

IEC/COMMITTEE: <b>TC 3</b>	SECRETARIAT: <b>Sweden</b>	DATE: <b>2023-11-10</b>
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Please ensure this form is annexed to the Report to the Standardization Management Board if it has been prepared during a meeting or sent to the IEC Secretariat promptly after its contents have been agreed by the committee.

**A. TITLE AND SCOPE OF COMMITTEE****Documentation, graphical symbols and representations of technical information****SCOPE**

Standardization in the field of documentation, graphical symbols and representations of technical information, covering

- 1) Rules, principles and methods focusing on machine sensible representation of information. This includes but is not limited to:
  - Definition and identification of classes and properties (e.g. sematic data),
  - ontologies and data dictionaries (e.g. CDD),
  - Information models for structuring of technical data and document management,
  - information exchange based on existing communication means,

It includes definition, co-ordination and management of the information required during the whole life cycle of a device, system, or plant, also covering aspects of documentation.

- 2) Rules, principles and methods focusing on human sensible representation of the information. This includes but is not limited to:
  - presentation of information in documentation,
  - graphical symbols for use in documentation,
  - graphical symbols for the human interaction with equipment,

The standards deal with the presentations and graphical symbols as shown in documents or on equipment, independently of their forms of representation, analogue or digital, but may also include requirements for the development of documentation.

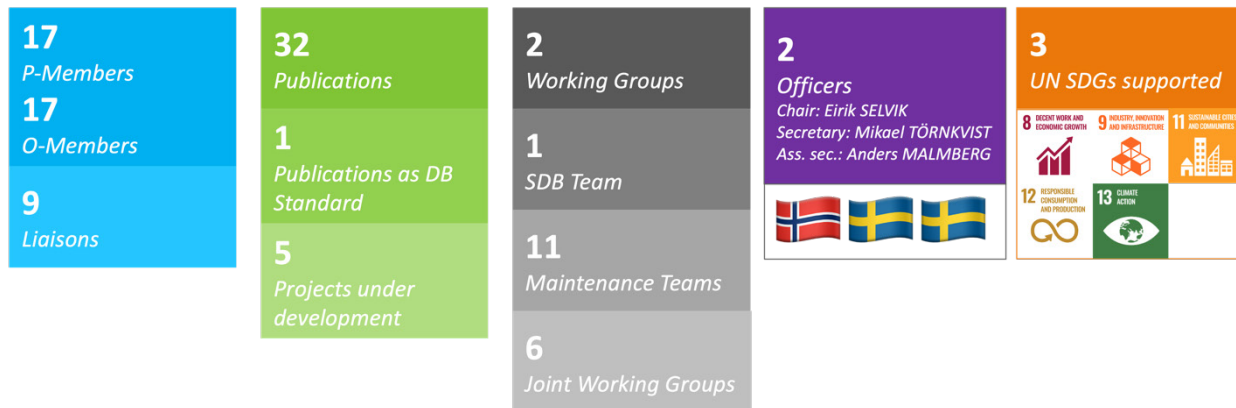
- 3) Rules, principles and methods for general and safety related marking, identification and arrangement of information in electrical installations, equipment and man-machine interfaces. This includes but is not limited to:
  - the meanings of colours and alternative means, when used for marking and identification,
  - the arrangement of indicating devices and actuators,
  - coding principles for indicating and actuating devices,
  - terminal designation of electrical and electronic components, apparatus and equipment,
  - designation of certain designated conductors,
  - marking of electrical and electronic equipment with ratings related to supply and to its properties,
  - marking of bare and insulated conductors.

**Horizontal functions:**

- To develop basic safety publications related to marking, identification and arrangement of information in electrical installations, equipment and man machine interfaces.
- To develop horizontal publications in the area of documentation, graphical symbols and representation of technical information.

