# UnderstandingIEC 62682 Alarm Management Standard

PAS

Ensuring **OT** Integrity

# Summary

This white paper explains why there are now both an ISA-18.2 and an IEC 62682 Standard on "Management of Alarm Systems for the Process Industries." The genesis of the IEC document is explained and the differences between the two documents are detailed.

# Contents



There is much confusion around this new IEC 62682 International Standard on Alarm Management. The context and details are important. (For examples of such treatments, see ***The Alarm Management Handbook*** and ***The High Performance HMI Handbook***.)

# How to Use This White Paper

This paper is a supplement to another PAS white paper, "Understanding and Applying the ISA-18.2 Alarm Management Standard." Reading and understanding that paper is essential prior to tackling this one. Important material regarding the Life Cycle, the regulatory implications, and practical advice are not duplicated in this paper.

Note:
***The Alarm Management Handbook***, 2nd Edition, has even more details on ISA-18.2 than are in our ISA-18.2 white paper, and reading that book also provides the necessary background for using this IEC paper.

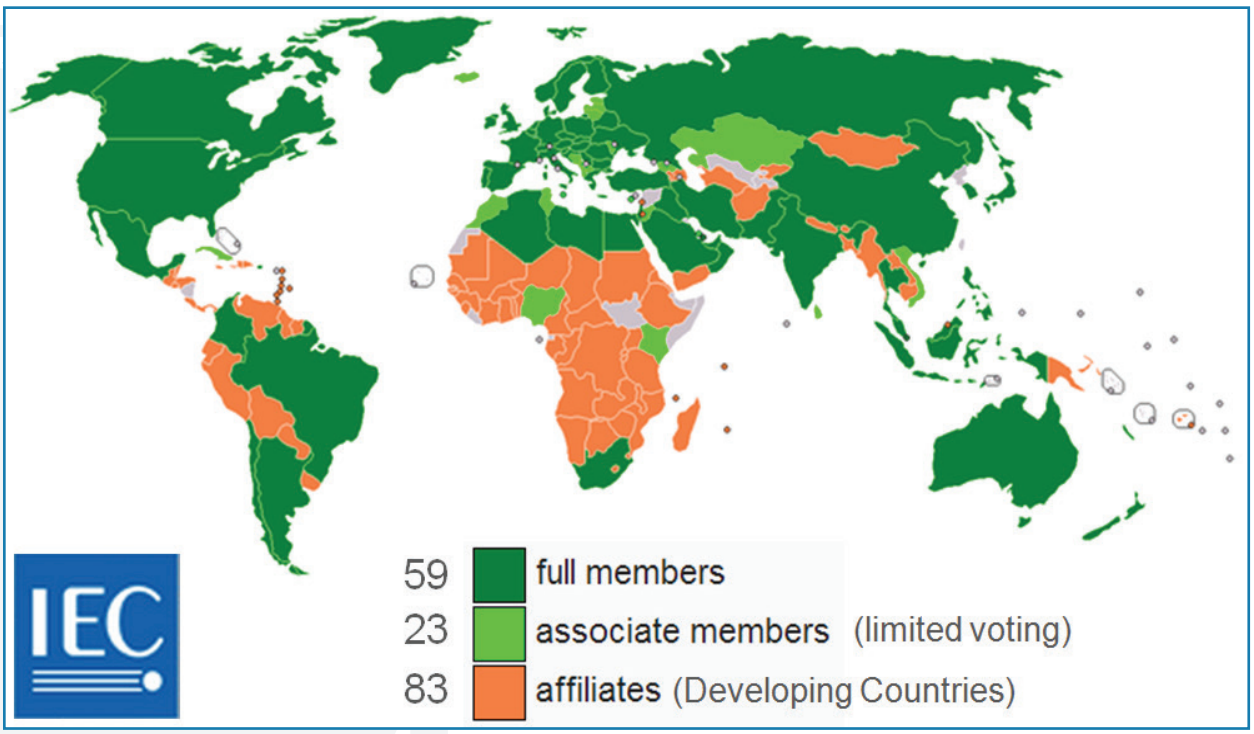
In the U.S., it is well-established that ISA Standards can, have, and will be used by U.S. regulatory agencies as the basis for fines and enforcement actions, even in the absence of specific regulations. The worldwide regulatory environment is more complex, frequently changing, and often arbitrary. The issue regarding whether standards like ISA-18.2 / IEC 62682 are enforced (or enforceable) by various jurisdictions is answerable only on a case-by-case basis. Do not expect consistency in the answers!

