Pipeline Control Systems Cybersecurity

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Suggested revisions are invited and should be submitted at any time to the Standards Department, API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001, standards@api.org.

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Background

This standard was developed using U.S. Transportation Security Administration's (TSA) *Pipeline Security* Guidelines (March 2018), especially Section 7, "Pipeline Cyber Asset Security Measures." This standard is based on the U.S. National Institute of Standards and Technology's (NIST) *Framework for Improving Critical Infrastructure Cybersecurity*, *Version 1.1* (CSF) (April 16, 2018), addressing all functions, categories, and subcategories. Activities were selected from the CSF core, with a focus and scoping of industrial automation and control (IAC) environments for the oil and natural gas (ONG) pipeline industry. Special attention was given to common risk management considerations, legal and regulatory requirements (e.g., TSA, FERC, DOT, PHMSA, etc.), and shared business mission objectives.

This document is specifically written to provide an industry targeted IAC cybersecurity standard for the owner/operators of pipelines regulated under *Code of Federal Regulations (CFR) Title 49 for Transportation, Volume 2, Chapter I, Pipeline and Hazardous Materials Safety Administration (PHMSA), Department of Transportation, Part 192 – Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards or Part 195 - Transportation of Hazardous Liquids by Pipeline*. This targeted standard specifies the framework, practices, and requirements needed to develop, implement, maintain, test, and constantly improve a robust IAC security program as part of the TSA's required Corporate Security Program. References to these regulations were incorporated at the time of this document's publication. Users are responsible for conforming to current and applicable regulations.

Pipeline Control Systems Cybersecurity

1 Scope

1.1 Purpose

This standard provides requirements and guidance for managing cyber risk associated with industrial automation and control (IAC) environments to achieve security, integrity, and resiliency objectives. Within this standard, this is accomplished through proper isolation of IAC environments from non-IAC environments to help IAC operational continuity.

Even with proper isolation of IAC environments from IT environments, both play a part in overall business continuity. IAC operational continuity and IT system continuity are often developed and implemented jointly as part of the overall business continuity plan.

The scope of this standard is limited to only the IAC cybersecurity aspects that can influence overall business continuity.

This standard is tailored for the oil and natural gas (ONG) pipeline industry, which includes, but is not limited to, natural gas and hazardous liquid transmission pipeline systems, natural gas distribution pipeline systems, liquefied natural gas (LNG) facilities, propane air facilities, and others involved in these industries.

This standard was developed to provide an actionable approach to protect IAC essential functions by managing cybersecurity risk to IAC environments. IAC environments can include, but are not limited to, supervisory control and data acquisition (SCADA), local control, and industrial internet of things (IIoT) solutions. This standard should be used in the context of developing, implementing, maintaining, and improving an IAC cybersecurity program, which includes the policies, processes, and procedural and technical controls for IAC cyber environments.

This standard is a set of requirements that should be customized prior to implementation using the company's risk management processes. The outcome is a customized, company-specific set of requirements for an IAC cybersecurity program to help manage the cybersecurity posture and any resulting residual risk to its IAC environments in alignment with the company's mission, objectives, and risk strategy, and in accordance with its policies and procedures.

While identification of threats and impacts is critical to the development of the IAC cybersecurity program, a risk-based evaluation of each will ensure the program is appropriately implemented, executed, and sustained consistent with an organization's desired risk posture. This standard focuses on desired cybersecurity outcomes by defining requirements for specific business objective impact protection levels.

Although the principles defined in this standard could be applied to safety instrumented systems (SIS), they are out of scope of this document. The security requirements specified within this standard do not attempt to address potential impacts to SIS safety integrity level (SIL) selection or determination. Any use of this standard in SIS environments is at the implementer's discretion and risk.

For companies that already have an IAC cybersecurity program, including one or more approved program policies and a documented IAC cybersecurity plan or plans implemented or being implemented, this standard should be considered an augmentation to their existing cybersecurity program elements. In these situations, a process of mapping this standard to current IAC cybersecurity program elements will determine any API 1164 requirements not currently in the existing program. The implementation of any missing elements should be tailored and prioritized using the company's risk management processes. The tailoring process for API 1164 cybersecurity requirements is described in 5.5.