Product Realization Plan

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Letter	E.O. Number - Description		Date

Used On	Contract#:		**Your Co**					
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Your Dept:								
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Your Logo

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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:

a) [redacted]
b) [redacted]
c) [redacted]
d) [redacted]
e) [redacted]
f) [redacted]
g) [redacted]
h) [redacted]
i) [redacted]
j) [redacted]
k) [redacted]
l) [redacted]
m) [redacted]

n) [redacted]

o) [redacted]

1.2.1 REFERENCES

(Your Co)

1.3 ORDER OF PRECEDENCE

Once approved by the Customer, this plan becomes the primary controlling document for all activities in the project, and other documents are only applicable to the extent specified herein. In the event of conflict between this document and any referenced document, this document shall govern. Document revisions in effect at the time of the PRP approval shall apply. The original signatories shall [redacted]

1.4 MANAGEMENT OF THE ASSURANCE PROJECT

The Customer Project Office and the Company Program Manager have been given oversight responsibility for [redacted] Figure 1 shows the Company organization and Figure 2 shows the Company organization as structured for the project. A Responsible Engineering Authority (REA) must be assigned to the project. The REA shall [redacted]

Figure 1. (Your Co) Organization

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 Customer personnel to [redacted] Quality Assurance has the following functions:

a) [redacted]
b) [redacted]
c) [redacted]
d) [redacted]
e) [redacted]
f) [redacted]
g) [redacted]

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:

a) [redacted]
b) [redacted]
c) [redacted]
d) [redacted]
e) [redacted]
f) [redacted]
g) [redacted]

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:

a) [redacted]
b) [redacted]
c) [redacted]
d) [redacted]
e) [redacted]
f) [redacted]
g) [redacted]

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 [redacted]

1.6.2.3 Preferred EEE Parts Supplier

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

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:

a) [redacted]
b) [redacted]
c) [redacted]

1.6.2.5 Specifications Review

All procurement specifications shall be reviewed prior to release. This review shall determine, as a minimum, that:

a) [redacted]

b) [redacted]

1.7 SURVEYS AND AUDITS

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

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

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

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 [redacted]

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 [redacted] Safety and software issues shall be agenda items during design reviews. Design data packages shall [redacted] The REA shall head the review board and [redacted]

[redacted]

2.2.2 Subsystem Design Reviews

Acceptance reviews shall be held for [redacted]
The REA shall schedule in-house reviews of [redacted]

2.2.3 Design Review Support

The Company shall participate in design reviews. The REA shall attend or arrange for representatives to participate in design reviews to ensure [redacted]

2.2.4 Review of Existing/Modified Designs

Certain components that have heritage in previously accepted hardware shall [redacted]

2.3 ACCEPTANCE DATA PACKAGE

An Acceptance Data Package shall be available ten days prior to the Final Acceptance Review as a part of the data package for that review. The Acceptance Data Package shall include [redacted]

3.0 PERFORMANCE VERIFICATION REQUIREMENTS

3.1 GENERAL

All components of the hardware (including instruments) shall be tested to levels necessary to ensure [redacted]

3.2 ACCEPTANCE TEST DOCUMENTATION

Acceptance tests shall be performed on all components and instruments. Acceptance tests shall have a test plan and test procedures as described in the Component Specification.

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.

3.2.2 Documents and Records of All Acceptance Tests and Inspections

The disposition of acceptance test documents and records shall be as specified in the Acceptance Test Plans and Procedures. The scope, duration, and number of inspections and tests to be conducted on the completed equipment shall [redacted] After acceptance tests and inspection have been completed, the REA and Program Manager shall [redacted] The Test Review Board shall [redacted]

3.3 GROUND SUPPORT EQUIPMENT (GSE)

Prior to use for testing hardware, all GSE (if applicable) shall [redacted] This includes [redacted]

3.4 TEST REVIEW BOARD (TRB)

A Test Review Board shall be established. The TRB members shall include (or represent) the cognizant Design Engineer, REA, QA Engineer, and Program Manager. The TRB shall:

a) [redacted]

b) [redacted]

c) [redacted]

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

a) [redacted]
b) [redacted]
c) [redacted]
d) [redacted]
e) [redacted]
f) [redacted]
g) [redacted]
h) [redacted]
i) [redacted]

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 [redacted]

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 [redacted]

[redacted]

4.1 PERSONNEL SAFETY

All appropriate precautions shall be taken to provide for maximum protection of personnel. Where necessary, special provisions shall [redacted]

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) [redacted]

b)

c)

d)

e)

5.0 EEE PARTS REQUIREMENTS AND DEFINITIONS

The Company shall: (1) [redacted] (2) [redacted] (3) [redacted] (4) [redacted] (6) [redacted]

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 [redacted]

5.2 EEE PARTS SCREENING

5.2.1 EEE Parts Screening and Test

EEE screening shall be in accordance with documented requirements. Optional additional testing may be specified based on [redacted] Repeating any inspection or screen that has previously been

performed by the manufacturer (or third party) is optional. Deviation from the screening instructions provided herein requires [redacted]

5.2.2 Data Evaluation

All manufacturer test data purchased with EEE parts, and test data generated shall be reviewed for [redacted]

