

The plans procedures for indirect examination must follow the requirements in Section 6.4 of ASME/ANSI B31.8S and Section 4 of NACE RP0502–2002, and include criteria for:

- Identifying and documenting those indications that must be considered for excavation and direct examination;
- For defining the urgency of excavation and direct examination of each indication identified during the direct examination; and
- For scheduling excavation of indications for each urgency level.

The procedures for direct examination must follow the requirements in Section 6.4 of ASME/ANSI B31.8S and Section 5 of NACE RP0502–2002, and include criteria for:

- Deciding what action should be taken if either corrosion defects are discovered that exceed allowable limits (Section 5.5.2.2 of NACE RP0502–2002), or root cause analysis reveals conditions for which ECDA is not suitable (Section 5.6.2 of NACE RP0502–2002);

- For any changes in the ECDA Plan, including changes that affect the severity classification, the priority of direct examination, and the time frame for direct examination of indications; and

- That describe how and on what basis an operator will relax any of the criteria that NACE RP0502–2002 specifies can be relaxed.

The plan's procedures for post assessment of the effectiveness of the ECDA process must follow the requirements in Section 6.4 of ASME/ANSI B31.8S and Section 6 of NACE RP0502–2002, and also include measures for evaluating the long-term effectiveness of ECDA in addressing external corrosion in covered segments and criteria for evaluating whether conditions discovered by direct examination of indications in each ECDA region indicate a need for reassessment of the covered segment at an interval less than that specified in § 192.939. (Appendix D of NACE RP0502–2002 provides guidance for performing this evaluation).

Section 192.927 What Are Requirements for Using Internal Corrosion Direct Assessment (ICDA)?

This section specifies requirements an operator must follow in using Internal Corrosion Direct Assessment (ICDA). An operator must follow the requirements in Section 6.4 and Appendix B2 of ASME/ANSI B31.8S, as well as those listed in this section. The ICDA process described in this rule applies only for a segment of pipe transporting nominally dry natural gas and not for a segment with electrolyte nominally present in

the gas stream. If an operator uses ICDA to assess a covered segment operating with electrolyte present in the gas stream, the operator must develop a plan that demonstrates how it will conduct ICDA in the segment to effectively address internal corrosion.

The rule defines ICDA as a process an operator can use to identify areas along the pipeline where fluid or other electrolyte that might be introduced during normal operation or by an upset condition may reside. ICDA then focuses direct examination on the locations in each area where internal corrosion is most likely to exist. The process identifies the potential for internal corrosion caused by microorganisms, or fluid with CO₂, O₂, hydrogen sulfide or other contaminants present in the gas.

The rule requires that an operator's ICDA plan must provide for preassessment, identification of ICDA regions and excavation locations, detailed examination of pipe at excavation locations, and post-assessment evaluation and monitoring.

In the preassessment stage, an operator must gather and integrate data and information needed to evaluate the feasibility of ICDA for the covered segment, to identify the locations in the covered segment where electrolyte may accumulate, to identify ICDA regions within the covered segment, and to support the use of a model to identify areas within the covered segment where liquids may potentially be entrained. This data and information includes, but is not limited to—

- All data elements listed in Appendix A2 of ASME/ANSI B31.8S.
- Information needed to support use of a model that an operator must use to identify areas along the pipeline where internal corrosion is most likely to occur. This information, includes, but is not limited to, location of all gas input and withdrawal points on the pipeline; location of all low points on covered segments such as sags, drips, inclines, valves, manifolds, dead-legs, and traps; the elevation profile of the pipeline in sufficient detail that angles of inclination can be calculated for all pipe segments; and the diameter of the pipeline, and the range of expected gas velocities in the pipeline.

- Operating experience data that would indicate historic upsets in gas conditions, locations where these upsets have occurred, and potential damage resulting from these upset conditions.

- Identification of covered segments where cleaning pigs may not have been used or where cleaning pigs may deposit electrolytes.

The plan must define all ICDA Regions within each covered pipeline segment. An ICDA region extends from the location where liquid may first enter the pipeline and encompasses the entire area along the pipeline where internal corrosion may occur and where further evaluation is needed. In the identification process, an operator must use the model in GRI 02–0057 “Internal Corrosion Direct Assessment of Gas Transmission Pipelines—Methodology” or an equivalent model if the operator demonstrates it is equivalent to the GRI model. A model must consider changes in pipe diameter, locations where gas enters a pipeline (potential to introduce liquid) and locations downstream of gas draw-offs (where gas velocity is reduced) to define the critical pipe angle of inclination above which water film cannot be transported by the gas.

An operator's plan must identify the locations where internal corrosion is most likely in each ICDA region. In the location identification process, an operator must identify a minimum of two locations for excavation within each ICDA Region and must perform a direct examination for internal corrosion at each location, using ultrasonic thickness measurements, radiography, or other generally accepted measurement techniques. One location must be the low point (e.g., sags, drips, valves, manifolds, dead-legs, traps) nearest to the beginning of the ICDA Region, and the second must be at the upstream end of the pipe containing a covered segment, having a slope not exceeding the critical angle of inclination nearest the end of the ICDA Region. If corrosion exists at either location, the operator must evaluate the severity of the defect (remaining strength) and remediate the defect in accordance with § 192.933; as part of the operator's current integrity assessment either perform additional excavations in covered segments within the ICDA region or use an alternative allowed assessment method to assess the line pipe in the covered segment for internal corrosion; and evaluate the potential for internal corrosion in all pipeline segments (both covered and non-covered) in the operator's pipeline system with similar characteristics to the covered segment in which the corrosion was found, and as appropriate, remediate the conditions the operator finds in accordance with § 192.933.

An operator's plan must provide for evaluating the effectiveness of the ICDA process and continued monitoring of covered segments where internal corrosion has been identified. The evaluation and monitoring process includes: