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Product Realization Plan

Revisions Rev: E.O. Number - Description Letter Date Contract#: Your Co Your Dept: Your Dept: **ENGINEERING PROCEDURE** Your Dept: QC-130 Your Dept: Size: CAGE: 1 of 20 Form Rev: Orig

TABLE OF CONTENTS

1.0	GENERAL				
1.					
1.	2 SCOPE OF REQUIREMENTS				4
1.	2.1 REFERENCES				5
1.					5
1.	4 MANAGEMENT OF THE ASSURANCE PRO	OJECT			5
Figu	re 1. (Your Co) Organization		•••••	•••••	5
Figu	re 2. (Your Co) Quality Assurance Group Organi	ization	•••••	•••••	6
Figu	re 3. (Your Co) Department Organization	•••••	•••••	•••••	6
1.	5 STATUS REPORTS				6
1.					7
1.	7 CLIDUEUG AND ALIDUEG				0
2.0	PRODUCT ASSURANCE REVIEWS		•••••	•••••	8
2.	PRODUCT ASSURANCE REVIEWS			<i>թ</i>	8
2.	2 DESIGN REVIEWS				28
2.	3 ACCEPTANCE DATA PACKAGE				9
3.0	PERFORMANCE VERIFICATION REQUIRE	EMENTS			9
3.	1 GENERAL				9
3.	2 ACCEPTANCE TEST DOCUMENTATION			(0)	9
3.	3 GROUND SUPPORT EQUIPMENT (GSE)				10
3.				2 2	10
3.	5 DROVEGE DOGULIEUM MEGORDO				1.0
3.	6 PROBLEM/FAILURE REPORTS AND COR	RECTIVE AC	TION•		11
3.	7 FAILURE-FREE OPERATION				11
4.0	7 PROJECT DOCUMENTATION RECORDS 6 PROBLEM/FAILURE REPORTS AND CORI 7 FAILURE-FREE OPERATION			•••••	11
4.	1 PERSONNEL SAFETY				
7.					1 4
5.0	EEE PARTS REQUIREMENTS AND DEFINI	TIONS	4	•••••	12
5.	1 PARTS, MATERIALS, & PROCESS SELECT	TION and SPI	ECIFICATIO.	N	12
5.	2 EEE PARTS SCREENING				12
5.					
6.0	MATERIALS AND PROCESS CONTROLS		•••••	•••••	13
6.					
6.					
6.					14
6.	4 CRITICAL FASTENERS5 CORROSION PROTECTION				14
6.	5 CORROSION PROTECTION				14
6.					14
6.	7 PRINTED WIRING BOARDS				
7.0	DESIGN ASSURANCE AND RELIABILITY R	EQUIREME	ENTS	•••••	15
7.	1 RESPONSIBILITIES AND ORGANIZATION	· · · · · · · · · · · · · · · · · · ·			
7.	2 WORST-CASE ANALYSIS				
7.					
7.					
7.	5 EEE PARTS STRESS DERATING				
7.	6 LIMITED-LIFE ITEMS				
8.0	QUALITY ASSURANCE		•••••	•••••	16
8.					
8.	2 ELECTROSTATIC DISCHARGE (ESD) CON	VTROL			16
8	NON-CONFORMANCE CONTROL				
8.	MATERIAL REVIEW BOARD (MRB)				16
8.	SUBCONTRACTOR QUALITY REQUIREM	ENTS			17
) 8.					
8.					
8.					
					
	Your Co	REV	CAGE	DOC#:	2 of 20
	Tour Co				
				ŲC-	-130

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8.9)	I d
8.1	10 PRESERVATION, PACKAGING, HANDLING, STORAGE, AND SHIPPING	19
9.0	CONTAMINATION CONTROL REQUIREMENTS	
	PROTECTION	
9.2		
9.3		
	ACRONYMS AND ARRREVIATIONS	4

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Your Co	REV	CAGE	DOC#:		3 of 20
				QC-130	

