ECSS NextGen Status – Sep / Oct 2024

ESA-TECQES-HO-2024-003182

→ THE EUROPEAN SPACE AGENCY

ECSS has 30 years of successful heritage now it needs to be updated for the next 30 years!

→ tailoring is heavy for projects teams

→ unclear what requirements to apply in smaller activities

→ lacks industrialisation view

>29000 requirements

document centric

what vs how
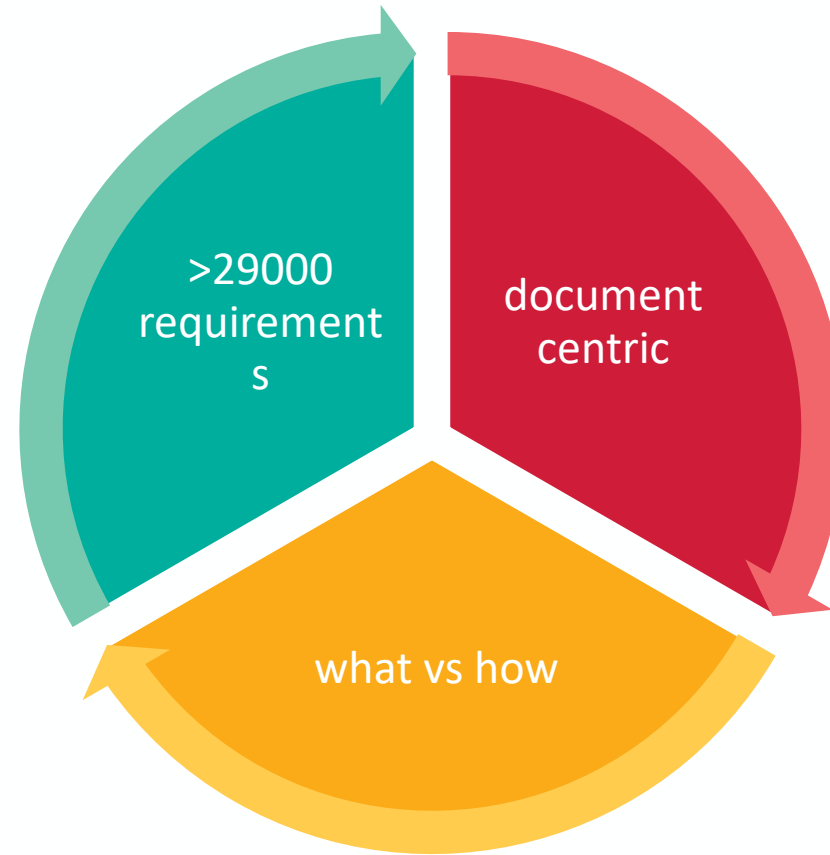
→ requirements are organised in documents

→ multiple documents must be used at the same time

→ large number of procedural requirements

→ unclear what requirements apply and when

ECSS NextGen Mission Statement

ESA

ECSS members agreed on a project-based approach, mission statement, and draft project plan for the next generation ECSS system to be completed by the end of 2025

Key Objectives

1 Lower the cost and threshold to utilise ECSS in different scenarios, whilst achieving the expected quality for the products.

2 Enable all stakeholders to select and apply the **relevant** and **essential** content from ECSS for their activities, through a simplified normative structure and digital tailoring means.

To be achieved by

Identify the requirements (**what** – target under 50% of current requirements), technical specifications, means of compliance (**how**), and informative elements (**why**) from the current standards. Identify obsolete requirements for removal.

