Machinery Protection Systems

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Machinery Protection Systems

1 Scope

1.1 General

This standard covers the minimum requirements for a machinery protection system (MPS) measuring radial shaft vibration, casing vibration, shaft axial position, shaft rotational speed, crosshead vibration, piston rod monitoring, phase reference, crank angle reference, overspeed, surge detection, and critical machinery temperatures (such as bearing metal and motor windings). It covers requirements for hardware (transducer and monitor systems), installation, documentation, and testing.

NOTE A bullet [●] at the beginning of a subsection or paragraph indicates that either a decision is required or further information is to be provided by the purchaser.

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.

API Standard 612, *Petroleum, Petrochemical, and Natural Gas Industries—Steam Turbines—Special-purpose Applications*

API 618, *Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services*

API Technical Report 684-1, *API Standard Paragraphs Rotordynamic Tutorial: Lateral Critical Speeds, Unbalance Response, Stability, Train Torsionals, and Rotor Balancing*

ASTM E230/E230M-23a [1], *Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples*

NEMA WC 57 [2]/ICEA S-73-532-2021 [3], *Standard for Control, Thermocouple Extension, and Instrumentation Cables*

IEC 60079 [4], (all parts) *Explosive atmospheres*

IEC 60259, *Degrees of protection provided by enclosures (IP Code)*

IEC 60584-1, *Thermocouples—Part 1: EMF specifications and tolerances*

IEC 61000-6-2, *Electromagnetic compatibility (EMC)—Part 6-2: Generic standards—Immunity standard for industrial environments*

IEC 61508, (all parts) *Electronic functional safety package*

IEC 61511, (all parts) *Functional safety—Safety instrumented systems for the process industry sector*

IEC 62061, *Safety of machinery—Functional safety of safety-related control systems*

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1 ASTM International, PO Box C700, 100 Barr Harbor Drive, West Conshohocken, PA 19428, www.astm.org.

2 National Electrical Manufacturers Association, 1812 N. Moore Street, Arlington, VA 22209, www.nema.org.

3 Insulated Cable Engineers Association, P.O. Box 493, Miamitown, OH 45041, www.icea.net.

4 International Electrotechnical Commission, 3 rue de Varembé, P.O. Box 131, CH-1211 Geneva 20, Switzerland, www.iec.ch.