

SAVOIR

Avionics Reference Architecture

Operability in the SAVOIR Context

Avionics, Data Control & Software Systems Workshop

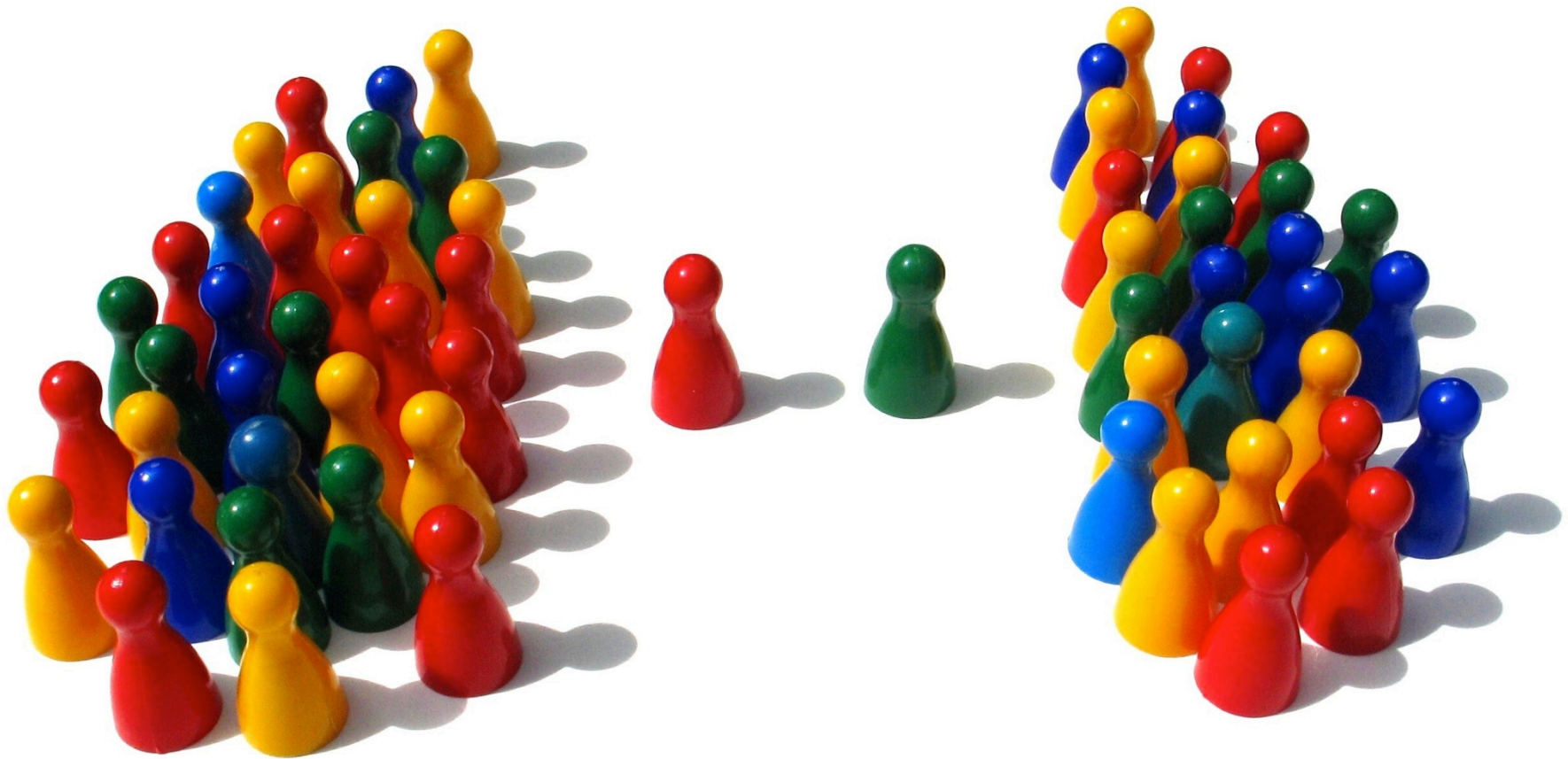
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Implementing Operability



