Procedures and Guidelines

DIRECTIVE NO. 600-PG-8730.4.3A
EFFECTIVE DATE: _____
EXPIRATION DATE: _____

APPROVED BY Signature: _____
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TITLE: Director of Space Sciences

Responsible Office: 600 / Space Sciences Directorate

Title: Code 600 Projects Quality System

P1. POLICY

This procedure is to define the processes, requirements and responsibilities of a Directorate principal investigator who has been assigned management responsibility for a Project (activities leading to the delivery of a Center product in response to a Customer Agreement (see GPG 1310.1)) and in accordance with Agency and Center requirements.

The primary function of GSFC's Space Sciences Directorate (SSD) is to carry out and enable high quality research in the field of space sciences. This is accomplished by employing and collaborating with experts in this field and by providing them with facilities with which to perform the research. Funding for this effort comes largely to the SSD through NASA Headquarters.

The process by which funds are obtained, resources are gathered, and science tools are created within the SSD is described in figure 1.

Science is a continuous iterative process. Goals are driven by Agency-level strategic plans. Achieving the goals implies a continuing requirement for new or refined measurements, analyses, etc. Once a requirement has been established by a SSD scientist (or the scientific community at large), the process for fulfilling that requirement is set in motion.

P2. REFERENCES

NPG 7100.5 Program and Project Logistics Policy
NPG 7120.5A NASA Program and Project Management Processes and Requirements
GPG 1310.1 Customer Agreements
GPG 1410.1 Directives Management
GPG 1440.7 Control of Quality Records
GPG 1710.1 Corrective and Preventive Action
GPG 3410.2 Employee Training and Qualification
GPG 4520.2 Incoming Inspection and Test
GPG 5100.1 Procurement
GPG 5100.2 Supplier Performance Records
GPG 5310.4 Identification and Traceability of Products
GPG 5340.2 Control of Nonconforming Product
GPG 5340.3 Preparation and Handling of Alerts and Safe Alerts
GPG 5900.1 Control of Customer Supplied Product

GPG 6400.1 Handling, Storage, Packaging, Marking, Preservation and Transportation
GPG 8072.1 Process Control
GPG 8700.1 Design Planning and Interface Management
GPG 8700.2 Design Development
GPG 8700.3 Design Validation
GPG 8700.4 Technical Review Program
600-PG-8700.1.1 Code 600 Product design Planning and Interface Management
600-PG-8700.2.1 Design Development
600-PG-8700.3.1 Code 600 Validation of Product Design
600-PG-8700.4.1 Code 600/Technical Review Program
600-PG 8730.4.1 Science Research Management
600-PG 8730.4.2 Data Centers

Forms

Project Proposal
Periodic Status Reports
Review Presentations and Commentary
Engineering Test Documentation and Results

P3. SCOPE

This procedure describes the basic processes and requirements for the life cycle of all projects for which Directorate personnel have been assigned responsibility for a project. While all process activities and requirements shall be addressed, principal investigators should adjust implementation procedures to the specific needs of the project consistent with project size, complexity, criticality and risk. All projects shall comply with requirements established by law, regulations, Executive Orders, and Agency/Center directives.

P4. DEFINITIONS

Principal Investigator - individual responsible for the project cost, schedule, technical performance, and management requirements.

P5. AUTHORITIES AND RESPONSIBILITIES

GPD 1270.3, GSFC Quality Management System (QMS)

P6. IMPLEMENTATION

The activities associated with a principal investigator project within the Directorate are defined in the initial proposal submitted in response to an Agency announcement of opportunity and a Center customer agreement. The subsequent activities are delineated in the reference section documentation list, and scaled to fit the particular projects unique characteristics.

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Proposal Phase

The initiating scientist, or team of scientists first develop an overall Plan (reference GPG 8700.1, related 600-PG, and 600-PG-8730.4.3). The Plan begins by obtaining the necessary resources.