In some companies, it is a normal reaction to standards to want to simply put into equipment or services purchase agreements a requirement to "Comply with Standard ABC-123." This simplistic approach does not work for work-process standards such as ISA-18.2 / IEC 62682. These are not standards having to do with hardware, such as for standardizing things like USB ports.

A useful analogy is in purchasing a vehicle. One could write in the purchase specification that "The vehicle must comply with all USA federal regulations for vehicle construction." That would be a reasonable requirement. But one cannot write that "The vehicle must comply with all USA Traffic Regulations." Because it is the operator of the vehicle that is in control and has the responsibility for following traffic laws. The car does not know if it is running a stop sign! Similarly, it is the end user of a control system that sets up or changes most of the configuration of the alarm system. The standards cover the principles associated with that activity and doing it effectively.

Compliance with ISA-18.2 or IEC 62682 requires understanding their content in detail, and examining your own work processes and ensuring your compliance. This requires a fair amount of effort. PAS's two white papers (and the book) makes this task a lot easier.

The ISA document is priced at 180 US$. ISA members can view it at no cost. The IEC document must be purchased, for Swiss francs 290 (about $300 US$), for either a printed or PDF version.




**Countries that are IEC Members**

After the IEC issues its version, the original ISA document undergoes a "harmonization" review. This can be part of the normal 5-year update cycle of all ISA Standards. (Note – that is the ISA "rule" but, in practice, updates are less frequent.) In some cases, the IEC version is adopted by the ISA, replacing the prior version. In other cases, the ISA version may simply be revised but retain differences with the IEC document.

The ISA-18.2 document began its 5-year review cycle in 2014 and is taking into account a review of the IEC differences. The result is expected to be published in 2015. The current status of the review (PAS is participating) is that the IEC document "as-is" will not be adopted outright by the ISA. The likely changes to ISA-18.2 will be relatively minor ones.

# ISA and IEC Standards Development Work Process Differences

The work process between the two organizations is quite different.

ISA Work Process:

- The ISA standards development process follows strict ANSI methodologies.
- Content is constrained to "what" to do and not "how" to do it.
- Anyone can participate on a ISA technical committee in creating, reviewing, and commenting on draft standards during the development process. (Other countries often do not realize this.)
- Actual voting rights (approval or disapproval of drafts) depend on the individual committeemember's participation in the development process. A single company cannot have more than one voting member on an ISA committee, but can have more than one review member.
- The ISA work process is very open and transparent. Anyone can see drafts, comments, and comment resolutions.
- Commenting on draft procedures follows a tracked methodology with right of appeal.
- Committees must be balanced in voting membership amongst a variety of categories such as manufacturers, consultants, integrators, and users. No one sector can predominate past certain limits.

IEC Work Process:

- Follows guidelines internally created by the IEC itself, not from another body.
- The Standard's content is "whatever the committee wants it to be" rather than having the significant restrictions associated with an ISA standard.
- The IEC Committee membership is very limited and closed. You may not simply volunteer and be on the committee. Non-committee members are not allowed to view drafts or make comments.
- Committees are significantly weighted towards manufacturers rather than users, integrators, or consultants.
- Voting is "One Country One Vote." Since European countries typically vote as a bloc, the resulting IEC standards are usually perceived as Euro-centric. They reflect the European penchant for containing many mandatory requirements (rather than options) and requiring documented tracking. The philosophy is, as the joke goes, that "Everything must be either MANDATORY or FORBIDDEN!"

The co-chairs of the ISA 18.2 committee (Nick Sands and Donald Dunn) participated on the IEC committee in their adaptation of ISA-18.2. They obtained and consolidated review comments from the ISA-18.2 committee members and supplied those to the IEC.

