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**Plum Brook Station
Work Instruction No.**

GRC-W7030.012

Revision

C

Plum Brook Station Work Instruction

Design Control

APPROVED

Approved by Plum Brook Management Office/7030:

**NASA - Glenn Research Center
Cleveland, OH 44135**

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Procedure Owner: Plum Brook Management Office

Point of Contact: Robert Smalley (419-621-3205)/Dave Hill (419-621-3225)

Change Record

Rev.	Effective Date	Description
Initial	1/13/99	Initial Release
Initial Release 1	7/12/99	CR 1999-50, multiple formatting & editorial changes
A	6/22/00	CR 2000-44, in sections 2.0 and 6.10 replace "Plum Brook Records Management Procedure GRC-P7030.033" with "NASA C-278 Organizational Records List"; modify section 7.0 block 6.10.
A1	11/9/00	CR 2000-116, update Point of Contact
B	9/21/02	CR 2002-70, change Point of Contact and replace "GRC-W7030.001 Work Plan" with "GRC-P7030.048 Plum Brook Work Planning Process" throughout the document. Work Instructions has been deleted and procedure was created to replace it.
C	5/13/03	CR 2003-24, Removed deleted procedures in Section 2.0.

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1.0 PURPOSE

The purpose of this work instruction defines the methods and procedures at Plum Brook to design Test Package related hardware, and software.

2.0 REFERENCES

Document Number	Document Title
GRC-P7030.011	Test Program Initiation
GRC-P7030.014	Design/Engineering
GRC-P7030.015	Design Reviews
GRC-P7030.016	Drawing File Management
GRC-P7030.048	Plum Brook (PB) Work Planning Process
NASA C-278	Organizational Records List
Internal	Fluid Flow References
Internal	Cryogenic Fluid Service References
Internal	Valves References
Internal	Instrumentation References
Internal	Electrical Power References
Internal	Controls References
Internal	Structural Analysis References
Internal	Pressure Vessels References
Internal	Thermodynamics References
Internal	Heat Transfer References
Internal	Fluid Mechanics References
Internal	Fasteners References
Internal	Welding References
Internal	Hydraulics References
Internal	Drafting References
Internal	Vacuum References

3.0 RECORDS

Analysis
 Calculations
 Sketches
 Instrument/Equipment Lists
 Software code/listings

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4.0 SAFETY PRECAUTIONS

“Not Applicable”.

5.0 PERSONNEL TRAINING AND/OR CERTIFICATION

Engineering supervisor will identify engineering staff requiring personnel training and /or certification for given design task.

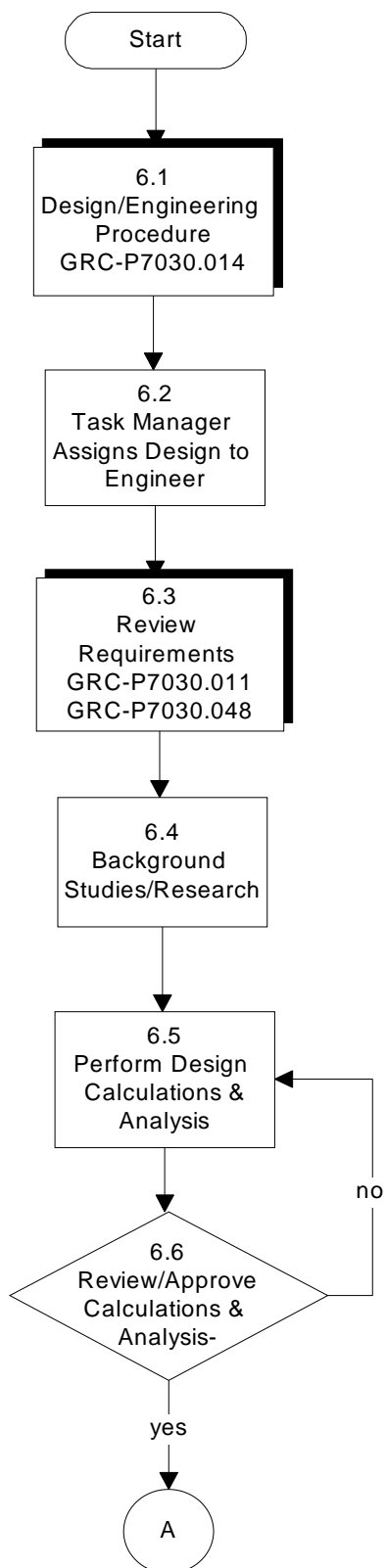
6.0 INSTRUCTIONS

- 6.1 Test Package Related Design is required. (Design/Engineering Procedure GRC-P7030.014)
- 6.2 Before beginning any test package related design, the engineer receives instructions from the Task Manager defining the work to be done.
- 6.3 Engineer plans and reviews requirements stated in the Work Plan to insure compliance with aspects of design and development. (Test Program Initiation GRC-P7030.011 & PB Work Planning Process GRC-P7030.048)
- 6.4 Engineer reviews and becomes familiar with program and design requirements. The engineer investigates if similar hardware and software design work has been performed in the past, and is it suitable for current design needs.
- 6.5 Engineer performs design calculations to determine material and hardware required for design per the listed engineering references.
- 6.6 Review and Approve calculations and analysis.
- 6.7 Engineer evaluates and identifies material, hardware and software to ensure that design requirements will be met. (Design Review process is initiated per Design Reviews Procedure GRC-P7030.015)
- 6.8 Create conceptual sketches, outlines, and models of designs, equipment/instrumentation lists, operating limits/design margins, list of aborts/interlocks and software programming lists which satisfy requirements. If sketches are suitable for fabrication purposes return to Design/Engineering Procedure GRC-P7030.014. If a detail drawing is required, (this is determined by design criticality in the PB Work Planning Process procedure GRC-P7030.048. They will be completed per Drawing File Management Procedure GRC-P7030.016.
- 6.9 Design/Engineering process is continued per Design/Engineering Procedure GRC-P7030.014.
- 6.10 The design related documents shall be archived in the project file in accordance with the NASA C-278 Organizational Records List.

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7.0 FLOW DIAGRAMS



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