Test programs and hardware shall be approved prior to use on all part types electrically tested at the supplier). Deficiencies shall [redacted]

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 [redacted]

5.2.4 Re-testing of EEE Parts in Stock

Parts intended to be issued from existing stock shall be reviewed for [redacted]

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 [redacted]

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 [redacted]

[redacted]

6.2 METALLIC MATERIAL SELECTION

Materials selected for use as structural elements, housings, brackets, etc. shall be subject to [redacted]

6.3 PARTS AND MATERIALS LIST

Materials shall be identified in fabrication drawing bills of materials for hardware. An as-built parts and materials list shall be prepared for hardware, and shall include the following:

a) [redacted]
b)

6.4 CRITICAL FASTENERS

For the project, any fastener whose failure could contribute to a single point failure of the system shall be designated a “Critical Fastener.” “Critical Fasteners” shall be identified during the design phase of the project. The list of identified “Critical Fasteners” shall be supplied as [redacted]

6.5 CORROSION PROTECTION

Metals shall be of the corrosion-resistant type or suitably protected to resist corrosion. The hardware shall be designed so as to [redacted]

6.6 FINISHES AND COATINGS

The use of cadmium, zinc and pure tin is prohibited.

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 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 WORST-CASE ANALYSIS

Electronic circuits and electromechanical and mechanical items shall be designed using [redacted] The results shall be reviewed at the Customer subsystem-level design reviews.

7.3 TREND ANALYSIS

Trend analyses shall identify performance parameters for [redacted]

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 [redacted], and to [redacted] shall [redacted]

7.5 EEE PARTS STRESS DERATING

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

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.

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:

a) [redacted]
b)
c)
d)

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:

a) [redacted]
b)
c)

8.4 MATERIAL REVIEW BOARD (MRB)

All referred non-conformances shall be evaluated by a MRB, as a minimum consisting of: (1) [redacted], (2) [redacted], (3) [redacted], and (4) [redacted]

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 [redacted]

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

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

a) [redacted]

b) [redacted]

c) [redacted]

8.5 SUBCONTRACTOR QUALITY REQUIREMENTS

8.5.1 Source Selection

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 [redacted]

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 [redacted]

8.5.4 Supplier MRB

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

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 [redacted]

8.6 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:

a) [redacted]
b) [redacted]
c) [redacted]
d) [redacted]
e) [redacted]

Inspection of support equipment shall be limited to [redacted]

8.7 STAMP CONTROL SYSTEM

8.7.1 Stamp Log

An inspection stamp log shall be used to maintain traceability to the individual responsible for the use of each specific stamp. Issuance of the stamp and maintenance of the log are controlled by the Quality Group.

8.7.2 Stamp Use

Inspection stamps shall be used to signify that articles and materials have [redacted] The presence of the inspection stamp on the traveler shall signify [redacted]

8.8 SOFTWARE QUALITY ASSURANCE

The Software Group shall develop a Software Management Plan applicable to the project and shall [redacted]
The Software Management Plan shall be based on documented Guidelines. Key personnel shall [redacted]

8.9 INSPECTION, MEASURING, AND TEST EQUIPMENT CALIBRATION

Hardware acceptance testing requires the use of Class 1 test equipment as defined in Test and Measurement Equipment Calibration Practices and Procedures. Calibrations shall be performed using [redacted]

8.10 PRESERVATION, PACKAGING, HANDLING, STORAGE, AND SHIPPING

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 [redacted]

8.10.2 Preservation

Preservation procedures shall be designed to [redacted]

8.10.3 Handling

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

8.10.4 Storage

The Company shall provide protected and controlled storage for all assembled articles. Special attention shall [redacted]

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 [redacted]

9.0 CONTAMINATION CONTROL REQUIREMENTS

9.1 PROTECTION

Gloves, protective covers, and other appropriate measures shall be used as required. The hardware shall [redacted]

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 [redacted]

9.3 MONITORING

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

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
DRR Drawing Release Review
EDR Engineering Design Review
EEE Electrical, Electronic, and Electromechanical
EMC Electromagnetic Compatibility
EMI Electromagnetic Interference
EO Engineering Order
ESD Electrostatic Discharge
FRR Fabrication Feasibility Review
GIDEP Government Industry Data Exchange Program
GSE Ground Support Equipment
GSI Government Source Inspection
ICD Interface Control Document
DMR Discrepant Material Report
IRR Integration Readiness Review
Mil-Spec Military Specification
MRB Material Review Board
NCR Nonconformance Report Form
NIST National Institute of Standards and Technology
QA Quality Assurance
PRP Performance Assurance Plan
PDR Preliminary Design Review
PER Pre-Environmental Review
PI Purchase Instruction (or Principle Investigator)
PM Project Manager
PPL Preferred Parts List
PPP&M Preservation, Packaging, Packing, and Marking
PSR Pre-Ship Review
PWB Printed Wiring Boards
QA Quality Assurance
QC Quality Control
QML Qualified Manufacturers List
QPL Qualified Product List
REA Responsible Engineering Authority
RR Readiness Review
TML Total Mass Loss
TRB Test Review Board
TRR Test Readiness Review