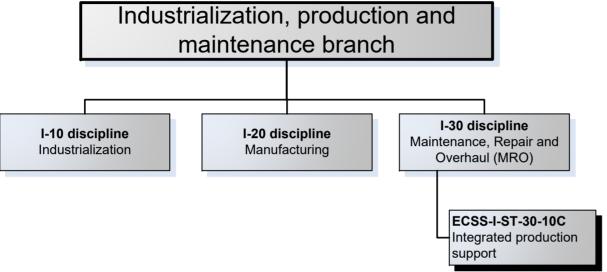
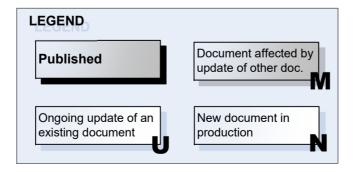


Industrialization branch





Engineering branch

Space engineering branch

E-10 discipline System engineering ECSS-E-ST-10C Rev.1 System engineering general requirements ECSS-E-ST-10-02C Rev.1 Verification ECSS-E-ST-10-03C Rev.1 Testing ECSS-E-ST-10-04C Rev.1 Space environment ECSS-E-ST-10-06C Technical requirements specification ECSS-E-ST-10-09C Reference coordinate system ECSS-E-ST-10-11C Human factors engineering ECSS-E-ST-10-12C +Corr.1 Method for the calculation design margins

E-20 discipline Electrical and optical engineering

ECSS-E-ST-20C Rev.2 Electrical and electronic

ECSS-E-ST-20-01C Multipactor design and test

ECSS-E-ST-20-06C Rev.1 Spacecraft charging

ECSS-E-ST-20-07C Rev.2 Electromagnetic compatibility

> ECSS-E-ST-20-08C Rev.2 Photovoltaic assemblies and components

ECSS-E-ST-20-20C Interface requirements for electrical power

ECSS-E-ST-20-21C Interface requirements for electrical actuators

ECSS-E-ST-20-40C of radiation received and ASIC, FPGA and IP Core its effects, and a policy for engineering

ECSS-E-ST-10-24C Interface management ECSS-E-ST-10-24C Rev.1

ECSS-E-AS-11C Adoption Notice of ISO 16290 - Definition of TRLs and their criteria of assessment

E-30 discipline Mechanical engineering

> Note: E-30 discipline is detailed in the next chart

E-40 discipline Software engineering

ECSS-E-ST-40C Software general requirements ECSS-E-ST-40C Rev.1

> ECSS-E-ST-40-02C Machine learning software engineering, verification and validation

ECSS-E-ST-40-07C Simulation modelling platform ECSS-E-ST-40-07C Rev.1

ECSS-E-ST-40-08C Simulation modelling platform - Level 2

E-50 discipline Communications

Note: E-50 discipline is detailed in the next chart

E-60 discipline Control engineering

ECSS-E-ST-60-10C Control performances

> ECSS-E-ST-60-20C Rev.2 Star sensor terminology and performance specification

ECSS-E-ST-60-21C Gyros terminology and performance

ECSS-E-ST-60-30C Attitude and orbit control systems (AOCS) requirements

E-70 discipline Ground systems and operations

ECSS-E-ST-70C Ground systems and operations

ECSS-E-ST-70-01C On-board control procedures

ECSS-E-ST-70-11C Space segment operability ECSS-E-ST-70-11C Rev.1

ECSS-E-ST-70-31C Ground systems and operations - Monitoring and control data definition

> ECSS-E-ST-70-32C Test and operations

ECSS-E-ST-70-41C Telemetry and telecommand packet utilization

ECSS-E-ST-70-41C Rev.1

procedure language

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E-80 discipline

Security

Security in space systems

ECSS-E-ST-80C

lifecycles

E-30 discipline

Mechanical engineering

ECSS-E-ST-31C

Thermal control general requirements

ECSS-E-ST-31-02C Rev.1

Two-phase heat transport equipment

ECSS-E-ST-31-04C

Exchange of thermal analysis data

ECSS-E-ST-32C Rev.1

Structural general requirements

ECSS-E-ST-32-01C Rev.2

Fracture control

ECSS-E-ST-32-02C Rev.1

Structural design and verification of pressurized hardware

ECSS-E-ST-32-02C Rev.2

ECSS-E-ST-32-03C

Structural finite element models

ECSS-E-ST-32-08C Rev.1

Materials

ECSS-E-ST-32-10C Rev.2

Structural factors of safety for spaceflight hardware

ECSS-E-ST-32-11C

Modal survey assessment

ECSS-E-ST-33-01C Rev.2

Mechanisms

ECSS-E-ST-33-11C Rev.1

Explosive subsystems and devices

ECSS-E-ST-34C

Environmental control and life support

ECSS-E-ST-35C Rev.1

Propulsion general requirements

ECSS-E-ST-35-01C

Liquid and electric propulsion for spacecraft

ECSS-E-ST-35-02C

Solid propulsion for spacecraft and launchers

ECSS-E-ST-35-03C

Liquid propulsion for launchers

ECSS-E-ST-35-06C Rev.2

Cleanliness requirements for spacecraft propulsion hardware

ECSS-E-ST-35-10C

Compatibility testing for liquid propulsion systems

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E-50 discipline

Communications

ECSS-E-ST-50C Rev.1

Communications

ECSS-E-ST-50C Rev.2

ECSS-E-ST-50-02C

Ranging and Doppler tracking

ECSS-E-ST-50-05C Rev.2

Radio frequency and modulation

ECSS-E-AS-50-21C Rev.1

Adoption Notice of CCSDS 131.0-B-4, TM Synchronization and Channel Coding

ECSS-E-AS-50-21C Rev.2

ECSS-E-AS-50-22C Rev.1

Adoption Notice of CCSDS 132.0-B-3, TM Space Data Link Protocol

ECSS-E-AS-50-23C Rev.1

Adoption Notice of CCSDS 732.0-B-4, AOS Space Data Link Protocol

ECSS-E-AS-50-24C Rev.1

Adoption Notice of CCSDS 231.0-B-4, TC Synchronization and Channel Coding

ECSS-E-AS-50-25C Rev.1

Adoption Notice of CCSDS 232.0-B-4, TC Space Data Link Protocol

ECSS-E-AS-50-26C

Adoption Notice of CCSDS 232.1-B-2, Communications Operation Procedure-1

ECSS-E-ST-50-11C

SpaceFibre – Very high-speed serial link

ECSS-E-ST-50-12C Rev.1

SpaceWire - Links, nodes, routers and networks

ECSS-E-ST-50-13C

Interface and communication protocol for Mil std 1553B

ECSS-E-ST-50-14C

Spacecraft discrete interfaces

ECSS-E-ST-50-15C

CAN bus extension protocol

ECSS-E-ST-50-15C Rev.1

ECSS-E-ST-50-16

Time-triggered ethernet (TTE)

ECSS-E-ST-50-51C

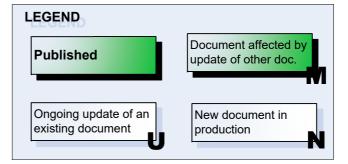
SpaceWire protocol identification

ECSS-E-ST-50-52C

SpaceWire - Remote memory access protocol

ECSS-E-ST-50-53C

SpaceWire - CCSDS packet transfer protocol



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Product assurance branch Space product assurance branch Q-10 discipline Q-70 discipline Q-20 discipline Q-30 discipline Q-40 discipline Q-60 discipline Product assurance Materials, mechanical parts Dependability Quality assurance Safety **EEE** components and processes management ECSS-Q-ST-60C Rev.3 ECSS-Q-ST-10C Rev.1 ECSS-Q-ST-20C Rev.2 ECSS-Q-ST-30C Rev.1 ECSS-Q-ST-40C Rev.1 Product assurance Electrical, electronic and NOTE: Quality assurance Dependability Safety electromechanical (EEE) management Q-70 discipline is components detailed in the next ECSS-Q-ST-60C Rev.4 ECSS-Q-ST-20-07C ECSS-Q-ST-10-04C ECSS-Q-ST-30-02C chart ECSS-Q-ST-40-02C Critial-item control Quality and safety Failure modes, effects Hazard analysis assurance for space test (and criticality) analysis ECSS-Q-ST-60-03C centres ASIC, FPGA And IP Core ECSS-Q-ST-20-07C ECSS-Q-ST-10-09C Rev.1 product assurance Nonconformance control Rev.1 ECSS-Q-ST-40-12C ECSS-Q-ST-30-09C system Fault tree analysis -ECSS-Q-ST-20-08C Availability analysis Adoption notice ECSS/ ECSS-Q-ST-60-05C Rev.1 Storage, handling and IEC 61025 Generic procurement transportation of requirements for hybrids spacecraft hardware ECSS-Q-ST-30-11C Rev.2 ECSS-Q-ST-20-10C Derating - EEE ECSS-Q-ST-60-12C components Off-the-shelf items Design, selection, procurement utilization in space and use of die form monolithic systems microwave integrated circuits ECSS-Q-ST-20-30C ECSS-Q-ST-60-13C Rev.1 Manufacturing and control Commercial electrical, electronic of electronic harness and electromechanical (EEE) components **LEGEND** ECSS-Q-ST-60-14C Rev.1 Corr.1 Relifing procedure - EEE Document affected by **Published** components update of other doc. ECSS-Q-ST-60-15C Radiation hardness assurance -

