INTERNATIONAL ELECTROTECHNICAL COMMISSION

2008-12

IEC 61360 Quality guide

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland

Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
International Electrotechnical Commission

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FOREWORD

This standing document has been prepared by subcommittee 3D; Data sets for libraries, of IEC technical committee 3: information structures, documentation and graphical symbols.

1 General

1.1 Introduction

The exchange of product data is an essential part of e-business. Product selection, business transactions, maintenance procedures etc. rely on the availability of data about products and services. To ensure a common understanding and a general treatment of product data, classification and dictionary systems are used to define their essential technical parameters and/or to categorize the products

The standards of the series IEC 61360 specify the creation of collections of product properties and classification structures.

In most cases the properties contained in such collections are intuitively understandable. But, unfortunately, creating such properties and its assigned textual content, such a s definitions, has proved to be a quite demanding task with many potential pitfalls and problems. So a guide is needed to help the proposers of new properties not to run into such problems.

1.2 Scope

This guide is intended for domain specialists who are technical experts in their specific technical domain. They do not necessarily have an in-depth knowledge of IEC 61360-1 or IEC 61360-2.

The purpose of this document is to provide

- a basic understanding of concepts and procedures used within IEC CDD (IEC Component Data Dictionary);
- a binding reference for quality control of IEC 61360 content;
- guidance on documents where the necessary in-depth knowledge may be acquired (see clauses 1.3 Normative references and 15 Bibliography).

This document is a standing document of IEC SC3D, which may be revised whenever necessary. It provides introductory material and quality guidelines to all those who intend to extend or modify the content of the IEC 61360 database.

The guide covers of the following subjects:

- Basic overview about fundamental concepts of IEC 61360
- Writing of definitions and other textual parts
- Checklist for those who provide input to the data base
- IEC Maintenance procedure for the database (tbd)

1.3 Normative references

The following referenced documents are indispensable for the application 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 61360-1, *Standard data element types with associated classification scheme for electric components – Part 1: Definitions – Principles and methods*

IEC 61360-2, *Standard data element types with associated classification scheme for electric components – Part 2: EXPRESS dictionary sche*ma

IEC 61360-5, *Standard data element types with associated classification scheme for electric components – Part 5: Extensions to the EXPRESS dictionary sch*ema

ISO 704:2000, *Terminology work — Principles and methods*

ISO/IEC Guide 77-1, *Guide for specification of product properties and classes: Part 1: Necessity and benefits*

ISO/IEC Guide 77-2, *Guide for specification of product properties and classes: Part 2: Technical guide*

ISO/IEC Guide 77-3, *Guide for specification of product properties and classes: Part 3: Case studies*

ISO 13584-42, *Industrial automation systems and integration — Parts library — Part 42: Description methodology: Methodology for structuring part families*

ISO 13584-25, *Industrial automation systems and integration — Parts library — Part 25: Logical resource: Logical model of supplier library with aggregate values and explicit content*

ISO 10303-11, *Industrial automation systems and integration. Product data representation and exchange. Part 11: Description methods: The EXPRESS language reference manual*

ISO 10303-21, *Industrial automation systems and integration. Product data representation and exchange. Part 21: Implementation methods: Clear text encoding of the exchange structure*

2 Definitions

For the purpose of this part the following definitions apply.

2.1
characteristic
abstraction of a property of an object or of a set of objects

NOTE Characteristics are used for describing concepts.

2.2
concept
unit of knowledge created by a unique combination of characteristics

2.3
definition
representation of a concept by a descriptive statement which serves to differentiate it from related concepts

2.4
designation
representation of a concept by a sign which denotes it

2.5
intension
set of characteristics which makes up the concept

Note Intensional definitions are best used when something has a clearly-defined set of properties, and it works well for sets that are too large to list in an extensional definition. It is impossible to give an extensional definition for an infinite set, but an intensional one can often be stated concisely – there is an infinite number of even numbers, impossible to list, but they can be defined by saying that even numbers are integer multiples of two.

2.6
extension
totality of objects to which a concept corresponds

NOTE An extensional definition of a concept or term formulates its meaning by specifying its extension, that is, every object that falls under the definition of the concept or term in question.

EXAMPLE An extensional definition of the term "nation of the world" might be given by listing all of the nations of the world.

3 Data structure fundamentals

This section introduces key concepts used in the IEC 61360 area. The intention is to create a basic understanding that allows dealing with the information objects that make up the IEC 61360 database. For further information please refer to ISO/IEC Guide 77 (all parts) and to IEC 61360 (all parts).

IEC 61360 database provides an ordered collection of item characteristics. Those characteristics may be used to describe products and services in data sheets, engineering tools, or electronic business applications, etc. Such items can be any material or non-material products, services, functions, locations, documentations, etc. All characteristics are valid within a well defined scope and shall contain a textual definition to lay down the meaning of the characteristic.

To understand the IEC 61360 standards a basic understanding of the following fundamental concepts is essential:

- product characterization class (item class);
- property (data element type);
- attribute.

A product may be characterized by a product characterization class to which it belongs and by a set of property-value pairs. Therefore a reference dictionary shall define both a set of product characterization classes and a set of product properties.

3.1 What is a product characterization class?

A product characterization class (item class) is an abstraction of a set of products that fulfil the same function and that share a number of common properties.

They are used to collect the characteristics of specific types of items.

By this such classes serve multiple purposes

- grouping of characteristics into easily manageable sets
- the system of classes as a whole forms a classification system that allows to easily identify characteristics belonging to a specific type of items
- provide scoping information for the assigned characteristics and thus providing information about the intended domain of uses.

EXAMPLE The taxonomy of species, introduced by Carl von Linné at 1735, is an early representative of a successful classification system. His groupings for animals remain to this day even though the groupings themselves have been significantly changed since their conception.

The product characterization class can be seen as a placeholder for all products of the same kind, e.g. the class of fasteners. A product is any material or non-material concept that is defined for some purpose. Material concepts include items such as articles, goods, material commodity, etc., whereas non material concepts include concepts such as services, consulting, or intellectual property.

NOTE 1 The creation of a consistent hierarchy of classes that properly mirrors a business domain is sometimes quite difficult. Such a classification should be consistent, comprehensive, and concise.

NOTE 2 A product that complies with the abstraction defined by a class is called a class member

The figure below shows a characterization tree for amplifiers.

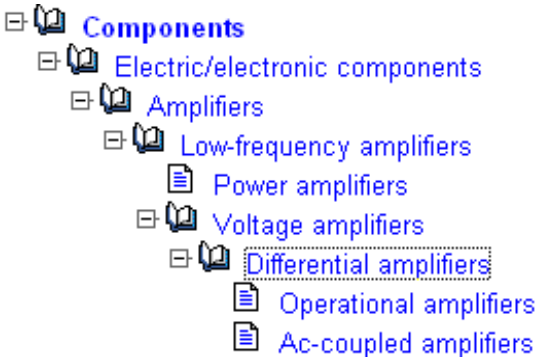

Figure 1 – Characterization tree for amplifiers

The class 'Differential amplifiers' groups all characteristics that are specific for amplifiers whose output signal is proportional to the algebraic difference between the voltages applied to their two inputs. Such a class may be split further down into subclasses like operational amplifiers and ac-coupled amplifiers as shown in the example.

3.2 What is a property?

A property (data element type) is any defined parameter suitable for the description and differentiation of items.