# The Gory Details – How IEC 62682 Differs from ISA-18.2

### General Differences

IEC 62682 was made by taking the ISA-18.2 document and altering it. The basic structure is identical. There are no new sections or surprising new content. However, due to minor changes, numbered sub-sections in the IEC document are sometimes different than in the ISA document.

IEC documents have slightly different formatting. Since they are translated into different languages, great attention is paid towards using the exact same terminology in every part of the document. (ISA also tries to do this, but with varying degrees of success.)

The major difference in the IEC version is that many things that are "recommended" (e.g. "should") in ISA-18.2 are "mandatory" (e.g. "shall") in IEC 62682.

### Detailed Differences

A copy of ISA-18.2 is essential for following along with these differences. We list both the ISA and IEC sub-section numbers when they are different, with ISA number in parentheses.

## Section 1: Introduction

This section contains no alterations of significance or real consequence.

The Alarm System Dataflow, Figure 1, moved the Alarm Historian box "inside" the zone designated as the Alarm System, leaving only the "Process" and "External Systems" as outside the Alarm System.

The ISA box "Alarm Log" becomes the IEC box "Alarm log monitor," with the difference unexplained.

Exclusions: In the Exclusions statement, ISA-18.2 did not have an exclusion statement about Operators. IEC does, saying

#### 1.2.1 Operators

*The functions of the operator receiving and responding to alarms are included in the scope of this standard. Management of operators is excluded from the scope of this standard.*

Note that the IEC does not change the underlying definition of an operator, as the person who monitors and makes changes to the process.

## Section 2: Normative References

ISA-18.2 lists ANSI.ISA S84 (IEC 61511) and ANSI.ISA 91 as normative references. IEC does not list any normative references.

## Section 3: Definitions

ISA definitions are sentences. IEC definitions are phrases. The international nature of the IEC document and the need for translation to many languages uncovered some inconsistent usage and terminology in ISA-18.2. So, some of the mods in the definitions are to increase consistency for ease in translation.

IEC adds the word "timely" to the ISA definition of an alarm:
Alarm:
*audible and/or visible means of indicating to the operator an equipment malfunction, process deviation, or abnormal condition requiring a* ***timely*** *response*

IEC defines the term "annunciation" which was not thought to need a definition in ISA.
Annunciation, alarm annunciation:
*function of the alarm system to call the attention of the operator to an alarm*

The original ISA-18.2 has a much clearer definition of:
Alarm System:
*the collection of hardware and software that detects an alarm state, communicates the indication of that state to the operator, and records changes in the alarm state.*

The much less precise IEC version is:
Alarm system:
*operator support system for generating and handling alarms for managing abnormal situations*

The ISA version of Alert is more detailed:
ISA alert: *An audible and/or visible means of indicating to the operator an equipment or process condition that requires awareness, that is indicated separately from alarm indications, and which does not meet the criteria for an alarm.*

The IEC version of Alert is less detailed and the differences moved to the section on alerts:
IEC alert: audible and/or visible means of indicating to the operator an equipment or process condition that can require evaluation when time allows

## Section 4: Conformance to the Standard

There are no significant differences in this section. The IEC mentions that conformance is the responsibility of the owner/operator, just in case anyone incorrectly thought it was the vendor!

## Section 5: Alarm System Models

### 5.1 Alarm Systems

In this section, the new word "timely" is left out of the definition of an alarm. This is likely a typo.

### 5.2: Alarm Management Life Cycle

There are no changes of real significance in the Life Cycle Model.

The ISA-18.2 Figure 4 "Process Condition Model" figure and ISA section 5.3 describing it was left out of IEC 62682. This is the "bullseye" diagram showing process conditions of Target, Normal, Upset, and Shutdown – a diagram that is not really of much use for the purposes of a standard.

### 5.3: Alarm States (ISA's 5.4)

IEC 62682 leaves out the "Latched" condition as a specific alarm state. This condition is not supported by many DCSs and is not widely used. Its existence in 18.2 tended to overcomplicate discussions, and its IEC omission is not a matter of concern.

There are no changes of significance in the remainder of IEC's Section 5.

