An Introduction into the ECSS standardization system and its implementation in the ECSS member's programs

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1 Understanding of the ECSS standardization system

a. Needs of Space standards
b. ECSS and the commitment of its members
c. ECSS organization
d. Production & approval of standardization docs under ECSS
e. ECSS general policies:
    1. Policy on certification and training
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    3. Policy on copyrights and use by non-ECSS members
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1. Understanding the ECSS standardization system

1.a - Need of Space standards (1/1)

- **Competitiveness**
  Standards have an important economic and social role for enabling our industry to remain competitive on the market and to conquer new markets.
- **Efficiency**
  Standards contribute to making the development, manufacturing and supply of products and services more efficient, reliable, safer and cleaner.
- **Trading facilitation**
  Standards allow trading between organizations to progress easier and fairer.
- **Knowledge transfer**
  Standards aid in transferring knowledge and enhancing engineering capabilities to smaller or developing organizations.
- **Education**
  Finally, Standards participate to the education of today's and future engineers when conforming to standards is secured, thus, for instance, avoiding designers "reinventing the wheel".

1. Understanding the ECSS standardization system

1.b - ECSS and the commitment of its members (1/2)

- Back in the early nineties, European Space Industry had to satisfy different standardization systems for different customers (ESA, Space national Agencies, other industrial organization…).
- Specifically, the Quality system of each Industry had to be re-aligned to the Q and PA requirements of the customer of each project.
- The need of a common standardization system for all European stakeholders was identified and reported in 1994.
  In 1995 ECSS was created by the signature of its members.
- ECSS members are committed to:
  - Contribute in the development of ECSS documents by:
    - Participating in the ECSS governing bodies
    - Contributing to the development of docs by appointing experts to WGs
    - Providing comments to the docs under development, during their review
    - Providing CRs as needed, and contributing to the feedback process
  - Use the ECSS standards for their Space projects and programmes

How can you contribute to the development of standards?

1. Understanding the ECSS standardization system

1.c - ECSS organization (1/2)

ECSS Membership

Voting members | Associate | Observers

European Space Agency

European Industry,

represented by

EUROSPACE – The Association of European Space Industry

Some organization have an **observer** role on ECSS, e.g.

→ **CEN,**

→ **EUMETSAT,**

→ **EDA**

National Space Agencies

Italy

France

Germany

The Netherlands

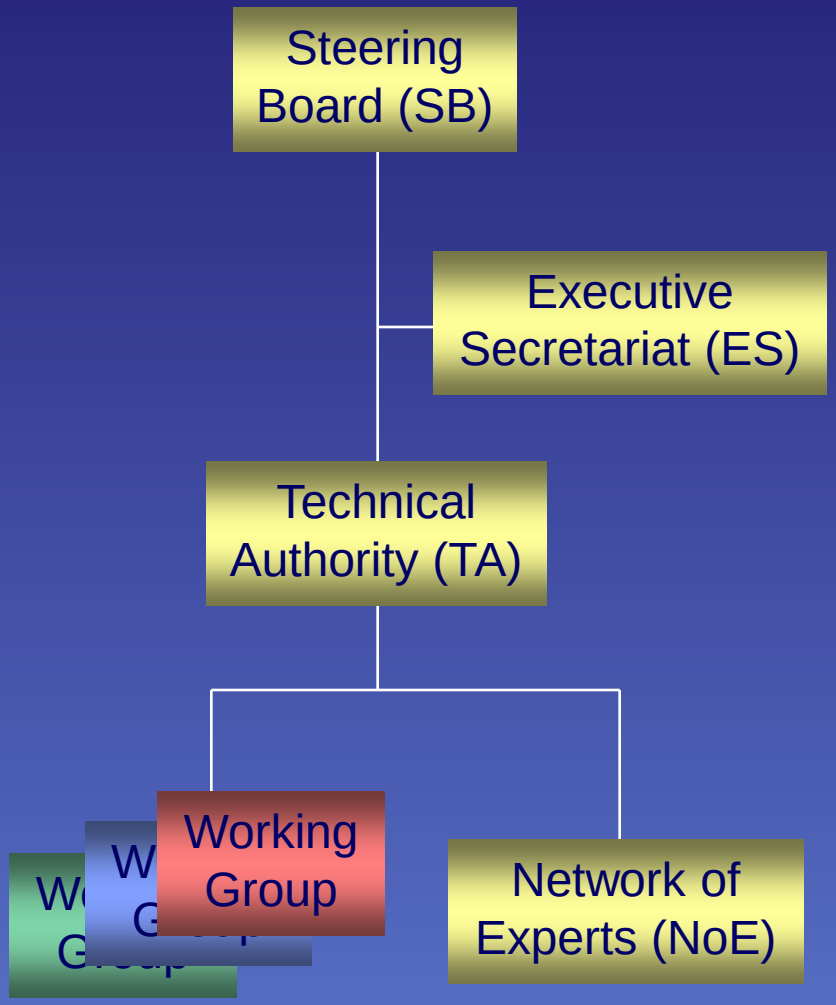
Norway

United Kingdom

Canada

1. Understanding the ECSS standardization system

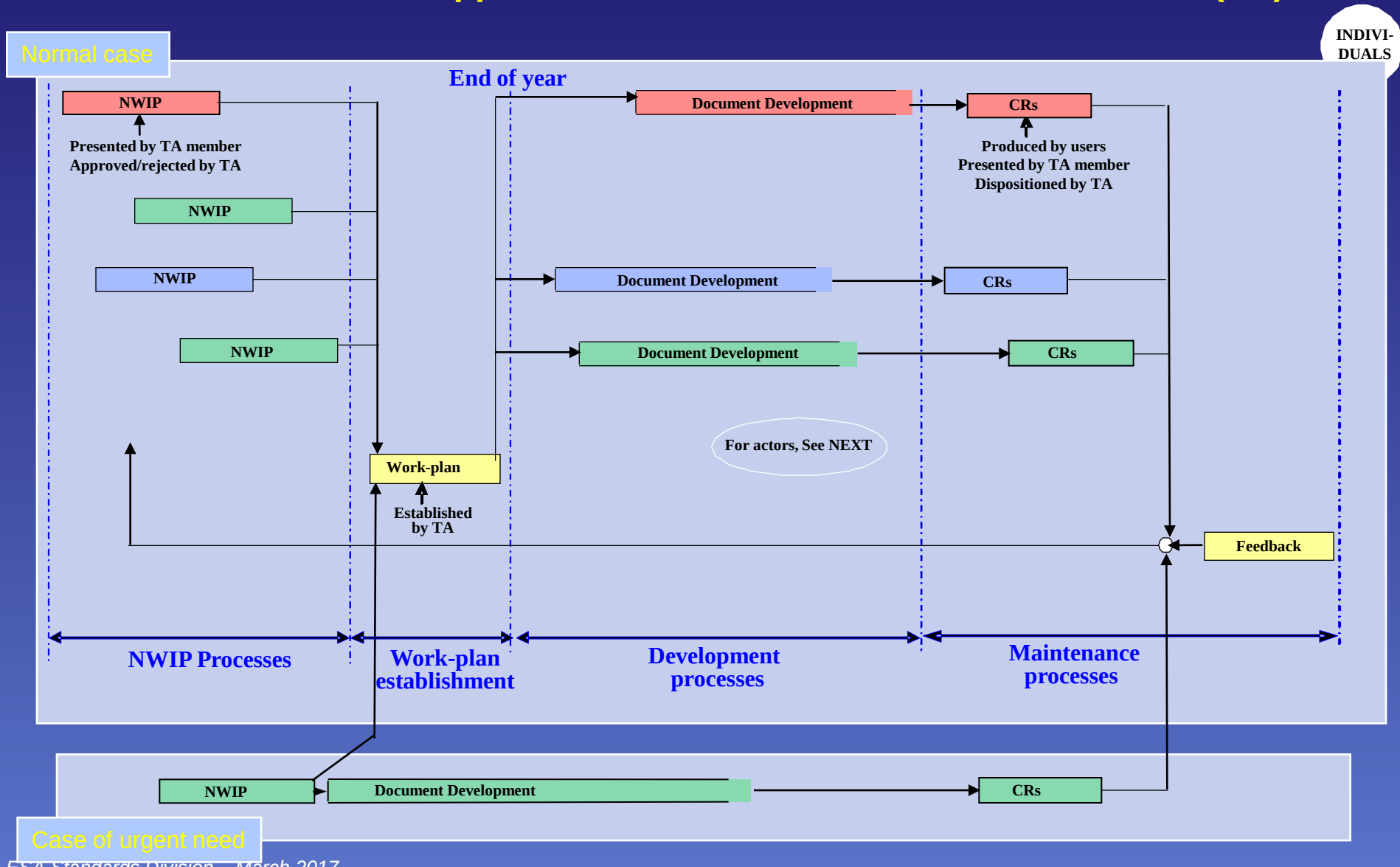
1.c - ECSS organization (2/2)



- Steering board (SB)
  - Delegates from member organizations
  - Responsible for policy and strategy issues and for overall supervision
  - Does not approve individual standards
- Technical Authority (TA)
  - Delegates from member organizations
  - Set up & implement the work-plan
  - Authorize public review & approval of documents
- Executive Secretariat (ES)
  - Provided by ESA TEC-QR (ESA Standards division)
  - Give Secretariat support to SB & TA
  - Support WGs in drafting documents in accordance with ECSS rules/procedures
  - Custody ECSS docs: collect and analyze CRs, NWIPs and Feedback
  - Administrate the ECSS Website
- Working groups
  - Experts appointed by the ECSS members and endorsed by the TA – **They shall act on behalf of their organizations**
  - Draft the ECSS documents
  - Disposition ECSS community comments (DRRs) to the ECSS documents
  - Identify Document Focal points (DoFP)
- Network of Experts (NoE):
  pool of experts to support the TA on an ad-hoc basis (individually or in specific groups or TFs)

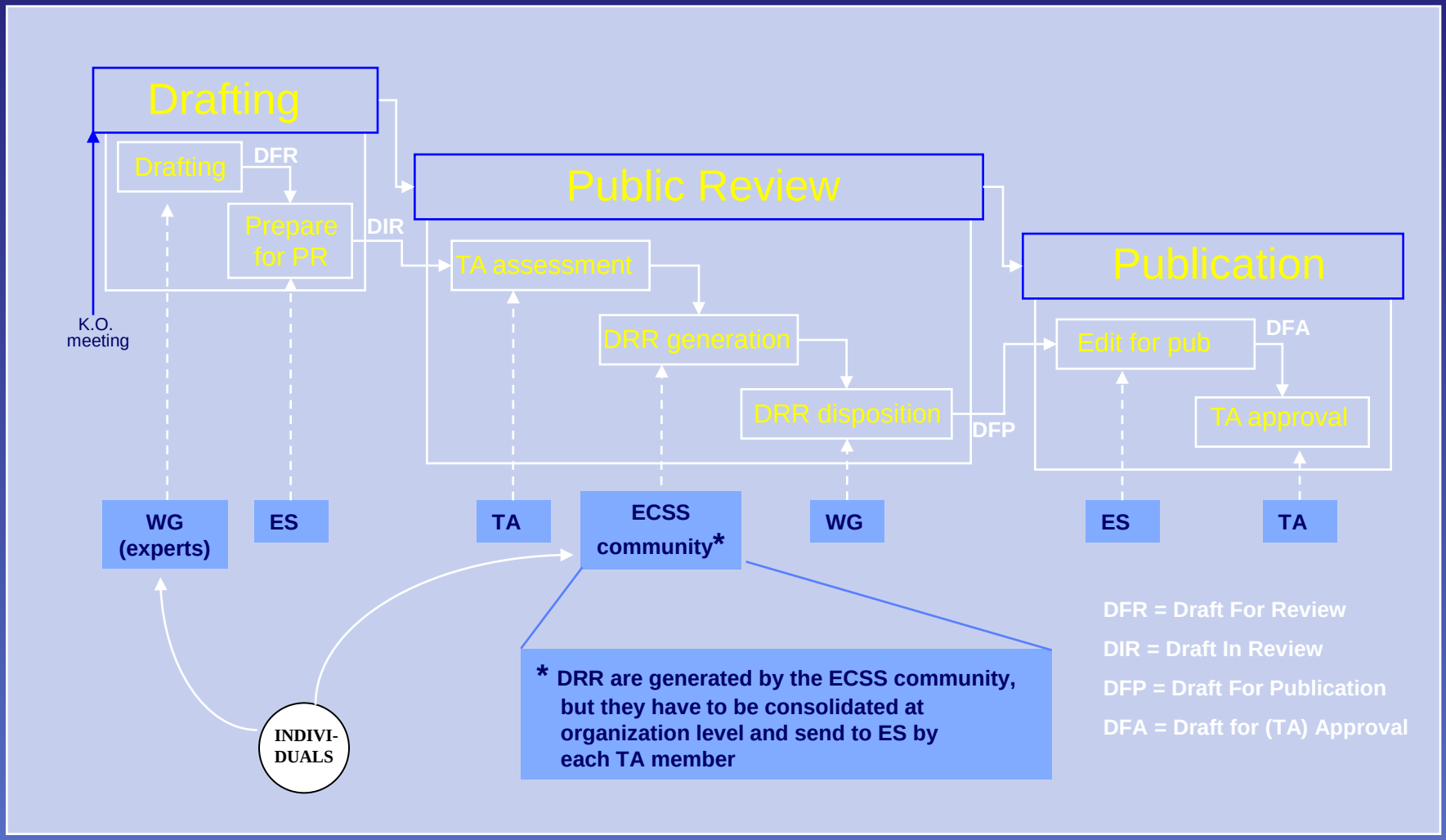
1. Understanding the ECSS standardization system

1.d - Production & approval of standardization docs under ECSS (1/2)



1. Understanding the ECSS standardization system

1.d - Production & approval of standardization docs under ECSS (2/2)



1. Understanding the ECSS standardization system

1.e – ECSS General policies (1 of 9)
Policy on certification and training

- In accordance with ECSS-P-00C #5.5.1.1, “ECSS neither provides nor recognizes any certification process of supplier or of product according to ECSS requirements, by any party”.

  However, nothing prevents that individual ECSS members can certify against ECSS on their own behalf.

- In accordance with ECSS-P-00C #5.5.1.2, “ECSS promotes usage of ECSS system in European space projects and beyond through information and, as far as practical, through training of potential users. In addition, ECSS does not endorse the development of third party training courses related to ECSS system”

  Therefore:
  - ECSS welcome training from individual ECSS members (e.g. the current training),
  - ECSS will not endorse the training of non-ECSS partners.

1.e – ECSS General policies (2 of 9)
Policy on translations by an ECSS member

- In accordance with ECSS-P-00C #5.7:

ECSS document are written in English language ONLY.

ECSS members may translate them into another language, provided that:

- It is communicated to the ECSS Secretariat
- The translator ECSS member remains the sole and total responsible
- The translations are not part of the ECSS system, and therefore they shall bear a different identification number
- The translation shall clearly identify which ECSS original document(s) have been used.
- No approval from nor duties for any ECSS entity (e.g. SB or ES)
- Translation cannot be sold.
- No ECSS recognition nor maintenance of the translation

1. Understanding the ECSS standardization system

1.e – ECSS General policies (3 of 9)

Policy on copyrights and use by ECSS and non-ECSS members

- In accordance with ECSS-P-00C #5.8:

Copyrights and use by ECSS members:

- ESA holds ECSS copyrights on behalf of the ECSS members.
- No ECSS document may be reproduced without explicit consent of ESA.
- However, **this consent is granted to ECSS members** for their own use and their (sub)contractors

Use by non-ECSS members:

- Process:
  - Only under request to ECSS ES.
  - ECSS ES will propose an agreement based on the present conditions
  - Final version of the agreement, to be approved by the ECSS SB
- Conditions:
  - Direct use of ECSS rather than re-writing quoting ECSS -> This will avoid inconsistencies
  - ECSS copyright is acknowledged, together with the exact reference and potential modifications of ECSS documents.
  - If translations are performed, the translated documents shall be made available to ECSS.

1. Understanding the ECSS standardization system

1.e – ECSS General policies (4 of 9)

Interfaces with other SDOs (1/6)

Policy and background

- It is the ECSS policy to avoid the development of documents, if an existing or planned document on the subject from other SDO is considered suitable for ECSS use.

- If the document exist, two cases are possible:
  - It is suitable “as is”. No additional action needed (it will be cross-referenced By ECSS docs)
  - It is usable, but need some modifications for full suitability. Then it may be adopted via an Adoption Note.

    NOTE: An Adoption Note lists one by one all the clauses/paragraphs/requirements:
    - To be deleted
    - To be modified (and then including the modified text)
    - To be added (and then including the added text)

- An external document may be adopted as:
  - a standard (and then call “AS” in the ECSS terminology, e.g. ECSS-U-AS-10 “Space debris mitigation” or as a handbook.
  - A handbook, and then call “AH” in the ECSS terminology. At the moment, no document has been yet adopted as a handbook.

- No intention in ECSS to adopt documents as “TM”.

1. Understanding the ECSS standardization system

1.e – ECSS general policies (5/9)

Interfaces with other SDOs (2/6)

Policy and background

- If the document under development, or planned by the other SDO is of ECSS interest, **three scenarios** are **considered**:
  1. ECSS decides not to participate at all in the development, and when the document is published, apply the “adoption policy” explained in the previous viewgraph.
     The risk is that if the final product is not suitable, ECSS will have to generate its own document.
  2. ECSS does not contribute directly to the drafting, but it comments the document during the Public Review and monitor the dispositions and implementation.
     This permits certain control on the final product, but it does not ensure that it will meet the ECSS needs.
  3. ECSS decides to fully cooperate with the other SDO in the complete development of the document, by providing experts to the WG and producing comments during the PR.

- Approaches 2 and 3 above will need an (either ad-hoc or formal) agreement between ECSS and the SDO. Therefore three types of cooperation are foreseen:
  - **Liaison**
  - **Ad-hoc agreement**
  - **Formal agreement**,

1. Understanding the ECSS standardization system

1.e – ECSS General policies (7 of 9)

Interfaces with other SDOs (4/6)

Ways of cooperation with other SDOs includes:

- **Liaison:**
  No collaborative activities, only mutual visibility. Performed at TA level.

- **Ad-hoc cooperation.**
  Performed i.a.w. an SB mandate to the TA of limited scope.
  Example, cooperation **with CCSDS,** only for those CCSDS documents considered of ECSS interest.
  - (not direct ECSS involvement during drafting, but formal ECSS contribution to the PR by commenting the draft document), This considering that most of the ECSS members (the Space Agencies) are also members of CCSDS and there is a consultation of positions at ECSS LEVEL]

- **Formal agreement**
  Signed by both organizations. The SB will sign on behalf of ECSS.
  - For MUTUAL RECOGNITION
    Example, agreement **with ISO** for mutual recognition of the two organisations.
    Collaboration is decided on an ad-hoc basis (SEE NEXT SLIDES)
  - For FORMAL COOPERATION
    Example: A new formal cooperation agreement (MoU, memory of understanding) **with CEN/CENELEC** have been signed for full cooperation (SEE NEXT SLIDES)

1. Understanding the ECSS standardization system

1.e – ECSS General policies (8 of 9)

Interfaces with other SDOs (5/6)

Cooperation with ISO (international standardization organization)

- ISO has two sub-committees for space:
  - ISO TC20/SC13, for space data handling and communications. It is *constituted* by CCSDS (of which ESA is a member).
  - ISO TC20/SC14, for any other subject on space standardization. ECSS (of which ESA is a member) has a *limited cooperation* with it:
    - A formal agreement exists for mutual recognition (ISO-ECSS), and
    - Presently ad-hoc ECSS cooperation with ISO exists for :
      - Space Debris series of standards
      - Solar panels and cells (ISO 11221, 15386 and 23038)
      - TRL definition → NOT ANYMORE (already published)
- ISO has other ***non-aerospace*** specific committee that ECSS is interested in: TC209 “Cleanliness”, for which ECSS is now in the process of establishing a formal relationship

1. Understanding the ECSS standardization system

1.e – ECSS General policies (6 of 9)
Interfaces with other SDOs (3/6)

Objectives for cooperation

- General ECSS objectives for cooperation with other SDO
  - Ensure that, where international consensus and recognition is essential in order to allow global interoperability and/or common policies and treaties, standards are developed in conjunction with the appropriate SDO [at international level ISO/TC20/SC14]
  - Avoid duplication of and conflicts between standards that are planned to be used for space application by the European and international community
  - Take into account inputs & feedback, in an agreed format, from all stakeholders, in particular liaison SDO like ISO, in the preparation / maintenance / evolution of ECSS standards

1. Understanding the ECSS standardization system

1.e – ECSS General policies (9 of 9)

Interfaces with other SDOs (6/6)

Cooperation with CEN/CENELEC (Comision Eurepeen du normalisation)

- CEN/CENELEC received in 2011 a **CE mandate (M469)** for Space standardization.
  This mandate addressed standardization in **10 sectorial dossiers** (covering both upstream and downstream standards). NOTE: Not all are of ESA/ECSS interest.

  NOTE: Some "downstream standards" may need to be observed by ESA/ECSS, since they may have some "upstream impact" (e.g. WG 3 on "Info exchange in a system of systems environment, in particular inside and between EO, NAV and POS, and TEL)

- CEN/CENELEC contacted ECSS to avoid "reinventing the wheel". As a result of this contact, a CEN/CENELEC – ECSS **MoU** was signed in May 2013, covering:
  - Transfer and maintenance of existing ECSS standards as European Norms (EN)
  - ECSS involvement in the development of new EN standards for space:
    - If ECSS initiates upstream, ECSS will lead and will invite CEN to participate.
    - If CEN initiates upstream, ECSS may decide to lead. I so, ECSS will lead and CEN will participate. Otherwise, CEN will lead and ECSS will participate.
    - If CEN initiates downstream, CEN will lead and will invite ECSS to participate.

2 The ECSS standardization documentation model

a. Type of ECSS standardization documents
b. ECSS documentation structure (branches & disciplines)
c. Denomination of ECSS documents
d. ECSS documents available
e. The set of ECSS standards as a system
f. Characteristics of individual ECSS standards and requirements
g. Anatomy of an ECSS standard

2. The ECSS standardization documentation model

2.a – ECSS type of documents (1/2)

ECSS types of documents

	ecss types of documents
standards	for direct use in invitation to tender and business agreements
handbooks	non-normative documents providing guidelines and/or collection of data
technical memoranda	non-normative documents providing useful info or data not yet mature for a standard or handbook

2. The ECSS standardization documentation model

2.a – ECSS type of documents (2/2)

ECSS standards are characterized by:

They express what to do, not how

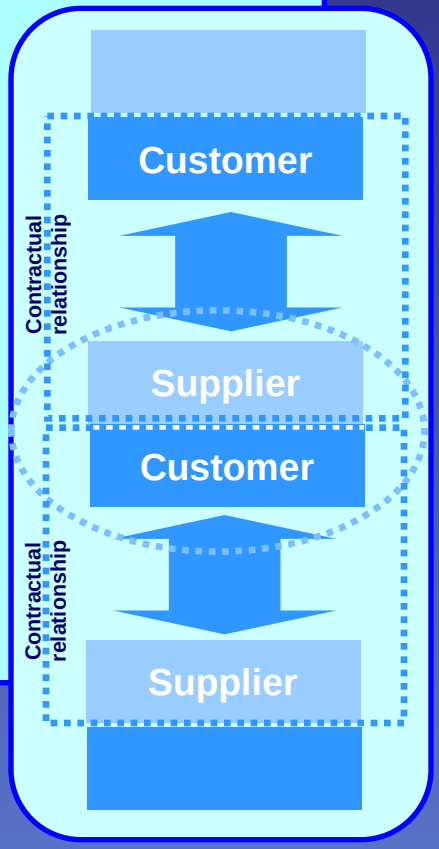
Therefore, the procedural part is not normally covered.
Handbooks are the appropriate documents for it.

They express this in term of regulatory provisions, i.e.

Requirements, recommendations or permissions
NOTE: Explanatory text is only included if necessary to support these provisions

These provisions are focused on a contractual relationship

The contractual model used in ECSS is defined in ECSS-S-00



2. The ECSS standardization documentation model

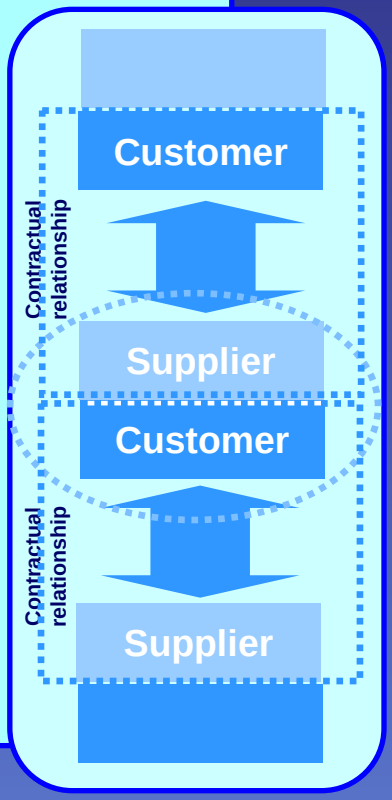
2.a – ECSS type of documents (2/2)

Focus on a contractual relationship

- Customer = organization or person that receives a product as part of a business agreement
- Supplier = organization or person that provides a product as part of a business agreement

  Note: the term product covers: services, software, hardware, documentation, and processed materials

- All space project actors are either a customer or a supplier, or both.
- Business agreement = legally binding agreement, for the supply of products, between two or more actors in the customer–supplier chain
- Business agreements are recorded in a variety of forms, such as:
  - Contracts,
  - Memoranda of understanding,
  - Inter-governmental agreements,
  - Inter-agency agreements,
  - Partnerships,
  - Bartering agreements, and
  - Purchase orders.



2. The ECSS standardization documentation model

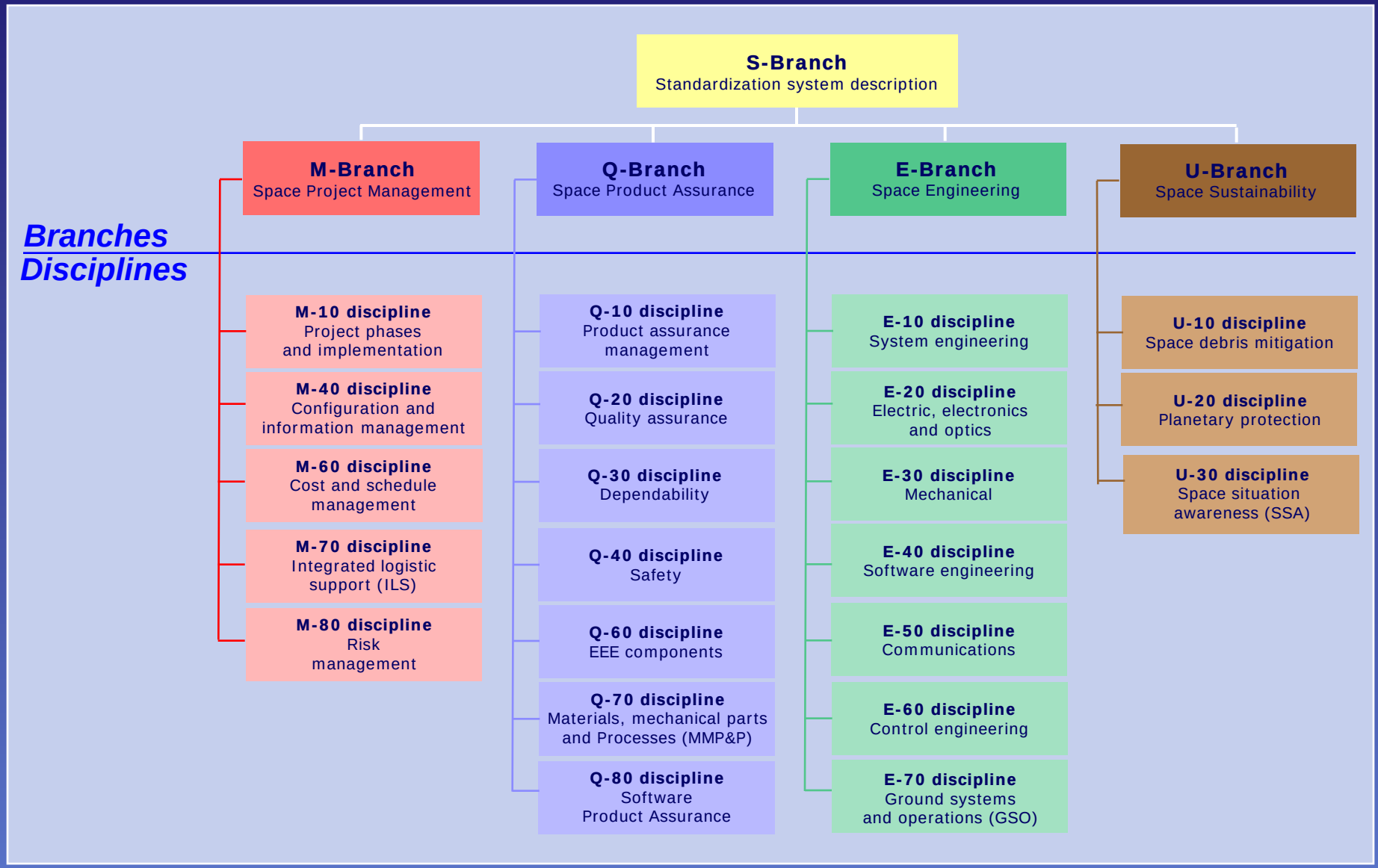
2.b – ECSS documentation structure (1/2)

Branches

S - System	Define the system of standardization documents, and specifies how to use it in Space projects
M - Management	The project manager is responsible for the achievement of the totality of the project objectives and specifically for quality organization and its timely and cost effective execution
Q - Product assurance	Product assurance is responsible for the implementation of the quality assurance elements of the project and other activities like dependability, safety, parts, material and processes, software, and audits
E - Engineering	Engineering is responsible for the definition of the end product, verification that customer's technical requirements are achieved and in conformance with the regulation and company constraints
U - Sustainability	The U branch is providing requirements and principles for a continuous sustainability of the space environment in order to ensure appropriate and safe present and future of space activities.

2. The ECSS standardization documentation model

2.b – ECSS documentation structure (2/2)



2. The ECSS standardization documentation model

2.c – Denomination of ECSS documents (1/1)

- **ECSS documents are named as**

ECSS - { S, M, Q, E, U } - { ST, AS, HB, AH, TM } - <number><version>

- **<S, M, Q, E or U> represents the branch**
  - S for ECSS system, the top level document that gives a general introduction into ECSS and the use of ECSS documents
  - M for Management, Q for Product assurance, E for engineering, and U for Sustainability

- **<ST, AS, HB, AH or TM> is the type of document**
  - ST for standard, AS for adopted as standard, HB for handbook, AH for adopted as handbook, and TM for technical memo

- **<Number> is one or two groups of two digits each**
  - one group of two digits to identify those documents with more generic requirements
  - two groups of two digits to identify those with more specific requirements
  - the difference is not to indicate higher relevance of some standards with respect to others.

- **<version> is a letter from A onwards, representing the issue. It may include also a Rev index, from 1 onwards.**

Example:

S-ST-00C
ECSS system (standard)

E-ST-50C
Communications (standard)

↓

E-ST-50-05C
Radio frequency and modulation (standard)

E-HB-50A
Communications (handbook)

2. The ECSS standardization documentation model

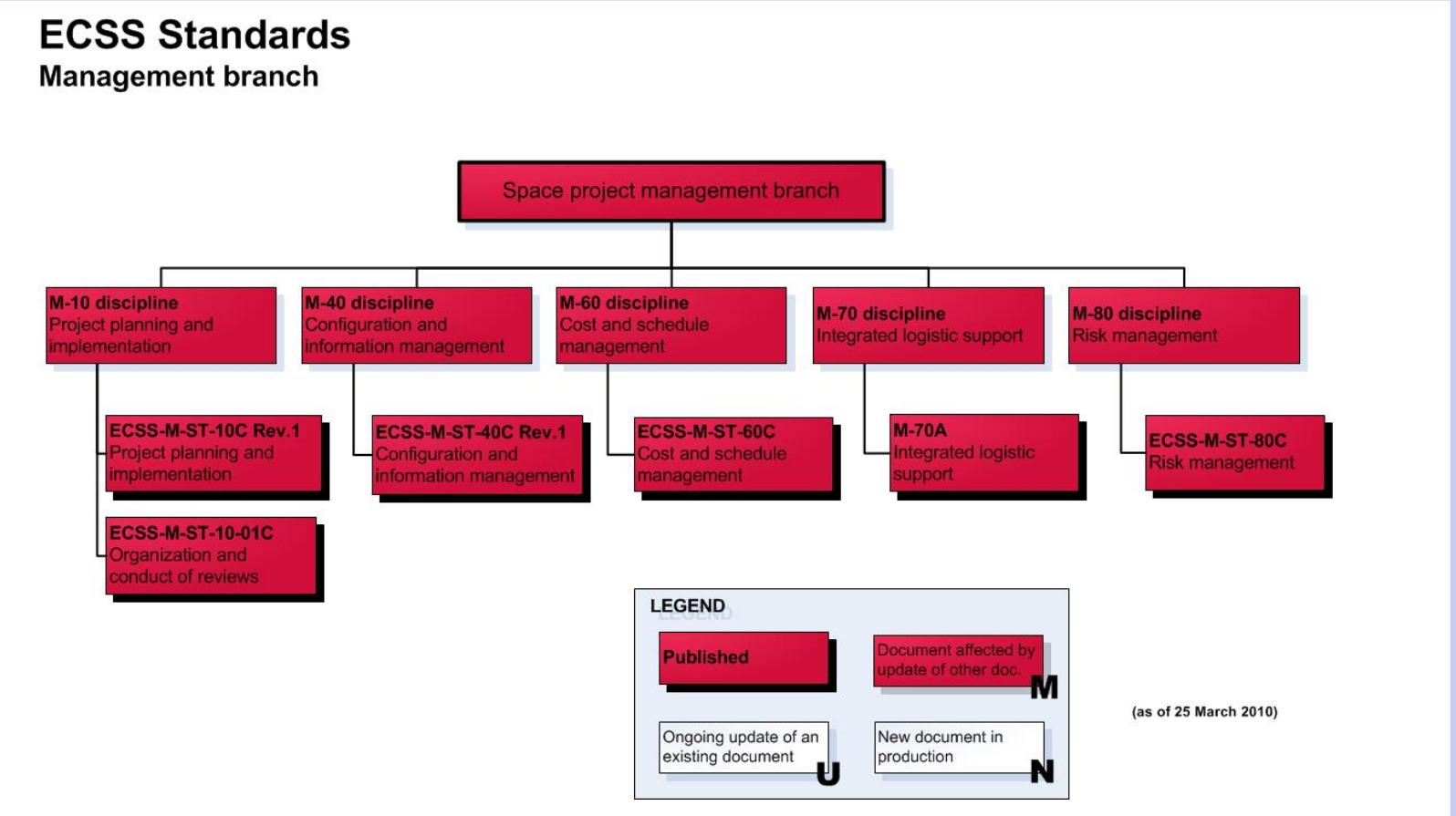
2.d – ECSS available documents at 1 October 2015 (1/10

	ST/AS	HB/AH	TMs	Total per branch
S branch	2	0	0	2
M branch	6	0	0	6
Q branch	58	8	4	70
E branch	58	20	6	84
U branch	1	0	0	1
Total per type	125	28	10	**163**

2. The ECSS standardization documentation model

2.d – ECSS available documents (2/10)

The M branch – Standards

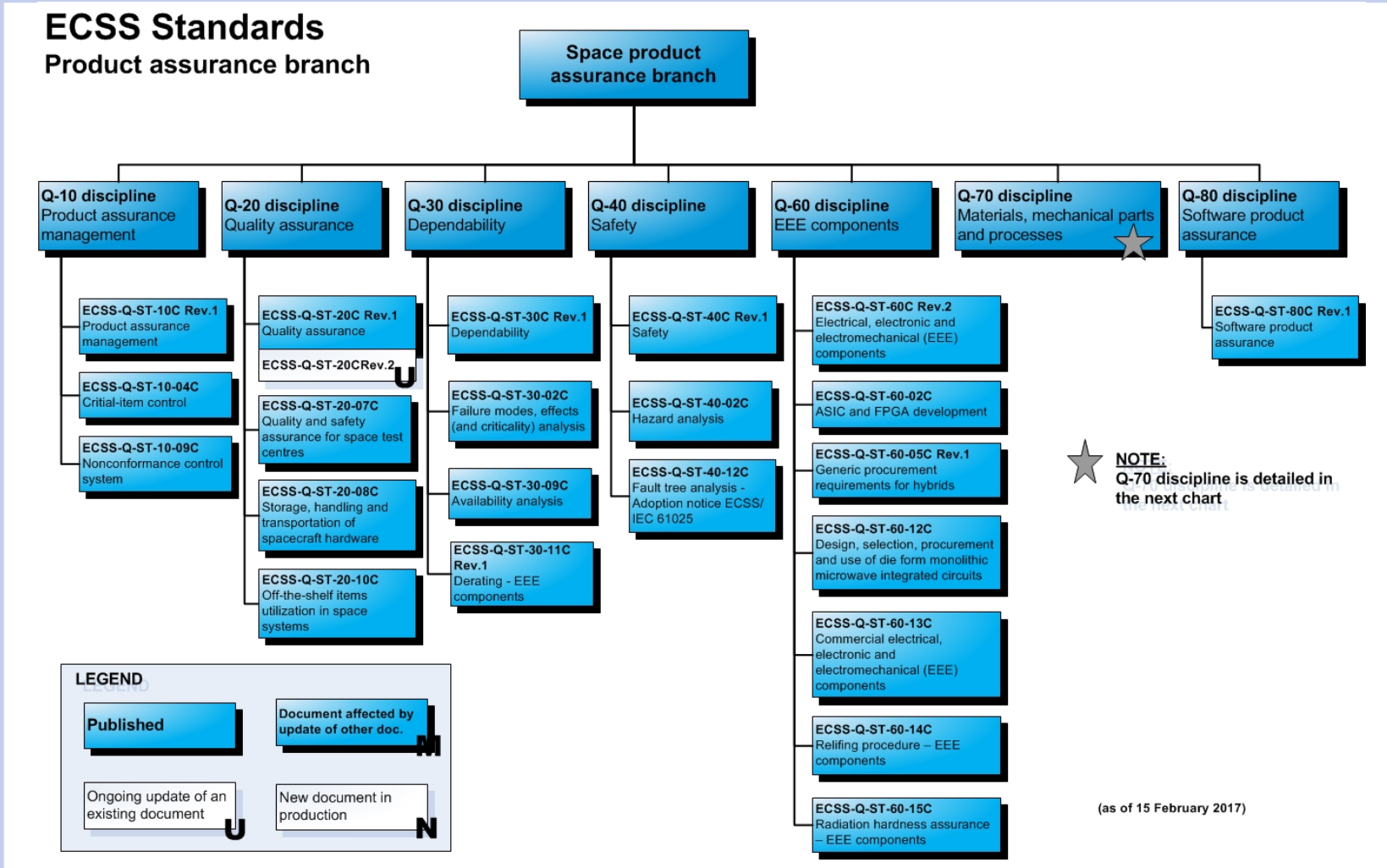


NOTE: There are not HBs and TMs in the M branch

2. The ECSS standardization documentation model

2.d – ECSS available documents (3/10)

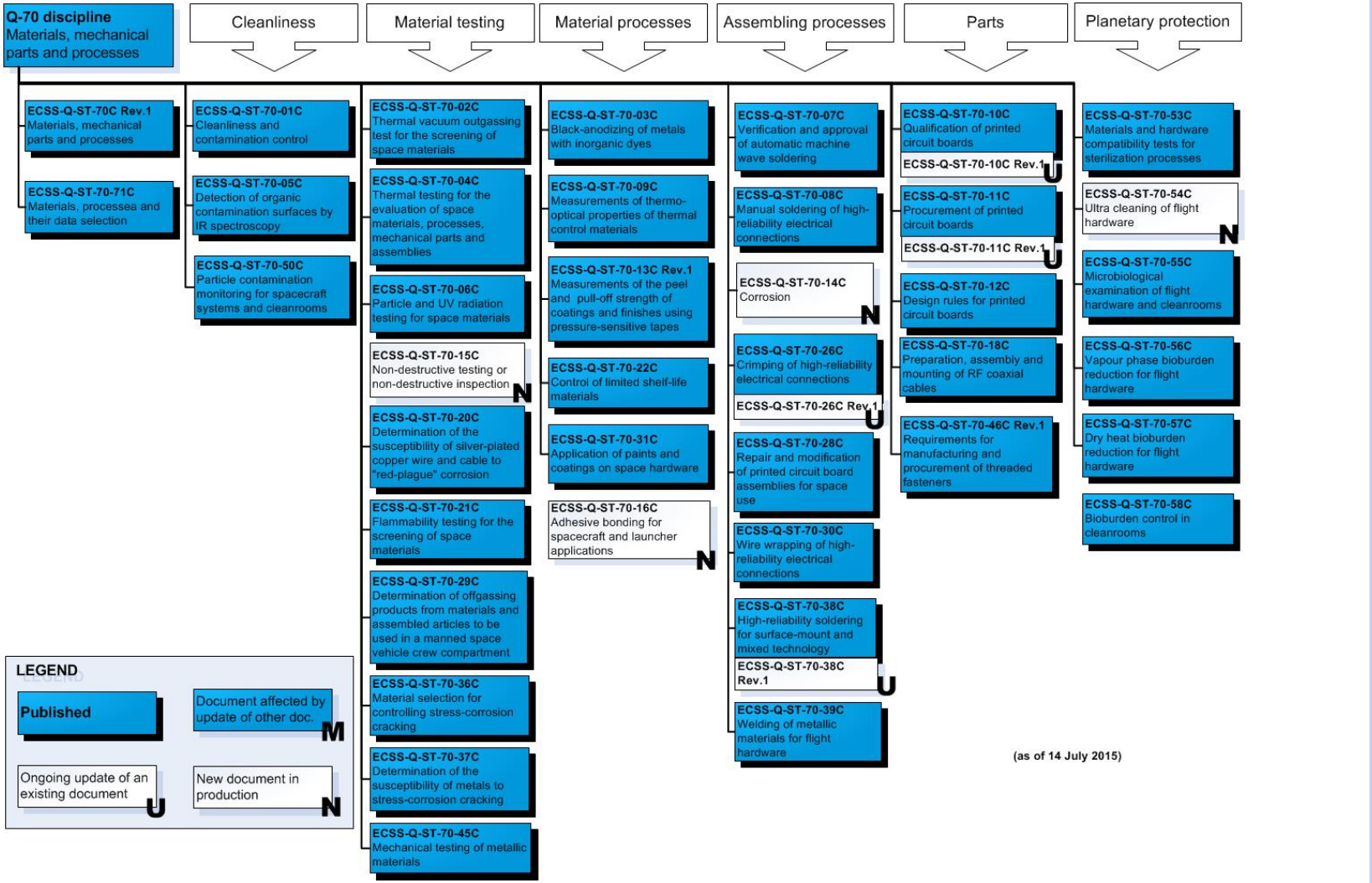
The Q branch – Standards (1/2: General)



2. The ECSS standardization documentation model

2.d – ECSS available documents (4/10)

The Q branch – Standards (2/2: The Q-70 discipline)



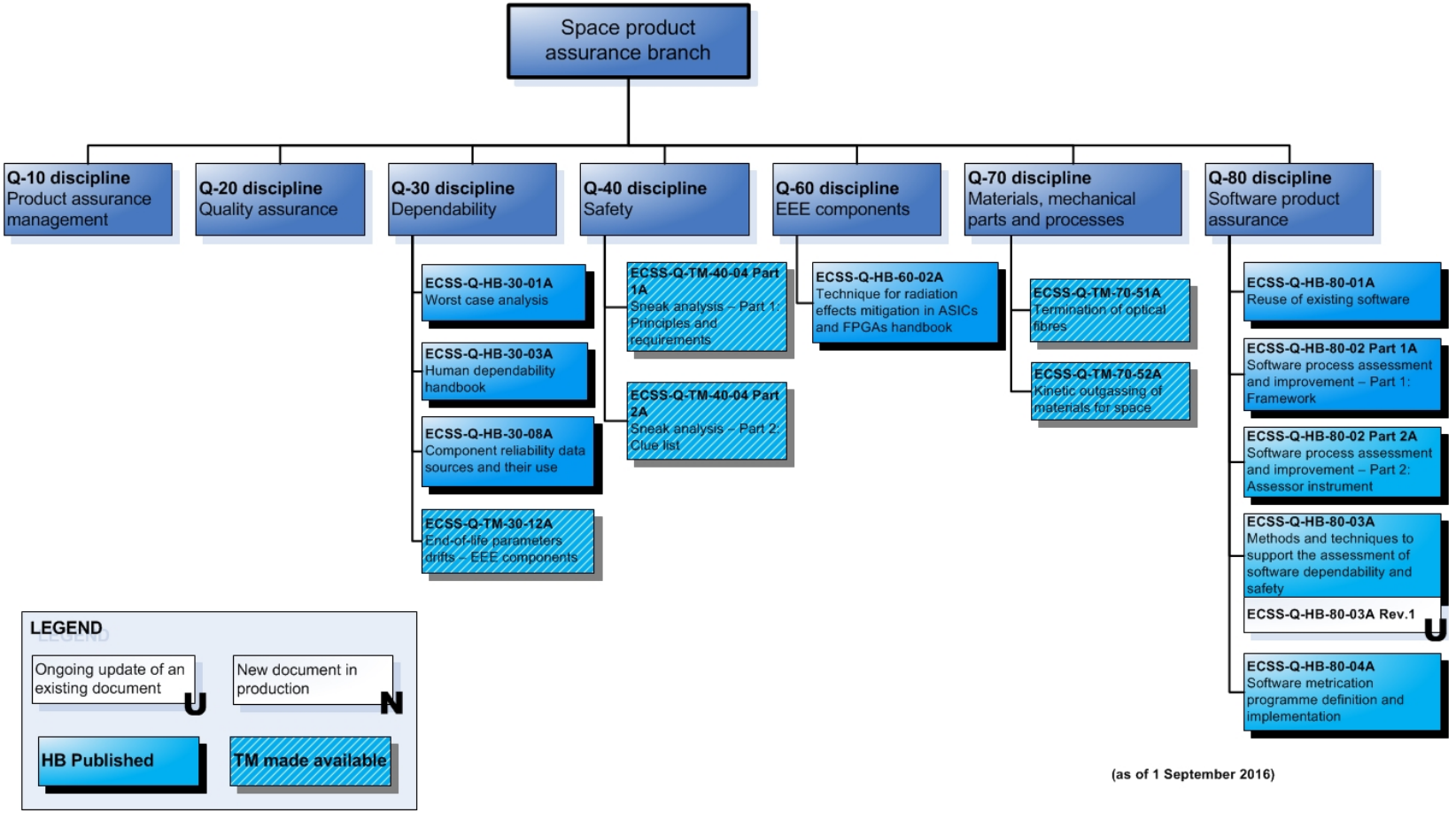
2. The ECSS standardization documentation model

2.d – ECSS available documents (5/10)

The Q branch – HBs & TMs

ECSS Handbooks and Technical memoranda

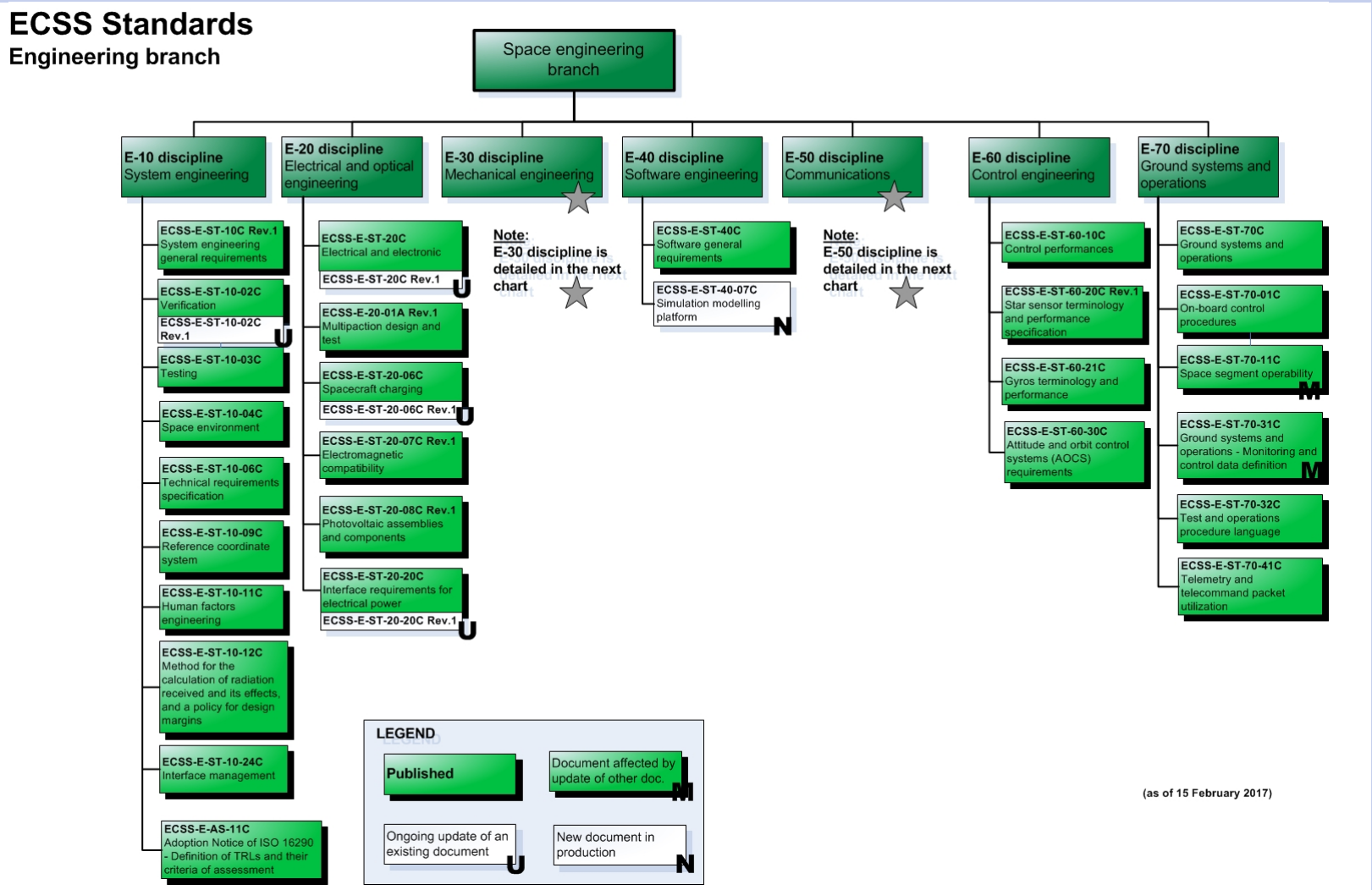
PA branch HBs and TMs



2. The ECSS standardization documentation model

2.d – ECSS available documents (6/10)

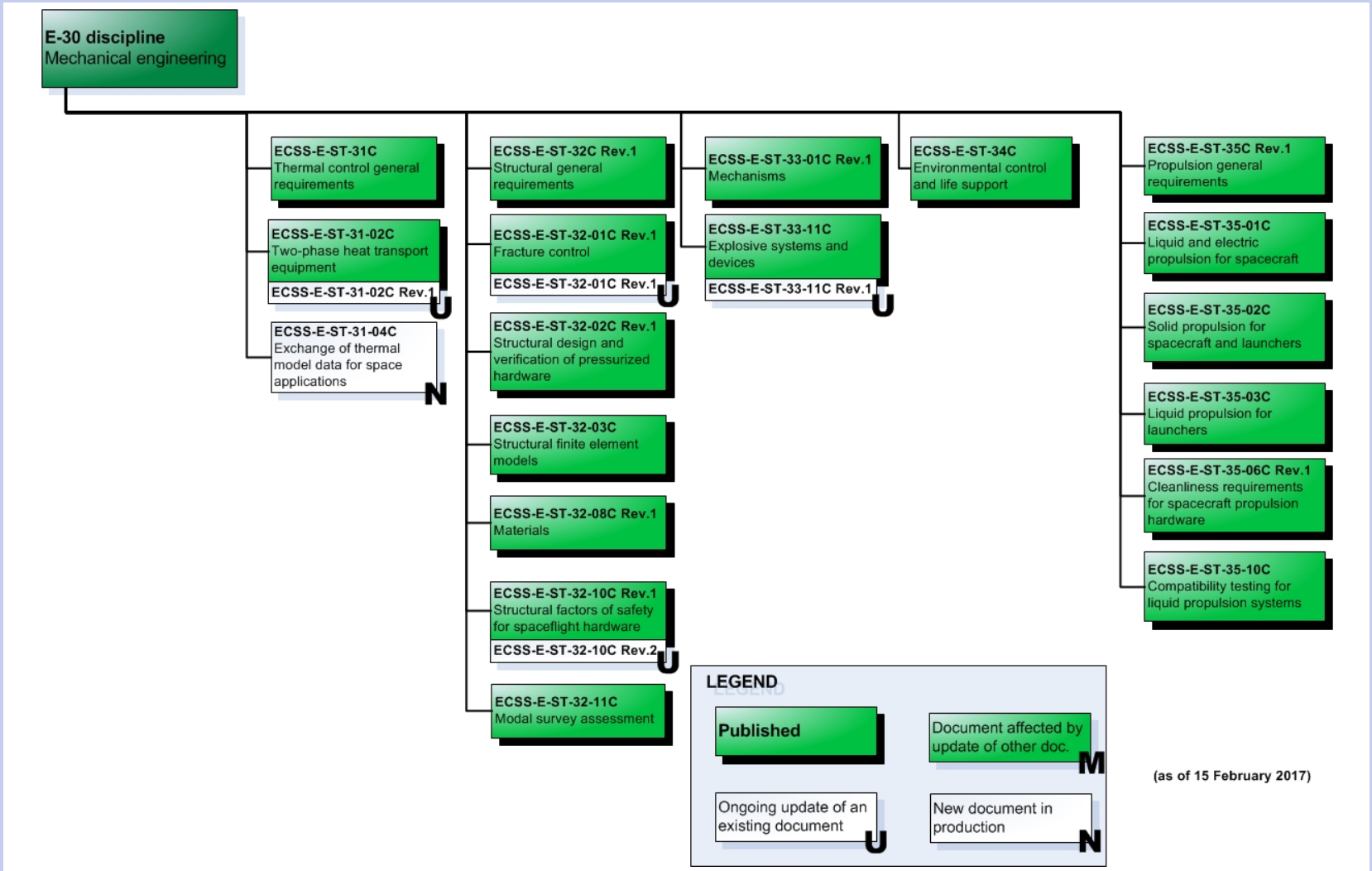
The E branch – Standards (1/2: General)



2. The ECSS standardization documentation model

2.d – ECSS available documents (7/10)

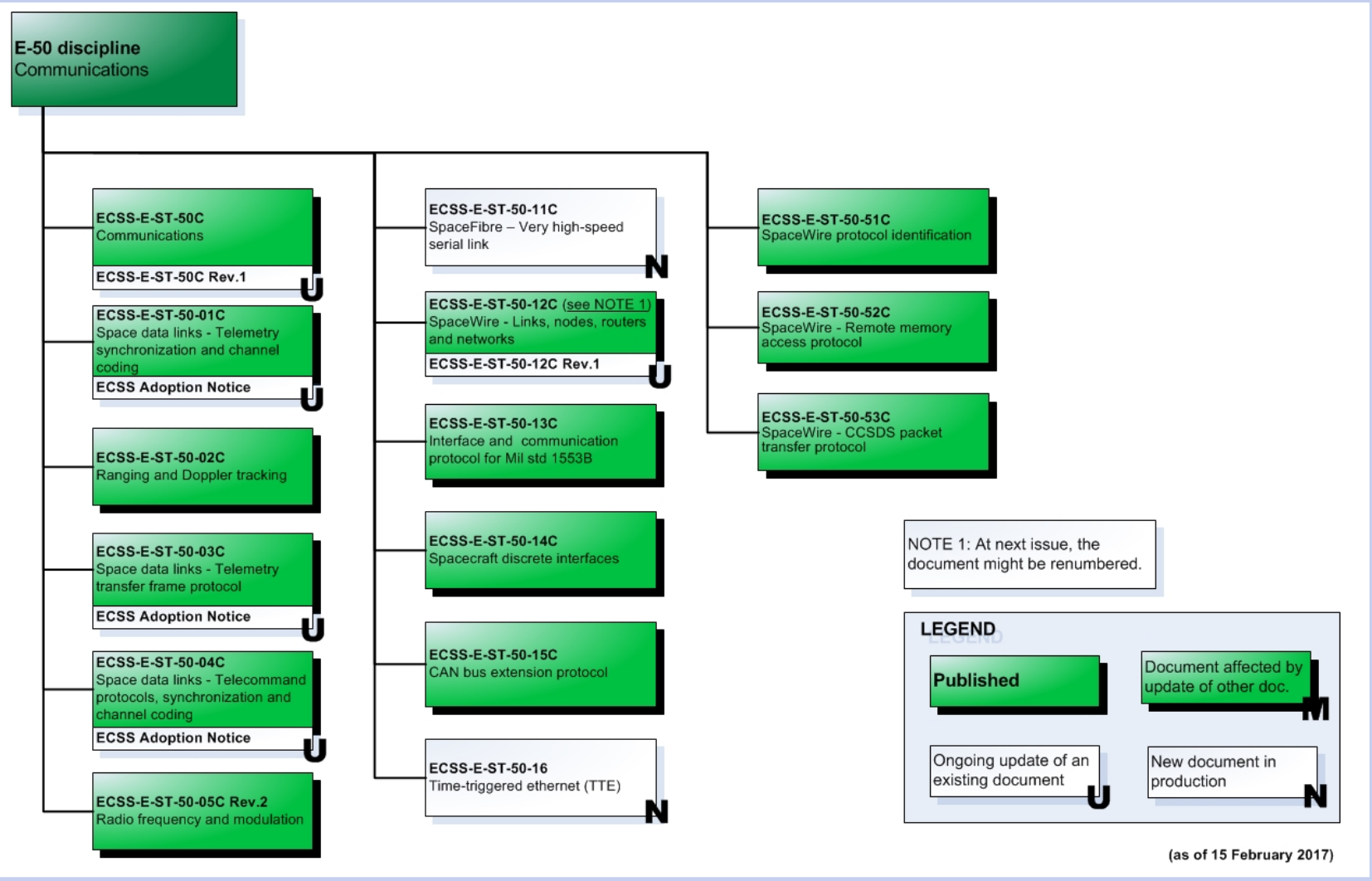
The E branch – Standards (1/2: General)



2. The ECSS standardization documentation model

2.d – ECSS available documents (8/10)

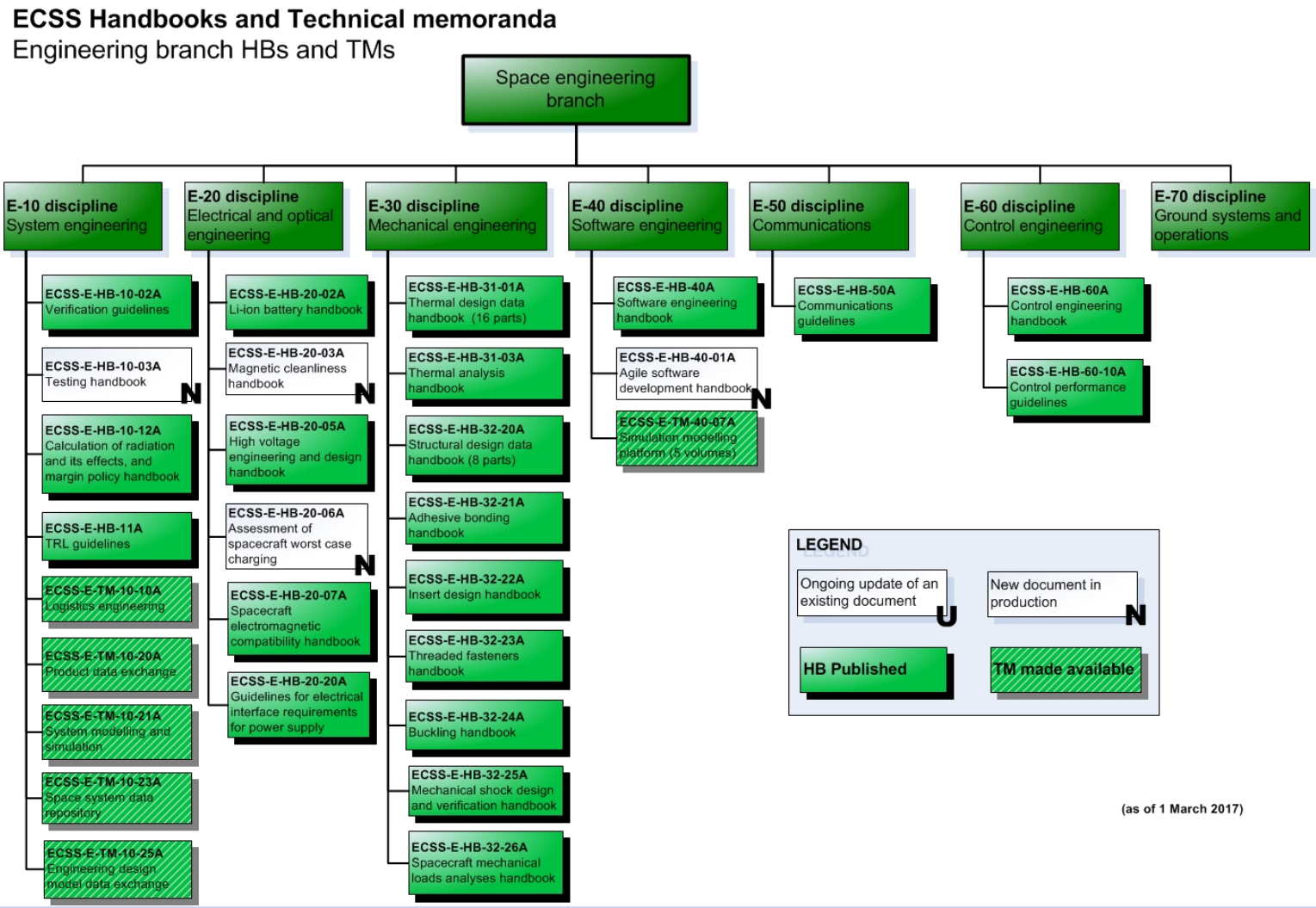
The E branch – Standards (1/2: General)



2. The ECSS standardization documentation model

2.d – ECSS available documents (9/10)

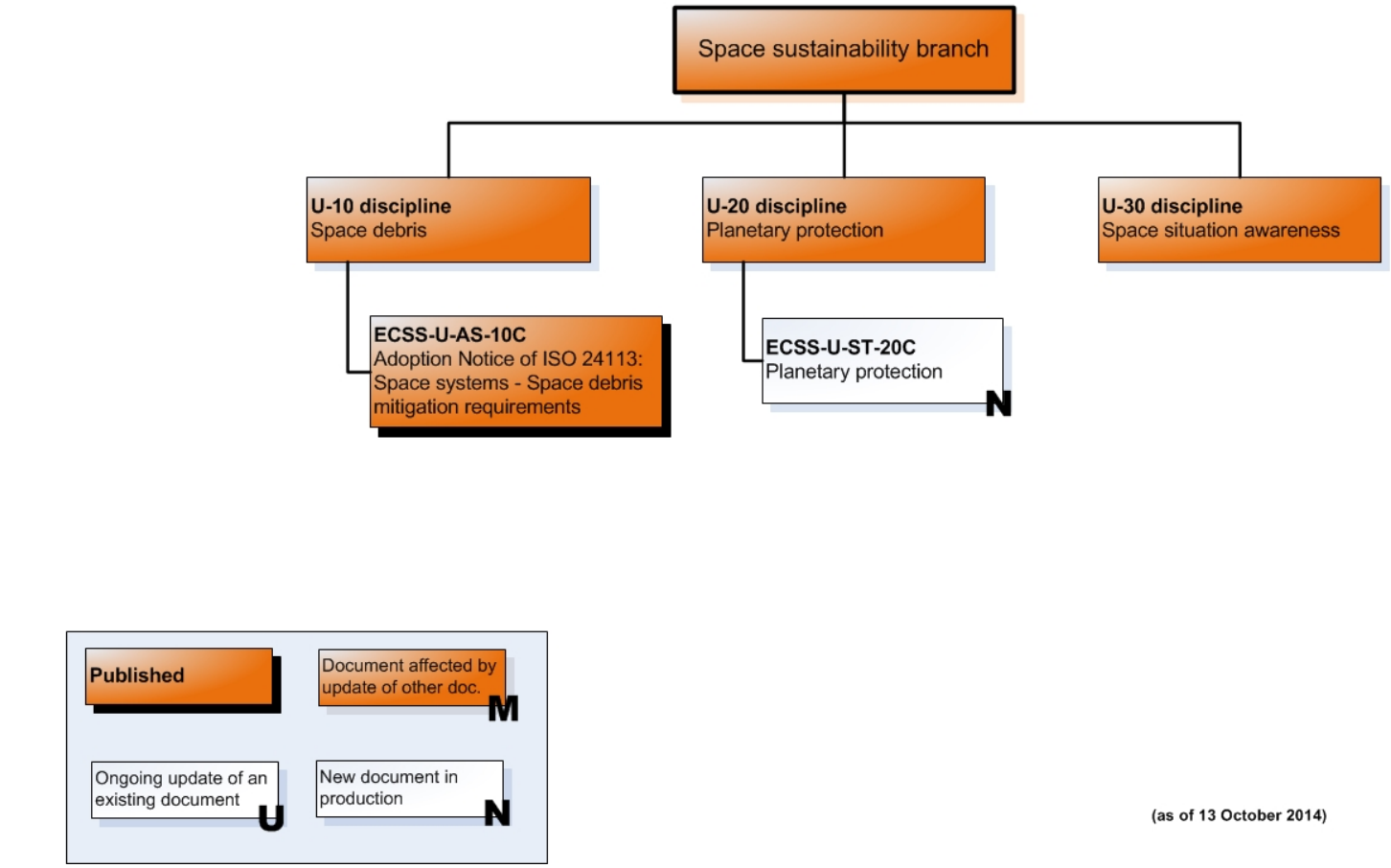
The E branch – HBs & TMs



2. The ECSS standardization documentation model

2.d – ECSS available documents (10/10)

The U branch – Standards



2. The ECSS standardization documentation model

2.e – The set of ECSS standards as a system (1/2)

- ECSS was started with the aims to develop a **single coherent set of space standards,** either adopted from other SDOs or developed by ECSS itself, for the use of the entire Space community
- This implies that **repetition and overlapping among standards should be avoided**.
  If an existing part of a document needs to be addressed in a second one, it is not repeated but a reference to the first one should be done
- Two types of references:
  - **Normative references**, which are references from a normative statement (e.g. a requirement), incorporating as part of such a requirement a part of other document. They exist ONLY in standards, and are listed in “Normative references”
  - **Informative references**, which are references from a non-normative (i.e. informative) statement.
    They may exist in standards, handbooks and TMs.
    In standards, they are listed in “Bibliography”
    In HBs & TMs, are listed in “References”.

- **ECSS is a consistent and coherent set of standards**
- **ECSS Standards shall NOT be used in isolation**

2. The ECSS standardization documentation model

2.e – The set of ECSS standards as a system (2/2)

Example: Software

- Software is specifically covered by the following ECSS standards: ECSS-E-ST-40 (SW engineering) and ECSS-Q-ST-80 (SW PA).
- However, these two documents are not enough to run a Space contract, even if the contract includes only SW.
- Examples of other ECSS standards which may need to be included are:
  - ECSS M-ST-10 “Project planning and implementation” for e.g. the definition of the project phases.
  - ECSS-M-ST-10-01 “Organization and conduct of reviews”
  - ECSS-M-ST-40 “Documentation and configuration management” for e.g. the SW configuration control
  - ECSS-E-ST-10 “System Engineering” for e.g. DDF, DJF, Technical Specification, …
  - ECSS-E-ST-10-02 “Verification”
  - ECSS-Q-ST-10-09 “Non-conformance control system”
  - ECSS-Q-ST-30 “Dependability” and Q-ST-40 “Safety” for e.g. criticality definition

2. The ECSS standardization documentation model

2.e – The set of ECSS standards as a system (2/2)

Exercise: Subject of debate

- Objectives
  - To become familiar with the tree of standards
  - Understand the intellectual exercise behind the selection process
- Methodology:
  - Every participant, with the tree of standards in front, to annotate his thoughts on the questions below for 5 minutes.
  - After this, an open debate between the participants (5-10 minutes) will take place.
- Question:
  - Which standards will be very likely applicable to the procurement of a **star sensor**,
  - Which standards may be applicable
  - Why?

2. The ECSS standardization documentation model

2.f – Characteristics of individual ECSS standards and requirements (1/3)

- ECSS standards are documents intended for direct use in ITTs and business agreements (e.g. in contracts).
- What does it mean “suitability for direct application in ITTs and contracts”?
  - It does **NOT** mean that a specific legal language is used.
  - It does mean that the content of the standards is improved to:
    - Avoid possible different interpretations
    - Clearly identify the obligations of each actor (customer and supplier)

In practical terms, this leads to the following 5 golden rules:

1. **Clear identification of what is really part of the obligations of the contract (i.e the normative statements), and what is only guidance and therefore is not part of the contract**
2. **Clear physical separation between obligations and guidance material.**
3. **Clear identification (by an UNIQUE identifier) of individual normative provisions.**
4. **All the requirements are clear, unambiguous, feasible and VERIFIABLE.**
5. **All normative cross-references (internal or external) are to the appropriate paragraphs**

2. The ECSS standardization documentation model

2.f – Characteristics of individual ECSS standards and requirements (2/3)

The 5 golden rules:

1. Clear identification of what is really part of the obligations of the contract (i.e the normative statements), and what is only guidance and therefore IS NOT PART OF THE CONTRACT.

   In ECSS normative statements are identified as follows:

   - Requirements, with SHALL / SHALL NOT
   - Recommendations, with SHOULD / SHOULD NOT
   - Permissions, with MAY / NEED NOT

2. Clear physical separation between obligations and guidance material.

   In ECSS a combination of all the following approaches is used:

   - Guidance material is covered in a specific clause(s). Normally Clause 4 is used to explain the principles. It is also usual that the first sub-clause of each main clause is used to introduce the subject.
   - For a unit of guidance/informative material, informative annexes can also be used.
   - For small pieces of information related to a specific requirement, NOTES to such a requirement are used.

Cont'd

2. The ECSS standardization documentation model

2.f – Characteristics of individual ECSS standards and requirements (3/3)

The 5 golden rules (Continuation):

3. Clear identification (by an UNIQUE identifier) of individual normative provisions.

   In ECSS, each requirement, recommendation and permission is individually tagged with an identifier. This is fundamental for two purposes:

   - ✧ For an easy and unambiguous **tailoring**
   - ✧ For an efficient control of the **verification** process.

4. All the requirements are clear, unambiguous, feasible and VERIFIABLE.

   Writing verifiable requirements has proved to be sometimes a challenge at the time of writing the standard. However, ECSS consider that this is a MUST for any ECSS standard.

5. All normative cross-references (internal or external) are to the appropriate paragraphs (i.e. they don't make mandatory a complete document, when only some paragraphs are applicable)

2. The ECSS standardization documentation model

2.g – Anatomy of an ECSS standard (1/1)

Anatomy of a typical standard (ESA-only and ECSS)

- ❑ **Change log, ToC** & *[Introduction]*
- **1. Scope**
  Clearly and concise identification of the coverage and the applicability of the standard
- **2. Normative references**
  Listing ONLY documents referenced from requirements.
- **3. Terms, definitions and abbreviations**
- *4. [Principles and/or background]*
  Containing ONLY informative/guidance material
- **5. Requirements**
  Containing the normative provisions.
  It may contain some NOTES and some few guidance sub-clauses with only guidance material.
- *6. [More requirements…]*

Last Clause: **Pre-tailoring (per product type)**
Only mandatory if standard is subject to pre-tailoring

A,B,…[Annexes]
First Normative annexes **(DRDs)**, and then Informative annexes]

- ❑ **Bibliography**
  Listing the documents referenced from the informative / guidance text

Clause/section always present
[Optional clause/section]

What are DRDs? (Document Requirement Definition)

- ❑ DRDs are Normative Annexes, i.e. they are requirements
- ❑ They specify the content of a deliverable document
- ❑ They do not specify the format, only the information to be provided.
- ❑ They are always referenced from a requirement specifying who, when, and how often the document shall be provided. The DRD specifies ONLY the content.

3 Application in Space projects and dissemination of ECSS standards

a. Tailoring:
   - What is tailoring
   - The customer-supplier chain
   - The tailoring process
   - The EAT (ECSS applicability table)
   - The EARM (ECSS applicability requirement matrix)

b. Requirement management tools:
   DOORS databases

c. Dissemination of ECSS information

3. Application and dissemination of ECSS standards

3.a – Tailoring (1/5)

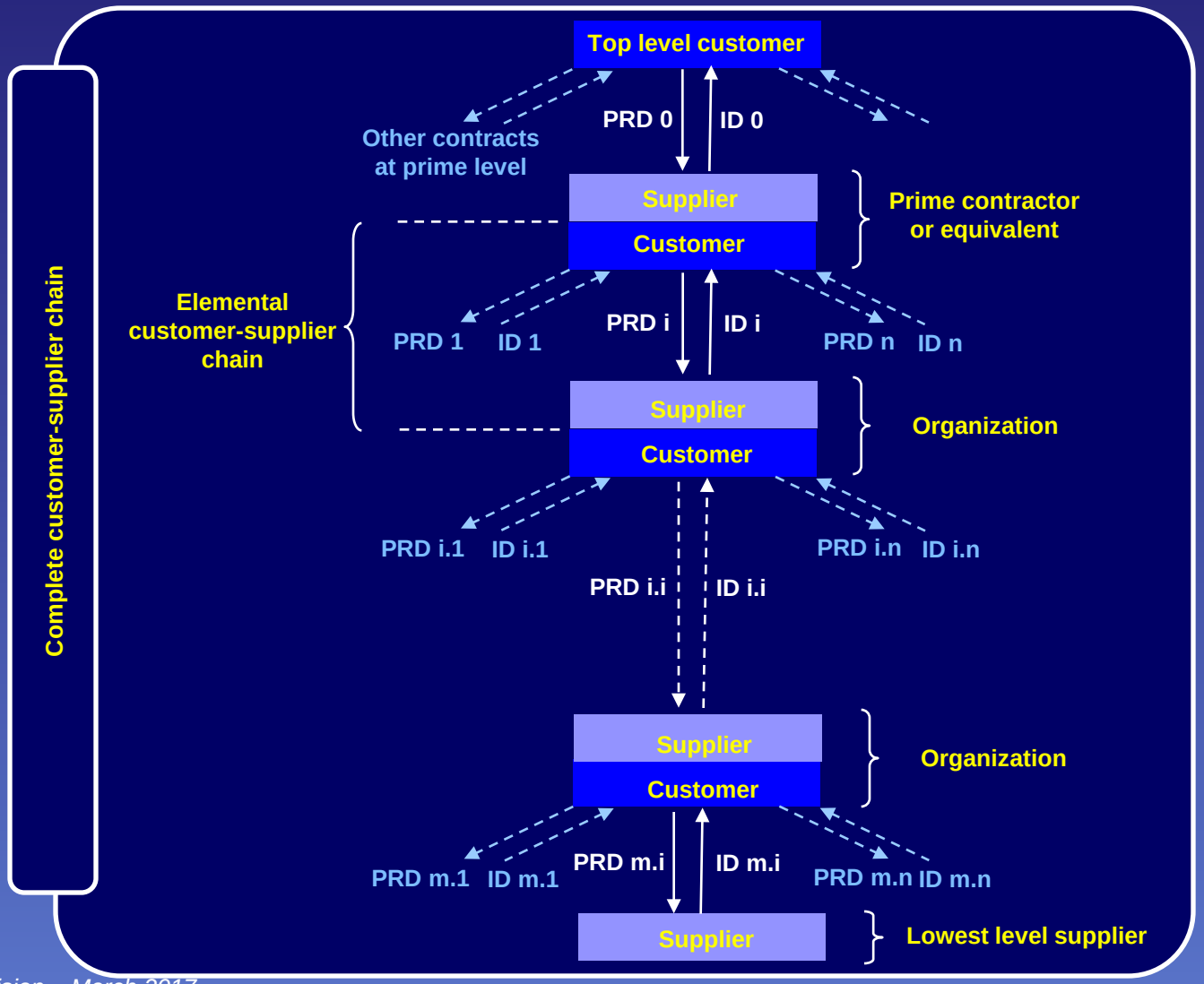
What is tailoring

- ECSS standards are made applicable at each level of the customer-supplier chain by adapting them to the specificities of the project, at this level. This adaptation process is called tailoring.
- Project requirements within the PRD are therefore composed by 2 sets:
  - Requirements specific to the project
  - ECSS Requirements, once tailored to the project
- Tailoring shall be performed by the customer, at each level of the customer-supplier chain.

3. Application and dissemination of ECSS standards

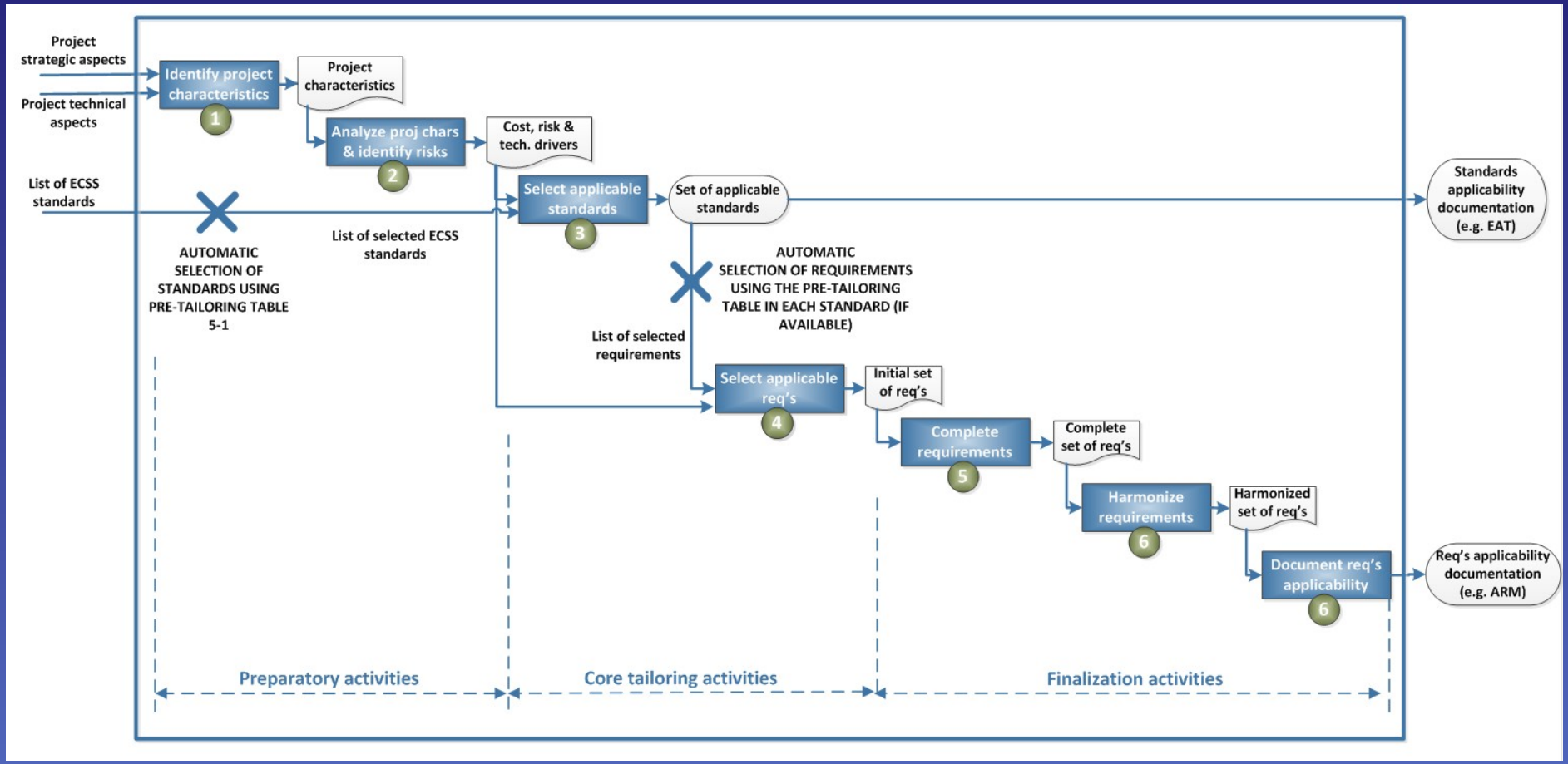
3.a – Tailoring (2/5)

Customer-supplier network concept



3. Application and dissemination of ECSS standards

3.a – Tailoring (3/5) – The tailoring process



3. Application and dissemination of ECSS standards

3.a – Tailoring (4/5)

The ECSS Applicability Table (EAT)

ECSS Applicability table (EAT)

Project/Programme: Mission type:
Contract information: Issue date:
Originator: Event generation:

Standard	Applicability (A / T / >> /NA)	Justification (including justification of the use of other standard instead of)

A: Standard fully applicable without tailoring
M: Standard applicable with tailoring. For each of these standards, the generation of a EARM is expected.
>> See meaning in #5.2.1a and Table 5-1. Standard applicable at a lower level of product and to be tailored by the customer of this lower level
NA Standard not applicable at all

3. Application and dissemination of ECSS standards

3.a – Tailoring (5/5)

The ECSS Applicability Requirement Matrix (EARM)

ECSS Applicability requirement matrix (EARM)

Project/Programme:
Issue date:
Event generation:
Product type:

Contract information:
Originator:
Standard reference:

THE COMPLETE SET OF REQUIREMENTS IN THE STANDARDS IN THE EAT ARE APPLICABLE, WITH THE MODIFICATIONS STATED IN COLUMNS 2 TO 6 OF THIS EARM					
1. ECSS Standard	2. ECSS Req. identifier	3. Org. Req. identifier	4. Applicability (M/D/N)	5 Modified or New requirement (Full text)	6. Justification (Only in case of M, D or N in column 4)

NOTE: Column 3 is provided to give the users the capability of using their own requirement identification system, in parallel with the identification of the requirement in the applicable standard (Column 2).

M: Requirement applicable with Modification
D: Requirement Deleted, not applicable
N: New requirement (requirement added)

3. Application and diof ECSS standards in Space projects

3.c – Requirement management tools: DTT and DOORs (1/1)

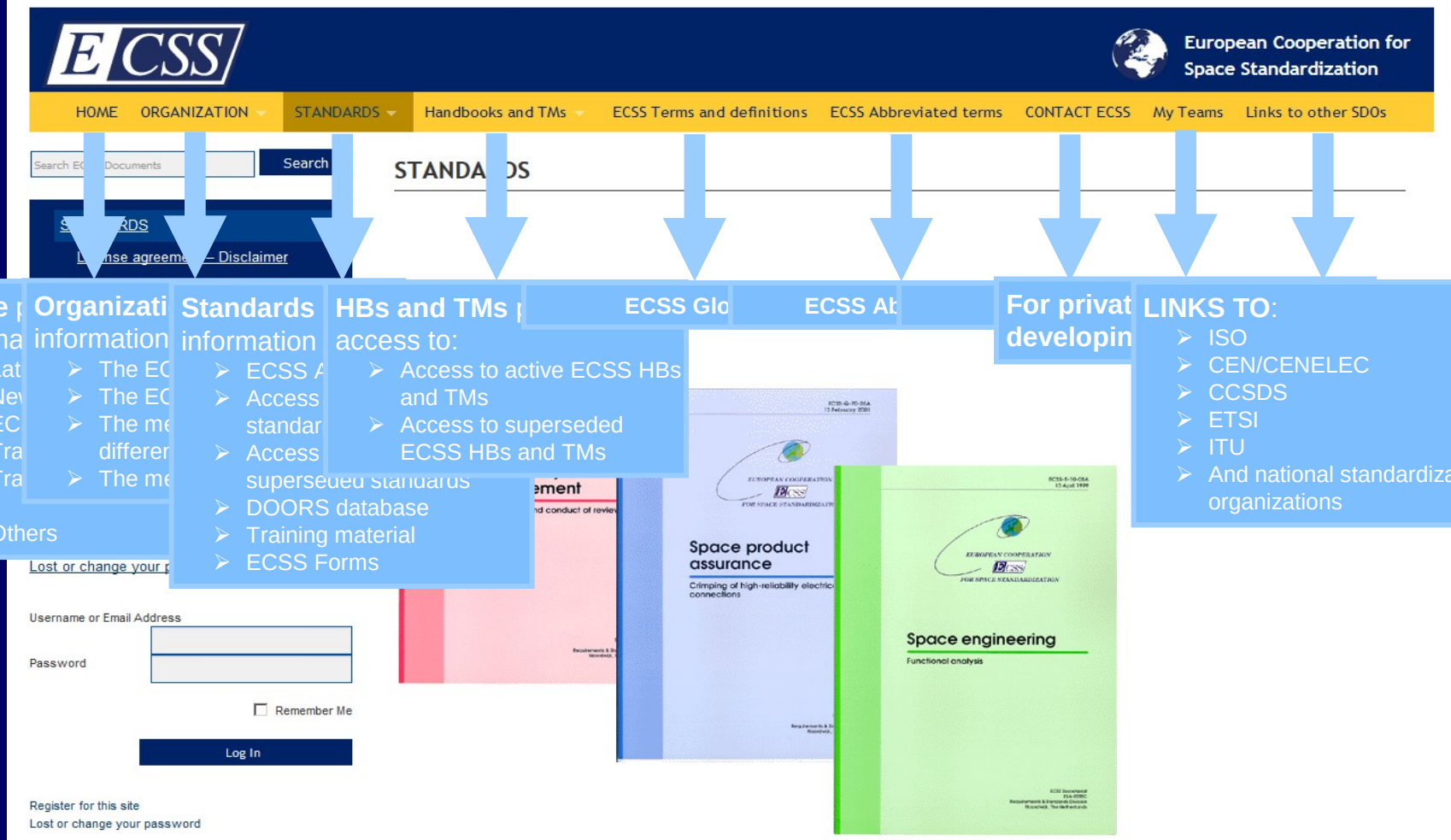
DOORs ECSS database

- DOORs is a commercial SW from IBM for **requirement management**
- **It is designed for management of requirements during their lifecycle, including flowing down to (sub)contractors**
- **The tool, customized for Space requirement management purposes, and the database with all the ECSS standards version C (or later), is available under request to ESA.**
- **The application and the database with all ECSS (standards and requirements) in version C or later, is available under request to ESA.**
- Advantages:
  - Powerful. It permits full requirement configuration control, at all levels in the customer-supplier chain, including full traceability to the original requirements.
- Disadvantages:
  - It needs a license → not usable universally.
  - Expensive, both the license and in terms of learning time
- **ECSS has produce a DOORS database of all ECSS requirements**
- **Now this database is approved by the ECSS SB and available**

3. Application and dissemination of ECSS standards

3.c Dissemination of ECSS information (1/4)

The ECSS Website: www.ecss.nl



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Standards information
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- Access standar
- Access superseded standards
- DOORS database
- Training material
- ECSS Forms

HBs and TMs access to:
- Access to active ECSS HBs and TMs
- Access to superseded ECSS HBs and TMs

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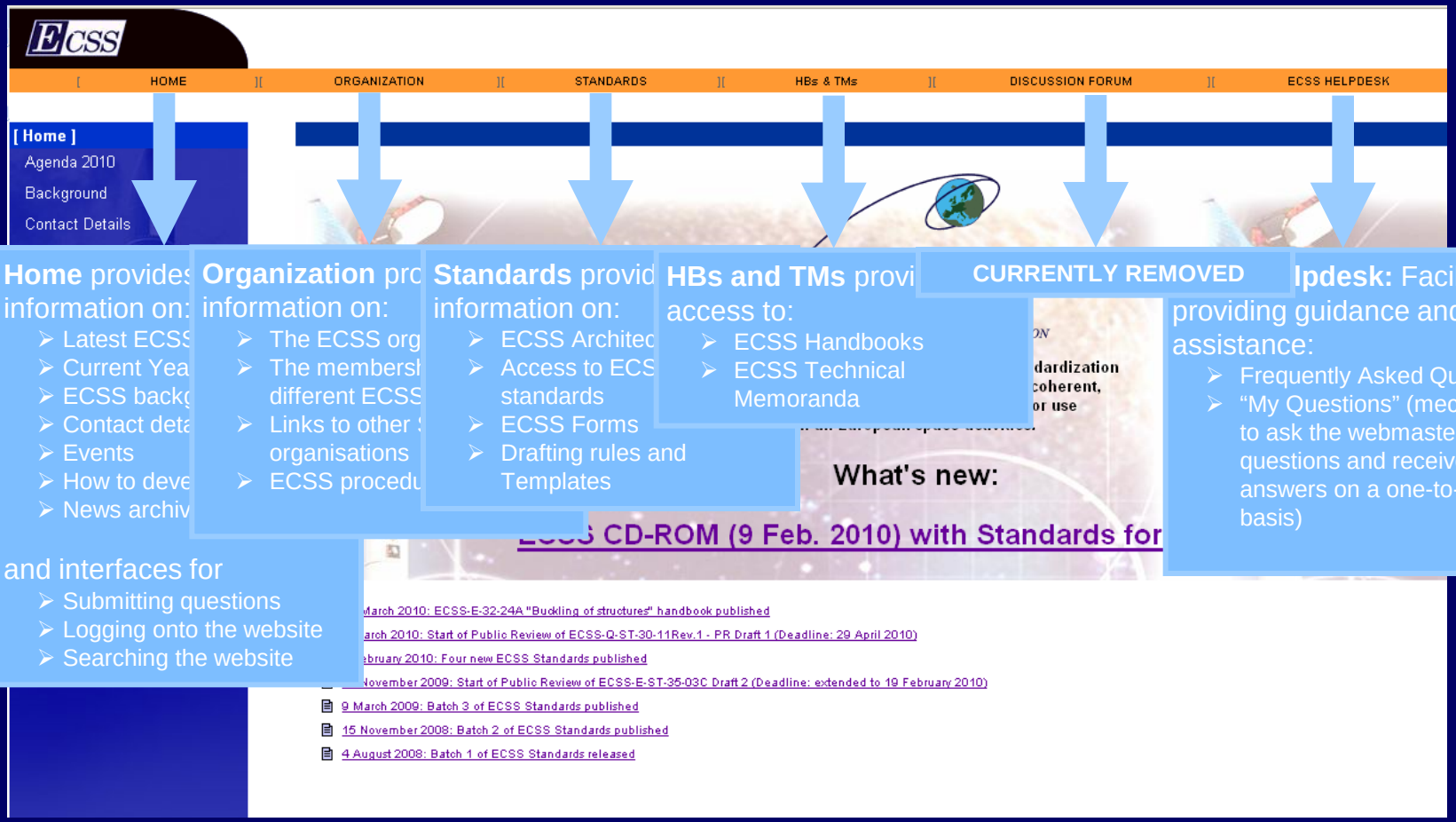
LINKS TO:
- ISO
- CEN/CENELEC
- CCSDS
- ETSI
- ITU
- And national standardization organizations

3. Application and dissemination of ECSS standards

3.c Dissemination of ECSS information (2/4)

The ECSS Website: www.ecss.nl



Home provides information on:
- Latest ECSS
- Current Yea
- ECSS backg
- Contact deta
- Events
- How to deve
- News archiv

and interfaces for
- Submitting questions
- Logging onto the website
- Searching the website

Organization pro information on:
- The ECSS org
- The membersh different ECSS
- Links to other organisations
- ECSS procedu

Standards provid information on:
- ECSS Architec
- Access to ECS standards
- ECSS Forms
- Drafting rules and Templates

HBs and TMs provi access to:
- ECSS Handbooks
- ECSS Technical Memoranda

CURRENTLY REMOVED

lpdesk: Facility for providing guidance and assistance:
- Frequently Asked Questions
- "My Questions" (mechanism to ask the webmaster questions and receive answers on a one-to-one basis)

The ECSS Website: www.ecss.nl

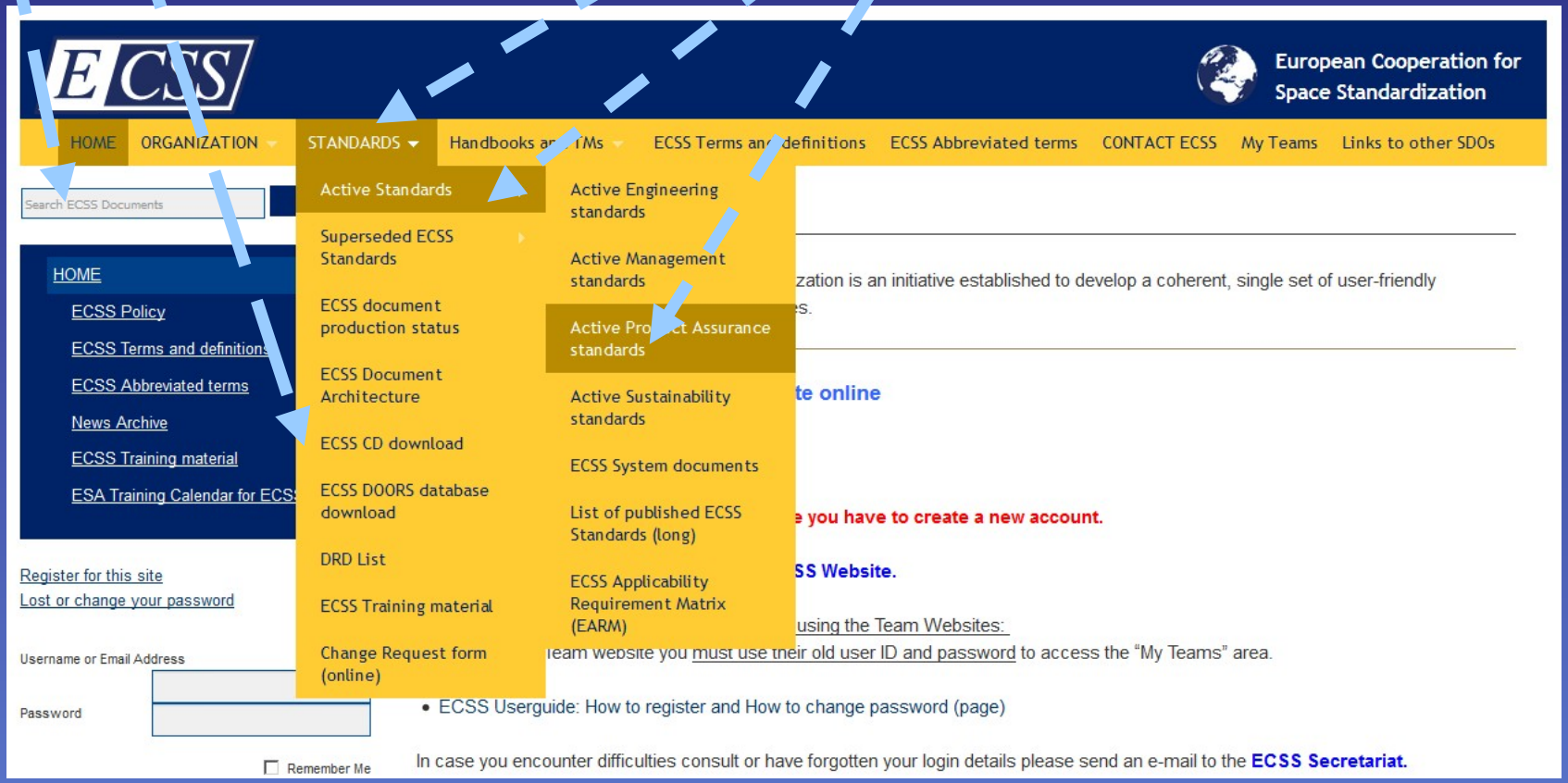
How to obtain ECSS standards (3/4)

1. Log in with your username & password, and then either…

2. Download the complete set of docs to burn a CD, or…

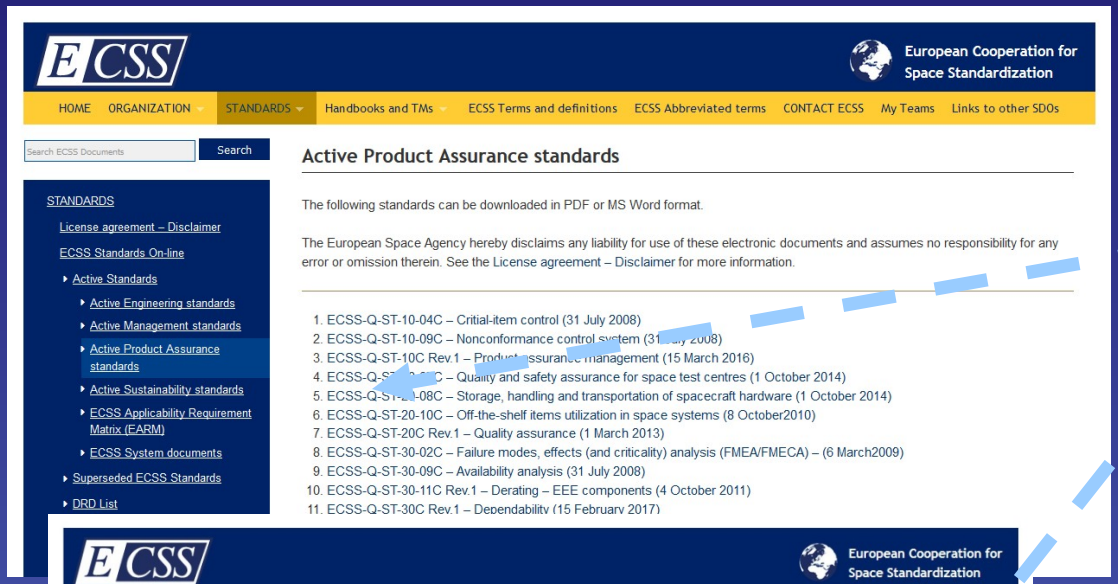
2. Go on “Standards”
3. Go on “Active standards”
4. Click on the desired branch (e.g. Product Assurance standards)

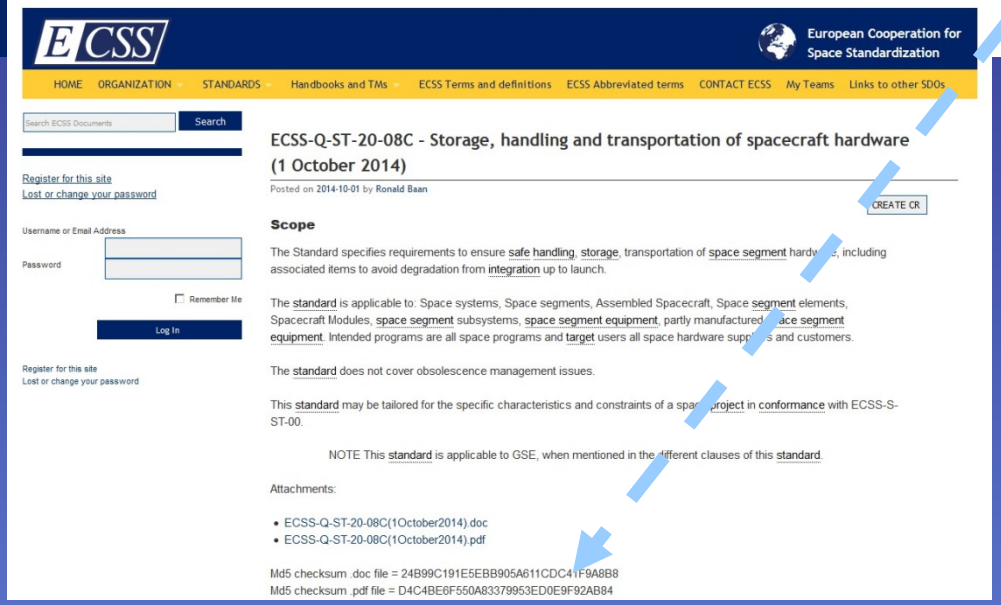
Cont’d…



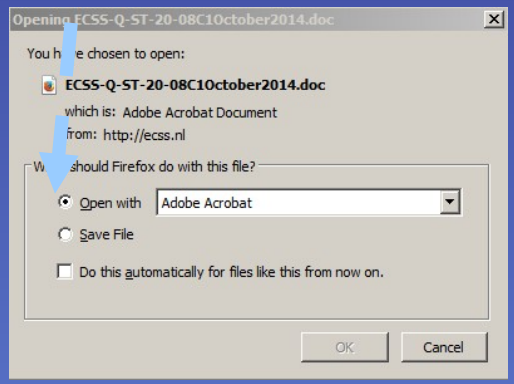
The ECSS Website: www.ecss.nl

How to obtain ECSS standards (4/4)





1. Click on the desired standard (e.g. ECSS-Q-ST-20-08C
2. Click on the desired format (doc or pdf)
3. Open or Save



3. Application and dissemination of ECSS standards

3.c Standardization points of contact (1/2) – In ESA

Discipline	ESA Discipline responsible	
M	TBD	(ESTEC)
Q10/Q20	Rafael.Prades@esa.int	(ESTEC)
Q-30	Luigi.Bianchi@esa.int	(ESTEC)
Q-40	Rafael.Prades@esa.int	(ESTEC)
Q-60	Ralf.de.Marino@esa.int	(ESTEC)
Q-70	Mikko.Nikulainen@esa.int	(ESTEC)
Q-80	Lothar.Winzer@esa.int	(ESTEC)
E-10	Frederic.Teston@esa.int	(ESTEC)
E-20	Henri.Barde@esa.int	(ESTEC)
E-30	Benoit.Laine@esa.int	(ESTEC)
E-40	Jean-Loup.Terraillon@esa.int	(ESTEC) &
	Mariella.Spada@esa.int	(ESOC)
E-50	Gian.Paolo.Calzolari@esa.int	(ESOC)
E-60	Alain.Benoit@esa.int	(ESTEC)
E-70	Mario.Merri@esa.int	(ESOC)
U10/U20	Rosario.Nasca@esa.int	(ESTEC)

TEC-QR

DIVISION HEAD:
Roger.Jegou@esa.int

STANDARDIZATION ENGINEERS:
ESA rep. in the ECSS TA:
Enrique.Gonzalez.Conde@esa.int

ECSS Secretary:
Andrew.Herd@esa.int

Standardization officer engineers:
Lorenzo.Marchetti@esa.int
Olga.Zhdvanovich@esa.int

DOCUMENT CONTROL & ADMIN
Klaus.Ehrlich@esa.int
Nathalie.Reuze.Witasse@esa.int

PROGRAMME CONTROLLER
Evelyne.Cheroux@esa.int

3. Application and dissemination of ECSS standards

3.c Standardization points of contact (2/2) – In ECSS

Branch	TAAR1	TAAR2	DiFP
M-10	**W. Knorr** (Airbus DS / Eurospace)	**R. Carpentiero** (ASI)	**D. Schiller** (DLR)
M-40	**R. Carpentiero** (ASI)	**W. Knorr** (Airbus DS / Eurospace)	**M. Marchi** (TAS / Eurospace)
M-60	**E. Gonzalez-Conde** (ESA)	**W. Knorr** (Airbus DS / Eurospace)	**C. Blacker** (ESA)
M-70	**E. Gonzalez-Conde** (ESA)	**W. Knorr** (Airbus DS / Eurospace)	**TBD**
M-80	**R. Carpentiero** (ASI)	**W. Knorr** (Airbus DS / Eurospace)	**TBD**
E-10	**D. Dodi** (TAS / Eurospace)	**F. Durand-Carrier** (CNES)	**F. Teston** (ESA)
E-20	**D. Dodi** (TAS / Eurospace)	**E. Gonzalez-Conde** (ESA)	**H. Barde** (ESA)
E-31	**J.-P. Hulier** (Airbus DS / Eurospace)	**E. Gonzalez-Conde** (ESA)	**W. Supper** (ESA)
E-32	**J.-P. Hulier** (Airbus DS / Eurospace)	**E. Gonzalez-Conde** (ESA)	**T. Henriksen** (ESA)
E-33	**J.-P. Hulier** (Airbus DS / Eurospace)	**F. Castanet** (CNES)	**T. Henriksen** (ESA)
E-34	**W. Knorr** (Airbus DS / Eurospace)	**D. Schiller** (DLR)	**TBD**
E-35	**J.-P. Hulier** (Airbus DS / Eurospace)	**F. Castanet** (CNES)	**D. Arrat** (CNES)
E-40	**J.-P. Hulier** (Airbus DS / Eurospace)	**E. Gonzalez-Conde** (ESA)	**J.-L. Terraillon** (ESA)
E-50	**F. Castanet** (CNES)	**D. Dodi** (TAS / Eurospace)	**J.-P. Calzolari** (ESA)
E-60	**F. Durand-Carrier** (CNES)	**W. Knorr** (Airbus DS / Eurospace)	**D. Gendre** (Airbus DS / Eurospace)
E-70	**D. Dodi** (TAS / Eurospace)	**F. Durand-Carrier** (CNES)	**N. Peccia** (ESA)
Q10/Q20	**D. Schiller** (DLR)	**G. Crivellari** (TAS / Eurospace)	**T. Peacock** (Airbus DS / Eurospace)
Q-30	**F. Castanet** (CNES)	**G. Crivellari** (TAS / Eurospace)	**B. Guerin** (TAS / Eurospace)
Q-40	**G. Crivellari** (TAS / Eurospace)	**F. Castanet** (CNES)	**L Bianchi** (ESA)
Q-60	**G. Crivellari** (TAS / Eurospace)	**D. Schiller** (DLR)	**P. Lay** (CNES)
Q-70	**E. Gonzalez-Conde** (ESA)	**G. Crivellari** (TAS / Eurospace)	**M. Nikulainen** (ESA)
Q-80	**J.-P. Hulier** (Airbus DS / Eurospace)	**E. Gonzalez-Conde** (ESA)	**L. Winzer** (ESA)
U-10	**F. Durand-Carrier** (CNES)	**J.-P. Hulier** (Airbus DS / Eurospace)	**R. Destefanis** (TAS / Eurospace)
U-20	**E. Gonzalez-Conde** (ESA)	**J.-P. Hulier** (Airbus DS / Eurospace)	**TBD**
S, D & P docs	**F. Castanet** (CNES)	**ES**	**TBD**

Thanks for your attention