FOREWORD

In 2009, ANSI/ISA-18.2-2009, *Management of Alarm Systems for the Process Industries*, commonly referred to as ISA-18.2, was issued and was later updated in 2016. In that same year the ISA18 Committee established working groups to develop and maintain a series of technical reports with guidance on how to implement the practices outlined in ISA-18.2. The eight independent technical reports are described below:

- ISA-TR18.2.1, *Alarm Philosophy* [TR1], provides guidance on the alarm philosophy. TR1 is limited to the scope of Clause 6 in ISA-18.2. The alarm philosophy provides guidance for successful management of the alarm system. It covers the definitions, principles, and activities by providing overall guidance on methods for alarm identification, rationalization, classification, prioritization, monitoring, management of change, and audit.

- ISA-TR18.2.2, *Alarm Identification and Rationalization* [TR2], provides guidance on alarm identification and rationalization. TR2 is limited to the scope of Clauses 8 and 9 in ISA-18.2. Identification and rationalization cover the activities to determine the possible need for an alarm or a change to an alarm; systematically compare alarms to the alarm philosophy; and determine the alarm setpoint, consequence, operator action, priority, and class. Activities include, but are not limited to, identification, justification, prioritization, classification, and documentation.

- ISA-TR18.2.3, *Basic Alarm Design* [TR3], provides guidance on basic alarm design. TR3 focuses on the scope of Clause 10 of ISA-18.2 and may include other clauses as needed (e.g., Clause 14 on operations and Clause 15 on maintenance). Basic alarm design covers the selection of alarm attributes (e.g., types, deadbands, and delay times) and may be specific to each control system.

- ISA-TR18.2.4, *Enhanced and Advanced Alarm Methods* [TR4], provides guidance on enhanced and advanced alarm methods. TR4 focuses on the scope of Clause 12 of ISA-18.2. Enhanced alarm design covers guidance on additional logic, programming, or modeling used to modify alarm behavior. These methods may include dynamic alarming, state-based alarming, adaptive alarms, logic-based alarming, and predictive alarming, as well as most of the designed suppression methods.

- ISA-TR18.2.5, *Alarm Monitoring, Assessment, and Audit* [TR5], provides guidance on monitoring, assessment, and audit of alarms. TR5 focuses on the scope of Clauses 16 and 18 in ISA-18.2. Monitoring, assessment, and audit cover the continuous monitoring, periodic performance assessment, and recurring audit of the alarm system.

- ISA-TR18.2.6, *Alarm Systems for Batch and Discrete Processes* [TR6], provides guidance on the application of ANSI/ISA-18.02-2009 alarm lifecycle activities to batch and discrete processes, expanding on multiple clauses of ISA-18.2.

- ISA-TR18.2.7, *Alarm Management when Utilizing Packaged Systems* [TR7], provides guidance on the application of ANSI/ISA-18.2-2009 to plants utilizing packaged systems, expanding on multiple clauses of ANSI/ISA-18.02-2009.

- ISA-TR18.2.8, *Guidelines for Non-alarm Notifications* [TR8], provides a system of nomenclature for notifications other than alarms and guidance on managing notifications generated by automation systems.

