What is ISA 108 ?

MLM-108-A

Industry	– All
Principal Role	– All
Professional Role	– All
Enterprise Phase	– All

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START

This MLM describes the ISA 108 standard on configuration management of intelligent industrial devices and networks.

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What is ISA 108 ?

ISA 108 describes how to apply Intelligent Industrial Devices (IIDs), including the Design, Operation, and Maintenance of control & Information systems that contain them.

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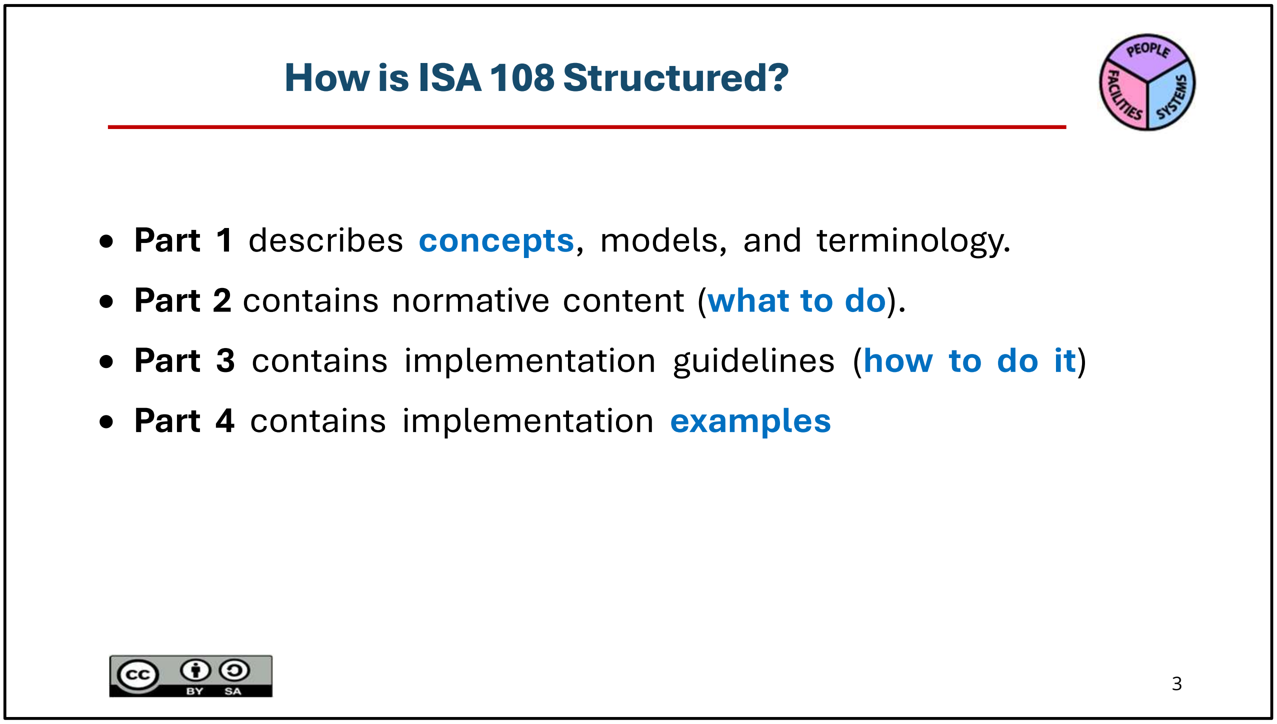
ISA 108 is a standard established to assist engineers to apply Intelligent Industrial Devices such as smart instruments, device controllers and associated industrial communication highways.

It describes how to apply intelligent Industrial Devices (or IIDs), including the design, Operation, and maintenance of control and information systems that contain them.



ISA 108 contains the following sections:

Part 1 describes concepts, models, and terminology. This was issued as ISA108 and submitted to the International Electrotechnical Committee as IEC 63082-1.

