

MINISTÉRIO DA CIÊNCIA, TECNOLOGIA, INOVAÇÕES E COMUNICAÇÕES INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS PROJECT:

## EQUARS

## MPMP PLAN FOR EQUARS MISSION - SPACE SEGMENT

DOCUMENT: EQUARS-4960-PLN-001-A		STATUS: APROVADO	
<b>DESCRIPTION:</b> This doc EQUARS mission conside	ument describes the Mechanical ering the space segment.	Parts, Materials	and Process Plan for
DATE: 15-08-2019	EDT: 3600 – COMPONENTES EEE		<b>PAGES:</b> 20



AUTORS			
NAME	DIVISION	DATE	SIGNATURE
José Eduardo May	CGETE/SESEQ	1309.19	any
			10
			ч.

REVIEWERS			
NAME	DIVISION	DATE	SIGNATURE
Cristiane Mariano Zavati	CGCEA	13.09.19	Dup.
ALMAN - NUMBER	SHAU,	L State Stat	/
η			

	APPROVED B	Y	d <sup>e</sup>
NAME	DIVISION	DATE	SIGNATURE
Leandro Hoffmann	CGETE/ DIDSS	13.09.19	Compatit
		s	

6	REVISIONS				
REV.	DATE	CHANGES/ PAGES N.	AUTOR	APPROVED BY	
А	15/08/2019	Inicial edition	J. Eduardo; May	L. T. Hoffman	
	~				
5.0	(.)				
13					
		9	2		

.

## SUMMARY

1	INTR	ODUCTION5
	1.1	SCOPE
	1.2	APPLICABILITY
	1.3	APPLICABLE DOCUMENTS AND REFERENCES
	1.3.1	Applicable Documents
	1.3.2	Reference Documents
	1.4	ACRONYMS AND DEFINITIONS
	1.4.1	Acronyms List
	1.4.2	Definition List
	1.5	DESCRIPTION
	1.5.1	Risk Classification
	1.5.2	PMP Plan8
	1.5.3	Organizational structure, responsibility and authority descriptions, management approach
	1.5.4	Mission for documentation, or standardization when applicable, and control MPMP selection 9
	1.5.5	MPMP evaluation and qualification approach9
	1.5.6	MPMP testing level and lot acceptance9
	1.5.7	MPMP quality assurance activities including incoming inspection
	1.5.8	Requirements on, and system for the control of lower level suppliers, procurement agents
	1.5.9	System and schedule of audits and surveillance for control of supplier and procurement agency 9
	1.5.1	0 Coordinated procurement plan for parts of supplier, if applicable
	1.5.1	1 Submission of proposed PMP lists (Declared Materials List, Declared Mechanical Parts List, and
	Decla	rred Processes List) to PMPCB approval
	1.5.1	2 Reporting and delivery of MPMP Data Items 10
	1.5.1	3 Assurance of traceability, lot control and that only those parts, materials and processes
	auth	prized by PMPCB are used in manufacture 10
	1.5.1	4 Identification and control of age and cycle limited parts and material
	1.5.1	5 Implementation of a non-conform MPMP reporting and control Mission
	1.5.1	6 Participation in Mission design reviews 10
	1.5.1	7 Development of MPMP milestones and task Execution by Phase
	1.5.1	8 INPE's MPMP requirements14

## LIST OF TABLES

Table 1 – EQUARS Mission Risk, Class C [DR01].	. 7
Table 2 - Extract of the requirements for MPMP Plan [DR01]	. 7
Table 3 - Extract of the requirements for Manufacturing regarding MPMP [DR01]	8
Table 4 - Extract of Class C requirements for MPMP [DR01]	8
Table 5 – Task phases for NASA and ESA Missions 1	10
Table 6 - Reference Set of MPMP Tasks, [DR05]1	11
Table 7 - Enabling MPMP Products, [DR05] 1	11
Table 8 - Key Tasks By Phase, [DR05] 1	12

## **1** INTRODUCTION

### 1.1 SCOPE

The EQUARS Satellite Mission has defined that the risk of mission is classified as Class C, according to the TOR-2011(8591)-21 - Aerospace Report - Mission Assurance Guidelines for A-D Mission Risk Classes [DR1].