1.0 GENERAL

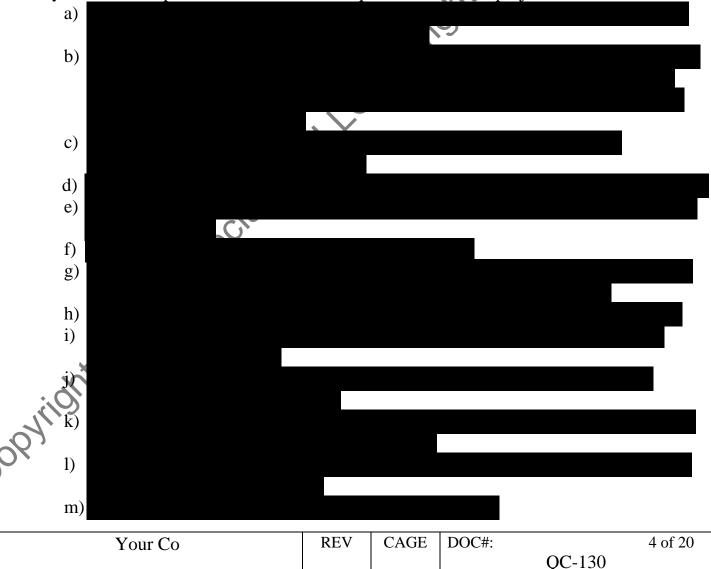
1.1 BASIC REQUIREMENTS

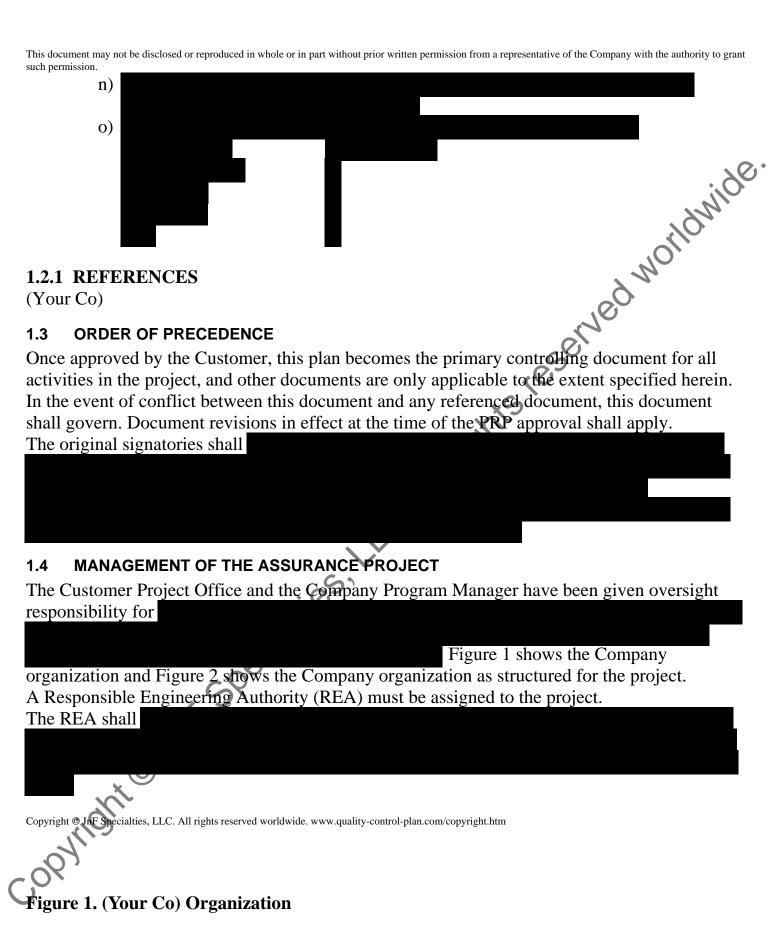
This Product Realization Plan (PRP) applies to hardware-software and ensures that Good Manufacturing Practices (GMP) and Quality Assurance requirements are satisfied throughout all phases of the project.

1.2 SCOPE OF REQUIREMENTS

This PRP describes the methods and controls to be implemented for the GMP and QA program. The PRP shall be invoked and maintained throughout the project. The deliverable hardware being built by (Your Supplier) for the project falls within the definition of Quality Assurance Level ?? of the Supplier Quality Assurance Plan.

