PIPELINE INTEGRITY
CORROSION GROWTH RATE ANALYSIS
LINE 5 ENO-EMA 2013 MFL WITH 2008 MFL

Line Segment: 5
Date of Most Recent Inspection: 2013
Inspection Technology & Vendor: GE MFL
ILI Report Issue: 1

Date of Previous Inspection: 2008
Inspection Technology & Vendor: GE MFL
ILI Report Issue: 1

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1. EXECUTIVE SUMMARY

Corrosion Growth Rate analysis was conducted for Line 5 ENO-EMA by comparing the 2013 MFL GE and 2008 MFL GE inspections. A total of 4 joints were reviewed; of these:

- 0 joints require further action as detailed below
- 4joints require no further action

Joint	Action	Comment
XXXXX	Excavate	XXX-day timeline
XXXXX	Monitor	Monitor in AFD

2. OUTLIER CORROSION GROWTH RATES

The following is a summary of apparent outlier CGRs:

Case	Description	# Joints (Ext)	# Joints (Int)	Comments
1	Historical CGR ≥0.30 mm/yr	0	0	
2	Back-to-back CGR ≥0.30 mm/yr	1	0	
3	RunCOM CGR ≥0.30 mm/yr	0	0	
4	Back-to-back CGR more than double historical CGR	0	3	
5	RunCOM CGR more than double historical CGR	0	0	
6*	RPR severity increase is ≥0.02/yr with **non-shielding** coatings	50	31	

* For RPR severity comparison, only RStreng, Effective Area or LAPA RPRs should be used since 0.85dL RPRs are typically overly conservative as the feature severity increases.

** In the case that no features meet the above criteria, the SML should consider reviewing the three most severe internal and external joint-specific CGRs.

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3. DETAILED REVIEWS – EXTERNAL CORROSION

3.1. CASE 1 - HISTORICAL CGR ≥0.30 MM/YR

No anomaly meets this criterion.

3.2. CASE 2 - BACK-TO-BACK CGR ≥0.30 MM/YR

The anomaly was reported by the 2013 MFL to be a manufacturing defect. If the is a corrosion anomaly and misclassified by the vendor, a CGR calculation is required. A CGR is calculated based on the depth reported by the 2013 and 2008 ILI. A calculated value of 0.43mm/yr was found. Thus, an anomaly with a depth of 25% and CGR of 0.43mm/yr is expected to grow to a depth of 35% by the next inspection run (2018). Since the estimated depth does not reach not reach excavation criterion by next inspection, no action is required.

GW	Nr features	NWT, in	Depth, %	RPR	Historical CGR	Level 2 CGR	RunCom CGR	Depth by next inspection (2018)
5110	1	0.812	25		0.20	0.43	-	35

3.3. CASE 3 - RUNCOM CGR ≥0.30 MM/YR

No anomalies with RunCom CGR higher or equal then 0.30 mm/yr were reported. However, RunCom listing presented several mill anomalies with depths higher than 50%. MFL does not provide enough information to assess in depth manufacturing defects. These anomalies will be assessed at the next UT ILI run. In addition, since these anomalies were reported as manufacturing defects, no CGR analysis was performed.

3.4. CASE 4 - BACK-TO-BACK CGR MORE THAN DOUBLE HISTORICAL CGR

No anomaly meets this criterion.

3.5. CASE 5 - RUNCOM CGR MORE THAN DOUBLE HISTORICAL CGR

No anomaly meets this criterion.

3.6. CASE 6 - RPR SEVERITY INCREASE IS ≥0.02/YR WITH NON-SHIELDING COATINGS

All features with RPR CGR equal or higher than 0.02 were reported to be manufacturing defects by the 2013 MFL. A conservative value of RPR CGR was provided by the macro for those anomalies without RPR. As the manufacturing defects had no RPR values provided no further evaluation have been performed. Since all the features were manufacturing anomalies, no action is required.

4. DETAILED REVIEWS – INTERNAL CORROSION

4.1. CASE 1 - HISTORICAL CGR ≥0.30 MM/YR

No anomaly meets this criterion.

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4.2. CASE 2 - BACK-TO-BACK CGR ≥0.30 MM/YR

No anomaly meets this criterion.

4.3. CASE 3 - RUNCOM CGR ≥0.30 MM/YR

No anomalies with RunCom CGR higher or equal then 0.30 mm/yr were reported. However, RunCom listing presented several mill anomalies with depths higher than 50%. MFL does not provide enough information to assess in depth manufacturing defects. These anomalies will be assessed at the next UT ILI run. In addition, since these anomalies were reported as manufacturing defects, no CGR analysis was performed.

4.4. CASE 4 - BACK-TO-BACK CGR MORE THAN DOUBLE HISTORICAL CGR

3 anomalies were found within the case for. All 3 anomalies were reported to be manufacturing defects. A CGR was calculated for the case where the anomalies are corrosion features. The expected depth by the next inspection calculated with the Level 2 CGR provides depth values that are much lower than depth excavation criterion. Since the estimated depth does not reach not reach excavation criterion by next inspection, no action is required.

GW	Nr features	NWT, in	Depth, %	RPR	Historical CGR	Level 2 CGR	RunCom CGR	Depth by next inspection (2018)
840	1	0.812	14		0.08	0.19	-	19
2250	1	0.812	19		0.11	0.27	-	26
3020	2	0.812	14		0.08	0.15	-	18

4.5. CASE 5 - RUNCOM CGR MORE THAN DOUBLE HISTORICAL CGR

No anomaly meets this criterion.

4.6. CASE 6 - RPR SEVERITY INCREASE IS ≥0.02/YR WITH NON-SHIELDING COATINGS

All features with RPR CGR equal or higher than 0.02 were reported to be manufacturing defects by the 2013 MFL. A conservative value of RPR CGR was provided by the macro for those anomalies without RPR. As the manufacturing defects had no RPR values provided no further evaluation have been performed. Since all the features were manufacturing anomalies, no action is required.

5. CONCLUSIONS

In conclusion, four anomalies were reviewed within this CGR analysis. None of the anomalies is expected to have excavation criteria by the next inspection run.

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