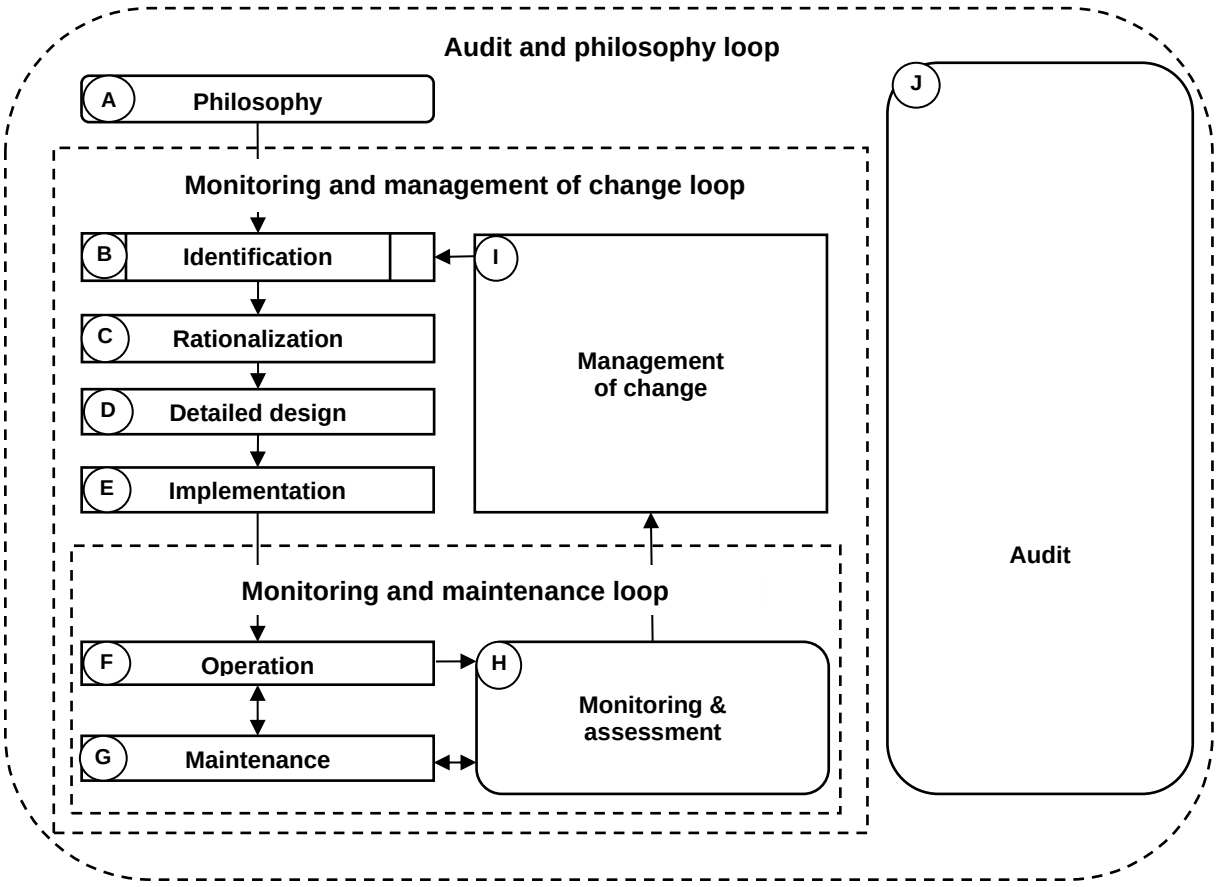
The guidance as presented in this document is general in nature and should be applied to each system as appropriate by personnel knowledgeable in the manufacturing process and control systems to which it is being applied. This guidance will evolve with experience and technology advancements.

Introduction

Alarm management lifecycle

ISA-18.2 defines requirements that address alarm systems for facilities in the process industries to improve safety, quality, and productivity. The general principles and processes in ISA-18.2 are intended for use in the lifecycle management of an alarm system based on programmable electronic controller- and computer-based human-machine interface (HMI) technology. These requirements are presented in the standard, using the alarm management lifecycle shown in Figure 1.

The lifecycle model is useful in organizing the requirements and responsibilities for implementing an alarm management system. The lifecycle is applicable for the installation of new alarm systems or managing an existing system.



NOTE 1 The box used for stage B represents a process defined outside of this document per 5.2.2.3.
NOTE 2 The independent stage J represents a process that connects to all other stages per 5.2.2.11
NOTE 3 The rounded shapes of stages A, H, and J represent entry points to the lifecycle per 5.2.3.
NOTE 4 The dotted lines represent the loops in the lifecycle per 5.2.5.

Figure 1 – Alarm management lifecycle (from ISA-18.2)

Basic alarm design

This technical report is designed to provide guidance, rationale, and examples of the basic alarm design process described in ISA-18.2 Clause 10. Basic alarm design, which is a step in the detailed design stage of the lifecycle, covers the selection of alarm attributes (e.g., types, deadbands, and delay times) and may be specific to each control system.

Following the recommended guidance in this technical report will not necessarily ensure that alarm management problems will be avoided. It will, however, help to identify and address alarm management vulnerabilities and help minimize the existence of nuisance alarms that could compromise and impair the operator's awareness, understanding, and response to abnormal situations.

Purpose of this technical report

This technical report provides details on the basic alarm design process described in ISA-18.2 Clause 10. Following the lifecycle model shown in Figure 1, this report assumes that alarms to be addressed in basic alarm design have completed rationalization where attributes such as alarm setpoint and priority have already been defined.