NOTE 1 A property describes one aspect of a given object.

NOTE 2 The property as such is constituted by the totality of all its associated attributes.

A property is common to all members of the same class. In most cases properties have a unit and sometimes they have an assigned value list.

EXAMPLE Properties are parameters such as length, diameter, or rated voltage.

Each product property is associated with a product characterization class that defines its domain of application. The property is meaningful for the domain specified by this class.

Identity number:	AAA044	
Version number:	002	
Revision number:	02	
Name:	**Diodes**	
Alternative names:	diode	
Coded name:	DIO	
Definition:	A set of diodes of which each diode can be described with the same group of data element types.	
Note:	DIODES are two-terminal semiconductor devices having an asymmetric voltage-current characteristic.	
Higher-level classes:	AAA001	Components
	AAA002	Electric/electronic components
	AAA042	Diode devices
Classifying DET:	AAE273	diode application
Applicable properties:	AAE273	diode application
	AAE276	reverse current
	AAE277	reverse voltage
	AAE279	forward voltage
	AAE331	diode package
	AAE337	junction temperature
	AAE489	diode technology
	AAE494	nearest conventional type

Figure 2 – Properties of class 'Diodes'

3.3 What is an attribute?

From a users point of view an attribute can be regarded as the smallest piece of information that is interpretable by the computer. Each attribute specifies a single detail of the property or class it belongs to.

An attribute is a data element for the computer- sensible description of a property or a class.

NOTE 1 An attribute describes only one single detail of a property, of a class or of a relation.

EXAMPLE The name of a property, the code of a class, the measure unit in which values of a property are provided are examples of attributes.

NOTE 2 All information elements such as classes or properties receive their information content from the related attributes.

Identity number:	AAA007	
Version number:	001	
Revision number:	02	
Name:	**Differential amplifiers**	
Alternative names:	differential	
Coded name:	DFA	
Definition:	A set of differential amplifiers of which each amplifier can be described with the same group of data element types.	
Note:	DIFFERENTIAL AMPLIFIERS are amplifiers whose output signal is proportional to the algebraic difference between the voltages applied to their two inputs. [ANSI/IEEE Std. 100-1988]	
Higher-level classes:	AAA001	Components
	AAA002	Electric/electronic components
	AAA003	Amplifiers
	AAA004	Low-frequency amplifiers
	AAA006	Voltage amplifiers
Classifying DET:	AAF192	coupling method
Applicable properties:	AAF157	common-mode input voltage
	AAF160	common-mode rejection ratio
	AAF163	differential input resistance
	AAF164	common-mode input resistance
	AAF192	coupling method

Figure 3 – Attributes of a characterization class

Identity number:	AAF163
Version number:	005
Revision number:	01
DET class:	E33 (resistance)
Name:	**differential input resistance**
Symbol:	r_{id}
Short name:	r_id
Definition:	The minimum resistance (in ohm) between the inputs of a differential amplifier at reference conditions.
Remark:	In order to be able to consider the input impedance as a pure resistance, the measurement signal frequency must be sufficiently low so that there are no significant phase differences between the voltages at the input terminals of the amplifier to be measured with or without the series resistor.
Units:	ohm
Level:	min
Data type:	level
Format:	NR3..3.3ES2
Data value:	real measure
Definition source ref:	IEC 60748-3 (II.2.1.10) (1986)
Conditions:	AAE995 reference conditions
Applicable in classes:	AAA007

Status level:	Standard
Published in:	IEC 61360-4
Published by:	IEC
Proposal date:	1997-04-01
Release date:	1997-01-01
Version date:	1996-08-01
Version release date:	1997-01-01

Figure 4 – Attributes of a property

3.4 Key elements of IEC CDD entries

Key elements of IEC CDD entries are the attributes that assign meaning to properties and classes (DETs – Data Element Types). The so called semantic attributes (see IEC 61360-1) contain the definitional elements of the IEC CDD entries. Because of their importance the related parts of IEC 61360-1 are repeated here. The most important attributes are:

- definition;
- note;
- remark.

The quality of an IEC CDD entry mainly depends on the information given within these attributes. Thus, it is highly advisable to draft their content carefully.

3.4.1 Semantic attributes (see also IEC 61360-1, Clause 4.3)

Figure 5 shows the possible attributes of a data element type used to clarify the semantics of a data element type.

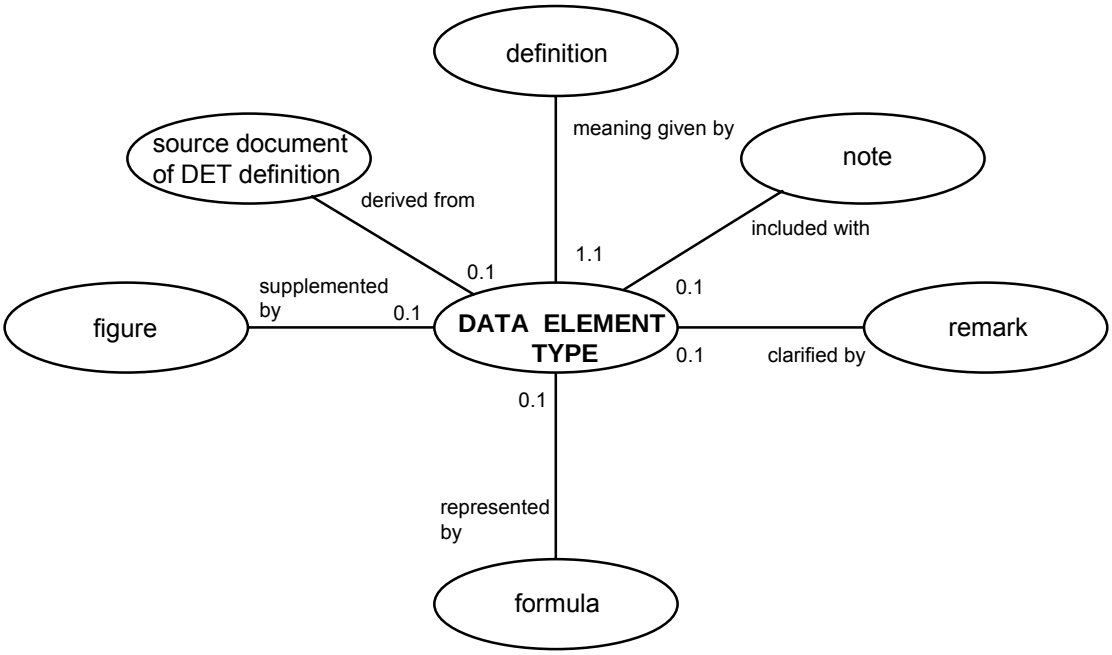

Figure 5 - Semantic attributes for data element type

3.4.2 Definition

Attribute name: definition

Attribute definition:

statement that describes the meaning of a data element type in an unambiguous and unique manner to permit its differentiation from all other data element types

EXAMPLE Definition of the quantitative data element type "arcing distance":

arcing distance
value of the shortest distance in air external to the insulator between metallic parts normally having the operating voltage between them

Comments: conventions and requirements:

a) The definition of a data element type shall be derived from the original definition as appearing in the latest corresponding IEC or ISO standards, if available.

b) ISO 704 and ISO/IEC 11179-4 standards should be used as a basis for the writing of the definition.

c) The unit of measure of the DET shall not be included in the DET definition.

d) If the Level_type attribute is specified, the level information need not be repeated in the definition.

e) The semantic context(s) should be included in the DET definition, if this is essential for the understanding of its meaning.

f) If the concept requires a limitation of its applicability this shall be explicitly expressed in the definition.

