

<b>TR Number</b>	<b>23-05</b>
<b>Primary</b>	192.925
<b>Purpose</b>	Revise GM Section 925 to adjust for NACE 0502 differences from the 2008 to current IBR version 2010. Most changes appear to be location moves in the newer NACE version but some content did change as well and should be reviewed against the GM.
<b>Origin/Rationale</b>	In the revision of NACE 0502-2008 to 2010 content moves occurred that changed NACE section numbering that have not been addressed in the current GM. Some language revisions also occurred and which should be considered in this TR assignment. Based on initial review it is believed that GM 192.925 Section 5.3(a) should be revised from NACE 5.3.2 to 5.4.2, 5.3 (d)(1) - NACE 5.4.3.5 to 5.5.3.5, 5.4 (a) – NACE 5.5.1 to 5.6.1, 5.5(a) – NACE 5.6.1 to 6.3.1, 5.6(a) – NACE 5.7.1 to 6.4.1, 5.7 – NACE 5.8 to 5.7, 5.7(a) – NACE 5.9 to 6.5, 5.7(a)(2) – NACE 5.8.4.3.1 to 5.7.4.3.1, 5.7 (a)(4) – NACE 5.8.4.4 to 5.7.4.4, 5.7(b) – NACE 5.9 to 6.5, 5.7(b)(3) – NACE 5.9.1.1 to 6.5.1.1, 5.7(b)(4) – NACE 5.9.1.2 to 6.5.1.2, 5.7(c) – NACE 5.9.3 to 6.5.3, 6.2(b) – NACE Appendix D to Appendix C and NACE D3.3 to C3.3, 6.2(c) – NACE Appendix D to Appendix C, 6.3(b) – NACE 6.3.1 to 6.6.1, 6.3(d) – NACE 6.3.3 to 6.6.3, 6.4(a) – NACE 6.4.2.2 to 6.7.2.2, 6.4.(b) – NACE 6.4.3 to 6.7.3, 6.4(d) – NACE 6.4.4 to 6.7.4, 6.5(a) – NACE 6.5.1 to 6.8.1, and 6.5(b) – NACE 6.5.2 to 6.8.2.
<b>Assigned to</b>	IM/CORR Task Group

**Note:** Revisions are shown in **yellow highlight** and **red font**.

### Section 192.925

Note: References to NACE throughout this section of guide material are specific to the edition of NACE SP0502 as incorporated by reference (IBR) in §192.7. Abbreviated references are used in guide material below. Example: "NACE 5.2.1" means NACE SP0502, Paragraph 5.2.1 of the IBR edition. See 3 of the guide material under §192.907. NACE SP0502 is an IBR standard; therefore, "shall", "requires", or "must" statements in this section of guide material with specific reference to NACE SP0502 are required to be followed per §192.925(b).

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#### 5.3 Data collection.

- (a) Minimum requirements. Before conducting excavations, NACE ~~5.3.2~~ **5.4.2** requires the operator to define minimum requirements for consistent data collection and recordkeeping at each excavation. When establishing the minimum requirements, the operator is required to address the following unless an alternative method is documented.

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- (c) Coating damage or exposed pipe surface. If the coating is damaged or corrosion is present on the pipe, examples of data and related activities that may be performed at each excavation include the following.

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- (10) Other data deemed appropriate (e.g., pH in the corrosion pit).

*Note:* NACE ~~Appendix C provides~~ Appendices A and B provide additional data collection guidance.

- (d) Supplemental data collection.

- (1) In accordance with NACE ~~5.4.3.5~~ 5.5.3.5, the operator shall consider other evaluations unrelated to external corrosion. Such evaluations may include magnetic particle or dye penetrant testing for cracks.

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#### 5.4 *Evaluations of indications.*

- (a) Corrosion defects. In accordance with NACE ~~5.6.4~~ 6.3.1, the pipeline operator must evaluate the condition of the coating and pipe wall at each excavation location.

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#### 5.5 *Root-cause analysis.*

- (a) In accordance with NACE ~~5.6.4~~ 6.3.1, the pipeline operator shall identify the root cause of all significant corrosion activity. Typical examples of root causes include the following.

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- (c) The operator is required to document root-cause identifications and analyses (NACE 7.4.1.3).

#### 5.6 *Mitigation (remediation).*

- (a) In accordance with NACE ~~5.7.4~~ 6.4.1, the operator is required to identify and implement remediation activities to mitigate or preclude future external corrosion resulting from significant root causes. Examples of remediation activities include the following.

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#### 5.7 *In-process criteria evaluation, reprioritization, and reclassification.*

NACE ~~5.8~~ 5.7 requires the operator to evaluate the indirect inspection data versus the results of remaining strength evaluation and the root-cause analysis by comparing the actual conditions found to the conditions predicted by the criteria used to classify and categorize indications. This evaluation should be conducted periodically throughout the direct examination step so that operator can make adjustments to its criteria to adequately address the threat of external corrosion. These direct examination tasks may require that certain indications need to have their severity classification or priority category raised. Based on the results of the evaluation an operator may downgrade an indication's classification or categorization.

- (a) Reclassification of indications.

- (1) NACE ~~5.9~~ 6.5 requires the operator to reclassify indications when results from the direct examination show corrosion activity (e.g., corrosion, coating damage) that is worse than indicated by the indirect inspection data. The classification criteria shall be reevaluated and adjusted to reflect the severity of indications found.

