Payload and Components Real-time Automated Test System (PACRATS)

Data Acquisition of Leak Rate & Pressure Data Test Procedure

Flight Systems Integration and Test Branch
Systems Development, Integration & Test Division
Space Systems Department
Engineering Directorate

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
### REVISION RECORD

<table>
<thead>
<tr>
<th>REVISION</th>
<th>DESCRIPTION</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
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<td>Baseline</td>
<td>Original Release</td>
<td>06/28/2011</td>
</tr>
</tbody>
</table>

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
TEST ARTICLE IDENTIFICATION

There are no test articles for this procedure. The system under test is the Payload and Components Real-Time Automated Test System (PACRATS) for the use of data-acquisition during leak-rate and pressure-data testing.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Revision Record</td>
<td>ii</td>
</tr>
<tr>
<td></td>
<td>Approval Page</td>
<td>iii</td>
</tr>
<tr>
<td></td>
<td>Test Article Identification</td>
<td>iv</td>
</tr>
<tr>
<td></td>
<td>Table of Contents</td>
<td>v</td>
</tr>
<tr>
<td>1.0</td>
<td><strong>Introduction</strong></td>
<td>1</td>
</tr>
<tr>
<td>1.1</td>
<td>Purpose</td>
<td>1</td>
</tr>
<tr>
<td>1.2</td>
<td>System Description</td>
<td>1</td>
</tr>
<tr>
<td>1.3</td>
<td>Test Program Classification</td>
<td>1</td>
</tr>
<tr>
<td>1.4</td>
<td>Responsibilities</td>
<td>1</td>
</tr>
<tr>
<td>1.5</td>
<td>List of Abbreviations</td>
<td>1</td>
</tr>
<tr>
<td>1.6</td>
<td>Applicable Documents</td>
<td>2</td>
</tr>
<tr>
<td>2.0</td>
<td><strong>Safety / Quality Assurance Information</strong></td>
<td>3</td>
</tr>
<tr>
<td>2.1</td>
<td>Risk Assessment Code</td>
<td>3</td>
</tr>
<tr>
<td>2.2</td>
<td>Job Hazard Analysis</td>
<td>3</td>
</tr>
<tr>
<td>2.3</td>
<td>Personnel Protective Equipment</td>
<td>3</td>
</tr>
<tr>
<td>2.4</td>
<td>Hardware Handling</td>
<td>3</td>
</tr>
<tr>
<td>2.5</td>
<td>Cleanliness Requirements</td>
<td>3</td>
</tr>
<tr>
<td>2.6</td>
<td>Electrostatic Discharge (ESD) Requirements</td>
<td>3</td>
</tr>
<tr>
<td>2.7</td>
<td>Grounding Requirements</td>
<td>3</td>
</tr>
<tr>
<td>2.8</td>
<td>Electrical Conventions</td>
<td>3</td>
</tr>
<tr>
<td>2.9</td>
<td>Emergency Telephone Numbers</td>
<td>4</td>
</tr>
<tr>
<td>2.10</td>
<td>Emergency Shutdown Procedures</td>
<td>4</td>
</tr>
<tr>
<td>2.11</td>
<td>Close Call / Mishap Reporting</td>
<td>4</td>
</tr>
<tr>
<td>2.12</td>
<td>Test Verifications</td>
<td>4</td>
</tr>
<tr>
<td>3.0</td>
<td><strong>Pre-Test Preparation</strong></td>
<td>5</td>
</tr>
<tr>
<td>3.1</td>
<td>Test Requirements</td>
<td>5</td>
</tr>
<tr>
<td>3.2</td>
<td>Test Readiness Review</td>
<td>5</td>
</tr>
<tr>
<td>3.3</td>
<td>Test Facility</td>
<td>5</td>
</tr>
<tr>
<td>3.4</td>
<td>Test Equipment / GSE</td>
<td>5</td>
</tr>
<tr>
<td>3.5</td>
<td>Pre-test Setup</td>
<td>6</td>
</tr>
<tr>
<td>4.0</td>
<td><strong>Test Operations</strong></td>
<td>7</td>
</tr>
<tr>
<td>4.1</td>
<td>Proof Test</td>
<td>7</td>
</tr>
<tr>
<td>4.2</td>
<td>Sniffer Probe Leak Test with Inficon</td>
<td>10</td>
</tr>
<tr>
<td>4.3</td>
<td>Sniffer Probe Leak Test with Varian</td>
<td>15</td>
</tr>
<tr>
<td>4.4</td>
<td>Test Documentation Update</td>
<td>19</td>
</tr>
</tbody>
</table>

