

Jefferson Lab Thomas Jefferson National Accelerator Facility	TITLE:	ES&H Manual
DOCUMENT ID:	3310 Appendix T2 Operational Safety Procedure Form	
	Click for OSP/TOSP Instructions	

PHYSICS # PHY-11-009

Serial Number: PHY-11-036-OSP

(Assigned by ESH&Q Document Control x7277)

☒ **OSP** ☐ **TOSP**

*Attach the Task Hazard Analysis (THA) related to this procedure

Click
For Word Doc

Issue Date:	<u>11/3/11</u>	Expiration Date:	<u>11/3/2014</u>
(No more than three years from Issue Date except TOSP which is three months from issue date)			
Title:	Safe Operation of the HKS Power Supply		
Location:	Hall A		
Risk classification (See <u>ESH&Q Manual Chapter 3210 Appendix T3 Risk Code Assignment.</u>)	Without mitigation measures (3 or 4):		3
	With mitigation measures in place (0, 1, or 2):		0
Document Owner(s):	Howard Smith, Ed Folts		Date:

Supplemental Technical Validations:

Hazard Reviewed (per <u>ES&H Manual 2410-T1</u>):	Subject Matter Experts Signature:	Date:
Electrical: Charles Hightower	<i>Charles Hightower</i>	<u>11/01/11</u>
Fire: Timothy Minga	<i>Timothy Minga</i>	<u>10/28/11</u>

Approval Signatures:	Print	Signature	Date:
Division Safety Officer:	Javier Gomez	<i>Javier Gomez</i>	<u>11/4/11</u>
Department or Group Head:	Bob Michaels	<i>Bob Michaels</i>	<u>11/2/11</u>
Safety Warden of Area:	Ed Folts	<i>Ed Folts</i>	<u>11/3/11</u>
Other Approval(s):	Jack Segal	<i>Jack Segal</i>	<u>11/4/11</u>

Document History:

Revision:	Reason for revision or update:	Serial number of superseded document
	New installation in hall to run experiment.	

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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ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05/12	0	1 of 8

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1. Purpose of the Procedure

The intent of this procedure is to provide instruction for authorized personnel to safely operate, service, and troubleshoot the HKS power supply.

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

The use and safe operation of the HKS power supply to provide power for the Septum magnets.

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

Water cooled 1254 amp, 252 volt DC power supply.

4. Authority and Responsibility:

4.1 Who has authority to implement/terminate

Jack Segal
Ed Folts
Howard Smith
Heidi Fansler
Jessie Butler

4.2 Who is responsible for key tasks

Jack Segal
Howard Smith

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

Ed Folts.
Howard Smith.
Jack Segal.

6. Personal and environmental hazard controls including:

6.1 Shielding

None

6.2 Interlocks

Due to the need to drive each coil set on the septum independently, both the HKS and Big Bite

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Harry Fanning

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01/01/10

10/05012

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power supply faults will be interlocked together back to EESSAF to prevent beam steering problems.

- Platform Gate access interlocks
- Septum magnet temperature interlocks
- HKS and Big Bite power supply faults interlock
- Magnet coil temperature interlocks
- Emergency Stop interlocks

6.3 Other

7. Monitoring systems

Once the HKS power supply has been enabled the power supply can be controlled and monitored locally; or remotely with the EDM GUI.

8. Ventilation

- LCW (Low Conductivity Water)
- Free Air (fans integral to the power supplies)

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

- Locks and Tags
- Safety Glasses
- VOM Meter
- Necessary Arc Flash attire

10. Associated administrative procedures

Log all work done in the Hall A online log, the halog webpage

11. Operating guidelines

Power supply should be operated within manufacturer's guidelines and agreed upon limits set for experiment.

12. Notification of Affected Personnel (How and Who)

Use the Hall A Tech on Call procedure.

