Integrity Update July 2020

Since the "Stop Work" issued in October 2019, Mountain Valley Pipeline (MVP) has continued to ensure there are no integrity issues associated with corrosion of the already installed, buried pipe. MVP has accomplished this by taking a number of proactive approaches to cathodic protection (CP) and corrosion mitigation.

To date, MVP has installed four permanent impressed current system CP groundbeds. Of these, only one is currently energized. The currently energized groundbed, Groundbed 2 at MP 15.4, is protecting approximately 12 miles of pipe on Spread A. The remaining three beds are waiting on commercial power hookups from the utility company. Once the power hookups are completed, these three groundbeds will protect an additional 2.4 miles of pipe. However, until work is permitted to resume on MVP, the commercial power drops cannot be installed.

In addition to the four impressed current systems on the pipeline (1 operating, 3 awaiting power), the CP systems within the three compressor stations have been installed and are energized. To further maximize the amount of pipe receiving CP, jumpers were installed around isolation points within and near the Bradshaw Compressor station allowing the pipeline just outside of the station to be temporarily protected by the Bradshaw CP system. Installation of these jumpers resulted in an additional 2.8 miles of pipeline to be protected using an impressed current system.

As discussed in the March 2020 correspondence between PHMSA and MVP, coating surveys continue to be conducted along the pipeline. In addition to the three coating surveys conducted prior to March 2020, the corrosion specialist firm hired by MVP has performed DCVGs on all continuous sections of pipe greater than 3 miles in Spreads A and B. At this time, approximately 38 miles of pipe have undergone a coating survey. Once construction is permitted to resume, MVP will perform these investigations to determine the severity of the indications and if coating repairs are required. In the meantime, MVP plans to continue conducting coating surveys on all continuous pipe segments greater than 3 miles in length.

MVP completed a full pass of test station readings along the pipeline in late 2019 and early 2020. However, MVP will continue to monitor the test stations along the pipeline where areas of higher than expected potential readings were found during the initial monitoring of these test stations. The most recent test station readings, taken in April show no areas where immediate response is required, but the sooner protective systems can be installed the better. Once construction resumes, MVP plans to do further investigations in these areas to mitigate the corrosion risk and install localized temporary CP.

Given MVP's request to install temporary CP during the "stop work" has not been approved, no additional temporary CP has been installed since the shutdown occurred in October 2019. MVP plans to prioritize installation of these anode beds at the locations identified when earth disturbance is permitted to resume. Installation of these additional anodes will protect the pipeline during the remainder of construction until the permanent CP systems can be installed and energized.

MVP currently plans to wait until the SWO is lifted and construction resumes before commencing with installation of the temporary CP systems. However, if the start of construction continues to be delayed, MVP plans to seek permission to install temporary CP to mitigate the risk of interference and corrosion occurring on the buried, unprotected pipe segments. Ideally, MVP would like to install these temporary

anode beds before the growing season ends to ensure the limited areas disturbed during installation are reclaimed during the growing season.

Once the pipeline is complete and all the groundbeds are installed and energized, the system will be rebalanced to ensure the entirety of the pipeline is received adequate permanent cathodic protection.

MVP is currently discussing when and MFL Inline Inspection is going to be competed. The line currently has multiple HCAs and will need to have an inspection within 10 years of being turned in line. The preference is to run the tool early in the pipeline's life to get a baseline to base corrosion growth rates and other potential anomalies. The plans have not been finalized.

PHMSA Q1:

Tell me if any of the installed pipe has undergone a hi-res caliper tool run and/or Subpart J hydrotest at this juncture? If so which of the aforementioned segments?

MVP Response Q1:

MVP ran a sizing pig on the Pigg River HDD to determine whether the pipe incurred any unacceptably large deformations after pull back. The run found the pipe to be acceptable. No high-resolution geometry tools have been run to date.

The only 42-inch mainline hydrotest completed thus far was on a portion of the suction, discharge, and bypass piping around the Bradshaw Compressor Station. After the successful completion of this test, only cleaning and drying pigs were used. MVP will run high-resolution caliper pigs through these portions of the pipeline when the adjacent 42-inch mainline is hydrostatically tested and tied-in.

PHMSA Q2:

Please provide CP alignment and design sheets. Just want to better understand "temporary" vs permanent CP design slated for MVP. What will happen with these temp installs?

MVP Response Q2:

The permanent and temporary CP drawings are available in the BOX folder accessible by PHMSA.

MVP plans to install 31 permanent cathodic protection anode beds to protect the pipeline. Currently one of these beds has been installed and is operating (groundbed #2), which is protecting approximately 12 miles of buried pipe.

The temporary installs will be installed at existing test stations along the project. Upon completion of construction, these beds will be abandoned in-place. To accomplish this, the wire leads connected to the anodes will be disconnected in the test station head. The anodes will remain in the ground.

PHMSA Q3:

Is there a contractual agreement between MVP and the installation contractor to perform post-installation coating surveys (ACVG/DCVG/CIS) to assess quality of construction? If so, what segments have been completed to date? Will these surveys also be pursued if access is granted for temporary CP installs at this time?

MVP Response Q3:

MVP has contracted directly with a corrosion specialist firm to conduct CIS and coating surveys post-construction.

MVP has conducted a number of coating surveys thus far. DCVGs were conducted near the Shulman Hill Road crossing on Spread A in West Virginia and between mileposts 133.45 and 135.75 on Spread E in

Virginia. An ACVG was conducted between milepost 227.7 and 228.7 on Spread H in Virginia. No anomalies were detected during these surveys.

In addition to voltage gradient testing, coating conductance testing was conducted on the Pigg River HDD. The results of the testing showed the coating to be in excellent condition.

MVP is starting an initiative to perform DCVG surveys on tied-in sections of pipe longer than three miles in the coming weeks.

In addition, MVP has successfully energized ground bed #2 on Spread A which effectively protects over 12 miles of 42-inch mainline. Initial pipe-to-soil readings on this section of pipe show favorable results with respect to corrosion mitigation.

PHMSA Q4:

Also, as I am certain the issue will be broached by FERC, MVP's explanation as to the delay in securing temporary CP on MVP - foreseeing the potential issuance of a "stop work" order? Note, as discussed yesterday, ACP apparently had this covered and protected their installs accordingly, albeit less mileage than MVP at this time.

MVP Response Q4:

Prior to shutting down construction for the winter of 2018-2019, MVP hired a corrosion specialist firm to take pipe-to-soil readings at all test stations installed on the pipeline. The readings were reviewed to determine if there were portions of pipe experiencing interference current pick-up and discharge that would elevate the level of corrosion that might occur if left unprotected during the winter. The review of the data showed that there were no areas of concern along the pipeline that required immediate action.

Additionally, magnesium anodes were installed at easily accessible locations along the pipeline to help increase the potentials in these areas in an attempt to minimize the level of corrosion that would occur along the buried sections of the pipeline. Because the majority of these anodes were installed where tie-ins later occurred, much of this temporary protection is no longer operational.

Upon commencement of construction in spring of 2019 MVP's main CP focus was on the installation of the permanent CP groundbeds. When it became apparent in late summer of 2019 that the pipeline would not be continuous, thereby limiting the effectiveness of the permanently designed CP systems, MVP started to look into installing temporary CP on sections of the 42-inch mainline, where necessary. The plan was to install the temporary CP in the fall after pipeline construction stopped for the year. This was to ensure the temporary CP was effective in covering a large portion of the buried pipeline.

However, MVP was issued the stop work order on October 15, 2019. Temporary CP installations were planned to occur over the winter months, starting in November. Upon receipt of the work cessation, MVP began preparing the necessary request to FERC for authorization of this activity.

162336_162337_162349_MVP_WV VA_I02
EQT MIDSTREAM (31604)
Regulator: Eastern Region
Lead: Eastern Region

Observation Type / Status: **Any Observation Type** / **Any Issue Status (including no issue)**
Date Range: **10/01/2016** - **10/26/2019** (1,120 days)

		Type	Issue Observed	Issue Resolved	Issue Duration
3/7/2019	**7 March 2019 - Puth | MVP ✓**				
	85614 : Bradshaw CS				
1	New Construction Observation	Welding, NDE	--	--	--
6/4/2019	**4 June 2019 - Puth | MVP spread I ✓**				
	85614 : HDD Pigg River				
1	New Construction Observation	HDD's, Bores	--	--	--
6/5/2019	**5 June 2019 - Puth | MVP ✓**				
	85614 : Spread F				
1	New Construction Observation	Welding, NDE	--	--	--
2	New Construction Observation	Trenching, Lowering, Backfilling	--	--	--
3	New Construction Observation	Transportation, Stringing	--	--	--
8/6/2019	**6 August 2019 - Klesin | Mountain Valley ✓**				
	85614 : Spread C				
1	Flatwoods Office	Other	--	--	--
2	Welding - Brown Mountain	Welding, NDE	--	--	--
3	Coating_Mudlick	Coating, Corrosion Control	--	--	--
4	Trenching_Lowering_Backfill	Trenching, Lowering, Backfilling	--	--	--
5	Stringing	Transportation, Stringing	--	--	--
8/7/2019	**7 August 2019 - Klesin | MVP ✓**				
	85614 : Spread C				
1	NDE Records Review	Welding, NDE	--	--	--

2	Harris Compressor Station	Other	--	--	--
8/8/2019	**8 August 2019 - Klesin | MVP ✓**				
	85614 : Spread C				
1	Coating - Access Road 128 (Web	Coating, Corrosion Control	--	--	--
2	Construction Daily Observation	Transportation, Stringing	--	--	--
3	Access Road 125.01	Trenching, Lowering, Backfilling	--	--	--
4	Access Road 128	Trenching, Lowering, Backfilling	--	--	--
5	Coating_Jeeping_Rock Shield	Coating, Corrosion Control	--	--	--
6	Welding	Welding, NDE	--	--	--
7	Valve Set	Material Verification	--	--	--
8	Steep Slope Install Location	Other	--	--	--
9/24/2019	**24 Sept 2019- Puth | MVP - Spread F ✓**				
	85614 : i64 Bore and access 199 tie-in and. Alive Stations 21 & 20				
1	New Construction Observation	HDD's, Bores	--	--	--
2	New Construction Observation	Trenching, Lowering, Backfilling	--	--	--
3	New Construction Observation	Coating, Corrosion Control	--	--	--
4	New Construction Observation	Welding, NDE	--	--	--
5	Main line valve 21	Welding, NDE	--	--	--
6	Valve 20	Welding, NDE	--	--	--
9/25/2019	**25 Sept 2019 - Puth | Spread F and CS ✓**				
	85614 : Various pipeline access (198, 199)				
1	New Construction Observation	Welding, NDE	--	--	--
2	New Construction Observation	Coating, Corrosion Control	--	--	--