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
### TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>Post Test Verification</td>
<td>20</td>
</tr>
<tr>
<td>6.0</td>
<td>Figures</td>
<td>21</td>
</tr>
<tr>
<td>6.1</td>
<td>Proof Test Setup</td>
<td>21</td>
</tr>
<tr>
<td>6.2</td>
<td>Sniffer Probe Leak Test with Inficon Setup</td>
<td>22</td>
</tr>
<tr>
<td>6.3</td>
<td>Sniffer Probe Leak Test with Varian Setup</td>
<td>23</td>
</tr>
<tr>
<td>7.0</td>
<td>Tables</td>
<td>24</td>
</tr>
<tr>
<td>7.1</td>
<td>Proof Test Table</td>
<td>24</td>
</tr>
<tr>
<td>7.2</td>
<td>Sniffer Probe Leak Test with Inficon Table</td>
<td>24</td>
</tr>
<tr>
<td>7.3</td>
<td>Sniffer Probe Leak Test with Varian Table</td>
<td>25</td>
</tr>
<tr>
<td>8.0</td>
<td>Appendices—TRI Information</td>
<td>26</td>
</tr>
<tr>
<td>8.1</td>
<td>Proof Test Inspection</td>
<td>26</td>
</tr>
<tr>
<td>8.2</td>
<td>Sniffer Probe Leak Test with Inficon Inspection</td>
<td>27</td>
</tr>
<tr>
<td>8.3</td>
<td>Sniffer Probe Leak Test with Varian Inspection</td>
<td>28</td>
</tr>
<tr>
<td>9.0</td>
<td>Emergency Page</td>
<td>29</td>
</tr>
<tr>
<td>9.1</td>
<td>Emergency Shut Down Procedure</td>
<td>29</td>
</tr>
</tbody>
</table>
1.0 Introduction

1.1 Purpose

The purpose of this activity is to provide the Mechanical Components Test Facility (MCTF) with the capability to obtain electronic leak test and proof pressure data. Payload and Components Real-time Automated Test System (PACRATS) data acquisition software will be utilized to display real-time data. It will record leak rates and pressure/vacuum level(s) simultaneously. This added functionality will provide electronic leak test and pressure data at specified sampling frequencies. Electronically stored data will provide ES61 with increased data security, analysis, and accuracy. The tasks performed in this procedure are to verify PACRATS only, and are not intended to provide verifications for MCTF equipment.

1.2 System Description

An in-house Personal Computer—based data acquisition software system (PACRATS) developed by NASA Engineers will be utilized to interface with MCTF hardware to collect, display, and record real-time serial data.

1.3 Test Program Classification

This activity is a Non-Mission Critical and Non-Safety Critical Program.

1.4 Responsibilities

ES61 and ES63 will be responsible for overall test management and will develop the test plan, procedure, and a final test report. ES61/MCTF engineers will be responsible for operation of MCTF devices interfacing to PACRATS.

1.5 List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBL</td>
<td>Cable</td>
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<tr>
<td>CCW</td>
<td>Counter Clockwise</td>
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<tr>
<td>COM</td>
<td>Communications</td>
</tr>
<tr>
<td>ESD</td>
<td>Electrostatic Discharge</td>
</tr>
<tr>
<td>GHe</td>
<td>Gaseous Helium</td>
</tr>
<tr>
<td>GN2</td>
<td>Gaseous Nitrogen</td>
</tr>
<tr>
<td>GSE</td>
<td>Ground Support Equipment</td>
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<tr>
<td>JHA</td>
<td>Job Hazard Analysis</td>
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<tr>
<td>MCTF</td>
<td>Mechanical Components Test Facility</td>
</tr>
<tr>
<td>MSFC</td>
<td>Marshall Space Flight Center</td>
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<tr>
<td>OWI</td>
<td>Organizational Work Instruction</td>
</tr>
<tr>
<td>PACRATS</td>
<td>Payload and Components Real-time Automated Test System</td>
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<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
</tbody>
</table>

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
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<tr>
<th>Abbreviation</th>
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</tr>
</thead>
<tbody>
<tr>
<td>S&amp;MA</td>
<td>Safety and Mission Assurance</td>
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<tr>
<td>SHE</td>
<td>Safety, Health, and Environment</td>
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<tr>
<td>TCP</td>
<td>Test and Checkout Procedure</td>
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<tr>
<td>TDR</td>
<td>Test Discrepancy Record</td>
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<tr>
<td>TPD</td>
<td>Test Procedure Deviation</td>
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<tr>
<td>TRR</td>
<td>Test Readiness Review</td>
</tr>
<tr>
<td>TRI</td>
<td>Test Readiness Inspection</td>
</tr>
</tbody>
</table>