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

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See Attached Procedure
14. Back out procedures, i.e., steps necessary to restore the equipment/area to a safe level.
Power down and turn off the power supply. Lock and tag out main power if authorized to do so.
15. Special environmental control requirements:
None
16. Environmental Impacts (See <u>EMP-04 Project/Activity/Experiment Environmental Review</u>)
None
17. Abatement Steps – Secondary Containment, or Special Packaging requirements
None
18. Training requirements
To work on or about the power supply, one needs to have the necessary training to be an Electrical Worker <ul style="list-style-type: none"> • Lock Tag and Try (SAF104). • Electrical Safety (SAF603A). • Fire Prevention (SAF603N). • CPR (SAF105).
19. Unusual/Emergency procedures e.g., Injury, Fire, Loss of power
None
20. Instrument calibration requirements, e.g., safety system/device recertification, RF probe calibration
None
21. Inspection schedules
None
22. References/Associated Documentation
Equipment Manuals: https://hallaweb.jlab.org/tech/Detectors/public_html/magnets/miscellaneous/hall_c_hks_hes/
23. List of Records Generated (Include Location / Review and Approved procedure)
None

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Author:	Howard W Smith				
Date:		Task #: If applicable		Frequency of use:	Periodically
Complete all information. Use as many sheets as necessary					
Task Location:	Hall A		Task Title:	HKS power supply operation and troubleshooting.	
Division:	Physics		Department:	Hall A	
Lead Worker:	Howard Smith				
Mitigation already in place: Standard Protecting Measures Work Control Documents		All exposed 480 and 120 volt AC and DC current shielded in control cabinet.			

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)
1	Electrical	High	Low	3	Follow Jlab Electrical Policy.	Lock Tag and Try	0
2	Work in low voltage (controls) section of the HKS power supply	Low	Low	1	Follow equipment operation manual	Proper PPE in accordance with this procedure. Equipment specific training	0

Highest Risk Code before Mitigation: 3

Highest Risk Code after Mitigation: 0

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.

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Have the package reviewed and approved prior to beginning work. (See ES&H Manual Chapter 3310 Operational Safety Procedure Program.)

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Authorized/Trained Individuals

Print Name/Signature	Date
Jack Segal	
Ed Folts	
Howard Smith	
Heidi Fansler	
Jessie Butler	
Todd Ewing	
Andrew Lumanog	

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1. Define the scope of work

- Job Summary
Safe operation and Maintenance of HKS power supply.

Affected systems

- Electrical power.

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- LCW.
 - Septum Magnet
 - HKS power supply

2. Analyze Hazard

See attached THA.

3. Develop and implement Hazard controls

- List of PPE
 - Safety Glasses
 - Locks and Tags
 - Appropriate Arc Flash PPE.
- Identify danger zones
 - Immediate surrounding area.
 - Target access platform.
- Training required
 - Lock Tag and Try (SAF 104).
 - Electrical Safety (SAF 603A).
 - Fire Prevention (SAF 603N).
 - CPR (SAF 105).

4. Perform work within controls

- Number of people needed
 - Two Electrically Certified workers should be present when locking and tagging out equipment.
- Verify that needed training is complete and current
 - Persons working on or about the HKS power supply must have appropriate Jefferson Lab training to be an Electrical Worker.

Commissioning Procedure

- Perform pre-job briefing (*1st step*).
- Ensure that all electrical connections are torqued properly.
- Make sure that there is adequate LCW pressure (120PSI) and flow.
- Verify voltage and phase rotation of main power.
- Check for and clear all internal power supply faults.
- Confirm that the power supply can be controlled locally.

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- Authenticate remote communications to power supply.
 - Insure that all external faults (interlocks) are functioning properly.
 - Validate voltage and current stability.
- Post job briefing and cleanup
Follow procedure

Operating HKS power supply.

1. Before operating the power supply one must read and understand this document and complete training on power supply operation by Hall A technical staff.
2. Read and sign conduct of operation for G2P experiment.
3. Check with Hall A work coordinator to verify that the HKS power supply is operational.
4. Ensure that it is safe to operate power supply by communicating with all affected personnel working in the general area around the Septum magnet and Target.
5. Verify that all access gates leading to Septum magnet/Target platform are closed.
6. Using the GUI for the HKS power supply, turn on the power supply and reset to clear faults; if faults do not clear a manual reset will have to be initiated by depressing the E-Stop button.
7. If faults still do not clear, inform the Hall A Techs (*Tech on call procedure*).
8. Set desired current needed for operation. (There are two modes of controlling the HKS power supply output current in software; through individual current settings or by setting the momentum. Additionally, do not adjust current while taking beam, only a **Primary Spokesperson** can authorize current changes while taking Beam.).
9. Power supply must be operated within the agreed upon parameters set by **Primary Spokespersons.**
10. For any issues concerning the Septum magnet refer to the Septum magnet OSP.

5. Provide feedback and continuous improvement.

Document any mistakes, corrections, changes and pictures and implement changes. Turn in feedback to Hall work coordinator

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