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SPECIFICATION

IEC
PAS 62381

Pre-Standard

First edition
2004-01

Activities during the factory acceptance test (FAT), site acceptance test (SAT), and site integration test (SIT) for automation systems in the process industry

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ACTIVITIES DURING THE FACTORY ACCEPTANCE TEST (FAT), SITE ACCEPTANCE TEST (SAT), AND SITE INTEGRATION TEST (SIT) FOR AUTOMATION SYSTEMS IN THE PROCESS INDUSTRY

FOREWORD

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IEC-PAS 62381 has been processed by IEC technical committee 65: Industrial-process measurement and control.

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
65/309/PAS	65/322/RVD

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned will transform it into an International Standard.

INTRODUCTION

There is an increasing trend in the process industry to shorten the time period for project execution. At the same time, the complexity of automation systems is being increased due to the number of connected systems and the use of new technologies, for example, fieldbus systems.

Experience has shown that the owner, the contractor and the vendor have long and extensive discussions to unambiguously lay down the scope of activities and responsibilities in order to achieve a timely delivery and acceptance of automation systems.

This document should lead to an improvement and acceleration of the negotiation phase and to a mutual understanding about the scope of activities of each party.

This document does not reflect the additional interests of industries which are subject to special requirements such as validation.

The annexes of this standard contain forms which may be used in the test procedures. They are attached to this publication in Excel format. Buyers of this publication may copy these forms for their own purposes only in the required amount.

The IEC sells read-only PDF files as a general rule. In the present instance, and quite exceptionally, to enable the user to fill in the forms, a revisable file is included in a pocket affixed to the back cover of this publication. Please use the zip/unzip function.

This file can also be downloaded from the Web as a PDF file.

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WITHDRAWN

ACTIVITIES DURING THE FACTORY ACCEPTANCE TEST (FAT), SITE ACCEPTANCE TEST (SAT), AND SITE INTEGRATION TEST (SIT) FOR AUTOMATION SYSTEMS IN THE PROCESS INDUSTRY

1 Scope

This document defines procedures and specifications for the factory acceptance test (FAT), site acceptance test (SAT), and site integration test (SIT). These tests are carried out to prove that the automation system is in accordance with the specification.

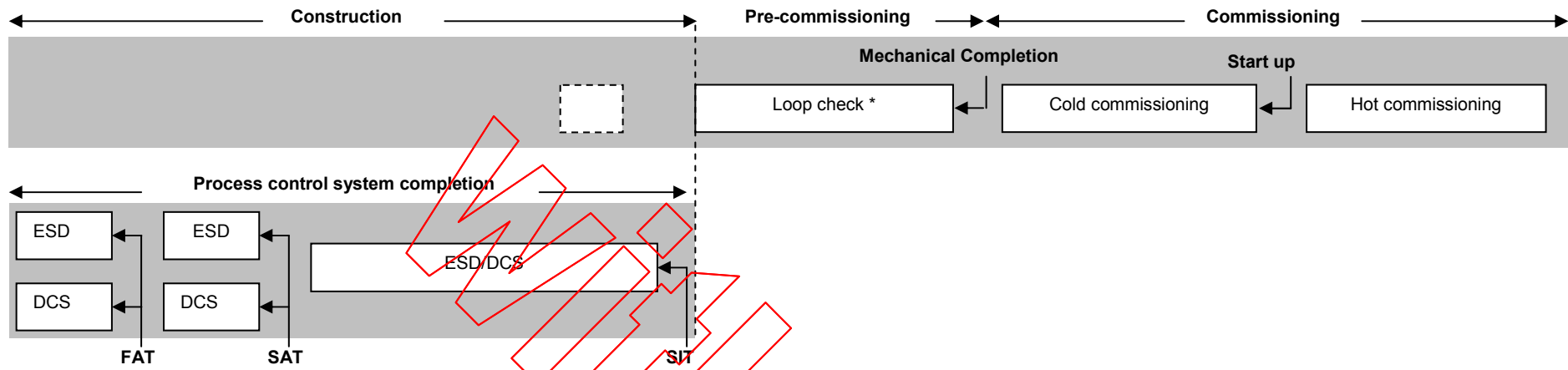
Engineering and manufacturing activities prior to these tests are not covered by this document.

The description of activities described in this document can be taken as a guideline and adapted to the specific requirements of the process/plant/equipment. A typical sequence of activities and events is shown in Figure 1, their relationship in Figures 2 and 3.

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Prerequisite for FAT

- SW complete
- System hooked up
- Vendor in-house test

Prerequisite for SAT

- Shipment of system to site
- Proper Installation
- System start up

Prerequisite for SIT

- Systems properly connected
- SAT complete

*The loop check can actually be started during the construction phase once the required infrastructure has been installed.