## B. MANAGEMENT STRUCTURE OF THE COMMITTEE

### **TC 3**



**Chair:** Mr Eirik Selvik, Norway  
**Secretary:** Mr Mikael Törnkvist, Sweden  
**Assistant Secretary:** Mr Anders Malmberg, Sweden

#### Working groups

[WG 27](#) Terminology  
[WG 28](#) Intelligent Information Request and Delivery specification (iiRDS) –  
A Process Model for Information Architecture

#### MAINTENANCE TEAMS

[MT 21](#) Maintenance team of IEC 62027 and IEC 61082  
[MT 22](#) Maintenance team of IEC 60073, IEC 60445 and IEC 60447  
[MT 23](#) Maintenance team of IEC 60152, IEC 60757 and IEC 61293  
[MT 29](#) Graphical symbols for diagrams  
[MT 60848](#) Maintenance of IEC 60848  
[MT 61175](#) Maintenance of IEC 61175  
[MT 61666](#) Maintenance of IEC 61666  
[MT 62023](#) Maintenance of IEC 62023  
[MT 62491](#) Maintenance of IEC 62491  
[MT 62507](#) Maintenance of IEC 62507  
[MT 81714](#) Maintenance of the IEC 81714 series

#### JOINT WORKING GROUPS

[JWG 16](#) Maintenance of IEC 82079 series linked to [ISO/TC10/SC1](#)  
[JWG 17](#) Documentation of communication in power utility automation  
linked to [TC 57](#)  
[JWG 18](#) Revision of IEC 81355-1 (former IEC 61355-1), to replace the existing MT 61355  
linked to [ISO/TC 10](#)  
[JWG 24](#) Maintenance of the IEC 81346 series linked to [ISO/TC 10](#)  
[JWG 25](#) Industrial systems, installations and equipment and industrial products -  
Structuring principles and reference designation - Part 10: Power plants  
linked to [ISO/TC 10/SC 10](#)  
[JWG 26](#) IEC 82045 series  
linked to [ISO/TC 10](#)

#### Advisory groups

[AG CAG](#) Chair Advisory Group

#### VALIDATION TEAMS

[VT 60617](#) [SDB team for IEC 60617 - Graphical symbols for diagrams](#)

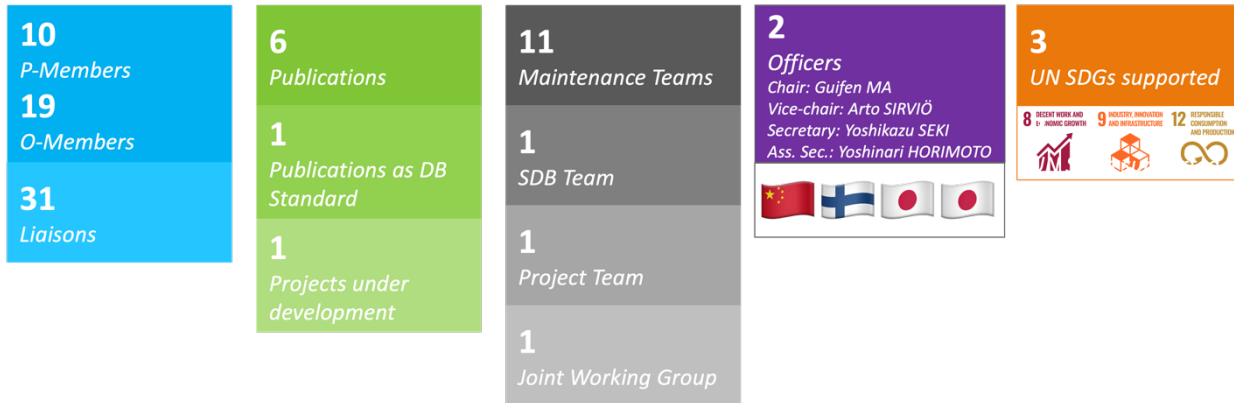
## Subcommittees

Directly connected to **TC3**, there are currently two subcommittees:

SC 3C Graphical symbols for use on equipment

SC 3D Classes, Properties and Identification of products - Common Data Dictionary (CDD)

### **SC 3C**



**Chair:** Ms Guifen Ma, China  
**Vice-Chair:** Mr. Arto Sirviö, Finland  
**Secretary:** Mr Yoshikazu Seki, Japan  
**Assistant Secretary:** Mr. Yoshinari Horimoto, Japan

#### Title

#### Graphical symbols for use on equipment

#### Scope

Standardization in the field of graphical symbols for the human interaction with equipment regarding methods and rules. Included:

- Basic design rules for graphical symbols;
- The design of graphical symbols for particular applications.

Graphical symbols for use on equipment are primarily intended to:

- identify the equipment or a part of the equipment (e.g. a control or display);
- indicate a functional state (e.g. on, off, alarm);
- designate connections (e.g. terminals, filling points for materials)
- provide information on packaging (e.g. identification of contents, instructions for handling);
- provide instruction for the operation of the equipment (e.g. limitations of use).