EXAMPLE There exist different semantics by using the term "rated voltage"; within products ≥ 1 kV the terms rated voltage express the maximum voltage for which a product is being designed and can be operated (see IEC 60694). This is currently not applicable to products less than 1kV.

g) If dependency relations are an inherent part of the concept, these shall be included in the definition.

EXAMPLE Definition of the quantitative data element type "reverse recovery time":
reverse recovery time

value of the time required for the reverse current of a diode to recover to a specified value, when switched from a specified forward current to a specified reverse voltage, at specified conditions

h) In the case conditions are specified, the definition ends with the wording "at specified condition(s)".

i) If the concept represents a mean value, the type of average shall be specified by using a qualifier (e.g. arithmetic) either in the preferred name or be given in the definition..

NOTE A DET standardized under former editions of IEC 61360-1 may be updated only in case of change requests.

Obligation: mandatory

Character type of values: those characters from the character set of ISO/IEC 10646-1, as defined in annex A

3.4.3 Note

Attribute name:	note
Attribute definition:	statement which provides further information on the definition, which is essential to the understanding of that definition
Comments:	EXAMPLE The data element type reverse recovery time is further clarified by a note: "The reverse recovery time is measured as the time interval between t_0, the point where the forward current crosses the zero current axis, and the instant when for decreasing values of i_R a line through the points for 0.9 I_{RM} and 0.25 I_{RM} crosses the zero current axis."
Obligation:	optional
Character type of values:	those characters from the character set of ISO/IEC 10646-1, as defined in annex A

3.4.4 Remark

Attribute name:	remark
Attribute definition:	explanatory text to further clarify the meaning of the definition
Comments:	remarks shall not influence the meaning of the definition
Obligation:	optional
Character type of values:	those characters from the character set of ISO/IEC 10646-1, as defined in annex A

3.4.5 Additional conventions (see also IEC 61360-1, Annex G)

a) The term “value” shall not be written in plural even if it is a level type (e.g., minimum, typical and maximum value)

b) Always include the term “value” in the definition for quantitative DETs except for conditional data element types.

c) Changing attributes to conform to the new conventions of this part of IEC 61360 is by default a revision change (minor change) unless specified otherwise, and will only be done along with a change request associated with the relevant data element type.

4 Writing of definitional content

4.1 Nature of definitions

A definition shall define the concept as a unit with a unique intension and extension. The unique combination of characteristics creating the intension shall identify the concept and differentiate it from other concepts. The quality of most dictionaries will be determined by the quality of the definitions.

A definition may be complemented by a note or an example.

4.2 Definition writing

4.2.1 Principles for definition writing

A definition shall be composed of a statement explaining what the concept is. The statement is made up of a subject, copula and predicate. The subject is the designation, the copula is understood to be the verb “is“ and the predicate constitutes the definition.

EXAMPLE
lead pencil: pencil whose graphite core is fixed in a wooden casing that is removed for usage by sharpening
NOTE To be used for writing or making marks, a lead pencil must be sharpened at least at one end.

The entry should read as follows:
“[A] lead pencil [is a] pencil whose graphite core is fixed in a wooden casing that is removed for usage by sharpening”.

A definition shall describe a concept, not the words that make up a designation.

If a definition already exists, e.g., in an International Standard, it shall be adopted as it stands only if it reflects the concept system in question. Otherwise, it shall be adapted.

4.2.2 Conciseness

Ideally, definitions shall be as brief as possible and as complex as necessary. Complex definitions can contain several dependent clauses, but carefully written definitions contain only that information which makes the concept unique. Any additional descriptive information deemed necessary should be included in a note.

EXAMPLE 1
lead pencil
pencil whose graphite core is fixed in a wooden casing that is removed for usage by sharpening
NOTE To be used for writing or making marks, a lead pencil must be sharpened at least at one end.

A definition shall describe only one concept. It shall not include hidden definitions for any concepts used to identify characteristics. Any characteristic that requires an explanation shall be defined separately as a concept or given in a note.

EXAMPLE 2
lead pencil
pencil whose wooden casing is fixed around graphite, a soft, black form of carbon

This definition of ‘lead pencil’ includes a hidden definition for the concept ‘graphite’, an essential characteristic. The characteristic a soft, black form of carbon, should be removed and used in a separate definition for the concept ‘graphite’.

4.2.3 Principle of substitution

The substitution principle shall be used to test the validity of a definition. A definition is valid if it can replace a designation in a text without loss of or change in meaning.

4.3 Deficient definitions

4.3.1 Circular definitions

Common types of deficient definitions are: circular, incomplete and negative definitions.

If one concept is defined using a second concept, and that second concept is defined using the term or elements of the term designating the first concept, the resulting

definitions are said to be circular. Circular definitions do not add to our understanding of the concept and shall be avoided as much as possible.

Definitions can be circular:

— within a single definition;

— within a system of definitions.

Circularity within a definition occurs when the designation is repeated to introduce the definition or an element of the designation is used as a characteristic. When formulating a definition, it is not permissible to repeat the designation to introduce the definition (see example 1). The use of an element of the designation, other than the head word, as a characteristic in the definition should be avoided as much as possible (see example 2).

EXAMPLE 1
tree height:
circular definition: tree height measured from the ground surface to the top of a tree
c*orrected definition:* distance between the ground surface and the top of a tree

EXAMPLE 2
evergreen tree
circular definition: tree with *evergreen* foliage
corrected definition: tree that retains its foliage throughout its lifetime

A definition is circular within a system of definitions when two or more concepts are defined by means of each other.

4.3.2 Incomplete definitions

A definition shall describe the content of the concept precisely. It shall be neither too narrow nor too broad.

Otherwise, the definition is considered incomplete. Non-essential or irrelevant characteristics in the definition may unintentionally include or exclude objects from the extension of the concept. A definition is considered too broad if the characteristics selected to describe the concept allow for objects that should not be part of the extension. A definition is considered too narrow if the characteristics selected exclude objects that should be part of the extension.

EXAMPLE 1
mechanical pencil
too broad: writing instrument composed of a barrel and a refill

By not specifying precisely the type of refills, this definition broadens the extension to include ball-point, roller-ball and felt-tip pens as well as mechanical pencils.

mechanical pencil
too narrow: writing instrument composed of a barrel, a lead refill and push-button advance mechanism

By specifying a push-button advance mechanism, this definition narrows the extension to exclude those mechanical pencils using other types of advance mechanisms.

mechanical pencil
corrected definition: writing instrument composed of a barrel, a lead refill and a lead-advance mechanism

In adapting an existing definition to a specific subject field or context, care should be taken not to change the extension of the concept. A change to the extension leads to a new unit and a different concept. Similarly, changes to any of the essential characteristics in a definition result in a new concept.

A particular context rarely refers to all the objects making up the extension of a concept. Definitions in laws and regulations tend to be interpretive rather than

defining. Definitions in International Standards should be defining rather than interpretive. If a concept is restricted to a particular interpretation for a given text, it shall be explained in the body of the International Standard rather than by creating a new concept with a narrower extension. If specification information is associated with the concept, then this should be given in an appropriate specification clause rather than in a definition.

EXAMPLE 2
too narrow: organization
for the purposes of this regulation, bodies not operating for profit

This *definition* of 'organization' does not define the *concept* 'organization' but merely signals how to interpret the *concept* in a given context. From all the *objects* that make up *extension* of the *concept* 'organization', this context considers only those not operating for profit.

4.3.3 Negative definitions

A definition shall describe what a concept is, not what it is not.

EXAMPLE 1
deciduous tree
inappropriate negative definition: tree other than an evergreen tree

deciduous tree
corrected definition: tree that loses its foliage seasonally

However, when the absence or non-existence of a *characteristic* is essential to the understanding of a *concept*, a negative definition may be required.

EXAMPLE 2 nonconformity: non-fulfilment of a specified requirement

4.4 Notes

All secondary and extra information on a concept and its designations shall be given in a note that complements the definition. A note shall be clearly distinguished from the definition.

Notes may include non-essential characteristics or optional parts often associated with the concept, typical elements that make up the extension of the concept, or explanatory information that complements the definition but is not essential for understanding the concept.

5 Recommendations for textual information in IEC 61360 databases

5.1 Recommendations that emerge from the current implementation of IEC 61360 database

Due to the limited import capabilities of the current implementation of IEC 61360 database, certain restrictions apply.

a) Blank fields (fields containing no data) shall be entirely empty, containing no null characters or spaces.

b) Fields shall not contain any leading or trailing null characters or spaces.

c) Where the field itself contains one or more exclamation marks (which is a circumstance that should not occur), the whole field shall be enclosed in double quotes.

d) Dates shall be given in the form yyyy-mm-dd.

e) Each record in the file should be terminated by a line feed with an optional carriage return.

f) Field values that extend over more than one line (notably definition, note and remark) should be typed as continuous text with no line breaks. To indicate a line break in the text, the vertical bar character (|) shall be used. For tabular display, the start of a new column shall be indicated by the tilde character (~).

g) Because special characters and formats are usually lost when copying from one application to another and there is no guarantee that any target system will read them correctly, a pure ASCII representation is used for symbols and units in the database. For Greek letters, the SGML form is used, e.g. α, whilst for subscripts and superscripts the escape characters _ and ** respectively should be used before the subscript or superscript, followed by a closing curly bracket } after the subscript or superscript. Thus, a symbol name can appear as α_1} (short name $a_1), to be reproduced in a text document as $_1$ and a unit as A/m**2}, to be reproduced as A/m^2. These forms can be interpreted by software to reproduce as shown.

For a detailed description of the import file format see document 'Import file format specification' (SC3D/WG/088f).

5.2 Acceptable wording

This subclause gives details on the wording to be used to explain requirements and recommendations.

5.2.1 Using “shall” and “shall not”

The verbal forms “shall” and “shall not” indicate requirements to be followed to conform to the standard and from which no deviation is permitted. The words “shall” and “shall not” shall be used in normative text and shall not be used in the introduction, foreword, notes, or examples, which are informative text.

“Shall” shall be used to denote the following:

— is to…;

— is required to …;

— it is required that …;

— has to…;

— only… is permitted;

— it is necessary ….

"Shall not" shall be used to denote the following:

— it is not allowed (permitted, acceptable, permissible)...;

— is required to be not …;

— is required that… be not...;

— is not to be ….

Do not use "must" except to describe "unavoidable" situations. Do not use "may not" instead of "shall not" to express a prohibition.

NOTE To express a direct instruction, such as referring to steps to be taken in a test method, use the imperative. For instance, "Use the imperative".

5.2.2 Using "must" and "must not"

The words "must" and "must not" shall be used only to convey external statutory regulations.

5.2.3 Using "should" and "should not"

The words "should" and "should not" shall be used to recommend a particularly suitable possibility or course of action without excluding others. "Should" shall be used to denote the following:

— it is recommended that …;

— ought to …;

"Should not" shall be used to denote the following:

— it is recommended that… not;

— ought not to ….

5.2.4 Use of "may" and "need not"

The words "may" and "need not" indicate a course of action that is permissible within the limits of the standard. "May" shall be used to denote the following:

— … is permitted;

— … is allowed;

— … is permissible.

"Need not" shall be used to denote the following:

— it is not required that …;

— no …is required.

Do not use "can" instead of "may" in this context. Do not use "possible" or "impossible" in this context.

NOTE "May" refers to something that is permitted whereas "can" refers to something that is possible.

5.2.5 Use of "can" and "cannot"

The words "can" and "cannot" indicate possibility and capability.

"Can" shall be used to denote the following:

— to be able to …;

— to be in a position to …;

— there is a possibility of …;

— it is possible to ….

“Cannot” shall be used to denote the following:

— to be unable to …;

— to be not in a position to …;

— there is no possibility of …;

— it is impossible to ….

NOTE “Can” refers to something that is possible whereas “may” refers to something that is permitted.

5.2.6 Use of “i.e.”, “e.g.”, and “etc.”

Do not use “i.e.” and “e.g.”. Instead, use “that is” and “for example”. If using “that is,” the list that follows shall be all inclusive whereas “for example,” shall only list some of the possibilities and shall only appear in a note or example. Likewise, do not use “etc.”. End the series prior to the “etc.” being certain to use a serial comma before the “and” (added if not already there). To state that the series is incomplete, use “such as” at the start of the series.

5.3 Quotations from other standards

In many cases it is desirable to introduce concepts from other standards as properties in the IEC 61360 database. In such cases, the definitions which originally specified those concepts should be used to specify the concept within the database. To help the reader, it is recommended to refer to the source of the definition in a note.

EXAMPLE Definition following IEC xvz.

When a rewording of the original definition cannot be avoided, care should be taken not to spoil the original meaning.

5.4 References to other International Standards and documents

Any publicly available document recognized by SC3D as having wide acceptance and authoritative status as well as being publicly available (see ISO/IEC Directives, Part 2, 6.2.2) can be referenced. National and industry standards can be referenced; however, if there is also an ISO or IEC standard, the ISO or IEC standard shall be used. When referring to another International Standard from normative text, use “ISO” or "IEC" in the text followed by the reference number; only include the part number if applicable. Give the full title in the normative references clause. References to a particular element of another International Standard shall include the clause referred to as well as the reference number of the International Standard and the date of publication. ISO or IEC Technical Specifications, Publicly Available Specifications, and Technical Reports may be referenced in the same way.

5.5 Use of quotation marks

Quotation marks shall be used to set off words or phrases that may confuse the reader if not marked. Double quotation marks “…” denote quoted text. Single quotation marks ‘…’ denote particular text string values.

5.5.1 Spelling

The spelling of names of organizations and their abbreviations shall be as used by those organizations in English, French, or Russian. For the text portion of the part, The Concise Oxford Dictionary of Current English shall be used for spelling.

NOTE Spelling checkers associated with word processor programs rarely, even in the "British spelling" mode, conform to the required dictionary.

Note the correct spelling of the following:

— numbers from one to nine shall be spelled out in words;

— modelling, modelled, centre, colour, coordinate, faceted, litre, metre, millimetre, neighbour, organization;

and the preferred spelling of the following:

— instantiation.

5.6 Hyphenation

In general, hyphenation should be used to improve readability and appearance. Hyphenation shall follow The Concise Oxford English Dictionary of Current English. These special terms shall be hyphenated as follows:

— non-zero;

— two-dimensional, three-dimensional (may be abbreviated as "2D" or "3D");

— X-axis, Y-axis, and Z-axis.

Abbreviations shall not be divided by a line break.

5.7 Words to avoid

Avoid the use of words that are corporate trademarks. If using them is necessary, accompany the word by the trademark symbol "™" or the registered trademark symbol ® as appropriate.

EXAMPLE The title of ISO 10303-27 is "Product data representation and exchange: Implementation methods: Java™ programming language binding to the standard data access interface with Internet/Intranet extensions". Since the word "Java" in this context is a trademark, it is accompanied by the symbol "™".

Avoid the following words to provide editorial consistency:

— and/or: rather than use this form, expand the explanation and present both cases;

— datums: the plural of "datum" is "data". If one is tempted to use "datums", change it to "datum points" or "datum lines" or "datum planes" as the case may be;

— utilise: use "use" instead;

— "in other words": this phrase is often used to join two alternative definitions of a term or concept: the alternative definitions should be reviewed and reconciled.

However, if a project cites another ISO or IEC standard, or broadly-accepted terminology for a given domain for a specific meaning of a prohibited term, the editor should follow the cited spelling.

5.8 Frequently used words

The following terms are used frequently in standards. To ensure editorial consistency, they should be used only in precisely defined contexts.

— between/among: use “between” to mean “exactly two;” use “among” to mean “two or more than two.”

— data: “data” is a plural noun and requires a plural verb, that is, “data are” not “data is”.

— if: if an “if” clause ends in a comma, do not follow it with the word “then”.

— presentation: do not use “presentation” for “representation”. “Presentation” should be restricted to situations with visual aspects;

— which: do not use “which” in place of “that”. “That” introduces a defining phrase; “which” introduces an informational phrase.

6 Names

6.1 Preferred Name

When a new entry is added, a preferred name must be selected. This name should match the most commonly used English name within the industry for which the represented product is used.

NOTE Within IEC British English is requested.

6.2 Synonymous Name

Alternatives to a preferredName may be used to accomplish global understanding. Specifically, the synonomousName may use languages other than English.

6.3 Names shall not infer Range Values

Entries shall not be named or defined in such a way so as to infer multiple values, and thus, any entry whose preferred name or synonymous name contains the word “range” should be examined closely for violation of this constraint.

The value domain for any Characteristic is restricted to a single integer, single real, single Boolean, single code out of a value code list, or single text string. The interchange supports multiple value instances of any Characteristic, each of which may be identified by a value ‘type’ attribute (such as “min”, “typ”, “max”, etc.).

Therefore, the name or definition semantics of a PropertyDefinition normally should not specify or infer value ranges.

For example, Characteristic instances of the same PropertyDefinition “Supply Voltage” can be reported in an interchange with a “min” and “max” value ‘type’ attribute qualifier. In this case, there should not be two different PropertyDefinitions with names like “Supply Voltage Minimum” and “Supply Voltage Maximum”. However, the PropertyDefinition “OFF-state Leakage Current” is normally reported in a datasheet only in the context of a maximum leakage, which may be positive or negative, depending on some other voltage Characteristic. So the definition semantics should state something like, “…the absolute value of the maximum current leakage…”, so that the interchange reports a single, positive number with clear semantics.

6.4 Names shall not infer product packaging

Names should be associated with unit items and not be dependent on packaging or any other aspect of the supply chain. (For example, Weight is a valid characteristic, Weight (per gross) is not valid.) Exceptions to this rule may be made where a unique need, an unambiguous definition, and availability of information (sourceabilty) support the rigor required to maintain a single class set.

7 Unit of measure

Recommended units are those listed in 61360-1 annex B.

8 Versioning rules

See 61360-1 annex E.

9 Import of data into the IEC database

The import into the IEC database is specified in document SC3D/WG/088f.

NOTE Quality checks may highly depend on tools or interfaces provided by the IT infrastructure of IEC 61360CDD. So this clause may change when another version of IEC61360CDD becomes available.

10 Quality of content

Before submitting data to IEC for import into IEC database, a quality check of the input data shall be performed. This quality check shall be done by providing the data in ISO 10303-21 file format and checking by a STEP validation tool which is capable to check the rules contained in the schema. The logfile of the validation shall be provided. It must not contain any errors.

NOTE Quality checks may highly depend on tools or interfaces provided by the IT infrastructure of IEC 61360CDD. So this clause may change when another version of IEC61360CDD becomes available.

11 Contributing content

Proposing and standardizing classes and properties is a process in which various parties may be involved, such as expert committees, liaisons, and – of course – SC3D. The following figures enumerate the possibilities and the corresponding interactions of the involved bodies.

The following choices exist:

— Input from IEC TCs;

— Input from liaison committees;

— Input from IEC SC3D;

— Contributing content already contained in IEC standards.

NOTE Overlapping areas in the figures indicate close collaboration between groups.