The Product Engineering Group, from Quality Engineering Service at Space Engineering and Technology General Coordination of the Instituto Nacional de Pesquisas Espaciais (INPE) has screened the SESEQ-E-PRC-00199 - Product Engineering Procedure for INPE' Space Missions taking into account the risk of the considering the space segment of the mission, the requirements for MPMP, the necessary controls and procedures and the activities at each task mission phase.

#### **1.2 APPLICABILITY**

This document defines the MPMP Plan to EQUARS Mission considering the space segment. It is excluded from this document the Plan for radiation and electrical, electronic and electro-mechanical components.

#### **1.3 APPLICABLE DOCUMENTS AND REFERENCES**

#### **1.3.1** Applicable Documents

The following documents contain provisions that are considered as part of this document. For dated references, subsequent amendments to, or revision of any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

DA01:	EQUARS-0000-MS-001-A	Declaração da Missão EQUARS
DA02:	EQUARS-XXX-TS-XXX-A (TBC-1)	Mission Assurance Requirements EQUARS
DA03:	EQUARS-2000-TS-001-A	Especificação Preliminar de Requisitos Técnicos da Missão EQUARS
DA03:	SESEQ-E-PRC-00199	Product Engineering Procedure for INPE' Space Missions – Space Segment

Conflicts between documents must be reported to INPE that shall establish precedence.

#### **1.3.2** Reference Documents

The following documents contain information that develop, add, or clarify concepts described in this document. For dated references, subsequent amendments to, or revision of any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

DR01:	TOR-2011(8591)-21	Aerospace Report - Mission Assurance Guidelines for A-D Mission Risk Classes
DR02:	TOR2006-8583-5235	Aerospace Report - Parts, Materials, and Processes Control Mission for Expendable Launch Vehicles

DR03:	TOR-2006(8583)-5236	Aerospace Report – Technical Requirements for Electronic Parts, Materials, and Processes Used in Space and Launch Vehicles
DR04:	SMC-S-009	Air force Space Command – Space and Missile Systems Center Standard - Parts, Materials, and Processes Control Mission for Space Vehicles
DR05:	TOR-2007(8546)-6018	Aerospace Technical Operating Report – Mission Assurance Guide
DR06:	CSS-M-ST-10C	Space project management Project planning and implementation
DR07:	SESEQ-E-PRC-00124	Mechanical Parts, Materials and Process Requirements Control of the Product Engineering Group

Conflicts between documents must be reported to INPE that shall establish precedence.

## 1.4 ACRONYMS AND DEFINITIONS

#### 1.4.1 Acronyms List

INPE	Instituto Nacional de Pesquisas Espaciais
CGETE	Coordenação-Geral de Engenharia e Tecnologia Espacial
SESEQ	Serviço de Engenharia da Qualidade
AD	Applicable Document
DR	Reference Document
MPMP	Mechanical parts, materials, and processes
GEP	Product Engineering Group (Grupo de Engenharia do Produto)
EEE	Electrical, Electronic and Electro-mechanical Components
LCC	Life cycle cost
SOW	Statement of work
WBS	Work Breakdown Structure
TRA	Technology Readiness Assessments
SRR	System Requirements Review
SDR	Systems requirements document
PDA	Preliminary design audit
PDR	Preliminary Design Review
CA	Corrective action
EOL	end of life
CDRL	Contract deliverable requirements list
N.A.	Non-Applicable

#### 1.4.2 Definition List

Mechanical part	defined as one piece, or two or more pieces joined together, which are not normally subjected to disassembly without destruction or impairment of its designed use.
Material	a metallic or nonmetallic element, alloy, mixture, or compound used in a manufacturing operation, which becomes either a temporary or a permanent portion of the manufactured item. A set of related or interacting activities, which transform inputs into
1000033	outputs.
МРМР	a critical engineering discipline comprising a set of skills and knowledge used to select, apply, design, and manage Mechanical Parts, Materials and Process to manufacture an end product.

#### 1.5 DESCRIPTION

#### 1.5.1 Risk Classification

The EQUARS Satellite Mission has defined as Class C the risk of mission, according to the AEROSPACE REPORT No. TOR-2011(8591)-21 Mission Assurance Guidelines for A-D Mission Risk Classes [DR01]. Class C missions are defined as lower national significance, exploratory or experimental missions, with a reduced set of Mission Assurance standards applied resulting in a moderate risk profile.