### 1.6 Applicable Documents

<table>
<thead>
<tr>
<th>Document ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES61-JHA-003</td>
<td>Electrical/Mechanical Operations Job Hazard Analysis</td>
</tr>
<tr>
<td>ES61-JHA-011</td>
<td>Leak Detection Job Hazard Analysis</td>
</tr>
<tr>
<td>ES61-JHA-012</td>
<td>Pressurization Job Hazard Analysis</td>
</tr>
<tr>
<td>ES61-JHA-014</td>
<td>Small hand Tools Job Hazard Analysis</td>
</tr>
<tr>
<td>ES61-OWI-001</td>
<td>Systems Testing</td>
</tr>
<tr>
<td>ES61-OWI-004</td>
<td>Mechanical Components Test Facility (MCTF) Test Operations</td>
</tr>
<tr>
<td>MPR 1280.4</td>
<td>MSFC Corrective Action System</td>
</tr>
<tr>
<td>MPR 8715.1</td>
<td>Marshall Safety, Health, and Environmental (SHE) Program</td>
</tr>
<tr>
<td>MPR 8730.1</td>
<td>Inspection and Testing</td>
</tr>
<tr>
<td>MPR 8730.3</td>
<td>Control of Nonconforming Product</td>
</tr>
<tr>
<td>MPR 8730.5</td>
<td>Control of Inspection, Measuring, and Test Equipment</td>
</tr>
<tr>
<td>MWI 8715.15</td>
<td>Ground Operations Safety Assessment Program</td>
</tr>
<tr>
<td>ES61-PLAN-SSITF-302</td>
<td>Safety Assessment Plan</td>
</tr>
<tr>
<td>SN-C-0005</td>
<td>NASA Specification Contamination Control Requirements for Space Shuttle Program</td>
</tr>
</tbody>
</table>

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2.0 **Safety / Quality Assurance Information**

2.1 **Risk Assessment Code**

A safety assessment of the operations in this procedure was performed in accordance with MWI 8715.15, Ground Operations Safety Assessment Program, and is documented in ES61-PLAN-SSITF-302, Safety Assessment Plan. The electrical/mechanical test operations specified in this procedure are categorized as a Risk Acceptance Code 3E. Based upon an assessment of the complexity and risk to the hardware, this procedure can be performed by one individual after test setup verification by a second person.

2.2 **Job Hazard Analysis**


2.3 **Personnel Protective Equipment**

No Personnel Protective Equipment (PPE) is required.

2.4 **Hardware Handling**

No planned moves are to be performed during the execution of this procedure.

2.5 **Cleanliness Requirements**

MCTF hardware will be maintained per SN-C-0005 Level 300A.

2.6 **Electrostatic Discharge (ESD) Requirements**

Wrist straps will not be required for any cable connections. All cables used within this procedure are commercial grade.

2.7 **Grounding Requirements**

There are no specified grounding requirements.

2.8 **Electrical Conventions**

No test lead connections will be made as part of this procedure.
2.9 **Emergency Telephone Numbers**

The emergency telephone numbers are listed on the last page of the test procedure in section 9.0.

2.10 **Emergency Shutdown Procedure**

In case of an emergency, perform the emergency shutdown procedure located on the last page of the test procedure in section 9.0.

2.11 **Close Call/Mishap Reporting**

The test engineer is responsible for immediately notifying their supervisor for all ES61 mishaps and close calls. An initial estimate of the mishap severity based on injuries and cost shall be done by the responsible supervisor to determine the mishap type and notifications required in accordance with MWI 8621.1, Close Call and Mishap Reporting and Investigation Program.

All onsite mishaps and close calls shall be reported to the Industrial Safety Office within 4 hours of occurrence or awareness by calling (256) 544-4357, Option “0” (NASA Information Support Center) or the MSFC Industrial Safety Hotline at (256) 544-4357, Option “2”, or by electronic submittal from the MSFC SHE Page, under the “Report a Mishap” block to generate a NASA Initial Safety Incident Report, also known as a Flash or Quick Incident Report.

2.12 **Test Verification**

The Safety and Mission Assurance Directorate will monitor and verify all tests and inspections per MPR 8730.1. If a nonconformance or unsatisfactory condition is obtained during test operations, the Guidelines of MPR 8730.3, Control of Nonconforming Product, and MPR 1280.4, MSFC Corrective Action System will be followed to troubleshoot and document the corrective action.
3.0 Pre-Test Preparation

3.1 Test Requirements

The purpose of this procedure is to verify the operation of the PACRATS software only. MCTF hardware will be utilized to support this activity. However, no flight hardware will be required to perform operations within this procedure.