Figure 1 – Diagram depicting a typical sequence of events for FAT, SAT and SIT with respect to the project milestones

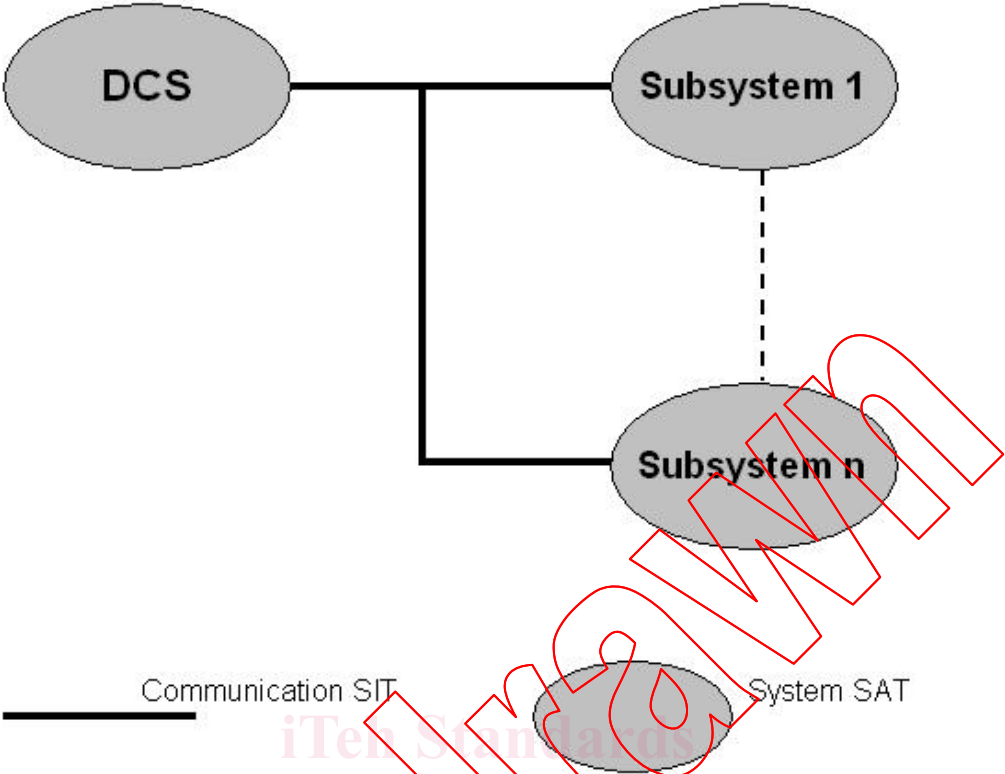


Figure 2 – Diagram depicting the relationship for the SAT and the SIT between the DCS and subsystems