## Section 6: Alarm Philosophy Contents

ISA-18.2 has a table for the content sections of an alarm philosophy document, and whether each topic is recommended (should) or mandatory (shall). The IEC took this table and changed some of the ISA recommended contents to mandatory. Those items are:

- *References*
- *Alarm Documentation*
- *Alarm System Audit* (The IEC added this item as required, it was not in the ISA table.)

Other Section 6 changes are:

### 6.2.2 Purpose of the Alarm System (ISA's 6.2.1)

Should to Shall: *"The purpose and objectives of a process plant alarm system shall be defined."*

### 6.2.6 Alarm Design Principles (ISA's 6.2.5)

Should to Shall: *"The criteria for selection and principles for design of alarms shall be consistent with the definition of an alarm."*

### 6.2.13 Alarm System Performance Monitoring (ISA's 6.2.11)

Should to Shall:

*Specific elements that shall be covered in this section include the following:*

*a) the objective for monitoring and assessment,*

*b) the monitoring metrics and target values,*

New IEC Requirement: *c) guidance on frequency to review alarm system performance,*

*d) guidance on the approach to improve performance on the metrics.*

### 6.2.14: Alarm System Maintenance (ISA's 6.2.12)

Should to Shall:

*Specific elements that shall be covered in this section include the following:*

*a) alarm maintenance record keeping,*

*b) the requirements for out-of-service alarms, and*

*c) the policy on the use of interim alarms.*

### 6.2.15: Testing of the alarm system (ISA's 6.2.13)

Should to shall: *Testing applicability, criteria, methods, and frequency shall be thoroughly documented by alarm classes.*

### 6.2.17 Alarm documentation (ISA's 6.2.15)

Should to Shall: *Appropriate documentation shall be addressed in the alarm philosophy.*

### 6.2.19 Management of change (ISA's 6.2.17)

Should to Shall: *A management of change procedure shall be documented.*

### 6.2.20 Training (ISA's 6.2.18)

Should to Shall:

*Specific aspects of training that shall be covered in the alarm philosophy or other equivalent documentation for each of the alarm classes include the following:*

*a) the job roles or personnel requiring training relating to the alarm system,*

*b) an outline of the training contents, and*

*c) when training is required.*

### 6.2.21 Alarm history preservation (ISA's 6.2.19)

Should to Shall:

*This section defines what aspects of the alarm history (e.g., annunciations, acknowledgements, return to normal, and operator actions) shall be preserved and the retention period (e.g., incidents, violation of safe operating limits).*

### 6.2.24 Alarm system audit

ISA-18.2's discussion of the Audit was not included in Section 6 as being a necessary part of the philosophy document. This is a new IEC section with mandatory requirements:

*The philosophy document shall specify the requirements of periodic alarm management audits. These requirements may include:*

*a) audit frequency, which may be specified based on alarm class,*

*b) audit topics, and*

*c) process for operator interviews.*

## Section 7: Alarm System Requirements Specification

There are no changes of significance.

## Section 8: Alarm Identification Methods

There are no changes of significance.

## Section 9: Alarm Rationalization

### 9.1 Purpose

In section 9.1, an 8th item was added to the ISA-18.2 mandatory list of alarm information to document, namely the probable cause of the alarm. However, the inclusion of that list in section 9.1 is an IEC typographic error as it is repeated in IEC sections 9.2, 9.2.1, and 9.2.2 – Alarm Rationalization Documentation. In those sections, the mandatory list from ISA-18.2 is repeated in IEC 62682, with the (unusual!) exception that

> *"the need for advanced alarming techniques if necessary"* is changed from a shall to a should in the IEC version! This is the only such instance!

The IEC version also lists these three additional things as recommended (should) which are not listed in 18.2:

*a) maximum allowable response time,*

*b) probable cause,*

*c) identification method*

Much more detail, examples, recommended methods, pitfalls, and experienced advice on performing Rationalization are found in ***The Alarm Management Handbook, 2nd Edition.***

Other minor changes in Section 9 are of little significance.

## Section 10: Detailed Design: Basic Alarm Design

### 10.2.3 Alarm suppression and other logic functions

A new IEC subsection with a mandatory requirement is added:

> *The alarm suppression functionality shall not bypass other logic functions (e.g., interlock actions.)*

This was implied in ISA-18.2 but is made explicit in IEC 62682.