The requirements of this PRP shall be flowed down to subcontractors and/or suppliers. Conformance to approved internal procedures shall allow subcontractors and suppliers to maintain compliance with the requirements of the project. The following list provides a summary of the developed hardware-software requirements for the project:





Your Co	REV	CAGE	DOC#:		5 of 20
				QC-130	

Figure 2. (Your Co) Quality Assurance Group Organization

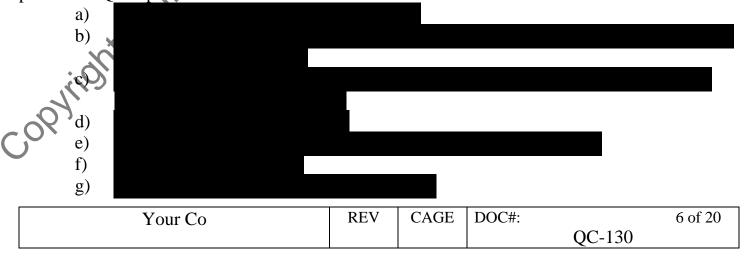
The Company shall employ drafting, package design, fabrication, assembly, and Quality Control (QC) inspection services to build deliverable hardware. Figure 3 shows the Company organization that supports hardware fabrication. Quality Control (QC) inspectors work with the



Figure 3. (Your Co) Department Organization

1.5 STATUS REPORTS

The REA shall report the status of QA activities, problems, and deficiencies, (both in-house and from outside subcontractors) to the Program Manager and the Customer Project Office monthly, via the Contracts Group. The REA shall include the following quality assurance information as part of the QA report:



1.6 PROCUREMENT

1.6.1 General

All purchased hardware specifications shall have quality requirements included in the procurement documents. The Company shall perform the following tasks as appropriate to verify the quality and reliability of hardware purchased from subcontractors and vendors for the project:



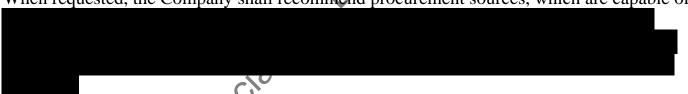
1.6.2 Supplier Controls

1.6.2.1 General

The Company shall review the reliability and quality requirements of purchased materials, articles, and services for the hardware as necessary.

1.6.2.2 Selection of Qualified Procurement Sources

When requested, the Company shall recommend procurement sources, which are capable of



1.6.2.3 Preferred EEE Parts Supplier

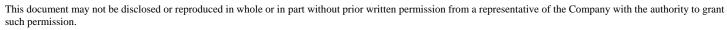
The Customer may have identified certain preferred manufacturers of parts and components, based on

1.6.2.4 Procurement Documents

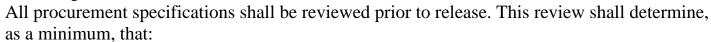
The requirements of this plan shall be imposed upon subcontractors and/or suppliers to the extent necessary to assure compliance with the requirements of the project. Provisions shall be included for:



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Your Co	REV	CAGE	DOC#:		7 of 20
				QC-130	



1.6.2.5 Specifications Review



- a)
- b)

1.7 SURVEYS AND AUDITS

The Quality Assurance Group shall perform surveys and audits, as necessary, to

These surveys and audits provide a basis for measuring performance and aid in the management control of the plan. Elements of this plan may

The survey and audit reports shall be prepared by the Company. These reports shall outline

2.0 PRODUCT ASSURANCE REVIEWS

2.1 DESIGN DRAWINGS

The Project shall use a Level ?? drawing system. Level ?? drawing and change control signature responsibilities shall be documented. All drawing changes shall

2.2 DESIGN REVIEWS

2.2.1 Design Reviews

The Company, under the direction of the REA, shall conduct formal and documented design reviews of the hardware designs. These reviews shall include

