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Human machine interfaces for process automation systems

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65A/1115/FDIS

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HUMAN MACHINE INTERFACES FOR PROCESS AUTOMATION SYSTEMS

FOREWORD

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The text of this International Standard is based on the following documents:

Draft	Report on voting
65A/XX/FDIS	65A/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

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- reconfirmed,
- withdrawn, or
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INTRODUCTION

The purpose of this document is to address the philosophy, design, implementation, operation, and maintenance of human machine interfaces (HMIs) for automation systems, including multiple work processes throughout the HMI life cycle. It is intended to help users to better understand the style of HMI recommended by this document.

It is assumed that the reader has a fundamental knowledge of basic HMI functionality.

This document was derived from ANSI/ISA-101.01-2015 Human Machine Interfaces for Process Automation Systems.

This document defines the terminology and models to develop an HMI and the work processes recommended to effectively maintain the HMI throughout its life cycle. This document can be used to:

– provide guidance to design, build, operate and maintain HMIs to achieve a safer, more effective, and more efficient control system under all operating conditions, and
– improve the user's abilities to detect, diagnose, and properly respond to abnormal situations.

The HMI is the collection of hardware and software used to monitor and interact with the control system and ultimately with the process.

In some cases, the primary user(s) operate equipment from different suppliers that have their own HMI system standards, and it is impractical to achieve uniformity across these HMI systems or the ideal adherence to the asset owner's HMI system standards.

In such cases, the asset owner should perform a formal assessment of deviations of each equipment HMI from the asset owner's HMI philosophy. This assessment should consider human factors engineering and task analysis.

The outcome of the assessment should determine if any mitigations are required to ensure the safe and efficient control of the process including start-up, operation, and shutdown, in addition to early detection, diagnosis, and proper response to abnormal situations.

The proper design and implementation of HMI systems as described in this document will result in increased efficiencies and reduced stress of the users. Other factors such as ergonomics and overall design of the control room also contribute to potential stressors that need to be managed. International Standard series ISO 11064 "Ergonomic design of control centres" has been developed to address the broader control room environment.

This document is organized into ten clauses. The first three clauses are introductory in nature. Clause 4 presents user types. Clause 5 introduces the life cycle model for the HMI. Clauses 6 through 10 provide additional details to support the HMI life cycle. The main body of this document (Clauses 4 to 10) presents mandatory requirements and non-mandatory recommendations.

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HUMAN MACHINE INTERFACES FOR PROCESS AUTOMATION SYSTEMS

1 Scope

1.1 General applicability

This document defines general structures and functions of HMI systems.

An HMI life cycle example for HMI systems is included.

This document specifies requirements and recommendations for activities in each stage of the life cycle including designing, using, and maintaining the HMI system.

It also provides requirements and recommendations for functions and performance of HMI systems.

The requirements and recommendations in this document are applicable to any controlled process using an HMI to interface to a control system. There can be differences in implementation to meet the specific needs based on the application and controlled process type.

1.2 Exclusions

1.2.1 Management of change (MOC)

Some requirements and recommendations to be included in a MOC procedure are included in this document. However, a specific MOC procedure has not been included in this document.

1.2.2 Jurisdictions

In some jurisdictions, the governing authorities (e.g. national, federal, state, province, county, city) have established process safety design, process safety management, or other requirements.

1.2.3 Purchase specification

This document is not intended to be used as a human machine interface system selection or purchase specification, although at the discretion of the person specifying or requiring it, suppliers could be requested to provide an HMI system including the features mentioned herein. This document does not eliminate the need for sound engineering judgment. No HMI platform or technology is mandated nor implied.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62381, *Automation systems in the process industry – Factory acceptance test (FAT), site acceptance test (SAT), and site integration test (SIT)*

IEC 62443 (all parts), *Security for industrial automation and control systems*