3.2 Test Readiness Review

According to ES61-PLN-PACRATS-MCTF-001, a Test Readiness Review (TRR) is not required. A Test Readiness Inspection (TRI) shall be performed following test setup and prior to the start of test operations for each test configuration. TRI will consist of personnel directly involved with the test. A TRI Checklist is in Appendix 8.0 which shall be filled out by the Test Conductor and signed by all test participants.

3.3 Test Facility

Mechanical Components Test Facility (MCTF) located in building 4493.

3.4 Test Equipment/GSE

All test equipment utilized in the performance of this test procedure shall be inspected for damage, and where appropriate, shall be verified to be operational and in current calibration.

(a) Heise Meter

Manufacturer________________________ Model________________________

Cal ID________________________ Cal Due Date________________________

(b) INFICON

Manufacturer________________________ Model________________________

(c) Varian

Manufacturer________________________ Model________________________

(d) Pressure gauge (or transducer) PG1:

Cal ID.________________________ Cal. Due Date________ Range________

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
3.5 Pre-test Setup

Pretest setups for the varying configurations of the three unique tests are provided in the respective test operations sections.
4.0. **Test Operations**

4.1 **Proof Test**

Reference Section 6.0 Figure 6.1 for the test setup. The steps can be performed out of sequence at the discretion of the test conductor.

4.1.1 □ Setup the MCTF and PACRATS hardware per Section 6.1.

4.1.2 □ 2\textsuperscript{nd} Person Verification ____________________________ (Print Name)
__________________________ (Sign Name)

4.1.3 □ Power on the Heise meter.

4.1.4 □ Press Setup.

4.1.5 □ Use the arrows to select “RS232.”

4.1.6 □ Select “Enable.”

4.1.7 □ Set the baud rate to “9600.”

4.1.8 □ Use the arrows to select the “Remote” mode.

4.1.9 □ Select “Terminal Mode.”

4.1.10 □ Select “CrLF” for the End of Message.

4.1.11 □ Verify/set regulator to full CCW (closed).

4.1.12 □ Verify/close HV1, HV2 and vent valve.

4.1.13 □ Verify PG1 and PG2 are reading atmospheric pressure.

4.1.14 □ Once the test setup is configured per Section 6.1, connect the setup to the dummy test article.

4.1.15 □ Conduct TRI. Complete the TRI Checklist in Appendix 8.0 Section 8.1 and the test participants shall sign and date.

4.1.16 □ Photograph the test setup and attach a copy to this procedure.

4.1.17 □ Power ON the PACRATS Computer and run the PACRATS application.

**VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.**
4.1.18 □ Record PACRATS Version by selecting Help/About PACRATS.

   PACRATS Version ______________________________

4.1.19 □ Load the PACRATS test file heise.tst by selecting File/Start Test and double click test file to be loaded.

   Record Test File Name ______________________________

4.1.20 □ Verify data is being received on the PACRATS workstation.

4.1.21 □ Start PACRATS data recording by selecting File/Set Record On.

   Record Data File Name ______________________________

4.1.22 □ Verify Heise PG1 and PG2 are reading atmospheric and record in Section 7.0 Table 7.1.

4.1.23 □ Verify PACRATS PG1 and PG2 are reading atmospheric and record in Section 7.0 Table 7.1.

4.1.24 □ Open BV1.

4.1.25 □ Set the pressure on PG1 to 5.0 +/- 1.0 psig by adjusting the regulator.

4.1.26 □ Open HV1 and pressurize up to HV2.

4.1.27 □ Open HV2 and pressurize the dummy test article.

4.1.28 □ Record the pressures of Heise PG1 and PG2 and PACRATS PG1 and PG2 in Section 7.0 Table 7.1.

4.1.29 □ Verify PACRATS by adjusting the regulator to change the pressure multiple times and record values from the Heise meter and PACRATS in Section 7.0 Table 7.1 after each change of pressure.

4.1.30 □ Close BV1.

4.1.31 □ Open the vent valve and vent until Heise PG1/PG2 and PACRATS PG1/PG2 read atmospheric pressure.

4.1.32 □ Record the final pressures in Section 7.0 Table 7.1.

4.1.33 □ Close HV1, HV2, and the vent valve.

4.1.34 □ Set the regulator to full CCW (closed).

   VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
4.1.35  □  Stop PACRATS data recording by selecting File/Set Record Off.

4.1.36  □  Close the PACRATS workspace by selecting File/Closed Workspace.

4.1.37  □  Stop the PACRATS test file by selecting File/Stop Test.

4.1.38  □  Save data to .CSV file by selecting Data/Convert.