Safety and software issues shall be agenda items

idvide

during design reviews. Design data packages shall

The REA shall head the review board and

Your Co	REV	CAGE	DOC#:		8 of 20
				QC-130	

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,				
2.2.2 Subsystem Design Reviews				
Acceptance reviews shall be held for				
The REA shall schedule in-house rev	iews of			
2.2.3 Design Review Support				2/1/2
The Company shall participate in des	ion review	The REA	chall attend	for arrange for
representatives to participate in desig	_		Shan auchu	or arrange for
representatives to participate in desig	n reviews t	o chibare	.5	
2.2.4 Review of Existing/Modified	l Designs		M	
Certain components that have heritage	_	usly accepte	d hardware	shall
	1			
		<i>\\ \\ \\</i>		
2.3 ACCEPTANCE DATA PACKAG	·= (-, '		
		1	41 . E'.	1 A
An Acceptance Data Package shall be		• •		-
as a part of the data package for that	leview. The	Acceptanc	e Data Fack	Rage shan iliciude
NO.				
3.0 PERFORMANCE VERIFICA	ATION RE	QUIREME	NTS	
3.1 GENERAL				
All components of the hardware (incl	uding instr	umanta) cha	11 ha tastad	to lavale nacassary to
ensure	uumg msu	umems) sna	in de lesieu	to levels necessary to
Chsure				
O LOCEDT MOS TEST DOCUME	·			
32 ACCEPTANCE TEST DOCUME				
Acceptance tests shall be performed	-			-
have a test plan and test procedures a	s described	in the Com	ponent Spec	cification.
Your Co	REV	CAGE	DOC#:	9 of 20

QC-130

3.2.1 Acceptance Test Report

A brief test report summarizing test results and their implications shall be available within 10 days after test completion. A final test report shall be prepared within 30 days after test completion.

	ments and Records of All Acceptance Tests and Inspections on of acceptance test documents and records shall be as specified in the
Acceptance T	est Plans and Procedures. The scope, duration, and number of inspections and
tests to be con	nducted on the completed equipment shall
	fter acceptance tests and inspection have been completed, the REA and Program
Manager shal	
	The Test
Review Boar	
Tto To W Bott	
	ND SUPPORT EQUIPMENT (GSE)
Prior to use for	or testing hardware, all GSE (if applicable) shall This includes
	SEMEM BOARD (TRR) : (C)
	REVIEW BOARD (TRB)
	w Board shall be established. The TRB members shall include (or represent) the
	sign Engineer, REA, QA Engineer, and Program Manager. The TRB shall:
a)	
b)	
0)	
c)	
-/	
2 6 000016	CT DOCHMENTATION DECODING

3.5 PROJECT DOCUMENTATION RECORDS

Records that provide evidence of inspections, tests, configuration and material review actions during the fabrication and assembly process shall be maintained. These records shall

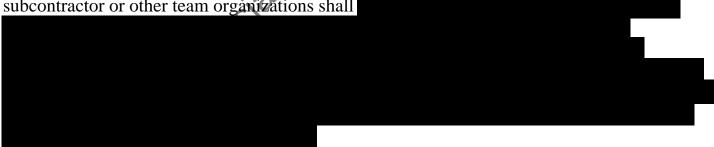
The documentation listed below shall be used to provide a complete record of the hardware, including traceability, configuration control, and application history:

Your Co	REV	CAGE	DOC#:	10 of 20
				QC-130



3.6 PROBLEM/FAILURE REPORTS AND CORRECTIVE ACTION

Problem/failure reporting is initiated with acceptance testing of a component or instrument and continues throughout integration and test of the final assembly. Problem/failures occurring at subcontractor or other team organizations shall



3.7 FAILURE-FREE OPERATION

Hardware shall demonstrate a minimum of xx hours cumulative failure-free operation immediately prior to delivery.

