Setting the Standard for Automation™

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Overview

The 62443 series of standards

Industrial Automation and Control Systems Security

Introduction

The 62443 series of standards have been developed jointly by the ISA99 committee and IEC Technical Committee 65 Working Group 10 (TC65WG10) to address the need to design cybersecurity robustness and resilience into industrial automation control systems (IACS). The ISA versions of the standards and reports in the series have names of the form “ISA-63443-x-y”, while the IEC versions appears as “IEC 62443-x-y.” The ISA and IEC versions of each document are released as closely together as possible.

Scope

The concept of industrial automation and control systems electronic security is applied in the broadest possible sense, encompassing all types of plants, facilities, and systems in all industries. Manufacturing and control systems include, but are not limited to:

- hardware and software systems such as DCS, PLC, SCADA, networked electronic sensing, and monitoring and diagnostic systems.
- associated internal, human, network, or machine interfaces used to provide control, safety, and manufacturing operations functionality to continuous, batch, discrete, and other processes.

Series Goal

The goal in applying the 62443 series is to improve the safety, availability, integrity and confidentiality of components or systems used for industrial automation and control, and to provide criteria for procuring and implementing secure industrial automation and control systems. Conformance with the requirements of the 62443 series is intended to improve electronic security and help identify and address vulnerabilities, reducing the risk of compromising confidential information or causing degradation or failure of the equipment (hardware and software) of processes under control.

The content of the series is directed towards those responsible for designing, implementing, or managing industrial automation and control systems. This information also applies to users, system integrators, security practitioners, and control systems manufacturers and vendors.

Approach

The 62443 series builds on established standards for the security of general purpose information technology systems (e.g., the ISO/IEC 27000 series), identifying and addressing the important differences present in Industrial Automation and Control Systems (IACS). Many of these differences are based on the reality that cyber security risks with IACS may have Health, Safety or Environment (HSE) implications and the response should be integrated with other existing risk management practices addressing these risks.

Organization

The elements of the 62443 series are shown in Figure 1.

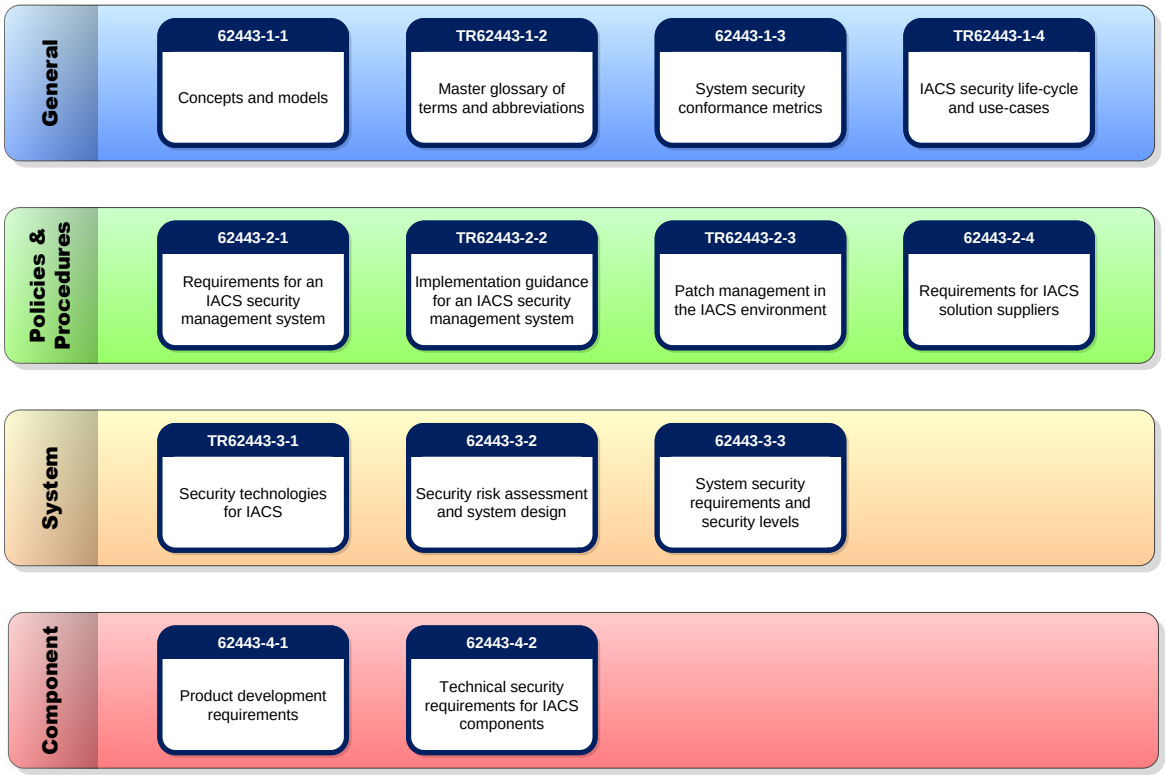

Figure 1 – 62443 Elements

These elements are arranged in four groups, corresponding to the primary focus and intended audience.

1. **General** – This group includes elements that address topics that are common to the entire series.
    - The **62443-1-1** standard introduces the concepts and models used throughout the series.

- The **62443-1-2** technical report contains a master glossary of terms and abbreviations used throughout the series.
- The **62443-1-3** standard describes a series of quantitative metrics derived from the foundational requirements, system requirements and associated.
- The **62443-1-4** technical report provides a more detailed description of the underlying life cycle for IACS security, as well as several use cases that illustrate various applications.

2. **Policies and Procedures** – Elements in this group focus on the policies and procedures associated with IACS security.

- The **62443-2-1** standard describes what is required to define and implement an effective IACS cyber security management system.
- The **62443-2-2** standard provides specific guidance on what is required to operate an effective IACS cyber security management system.
- The **62443-2-3** technical report provides guidance on the specific subject of patch management for IACS.
- The **62443-2-4** standard specifies requirements for suppliers of IACS.

3. **System Requirements** – The Elements in the third group address requirements at the system level.

- The **62443-3-1** technical report describes the application of various security technologies to an IACS environment.
- The **62443-3-2** standard addresses security risk assessment and system design for IACS.
- The **62443-3-3** standard describes the foundational system security requirements and security assurance levels.

4. **Component Requirements** – The fourth and final group includes elements that provide information about the more specific and detailed requirements associated with the development of IACS products.

- The **62443-4-1** standard describes the derived requirements that are applicable to the development of products.
- The **62443-4-2** standard contains sets of derived requirements that provide a detailed mapping of the system requirements to subsystems and components of the system under consideration.

More Information

Additional information about the 62443 series is available on the ISA99 committee wiki:

http://isa99.isa.org

Questions about the standards and their development may also be directed to the ISA99 committee chairs (isa99chair@gmail.com).

Developing and promulgating sound consensus standards, recommended practices, and technical reports is one of ISA's primary goals. To achieve this goal the Standards and Practices Department relies on the technical expertise and efforts of volunteer committee members, chairmen and reviewers.

ISA is an American National Standards Institute (ANSI) accredited organization. ISA administers United States Technical Advisory Groups (USTAGs) and provides secretariat support for International Electrotechnical Commission (IEC) and International Organization for Standardization (ISO) committees that develop process measurement and control standards. To obtain additional information on the Society's standards program, please write:

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