4.1.39  □  Select the correct file using Year/Month/Day/Time.HDR.

4.1.40  □  Open selected file.

4.1.41  □  Select the measurements tab in the Data Convert window.

4.1.42  □  Move measurements by selecting Heise 1 and Heise 2, and use the arrow to transfer to the right side.

4.1.43  □  Select Ok.

4.1.44  □  Select “No” on the Convert More Data to File window.

4.1.45  □  Exit the PACRATS application by selecting File/Exit.

4.1.46  □  Archive the PACRATS test data files, message log and photographs and record location:

//Australia/PACRATS_MCTF/__________________________

4.1.47  □  Turn off hardware if applicable.

4.1.48  □  Disconnect the test setup as required.

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
4.2 Sniffer Probe Leak Test with Inficon

Reference Section 6.0 Figure 6.2 for the test setup. The steps can be performed out of sequence at the discretion of the test conductor.

4.2.1 □ Setup the MCTF and PACRATS hardware per Section 6.2.

4.2.2 □ 2nd Person Verification ___________________________ (Print Name)

______________________________ (Sign Name)

4.2.3 □ Power on the Heise meter.

4.2.4 □ Press Setup.

4.2.5 □ Use the arrows to select “RS232.”

4.2.6 □ Select “Enable.”

4.2.7 □ Set the baud rate to “9600.”

4.2.8 □ Use the arrows to select the “Remote” mode.

4.2.9 □ Select “Terminal Mode.”

4.2.10 □ Select “CrLF” for the End of Message.

4.2.11 □ Power up the Inficon, and let it warm up for 20-30 minutes.

4.2.12 □ While the device is warming, put the device in “All Interfaces Mode” by performing the next twelve steps.

4.2.13 □ Select “Menu”.

4.2.14 □ Select “Settings”.

4.2.15 □ Select “Interfaces”.

4.2.16 □ Select “Control Location”.

4.2.17 □ Select “All”.

4.2.18 □ Select “OK”.

4.2.19 □ Press the “Back” button to return to the Settings Menu.

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
4.2.20  □ Select “Interfaces”.
4.2.21  □ Select “RS232 Protocol”.
4.2.22  □ Select “ASCII”.
4.2.23  □ Select “OK”.
4.2.24  □ Press the “Back” button twice to return to the Main Menu.
4.2.25  □ Select “Mode”.
4.2.26  □ Select “Sniff”.
4.2.27  □ Select “OK”.
4.2.28  □ Press the “Back” button.
4.2.29  □ Connect the Sniffer Probe to the Inficon.
4.2.30  □ Select “Start” button on Inficon.
4.2.31  □ Verify/set regulator to full CCW (closed).
4.2.32  □ Verify/close HV1, HV2 and vent valve.
4.2.33  □ Verify PG1 and PG2 are reading atmospheric pressure.
4.2.34  □ Once the test set up is configured per Section 6.2, connect the setup to the dummy test article.
4.2.35  □ Conduct TRI. Complete the TRI Checklist in Appendix 8.0 Section 8.2 and the test participants shall sign and date.
4.2.36  □ Photograph the test setup and attach a copy to this procedure.
4.2.37  □ Power ON the PACRATS Computer and run the PACRATS application.
4.2.38  □ Record PACRATS Version by selecting Help/About PACRATS.
        PACRATS Version________________________________________
4.2.39  □ Load the PACRATS test file Inficon-Heise.tst by selecting File/Start Test and double click test file to be loaded.
        Record Test File Name_____________________________________

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
4.2.40  □ Verify data is being received on the PACRATS workstation.

4.2.41  □ Start PACRATS data recording by selecting File/Set Record On.

    Record Data File Name ________________________________

4.2.42  □ Verify Heise PG1 and PG2 are reading atmospheric and record in Section 7.0 Table 7.2.

4.2.43  □ Verify the Inficon Leak Rate and Record in Section 7.0 Table 7.2.

4.2.44  □ Verify PACRATS PG1 and PG2 are reading atmospheric; verify the Leak Rate SCCS GHe and record all values in Section 7.0 Table 7.2.

4.2.45  □ Open BV1.

4.2.46  □ Set the pressure on PG1 to 5.0 +/- 1.0 psig by adjusting the regulator.

4.2.47  □ Open HV1 and pressurize up to HV2.

4.2.48  □ Open HV2 and pressurize the dummy test article.

4.2.49  □ Close HV2.

4.2.50  □ Open vent and allow Test Article to vent until PG2 reads atmospheric.

4.2.51  □ Close vent.

4.2.52  □ Open HV2 and pressurize Test Article as read on PG2.

4.2.53  □ Close HV2.