#### Horizontal functions:

- Basic design rules for graphical symbols and the design of graphical symbols for particular applications.

#### Project Team

[PT 45](#) Survey of graphical symbols for use on equipment used in product committee publications

#### Maintenance Teams

[MT 60417](#) Graphical symbols for use on equipment

[MT 62648](#) Graphical symbols for use on equipment –

Guidelines for the inclusion of graphical symbols in IEC publications

[MT 62964](#) Graphical symbols for use on equipment –  
Graphical symbols for multimedia equipment – Current practice

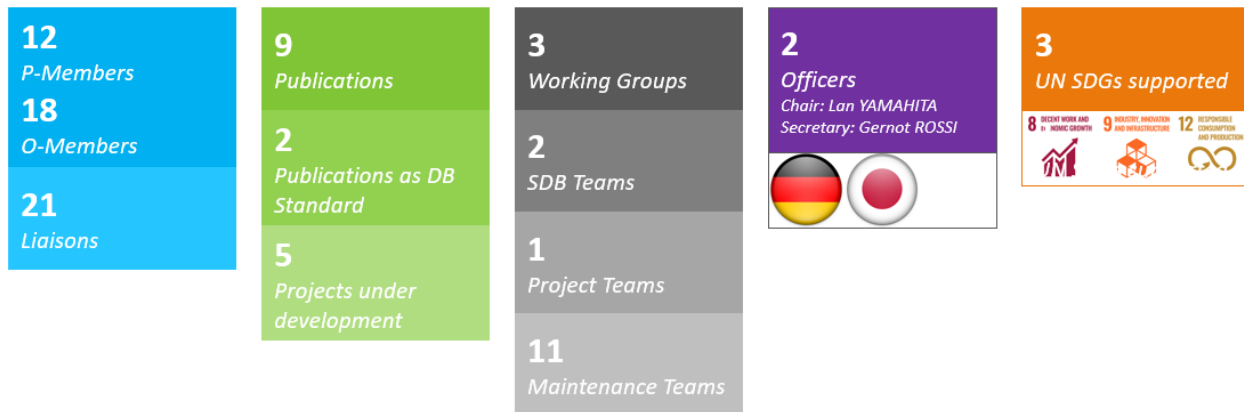
## Joint Working Groups

[JWG 11](#) IEC/SC 3C - ISO/TC 145/SC 3 linked to [ISO/TC 145/SC 3](#)

## Validation Teams

[VT 60417](#) SDB team for IEC 60417 - Graphical symbols for use on equipment

## SC 3D



**Chair:** Mrs Lan Yamashita, Japan  
**Secretary:** Mr Gernot Rossi, Germany

## Title

### Classes, Properties and Identification of products - Common Data Dictionary (CDD)

#### Scope

Standardization for representation of technical information along the life cycle of a product including service, device, system, software or plant, covering rules, principles and methods associated with the machine sensible representation of the technical information. This refers to:

- 1) definition, structuring and identification of classes and properties
- 2) structural design of product data dictionaries and ontologies
- 3) consistent methodology for the purpose of structuring technical information and its exchange
- 4) support for the design of classes and properties in all domains/industries and their publication in IEC Common Data Dictionary (IEC CDD)
- 5) maintenance and quality control of the IEC Common Data Dictionary (IEC CDD)
- 6) Supporting semantic interoperability

#### Horizontal functions:

- Methodology, design, architecture and definition of technical product data dictionaries.

## Working Group

[WG 2](#) Classification of components and definition of technical data element types

## Project Team

[PT 61360-7](#) Classes and properties for cross-domain use via IEC CDD.

