

(A) Unless the exception in paragraph (h)(3)(iii)(B) of this section applies, an operator must select at least two different, but complementary, indirect examination methods, for each location where ECDA is to be applied along the pipeline segment. An operator must select the methods that can best detect external corrosion activity and holidays in the pipe coating under the conditions the operator expects to find on the pipeline. (Appendix E gives guidance on selecting two complementary methods). Indirect examination methods include, but are not limited to, Close Interval Surveys (CIS), Direct (or Alternate) Current Voltage Gradient (DCVG or ACVG), and electromagnetic techniques, such as Pipeline Current Mapper (PCM), and C-Scan). An operator must perform the indirect examination using the complementary methods selected for each ECDA Region. An operator must define the boundaries for use of each pair of ECDA tools, and ensure complete coverage through overlap between adjacent ECDA regions.

(B) If one of the following conditions applies, an operator must use one indirect examination tool and one alternative (e.g. ultrasonic) tool to assess for external corrosion, unless the operator demonstrates that one method will be adequate to assure the integrity of the segment being assessed for external corrosion.

(1) Pipe in frozen ground;

(2) Pipe under paved roadways;

(3) Pipe in cased crossings (either road or river).

(C) An operator must also provide for the following in its indirect examination.

(1) Repeating indirect examination methods on a sample basis to ensure consistent data are obtained;

(2) Selecting intervals for capturing tool readings that are closely spaced enough to ensure consistent data are obtained. Data sampling intervals (locations of test points) for indirect examination methods should typically be no greater than the local depth of coverage of the pipeline;

(3) Carrying out indirect examination in an ECDA Region using the two complementary tools as close together in time as practical;

(4) Geo-referencing above ground measurements to compare examination results and accurately identify excavation locations.

(iv) *Post-indirect examination.* After an operator completes its indirect examination measurements for an ECDA Region, the operator must align the measures with the complementary tools and evaluate the consistency of the observations.

(A) If the results from the two complementary tools are not consistent and cannot be explained by differences in the tools' capabilities, the operator must either conduct a direct examination or additional indirect examinations to evaluate the reasons for the differences.

(B) If additional indirect inspections or direct examinations are not carried out or if they do not resolve the inconsistencies, the operator must re-evaluate the feasibility of ECDA.

(C) An operator must identify and locate indications following the indirect inspection, and classify the severity of each indication as severe, moderate or minor using the criteria in the ECDA Plan. (See paragraph (h)(3)(i) of this section). These classifications must be conservatively developed the first time the process is applied.

(D) An operator must compare the results from the pre-assessment step with the prior history for each ECDA Region. If assessment results are not consistent with operating history, the operator must reassess the feasibility of ECDA.

(v) *Direct examination.* An operator's ECDA plan must include a process for using the results from the indirect examination to develop and carry out a direct examination plan. A direct examination includes an excavation to confirm the ability of the indirect examination to locate external corrosion. To carry out the direct examination an operator must—

(A) Determine the order and timing of excavations from results of the indirect examination integrated with the risk factor data. An operator must base both order and timing on a classification of the indications as immediate action, scheduled action or monitored action. (See paragraph (h)(3)(i) of this section).

(B) Make a direct examination (excavation) of all indications that meet the criteria for immediate action. An operator must excavate all immediate action indications promptly, but no later than six months after completing the indirect examination. If an operator finds any evidence of severe corrosion in an ECDA region, the operator must evaluate the entire covered segment and all other covered and non-covered segments in the operator's pipeline system with similar characteristics, for corrosion, and take appropriate action for that segment, which could include an integrity assessment, remediation, or additional preventive or mitigative measures.

(C) Make a direct examination of at least two of the highest risk indications in each ECDA Region that meet the criteria of scheduled action. An operator

must excavate each scheduled action indication in order of priority, until the operator excavates at least two indications that have a corrosion of depth no greater than 20% of the wall thickness.

(D) Make a direct examination of at least one of the highest risk indications in an ECDA region that contains only monitored indications.

(E) Make a minimum of one direct examination in each ECDA Region. This examination must be made at the indication of highest risk. If no indications are shown in the ECDA Region, then the excavation must be made at a location that the operator considers to be the most suspect.

(vi) *Remediation.* Except for conditions specified in paragraph (i)(4) of this section, an operator must remediate indications found during the direct assessment according to the requirements in ASME/ANSI B31.8S, section 7. Remediation must be consistent with a determination of remaining strength using ASME B31G or RSTRENG. (See Appendix A to this part 192 for incorporation by reference and availability information). If an operator finds an indication is associated with a defect that requires immediate remediation, the operator must reduce operating pressure by at least 20% in the associated ECDA Region and not increase this pressure until the operator has excavated, evaluated and remediated, as necessary, 100% of such indications within the region. In remediating a condition, an operator must also comply with the following—

(A) If any exposed segment has significant coating degradation or corrosion, the operator must increase the size of that excavation until coating and pipe are determined to be adequate.

(B) The operator must identify the root cause of all significant corrosion activity revealed by excavation.

(C) When an operator identifies any defect in an ECDA Region that requires immediate mitigation, or determines that the root cause of any defect is a condition that ECDA is ineffective at assessing (e.g., MIC or shielded corrosion), the operator must for the current assessment cycle reassess the entire ECDA Region, using an alternative assessment method allowed by this section.

(vii) *Post-Assessment.* An operator must determine the reassessment interval for the pipeline segment and evaluate the overall effectiveness of the ECDA process.

(A) *Reassessment.* An operator must determine the reassessment interval according to the requirements in paragraph (k)(3) of this section.