

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Representation of electrical and instrument objects in digital 3D plant models during engineering**

**Représentation des objets électriques et d'instrumentation dans des modèles d'installation numérique 3D pendant la phase d'ingénierie**





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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**REPRESENTATION OF ELECTRICAL AND INSTRUMENT OBJECTS  
IN DIGITAL 3D PLANT MODELS DURING ENGINEERING**

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

Draft	Report on voting
65E/1083/FDIS	65E/1137/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.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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## INTRODUCTION

Engineering and construction in the process industries typically involve the cooperation of multiple companies. Due to economic reasons, special knowledge, special license, authorization or simply capacity utilization, the work is divided between partners. They will arrange their cooperation for each individual project differently. This implies well defined division of work and responsibilities across the different phases of project execution.

Efficient engineering of a digital 3D plant model is inextricably linked to highly sophisticated tools for the different needs of the involved work processes and departments. By nature of the plant model, all engineering disciplines meet in the model and imply clear definitions of the content and interfaces.

Digital 3D plant models play an important part in electrical and instrumentation engineering to create technical drawings and avoid clashes between the elements provided by different engineering disciplines.

The first aim of this document is to define the level of details of electrical and instrumentation equipment representations placed in the 3D plant model. It specifies minimum requirements at the different maturity grades of the model for each equipment, its related metadata and reports retrieved from the 3D plant model.

The second aim of this document is to define a timeline and project milestones with the associated level of detail for the incorporation of electrical and instrumentation equipment into the 3D plant model.

This document aims at avoiding misunderstandings and erroneous design work in order to reduce additional corrective works and expenses for clarification.

# REPRESENTATION OF ELECTRICAL AND INSTRUMENT OBJECTS IN DIGITAL 3D PLANT MODELS DURING ENGINEERING

## 1 Scope

This International Standard provides requirements for the E&I objects of a digital 3D plant model, used in the engineering phase to design and construct a process plant and its instrumentation. It provides guidance how to model plants and their electrical and instrumentation equipment.

This document also specifies the content and the possible output of the 3D plant model at project milestones.

This document can be used by the contractual partners to agree upon the content of the 3D plant model to be delivered at specified milestones.

This document does not specify the transfer and format of digital 3D plant models.

This document does not specify definitions or instructions for equipment representations and details of elements in the 3D plant model not belonging to electrical and instrumentation domains.

## 2 Normative references

There are no normative references in this document.

## 3 Terms, definitions and abbreviated terms

### 3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### 3.1.1

##### **plant**

complete set of technical equipment and facilities for solving a defined technical task

Note 1 to entry: A plant includes apparatus, machines, instruments, devices, means of transportation, control equipment and other operating equipment.

Note 2 to entry: This entry was numbered IEV 351-42-35 in IEC 60050-351:2013.

#### 3.1.2

##### **digital 3D plant model**

representation that defines, characterizes and relates electrical and instrumentation equipment, piping, structural elements as well as their building containment in a three-dimensional space