

INTERNATIONAL STANDARD

IEC 62381

First edition
2006-11

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**AUTOMATION SYSTEMS IN THE PROCESS INDUSTRY –
FACTORY ACCEPTANCE TEST (FAT),
SITE ACCEPTANCE TEST (SAT), AND SITE INTEGRATION TEST (SIT)**

FOREWORD

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International Standard IEC 62381 has been prepared by IEC technical committee 65: Industrial-process measurement and control.

This standard cancels and replaces IEC/PAS 62381 published in 2004. This first edition constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
65/385/FDIS	65/394/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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

The annexes of this standard contain forms which may be used in the test procedures. Buyers of this standard may copy these forms for their own purposes only in the required amount.

For application in the pharmaceutical or other highly specialized industries, additional guidelines (for example, Good Automated Manufacturing Practice (GAMP)) definitions and stipulations should apply in accordance with existing standards, for example, for GMP Compliance 21 CFR (FDA) and the Standard Operating Procedure of the European Medicines Agency (SOP/INSP/2003).

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WITOLD

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

1 Scope

This International Standard defines procedures and specifications for the Factory Acceptance Test (FAT), the Site Acceptance Test (SAT), and the 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 standard.

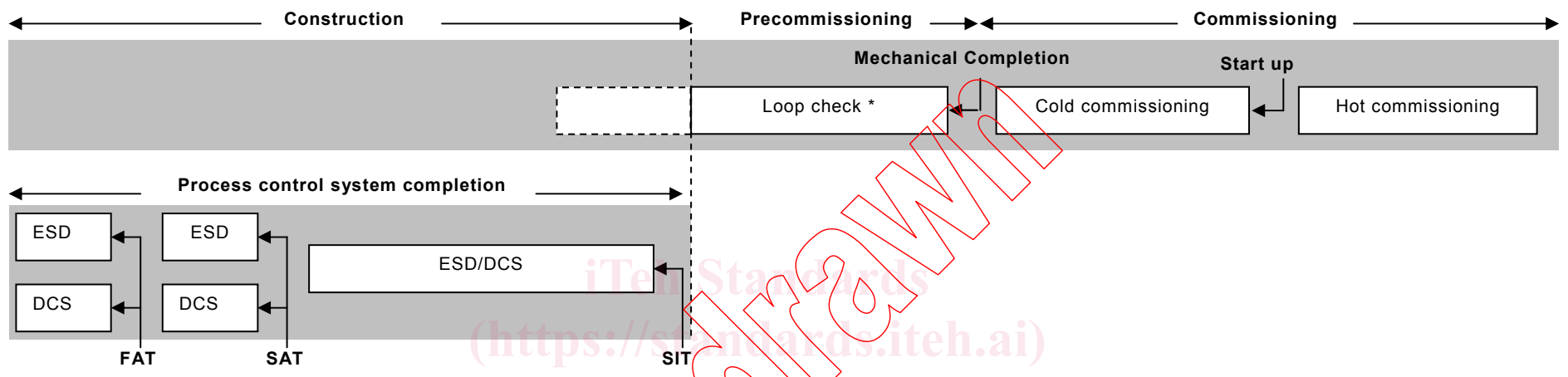
The description of activities described in this standard can be taken as a guideline and adapted to the specific requirements of the process/plant/equipment. A typical sequence of activities and events is shown in Figure 1, their relationship in Figures 2 and 3.

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- Prerequisite for FAT
- SW complete
 - System hooked up
 - Vendor in-house test completed

- Prerequisite for SAT
- Shipment of system to site
 - Proper installation
 - System start-up