Part 2 contains normative content (what to do).

Part 3 contains implementation guidelines (how to do it) , including Work Processes, Procedures, and Tasks, and who should execute these.

Part 4 contains implementation examples, including vertical industry examples (like oil refining) or product type examples (such as control valves).

Why is ISA 108 Standard Needed?

Intelligent Industrial Devices (IIDs) can bring significant benefits by reducing spares and predicting failures; however, this potential is often not realized.

Implementation problems have included:

- Capabilities not fully implemented or adequately maintained.
- Vendors have failed to supply, support, and update communication and configuration software.
- IID Implementation failures have cost $ billions of dollars.
- Failure to use available IID Health and Diagnostics have caused plant shutdowns.

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Intelligent Industrial Devices (IIDs) can bring significant benefits by reducing spares and predicting failures; however, this potential is often not realized.

Major implementation problems include:

- Added complexity has meant that IIDs are often never fully implemented or adequately maintained.
- Vendors have failed to supply, support, and update communication and configuration software, particularly for others' products.
- There are examples of industrial disasters costing $ billions that have involved IID Implementation failures.
- Unnecessary shutdowns costing $ millions have been caused by failure to use available IID Health and Diagnostic information.

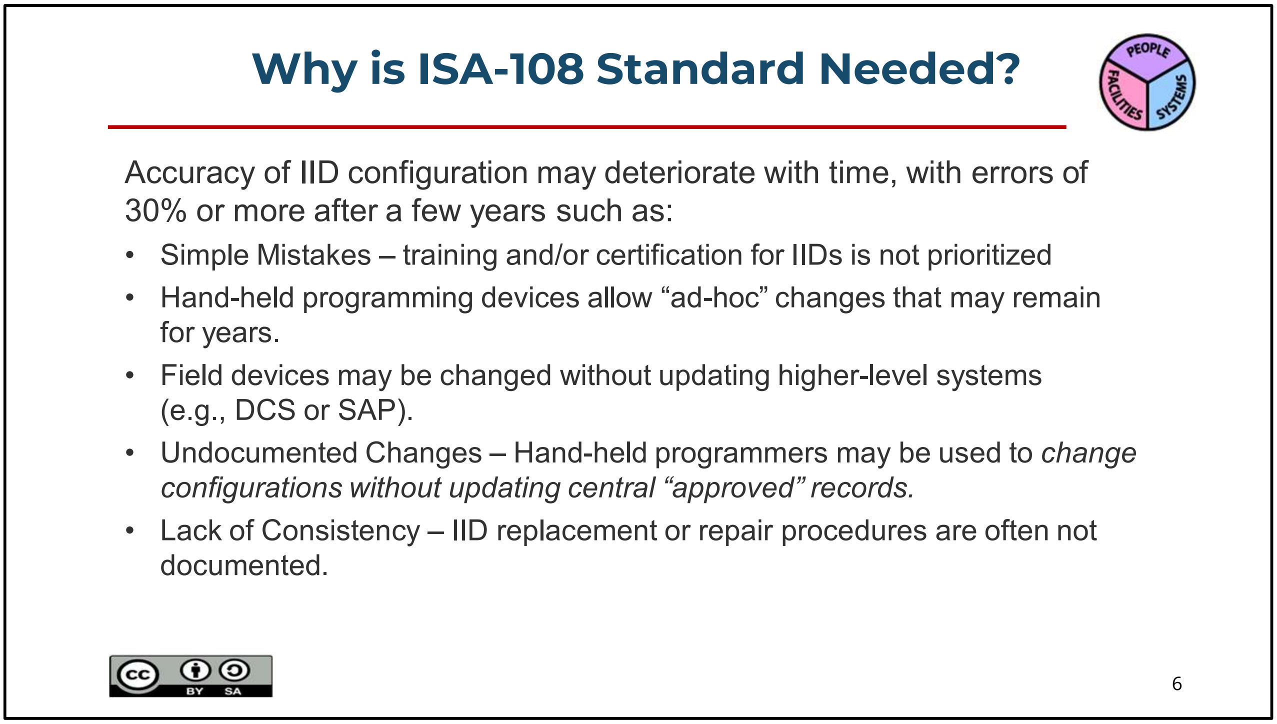
Why is ISA-108 Standard Needed?