Table 1 shows the main characteristics of Class C.

Characteristic	Class C
Risk Acceptance	Moderate Risk
National Significance	Less Critical
Payload type	Exploratory or Experimental
Acquisition costs	Medium LCC
Complexity	Medium – Low
Mission Life	≤ 4 years
Cost	Medium - Low
Launch Constraints	Few
Alternatives	Some
Mission Success	Reduced mission assurance standards
Typical Contract Type	Cost Plus Firm Fixed Price

Table 1 – EQUARS Mission Risk, Class C [DR01].

Regarding for MPMP Plan, it is defined that for Class C is necessary heritage or test qualification [DA04]. Table 2 shows an extract of the requirements for MPMP Plan.

Table 2 -	Extract of the	requirements for	MPMP Plan	[DR01].
-----------	----------------	------------------	-----------	---------

Mission Assurance Process	Class C	
Parts, Materials and Processes	Material: Heritage envelope or	
	test qualification	
	Material approval: Formal*	

\* Due to the lessons learned issues at previous INPE's Mission, the material approval must be formal from Class A to C.

Table 3 shows that for Class C it is necessary a MPMP plan for quality assurance, including materials assembly, drawings, tooling and machinability.

Requirement	Class C	
Manufacturing: Parts and	Manufacturing plans include EEE parts list review, mandatory inspection	
Materials Assembly Flow	points, assembly flows, first article approach, and quality assurance plan	
Drawings Tooling	Review and approval by prime contractor and Customer	
Machinability	Minor deviations more common than with Class A	

Table 3 - Extract of the requirements for Manufacturing regarding MPMP [DR01].

Table 4 shows the specific requirements for materials and process. Again, the requirements for Class C ask heritage, low outgassing and all the requirements stablished at TOR2006-8583-5235 - Parts, Materials, and Processes Control Mission for Expendable Launch Vehicles [DR02].

Materials	Class C
Material and Process Selection	Heritage when possible otherwise all require qualification to
	environment by analysis at a minimum
Contamination Control	TML < 1%, CVCM <0.1%
	per ASTM E595 unless approved per analysis
Materials and Process control	REF TOR-2006(8583)-5235
	or NASA doc for class 3 Missions
Material and Process Requirements	REF TOR-2006(8583)-5235
	or NASA doc for class 3 Missions

Table 4 - Extract of Class C requirements for MPMP [DR01].

However, TOR2006-8583-5235 is intended for use in acquisition contracts for launch vehicle Missions and TOR-2006(8583)-5236 Technical Requirements for Electronic Parts, Materials, and Processes Used in Space and Launch Vehicles [DR03] (also published as SMC Standard SMC-S-009 [DR04]) is intended for use in acquisition of satellites and experimental missions.

### 1.5.2 PMP Plan

According to the Class C risk of mission the GEP has defined the following tasks EQUARS Satellite Mission:

#### 1.5.3 Organizational structure, responsibility and authority descriptions, management approach

The Mission Manager (MM) is responsible for defining the mission risk. The Mission Assurance (MA) Manager is responsible for flowing down the mission requirements for the PA disciplines. Each responsible for PA disciplines is responsible for creating their own PA Plan and PA Requirements related with the discipline, in the present case, Product Engineering Group is responsible for creating the MPMP Plan and Requirements and also for analyzing the supplier plan, including the MPMP Lists. The supplier is responsible for creating his own plan complying with the requirements of this MPMP Plan and for flowing down the requirements to the sub-suppliers. The PMPCB is responsible for approve the mechanical parts, materials, and processes. The Mission Manager is also responsible to define the Chairperson for the PMPCB.

# 1.5.4 Mission for documentation, or standardization when applicable, and control MPMP selection

During manufacture planning and PMP procurement, emphasis is placed on supplier selection and supply chain management, where technical requirements/performance, cost, and schedule are monitored on a continuing basis.

The supplier will stablish requirements for documentation and MPMP selection and control, including manufacturing plans, cleanness and contamination control, mandatory inspection points, assembly flows, first article approach, and quality assurance plan, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

#### **1.5.5** MPMP evaluation and qualification approach

Several lists are typically generated for management of PMP Missions, as follow, Declared Materials List, Declared Process List, Declared Mechanical Parts List. These lists are reviewed by the MPMP MA team, which includes the Product Engineering Group. These lists comprise, in different phases, the preliminary MPMP Lists, the approved MPMP Lists, the as-designed PMP List and the as-built PMP List.

