



**From:** Elizondo, Theresa  
**Sent:** Fri Jun 11 12:57:09 2010  
**To:** Gates, Jayne; Kenny, Randall; Tabinor, Matthew  
**Cc:** Marshall, Tom V; Hoyle, Jeff (WYF); Birrell, Gordon Y; Hadaegh, Farid; Mathur, Kush; Blalock, Doug P; Sawchuk, Jeffrey H  
**Subject:** RE: UT Frequency on Enterprise  
**Importance:** Normal  
**Attachments:** FW: May 4th Erosion Results Update

Matt is a key contact on the corrosion/erosion philosophy. Note the calculations were done assuming 18,000 BPD into the cargo tank which corresponds to approximately 23,000 BPD in the feed line which the velocities were checked on.

**From:** Gates, Jayne  
**Sent:** Friday, June 11, 2010 3:01 AM  
**To:** Kenny, Randall  
**Cc:** Elizondo, Theresa; Marshall, Tom V; Hoyle, Jeff (WYF); Birrell, Gordon Y; Hadaegh, Farid; Mathur, Kush; Blalock, Doug P  
**Subject:** UT Frequency on Enterprise

Randall,

At our evening production call on 6/10, a question regarding the frequency of UT survey on the Enterprise came up. Terry Elizondo was in the meeting and said that there was a Corrosion Management Strategy that set out the frequencies. The excerpt below is from that document. I have highlighted the sections that are potentially applicable. However, I see a conflict between the two statements in red. Could you please clarify further with Terry whether there is another document that sets out what the 'corrosion management team' that is referred to, has come up with for monitoring. If there is no such reference, then I suggest that we need to convene this team (referenced in section 6). I believe Terry said you have a copy of the Corrosion Management Strategy, but just in case I will forward the note that has all the pertinent data attached (separately)

From the UT scans I have seen, it does not appear we have an erosion issue, but we need to clarify the expectations on the frequency of monitoring (in writing), establish who is accountable for making sure the testing is occurring, and then monitor the results (which I believe you are now doing).

I understand that there was a statement made that 'we are doing UT every day' and if that is not the case, we need to correct that perception.

As well, about a week ago, when we discussed with the field engineer, we informally decided (and then put in the field orders) that we would do UT once a week, and then maybe go to every two weeks.

Understanding now, the background, we need to revisit this.

Jayne Gates

Exerpt from Corrosion Management Strategy for Enterprise:  
4.0 EROSION CONTROL

BP SPPS modeling shows that the erosion risk is highly dependent on flow rate, and boarding pressure. If

the flow rate is greater than 5000 barrels (bbl)/day, then at the expected boarding pressure (700 to 900 psi), the erosion rate is estimated to be greater than 0.1mm/year. If the flow rate reaches 20,000 bbl/day, the erosion rate could reach 10mm/yr.

The amount of solids assumed in these estimates was 10 lbs of sand per 1000 bbl fluid and 0.1lb per 1MMSCF. This estimate will be highly dependent upon the dynamics of the flow in the containment device. At higher boarding pressures, the velocity and erosion rate will decrease. These velocities and flow rates will be determined by the rate of flow from the containment device, and will not have the ability to be controlled in a conventional way. Therefore, a rigorous inspection program where the velocities are highest, at bends and elbows downstream of the boarding, will be initiated. Vulnerable areas will be checked every 4 hours.

Inspection areas will be marked with grids so that wall thickness readings can be taken at consistent locations using a hand held ultrasonic probe. This will allow the monitoring of the onset of any erosion. Vulnerable bends and elbows will be identified by the corrosion management team, and an inspection plan will be prepared by the team. Suggested wall thickness survey program for 90° Elbows and Tee's is shown below: