

ISO 20188:2018-01 (E)

Space systems - Product assurance requirements for commercial satellites

Contents		Page
Foreword		vi
Introduction		vii
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Abbreviated terms	2
5	Product assurance	3
5.1	PA management	3
5.2	PA plan	4
5.3	Audit	4
5.4	Customer right of access	5
5.5	PA progress reports	5
5.6	Risk management	5
5.7	Critical item management	6
5.8	Subcontractor product assurance	6
5.9	End item data package	6
5.10	Organizational capability aspects	7
6	Quality assurance	7
6.1	Quality assurance program	7
6.2	Equipment qualification status review	7
6.3	Review meeting and control boards	7
6.4	Design review	8
6.5	Pre-shipment review	8
6.6	Flight readiness review	8
6.7	Procurement control	8
6.7.1	General	8
6.7.2	Sub-tier source selection and evaluation	9
6.7.3	Sub-tier source surveillance	9
6.7.4	Sub-tier source inspection	9
6.7.5	Procurement document review	9
6.7.6	Incoming inspection	9
6.8	Manufacturing and storage control	9
6.9	Manufacturing readiness review	10
6.10	In-process inspection	10
6.11	Process control	11
6.12	Mandatory inspection points	11
6.13	Workmanship standards	11
6.14	Personnel training and competence	11
6.15	Ground support equipment certification	12
6.16	Electrostatic discharge control plan	12
6.17	Contamination/cleanliness control plan	12
6.18	Testing	12
6.18.1	Test facilities and equipment	12
6.18.2	Test documentation	13
6.18.3	Test performance monitoring	13

6.19	Test reviews	13
6.20	Quality records and traceability	13
6.21	Non-conformance control	14
6.21.1	Non-conformance reporting	14
6.21.2	Non-conformance definition	14
6.21.3	Non-conformance disposition	15
6.22	Alert system	15
6.23	Handling, storage, preservation, packaging and shipping	15
6.23.1	General	15
6.23.2	Handling, storage and preservation	15
6.23.3	Packaging and shipping	15
6.24	Preparation for delivery	16
6.25	QA role in configuration management	16
6.26	Configuration identification	17
6.27	Configuration control	17
6.28	Change classification	17
6.29	Configuration status accounting	17
7	Dependability	18
7.1	General	18
7.2	Reliability prediction	18
7.3	Parts derating and application review analysis	18
7.4	Worst case analysis (WCA)	19
7.5	Wear-out assessment	19
7.6	Failure mode, effect and criticality analysis (FMECA) and single point failure (SPF) summary	19
7.7	Hardware-software interaction analysis (HSIA)	20
7.8	Fault tree analysis (FTA)	20
7.9	Common-cause analysis	21
7.10	Failure detection isolation and recovery (FDIR) analysis	21
7.11	Availability analysis	21
7.12	Qualification status	21
8	Safety	21
8.1	System safety control	21
8.2	Safety and hazard analysis	22
8.3	Safety design	22
8.4	Training	23
9	EEE parts	23
9.1	Program plan	23
9.2	Parts control board	23
9.3	Parts selection	24
9.4	Parts screening	26
9.5	Lot acceptance test (LAT)/quality conformance inspection (QCI)	26
9.5.1	LAT/QCI for space qualified parts (MIL, EU, JAXA, etc.)	26
9.5.2	LAT/QCI for non- space qualified parts	27
9.5.3	Radiation	27
9.5.4	Destructive physical analysis (DPA)	27
9.6	Parts qualification	28
9.7	Incoming inspection and storage condition	28
9.8	Parts traceability and lot control	28
9.9	Lot transfer	28
9.10	Non-conforming parts	28
10	Materials, mechanical parts and processes (MMPP)	29
10.1	Policy of materials selection and control	29
10.2	Policy of mechanical parts selection and control	30
10.3	Policy of processes selection and control	30
10.4	Special processes	30
10.5	Materials, mechanical parts and processes control board	31

11	Software product assurance	31
11.1	General	31
11.2	Software development	31
11.3	Software configuration management	32
11.4	Software non-conformance reporting and corrective action	32
	Annex A (informative) Parts approval document (PAD)	33
	Bibliography	34