The MPMP will be choose with heritage, when possible, otherwise is required qualification to environment by analysis at a minimum. A PMPCB will be established to control and approve mechanical parts, materials, and processes. The Product Engineering Group will establish the requirements for qualification of special process, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

#### **1.5.6** MPMP testing level and lot acceptance

The supplier will create a plan to show that the MPMP approved by qualification test, or heritage, meets the design, construction, and quality requirements. Some issues detected later in systems test could have been discovered earlier if the lot had received a complete and proper lot sample test.

The supplier will stablish requirements for MPMP evaluation and qualification according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

#### **1.5.7** MPMP quality assurance activities including incoming inspection

The supplier will stablish requirements for MPMP lot approval during the incoming inspection according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

#### 1.5.8 Requirements on, and system for the control of lower level suppliers, procurement agents

The supplier will flow down the requirements for the sub-suppliers and procurements agents, if any, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

# **1.5.9** System and schedule of audits and surveillance for control of supplier and procurement agency

The Mandatory Inspection Points (MPI) by the PA team will be established in order to guarantee the quality system process controls, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

#### **1.5.10** Coordinated procurement plan for parts of supplier, if applicable

The Mission Manager will define the Chairperson for the PMPCB which will control the procurement plan for parts from INPE or coordinate with the supplier, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

# **1.5.11** Submission of proposed PMP lists (Declared Materials List, Declared Mechanical Parts List, and Declared Processes List) to PMPCB approval

The PMPCB will establish the requirements for approval or MPMP Lists, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements:

- Preliminary lists available for PDR.
- As-designed lists available for CDR.
- As-built lists available for AR.

#### **1.5.12** Reporting and delivery of MPMP Data Items

The PMPCB will establish the requirements for approval or MPMP Lists, including the data related with evidence of heritage or PMP qualification, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

## **1.5.13** Assurance of traceability, lot control and that only those parts, materials and processes authorized by PMPCB are used in manufacture

The PMPCB, including the Product Engineering Group, will establish the necessary controls to guarantee that MPMP Approved Lists are being used in the manufacturing process, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

#### **1.5.14** Identification and control of age and cycle limited parts and material

The Product Engineering Group will establish the necessary controls of age and cycle limited parts and materials in the manufacturing process, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

#### **1.5.15** Implementation of a non-conform MPMP reporting and control Mission

The PMPCB will establish the requirements to non-conform MPMP control Mission, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

#### 1.5.16 Participation in Mission design reviews

The Product Engineering Group will participate of the design reviews in different phases and with different level of authority, according to SESEQ-Q-SPC-00045 v01 Experiments Product Assurance Requirements.

#### 1.5.17 Development of MPMP milestones and task Execution by Phase

The documents TOR-2007(8546)-6018 Aerospace Technical Operating Report – Mission Assurance Guide [DR05] and ECSS-M-ST-10C Space project management Project planning and implementation [DR06] define the MPMP tasks assigned to seven mission phases, Table 5.

TOR-2007(8546)-6018 (NASA)	ECSS-M-ST-10C (ESA)
Phase 0: Pre-Phase A Concept Studies	Phase 0: Mission analysis/needs identification
Phase A: Concept Development	Phase A: Feasibility
Phase B: Preliminary Design	Phase B: Preliminary Definition

Table 5 – Task phases for	NASA and ESA Missions.
---------------------------	------------------------

Phase C: Complete Design	Phase C: Detailed Definition
Phase D1: Fabrication and Integration	Phase D: Qualification and Production
Phase D2: Fielding and Checkout	Phase E: Utilization
Phase D3: Operations and Disposal	Phase F: Disposal

In order to match with the requirements of the INPE's Mission, that adopted the ECSS standards to guide the Mission Assurance Plan and the other low level documents, The MPMP plan also adopted the same nomenclature of ECSS. Regarding the phases, besides the differences in some approaches from NASA or ESA, for MPMP issues can be assumed equivalent.

Table 6 shows the activities in each task Mission phase.