4.0 SAFETY ASSURANCE

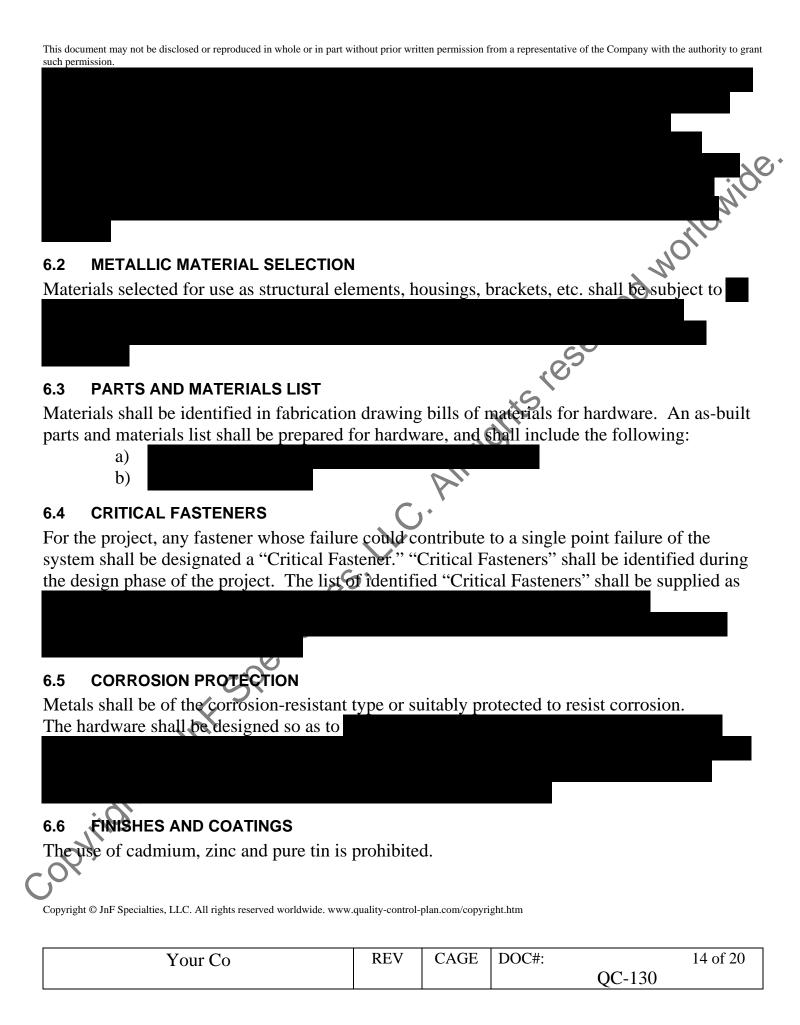
The Program Manager is responsible for ensuring safety in the project. This responsibility includes

Your Co	REV	CAGE	DOC#:	11 of 20
				QC-130

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4.1 PERSONNEL SAFETY
All appropriate precautions shall be taken to provide for maximum protection of personnel.
Where necessary, special provisions shall
4.2 HARDWARE SAFETY
Provisions shall be made to protect hardware from damage. Accepted safety practices include but are not limited to the following:
a)
b)
c) d)
e)
5.0 EEE PARTS REQUIREMENTS AND DEFINITIONS
The Company shall: (1)
(3)
(6)
5.1 PARTS, MATERIALS, & PROCESS SELECTION and SPECIFICATION
Approved EEE parts for hardware include Customer Preferred Parts List (PPL) and those items
purchased and/or screened to Customer requirements. The REA shall
5.2 EEE PARTS SCREENING
5.21 EEE Parts Screening and Test
EEE screening shall be in accordance with documented requirements. Optional additional
testing may be specified based on
Repeating any inspection or screen that has previously been
Your Co REV CAGE DOC#: 12 of 20
QC-130

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performed by the manufacturer (or third party) is optional. Deviation from the screening instructions provided herein requires
instructions provided herein requires
5.2.2 Data Evaluation
All manufacturer test data purchased with EEE parts, and test data generated shall be reviewed
for the state of t
Test programs and hardware shall be approved prior to use on all part types electrically tested at
the supplier). Deficiencies shall
5.2.3 Destructive Physical Analysis
When recommended, Destructive Physical Analysis (DPA) shall be performed in accordance
with (Your #), Destructive Physical Analysis Procedure. DPA shall be imposed with the
concurrence of the Program Manager. Pre-cap inspection by the Customer or its designated
representative may be performed as an alternative to DPA. Factors that are considered in this
decision include
5.2.4 Re-testing of EEE Parts in Stock
Parts intended to be issued from existing stock shall be reviewed for
5.3 (Your Customer) MANUFACTURED EEE PARTS
Parts manufactured at the Customer for assembly shall be evaluated as above. The REA shall
perform inspection and evaluation of these parts to assure
6.0 MATERIALS AND PROCESS CONTROLS
6.1 MATERIALS AND PROCESSES
Materials and processes used to fabricate hardware shall be reviewed for acceptability,
compatibility, and conformance to applicable design documentation and quality assurance
requirements. Controls are initiated from

Your Co	REV	CAGE	DOC#:		13 of 20
				QC-130	



6.7 PRINTED WIRING BOARDS

Printed wiring boards (PWBs) shall meet the requirements of (Your #). Design requirements governing printed wiring boards, printed wiring assemblies, and design considerations for the Morldwide mounting of parts and assemblies shall be in accordance with (Your #).

