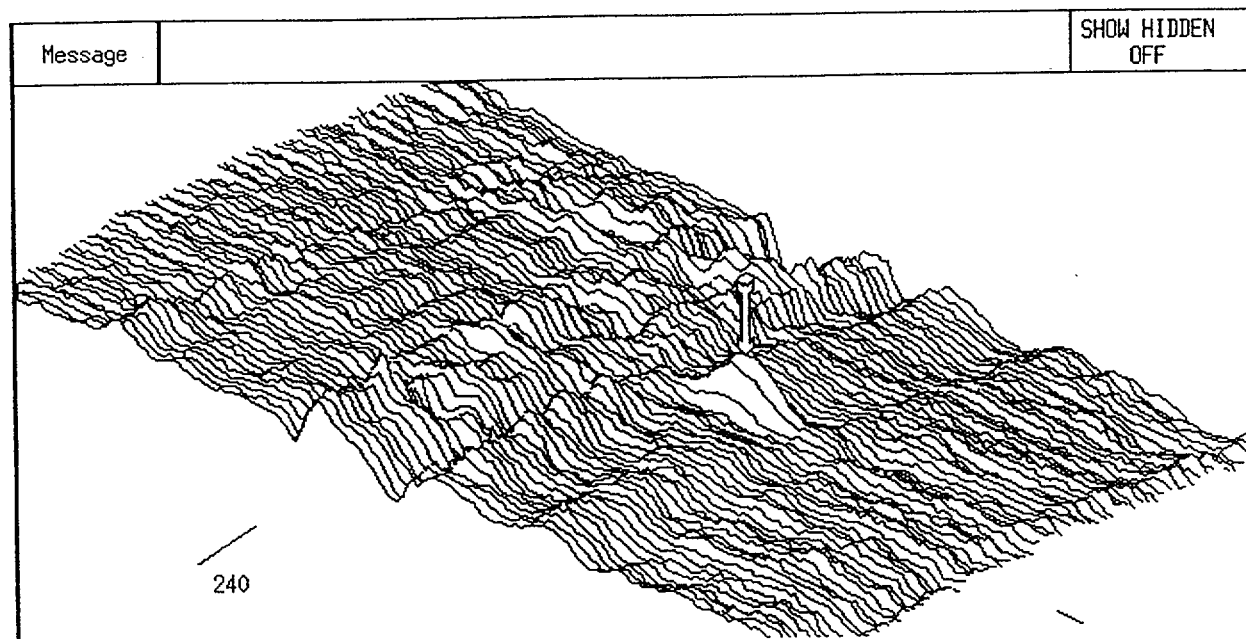


Figure 7 Tube 2-85 of SG23 in 1997 at 400 kHz, with circumferential average filter applied.

### Tubes 2-4 and tubes 2-74 of steam generator 24

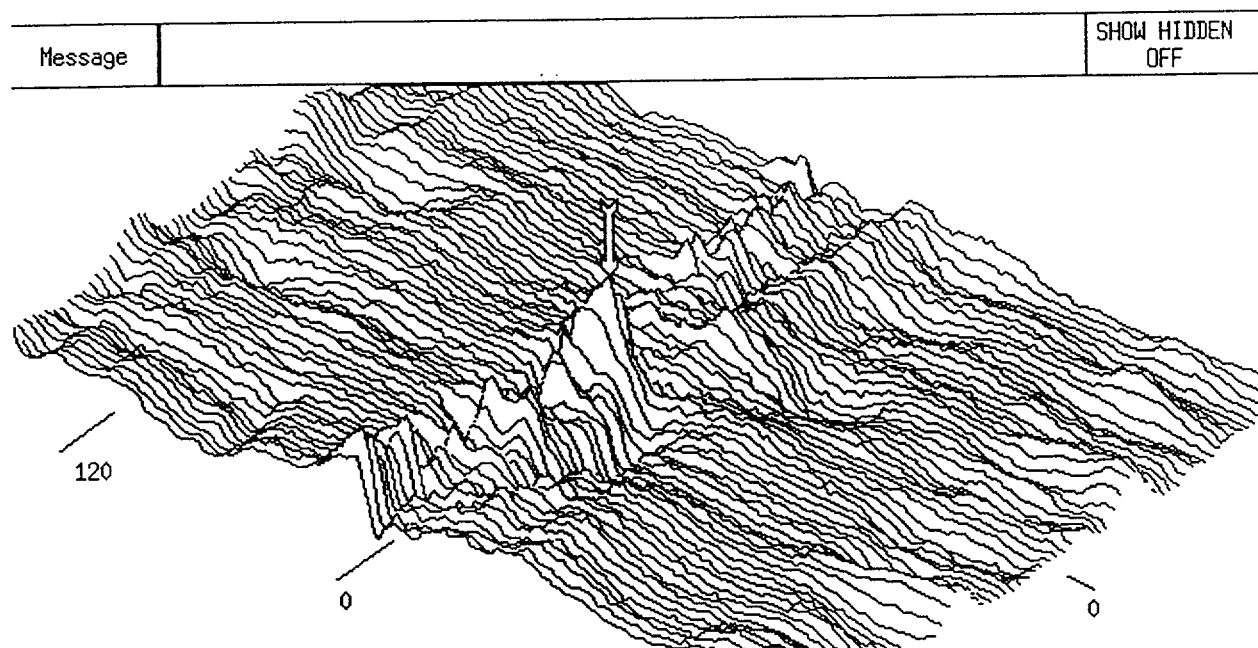


Figure 6 Tube 2-71 of SG24 in 1997 at 400 kHz, with circumferential average filter applied.

Tubes 2-4 and tubes 2-74 were questionable in the 1997 data. It was possible to find some indications, but I could not find a definite signal that I could be sure that this was the defect seen in 2000, even with the use of circumferential averaging filter.