**From:** Evan Vokes
**Sent:** Tuesday, July 28, 2009 5:25 PM
**To:** David Taylor
**Subject:** FW: third party inspection
**Attachments:** 3PI infomation related to decision summary

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**From:** Evan Vokes
**Sent:** Friday, July 24, 2009 1:39 PM
**To:** Gabe Nahas; Ron Curle; Rachel Lee; Dave Johnson
**Cc:** Trent Bertholet; Kevin Widenmaier; James Ferguson
**Subject:** third party inspection

Hello Everyone
Please forgive me for the long email. The point that I wanted to come around to yesterday that I think is the most important factor for quality control is control of Third Party Inspection. I believe the 3PI and NDE are the same process and must be treated as a holistic problem.
I have worked quite a bit on how 3PI is accomplished at TransCanada and I must say that we get very poor value for our money because we have failed to tell the 3PI what the expectations are. In engineering governance we see a lot of technical problems that are never logged in IIT by project managers. We have seen some interesting events that have come out of 3PI and it appears that many people do not understand what they do.

There are four major circumstances:
One of the problem is 3PI offering engineering opinion when they are not allowed too.
A second is when we pay for an inspection that was not adequate.
The third is the inspector has no technical background/training for the inspection.
The last is TransCanada requests an inspector but does not describe what to inspect; especially when inspection criteria is not dictated from TCPL (the classic EPCM failure).

For the Bison and Mexico projects, a root cause that truly affects these projects is the independence of inspections. In Canada, the independence of inspections is required under section 54 of the OPR. This independence of inspections does not apply in the USA but there are some learnings. Section 54 includes NDE as it is truly part and parcel of the 3PI process. I was hoping Meera would have attended as from my understanding KXL will be hiring NDE themselves. (Based on conversations with Dave Hodgkinson.)

If the contractor hires NDE, the NDE are often pressured to make calls that favour the contractor. We have had cases where we made the correct call to ask that piping be cut out after a NDE tech changed their call.
If TransCanada hires the NDE and audits the NDE we make a major increase in quality and control of costs. If the NDE over-calls the contractor can come back after us. If the NDE under-calls we are directly responsible to the regulator which is no different than the current situation. If we hire NDE, we can control inspection costs and quality at the same time.

Directly hiring NDE gives us the impetus to do have the job done correctly. Our NDE contractor on Keystone has complemented us on both the fact that it is easier to make the correct judgement on welds and how thorough the audits are. The NDE contractor on Buffalo West was shocked how we showed how poor their quality had become while working for welding contractors and this one came with a significant economic penalty. Our direct hire NDE contractors have worked closely with the welding contractors and it does not affect schedule as we drive the welding inspection and NDE through the chief welding inspector. As I audit the Canadian Keystone data it is very obvious that mainline repairs generally occur on same day which allows acceptance 24hrs later. To my knowledge, only one welding contractor has complained in recent times about our NDE contractor but this was expected with Midwest. The NDE was very responsive to work with as we were able to re-evaluate 4 HDDs in spring 2009 and make corrective actions in record time. (three of the incidences were caused by TCPL and one by a NDE company). The 24 hr delay issue has been dealt with very effectively by utilizing what is referred to as the prescanning rig. If anything additional shows up in the official 24hr scan it

would likely result in a cut-out but the risks are low if the contractor is not doing something to aggravate a potential cracking problem.

The contractors will complain bitterly about losing control of NDE as they lose control of the inspection of their own work and of course the attendant administration fees. The advantage that most contractors do not recognise is that an independent inspection and audit cuts back on severity of repairs caused by delayed audit results. The REX experience could have been avoided by KinderMorgan and saved the contractor a lot of money if they had used an independent inspection process. This would have resulted in a higher initial cut-out rate for the contractor which would have been preferable to the end result of several hydrotest failures and the resulting PHMSA dig program. (the cellulosic SMAW repair method used is very crack prone and they did not delay inspection. The old TransCanada built one of these leaky pipes)

The suggestion to have the quality built in at the front end such as the stress free pipe example is impractical when all parties need production. Since a perfect pipe is impractical, we need to make time and accept as much risk as possible without jeopardising quality. This was the whole purpose of developing ECA and AUT programs where we can allow indications many times larger than work workmanship and have a better engineered pipe. This means we have high production rates and should be able to do a better inspection job with a few well trained inspectors. This is the time when owner companies have the economic leverage to change the status quo. If we are serious about quality, this is the time to get all forms of third party inspection correctly lined up as it is the shovel of quality.

The following matrix shows how different processes interact

| Mainline | Poorboy | Tie-ins | Inspection | 24hr delay |
|---|---|---|---|---|
| GMAW | GMAW | FCAW | AUT | no but delay on SMAW repairs |
| GMAW | GMAW | SMAW | AUT | yes on tie-ins |
| GMAW | SMAW | SMAW | AUT | yes on tie-ins and Poorboy |
| SMAW | SMAW | SMAW | AUT | yes on all |
| SMAW | SMAW | SMAW | RT | yes on all |

Prescanning 24hr delay welds with AUT can really speed things up and allow the contractor to move on with their equipment.

The reason the SMAW RT is acceptable at TransCanada is it is very appropriate for small diameter(NPS 16 and less). It is not appropriate for large diameter high strength materials. The GMAW FCAW option is very suited to materials X80 and nigher. It makes more sense to understand the limitations of the material and the process and pick a process Fit For Purpose. If a contractor is well prepared, the FCAW tie-ins are very quick and of high quality. If you have a high water table you can close a ditch very fast with FCAW compared to an SMAW process. If I am recalling correctly, the FCAW repair rate at Fort Mac was zero with a couple of cut-outs for hi/lo. Other advantages include safety improvements but you need a slightly larger bell hole.

I was asked if AUT is permitted in Mexico. I checked and WeldSonix has worked for Pemex a few times so there is a precedent. In my mind, the big seller of AUT in a country that is working to increase employment is the better inspection offered by AUT as it does not miss root cracks.

As an FYI, attached is the rationalization for the development of the official 3PI program that is going out as a decision summary in the near future. The elements that you need to address in your project are contained in this attachment. I have the structure worked out and it would fit with the work being performed in North America. In the attachment I do not address field services which are a very important component of pipeline construction. The reason for this is we have a successful program that would need minor changes to be implemented under the same 3PI umbrella at a later date. If you want to see the start of the Engineering Directive document, come by and I will explain how it works and how it lines up with our current process that I have been working with SCM on.

Hope this helps
Evan