Task		Phase					
		Α	В	С	D	Е	F
Mechanical Parts, Materials and Processes Tasks							
Assess contractual implementation of MPMP	Х	Х					
Assess MPMP infrastructure	Х	Х					
Assess MPMP process	Х	Х					
Assess MPMP implementation	Х	Х	Х	Х	Х		
Assess MPMP activities are implemented		Х	Х	Х	Х		
Audit MPMP Process					Х		

Table 6 - Reference Set of MPMP Tasks, [DR05].

Table 7 shows the MPMP needs and controls for both sides, INPE and supplier.

Table 7 -	Fnahling	MPMP	Products	[DR05]
	LIIOUIIIg		riouucis,	

Phase	INPE Enabling Products	Supplier Enabling Products
Phase 0	Request for proposal (RFP), Statement of	Proposal MPMP Control Plan and MPMP
	work (SOW), Work Breakdown Structure	technical requirements detailing how
	(WBS)	requirements will be met
Phase A	Final contract Criteria for SRR (System	Completion of SRR, SDR,
	Requirements Review) and SDR (Systems	MPMP plan tailoring, counterfeit and
	requirements document). Review and	prohibited MPMP plans
	approval of MPMP plans including	
	requirements tailoring	
Phase B	Entrance/Exit criteria for PDR Attendance	MPMP characterization data Mission
	at Preliminary Design Audits (PDAs)	approved parts list, approved MPMP
	Technology Readiness Assessments (TRAs)	selection lists, preliminary parts lists,
	Review and approval of MPMP drawings,	MPMP approval requests Completion of
	lists, non-standard MPMP requests	internal TRAs for new technology
		insertion completion of PDAs, PDR, and
		CDRLs
Phase C	Participation in and entrance/exit criteria	Completion of CDR, and CDRLs As-
	for CDR and Manufacturing Readiness	designed parts lists. Screening,
	Reviews (MRRs) Review of parts lists and	qualification and DPA data MRB decision
	screening, qualification, and DPA	reports on nonconforming MPMP.

	(Destructive physical analysis) data Review of MRB decisions and all non-conforming MPMP	Analysis including input assumptions and exceptions for MPMP		
Phase D	Participation in and entrance and exit criteria SRR (System Requirements Review) and SDR (Systems requirements document). Review of manufacturing MPMP issues Review of SRR (System Requirements Review) and SDR (Systems requirements document). s) to ensure traceability to approved and as-designed parts lists	EIDPs Failure analysis reports and mitigation/ Corrective action (CAs) Deviations and waivers As-built parts lists Build/manufacturing discrepancy reports and FRB decisions		
Phase E	Not Applicable for INPE's Mission	Not Applicable for INPE's Mission		
Phase F	Not Applicable for INPE's Mission	Not Applicable for INPE's Mission		

Table 8 shows detailed how the MPMP contribute in each phase.

## Table 8 - Key Tasks By Phase, [DR05].

Tack	Phase						
TASK	0	А	В	С	D1	D2	D3
Assess contract items such as SOW and WBS to ensure that							
contractor tasks and deliverables are included, that evaluation	x						
criteria considered MPMP, and that MPMP is adequately	^						
addressed by the requirements.							
Ensure adequacy of the MPMP Mission policy and that it meets							
the derived system engineering constraints and performance		Х					
needs							
Ensure existence and adequacy of a cross-functional MPMP							
management plan for efficient and uniform implementation of		Х					
MPMP policy.							
Ensure the development of an approved suppliers list and that a		x					
rating system for supplier's performance exists and is adequate		^					
Assess contractual implementation of MPMP in contract to							
ensure that contractor tasks and deliverables are included and		Х					
MPMP is adequately addressed by the requirements.							
Ensure establishment and adequacy of a functioning MPMP		v					
control board for management of MPMP on the Mission.		^					
Review plans for new technology insertion, ensure long lead		x					
items are identified		^					
Review Systems Requirements Review (SRR) and System Design							
Review (SDR) entrance and exit criteria for MPMP and review		Х					
topics to ensure the MPMP is adequately addressed.							
Ensure that documented individual mechanical part, material, or			v				
process needs are consistent with MPMP Mission requirements.			^				
Ensure development, maintenance, and control of a							
database/system documenting design requirements,			v				
design baseline, control, and use and control of life-limited and			^				
lot control items.							
Ensure development, maintenance, and control of approved							
selection, as-designed, and as-built Mission compliant			Х				
MPMP lists and methodology for approval of new							

