

1.11.2. WAYS TO IMPROVE SENSITIVITY THRESHOLD OF MAGNETIC PASSABLE FLAW DETECTORS DURING DETECTION OF STRESS CORROSION CRACKS

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Magnetic passable flaw detectors of transverse magnetization are intended for detection and dimensional evaluation of defects in the walls of pipelines like stress corrosion cracks, pitting and general corrosion on internal and external surfaces of oil-and-gas pipelines.

In magnetic passable flaw detectors, method of magnetic field leakage is implemented. Testing is carried out in the flow of oil or gas with velocity of 2 to 4 m/s. Data on magnetic field distribution over internal surface of a pipeline are recorded into the memory of magnetic passable flaw detector.

For analysis of these data during stress corrosion examination of pipeline walls under method of magnetic field leakage, distribution of magnetic field tangential component over internal surface of the pipeline wall is used usually. This distribution allows good determination of defects topology.

In this case, dimensional evaluation of threshold defect depend on many factors like magnetic field value in testing zone, distance from tested surface to sensors, sampling rate along and across the pipeline surface, velocity of flaw detector movement, sampling rate of signal in the measurement point, etc.

Paper discusses matters of determination of stress corrosion cracks depending on above listed factors.

Basing on the analysis of distributions of magnetic field tangential component obtained during stress corrosion testing of gas pipelines by the flaw detector of KOD-4M-1420y series and in the result of additional studies in pits by magnetic scanners of SKM-T series, as well as on the analysis of theoretical distributions of the magnetic field tangential component over defects like “longitudinal crack”, necessary and sufficient conditions for detecting the given threshold defect like stress corrosion crack are established.