In 18.2, there is discussion (in neutral terms) of using alarm state to drive interlock actions. In reality, this not a good practice and only "works" if very rigorous administrative requirements around it are continually evaluated and enforced. In other words, don't do it!

### 10.4.2 Alarm description

ISA-18.2 did not have a numbered sub-section for this specific item. IEC adds one with a new mandatory requirement:

> *All alarms shall have an informative text provided as a tag description, or alarm description, or both. The use of a structured layout and consistent wording are recommended.*

### 10.4.4 Alarm priority

ISA-18.2 did not have a numbered sub-section for this specific item. IEC adds one with a mandatory requirement, although ISA-18.2 implies this:

> *Alarm priority shall be assigned based on the information documented in the master alarm database.*

Interestingly (and probably an IEC oversight), an otherwise identical statement about alarm setpoint uses the word "should" rather than "shall."

These two figures from ISA 18.2 were eliminated.

**Figure 9 – Recommended Starting Point Deadband Based on Signal Type and**

**Figure 10 – Recommended Delay Times Based on Signal Type**

The remaining parts of Section 10 have no changes of significance.

## Section 11: Detailed design: Human-machine interface design for alarm systems

More ISA-18.2 “shoulds” in Section 11 became IEC 62682 “shalls.” These are marked:

### 11.2.3 HMI functional requirements (ISA’s 11.2.2)

*ISA: The HMI shall provide the ability for the operator to:*

*a) silence audible alarm indications (i.e., without acknowledging the alarm),*

*b) acknowledge alarms,*

*c) place alarms out of service through access controlled methods as allowed in the philosophy,*

*d) modify alarm attributes through access controlled methods only,*

Should to Shall: e) initiate an alarm shelving function,

Should to Shall: f) display alarm messages, and

Should to Shall: g) assign alarms to operator stations.

Editorial Soapbox: This last item is a very bad idea! Operators should not be responsible for changing alarm routing at their whim, as the next operator will have no clue as to what routing the prior operator may have altered. Alarm routing is an engineered configuration. If multiple routing configurations are needed for different situations, these should be pre-engineered and selectable – but the choice in effect must be visible to the operator!

### 11.2.4 HMI display requirements (ISA’s 11.2.3)

ISA: The HMI shall provide the capability for the following, or equivalent:

a) alarm summary displays,

b) alarm indications on process displays,

c) alarm indications on tag detail display,

Should to Shall: d) shelved alarm summary displays, and

Should to Shall: e) out-of-service summary displays.

In the next two subsections, IEC 62682 specifically lists the mandatory and recommended content for the electronic records produced when alarm states change. ISA-18.2 was not so explicit, but did have mandatory requirements for the ability to view certain content in those records, implying that the information must exist. The content is not surprising and most existing alarm systems already have this information contained in the records. Requirements (shall), then recommendations (should) follow.

### 11.2.5 Alarm records requirements

*An alarm record is a set of information which documents an alarm state change.*

*An alarm record shall have the following alarm record attributes:*

*a) tag name for alarm,*

*b) tag description or alarm description for alarm,*

*c) alarm state,*

*d) alarm priority,*

*e) alarm type, and*

*f) time and date of occurrence of the alarm state change.*

### 11.2.6 Alarm records recommendations

*An alarm record should have the following alarm record elements:*

*a) process value at the time when the alarm record is recorded,*

*b) alarm setpoint,*

*c) process area,*

*d) alarm group, and*

*e) alarm message.*

There are more ISA "shoulds" to IEC "shalls" around the indication of alarm state. These are marked:

### 11.3.2 Required alarm state indications (ISA's 11.3.1)

ISA: *A combination of visual indications, audible indications, or both, shall be used to uniquely distinguish the following alarm states:*

*a) normal,*

*b) unacknowledged alarm,*

*c) acknowledged alarm,*

Should to Shall: *d) return-to-normal unacknowledged alarm,*

Should to Shall: *e) shelved alarm,*

Should to Shall: *f) suppressed-by-design alarm, and*

Should to Shall: *g) out-of-service alarm.*

The sections on the latched alarm state were removed from the IEC version as previously mentioned.

