

(B) *Performance measures.* An operator must define and monitor measures to determine the effectiveness of the ECDA process. At minimum, these measures must track—

- (1) The effectiveness of the overall process (e.g., the change in the calculated reassessment interval);
- (2) The extent and severity of corrosion found;
- (3) The number of indications in each classification located on successive applications of ECDA; and
- (4) The time from discovery of an indication categorized as immediate action or scheduled action to its excavation.

(4) *Internal corrosion direct assessment (ICDA).* ICDA is a process that identifies areas along the pipeline where water or other electrolyte introduced by an upset condition may reside, then focuses direct examination on the locations in each area where internal corrosion is most likely to exist. An operator using direct assessment as an assessment method to address internal corrosion in a pipeline segment must follow the requirements in ASME/ANSI B31.8S, Appendix SP-B2, and in this section.

(i) *ICDA plan.* An operator that uses direct assessment to assess internal corrosion must prepare a plan that, at minimum, provides for the following—

(A) A process for data gathering to evaluate the potential for internal corrosion, and to support pre-assessment in accordance with paragraph (h)(4)(ii)(A) of this section;

(B) Identification of ICDA Regions, in accordance with paragraph (h)(4)(ii)(B) of this section;

(C) Identification of excavation locations and direct examination of the locations in accordance with paragraphs (h)(4)(ii)(C) and (h)(4)(ii)(D) of this section;

(D) Post assessment and continuing evaluation in accordance with paragraph (h)(4)(ii)(E).

(ii) *Corrosion identification.* An operator must have a process to evaluate the potential for internal corrosion caused by water, CO<sub>2</sub>, O<sub>2</sub>, chlorides, hydrogen sulfide and other contaminants present in the gas, and for MIC. This process must, in accordance with the requirements of this paragraph, provide for pre-assessment, identification of ICDA regions and excavation locations, direct examination and post assessment.

(A) *Pre-assessment.* An operator must gather information needed to identify areas along the covered pipeline segment where internal corrosion is most likely to exist. An operator will use this information to identify the

locations where water may accumulate, to identify ICDA regions, and to support the flow model. This information includes, but is not limited to—

(1) All data elements listed in Appendix SP-A2 of ASME/ANSI B31.8S.

(2) Information needed to support a flow model that an operator uses to determine 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 line; location of all low points on the line 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.

(3) Operating experience data that would provide an indication of historic upsets in gas conditions, locations where these upsets have occurred, and any indications of damage resulting from these upset conditions.

(B) *Identification of ICDA regions.* An operator must define all ICDA Regions within each covered pipeline segment. An ICDA region extends from the location where water may first enter the pipeline and encompasses the entire area along the pipeline where internal corrosion may occur and further evaluation is needed. To identify ICDA regions, an operator must apply the results of a mathematical flow model that defines the critical pipe incline above which water film cannot be transported by the gas. This flow model must consider changes in pipe diameter, locations where gas enters a line (potential to introduce moisture) and locations downstream of gas draw-offs (gas velocity is reduced). Graph E.III.A in Appendix E of this Part provides the flow model.

(C) *Identification of excavation locations.* After identifying the ICDA regions, an operator must then identify for excavation the most likely locations for internal corrosion in each region. An operator must identify a minimum of two locations for excavation in each ICDA Region. One location must be the low point (e.g., sags, drips, valves, manifolds, dead-legs, traps) nearest to the beginning of the ICDA Region. The second location must be at the upstream end of the pipe incline nearest the end of the ICDA Region.

(D) *Direct examination.* An operator must, at a minimum, excavate in each ICDA Region the two locations identified for excavation in paragraph (h)(4)(ii)(C), and must perform a direct

examination for internal corrosion at each location, using ultrasonic thickness measurements. If corrosion exists at either location, the operator must—

(1) Remediate the conditions it finds in accordance with paragraph (i) of this section;

(2) As part of the operator's current integrity assessment either perform additional excavations in the ICDA region or use an alternative assessment method allowed by this section to assess the pipe for internal corrosion; and

(3) Evaluate all pipeline segments (both covered and non-covered) in the operator's pipeline system with similar characteristics to those in which the corrosion was found, and remediate the conditions it finds in accordance with paragraph (i) of this section.

(E) *Post Assessment and Continuing Evaluation.* An operator must continually monitor each covered segment where internal corrosion has been identified using techniques such as coupons or electronic probes. An operator must also periodically draw off fluids at low points and chemically analyze the fluids for the presence of corrosion products. The frequency of the monitoring and fluid analysis must be based on results from past and present integrity assessment results and risk factors specific to that pipeline. If an operator finds any evidence of corrosion products the operator must, either—

(1) *conduct excavations at locations downstream where moisture might accumulate; or*

(2) assess the segment using another integrity assessment method allowed by this section, and remediate the conditions it finds in accordance with paragraph (i) of this section. The interval for re-assessing the segment with another assessment method must not exceed the time frames specified in paragraph (k)(3)(ii) of this section.

(5) *Stress Corrosion Cracking (SCC).* An operator using direct assessment as an integrity assessment method to address stress corrosion cracking must develop and follow a plan that provides for—

(i) Development and implementation of a systematic SCC data collection and evaluation process for all segments to identify if the conditions for SCC are present and to prioritize the segments for assessment. An operator may refer to ASME/ANSI B31.8S, Appendix SP-A3 for identifying the threat of SCC. This process must include gathering and evaluating data related to SCC at all excavation sites where the criteria indicate the potential for SCC. This data includes at minimum, the data specified