## Maintenance Teams

[MT 61360-1](#) Maintenance of IEC 61360-1

[MT 61360-2](#) Maintenance of IEC 61360-2

<a href="#">MT 61360-6</a>	Quality guide for IEC 61360 compliant database content
<a href="#">MT 61987</a>	IEC 61987 in IEC CDD
<a href="#">MT 62271</a>	IEC 62271 in IEC CDD
<a href="#">MT 62656-1</a>	Maintenance of IEC 62656-1
<a href="#">MT 62656-2</a>	Maintenance of IEC 62656-2
<a href="#">MT 62656-3</a>	Maintenance of IEC 62656-3
<a href="#">MT 62656-5</a>	Interface for activity description
<a href="#">MT 62683</a>	IEC 62683 in IEC CDD
<a href="#">MT 62720</a>	Maintenance of IEC 62720

### Joint Working Groups

<a href="#">JWG 1</a>	Use of IEC CDD for ISO data dictionaries and ontologies linked to <a href="#">ISO/TC 184/SC 4</a>
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### Joint adhoc Groups

JahG1 Investigation and standardization proposal for “digitalization and data exchange of Carbon Footprint of Products (CFP)” linked to [IEC/TC 111](#)

### Advisory Groups

<a href="#">AG 1</a>	Chair’s Advisory Group
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### Validation Teams

<a href="#">VT IEC CDD</a>	SDB team IEC CDD
<a href="#">VT ISO CDD</a>	SDB team ISO CDD

## C. BUSINESS ENVIRONMENT

### C.1 General

With regard to the external business environment, the work is greatly influenced by the following factors:

- The documentation related to the whole life cycle is an integral part of any product, system or installation to be delivered
- Documents and information from different sources need to be integrated
- Multi-disciplinary environment, increased need for interoperability and the need of information on demand
- The extensive use of Information technology requires new ways of information management
- The growth in usage of e-commerce with the development of new data dictionaries and increasing requirements for interoperability
- The requirements on globally valid safety rules

### C.2 Competing standards

In the area of graphical symbols for diagrams:  
“Old standards” (national standards as well as other practices not being formal standards) never really die since they are preserved in text books used at schools and universities and thus promoted to the next generations. A similar preserving tendency is apparent in CAD-systems delivered with symbol libraries of old origin: users of the systems apply them instead of creating proper ones.

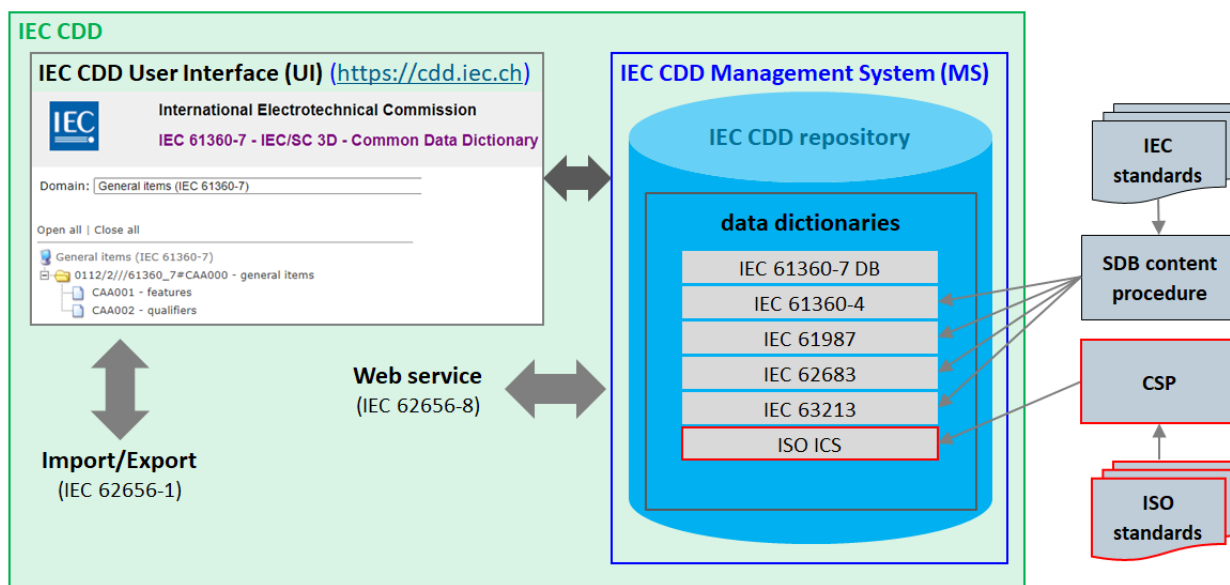
In the area of graphical symbols for use on equipment:  
Some IEC standards developed by product committees independently of SC 3C, which should be aligned with IEC 60417 DB taking into account IEC 80416-1.