- (2) If corrosion or coating damage was found worse than what was classified, NACE ~~5.8.4.3.4~~ 5.7.4.3.1 requires the operator to consider the need for additional indirect inspections over the ECDA region. Factors to consider whether additional indirect inspections are needed include:

...

...

- (4) If repeated direct examinations show corrosion activity that is worse than Indicated by the indirect inspection data, the operator is required to reevaluate the feasibility of ECDA (NACE ~~5.8.4.4~~ 5.7.4.4).

- (b) Reprioritization of excavations.

- (1) NACE ~~5.9~~ 6.5 requires the operator to reprioritize when existing corrosion is more severe than the assigned priority. For example, if examination of a "scheduled" indication reveals an external corrosion defect that requires immediate action, the prioritization criteria is required to be revised so the "scheduled" indication would be prioritized as "immediate."
- (2) ...
- (3) An indication that was originally placed in the immediate category cannot be moved lower than the scheduled category as a result of reprioritization unless the operator documents justification that demonstrates the technical basis for lowering the category (NACE ~~5.9.1.1~~ 6.5.1.1).
- (4) When ECDA is applied for the first time, NACE ~~5.9.1.2~~ 6.5.1.2 does not allow the pipeline operator to downgrade any indications that were originally placed in the immediate or scheduled priority category to a lower priority category unless the operator documents justification that demonstrates the technical basis for lowering the category.
- (5) ...
- (c) Root cause.  
For each root cause where corrosion activity was worse than expected, indications that occur in the pipeline segment where similar root-cause conditions exist (e.g., foreign line crossing, light rail) shall be identified and reevaluated (NACE ~~5.9.3~~ 6.5.3).

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5.8 *First-time application.*  
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## 6 POST-ASSESSMENT

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6.1 *Remaining flaw size estimation.*  
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6.2 *Corrosion growth rate calculation.*

- (a) The corrosion growth rate is required to be based on a sound engineering analysis (NACE 6.2.3). If available, an operator should use actual corrosion rate information for the region. Actual corrosion rates may be determined by direct measurement of wall thickness as a function of time on the pipeline in question. An operator should review data collected in the pre-assessment records to determine if this information is available. For example, an operator has a recent measurement of pipe wall loss (e.g., from direct examination). The wall loss divided by the number of years the pipeline has been in service may provide an adequate corrosion rate.
- (b) If actual corrosion rate data on the pipeline region is not available, NACE Appendix ~~DC~~ provides guidance on other methods to estimate corrosion rates. Appendix ~~DC~~ provides a default corrosion pitting rate of 16 mils per year (mpy) (1mil = 0.001 inch) when other data is unavailable. The 16 mpy rate can be reduced to 12 mpy if it can be shown that the CP levels of the effected pipeline regions had at least 40 mV of polarization (considering IR drop) since installation (NACE ~~DC~~3.3).
- (c) Acceptable alternatives to estimate the corrosion rate are referenced in NACE Appendix ~~DC~~. This Appendix provides information on various analytical techniques such as corrosion coupon analysis, linear polarization resistance measurement, and electrical resistance probes. It also discusses the various soil and environmental factors that affect corrosion rates.

6.3 *Remaining life and reassessment interval calculation.*

- (a) NACE 6.2.4 requires the operator to use sound engineering analysis to estimate the remaining life of the maximum remaining flaw. The operator may use the formula provided in NACE 6.2.4.1 or the following equivalent equation.

Remaining Life Equation:

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- (b) When corrosion defects are found during the direct examinations, the maximum reassessment interval for each ECDA region shall be taken as one-half the calculated remaining life (NACE ~~6.3.4~~ 6.6.1). The reassessment interval is then set at the lower of half of that value or the maximum allowed reassessment interval.

*Example:* ...

- (c) ...

- (d) NACE ~~6.3.3~~ 6.6.3 requires that any indications scheduled for evaluation should be addressed before the end of the reassessment interval. Examples of addressing scheduled indications at the location prior to the next reassessment interval include the following.

...

#### 6.4 *Assessment of ECDA effectiveness.*

- (a) Upon subsequent applications of the ECDA process, if it is determined that there is more severe corrosion than expected (calculated), then the process is required to be reevaluated and repeated or an alternative integrity assessment method used (NACE ~~6.4.2.2~~ 6.7.2.2).
- (b) NACE ~~6.4.3~~ 6.7.3 requires the operator to establish criteria to assess the long-term effectiveness of the ECDA process. Assessing effectiveness may be performed by establishing and tracking performance measures. Examples of ECDA performance measures include the following.

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- (d) In the event that the evaluation of performance measures does not show ECDA to be effective, the pipeline operator is required to reevaluate the ECDA application or consider alternative methods of assessing pipeline integrity unless the operator provides written justification (NACE ~~6.4.4~~ 6.7.4).

#### 6.5 *Feedback (continuous improvement).*

- (a) NACE ~~6.5.4~~ 6.8.1 requires the operator to endeavor to improve the ECDA process by providing opportunities to evaluate feedback from applicable processes.
- (b) NACE ~~6.5.2~~ 6.8.2 requires the operator to consider including the following activities in the feedback process.

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- (c) ...

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