Digitalise the system end-to-end to provide a multi-dimensional project and product-specific tailoring tool serving all stakeholders and procurement scenarios.
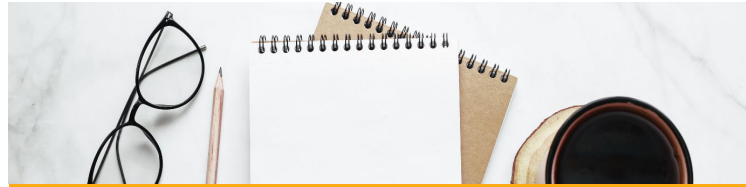
Implement a 15-months collaborative project with ECSS stakeholders to achieve by end of 2025:
→ digital platform to maintain, manage, and facilitate the use of the ECSS system
→ full re-organisation of ECSS system structure and content towards the agreed objectives

3-pillar approach for the future of ECSS NextGen

Full Digitalisation	ECSS Issue D	Multidimensional Tailoring
scope → accelerate existing procurements for the ECSS Digitalisation toolset → switch from document-based approach to a requirements database → exchange interfaces with industry	→ clear separation of existing ECSS content: **what** requirements **how** means of compliance **why** guidelines/information → commitment from ECSS members to participate	→ easy filtering of requirements for each project: i.e. *I am developing a solar panel for a 2000Wh satellite. What requirements shall apply ?* → use existing training data to help the application of standards in projects and **flow down of reqs**

key benefits
→ **Modern, digital and agile European Space Standards are an important asset for the European Space Industry, for all National Agencies, ESA and the European Commission**
→ **ECSS system serves as a recognised reference for all international partnerships with e.g. NASA and JAXA**

ECSS Next Generation Workshop: Project Plan

Schedule

→ 15 months overall project duration
→ **2025 final deliverables ready for ESA CMin25**
→ collocated 5-day sessions to review/agree the new and final format of the standards
→ the project-WG shall process about 10 to 15 standards/month (~ 2500 requirements)
→ Final review and approval process by ECSS TA before publication

Industrial Procurements

→ Industrial support to pre-classify all requirements [what/how/why] to serve as input for the project-WG review process
→ Digitalisation, implemented by an ESA ITT
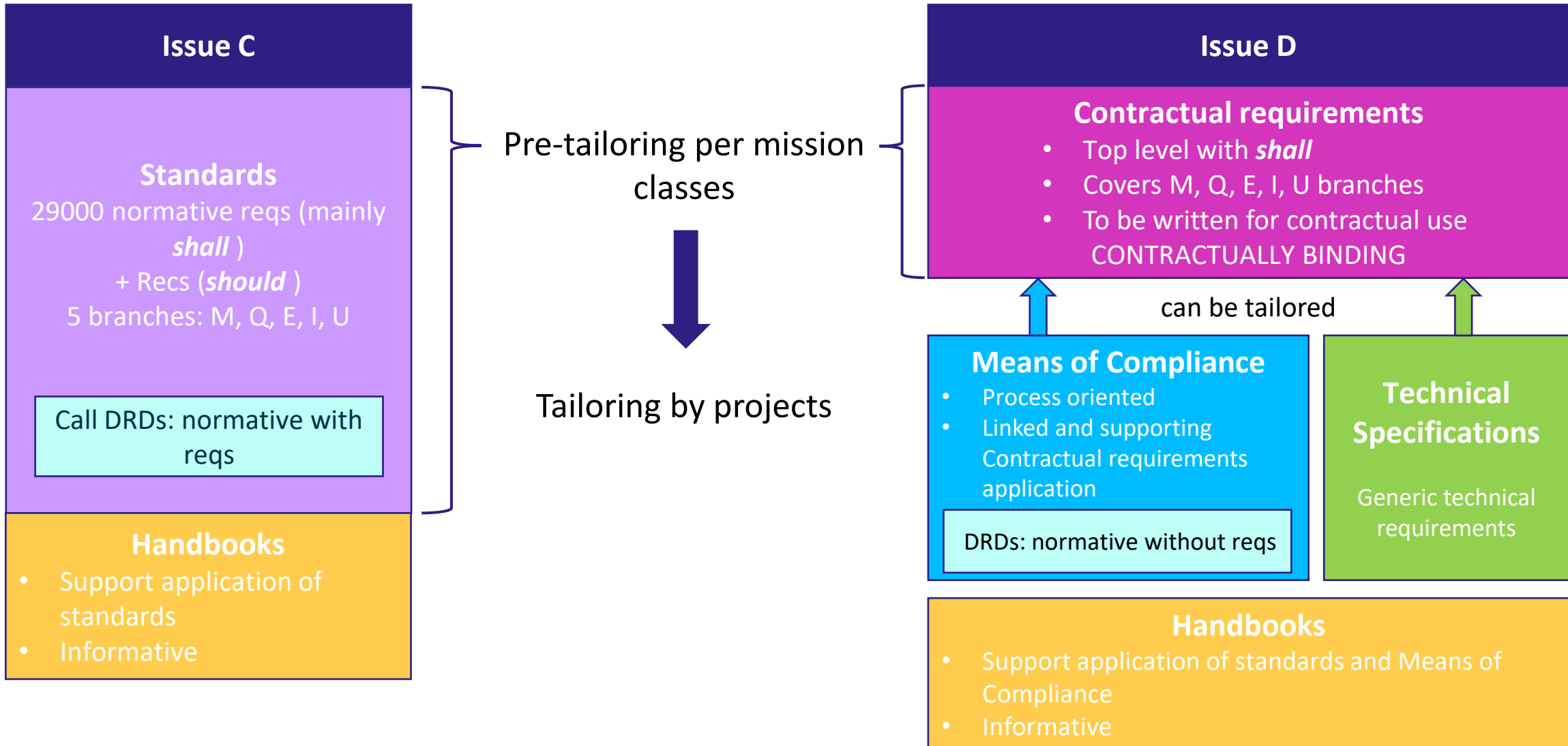→ Cost reimbursement for the ECSS WG participants
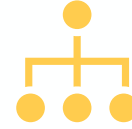
Organisation and Reporting

→ Space Agencies and Industry represented in the project-WG
→ monthly report to the ECSS SB and ECSS TA
→ the output of the project-WG will be submitted for approval and review by ECSS TA, before the publication of the entire ECSS NextGen
→ the project-WG will prepare a communication plan to ensure stakeholders are aware of ECSS NextGen
→ to involve the user community, test cases will be performed to simulate the application of a standard in a project between Agencies and Industry

Deliverables

→ all new ECSS system published in 4th Quarter of 2025 and composed of:
1. ECSS re-organised structure and content towards the agreed objectives
2. Digital platform to maintain, manage, and facilitate the use of the ECSS system

ECSS Re-structuring

Issue C

Standards
29000 normative reqs (mainly *shall*)
+ Recs (*should*)
5 branches: M, Q, E, I, U

Call DRDs: normative with reqs

Handbooks
- Support application of standards
- Informative

Pre-tailoring per mission classes

Tailoring by projects

Issue D

Contractual requirements
- Top level with *shall*
- Covers M, Q, E, I, U branches
- To be written for contractual use
  CONTRACTUALLY BINDING

can be tailored

Means of Compliance
- Process oriented
- Linked and supporting Contractual requirements application

DRDs: normative without reqs

Technical Specifications

Generic technical requirements

Handbooks
- Support application of standards and Means of Compliance
- Informative

News since the ECSS NextGen KoM

→ WG members received via ECSS NextGen SharePoint:
  → colour-coded E-10, Q-10, Q-20, Q-30 and Q-40 standards incl. level 3 standards
  → a feedback template to raise issues, if any

→ Follow-up between ECSS Secretariat and WG members during offline review week to clarify questions, if any

→ Feedback submission from WG members for colour-coded standards
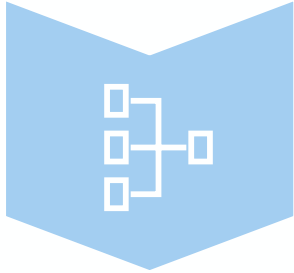
→ Received feedback is consolidated by ECSS Secretariat before the collocation meetings

→ Dispositions are discussed during the collocation meetings

ECSS NextGen Participation

→ ECSS NextGen WG

esa	Mikko Nikulainen, Chair observer from EMC: Andrew Brown
ASI Agenzia Spaziale Italiana	Raffaele Votta Deputy: Vincenzo Martucci
cnes	Karine Auvray Deputy: Thierry Floriant
arianeGroup	André Lacroix Deputy: J-P Huilier
UK SPACE AGENCY	Joshua Brayford

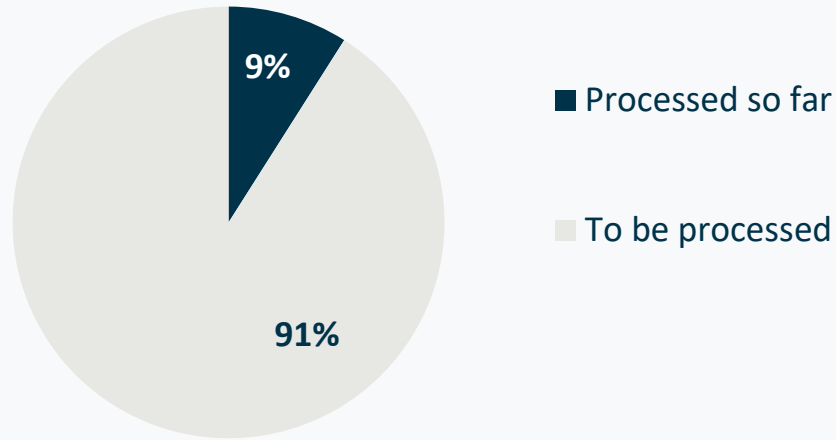|	
AIRBUS	Steve Willis deputy: Mickaël Guesnerie
OHB	Michael-Peter Gerhard Deputy: Wolfgang Schmid
ThalesAlenia Space	Olivier Leronde Deputies: Xavier Régnier, Philippe Lamotte
DLR	Grzegorz Musiolik
SME4SPACE	Rosario Pavone
esa COMMERCIALISATION GATEWAY — New Space Advisory Board	Peter Taubenreuther (observer/ advisory role)
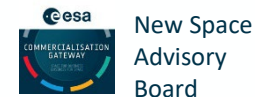
→ ECSS NextGen collaborative workspace at ESTEC in AC1 area

Progress overview – 1st Collocation Meeting

Overall progress

- Processed so far — 9%
- To be processed — 91%

Batch#1 (2637 reqs) – progress*

- direct agreement — 62%
- agreement during session — 18%
- on hold — 7%
- not discussed (due to time constraints) — 13%
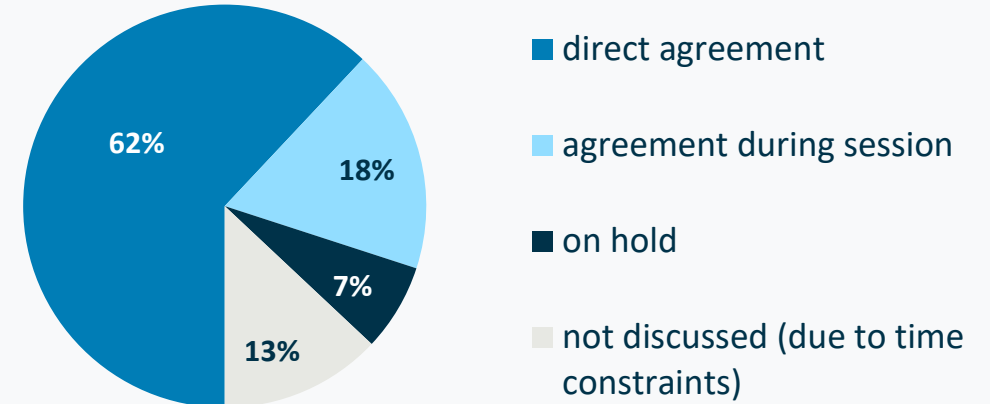
Documents

→ **Batch#1**

  → **Total**: ECSS Q-10, Q-20 and E-10, incl. level 3 standards

  → **Processed**: ECSS-Q-ST-10 Rev.1, ECSS-Q-ST-10-04C, ECSS-Q-ST-10-09C Rev.1, ECSS-Q-ST-20-10C, ECSS-E-ST-10C Rev.1, ECSS-E-ST-10-02C Rev.1, ECSS-E-ST-10-03Rev.1, (ECSS-E-ST-10-11C partially)

  → **TS**: ECSS-Q-ST-10-04C Rev.1, ECSS-Q-ST-10-06C, ECSS-Q-ST-10-09C, ECSS-Q-ST-10-12C Corr.1, ECSS-E-ST-AS-11C

Batch#1 – distribution of discussed requirements*

- requirements — 36%
- MoC — 56%
- information — 7%
- inconclusive — 1%
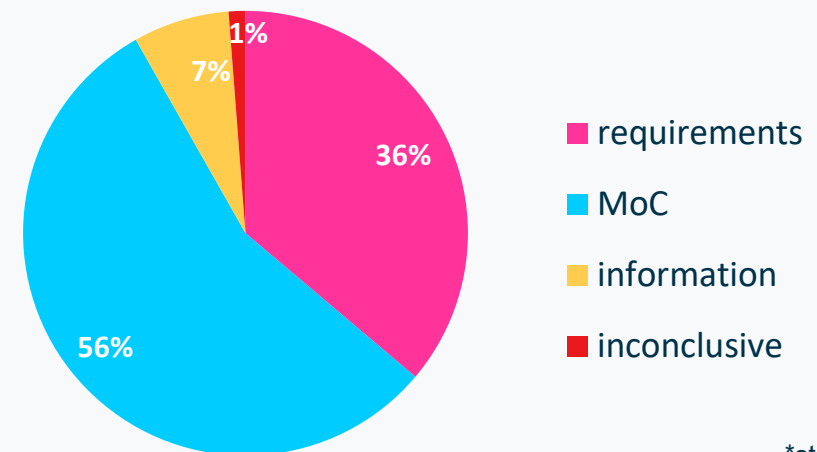
*status 25.09.2024, 6pm

Schedule and status
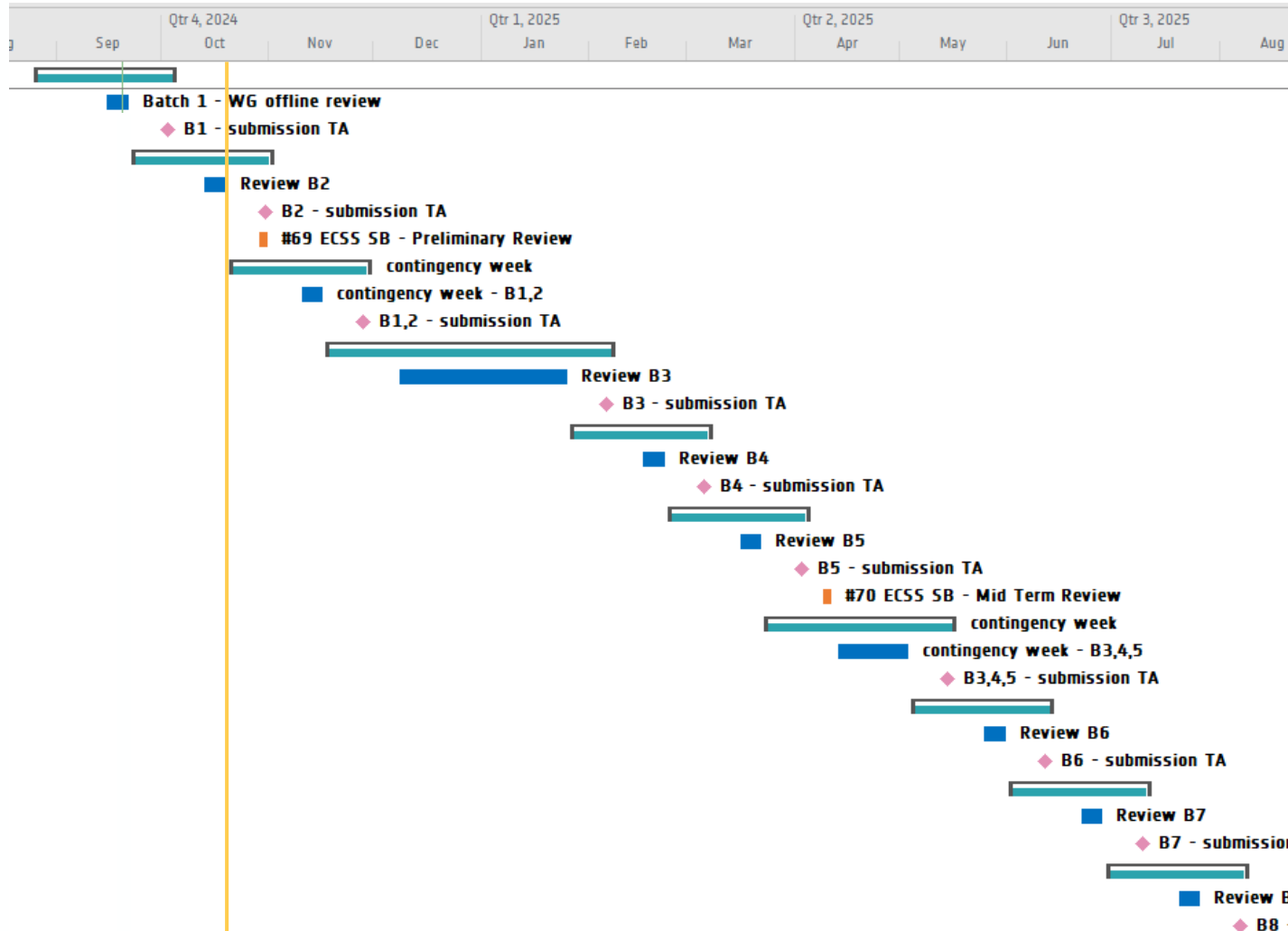
Updates

Contracts:

→ RFQs published on ESA-STAR for OHB, TAS-F, Airbus, and ArianeGroup

→ RFQ publishment on ESA STAR soon to follow for SME4Space

→ Consultancies will be ready to support batch#3

Next collocation meetings:

→ Review of batch#2

    → 21. – 25. October 2024

      → docs: Q-30, Q-40, (E-70)

→ Review of batch#3

    → 18. – 22. November 2024

      → docs: Q-70 (part 1)

New categorisation approach for the next batches

1. Identify links between higher (level 2) and lower (level 3) standards, in terms of requirements and means of compliance

2. Identify the standards which do not have such a link; check for level 3 to level 2 link

3. Analyse the standards with broken links

4. Extract the high-level requirements from level 3 standards (e.g. not called from level 2)

5. Identify the requirements from level 2 standards which do not have means of compliance

Produced by

esa
TEC-QES

Back-up slides

→ THE EUROPEAN SPACE AGENCY

Definitions (1/2)

Contractual requirements

- Contractual requirements need to be:
  - → Addressing a specific need
  - → Contractually binding
  - → Specifying, answering to questions: What, when, who i.e not including How nor Why
  - → Space specific i.e. not including common disciplines learnt at university and/or usually managed out of space activities
  - → Synthetic i.e. not going into unnecessary (technical) detailed requirements or means of compliance
  - → In active tense (« The contractor shall provide… »); and not « the … shall be provided by the contractor) »
  - → Clear and non-ambiguous
  - → Measurable, verifiable and attainable

Definitions (2/2)

Means of Compliance (MoC)

Means of Compliance are non-binding normative documents adopted by ECSS providing ways to comply with the contractual requirements.

They can be made applicable as contractual requirements, if considered necessary. If not made applicable, the supplier can propose Alternative Means of Compliance (AltMoC).

Alternative Means of Compliance (AltMoC)

Since MoCs are non-binding, the supplier may choose alternative means to comply with the Contractual Requirements.

In this case, however, they lose the presumption of compliance provided by the ECSS MoCs and need to demonstrate to the customer that they do comply with the Contractual Requirements.

Technical Specifications (TS)

Technical Specifications define specific interfaces, technical capabilities or protocols, or provide prescriptive and/or normative definitions of interfaces, protocols, other controlling standards such as encoding approaches, or terminology. If made applicable, TS cannot be modified.