

Jefferson Lab Thomas Jefferson National Accelerator Facility	TITLE:	ES&H Manual
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DOCUMENT ID:	3310 Appendix T2 Operational Safety Procedure Form	Click for OSP/TOSP Instructions
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PHYSICS # PHY-11-011

Serial Number: **PHY-11-038-OSP**

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☒ **OSP** ☐ **TOSP**

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

Click
For Word Doc

Issue Date:	11/3/11	Expiration Date:	11/3/2014
(No more than three years from Issue Date except TOSP which is three months from issue date)			
Title:	Septum Magnet Commissioning, Operation, and Troubleshooting		
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 W Smith	Date:	10/07/2011

Supplemental Technical Validations:

Hazard Reviewed (per <u>ESH&Q Manual 2410-T1</u>):	Subject Matter Experts Signature:	Date:
Electrical: Charles Hightower	<i>Charles Hightower</i>	11/2/11
Magnetic Fields: Jian-Ping Chen Roger Carlini	<i>R. Carlini</i>	10/31/11

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

Document History:

Revision:	Reason for revision or update:	Serial number of superseded document
	New instillation 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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1. Purpose of the Procedure

The safe operation of the Septum Magnet.

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

This document provides guidelines on how to manage the commissioning, operation, and troubleshooting of the septum magnet.

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

Septum Magnet positioned at the pivot in Hall A.

4. Authority and Responsibility:

4.1 Who has authority to implement/terminate

- Ed Folts
- Jack Segal
- Howard Smith

4.2 Who is responsible for key tasks

Howard Smith *JACK SEGAL*

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

- Ed Folts
- Jack Segal
- Howard Smith

6. Personal and environmental hazard controls including:

6.1 Shielding

- Electrical shielding around coil connections.
- Area marked as a High Magnetic Field area.

6.2 Interlocks

- Left and Right coil temperature sensors interlocked separately to their respective controlling power supply.
- Due to the need to drive left and right coils independently the HKS and Big Bite power supply faults will be interlocked back to the Machine Protection System to prevent

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- beam steering problems.
- Interlocks placed at balcony to control access to High Magnetic Field area of the Septum and the target.

6.3 Other

None

7. Monitoring systems

- Hall probe will be placed at magnet to monitor the magnetic field.
- Current to the magnet coils can be monitored at the EDM GUI controls of the HKS and Big Bite power supplies.

8. Ventilation

Free Air
LCW

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

None

10. Associated administrative procedures

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

11. Operating guidelines

Magnet operated at agreed upon guidelines set for the 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.

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 supplies. Lock and tag out main power if authorized to do so.

15. Special environmental control requirements:

None

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

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None
17. Abatement Steps – Secondary Containment, or Special Packaging requirements
None
18. Training requirements
Lock Tag and Try (SAF104) Fire safety(SAF603N) Electrical Safety(SAF603A) 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
None
23. List of Records Generated (Include Location / Review and Approved procedure)
None

Author:	Howard W Smith				
Date:	10/7/2011	Task #: <small>If applicable</small>		Frequency of use:	Periodically
Complete all information. Use as many sheets as necessary					
Task Location:	Hall A		Task Title:	Septum Magnet Operation and Testing	
Division:	Physics		Department:	Hall A	
Lead Worker:	Howard W Smith				
Mitigation already in place: <u>Standard Protecting Measures</u> <u>Work Control Documents</u>	None				

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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)
	Electrical	Med	Low	3	<ul style="list-style-type: none"> OSP. Proper training & execution of approved procedures Guard all exposed electrical. 	<ul style="list-style-type: none"> Lock Tag and Try (SAF104) Electrical Safety (SAF603A) Fire Protection (SAF603N) CPR (SAF105) 	0
	Magnetic Field	Med	Low	1	<ul style="list-style-type: none"> OSP. Designate area as strong magnetic field area. 	<ul style="list-style-type: none"> Label area as Strong Magnetic Field. Control area entry with interlocks and Gate access. Warning Beacons. 	0
	Fire	Low	Low	1	<ul style="list-style-type: none"> OSP 	<ul style="list-style-type: none"> Hall A Technical Work Permit <u>Protection Systems</u>. 	0

Highest Risk Code before Mitigation:	3	Highest Risk Code after Mitigation:	0
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When completed, if the analysis indicates that the Risk Code before mitigation for any steps is "medium" or higher ($RC \geq 3$), 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.)

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1. Define the scope of work

- Job Summary
This procedure provides guidelines on how to manage the commissioning, operation, and troubleshooting of the Septum magnet.
- Affected systems
Beam.
HKS and Big Bite power supplies.
Septum magnet
LCW

2. Analyze Hazard

Attached

3. Develop and implement Hazard controls

List of PPE

- Safety Glasses

4. Identify danger zones

- Target access platform area

5. Training required

- Lock Tag and Try (SAF104)
- Fire safety(SAF603N)
- Electrical Safety(SAF603A)
- CPR (SAF105)

6. Perform work within controls

- Number of people needed
1 or 2
- Verify that needed training is complete and current
- List of materials
VOM meter.
Locks and Tags.
DC Current meter.
Temperature probe.

Procedure

1. Perform pre-job briefing (*1st step*)
2. Ensure that LCW is on, that there is correct pressure (120 psi) and that there are no leaks.
3. Verify that all electrical connections are torqued and properly connected.
4. Check continuity and resistance of coil.
5. Check that all electrical connections are shielded.
6. Ensure that water and temperature are functioning properly.
7. Remove from the area all ferromagnetic objects that could be affected.

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8. Energize power supply and clear any faults.
 9. Incrementally ramp current to power the magnet and check for hot spots at connections and on coils with temperature probe.
 10. Also, verify that the current output from the HKS and Big Bite power supplies are stable and uniform between power supplies at the momentum settings for the power supplies.
 11. In addition to current checks, verify with a Hall probe that the magnet's B fields are the correct orientation and that the desired field uniformity and magnitude can be achieved.
- Post job briefing and cleanup
Follow procedure
7. Provide feedback and continuous improvement.
Document any mistakes, corrections, changes and pictures and implement changes. Turn in feedback to Hall work coordinator

Trained Individuals

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

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