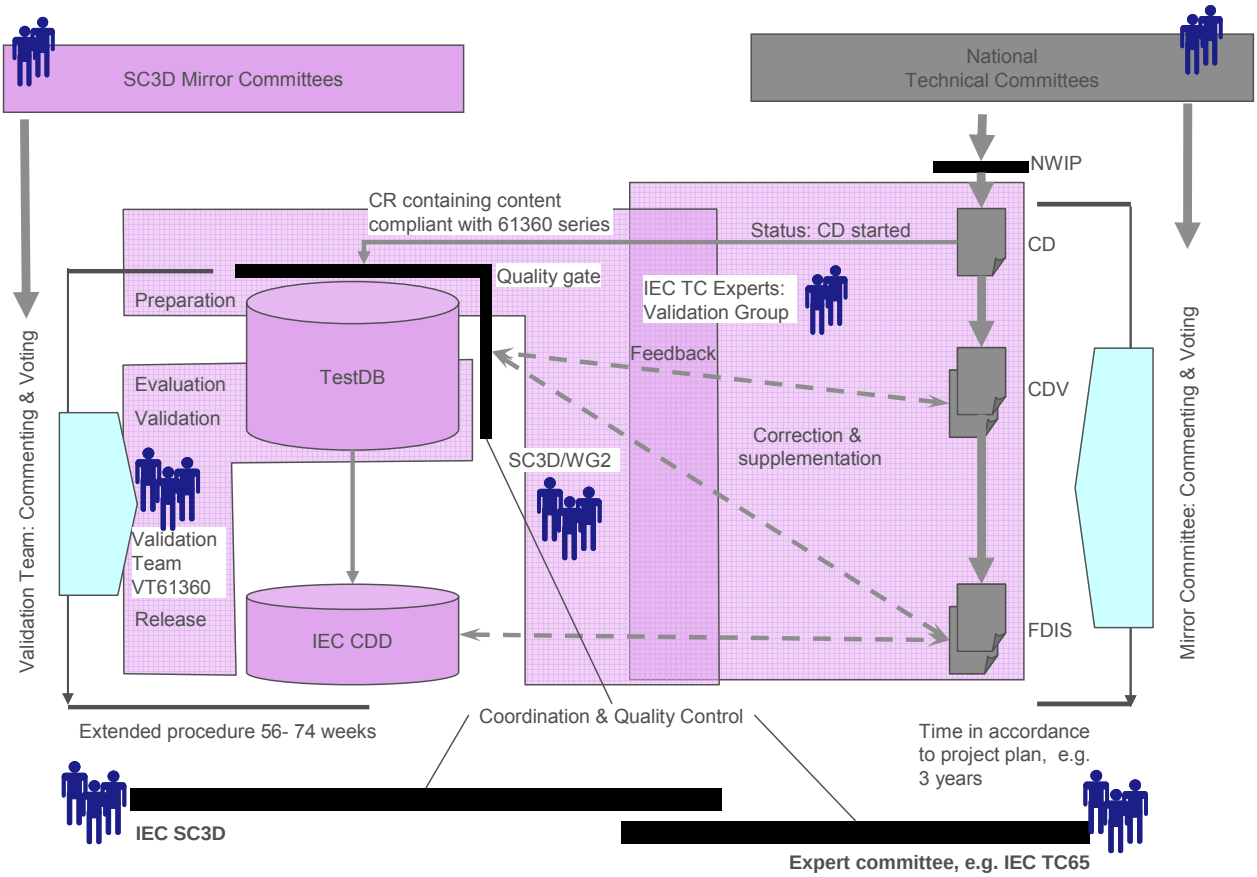

Figure 6 – Input from IEC TC standard under development

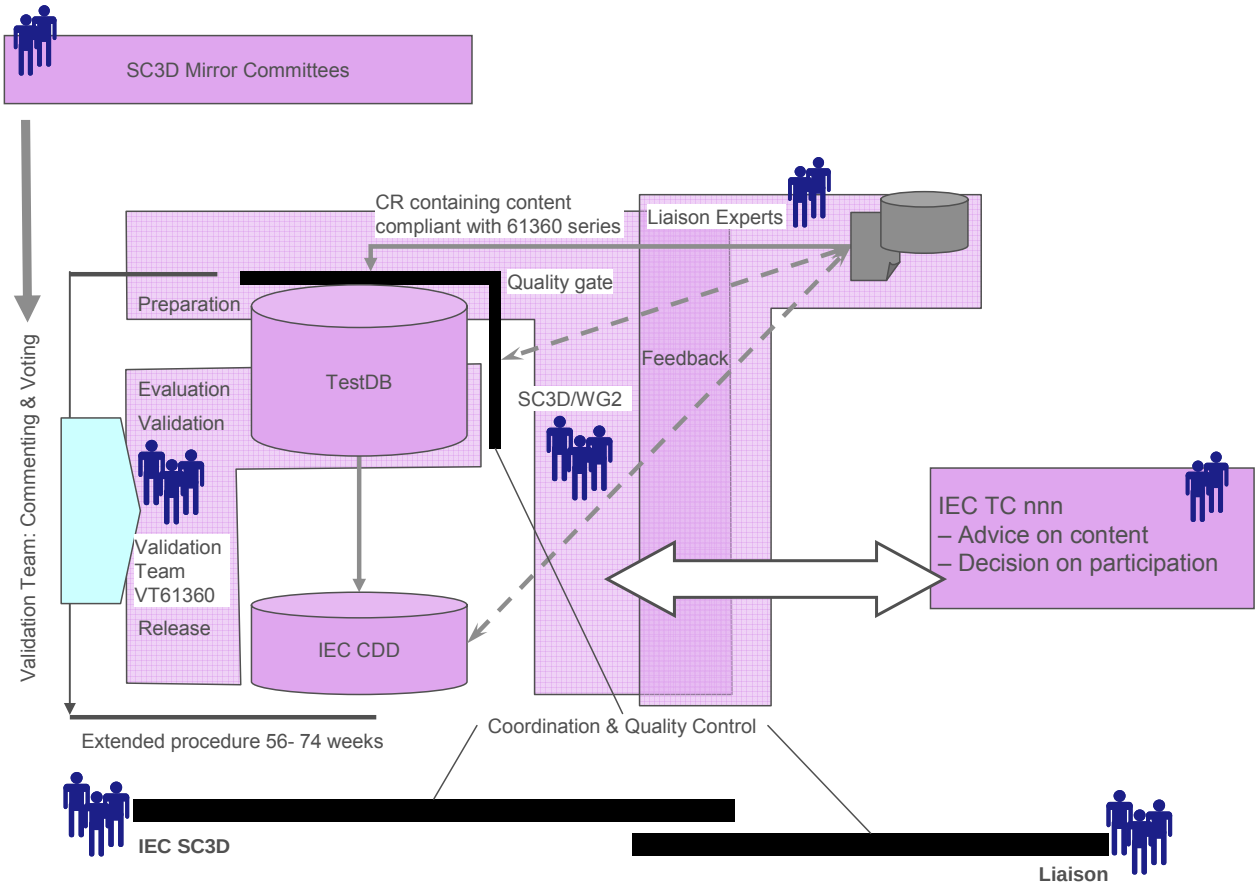

Figure 7 – Liaison input

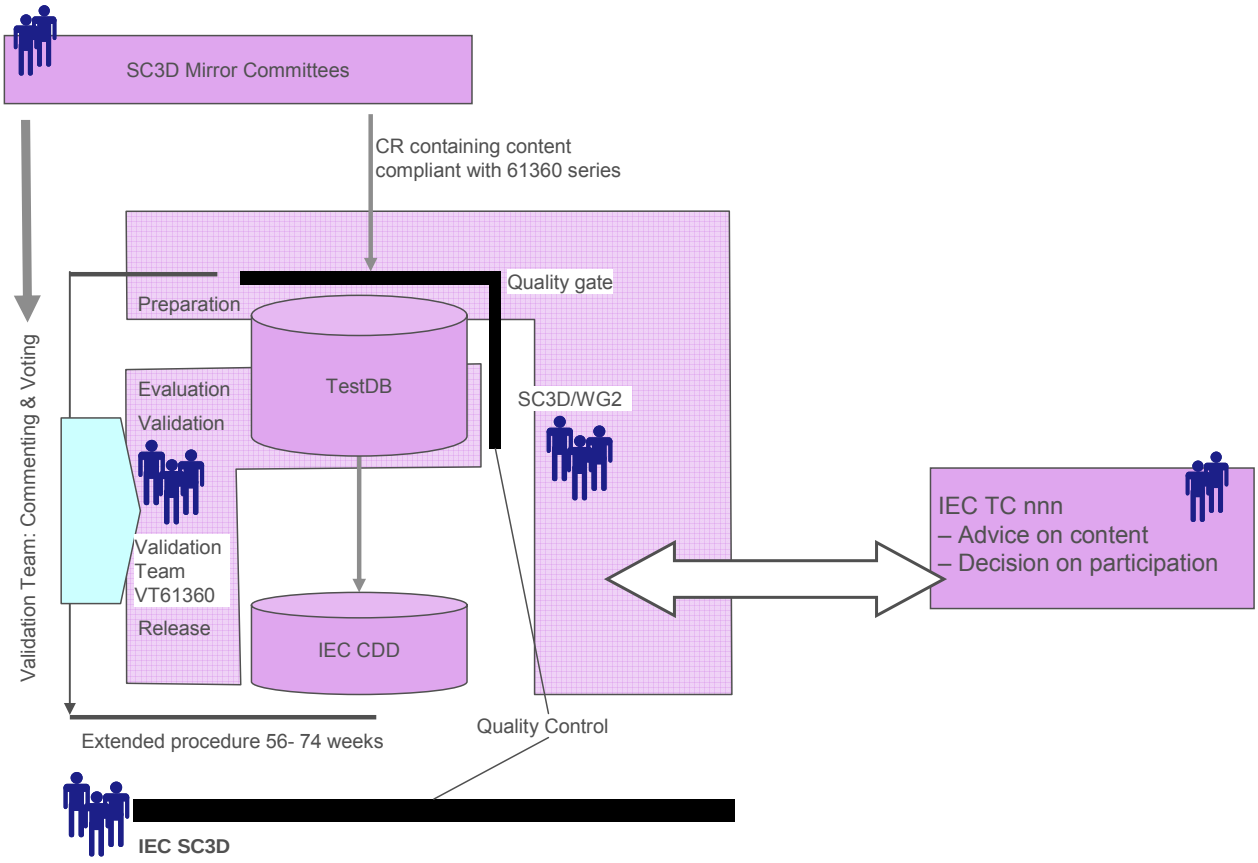

Figure 8 – IEC SC3D input

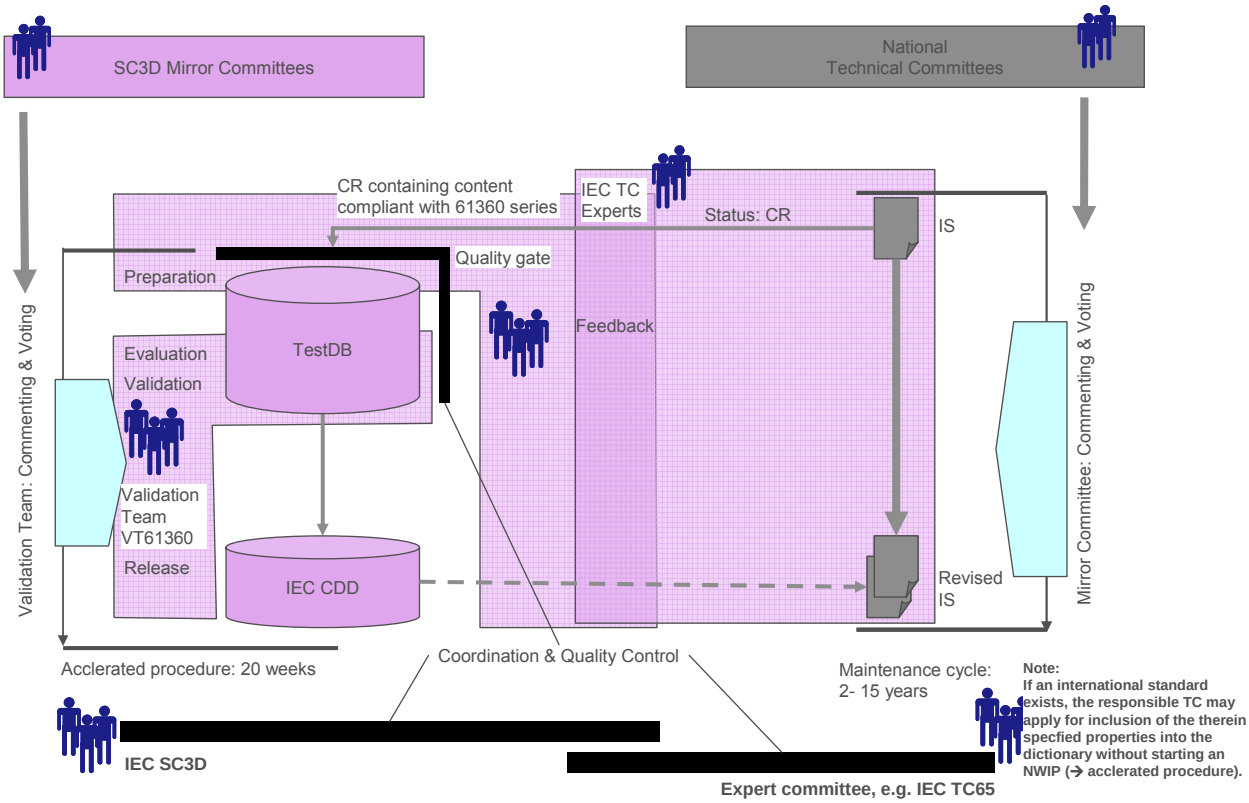

Figure 9 – Contributing content already contained in IEC standards

12 IEC Maintenance procedure for the database

IEC defines the procedure to maintain standards in databases. The detailed procedure is