MPMP				
Ensure implementation of cross Mission MPMP issue alert system	~			
for impact review, tracking, and mitigation.	X			
Ensure development of a methodology for generation of	v			
temperature to meet system performance at end of life (EOL).	X			
Ensure development of part selection criteria, including the				
development of design manuals to ensure parts application does	х			
not exceed performance boundaries.				
Review and ensure an approved suppliers list.	Х			
Participate in PMPCB and review and approve MPMP per Mission	~			
requirements.	X			
Review Preliminary Design Review (PDR) entrance and exit				
criteria and agenda topics to ensure MPMP is	Х			
adequately addressed				
Assess MPMP Contract deliverable requirements list (CDRL).	Х			
Review and ensure MPMPs have satisfactory screening,		v		
qualification, and lot qualification data.		X		
Ensure demonstration and qualification of all new technology(s).		Х		
Ensure the demonstration of critical manufacturing processes.		Х		
Perform audits of critical manufacturing processes, along				
with performance of part and material risk reduction tasks that				
address new technologies and verify readiness to enter		х		
production.				
Ensure development of a list of long lead items and methodology				
for ensuring "on-time" delivery.		х		
Ensure non-conforming MPMP and MRB decisions are adequate				
and reviewed and approved by MPMPCB.		х		
Ensure all analyses of failed components have reasonable root				
cause investigations and implementation of adequate		х		
corrective action (CA).				
Evaluate procured parts quality levels and specifications.		Х		
Participate in MPMPCB and review and approve MPMP per		v		
Mission requirements.		х		
Evaluate part stress analyses		Х		
Review derating of MPMP for compliance to requirements for		v		
long-term reliability.		X		
Review Critical Design Review (CDR) entrance and exit criteria,				
and agenda topics to ensure MPMP is adequately addressed.		~		
Review key MPMP issues and evaluate waivers		X		
and deviations. Ensure CDR agenda addresses MPMP				
Assess MPMP CDRLs.		Х		
Ensure there is an effective closed loop system to feed back				
necessary changes derived from system-level performance			Х	
results and industry data interchange.				
Review and monitor MPMP qualification and lot acceptance test				
results, with emphasis on assessing			v	
any deviation from the initial requirement set and/or appropriate	1		^	
Correction Action (CAs).				
Ensure actual designs and application impacts on MPMP are not			v	
exceeding limitations.			^	
Assess new application impacts on MPMP for reliability impacts			v	
and End of life (EOL) adjustments			~	

Ensure all analyses of failed components have reasonable root cause investigations and implementation of Correction Action (CA).			х		
Ensure new issue alerts are properly addressed for potential impacts.			Х		
During Phase E (fielding and checkout), MPMP engineering activities and processes continue to ensure that performance expectations are being met, provide a continuing identification of technology and performance upgrade opportunities, and resolve and implement CAs/lessons learned for any system anomalies that are traceable to MPMP.				NA	
Ensure all reviews include addressing MPMP waivers/deviations.				NA	
Ensure newly issued alerts are properly addressed for potential impacts.				NA	
As appropriate, provide MPMP assessments and guidance for ground segment, study efforts, and operational anomaly resolution.					NA

### **1.5.18** INPE's MPMP requirements

The INPE's document SESEQ-E-PRC-00124 - Mechanical Parts, Materials and Process Requirements Control of the Product Engineering Group [DR07] is the tailored document based on the SMC-S-009 Air force Space Command – Space and Missile Systems Center Standard - Parts, Materials, and Processes Control Mission for Space Vehicles [DR04], considering the particularities of the Quality Engineering Service department which split the discipline into different groups, as Product Engineering, Radiation and Electrical, Electronic and Electro-mechanical Components groups.

The SESEQ-E-PRC-00124 - Mechanical Parts, Materials and Process Requirements Control of the Product Engineering Group describes the general requirements for the MPMP for INPE's Mission, regarding the Class A to C The tasks division by phase described at this document is adopted to INPE's space Missions.

LIST OF ITEMS TO BE DEFINED						
ID	DESCRIPTION	STATUS				
TBD-1	NA	NA				
LIST OF ITEMS TO BE CONFIRMED						
ID	DESCRIPTION	STATUS				
TBC-1	EQUARS-XXX-TS-XXX-A - Mission Assurance Requirements EQUARS	open				