Jefferson Lab
Thomas Jefferson National Accelerator Facility

Operational Safety Procedure Form

(See ES&H Manual Chapter 3310 Appendix T1 Operational Safety Procedure (OSP) and Temporary OSP Procedure for instructions.)

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Serial Number: PHY-12-029-OSP
(Assigned by ESH&Q Document Control x7277)

[X] OSP [ ] TOSP

This document is written to mitigate hazard issues that are (check all that apply):
- [ ] Unable to comply with ES&H Manual requirements as written.
- [ ] New/anticipated/previously unrecognized.
- [X] Determined to have an unmitigated Risk Code of 3 or 4.

Issue Date: (No more than three years from Issue Date except TOSP which is three months from Issue Date)	4-24-'12
Expiration Date:	4-24-'15
Title:	Maintenance, testing and diagnosis of the HRS Q2/Q3 Quadrupole power supplies
Location:	Hall A
Risk classification (See *ESH&Q Manual Chapter 3210 Appendix T3 Risk Code Assignment.*) — **Without mitigation measures (3 or 4):**	4
With mitigation measures in place (0, 1, or 2):	N
Document Owner(s):	Ed Folts, Jack Segal
Date:	04-05-12

Supplemental Technical Validations:

Hazard Reviewed (per ES&H Manual 2410-T1):	Subject Matter Experts Signature:	Date:
Bill Merz	W. Merz	4/13/12
Charles Hightower	Charles F. Hightower	4/12/12

Approval Signatures:	Print	Signature	Date:
Division Safety Officer:	Javier Gomez		5/7/12
Department or Group Head:	Robert Michaels	Robert Michaels	4/19/12
Safety Warden of Area:	Ed Folts		4/20/12
Other Approval(s):	Bert Manzlak	Bert Manzlak	4/21/12

Document History:

Revision:	Reason for revision or update:	Serial number of superseded document

Distribution: Copies to: affected area, authors, Division Safety Officer, ESH&Q Document Control
After expiration: Forward original and log sheet of trained personnel to ESH&Q Document Control.

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Serial Number: _____

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1. Purpose of the Procedure

General safety guidance for the maintenance, testing and problem diagnosis of the Hall A HRS Q2/Q3 Quadrupole power supplies.

2. Scope – include operations, people, and/or areas where procedure applies

Work on the Q2/Q3 Quadrupole power supply, its controls and interlocks. This includes work with the control modules on extension boards.
This OSP does not cover diagnostics which require operation of an energized supply with covers removed or doors open.
Access to the power supply balcony.

3. Description of the Facility: (include floor plans and layout of a typical experiment or operation)

Balcony at the rear of the HRS.

4. Authority and Responsibility:

4.1 Who has authority to implement/terminate

Ed Folts, Jack Segal

4.2 Who is responsible for key tasks

Ed Folts, Jack Segal

5. Who analyzes the special or unusual hazards (See ES&H Manual Chapter 3210 Appendix T1 Work Planning, Control, and Authorization Procedure)

Jack Segal

6. Personal and environmental hazard controls including:

6.1 Shielding

none

6.2 Interlocks

none

6.3 Other

Lock and Tag for electrical.
In accordance with the standing Radiation Work Permit (RWP), Radcon personnel will survey the dust present for radioactive contamination and if required write a specific Radiation Work Permit for the job.

7. Monitoring systems

none

Serial Number: _____

(Assigned by ESH&Q Document Control x 7277)

8. Ventilation

Standard hall ventilation

9. List of safety equipment (i.e: personal protective equipment or special tools)

List of PPE for working in controls enclosure with 120V guards in place: none
List of PPE for working in controls enclosure with 120V guards in removed: Safety glasses; Flame resistant long pants and long sleeve shirt
List of PPE for safeing power supplies and performing diagnostics on the power supply: Safety glasses; Flame resistant long pants and long sleeve shirt; Meters rated to at least CAT IV for 480VAC.

10. Associated administrative procedures

[Start Typing Here]

11. Operating guidelines

[Start Typing Here]

12. Notification of Affected Personnel (How and Who)

Affected personnel are on the power supply balcony or performing work near the magnet.
Personnel executing the work on the power supply will notify affected personnel. Non-qualified, non-authorized personnel will vacate the area to a safe distance.
The gate at the top of the access stairs to the balcony will be closed and the areas will be restricted to trained and necessary personnel.

13. List of steps required to execute the procedure from start to finish.

De-powering and safeing the power supply

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1. Perform pre-job briefing and ensure training of personnel.
2. Ramp the magnet power to zero amps and turn off the power supply.
3. Turn off control and main power breakers on the front of the power supply.
4. Lower the contactor arm on the front of the power supply.
5. Using the VVU at the wall mounted disconnect switch, insure that there is power to the power supply. In the event the VVU is non-functional or gives unexpected results, back-out of the procedure and develop a plan to address the VVU issue.
6. Turn off power at the wall mounted disconnect switch and lock out the switch using lock and tag procedures.
7. Use the VVU to insure that the power has been shut down.
8. Close the gate at the access to the power supply balcony.
9. Open the left, front door of the power supply and use the shorting probe to ground the magnet power cables and the capacitor banks at the capacitor grounding panel.
10. Install the grounding bar at the capacitor grounding panel.
11. Notify Radcon that the power supply is open and have it cleared by them prior to beginning

Serial Number: _____
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work.
12. Post-job briefing and cleanup.