4.2.54  □ Open vent and allow Test Article to vent until PG2 reads atmospheric.

4.2.55  □ Close vent.

4.2.56  □ Open HV2 and pressurize until PG2 reads 5.0 +/- 1.0 psig.

4.2.57  □ Maintain pressure for dwell for 30 minute minimum.

    Start__________________________  Stop__________________________

4.2.58  □ Using a sniffer probe, test all seperable joints for leakage.

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
4.2.59  □ Verify that the PACRATS and Inficon data are the same and record maximum leakage from both in Section 7.0 Table 7.2.

4.2.60  □ Record the pressures of Heise PG1 and PG2, Inficon Leak Rate, and PACRATS PG1, PG2, and Leak Rate in Section 7.0 Table 7.2.

4.2.61  □ Verify PACRATS by adjusting the regulator to change the pressure multiple times and record the values from the Heise meter, Inficon, and PACRATS in Section 7.0 Table 7.2 after each change of pressure.

4.2.62  □ Close BV1.

4.2.63  □ Open the vent valve and vent until Heise PG1/PG2 and PACRATS PG1/PG2 read atmospheric pressure.

4.2.64  □ Record the final pressures in Section 7.0 Table 7.2.

4.2.65  □ Close HV1, HV2, and the vent valve.

4.2.66  □ Set the regulator to full CCW (closed).

4.2.67  □ Stop PACRATS data recording by selecting File/Set Record Off.

4.2.68  □ Close the PACRATS workspace by selecting File/Close Workspace.

4.2.69  □ Stop the PACRATS test file by selecting File/Stop Test.

4.2.70  □ Save data to .CSV file by selecting Data/Convert.

4.2.71  □ Select the correct file using Year/Month/Day/Time.HDR.

4.2.72  □ Open selected file.

4.2.73  □ Select the measurements tab in the Data Convert window.

4.2.74  □ Move measurements by selecting Heise 1, Heise 2, and Leak Rate, then use the arrow to transfer to the right side.

4.2.75  □ Select Ok.

4.2.76  □ Select “No” on the Convert More Data to File window.

4.2.77  □ Exit the PACRATS application by selecting File/Exit.

13

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
4.2.78 □ Archive the PACRATS test data files, message log and photographs and record location:
   //Australia/PACRATS_MCTF/______________________________

4.2.79 □ Turn off hardware if applicable.

4.2.80 □ Disconnect the test setup as required.
4.3  **Sniffer Probe Leak Test with Varian**

Reference Section 6.0 Figure 6.3 for the test setup. The steps can be performed out of sequence at the discretion of the test conductor.

4.3.1  □ Setup the MCTF and PACRATS hardware per Section 6.3.

4.3.2  □ 2\textsuperscript{nd} Person Verification ________________________________ (Print Name)

______________________________ (Sign Name)

4.3.3  □ Power on the Heise meter.

4.3.4  □ Press Setup.

4.3.5  □ Use the arrows to select “RS232.”

4.3.6  □ Select “Enable.”

4.3.7  □ Set the baud rate to “9600.”

4.3.8  □ Use the arrows to select the “Remote” mode.

4.3.9  □ Select “Terminal Mode.”

4.3.10 □ Select “CrLF” for the End of Message.

4.3.11 □ Power up the varian, and let it warm up for 20-30 minutes.

4.3.12 □ Connect the Sniffer Probe to the Varian.

4.3.13 □ Press the Start/Test button on the Varian.

4.3.14 □ Verify/set regulator to full CCW (closed).

4.3.15 □ Verify/close HV1, HV2 and vent valve.

4.3.16 □ Verify PG1 and PG2 are reading atmospheric pressure.

4.3.17 □ Once the test set up is configured per Section 6.3, connect the setup to the dummy test article.

4.3.18 □ Conduct TRI. Complete the TRI Checklist in Appendix 8.0 Section 8.3 and the test participants shall sign and date.

**VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.**
4.3.19  □ Photograph the test setup and attach a copy to this procedure.

4.3.20  □ Power ON the PACRATS Computer and run the PACRATS application.

4.3.21  □ Record PACRATS Version by selecting Help/About PACRATS.
        PACRATS Version____________________________

4.3.22  □ Load the PACRATS test file Varian-Heise.tst by selecting File/Start Test and double left click test file to be loaded.
        Record Test File Name____________________________

4.3.23  □ Verify data is being received on the PACRATS workstation.

4.3.24  □ Start PACRATS data recording by selecting File/Set Record On.
        Record Data File Name____________________________

4.3.25  □ Verify Heise PG1 and PG2 are reading atmospheric and record in Section 7.0 Table 7.3.