As IIDs become more complex, managing associated data and design decisions becomes increasingly difficult.

- IIDs may involve hundreds or even thousands of data values
- Reasons for design choices may be lost between Engineering and Operations.
- Tag and Loop Data may be corrupted as it is passed between incompatible Engineering, Construction, Operations, and Maintenance systems.
- Plant maintenance may not be to determine whether “like-for-like” Replacement of IIDs is possible.

As IIDs become more complex, managing associated data and design decisions becomes increasingly difficult.

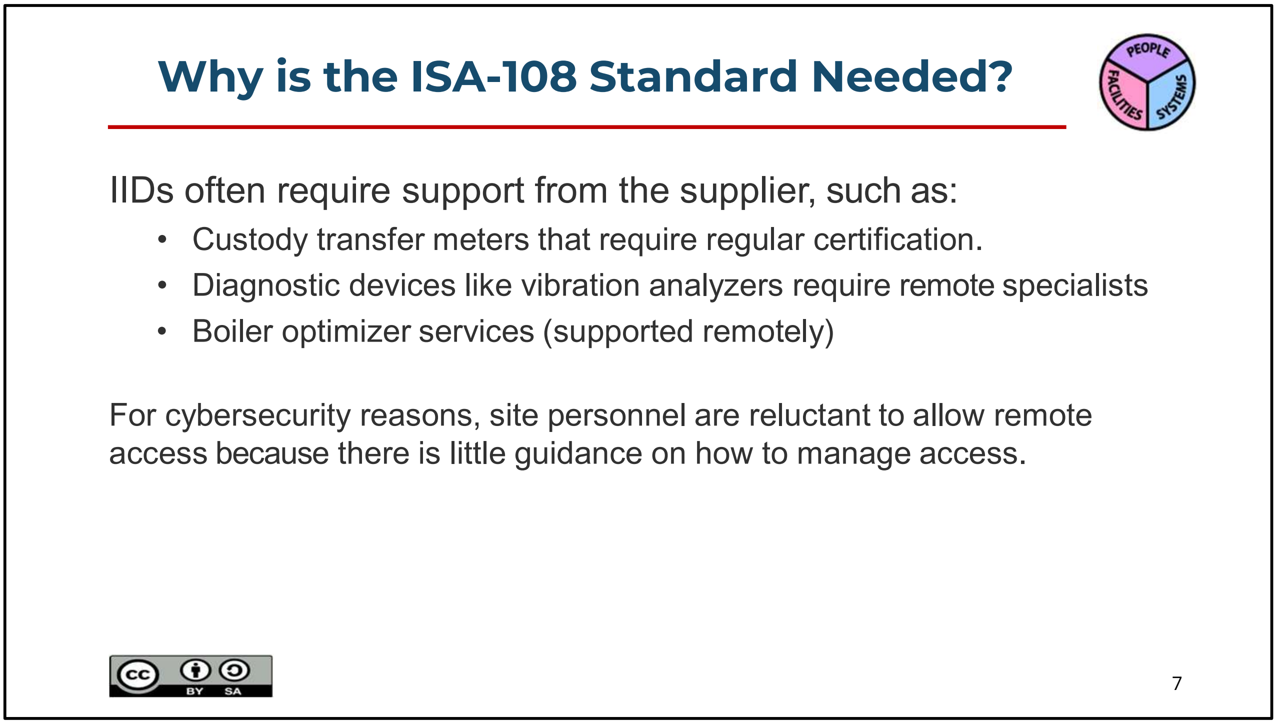
- IIDs may require selecting and maintaining hundreds or even thousands of data values whose sheer volume is challenging
- The reasons for design choices is often lost between Engineering and Operations.
- Tag and Loop Data may be corrupted as it is passed between incompatible Engineering, Construction,, Operations and Maintenance systems.
- Plant maintenance may not be able to determine whether “like-for-like” replacement of IIDs is possible.