(as of June 2024)

EEE components

ECSS-Q-ST-60-15C Rev.1

Q-80 discipline

Software product

assurance

ECSS-Q-ST-80C Rev.1

ECSS-Q-ST-80C Rev.2

Software product

assurance

Q-70 discipline Materials, mechanical parts and processes

Cleanliness

Material testing

Material processes

Assembling processes

Parts

Planetary protection

ECSS-Q-ST-70C Rev.2

Materials, mechanical parts and processes

ECSS-Q-ST-70-71C Rev.1

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Materials, processes and their data selection

ECSS-Q-ST-70-01C

Cleanliness and contamination control

ECSS-Q-ST-70-01C Rev.1

ECSS-Q-ST-70-05C Rev.1

Detection of organic contamination surfaces by IR spectroscopy

ECSS-Q-ST-70-05C Rev.2

ECSS-Q-ST-70-50C

Particle contamination monitoring for spacecraft systems and cleanrooms

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ECSS-Q-ST-70-02C

Thermal vacuum outgassing test for the screening of space materials

ECSS-Q-ST-70-04C

Thermal testing for the evaluation of space materials, processes, mechanical parts and assemblies

ECSS-Q-ST-70-06C

Particle and UV radiation testing for space materials

ECSS-Q-ST-70-15C

Non-destructive inspection

ECSS-Q-ST-70-20C

Determination of the susceptibility of silver-plated copper wire and cable to "red-plaque" corrosion

ECSS-Q-ST-70-21C

Flammability testing for the screening of space materials

ECSS-Q-ST-70-29C

Determination of offgassing products from materials and assembled articles to be used in a manned space vehicle crew compartment

ECSS-Q-ST-70-36C

Material selection for controlling stress-corrosion cracking

ECSS-Q-ST-70-36C Rev.1

ECSS-Q-ST-70-37C

Determination of the susceptibility of metals to stress-corrosion cracking

ECSS-Q-ST-70-37C Rev.1

ECSS-Q-ST-70-45C

Mechanical testing of metallic materials

ECSS-Q-ST-70-03C

Black-anodizing of metals with inorganic dyes

ECSS-Q-ST-70-09C

Measurements of thermooptical properties of thermal control materials

ECSS-Q-ST-70-13C Rev.1

Measurements of the peel and pull-off strength of coatings and finishes using pressure-sensitive tapes

ECSS-Q-ST-70-17C

Durability testing of coatings

ECSS-Q-ST-70-22C

Control of limited shelf-life materials

ECSS-Q-ST-70-31C Rev.1

Application of paints and coatings on space hardware

ECSS-Q-ST-70-14C

Corrosion

ECSS-Q-ST-70-26C Rev.1 +Corr.1

Crimping of high-reliability electrical connections

ECSS-Q-ST-70-28C

Repair and modification of printed circuit board assemblies for space use

ECSS-Q-ST-70-30C

Wire wrapping of highreliability electrical connections

ECSS-Q-ST-70-39C

Welding of metallic materials for flight hardware

ECSS-Q-ST-70-40C

Processing and quality assurance requirements for brazing of flight hardware

ECSS-Q-ST-70-61C

High reliability assembly for surface mount and through hole connections

ECSS-Q-ST-70-80C

Processing and quality assurance requirements for metallic powder bed fusion technologies for space applications