7.0 DESIGN ASSURANCE AND RELIABILITY REQUIREMENTS

7.1 RESPONSIBILITIES AND ORGANIZATION

The reliability tasks shall be undertaken and achieved using (Your #) as a guide.

7.2	WORS1	T-CASE	ΔΝΔΙ	YSIS
· · ·			Δ	- 1 010

Electronic circuits and electromechanical and mechanical items shall be designed using

The results shall be reviewed at the

Customer subsystem-level design reviews.

7.3 TREND ANALYSIS

Trend analyses shall identify performance parameters for

7.4 **MAINTAINABILITY**

To the extent possible, design features shall allow component access and facilitate performance of all checkout, repair, and maintenance tasks. Features intended to eliminate potential failures due to human error, to and to shall

EEE PARTS STRESS DERATING

EEE parts derating shall be in accordance with (Your #). Each electronic/electrical design engineer shall be responsible for

7.6 LIMITED-LIFE ITEMS

Limited-life items shall be identified on a Limited-Life Items List and included as part of the deliverable data package.

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Your Co	REV	CAGE	DOC#:	15 of 20
				QC-130

8.0 QUALITY ASSURANCE

8.1 TRAINING AND CERTIFICATION OF PERSONNEL

Supervisors shall ensure that all persons working on high-reliability hardware have received the proper training to produce high quality workmanship. Training is comprised of specific instruction in several basic areas as follows:



8.2 ELECTROSTATIC DISCHARGE (ESD) CONTROL

Hardware shall be protected from ESD damage.

8.3 NON-CONFORMANCE CONTROL

Nonconforming articles or materials (defined as those not satisfying fabrication, processing, assembly, or configuration requirements) shall be reviewed initially by Quality Assurance personnel and shall be subjected to one of the following dispositions:



8.4 MATERIAL REVIEW BOARD (MRB)

All referred non-conformances shall be evaluated by a MRB, as a minimum consisting of:



The MRB shall draw upon the various skill centers as required. A report of the MRB action shall be prepared on a Nonconformance Report Form (NCR) and shall include

Unanimous agreement must be obtained from the four MRB members, and for all articles and materials submitted to the MRB one of the following dispositions shall be directed. When there

Your Co	REV	CAGE	DOC#:	16 of 20
			QC-130	

is not unanimous agreement, one of the steps below shall be followed at the option of the Program Manager.

a) Molldwide b)

8.5 SUBCONTRACTOR QUALITY REQUIREMENTS

8.5.1 **Source Selection**

c)

Source selection shall be based upon the supplier's past performance history. Where no previous quality records are available, a quality assurance survey of the supplier's facilities and quality control system may

8.5.2 Supplier Product Assurance Requirements

Supplier Quality Requirements document QC-121-6 shall be generated to delineate the QA requirements.

8.5.3 Quality Assurance Inspection at Subcontractor Facilities

Source inspection at the supplier's facility may be required by purchase order or contract upon the recommendation of the QA authority and approved by the PM. The appropriate QA authority or a designated alternate shall

8.5.4 Supplier MRB

When suppliers of components, subsystems, or systems are delegated MRB authority, they shall

8.5.5 Hardware Buy-Offs

For subcontracted equipment, the buy-off meeting serves the purpose of the Integration Readiness Review for subsystems. The supplier's QA documentation package is reviewed, and

INSPECTION AND CONTROLS

QA personnel shall work closely with the REA to jointly determine the most cost effective, practical approach to ensure QA requirements are met. Inspections, evaluations, and/or audits shall be performed at the level necessary to assure compliance with the following:

Your Co	REV	CAGE	DOC#:		17 of 20
				QC-130	

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b)			
c)			
d) e)			\@'
			ilos
Inspection of support equipment shall be	limited to		
			160
8.7 STAMP CONTROL SYSTEM			6
8.7.1 Stamp Log An inspection stamp log shall be used to a	maintain	traceabili	ty to the individual responsible for
the use of each specific stamp. Issuance of			
by the Quality Group.		. (Wi
8.7.2 Stamp Use Inspection stamps shall be used to signify	that artic	cles and n	naterials have
map courant summps and ec discust a signific			
Th	0. 12.110.00.010.00	a of the in	nanaction stown on the traveler shall
signify	e presene	e or the n	nspection stamp on the traveler shall
	27		
8.8 SOFTWARE QUALITY ASSURANCE	E		
The Software Group shall develop a Software		nagement	Plan applicable to the project and
shall The Software Management Dan shall be	based on	doguman	tad Cuidalinas - Kay parsannal shall
The Software Management Plan shall be	based on	documen	ned Guidennes. Key personner snan
8.9 INSPECTION, MEASURING, AND T			
Hardware acceptance testing requires the Measurement Equipment Calibration Practice 1985.			
using			
Your Co	REV	CAGE	DOC#: 18 of 20
Tour Co			QC-130

PRESERVATION, PACKAGING, HANDLING, STORAGE, AND SHIPPING 8.10

8.10.1 General

The Company shall maintain procedures for preserving, packaging, handling, storing, and shipping to prevent damage, loss, deterioration, tampering, degradation, and substitution.

These procedures shall take into consideration

8.10.2 Preservation

Preservation procedures shall be designed to

8.10.3 Handling

Any article subject to damage due to normal handling during fabrication or testing shall

8.10.4 Storage

8.10.4 Storage
The Company shall provide protected and controlled storage for all assembled articles. Special attention shall

8.10.5 Packaging and Shipping

Packaging procedures shall be maintained for protection from damage or deterioration of the articles being shipped. These procedures shall take into consideration

CONTAMINATION CONTROL REQUIREMENTS 9.0

PROTECTION 9.1

Gloves, protective covers, and other appropriate measures shall be used as required.

The hardware shall

9.2 **FACILITIES**

All fabrication of electronic hardware shall be performed in class M7 air-conditioned areas. In addition, assembly and testing at the system level and for critical components shall be performed in

MONITORING 9.3

During periods of activity, Quality Assurance personnel shall monitor the clean room areas for

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Your Co	REV	CAGE	DOC#:	19 of 20
				QC-130

10.0 ACRONYMS AND ABBREVIATIONS

CDR Critical Design Review

CVCM Collected Volatile Condensable Mass

DCN **Drawing Change Notice**

DF Discrepancy Form

DESC Defense Electronic Supply Center

DPA Destructive Physical Analysis

Drawing Release Review DRR

EDR Engineering Design Review

EEE Electrical, Electronic, and Electromechanical

EMC Electromagnetic Compatibility

EMI Electromagnetic Interference

EO **Engineering Order ESD** Electrostatic Discharge

Fabrication Feasibility Review **FRR**

GIDEP Government Industry Data Exchange Program

GSE Ground Support Equipment

GSI Government Source Inspection

ICD Interface Control Document

Discrepant Material Report **DMR**

Integration Readiness Review IRR

Mil-Spec Military Specification

Material Review Board MRB

Nonconformance Report Form NCR

C. All rights reserved worldwide. National Institute of Standards and Technolog **NIST**

OA Quality Assurance

PRP Performance Assurance Plan

Preliminary Design Review **PDR**

PER Pre-Environmental Review.

Purchase Instruction (or Principle Investigator) PΙ

Project Manager PM

PPL Preferred Parts List

PPP&M Preservation, Packaging, Packing, and Marking

PSR Pre-Ship Review

Printed Wiring Boards **PWB**

Quality Assurance QA

Quality Control QC

QML Qualified Manufacturers List

Qualified Product List QPL

REA Responsion Readiness Review Responsible Engineering Authority

TML

TRB Test Review Board

TRR Test Readiness Review

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Your Co	REV	CAGE	DOC#:		20 of 20	
				QC-130		