The requirements and recommendations for depicting cases where alarms are "suppressed by design" is one of those items that kind of "snuck through" at the end of ISA-18.2's 6-year development. From a principled viewpoint, for an alarm to be suppressed-by-design means that an otherwise alarmed condition has been specifically designed to NOT be displayed or annunciated when it is not applicable to the current process condition, and annunciating and displaying it as an alarm would be inappropriate. (Example: displaying a low flow alarm when a pump is intentionally turned off.) Suppressed-by-design conditions require design and testing to be sure they work correctly. Once checked and operational, the thought of visually indicating all such conditions makes little sense. This dichotomy is being considered in the ISA-18.2 five-year review.

Regarding color use for alarm priority, ISA "should" became IEC "shalls" as indicated:

### 11.4.3 Colour alarm priority indications requirements (ISA's 11.4.2.1)

*A separate colour indication SHALL be used for each alarm priority, except in operating environments where this is not practical. The alarm priority colours SHALL be reserved and SHALL NOT be used for other elements of the HMI.*

In order to comply with this, many control system vendors will need to revise many aspects of their built-in HMI design, such as typical color choices in faceplates.

In this subsection, the IEC added one new mandatory item.

### 11.6.2.5 Functional requirements (ISA's 11.6.1.4)

*ISA: The alarm summary display shall provide the following functions:*

*a) sorting of alarms by chronological order,*

*b) sorting of alarms by priority,*

*c) individual acknowledgment of each alarm, and New IEC Requirement: d) acknowledgment of visible alarms.*

There is no definition of exactly what a "visible" alarm is or what it means in this context. For example, is this the ability to acknowledge all unacknowledged alarms that are currently visible on a particular display, i.e. "group acknowledge?"

Two new items were added in the IEC recommended list for Alarm Summary Displays, as shown:

### 11.6.2.6 Functional recommendations (ISA's 11.6.1.5)

*ISA: The alarm summary display should provide the following functions:*

*a) navigational link to the appropriate process display,*

*b) filtering of alarms by time of alarm,*

*c) filtering of alarms by priority,*

*d) filtering of alarms by alarm type,*

*e) filtering of alarms by alarm group,*

*f) filtering of alarms by process area,*

*h) time limits for filters, and*

New IEC Requirement: *g) filtering of alarms by tag name,*

New IEC Requirement: *i) sorting of alarms by tag name.*

Note: sorting by tag name is probably the least useful method of alarm display sorting in existence!

IEC omits the brief discussion of Overview Displays contained in ISA's section 11.6.4.

In ISA-18.2, shelving was an optional feature, but if it was used 18.2 specified certain mandatory requirements and recommended capabilities about it. In IEC 62682 shelving capability is mandatory, but there are no significant differences in the specifics of the functionality specified in ISA or IEC.

There are no significant ISA-IEC differences regarding out-of-service alarms, suppressed-by-design alarms, or the use of external alarm annunciators.

## Section 12: Detailed Design – Enhanced and Advanced Alarm Methods

In ISA-18.2, this section was an explanatory overview of various techniques, and contained no mandatory content. The IEC section has only a few, minor wording differences in its content, and one new mandatory statement (which is kind of a Captain Obvious statement.) Both ISA-18.2 and IEC give a brief description of a "supplementary alarm system. The IEC goes on with a new statement to say:

"Where a supplementary alarm system is used it shall comply with the all requirements of this standard."

## Section 13: Implementation

ISA-18.2's section 13 was a bit awkwardly arranged, jumping back and forth between recommendations and requirements for alarms in general, then separately listed requirements for "highly managed alarms."

*(See advice on highly managed alarms in our other White Paper on ISA-18.2! The advice there also applies to IEC 62682 – basically – NEVER say you have a "highly managed alarm" and do not use that optional classification There is no requirement in either document to use the "Highly Managed" alarm classification!)*

The ISA training and testing sections jumped between recommendations and requirements for "initial training" on a new system, and training regarding modifications to an existing system.