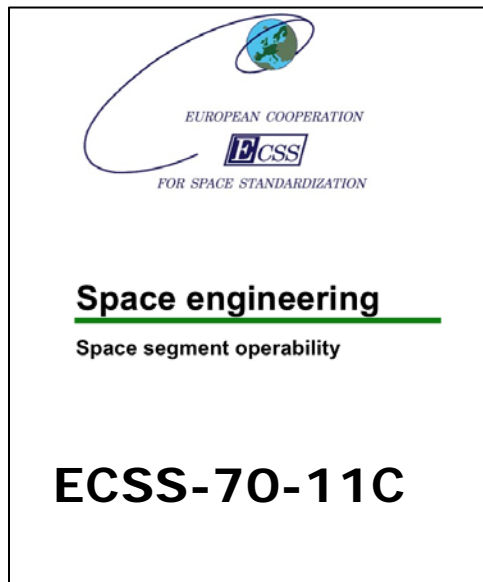
The CCN Standoff & the SOIRD



1. The Spacecraft Operations Interface Document was created 90's to standardise how ESA specified its operability requirements.
2. This document was eventually included in the ITT to Industry.
3. ECSS Standards for Operability were established early 2000, and were based on the SOIRD.
4. Packet Standards were also adopted.
5. There is a strong push by both Operations and Industry to have a standard set of requirements for Operability

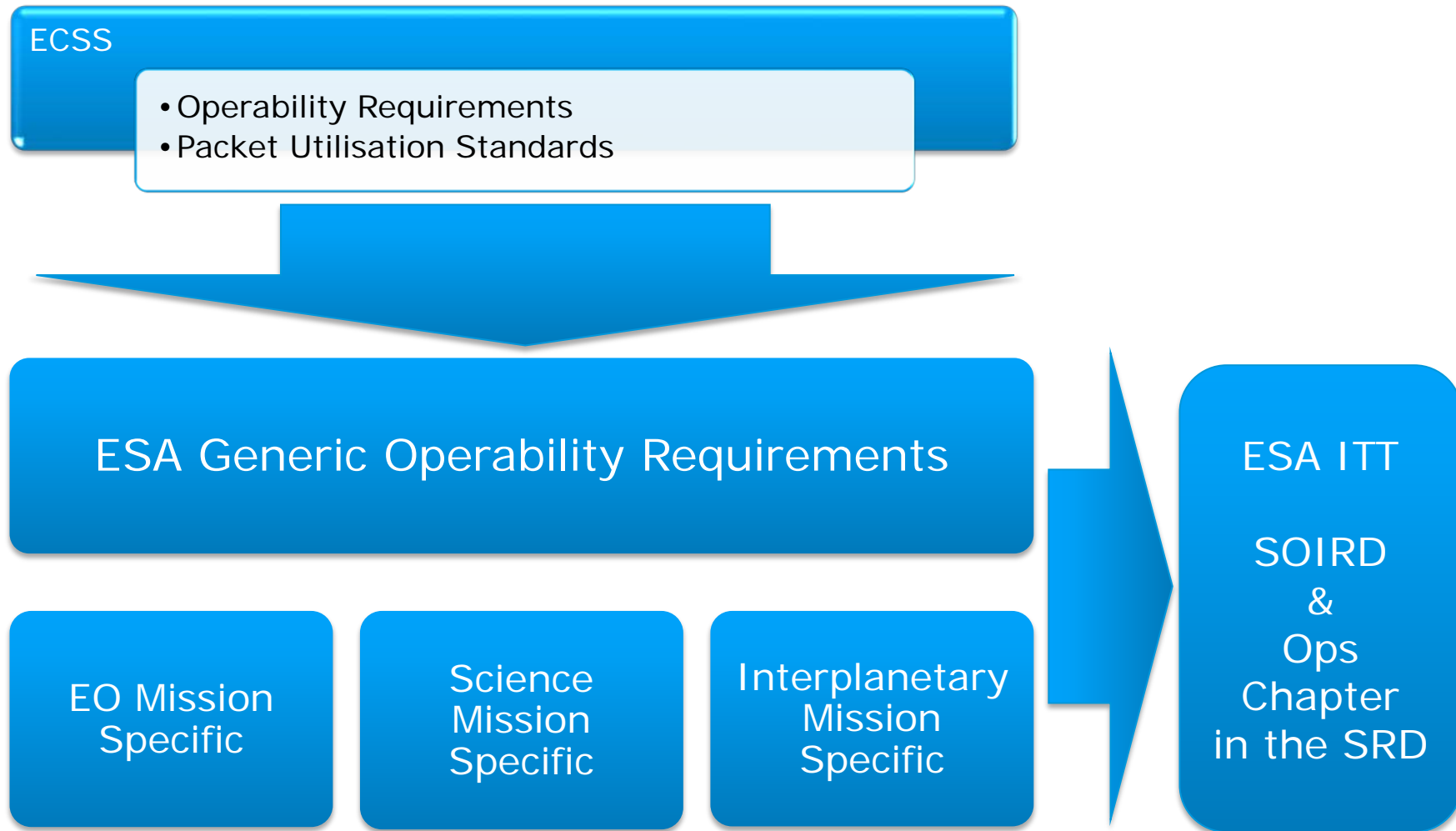
Operability is formally specified in the ESA ITT issued to Industry :