Many companies have found that the accuracy of IID configuration deteriorates with time, with configuration errors in 30% or more of their devices after a few years of operation.

Configuration errors may include:

- Simple Mistakes if special technician training and/or certification for IIDs is not recognized or prioritized (unlike welding for example).
- Quick Fixes – Hand-held programming devices facilitate "ad-hoc" modifications, but a "back shift" change may stay for years.
- Uncoordinated Changes – Field devices may be changed without updating higher level systems (e.g. DCS, SCADA, SAP, etc.)
- Undocumented Changes – Hand-held programmers may be used to
- change configurations without updating central "approved" records.
- Lack of Consistency – IID replacement or repair procedures are often not documented or enforced.



IIDs often require support from the supplier, or specialist services contractors, such as:

- Custody transfer meters that require regular certification or monitoring
- Sophisticated diagnostic devices like vibration analyzers that
- require specialists to interpret
- Boiler Stack Gas Analyzers (e.g., boiler optimizer services offered remotely)

However, for cybersecurity reasons, site personnel are reluctant to allow remote access as there is little guidance on how to manage access to these devices.

What is New and Useful about ISA 108 ?

ISA 108 recommends:

- Standardized Work Processes/Procedures/Tasks for managing IDM information
- Standardized Tasks (within Work Processes) requiring special training and certification.
- Examples of Roles associated with Work Processes and Tasks,
- interfaces between Roles, including “Swim Lane Charts” and Workflow Diagrams.
- These examples are structured by “Industry” or Technology
- Example(s) of how a Repository can be used to manage IID Information.
- Example standard formats for Engineering data in the Enterprise IDM Program.

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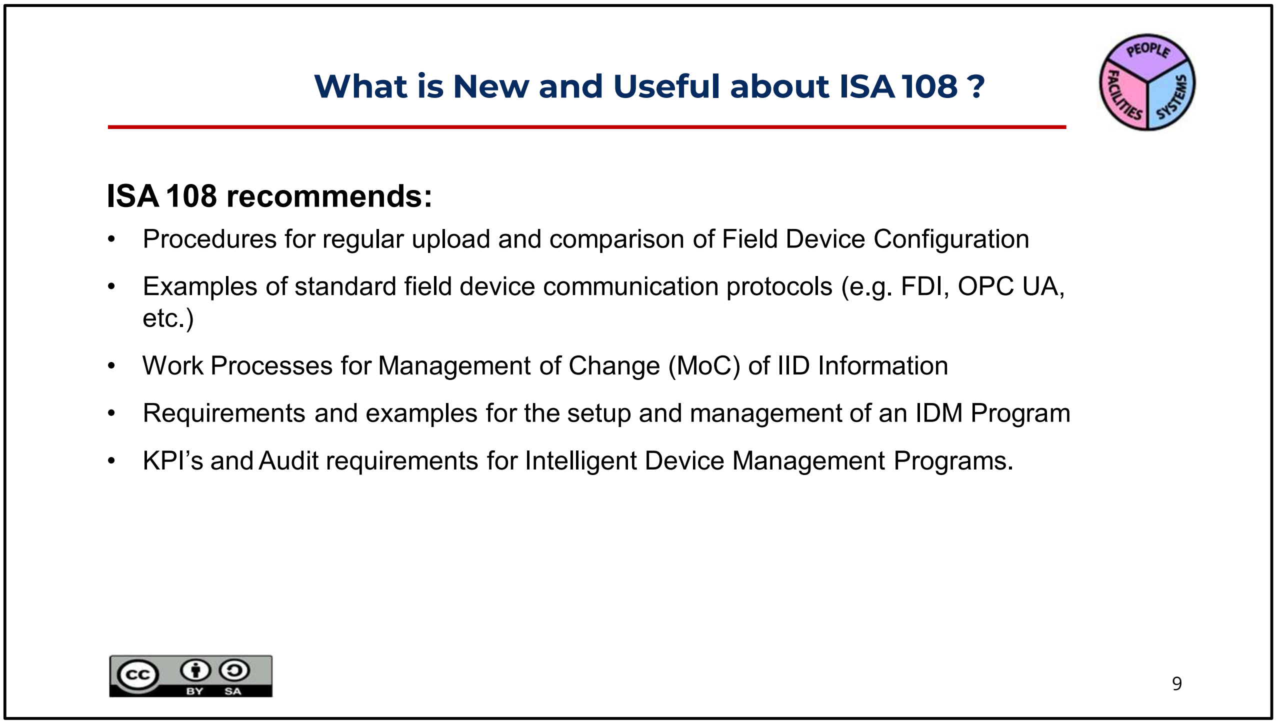
ISA 108 recommends:

- Standardized Work Processes/Procedures/Tasks for managing the continuity of IDM information through all phases from design to operations and maintenance.
- Standardized Tasks (within Work Processes) requiring special training and certification.
- Examples of Roles associated with Work Processes and Tasks, and interfaces between Roles, including “Swim Lane Charts” and Workflow Diagrams. These examples (and those that follow) will be structured by “Industry” (e.g. , Oil Fields or Pipelines) or Technology (e.g., Smart Valves).
- Example(s) of how a Critical Information Repository can be used by the Owner/Operator to manage IID Information.
- Example standard formats for Engineering data (e.g., STEP, ISO, etc.) to be defined in the Enterprise IDM Program.



ISA 108 recommends:

- Procedures for regular upload and comparison of actual Field Device Configuration and Authorized version (in CIR).
- Examples of use of standard multi-vendor field device communication protocols (e.g. FDI, OPC UA, etc.) to be used in the Enterprise IDM Program.
- Work Processes for Management of Change (MoC) for IID Information
- during Engineering and Operations Phases.
- Requirements and examples for setup of an IDM Program and ongoing management of such a Program.
- KPI's and Audit requirements for Intelligent Device Management Programs.

What is New About ISA 108 ?

ISA 108 recommends:

- Risk-based Work Processes that integrate with other engineering standards
- A way for maintenance to replace "like-for-like" or require engineering.
- How to facilitate "handover" of information between Project and Operations.
- How to detect changes in IDM configuration and/or Design Parameters.
- Implementation examples for different industries

ISA108 recommends:

- Risk-based Work Processes that integrate with other engineering standards, and eliminate Alarm/Alert "flooding" early in design.

- A way for maintenance to immediately determine whether they may immediately replace an IID "like-for-like" or only after engineering".

- A way to facilitate "handover" of information between Phases (especially between Project and Operations phases).

- A way to detect and address inadvertent changes in IDM configuration and/or Facility Design Parameters at any Phase.

- Implementation examples for different industries

Author

Gary has more than 40 years of experience with enterprise integration and optimization projects, including PERA master planning and project management.

As one of the initial authors of the PERA Handbook of Master Planning, he has used PERA Enterprise Architecture and Master Planning methodologies throughout his career including control and information systems for oil production, pipelines, refining and marine loading, petrochemicals, coal, gas, and oil-fired power plants, polyethylene, ammonia, explosives, paint, pulp and paper, food and beverage, and pharmaceuticals. LNG facilities included world-scale arctic, European, and US Gulf coast complexes.

infrastructure facilities included Fire, Police, and Emergency Response systems for major US cities, as well as emissions reporting and trading systems for more than 100 US Power Plants,

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