The IEC version simplifies this a little bit. So a direct comparison to 18.2 is difficult here due to the difference in structure. In general a few "shoulds" in 18.2 became "shalls" in IEC 62682 but overall, there is little difference. The differences are summarized here:

Training:

IEC reorganized the structure of Section 13 regarding training, so trying to cross-correlate sub-section numbers is not useful. For all alarms, IEC 62682 says

### 13.3.3 Implementation training requirements

*The training shall include:*

> *a) the rationalization information of the alarm (e.g., consequence, causes for alarm, corrective action, etc.), and*
>
> *b) the audible and visual indications for the alarm.*

This ISA "should" was converted to a "shall:"

### 13.3.6 Implementation training requirements for new or modified alarm systems

*Operators shall be trained on all new or modified alarm systems.*

For testing, the IEC version is also simplified and reordered, but more "shoulds" became "shalls."

### 13.4.4 Implementation testing requirements for new or modified alarm systems

Alarm systems shall be tested during implementation to ensure that appropriate items in the alarm philosophy and ASRS have been met. The testing of a modified alarm system shall be appropriate to the nature of the change, as determined by site MOC procedures.

*The testing of new alarm systems shall include:*

> *a) the audible and visual indications for each alarm priority,*
>
> *b) the HMI features, such as alarm messages in the alarm summary or equivalent,*
>
> *c) the methods for removing an alarm from service and returning an alarm to service*

Should to Shall: *d) the methods for shelving,*

Should to Shall: *e) the methods for alarm suppression,*

Should to Shall: *f) any additional functions of enhanced or advanced alarming techniques, and*

Should to Shall: *g) the methods of alarm filtering, sorting, linking of alarms to process displays.*

For the documentation of implementation, a new mandatory item was added:

### 13.5.2 Documentation requirements (ISA's 13.5.1)

*ISA: The following documentation shall be provided:*

*a) the rationalization information documented,*

*b) sufficient information to perform testing of alarms,*

*c) the alarm response procedures, and*

New IEC Requirement: *d) any designed suppression or enhanced alarming documentation.*

## Section 14: Operation

The IEC version introduces a new training documentation requirement:

### 14.4.2 Refresher training documentation for highly managed alarms

*ISA: If a highly managed alarm class is used then the following training information shall be documented:*

*a) the persons trained,*

*b) the method of training,*

*c) the date of the training, and*

New IEC Requirement: *d) the history of training.*

There are some other minor wording differences in Section 14 but the intent remains the same.

## Section 15: Maintenance

IEC has two additional mandatory items around testing:

### 15.2.2 Periodic alarm testing requirements (ISA's 15.2.1)

*ISA: When tests are performed, a record shall be kept for a period specified in the alarm philosophy. The records shall contain the following:*

*a) date(s) of testing,*

*b) name(s) of the person(s) who performed the test or inspection,*

*c) unique identifier of equipment (e.g., loop number, tag number, and equipment number),*

*d) result of tests (e.g. the as-found and as-left conditions),*

New IEC Requirement: *e) a reference to the testing procedure and methods used, and*

New IEC Requirement: *f) cause of test failures.*

Another ISA "should" to IEC "shall"

### 15.2.4 Periodic alarm test procedure requirements (ISA's 15.2.3)

Should to Shall: *Test procedures shall be provided for alarms requiring testing.*

The IEC removed the ~~struck-through~~ words below, thus removing some flexibility that was in the ISA version.

### 15.3.3 Out-of-service highly managed alarms (ISA's 15.3.2)

*If a highly managed alarm is taken out of service for longer than one shift, appropriate interim alarms or procedures shall be identified considering risk reduction requirements and the plant state.*

Another ISA "should" to IEC "shall"

### 15.3.5 Requirements for returning alarms to service (ISA's 15.6)

*ISA: Prior to returning out-of-service alarms to the operational state, operators shall be notified to ensure they are aware of the returning alarm and the removal of the interim methods.*

Should to Shall: *Interim alarms and procedures shall be removed, where applicable, when the original alarms are returned to service. (ISA's 15.6.1)*

