

Electrical Submersible Pump Dismantle, Inspection and Failure Analysis

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Electrical Submersible Pump Dismantle, Inspection and Failure Analysis

1 Scope

This recommended practice (RP) covers the processes and procedures of collecting required information to complete a root cause failure analysis of an electrical submersible pump (ESP) system. These include:

- Procedures for disassembly, inspection, final report, failure classification and corrective actions. Items covered by this recommended practice include pumps, intakes, gas separators, gas handling devices, seals, protectors, motors (induction and permanent magnet motors), gauges, sensors, motor lead extensions, potheads, and power cables. Tooling and test equipment may differ between suppliers; however, the typical assembly and inspection procedures and principles are generally applicable for most ESP systems.
- Information that should be collected prior to equipment dismantle and inspection as well as specific observations that should be recorded during equipment inspections/teardown/disassembly.
- General equipment drawings which may aid in identifying equipment components. It should be noted that these drawings are for generic equipment components, and there may be differences between manufacturers on the exact description or configuration of the assemblies. The user should refer to the manufacturer's specific drawings as needed.

This RP does not include gauge surface electronics, system grounding, alternative deployed systems, chemical injection systems, motor oil injection from surface, remote gauges, generators, power supply, wellhead, trees and valves, tubing, tail-pipe systems, operation maintenance and troubleshooting, pump testing, installation, sizing and selection, application of ESP cable systems, testing of ESP cable systems, application and testing of seals/protectors, sand handling devices, ESP system vibrations conditions covered by other API recommended practices.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any addenda) applies.

ASTM D877/D877M, *Standard Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes*

ASTM D1533, *Standard Test Method for Water in Insulating Liquids by Coulometric Karl Fischer Titration*

3 Terms, Definitions, and Abbreviations

3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1 bag chamber

A seal/protector chamber that relies on an elastomer barrier (bag) to isolate seal fluid from the well fluid.

NOTE The seal/protector may include multiple chambers connected in parallel or series.