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	Quality Assurance Procedure to Verify Group High Voltage Standoff 3		
	ATLAS project document no. ATL-IT-QP-0034	Date last modified. 24 May, 2001	Approval status Full Production

1 Scope

1.1 Scope

This procedure establishes requirements for inspection of the module assembly's straw high-voltage capability after final module assembly, but before shipment.

1.2 Applicability

1.2.1 Applicability

This procedure applies to all modules assembled by the ATLAS U.S. Production Facilities (ATLAS U.S.). It includes Types 1, 2, and 3 modules (references 6.1 through 6.3 below).

1.2.2 Relation to Other ATLAS Project Requirements

The inspection procedure described by this specification is in addition to other tests and inspections required for module assembly. Module assemblies may be shipped only after acceptable results from this inspection.

2 Applicable Documents

2.1

The following documents of the issue in effect on the effective date of this specification form a part of this specification to the extent specified herein.

2.1.1 ATL-IT-EY-0004, ATLAS U.S. Environmental, Health, and Safety Plan

2.2 Amendments and Revisions

Whenever this procedure is amended or revised subsequent to its effective date, the Revised Version will be placed in the Engineering Data Management System, the

Production Database displays, and released to the technicians. The QA Engineer and the affected Production Engineers will coordinate release to the technicians.

3 Requirements

3.1 ATLAS U.S. Responsibilities


This test, performed with active gas in the straws and with CO₂ purged radiator volume, confirms satisfactory high voltage circuitry prior to module assembly shipping.

Before shipping ATLAS U. S. will test all high voltage groups for isolation from potential leakage sources while they operate in a simulated detector environment. The radiator volume will be purged with CO₂ that will continue to flow throughout the test. The straw volume will be purged with active gas that will continue to flow throughout the test.

The Kapton HV strips will be connected to a high voltage test fixture. The circuits will be tested by sequentially raising each trace and each corresponding group of straws to 2.5 kV while holding all the other traces and groups at ground. Each group will be held at 2.5 kV for one minute. ATLAS U.S. will accept straw groups that show less than 1 microampere of current and no indication of breakdown. Others will be returned for rework.

ATLAS U.S. will use a Bertran high voltage power supply with an A/D board resolution of 2.44mV == 244nA. The noise level from the power supply is ~1-2mV after reducing ripple with a 0.47sec time constant (47nF and 10Mohm). The program running the device averages 10 samples of current for data input. The present limit of measurement accuracy is 100nA.

Appendix A provides a checklist to be used by Technicians performing this procedure.

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4 Preparation for Delivery

4.1.1 Storage, Packing , and Shipping Requirements

There are no storage, packing, and shipping requirements applicable to this procedure.


5 Environment, Health, and Safety (EH&S)

5.1.1 EH&S Invoked

This test requires use of high voltage equipment and test methods. Technicians performing this test must follow the ATLAS U.S. EH&S procedures for high voltage testing as described by reference 2.1.1 above.

6 References

- 6.1 ATLITB1_0001, Type 1 Isometric Assembly Diagram (Exploded)
- 6.2 ATLITB2_0001, Type 2 Isometric Assembly Diagram (Exploded)
- 6.3 ATLITB3_0002, Type 3 Isometric Assembly Diagram (Exploded)
- 6.4 ATLITB1_0010, Module 1 Thick High Voltage Plate
- 6.5 ATLITB2)0010, Module 2 Thick High Voltage Plate
- 6.6 ATLITB3_0010, Module 3 Thick High Voltage Plate

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Appendix A

Table Name:

tblChecklistVerifyGrpHVStandoff3

Step Check List Steps

1 Scan the "Quality Assurance Procedure to Verify Group High Voltage Standoff #3" Product ID barcode.

2 The cover plates should still be on from the pressure test. Connect the active gas supply line to the connector on one cover plate and attach a relief valve on the other cover plate Enter "Done".

3 If this is a Type 1 Module assembly display the next step, otherwise go to step 5.

4 Set the active gas flow to 150 mL per minute (black ball on 90). Enter "Done".

5 If this is a Type 2 Module Assembly display the next step, otherwise go to step 7.

6 Set the active gas flow to 220 mL per minute (black ball on 60). Enter "Done".

7 If this is a Type 2 Module Assembly, display the next step, otherwise go to step 9.

8 Set the active gas flow to 300 mL per minute (steel ball on 75). Enter "Done".

9 Connect gas line from the CO2 flowmeter to the temporary gas connector glued to shell. Check that all shell holes are covered except the hole under the connector and another hole on the other end of the module. Enter "Done".

10 Set the flow to full scale (0.7). Continue the following steps while the module flushes. Enter "Done."

11 Move the HV tester to a position close enough to the module end for the cables to reach. Enter "Done."

12 Attach the set of cables for the type of module to be tested to the resistor cards on the top of the relay box. Each cable has a label specifying it's position and orientation. Enter "Done."

13 Review this checklist and the HV Tester instruction booklet. Enter "Done."

14 Set the sequence file name in the LabView control panel to the appropriate setting for the module type to be tested. Enter "Done."

15 Turn on the control box (green lighted switch) and the Bertan HV supply side B. Also set the trip reset on the Bertan to automatic reset. Enter "Done."

16 Connect the Kapton HV strip cables 1 and 2 to the HV test cable connectors 1 and 2. The "visible side" of each connector should be visible. Enter "Done."


17 Connect copper tape between the shell and the frame. Enter "Done".

18 In the HV test program, set: HV=2500, trips=5, and the relay duration=15 seconds. Enter module ID, Set the button to record data and type a file prefix including the module number. Enter "Done".

19 Wait until the carbon dioxide and active gas have flowed for two hours. Enter "Done".

20 Run the HV test program which records current draw data and identifies the groups that trip continuously. Enter "Done".

21 Examine the list of files that are preceded by F. These files are for

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groups that tripped more than five times. The group number is in the file name. Retest these groups and try to locate the discharge. Enter "Done".

22 If the module does not trip continuously on any group, enter "Accept". If the module has HV trip problems, enter "Reject" and return for rework.

23 TURN OFF the Bertan supply and the control box. Disconnect the HV cables from the kapton strips. Exit the HV Test program. Enter "Done".

24 Enter "Save" to save the current page and exit the form. Otherwise, enter "Cancel" to exit the form without saving the current page.

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Procedure Part Number



Approvals

Name	Signature	Revision	Date
J.Callahan		B	
D. Rust		B	
C. Wang		B	