## Section 16: Monitoring and Assessment

In IEC Tables 5 and 7, Average Alarm Rates, IEC changed the daily numbers from (~150 to ~300) to (~144 to 288), being 24-hour multiples of 6 to 12. PAS feels this to have been a mistake, as the numbers ~144 and ~288 imply more precision than was ever intended. In any case, the numbers are still listed as examples and the user if free to adapt them. The "weasel words" in ISA-18.2 are repeated in IEC 62682:

> *"The target metrics described below are approximate and depend upon many factors, (e.g., process type, operator skill, HMI, degree of automation, operating environment, types and significance of the alarms produced). Maximum acceptable numbers could be significantly lower or perhaps slightly higher depending upon these factors. Alarm rate alone is not an indicator of acceptability."*

Other than this, Section 16 was essentially unchanged.

## Section 17: Management of Change

This section had only slight wording changes, which were not of significance.

## Section 18: Audit

This section had only slight wording changes, which were not of significance.

# Part 6: Conclusion

ISA-18.2 is an important standard and will undoubtedly result in a significant safety enhancement for the process industries. It validates and embodies practices that industry experts and leading manufacturing companies have advocated for many years. The publication of ISA-18.2 in 2009 has significant regulatory consequences, and companies are advised to become familiar with its contents.

IEC 62682 is important because it extends the reach of the principles contained in the ISA-18.2 standard. Compared to ISA-18.2, the overall differences in the new IEC document are minimal, but important. The IEC document makes mandatory many items that ISA-18.2 simply lists as recommended.

Multi-national companies may find that the IEC document may be applied in some jurisdictions, and thus have differences in alarm management requirements based upon plant location. Corporate-level guidance on alarm management may need to be revised to reflect this situation.

For many years, PAS has been supplying software, performing consulting services, and advocating practices that both ISA-18.2 and IEC 62682 now validate and embody. Because of our industry experience, our work practices and comprehensive software specifically address many of the requirements and recommendations of ISA-18.2 / IEC 62682 including:

- Automated alarm system analysis and reporting
- Alarm rationalization in a master alarm database
- Alarm documentation in a master alarm database, with web or HMI access
- Automated alarm system change tracking, reporting, and even enforcement
- Automated detection of unauthorized alarm suppression
- Operator alert systems
- State-based alarming and alarm flood suppression

# About the Author

## Bill R. Hollifield

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Bill is the Principal Consultant responsible for the PAS work processes and intellectual property in the areas of both Alarm Management and High Performance HMI. He is a member of the ISA SP-18 Alarm Management committee, the ISA-SP101 HMI committee, The American Petroleum Institute's API RP-1167 Alarm Management Recommended Practice committee, and the Engineering Equipment and Materials Users Association (EEMUA) Industry Review Group.

Bill has multi-company, international experience in all aspects of Alarm Management and HMI development. He has 28 years of experience in the petrochemical industry in engineering and operations, and an additional 14 years in alarm management and HMI software and services for the petrochemical, power generation, pipeline, pharmaceutical, and mining industries.

Bill is co-author of *The Alarm Management Handbook, The High Performance HMI Handbook,* and The Electric Power Research Institute (EPRI) Guidelines on Alarm Management for both Power Generation and Power Transmission.

Bill has authored several papers on Alarm Management and HMI and is a regular presenter on such topics in such venues as API, ISA, and Electric Power symposiums. He has a BSME from Louisiana Tech University and an MBA from the University of Houston.

In 2014, Bill was made an ISA Fellow.

# About PAS

PAS, the OT Integrity company, delivers software solutions that prevent, detect, & remediate cyber threats; reduce process safety risks and optimize profitability; and enable trusted data for decision-making. With operations in over 70 countries, PAS helps many of the world's leading industrial organizations ensure OT Integrity from the sensor to the cloud – including 13 of the top 15 refining, 13 of the top 15 chemical, 4 of the top 5 pulp and paper, 3 of the top 5 mining, and 7 of the top 20 power generation companies. PAS was recently named the #1 Global Provider of Safety Lifecycle Management and #1 Alarm Management Provider by ARC Advisory Group and is named as a Representative Vendor by Gartner for OT Network Monitoring and Visibility and OT Endpoints Security. For more information, visit www.pas.com. Connect with PAS on Twitter @PASGlobal and LinkedIn.

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