- Spacecraft Operations Interface Requirements Document, SOIRD
- Operability Requirements Chapter of the System Requirements Document



These requirements are tailored from the ECSS Operability Requirements for various mission families:

- **Earth Observations,**
- **Science missions,**
- **Interplanetary missions.**



So what is the Issue?



SOIRD or SRD?

- Operability requirements are becoming more integrated within the mission System Requirements Document.

I don't like Vanilla

- Evolution of the OIRDs into mission families flavours, also different branches within families.
- Often OIRDs are modified from one mission to the next.
- In the future, modifications could be based on the System Requirements Document rather than the OIRD.

Standardisation

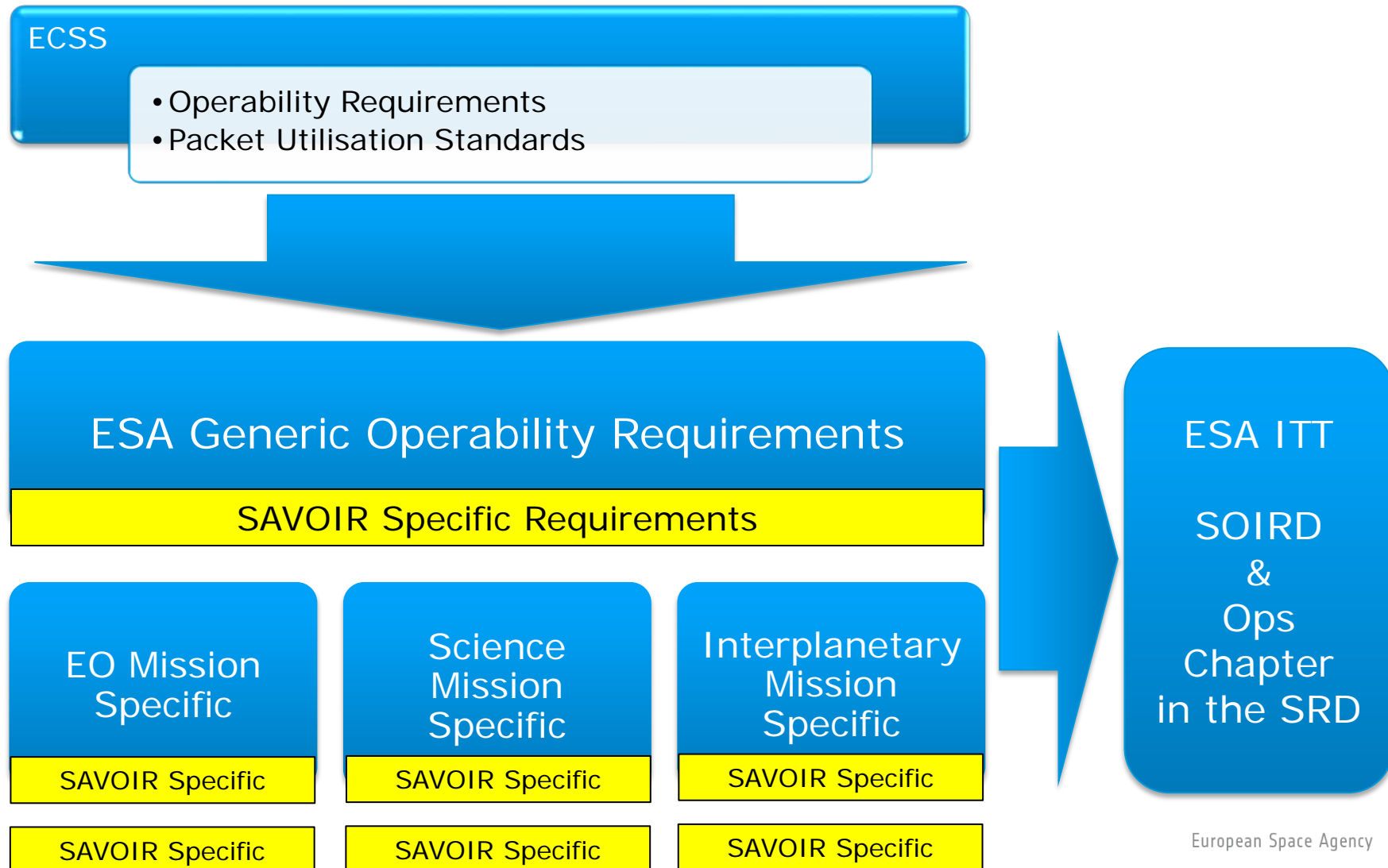
- Several functions required by missions are not covered by the ECSS.
- Less tailoring from the ECSS => Lack of a common baseline of Operability Requirements that covers all mission types and families.