- Prerequisite for SIT
- Systems properly connected
 - SAT complete

IEC 2059/06

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

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

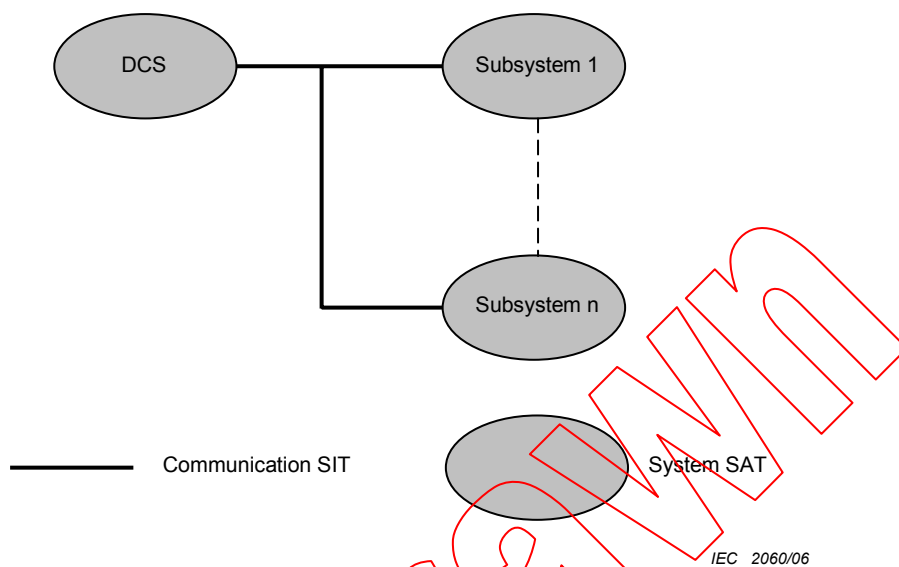


Figure 2 – Diagram depicting the relationship for the SAT and SIT between the DCS and subsystems

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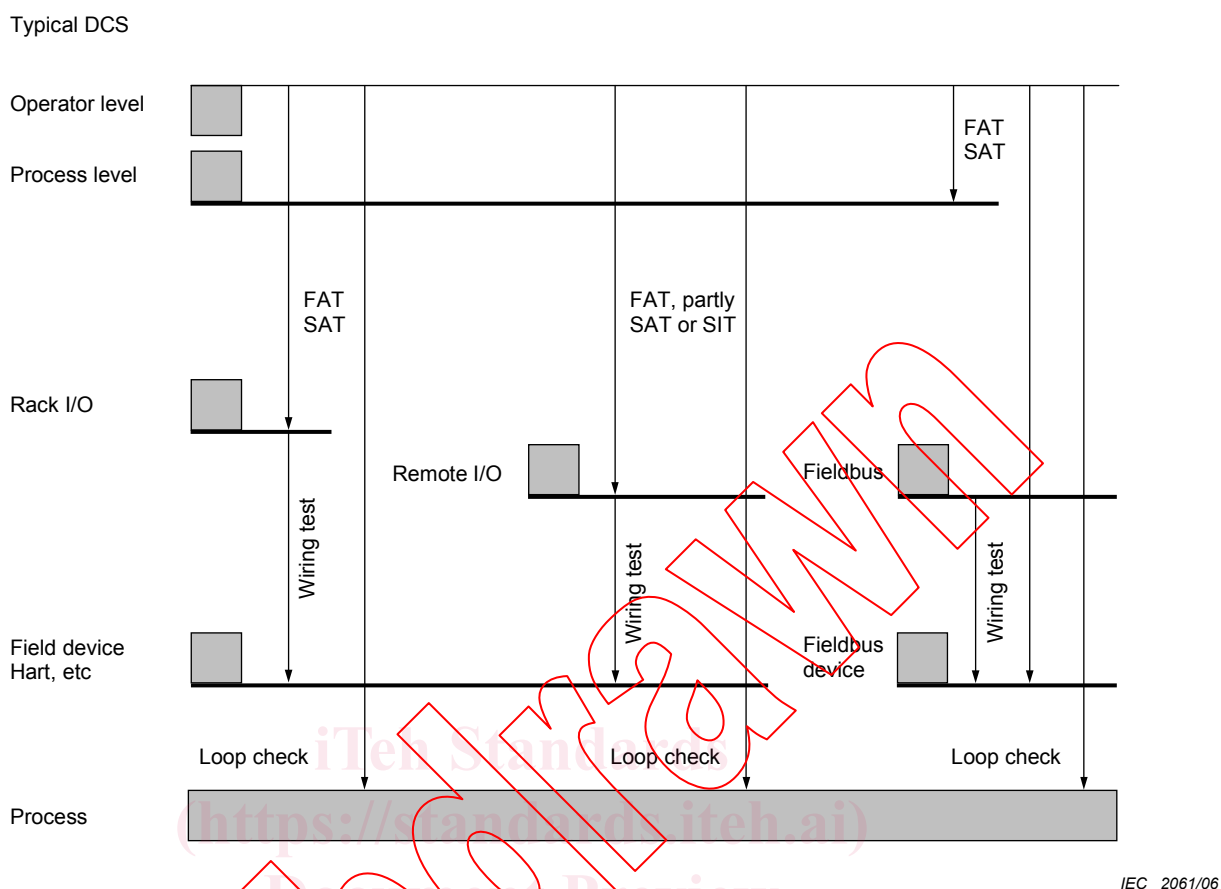


Figure 3 – Diagram depicting the relationship between the FAT, SAT and SIT with the relevant plant levels

2 Terms and definitions

For the purposes of this document, the following terms and 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

unambiguous alphanumeric descriptor which identifies a sensor or actuator

2.3 factory acceptance test

activity to demonstrate that the vendor system and additionally 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 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 stipulated 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