Recommended Practice on Electric Submersible System Vibrations

API RECOMMENDED PRACTICE 11S8
SECOND EDITION, OCTOBER 2012

AMERICAN PETROLEUM INSTITUTE

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Upstream Segment

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Recommended Practice on Electric Submersible Pump System Vibrations

1 Scope

This Recommended Practice (RP) provides guidelines to establish consistency in the control and analysis of electric submersible pump (ESP) system vibrations. This document is considered appropriate for the testing of ESP systems and subsystems for the majority of ESP applications.

This RP covers the vibration limits, testing, and analysis of ESP systems and subsystems.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Recommended Practice 11S4, *Recommended Practice for Sizing and Selection of Electric Submersible Pump Installations*

API Recommended Practice 11S7, *Recommended Practice on Application and Testing of Electric Submersible Pump Seal Chamber Sections*

ISO 2372:1974 [1], *Mechanical vibration of machines with operating speeds from 10 to 200 rev/s—Basis for specifying evaluation standards* (replaced by 10816-1:1995)

William T. Thompson, *Theory of Vibration,* Prentice-Hall, Inc., Englewood, N. J., 1965, pg. 243.

3 Terms and Definitions

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

3.1
acceleration
a
A vector quantity that specifies the time rate of change of velocity, both linear and angular. Common units are in./sec^2 (cm/sec^2) and radians/sec^2.

3.2
amplitude
The maximum value of a periodic quantity.

3.3
angular frequency
circular frequency
The frequency multiplied by 2π, in radians per unit time, applicable to a periodic quantity.

3.4
balancing
A procedure for adjusting the mass distribution of a rotor so that rotating imbalance, as seen by vibration of the journals or the forces on the bearings at once-per-revolution, is reduced or controlled.

[1] International Organization for Standardization, 1, ch. de la Voie-Creuse, Case postale 56, CH-1211 Geneva 20, Switzerland, www.iso.org.