In the area of semantic definition (classification and description of objects): Several semantic standards and dictionaries/repositories for specific domains (e.g. Industry 4.0, manufacturing, building, household) are available or under development. IEC CDD is focusing on industrial automation (Industry 4.0) and competes with the ECLASS dictionary in this domain. To sufficiently support the market needs a single COMMON DATA REPOSITORY for Industry 4.0 and other domains is requested. To offer this single repository together with common download possibilities (to support semantic interoperability), a project “COMDO” has been established between IEC, ISO and ECLASS. Goal is to publish the IEC CDD dictionary at a 2<sup>nd</sup> hosting location, the ECLASS CDP (Content Development Platform), together with the ECLASS dictionary. Official publication of IEC CDD at this 2<sup>nd</sup> hosting location is scheduled by end of 2023.

### C.3 Application standards

Many of the standards produced by the TC 3 and its SCs e.g. IEC 60617, IEC 60417, IEC/IEEE 82079 and IEC CDD will be used as part of the assessment for verifying compliance with regulations.

In the area of semantic definition (classification and description of objects) the IEC CDD is providing an IEC-hosted system that includes a common repository with data dictionaries for all ISO and IEC industrial/technical related-domains and that complies with the data model for data dictionaries defined in IEC 61360-2/ISO 13584-42 with an enhancement of its modelling capability adopted from IEC 62656-1. The common repository provides a collection of standardized data dictionaries managed as a database. The data dictionaries are a structured collection of dictionary elements that complies with the data model specified in IEC 61360-2/ISO 13584-42 and IEC 61360-1, and that represents product ontologies. Data dictionaries are based on IEC and ISO standards, preferable managed as standards as database (SDB) and developed by several ISO and IEC committees. Committees e.g. IEC/SC 3D, IEC/SC 65E, IEC/TC 85, IEC/TC 111 and IEC/TC 121 have already published data dictionaries in IEC CDD., To close gaps in the common repository of IEC CDD the committees responsible for technical areas of Industry 4.0 and other domain are requested to consider the development of classification/application standards for publication in IEC CDD.



### C.4 Standards in database format (SDB)

TC 3 and its SCs are developing and maintaining SDBs to support the digital transformation of the business (e-business) and to enable the electronic data exchange. SDBs are maintained and published according to the procedures defined in ISO/IEC Directives Part 1 – IEC Supplement Annex SK.

Following SDBs are under the responsibility of TC 3 and its SCs:

- IEC CDD (IEC 61360-4 DB) available at <https://cdd.iec.ch>
- IEC 60417 DB available at <https://www.graphical-symbols.info/equipment>

- IEC 60617 DB available at <https://std.iec.ch/iec60617>
- IEC 61355 DB available at <https://std.iec.ch/iec61355>

#### D. MARKET DEMAND

The market is today focusing on the two major transformation taken place in the society:

##### 1) The green transformation, taking care of the ecological environment.

Documentation methods have no direct impact on the ecological environment, although there may be some indirect effects: the use of IT-tools and electronic distribution of documents has reduced the paper consumption and physical transportation of documents, and the potential is that paper documents and documentation are avoided.

In the lifecycle of equipment and systems in the fields of electrical, electronic and related technologies, graphical symbols to indicate special treatment and handling play an important role for taking care of the ecological environment.

The market will see sustainable methods for description of systems and products, thus the means and methods for developing and maintaining documents and documentation should be resource and energy efficient.

##### 2) The digital transformation and the use of digital twins.

The industry is focused on information management, rather than documentation. Documentation is more considered being a way of conveying the information, i.e. the knowledge between parties involved.

TC3 is changing the focus from documents and documentation to information management. This evolution started in the 1980s and it is ongoing. However, this change needs to be speeded up in TC 3 activities to meet the stronger markets demand. The transformation of IEC 61355-1, focusing on kind of documents, to become IEC 81355-1, focusing on kind of information, is one step in this direction,

The industry is developing digital twins, thus a digital representation of products etc. for easy exchange of information between parties and including possibility for online check of compliance are required. These requirements are the basis for the development of methods for precise definition of concepts and properties as being implemented in the IEC CDD. The demand for providing standardized representation of products is increasing and forcing TC3, SC 3D and other TCs to meet these demands.

