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Plum Brook Station  
Work Instruction No.

GRC-W7030.029

Revision

H

## Plum Brook Station Work Instruction

# Performing Field Calibrations

*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:** Mark Woike (419-621-3379)/Mark Cmar (419-621-3273)

### Change Record

Rev.	Effective Date	Description
Initial	1/13/99	Initial Release
A	6/2/99	CR 1999-35, Modify Section 6.0 Instructions to correct omitted step, add sections 6.2.1 & 6.2.8 In sections 6.2.4, 6.2.6, & 6.4 change "Instrumentation System and Performance Validation" to "Field Calibration" Re-number flowchart and add block 6.2.8
A1	7/12/99	CR 1999-50, multiple formatting & editorial changes
B	9/17/99	CR 1999-89, add sentence to section 6.1.1, "Note: Test Equipment calibrations may be from GRC Cal Lab., Manufacturer , or 3 <sup>rd</sup> Party Cal Lab. Test Equipment will have calibration stickers and NIST Documentation; add sentence to section 6.2.7, "Notify engineer if an instrument in a loop is found out of calibration."
C	4/11/00	CR 2000-29, delete "Lab." from "3 <sup>rd</sup> Party Cal Lab. in section 6.1.1.
D	9/7/2000	CR 200-86, change LeR-P3.5.2 to GRC-P3.11.1
D1	10/27/2000	CR 2000-115 Update Approving Authority to match current list.
E	8/10/01	CR 2001-34, modify section 5.0.
F	10/12/01	CR 2001-53, replace statement in Section 5.0.
G	1/11/02	CR 2002-02, Update Point of Contact.
H	5/13/03	CR 2003-24, Removed deleted procedures from Sections 2.0 and 7.0.

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## 1.0 PURPOSE

The purpose of this Work Instruction is to provide instruction for the instrumentation field calibrations of various facility and test package associated instrumentation.

## 2.0 REFERENCES

Document Number	Document Title
NPD 8730.3	Metrology and Calibration
ANSI/NCSL Z540-1-1994	American National Standards for Calibration – Calibration Laboratories and Measuring and Test Equipment
ANSI/ASQC-Q9001-1994	Quality Systems-Model for Quality Assurance in Design, Development, Production, Installation, and Servicing.
GRC-P3.11.1	Control of Inspection, Measuring and Test Equipment
GRC-P7030.026	Control of Inspection, Measuring and Test Equipment
GRC-F7030.024	Field Calibration Data Sheet

## 3.0 SAFETY PRECAUTIONS

Verify with operation personnel that the performance of the field calibration will not create a safety hazard with any of the devices or systems controlled by the device to be field calibrated.

## 4.0 TOOLS, EQUIPMENT AND MATERIALS

Required test equipment to perform various field instrumentation calibrations, system validation and performance checks. Instruction for Completing Field Calibration Data Sheet, Field Calibration Data Sheet.

## 5.0 PERSONNEL TRAINING AND/OR CERTIFICATION

Individuals performing field calibrations must meet one of the following criteria:

- Journey level I/C technician
- Journey level electrician
- Supervised technician

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## 6.0 INSTRUCTIONS

- 6.1 Obtain a copy of the current instrumentation list from the facility I/C Engineer.
- 6.1.1 Obtain calibrated piece(s) of test equipment and verify the calibration and calibration certificate are up to date. **NOTE: TEST EQUIPMENT CALIBRATIONS MAY BE FROM GRC CAL LAB., MANUFACTURER, OR 3<sup>RD</sup> PARTY CAL. TEST EQUIPMENT WILL HAVE CALIBRATION STICKERS AND NIST DOCUMENTATION.**
- 6.1.2 Enter the name plate date from the test equipment into the appropriate fields of the “Field Calibration Data Sheet”.
- 6.2 Disconnect the instrument from its’ connection. **NOTE: FOR OXYGEN SERVICE CLEANED SYSTEMS DO NOT REMOVE THE TRANSMITTER/TRANSDUCER FROM ITS’ CONNECTION. SIMULATE THE SIGNAL AFTER THE DEVICE.**
  - 6.2.1 Attach a calibrated source and indicator . **NOTE: SOURCE AND INDICATOR MAY BE ONE (1) INTEGRAL UNIT.** Input 0% of range for device.
  - 6.2.2 Enter this data in the appropriate field of the Field Calibration Data Sheet.
  - 6.2.3 Perform the same at the mid-range, usually 50% of the range or a value close to the typical operating point of the device.
  - 6.2.4 Enter this data in the appropriate field of Field Calibration Data Sheet.
  - 6.2.5 Perform the same at 100% of range. If 100% of range can not be obtained with the on hand test equipment go to the highest signal possible.
  - 6.2.6 Enter this data in the appropriate field of Field Calibration Data Sheet.
  - 6.2.7 **NOTE: IF THE FINAL DISPLAY READINGS FOR ANY OF THE TEST POINTS (0%, 50%, 100%) ARE NOT WITHIN ACCEPTABLE LIMITS, 1% NOMINAL, 2% MAX (OR AS SPECIFIED IN THE WORK ORDER), A COMPLETE CHECK OF EACH DEVICE IN THE LOOP IS TO BE COMPLETED TO DETERMINE WHICH DEVICE IN THE LOOP IS OUT OF CALIBRATION. NOTIFY ENGINEER IF AN INSTRUMENT IN A LOOP IS FOUND OUT OF CALIBRATION.**
  - 6.2.8 Reconnect all equipment and field devices. **NOTE: ENSURE ALL WIRING POLARITIES ARE CORRECT, TUBING/BALKHEAD/THERMOWELL/ETC. CONNECTIONS ARE SECURE.**
- 6.3 Attach a Field Calibrated sticker on the equipment.
- 6.4 Turn in all completed Field Calibration Data Sheets to the Facility I/C Engineer.

## 7.0 FLOW DIAGRAMS