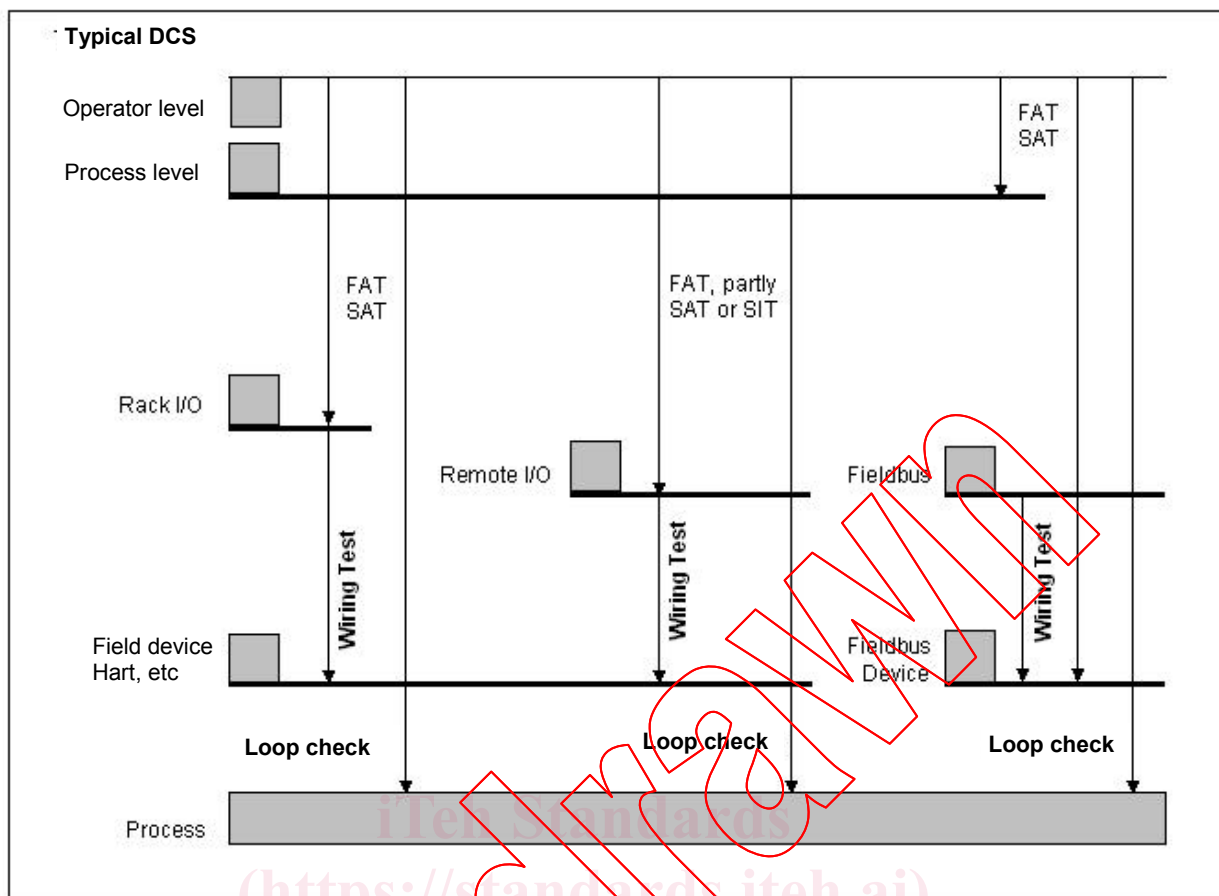


Figure 3 – Diagram depicting the relationship between the FAT, the SAT and the SIT with the relevant plant levels

2 Definitions

IEC PAS 62381:2004

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For the purposes of this document the following definitions apply.

2.1

automation system

DCS- or PLC- based system for the monitoring and controlling of production facilities in the process industry, including control systems based on fieldbus technologies

2.2

tag

an unambiguous alphanumeric descriptor which identifies a sensor or actuator

2.3

factory acceptance test

activity to demonstrate that the vendor system and additional supplied systems are in accordance with the specification

2.4

site acceptance test

activity to demonstrate that the installation of the various vendor systems are in accordance with the applicable specifications and installation instructions

2.5

site integration test

activity to demonstrate that the merging of the various systems to one overall system is completed and that all components work together as specified

2.6**buyer**

company which is functionally responsible for the automation system purchased from the vendor, i.e. either the owner or the contractor

2.7**owner**

company that hired a contractor to build a chemical plant, petrochemical plant, etc.

2.8**contractor**

company which is hired by the owner to design and build a chemical plant, petrochemical plant, etc.

NOTE The function of contractor can be fulfilled by the owner.

2.9**vendor**

manufacturer or distributor of the automation system

2.10**process industry**

industry that uses chemical reactions, separations, or mixing techniques in order to create new products, modify existing products or treat waste and includes the following types of industries: chemical, petrochemical, waste treatment, paper, cement, etc. It does not include such industries as equipment/machine manufacturing or other similar industries. Industries which are subject to special requirements and or validation, etc., are also not included

2.11**project design specification (PDS)**

document that defines detailed information needed to implement the functionality described in the PFS

2.12**project functional specification (PFS)**

document that contains the vendor's response to the requirements the buyer made prior to starting the project with the vendor

3 Abbreviations

C&E	Cause and Effect Diagram
DCS	Distributed control system
ESD	Emergency shut down system
FAT	Factory acceptance testing
FBD	Functional block diagram
FUP	Function plan
HMI	Human machine interface
HW	Hardware
MC	Mechanical completion
PDS	Project design specifications
PFS	Project functional specification
PLC	Programmable logic controller
SAT	Site acceptance test
SIT	Site integration test
SW	Software

4 General preparation before conducting the FAT

Prior to commencing FAT, the VENDOR shall complete full in-house testing. Test reports shall be available for inspection.

All relevant documents shall be prepared for use during the FAT. The following list shows documents typically used. The list should be adapted to be specific to the project.

4.1 Documents typically prepared by the OWNER/CONTRACTOR

- Specifications
- Preceding agreement(s)
- Function plans
- Cause and effect diagrams
- Sequential functional charts
- Sketches of operator displays and relevant text
- Control narratives
- Instrument index, for example TAG - Service text – I/O type - Scaling - Units
- Alarm message list, for example TAG - Type of alarm - Sorting criteria (priority / plant area)
- Setpoint, control, effect and safety directions
- Interlock list, for example interlocks assigned to each sensor/actuator, software (DCS) and hardware (ESD)

4.2 Documents typically prepared by the VENDOR

- System documentation
- Manuals, system data sheets, certificates
- System layout
- Hardware layout
- Description of interfaces
- I/O list
- Graphic printouts
- Configuration printout
- In-house test reports
- List of deliveries (hardware, software, application, and licenses)

5 Factory acceptance test

5.1 General

The FAT shall be performed by the VENDOR. The BUYER should witness the test activities.

The FAT shall comprise the following areas

- project relevant scope of supply;
- application-related functions of automation system from I/O to HMI;
- system related functions;
- adequate infrastructure shall be provided by the VENDOR.

The FAT shall be conducted using the Annex A checklists.