ECSS-Q-ST-70-12C

Design rules for printed circuit boards

ECSS-Q-ST-70-12C Rev.1

ECSS-Q-ST-70-18C

Preparation, assembly and mounting of RF coaxial cables

ECSS-Q-ST-70-46C Rev.1

Requirements for manufacturing and procurement of threaded fasteners

ECSS-Q-ST-70-60C

Qualification and procurement of printed circuit boards

ECSS-Q-ST-70-60C Rev.1

Materials and hardware compatibility tests for sterilization processes

ECSS-Q-ST-70-53C

ECSS-Q-ST-70-54C

Ultra cleaning of flight hardware

ECSS-Q-ST-70-55C

Microbiological examination of flight hardware and cleanrooms

ECSS-Q-ST-70-56C

Vapour phase bioburden reduction for flight hardware

ECSS-Q-ST-70-57C

Dry heat bioburden reduction for flight hardware

ECSS-Q-ST-70-58C

Bioburden control in cleanrooms

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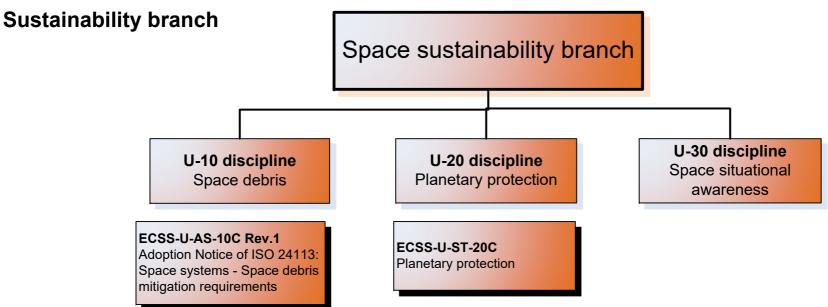
ECSS-Q-ST-70-60C

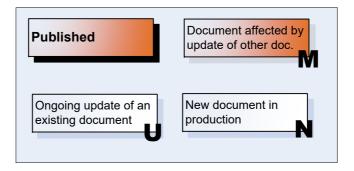
= merge of Q-ST-70-10C Rev.1 and Q-ST-70-11C

ECSS-Q-ST-70-61

= merge of Q-ST-70-07C, Q-ST-70-08C and Q-ST-70-38C Rev.1

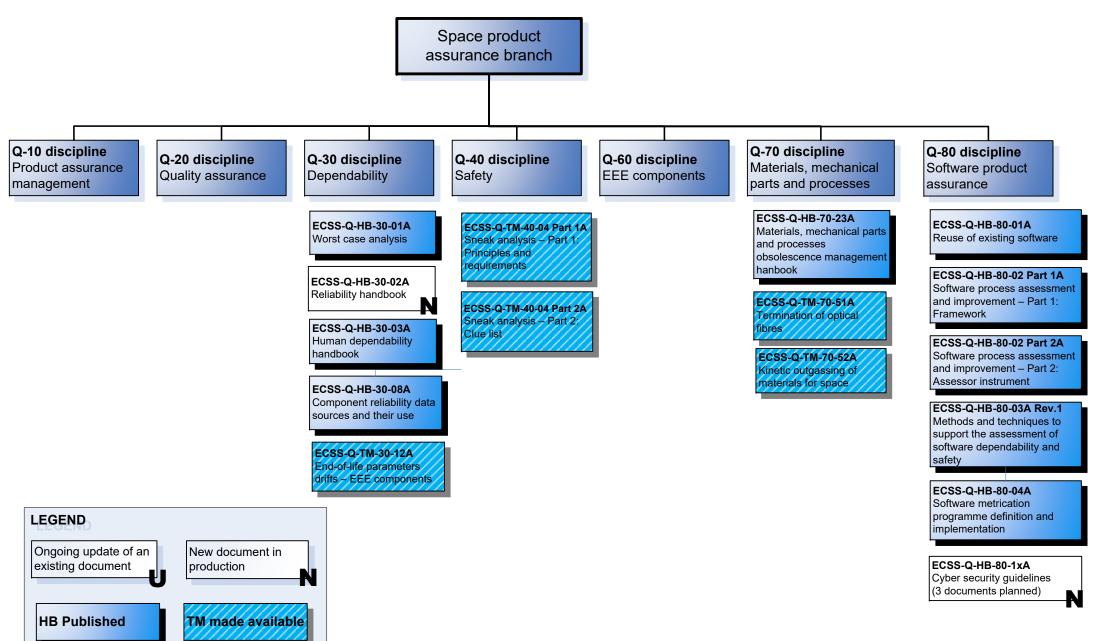
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ECSS Handbooks and Technical memoranda

PA branch HBs and TMs



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ECSS Handbooks and Technical memoranda

Engineering branch HBs and TMs

Space engineering branch

E-10 discipline

System engineering

E-20 discipline

Electrical and optical engineering

E-30 discipline

E-40 discipline Software engineering

E-50 discipline Communications

ECSS-E-HB-50A

Communications

guidelines

Control engineering

E-70 discipline Ground systems and operations

ECSS-E-HB-10-02A Verification guidelines

ECSS-E-HB-10-03A

Testing guidelines

ECSS-E-HB-10-12A Calculation of radiation and its effects, and margin policy handbook