As part of this planning process, a planning team is formed. This team is comprised of scientific experts in the subject field, partners, and engineers and technicians, as needed. When members with appropriate expertise are not available in house at GSFC, they are actively sought out, and brought in, when possible, through collaborative agreements, (GPG 1310.1 and 600-1310.1.1) contract vehicles, etc. (ref GPG 5100.1 and 5100.2).

The type of involvement being considered will determine the course of this process.

Science Research. If the effort is to be limited to scientific research, or a scientific collaboration with another institution, then the effort and funding involved will not warrant Project-style oversight, regulations, and adherence to rigid procedures. The process at this point is governed by the experts involved, and is controlled only as dictated in 600-PG-8730.4.1.

However, other controls come into play if the proposed involvement is to include the delivery of hardware, software, and/or data. The product in this case may be some analysis software, a data set, a sub-orbital payload, space flight payload, or a facility used on the ground to advance the subject science field.

Hardware/Software/Data. If the proposed effort will total more than the center visibility threshold, then this effort will be eventually governed by Codes 700 and 400 and the procedures within those codes will apply, as per GPG 1310.1. However, the SSD still will likely seek funding for an R&D effort utilizing available experts in order to bolster its proposal position. Such an R&D effort also helps to provide continuity to the overall effort while Codes 700 and 400 are assembling their teams and plans.

If the proposed effort will be less than the center visibility threshold, then the effort is managed by the SSD, or within one of its subordinate organizations, as per GPG 1310.1. The proposal is issued based on the original plan and information gained from any R&D effort initiated to support the proposal.

Producing the Product

In all cases, if the proposal is not accepted, the team is debriefed Quality records are any debriefing materials and any documented lessons learned. These Quality Records are kept by the lead proposing scientist for a period of one year, minimum.

If the proposal is accepted, the Plan is refined, if necessary, based on the conditions of the acceptance.

Hardware/Software.. If the proposed effort is part of a larger project that is managed outside of GSFC, then specifications and other requirements are obtained from that source. Otherwise, the Team is responsible for generating these requirements, ensuring that all science objectives are considered.

Once requirements are established, the product is developed through a process of design (ref GPG 8700.2), fabrication/assembly (ref GPG 5310.4, GPG 5900.1), and testing (ref GPG 8700.3, GPG 8070.2).

Reviews, as established by the Plan, are held at critical points along this development, and changes to the development are implemented if this is determined necessary through the review process.

Delivery

Delivery of the product is then made to the next level requiring the product, that is, outside of the SSD. This could be the end user, a launch site, a Data Center, or the provider of the next higher assembly (instrument, spacecraft, or launch vehicle) (ref GPG 6400.1, 600-PG-8730.4.2).

Generating Science from the Product

Regardless of the nature of the product, data (or refined data) and/or analysis will result (ref 600-PG-8730.4.X). All data collected from flight instruments managed by the SSD are archived and/or distributed (ref 600-PG-8730.4.2). The results of analyses are disseminated via published papers, formal talks, etc. (ref. 600-PG-8730.4).

The Quality Records that are typical of most projects and retained by the PI are:

Initiating proposal
Customer agreement

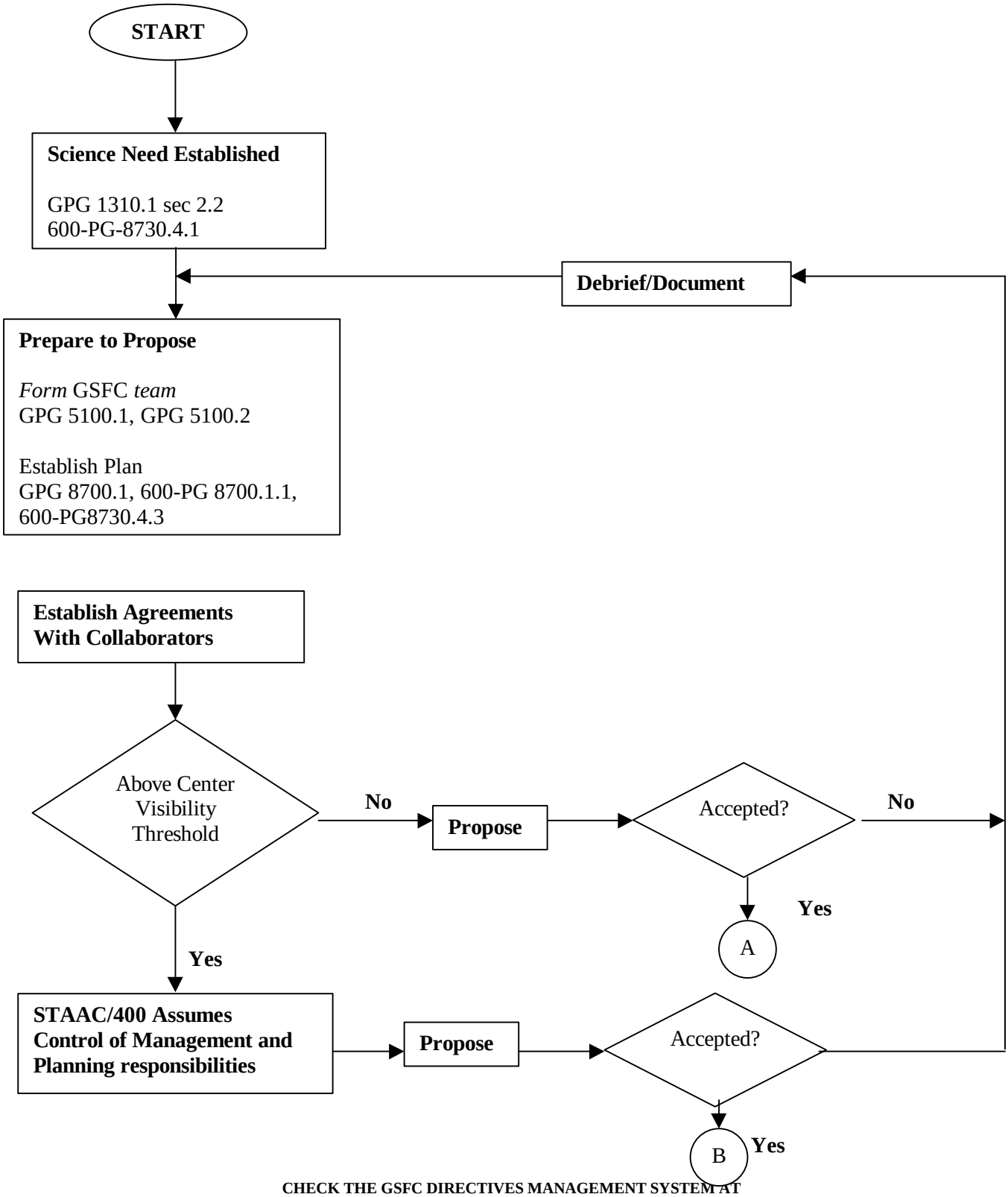
The PI's Laboratory will retain the route sheet that was used to forward the proposal through the Center's review and approval chain.