For the digital transformation to be successful, efficient tools and efficient usable standards are essential, allowing information stored and exchanged to be machine interpretable. TC 3 basic standards for modelling and structuring of systems and plants have appeared to give useful support for modern communication concepts, where awareness and understanding of the communicated information in a machine interpretable form is essential. In the concept of Smart Grid, TC 3 has worked together with TC 57 for improving the situation.

Other demands:

Development of graphical symbols for use on equipment is an ongoing activity reflecting the expressed needs from product committees for such symbols.

For graphical symbols for use in documentation the needs are less expressed as most functions can be expressed by the existing symbols. However, the rapid development of new technology and techniques may change that picture.

General rules for marking, identification and actuation principles related to products play an important role, particularly in relation to the human-machine interface. Growing world-wide trade requires that the safety rules for electrical equipment and components are compatible. Many parties involved in the design and manufacturing of electrotechnical products require a consistent set of safety regulations and standards. Users of electrotechnical products require that in addition



to the safety aspect the ergonomic aspects of the use of the product are to be considered too. This statement includes a high-level requirement for the development of safety standards.

#### E. SUSTAINABLE DEVELOPMENT GOALS

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| <input type="checkbox"/> <b>GOAL 1:</b> No Poverty                                       | <input type="checkbox"/> <b>GOAL 10:</b> Reduced Inequality                              |
| <input type="checkbox"/> <b>GOAL 2:</b> Zero Hunger                                      | <input checked="" type="checkbox"/> <b>GOAL 11:</b> Sustainable Cities and Communities   |
| <input type="checkbox"/> <b>GOAL 3:</b> Good Health and Well-being                       | <input checked="" type="checkbox"/> <b>GOAL 12:</b> Responsible Consumption & Production |
| <input type="checkbox"/> <b>GOAL 4:</b> Quality Education                                | <input checked="" type="checkbox"/> <b>GOAL 13:</b> Climate Action                       |
| <input type="checkbox"/> <b>GOAL 5:</b> Gender Equality                                  | <input type="checkbox"/> <b>GOAL 14:</b> Life Below Water                                |
| <input type="checkbox"/> <b>GOAL 6:</b> Clean Water and Sanitation                       | <input type="checkbox"/> <b>GOAL 15:</b> Life on Land                                    |
| <input type="checkbox"/> <b>GOAL 7:</b> Affordable and Clean Energy                      | <input type="checkbox"/> <b>GOAL 16:</b> Peace, Justice Strong Institutions              |
| <input checked="" type="checkbox"/> <b>GOAL 8:</b> Decent Work & Economic Growth         | <input type="checkbox"/> <b>GOAL 17:</b> Partnerships to achieve the Goals               |
| <input checked="" type="checkbox"/> <b>GOAL 9:</b> Industry, Innovation & Infrastructure |  |

The goals considered most relevant are ticked. In principle, all publications of TC 3, SC 3C and SC 3 D supports alle Sustainable Development Goals.

#### F. TRENDS IN TECHNOLOGY AND IN THE MARKET

There is a rapidly increasing worldwide demand for information management, data communication, exchange of technical product information and interoperability for a variety of business functions.

1. Classification standards should be accessible online
2. Graphical symbols should be accessible and usable online
3. Data dictionaries representing product ontologies and published in IEC CDD should be accessible online (via API or webservice) to support semantic interoperability, to provide references for Submodel elements in the Asset Administration Shell (IEC63278 - AAS) and to enable e-business with unambiguous identifiers and semantic meaning.

Classification of objects, documentation and information are increasingly used in industry for easy recognition and handling of objects. IEC TC 3 sees increasingly use of IEC 81346 and especially on the letter codes. A proper classification of documents and documentation is sought by the industry for implementation in their document management system, thus forcing IEC TC 3 to revise the IEC 61355-1 to become IEC 81355-1 in cooperation with ISO TC 10.

Several classification standards from ISO and IEC are already published in IEC CDD. However, many classification standards are not available as data dictionaries in IEC CDD, e.g. IEC 81355, UN classification standards, ISO ICS, UN/ECE Recommendation 16.

IEC CDD has published a data dictionary for UNITS OF MEASUREMENT (UoM). However, several other codes for UoM are available, e.g. UN/ECE Recommendation 20, QUDT, ECLASS, UCUM. More joint work between IEC/SC 3D and other organizations providing codes für UoM may be necessary.