ECSS-E-HB-11A

TRL guidelines

ECSS-E-TM-10-10A

ECSS-E-TM-10-20A roduct data exchang

ECSS-E-TM-10-21A System modelling and

ECSS-E-TM-10-23A Space system data

ECSS-E-HB-20-01A

Multipactor handbook

ECSS-E-HB-20-02A

Li-ion battery handbook

ECSS-E-HB-20-03A

Magnetic cleanliness handbook

ECSS-E-HB-20-05A

High voltage engineering and design handbook

ECSS-E-HB-20-06A

Assessment of spacecraft worst case charging

ECSS-E-HB-20-07A

Spacecraft electromagnetic compatibility handbook

ECSS-E-HB-20-08A

Guidelines for deltaqualification of photovoltaic assemblies

ECSS-E-HB-20-20A

Guidelines for electrical interface requirements for power supply

ECSS-E-HB-20-21A

Guidelines for electrical design and interface requirements for actuators

ECSS-E-HB-20-40A

Engineering techniques for radiation effects mitigation in ASICs and FPGAs handbook

ECSS-E-HB-20-41A

Guidelines for the Automatic Code Generation for High Level Synthesis (HDL) in Space Applications

Mechanical engineering

ECSS-E-HB-31-01A

Thermal design data handbook (16 parts)

ECSS-E-HB-31-03A

Thermal analysis handbook

ECSS-E-HB-32-20A

Structural design data handbook (8 parts)

ECSS-E-HB-32-21A

Adhesive bonding handbook

ECSS-E-HB-32-22A

Insert design handbook

ECSS-E-HB-32-23A Rev.1

Threaded fasteners handbook

ECSS-E-HB-32-24A

Buckling handbook

ECSS-E-HB-32-24A Rev.1

ECSS-E-HB-32-25A

Mechanical shock design and verification handbook

ECSS-E-HB-32-26A

Spacecraft mechanical loads analyses handbook

ECSS-E-HB-32-26A Rev.1

ECSS-E-HB-32-27A

Microvibration handbook

ECSS-E-HB-40A

Software engineering handbook

ECSS-E-HB-40A Rev.1

ECSS-E-HB-40-01A

Agile software development handbook

ECSS-E-HB-40-02A

Machine learning qualification for space applicatons handbook

E-60 discipline

ECSS-E-HB-60A

Control engineering handbook

ECSS-E-HB-60-10A

Control performance guidelines

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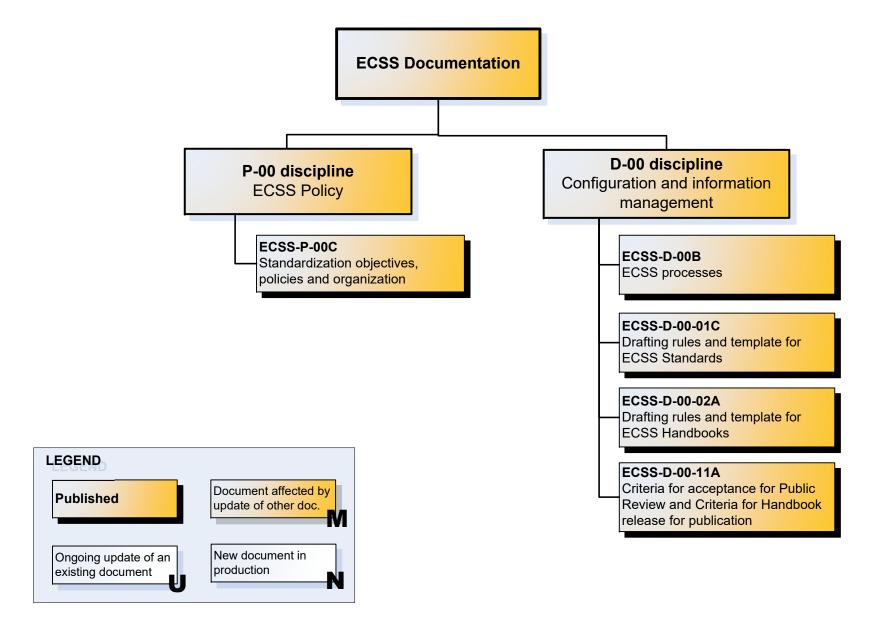
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HB Published

New document in production

TM made available

ECSS Policy (P) and Configuration and information mangement (D) documents



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