Restarting the power supply

1. Ensure that all components are reinstalled and secure. If the work was extensive, this should also be repeated by a second person.
2. Remove and secure the grounding bar.
3. Close and secure all doors.
4. Remove locks and turn on power at the wall mounted disconnect switch.
5. Turn on the main power and control breakers on the front of the power supply.
6. Raise the contactor arm on the front of the power supply.
7. Clear the final interlock and turn the power supply on.
8. Open the gate at the access to the balcony.
9. Ramp the power supply to the desired current.
10. Post-job briefing and cleanup.

Working on controls (low voltage)

1. Perform pre-job briefing and ensure training of personnel.
2. Do not remove finger guards while the power supply is energized.
3. Post-job briefing and cleanup.

Performing diagnostics

1. Perform pre-job briefing and ensure training of personnel.
2. Diagnostics includes measurements only. No manipulation of components is allowed during a diagnosis.
3. Post-job briefing and cleanup.

14. Back out procedures, i.e., steps necessary to restore the equipment/area to a safe level.

As required for the task.

15. Special environmental control requirements:

none

16. Environmental Impacts (See EMP-04 Project/Activity/Experiment Environmental Review

none

Serial Number: _____

(Assigned by ESH&Q Document Control x 7277)

17. Abatement Steps – Secondary Containment, or Special Packaging requirements
none
18. Training requirements
SAF603A and SAF 603N the basic electrical courses; SAF 802 Rad Worker II; SAF 104 Lock, Tag and Try; SAF105 CPR/AED USE; Equipment specific training
19. Unusual/Emergency procedures e.g., Injury, Fire, Loss of power
Standard JLAB response
20. Instrument calibration requirements, e.g., safety system/device recertification, RF probe calibration
none
21. Inspection schedules
[Start Typing Here]
22. References/Associated Documentation
[Start Typing Here]
23. List of Records Generated (Include Location / Review and Approved procedure)
[Start Typing Here]

Authorized/Trained Individuals:

Print Name/Signature	Date
Ed Folts ("Gatekeeper")	
Jack Segal ("Gatekeeper")	
Heidi Fansler	
Jessie Butler	
Bill Merz	

Serial Number: _____

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Form Revision Summary

Revision 1 – 12/01/11 - Added reasoning for OSP to aid in appropriate review determination.
Revision 0 - 10/05/09 – Updated to reflect current laboratory operations

ISSUING AUTHORITY	FORM TECHNICAL POINT-OF-CONTACT	APPROVAL DATE	EXPIRATION DATE	REV.
ESH&Q Division	Harry Fanning	12/01/11	12/01/14	1

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3210Appendix T2
Task Hazard Analysis (THA) Worksheet

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Author:	Jack Segal				
Date:	April 5, 2012	**Task #:** If applicable		**Frequency of use:**	Frequent
Complete all information. Use as many sheets as necessary					
Task Location:	Hall A	**Task Title:**	**Maintenance, testing and diagnosis of the HRS Q2/Q3 Quadrupole power supplies**		
Division:	Physics	**Department:**	Hall A		
Lead Worker:	Ed Folts				
Mitigation already in place: Standard Protecting Measures Work Control Documents	Plastic guards for AC power components Proper PPE OSP				

Sequence of Task Steps	Task Steps/Potential Hazards	Consequence Level	Probability Level	Risk Code (before mitigation)	Proposed Mitigation (Required for Risk Code >2)	Safety Procedures/ Practices/Controls/Training	Risk Code (after mitigation
	De-powering and safeing the power supply	H	M	4	Follow procedures in the OSP	Follow the OSP	N
	Restarting the power supply	H	M	4	Follow procedures in the OSP	Follow the OSP	N

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3210Appendix T2
Task Hazard Analysis (THA) Worksheet

Sequence of Task Steps	Task Steps/Potential Hazards	Consequence Level	Probability Level	Risk Code (before mitigation)	Proposed Mitigation (Required for Risk Code >2)	Safety Procedures/ Practices/Controls/Training	Risk Code (after mitigation
	Working on controls (low voltage)	L	EL	N	Follow procedures in the OSP	Follow the OSP	N
	Performing diagnostics	L	L	I	Follow procedures in the OSP	Follow the OSP	N
	Highest Risk Code before Mitigation:	4				**Highest Risk Code after Mitigation:**	N

When completed, if the analysis indicates that the Risk Code before mitigation for any steps is "medium" or higher (RC≥3), then a formal Work Control Document (WCD) is developed for the task. Attach this completed Task Hazard Analysis Worksheet. Have the package reviewed and approved prior to beginning work. (See ES&H Manual Chapter 3310 Operational Safety Procedure Program.)

ISSUING AUTHORITY	FORM TECHNICAL POINT-OF-CONTACT	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.
ESH&Q Division	Harry Fanning	10/05/09	01/01/09	10/05/12	0

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