specified in the ISO/IEC Directives Annex J. The following figures taken from the ISO/IEC Directives summarize the process.

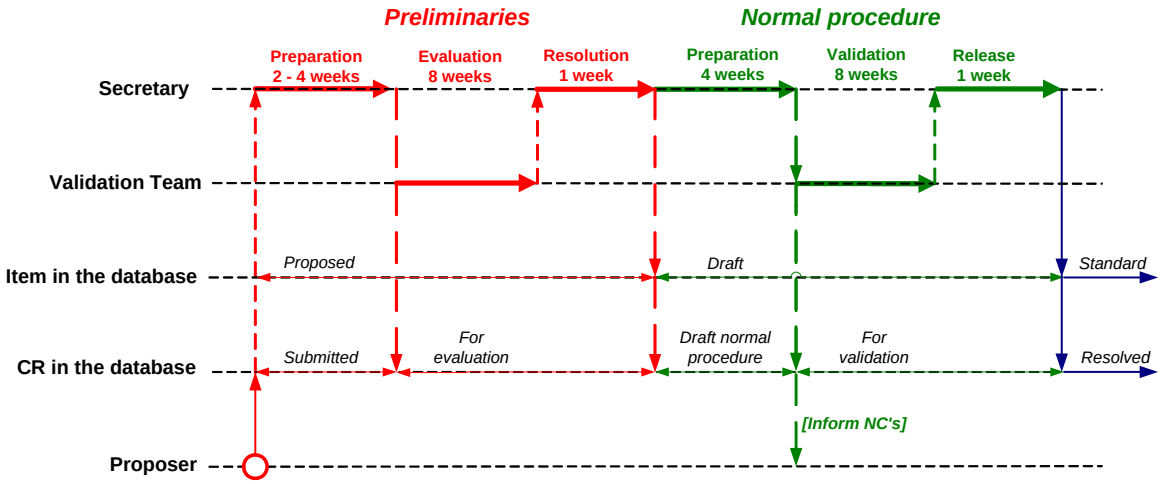

Figure 10 - The normal database procedure

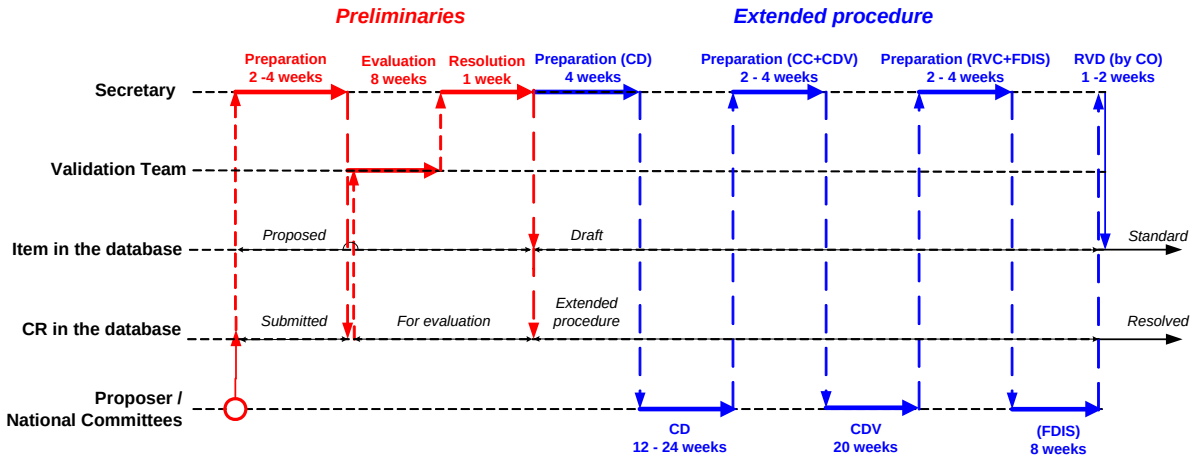

Figure 11 - The extended database procedure

Within IEC SC3D an IT infrastructure was set up and and forms are provided to support the process specified by IEC. The figure shows the related constituents and their interaction.