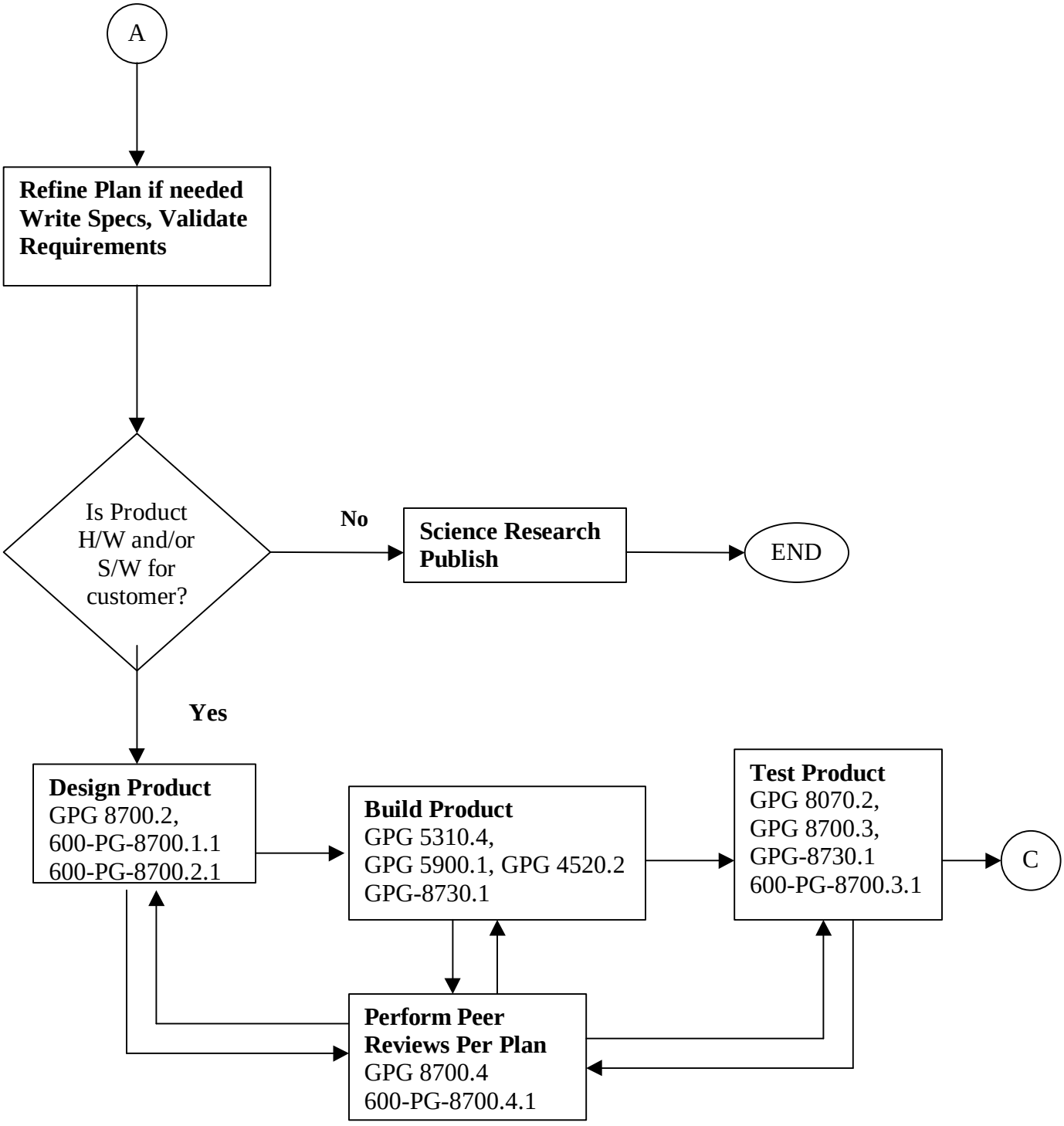
Other Quality Records that are typical of most projects such as:

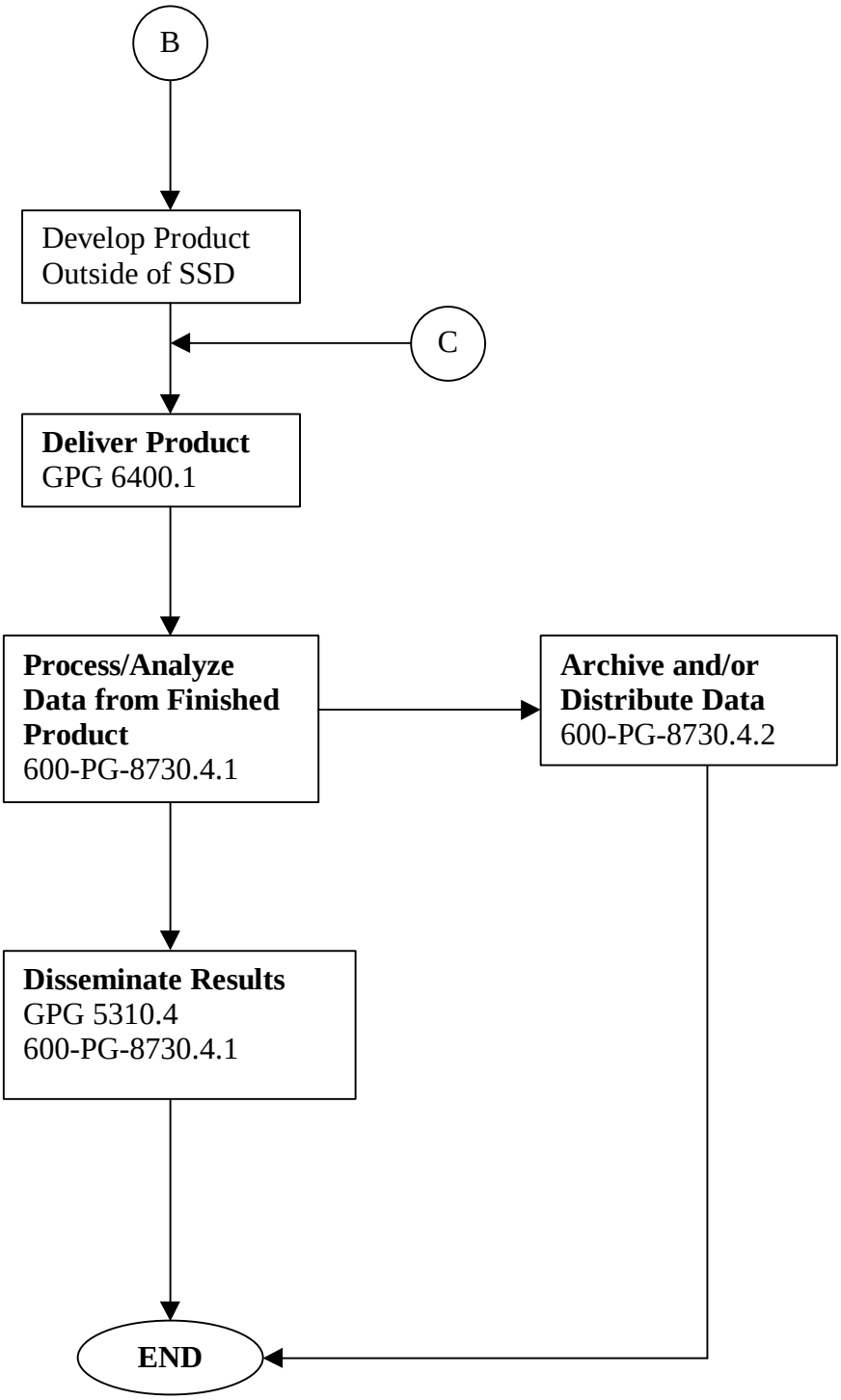
Project reviews
Periodic status reports
Relevant engineering documentation
Appropriate knowledge capture

Are covered and controlled by the appropriate Product Design Lead under the GPG 8700.x and the 600-PG-8700.x series of documents

FIGURE 1 PROJECT DEVELOPMENT PROCESS




A
Refine Plan if needed Write Specs, Validate Requirements
Is Product H/W and/or S/W for customer?
No
Science Research Publish
END
Yes
Design Product
GPG 8700.2,
600-PG-8700.1.1
600-PG-8700.2.1
Build Product
GPG 5310.4,
GPG 5900.1, GPG 4520.2
GPG-8730.1
Test Product
GPG 8070.2,
GPG 8700.3,
GPG-8730.1
600-PG-8700.3.1
C
Perform Peer Reviews Per Plan
GPG 8700.4
600-PG-8700.4.1


B
Develop Product Outside of SSD
C
Deliver Product
GPG 6400.1
Process/Analyze Data from Finished Product
600-PG-8730.4.1
Archive and/or Distribute Data
600-PG-8730.4.2
Disseminate Results
GPG 5310.4
600-PG-8730.4.1
END

CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
Baseline		
A	2/24/1999	**Added Project Development Process flow diagram, and added narrative to the P6. Implementation section to accompany the flow diagram.**