4.3.26  □ Verify the Varian Leak Rate and Record in Section 7.0 Table 7.3.

4.3.27  □ Verify PACRATS PG1 and PG2 are reading atmospheric; verify the Leak Rate SCCS GHe and record all values in Section 7.0 Table 7.3.

4.3.28  □ Open BV1.

4.3.29  □ Set the pressure on PG1 to 5.0 +/- 1.0 psig by adjusting the regulator.

4.3.30  □ Open HV1 and pressurize up to HV2.

4.3.31  □ Open HV2 and pressurize the dummy test article.

4.3.32  □ Close HV2.

4.3.33  □ Open vent and allow Test Article to vent until PG2 reads atmospheric.

4.3.34  □ Close vent.

4.3.35  □ Open HV2 and pressurize Test Article as read on PG2.

4.3.36  □ Close HV2.

4.3.37  □ Open vent and allow Test Article to vent until PG2 reads atmospheric.

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
4.3.38 □ Close vent.

4.3.39 □ Open HV2 and pressurize until PG2 reads 5.0 +/- 1.0 psig.

4.3.40 □ Maintain pressure for dwell for 30 minute minimum.

Start________________________ Stop________________________

4.3.41 □ Using a sniffer probe, test all separable joints for leakage.

4.3.42 □ Verify that the PACRATS and Varian data are the same and record maximum leakage from both in Section 7.0 Table 7.3.

4.3.43 □ Record the pressures of Heise PG1 and PG2, Varian Leak Rate, and PACRATS PG1 and PG2, and Leak Rate in Section 7.0 Table 7.3.

4.3.44 □ Verify PACRATS by adjusting the regulator to change the pressure multiple times and record the values from the Heise meter, Varian, and PACRATS in Section 7.0 Table 7.3 after each change of pressure.

4.3.45 □ Close BV1.

4.3.46 □ Open the vent valve and vent until Heise PG1/PG2 and PACRATS PG1/PG2 read atmospheric pressure.

4.3.47 □ Record the final pressures in Section 7.0 Table 7.3.

4.3.48 □ Close HV1, HV2, and the vent valve.

4.3.49 □ Set the regulator to full CCW (closed).

4.3.50 □ Stop PACRATS data recording by selecting File/Set Record Off.

4.3.51 □ Close the PACRATS workspace by selecting File/Close Workspace.

4.3.52 □ Stop the PACRATS test file by selecting File/Stop Test.

4.3.53 □ Save data to .CSV file by selecting Data/Convert.

4.3.54 □ Select the correct file using Year/Month/Day/Time.HDR.

4.3.55 □ Open selected file.

4.3.56 □ Select the measurements tab in the Data Convert window.

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
4.3.57 □ Move measurements by selecting Heise 1 and Heise 2, and use the arrow to transfer to the right side.

4.3.58 □ Select Ok.

4.3.59 □ Select “No” on the Convert More Data to File window.

4.3.60 □ Exit the PACRATS application by selecting File/Exit.

4.3.61 □ Archive the PACRATS test data files, message log and photographs and record location:

   //Australia/PACRATS_MCTF/

4.3.62 □ Turn off hardware if applicable.

4.3.63 □ Disconnect the test setup as required.

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
4.4 Documentation Update – This section is for ES61 purposes only.

4.4.1 □ Enter calibration data into MCTF Calibration Logbook.

4.4.1 □ Log all data in the ES61 database.
5.0 Post Test Verification

The test operations specified in this document have been satisfactorily completed.

________________________________________________________________________
Systems Test Engineer Date

________________________________________________________________________
S&MA Monitor Date
6.0 Figures

6.1 Proof Test

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
6.2 Sniffer Probe Leak Test with Inficon

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
6.3 Sniffer Probe Leak Test with Varian

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
7.0 Tables

7.1 Proof Test Table

<table>
<thead>
<tr>
<th>Heise Pressure Meter</th>
<th>PACRATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG1</td>
<td>PG2</td>
</tr>
<tr>
<td>Value 1</td>
<td></td>
</tr>
<tr>
<td>Value 2</td>
<td></td>
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<td>Value 3</td>
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<td>Value 8</td>
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</tr>
<tr>
<td>Value 9</td>
<td></td>
</tr>
<tr>
<td>Value 10</td>
<td></td>
</tr>
</tbody>
</table>

7.2 Sniffer Probe Leak Test with Inficon Table

<table>
<thead>
<tr>
<th>Heise Pressure Meter</th>
<th>Inficon</th>
<th>PACRATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG1</td>
<td>PG2</td>
<td>PG1</td>
</tr>
<tr>
<td>Value 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value 2</td>
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<td></td>
</tr>
<tr>
<td>Value 10</td>
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<td></td>
</tr>
</tbody>
</table>
### 7.3 Sniffer Probe Leak Test with Varian Table