The dynamic use of graphical symbols in different applications requires standards for representation of symbols in dynamic form and even for definition of different states of an object represented by such symbols. Although IEC has developed IEC 62744 on this matter, IEC TC 3 foresee that more work may be necessary.

#### G. SYSTEMS APPROACH ASPECTS (SEE DIRECTIVES PART 1 ANNEX SP)

The concept of "system approach" is primarily associated to the building of technical equipment but can also be applied to more abstract systems.

Therefore, at least two system aspects are considered:

1. The object (product, technical system or installation) to be documented is to be seen as a system which more and more often contains components and equipment (hardware and software) from different technical areas. This requires that the applicable documentation rules are similar or at least harmonized among those areas, in order to obtain a coherent overall documentation.

This calls for co-operation with other bodies, especially in ISO, working with documentation.



2. The documentation standards per se need to form a documentation system, in which the components (the standards) are “modules” that can be applied generally and seamless in the documentation processes. This system includes standards from IEC as well as from ISO.

Another example of this is the common information model between IEC 61360/ISO 13584 ensuring interoperability across a wide range of technical dictionaries.

**H. CONFORMITY ASSESSMENT**

For the time being, no IEC Conformity Assessment System is being considered in the development of the basic standards for TC 3.

**I. 3-5 YEAR PROJECTED STRATEGIC OBJECTIVES, ACTIONS, TARGET DATES**

STRATEGIC OBJECTIVES 3-5 YEARS	ACTIONS TO SUPPORT THE STRATEGIC OBJECTIVES	TARGET DATE(S) TO COMPLETE THE ACTIONS
<b>TC 3</b>		
Continuous maintenance of IEC 60617 DB initiated by Change Requests in accordance with Annex SK to IEC specific procedures, ISO/IEC Directives		Constantly
JWG18 to finalize the work of revising IEC 61355-1 and the conversion of this publication to become IEC 81355-1.		2024
JWG24 to finalize the revision of IEC 81346-2.		2024
Revision of IEC/IEEE 82079-1		
Revision of IEC 60447		
Revision of IEC 82045-1 and IEC 82045-2 following the new IEC 81355-1 and the technical development in the area of information and documentation management systems	Reactivate JWG26 in cooperation with ISO/TC 10	2028
Development of IEC 81346-14, a standard for the application of the IEC/ISO 81346-series for manufacturing systems	Establishing the work as part of JWG24	
Development of IEC 81346-50, a standard for the application of the IEC/ISO 81346-series for processes	Establishing the work as part of JWG24	
Minor revisions of a number of standards		
Publication of the new IEC/TC 3 homepage		2023

<b>SC 3C</b>		
Continuous maintenance of IEC 60417 DB initiated by Change Requests in accordance with Annex SK to IEC specific procedures, ISO/IEC Directives		Constantly
Co-ordination and collaboration with other committees which are developing graphical symbols for use on equipment in their standards to avoid inconsistency among IEC deliverables by following the horizontal standard IEC 62648		Constantly
Maintenance of the 80416 series of International Standards in collaboration with ISO TC 145/SC 3 via Joint WG 11		Constantly
Maintenance of on-line guidance for applicants of change requests to IEC 60417 DB in accordance with IEC 80416-1		Constantly
Maintenance of IEC62648		2026
Revision of IEC TR 62964 following the new scope and the technical development in the area of Graphical symbols for multimedia equipment		2029
In collaboration with the parent committee and taking into account IEC 62744, to develop families of graphical symbols to be used for "representation of states of objects by graphical symbols		
<b>SC 3D</b>		
Continuous maintenance and extension of IEC CDD initiated by Change Requests in accordance with Annex SK to IEC specific procedures, ISO/IEC Directives Part 1		Constantly
Collaboration with other committees which are developing data element types in their standards, e.g. IEC/SC 65E, IEC/TC 121, IEC/TC 85, IEC/TC 3, IEC/SC 23E		Constantly
Elaboration of the business model for IEC CDD.		Constantly
Support the Implementation of the new version of IEC CDD based on the new platform for IEC DB Standards as a joint effort with IEC SG 12 and IEC IT		2024
Revision of IEC 61360-1		2024
Revision of IEC 61360-6 with new title and scope		2025
Revision of IEC 62656-1		2025
Maintenance of IEC 62720 as a SDB published in IEC CDD		2024