Major issues identified and addressed

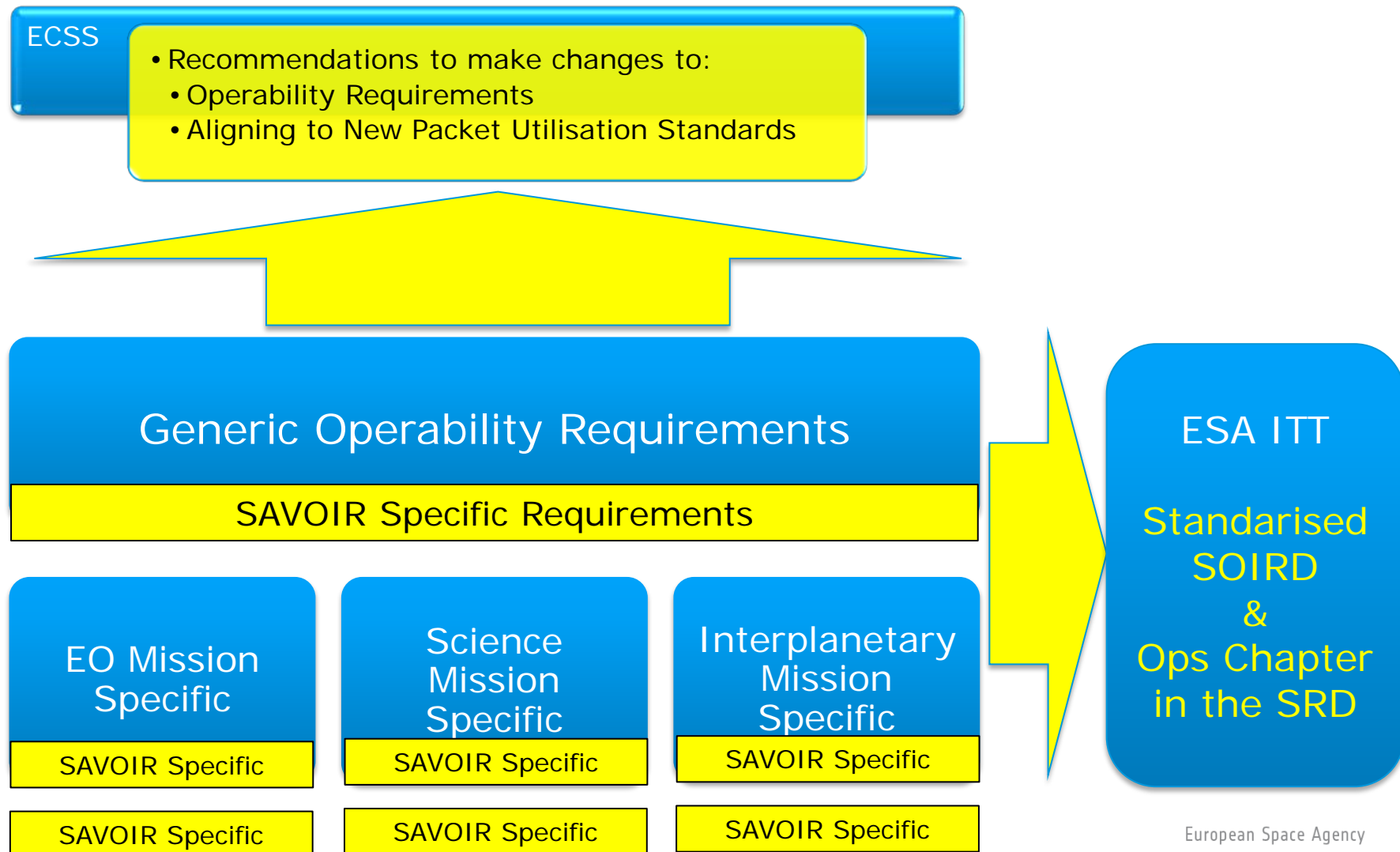


- There are also some ECSS requirements which, although not major, do not appear to be used by ESA missions.
- There are several operational functions that are not currently covered in the ECSS. Primarily these are:
 - File Transfer,
 - Specific EO Timeline Management,
 - Diagnostics Triggering Actions,
 - CFTP, and
 - Expansion of some monitoring functions.

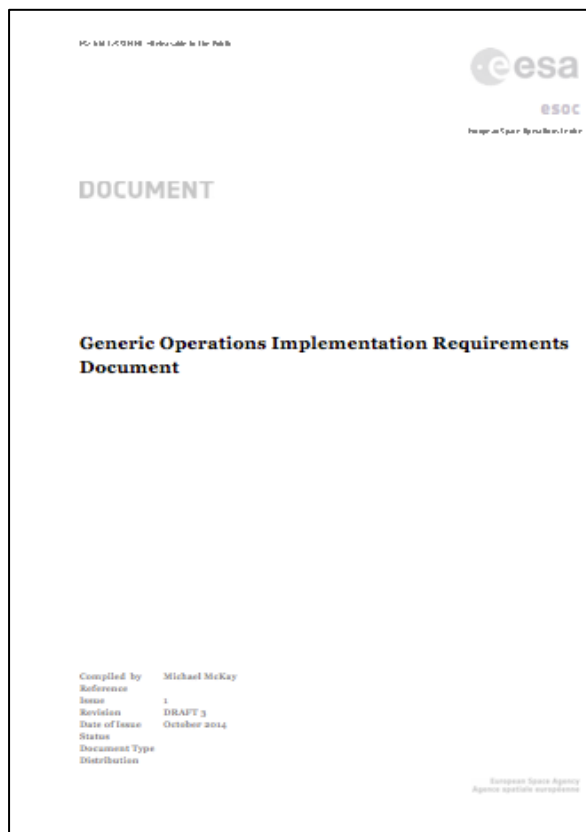
Extending the Savoir Operability Requirements



ESA & Savoir Operability Requirements



Generic OIRD



ECSS-E-70-11 Updates



MAS AIS Operability Requirements



Coordination with Projects

Harmonising Operability Requirements:

- A review of SRDs and SOIRDs has been made, with the aim to consolidate the format and specification wording where possible into generic cross-mission requirements with mission family specific adaptations.

Addressing the Standards:

- Providing operability requirements to the MAS AIS Study.
- Consolidate inputs to propose changes to the ECSS Operability Standards and include the new PUS Standards for aligning the ECSS with SAVOIR recommendations, current practices and including missing functionality.
- Mission Operations Services not excluded but are not driving the requirements.

Aspects outside SAVOIR to be addressed



Change in Approach

- Space Programmes wish to capitalise on previous investments and push for a maximum re-use of requirements from a previous similar mission
- We need to make the Operability Standards more useable
- We need better communication and tighter coordination with Projects

Validation & Demonstration

- Implementing and validating new functionality in the Ground Segment for In-Orbit Validation, e.g. OpsSat, End to End System Validation

Thank you for your attention



Any Questions?