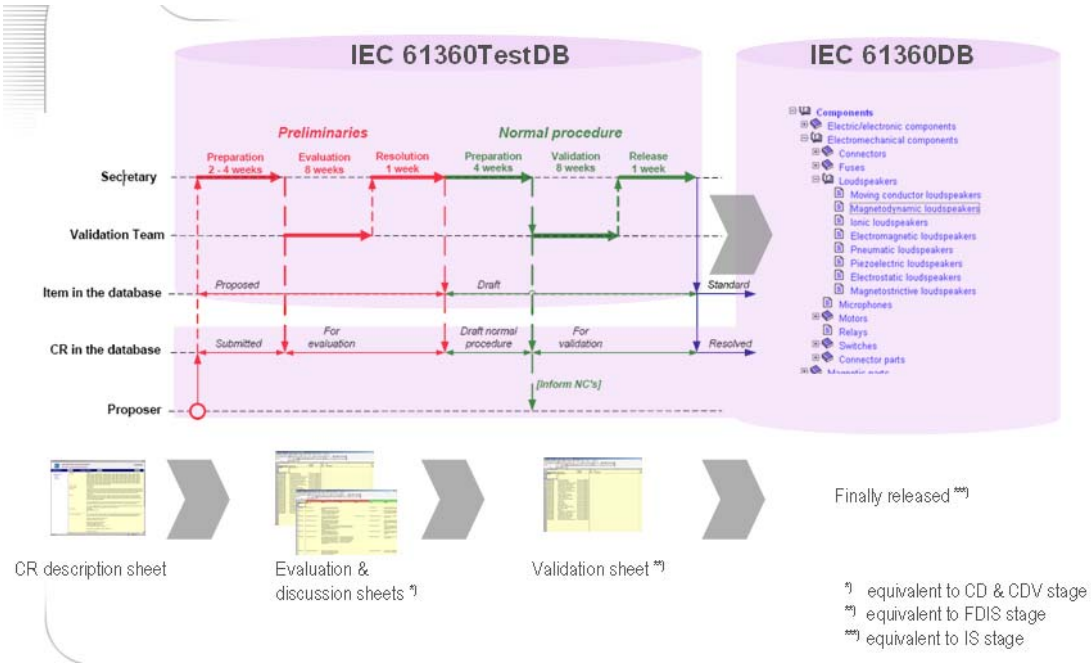

Figure 12 – Process and related documentation

13 Special purpose ranges for Identification Codes

The ranges of identification codes listed below are reserved for special purposes. These ranges are blocked and shall be only be used for the purposes listed here.

Identification Code	Allowed uses	
AAX000 – AAX999	DETs are considered as temporary	
ABA000 – ABZ999	For TC65 use	

TABLE – Predefined ranges of Identification Codes

14 IEC 61360 Checklist for data element entries

IEC CDD (IEC Components Data Dictionary) is a data base driven data dictionary where classes and associated data element types (DET) are being collected, serving as international reference library easing the electronic business to business communication between business partners .

This checklist serves as a guide for those who plan to provide input to the data base. It is recommended that involved persons are familiar with IEC 61360-1. It addresses common problems that were identified during the last years.

14.1 General

☐ Did you identify the relevant technical committee within your national committees or on the international level within IEC which needs to be addressed?

Note - One change request shall be addressed to one technical committee only.

☐ For organizational and time reasons limit the total quantity of DETs and Classes to max 250 entries per change request.

14.2 Extension of existing product classes by adding new DETs

☐ Did you look into the IEC test data base? Here you will find all proposed new entries and classes. Browse under www.iec.ch/test/iec61360.nsf

☐ Verify each of your data element types, whether it is product-class independent.

If yes, provide a class where to collect all such items; if no, identify the existing class to which the new data element types should belong.

Example 1 – A DET *Manufacturer* would apply to all product classes as each product is being manufactured by at least one organization

Example 2 – A DET *Vendor* will apply to all product classes as each product is being brought into the market by at least one organization.

Example 3 – A DET *Measuring principle* will apply probably only to the product class dealing with measuring instruments

☐ Did you consider that the content of the property *Definition* should be based on actual valid IEC or ISO standards?

Note – Where possible, definitions shall be written in such style that they are independent of a specific product class.

☐ Did you consider referring only to current IEC or ISO standards? Only in those cases where relevant IEC or ISO standards are not available, refer to publicly available National Standards.

☐ If requesting new quantitative DET using units other than SI- units, you have defined a separate new DET?

Example 4 – In order to describe conductors with sizes in American Wire Gauge (AWG) you need to define a new DET called e.g. *AWG size*

☐ Did you consider possible interdependencies among DETs?

Example 5 – The rated current of a device depends on the maximum value of the temperature for which it is foreseen. Dependent notations have to be established between the relevant DETs.

☐ Did you consider the property Symbol, if available? Did you consider its language independency? Did you consider its correct notation?

☐ Did you consider the property Short name? Did you consider its language independency? Did you consider its correct notation?

☐ Did you apply always consistently the notation for dates, YYYY-MM-DD?

☐ Did you apply the level construct when defining a range in quantitative data element types?

Note – To express a min and/or max value the level construct is applicable and the same DET is used once only by applying the value of the level.type minMax

☐ In the case you did not apply the recommended editing tool, did you do a quality and syntax check of your provided file, serving as input to IEC?

Note – Before a work item will be accepted a formal quality check will be made by the management of the data base. If the syntax is not in line, you run the risk not to get accepted the work item due to poor quality.

☐ Did you apply a spelling checker when preparing the textual content? Please take care that the British English (en-UK) is the favourite language.

Note – Within the IEC Component dictionary, the English language is the leading language, and is the only one considered to be the Standard. Starting July 2007, it is envisaged that more languages will be supported by the data base. However, each national language is under the exclusive control of the relevant National Committee. IEC will assign those National Committees being entrusted to prepare the relevant languages.

14.3 Setting up of new classes with associated data element types

☐ In the case you did not find a class where to assign your DETs, set up a new class with its class definition, its name etc., and identify the upper class node in the hierarchy to which it should be related.

☐ Don’t forget to define the classifying DET which is controlling possible subclasses of the class.

15 Bibliography

The documents referenced in this clause contain information that is recommended to know for people who create or maintain data elements of the IEC 61360 database or parts thereof.

SC3D/103hwg, *Data entry guide*

SC3D/88fwg, *Database import specification*