<table>
<thead>
<tr>
<th>Heise Pressure Meter</th>
<th>Varian</th>
<th>PACRATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG1</td>
<td>Leak Rate SCCS GHe</td>
<td>PG1</td>
</tr>
<tr>
<td>Value 1</td>
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<td>Value 10</td>
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</tr>
</tbody>
</table>

Verify that this is the correct version before use.
8.0 Appendices – TRI Information

8.1 Proof Test Inspection

Test Readiness Inspection Checklist:

☐ Test Readiness Review has been previously held.
☐ All test requirements have been properly incorporated into the test procedure.
☐ The test article configuration has been documented and is sufficient to meet the test requirements.
☐ The test setup is in accordance with the test procedure and is sufficient to meet test requirements and protect the test article, facility, and personnel from injury or damage.
☐ Facility and test equipment certifications/calibrations are current and adequate to meet the test requirements.
☐ Data collection, storage, reduction, and reporting provisions are in place to meet test requirements.
☐ All required PPE is in place.
☐ Emergency shutdown procedures are reviewed, documented, posted as appropriated, and understood by all test participants.
☐ Personnel staffing plans to cover the test are in place and understood by test participants and that all required personnel certifications are current.

Test Conductor _____________________________ Date __________

Test Operator _____________________________ Date __________

Test Operator _____________________________ Date __________

Test Operator _____________________________ Date __________

Quality Specialist _____________________________ Date __________
8.2 **Sniffer Probe Leak Test with Inficon Inspection**

Test Readiness Inspection Checklist:

- Test Readiness Review has been previously held.
- All test requirements have been properly incorporated into the test procedure.
- The test article configuration has been documented and is sufficient to meet the test requirements.
- The test setup is in accordance with the test procedure and is sufficient to meet test requirements and protect the test article, facility, and personnel from injury or damage.
- Facility and test equipment certifications/calibrations are current and adequate to meet the test requirements.
- Data collection, storage, reduction, and reporting provisions are in place to meet test requirements.
- All required PPE is in place.
- Emergency shutdown procedures are reviewed, documented, posted as appropriate, and understood by all test participants.
- Personnel staffing plans to cover the test are in place and understood by test participants and that all required personnel certifications are current.

______________________  ____________________
Test Conductor                  Date

______________________  ____________________
Test Operator                  Date

______________________  ____________________
Test Operator                  Date

______________________  ____________________
Test Operator                  Date

______________________  ____________________
Quality Specialist             Date

-27-

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
8.3 Sniffer Probe Leak Test with Varian Inspection

Test Readiness Inspection Checklist:

- Test Readiness Review has been previously held.
- All test requirements have been properly incorporated into the test procedure.
- The test article configuration has been documented and is sufficient to meet the test requirements.
- The test setup is in accordance with the test procedure and is sufficient to meet test requirements and protect the test article, facility, and personnel from injury or damage.
- Facility and test equipment certifications/calibrations are current and adequate to meet the test requirements.
- Data collection, storage, reduction, and reporting provisions are in place to meet test requirements.
- All required PPE is in place.
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- Personnel staffing plans to cover the test are in place and understood by test participants and that all required personnel certifications are current.

Test Conductor _______________________ Date

Test Operator _______________________ Date

Test Operator _______________________ Date

Test Operator _______________________ Date

Quality Specialist _______________________ Date

VERIFY THAT THIS IS THE CORRECT VERSION BEFORE USE.
9.0 Emergency Page

In the event of severe weather during test operations, perform the emergency shutdown procedure and proceed immediately to proper shelter.

If properly notified of a planned drill, testing may continue during a planned drill. However, if the fire alarm sounds, and it cannot be verified that a fire drill is taking place, perform the emergency shutdown procedure and evacuate the building.

The emergency telephone numbers are below.

<table>
<thead>
<tr>
<th>Service</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire/Ambulance</td>
<td>911</td>
</tr>
<tr>
<td>Security</td>
<td>4-4357</td>
</tr>
<tr>
<td>Industrial Safety Hotline</td>
<td>4-0046</td>
</tr>
<tr>
<td>Facilities</td>
<td>4-3919</td>
</tr>
<tr>
<td>ES61 Branch Chief</td>
<td>4-7392</td>
</tr>
</tbody>
</table>

9.1 Emergency Shutdown Procedure

9.1.1 □ Close BV1.

9.1.2 □ Open vent valve and vent the assembly until PG1 and PG2 read atmospheric pressure.