

Materials, Engineering Governance and Quality Management

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SERVICE: Keystone Spread 3B Coating Audit

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INTRODUCTION

Meera Kothari, Keystone Project Engineer, requested that Neil Pittman travel to the Keystone 3B Spread and audit Michels Pipeline's application and UEI's inspection for adherence to the Keystone coating specification, KPP-01 "Specification for liquid epoxy/urethane system." Dana Green, UEI RCS, Racer Hutchens, UEI Chief, Chuck Otwell, UEI Coating Auditor and various Michels Foremen and Straws participated in the audit.

CONCLUSIONS

Several items of concern were identified during the four day audit. As each item was identified it was corrected with the participation of Michels and UEI. After the audit there were no items that were not addressed and corrected to the minimum requirement of the specification.

1. Mainline Coating

- 1.1. Abrasive Blasting – The Michels mainline coating crew was using Black Beauty "medium" grit which has a 16-40 sieve size. According to the mainline coating foreman and NACE coating inspector this grit, combined with their equipment, was causing high anchor profiles when the specified coating cleanliness was met. The audit revealed seven girth welds on the right of way that were blasted to only a NACE #3, Commercial Blast prior to coating. The specification KPP-01 requires a NACE #2 Near White Blast. The entire girth weld area on all seven did not meet the cleanliness specification with the bottom having the lowest quality. The blast on the welds was rejected and they were re-blasted (some twice), resulting in a Near White Blast with an anchor profile within specification. The blast operators changed their technique which resulted in acceptable cleanliness and profile. High anchor profiles were not observed when a Near White Blast was achieved. The Michels foreman was informed that switching to a finer grit, Black Beauty 20-40, may result in the required cleanliness without the danger of high profiles. The foreman switched to the finer grit and a spot check of the mainline coating crew two days later reveal the anchor profile and cleanliness were being met on the entire circumference of the girth welds.
- 1.1.1. Coating Inspection – The UEI NACE coating inspector on the mainline had two deficiencies in her reporting.
 - 1.1.1.1. The seven girth welds that the audit rejected should have been rejected by her. Upon inspection of the welds with the SSPC vis. 1 standards she agreed that none of the seven met spec. She stated that they had been having the problem of not being

able to meet the Near White Blast, due to high anchor profiles, for two weeks. She reported the problem but later said the problem was resolved. The cleanliness on the previous two weeks mainline coating is not known. All blast cleanliness on form C11A for the previous two weeks was recorded as being Near White when that may not be the case. The inspector was instructed by her management to record the actual blast cleanliness on form C11A and reject anything that did not meet specification. A spot check in the field two days later found her correctly recording the cleanliness.

- 1.1.1.2. The UEI mainline coating inspector had “20 – 35” recorded as the WFT on all audited C11A forms. Eight instances were found where the lowering in inspector found low DFT, especially on the bottoms of the girth welds. The mainline coating inspector was instructed by her management to record the actual of all three measurements on form C11A.
- 1.1.2. Hydrogen Outgassing – The girth weld coatings show evidence of pinholes from hydrogen outgassing of the welds. The welds were being coated within 24 hours of weld completion. Jeeping was catching all holidays and they were being repaired. The UEI RCS was informed that moving the mainline coating crew back to >24 hours after welding would reduce the number of pinholes.
- 1.1.3. Coating Application – There were brush hairs found in the coating and stalactites on the bottom of the weld. The mainline coating crew was asked to not “work” the coating until it was curing, causing the coating to pull bristles from the brushes. The avoidance of stalactites by technique was also reviewed. The prejeeping crew was advised on how to adequately repair stalactites.
- 1.1.4. Welding – PHMSA noted in their exit report from Spread 3B that the welding clamps were disbonding dime sized pieces of parent FBE from the mainline. The mainline coating crew is now abrasive blasting and repairing the disbonded areas with SPC-2888.
- 1.1.5. Safety – In the Michels safety orientation it was presented that “if it doesn’t have a seat belt, don’t ride it.” The abrasive blasting truck was being ridden by the laborer adding abrasive to the pots. The Michels safety representative was informed of this and will make corrections.

2. Prejeeping

- 2.1. Unrepaired Holidays – At lowering in many holidays were found marked and not repaired. In addition, an audit of approximately one mile of pipe between prejeeping and lowering in found 29 unmarked visible holidays on the working side of the pipe alone. An audit of the prejeeping crew found that the addition of a prejeeping inspector and Michels voluntarily increasing prejeeping voltage to 2,500 volts and grounding directly to the pipe has eliminated this problem. The majority of holidays found now at lowering in are believed to have occurred by mechanical damage between prejeeping and lowering in. The prejeeping inspector is keeping meticulous records, performing cure and adhesion tests and rejecting inadequate and missed repairs. The quality of the prejeeping inspector’s work was reviewed with him.
- 2.2. Holiday repair – Michels believes that they were instructed not to use brushes on holiday repairs. They were instructed not to apply the coating directly to the brush but to mix on a clean palette. Without brushes, the Michels prejeeping crew was using tongue depressors to apply coating to repairs. This resulted in many repairs that were visibly inadequate due to high and low milage. Michels was informed that they may use brushes and the quality of repairs improved.

- 2.3. Brush Cleaning – Michels is cleaning their brushes of excess coating on the pipe which is acceptable. However, it creates a spot that looks like a holiday repair and is often messy and low in milage. The Michels prejeeping crew were advised that if they wipe their brushes in a “plus” pattern next to the repair that inspection would recognize it as not being a repair.
- 2.4. Milage – The prejeeping inspector is filling out form C11B now. On the form he has been recording the average of 5+ readings and rejecting if the DFT is outside of specification. He was informed that the spec requires recording five readings on form C11B and started doing that immediately.
- 2.5. Holiday Marking – It was unclear who was marking holidays and writing “jeep” next to them. The PHMSA auditor noticed several of these markings after prejeeping in his exit report. The UEI RCS announced in a morning foreman and inspectors meetings that the word “jeep” should not be written next to marked holidays or potential holidays. The RCS will address who should be marking on the pipe.
- 2.6. Jeep Spring – The prejeeping crew had two springs for their holiday detector. Both were loose and “tented” at the weld and at the arm connecting the spring to the holiday detector. It was recommended that a new spring may provide more complete holiday detection.

3. Lowering In

- 3.1. Accelerated Cure – Three defects were found during lowering in that were burned coating at and around repairs. One of the defects was already in the ditch. Lowering in was stopped and a bell hole dug so the defect in the ditch could be repaired. A hand-held propane torch was observed on the right of way and the lowering in foreman was informed that torches may not be used to post-heat coatings. The foreman had a heat gun in his truck and will use that on subsequent repairs that need accelerated curing. The UEI RCS, Chief, lowering in inspector and the Michels foremen from lowering in and backfill reviewed the rejected burned repair to ensure consistency of accepting accelerated cured repairs.

4. Tie In – Several tie in crews were visited with all quality measurements and processes meeting specification.

- 4.1. Safety – Two personnel were observed standing on the pipe. In one instance, a laborer was observed running on the pipe, jumping to another pipe and then standing on the pipe while it was lifted by heavy equipment to line it up for a tie in. She and her foreman were informed that TransCanada does not allow personnel on the pipe. Michel’s safety representative was informed of the issue.

Respectfully submitted,

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