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3310 Appendix T2
Operational Safety Procedure FormClick
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OSP/TOSP InstructionsSerial Number: [Enter Serial Number] PHY-11-035-TOSP / PHY-11-012
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* Attach the Task Hazard Analysis (THA) related to this procedure

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Issue Date: 11/28/11

Expiration Date: 2/28/12

(No more than three years from Issue Date except TOSP which is three months from issue date)

Title: Septa field measurement for g2p

Location: Hall A

Risk classification

(See ESH&Q Manual Chapter 3210 Appendix T3
Risk Code Assignment)

Without mitigation measures (3 or 4): 3

With mitigation measures in place (0, 1, or 2): 0

Document Owner(s): Jixie Zhang

Date: 11/28/2011

Supplemental Technical Validations:

Hazard Reviewed (per ES&H Manual 2410-T1):

Subject Matter Experts Signature:

Date:

Operation

Jack Segal

12/2/11

General (field and electric)

Bert Manzlak

12-1-11

Approval Signatures:

Print

Signature

Date:

Division Safety Officer: Javier Gomez

12/5/11

Department or Group Head: Robert Michaels

Dec 1, 2011

Safety Warden of Area: Ed Folts

Other Approval(s): Jack Segal

12/2/11

Document History:

Revision:	Reason for revision or update:	Serial number of superseded document
[Rev]	[Enter Reason]	[Previous Rev]

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ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05/12	0	1 of 5

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DOCUMENT ID:

3310 Appendix T2
Operational Safety Procedure Form

Serial Number:

(Assigned by [ESH&Q Document Control](#) x 7277)

1. Purpose of the Procedure

To study the magnet hysteresis.
To measure the "B vs I" curve of the septum magnet.

Procedures:

(Assuming the maximum current of the power supply is checked.)

1. Calibrate the magnetic probes.
2. Place 2 probes into the left tunnel of the septum. One at the center (in septum coordinate: $x=20$, $y=0$, $z=0$, cm) and another at the edge ($x=10$, $y=-11$, $z=34$, cm). The probes should be oriented to the direction that only B_y (vertical direction) is measured. Place another one probe in the center of the right tunnel (in septum coordinate: $x=-20$, $y=0$, $z=0$, cm).
3. Record the field values.
4. Turn on both power supplies.
5. Ramp both currents from 0 to the maximum then go down to 0. Record the field value at the following currents:
0, 100, 200, 300, 400, 430, 500, 550, 600, 650, 700, 750, 800, 850, 903, 950, ..., maximum
6. Repeat item 5 for 3 times.
7. Turn off the power supplies.
8. Record the field values.
9. Clean up the probes and the platform.

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

Operations will be executed jointly by physics group (Jixie Zhang responsible) and Hall A technical group (Jack Segal et al.).
The procedure will be taking place in Hall A.

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

Jixie need to measure how large is the the residue field. And then measure the field during ramping the magnet up and down to the maximum current that the power supply can go.
After place the probe at proper position, no one will stay at the platform. All operations are from remote.

4. Authority and Responsibility:

4.1 Who has authority to implement/terminate

Robert Michaels, Jianping Chen, Jack Segal, Jixie Zhang

ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05012	0	2 of 5

This document is controlled as an on line file. It may be printed but the print copy is not a controlled document. It is the user's responsibility to ensure that the document is the same revision as the current on line file. This copy was printed on 11/30/2011.

DOCUMENT ID:

**3310 Appendix T2
Operational Safety Procedure Form**

Serial Number:

(Assigned by [ESH&Q Document Control](#) x 7277)

4.2 Who is responsible for key tasks

Jixie Zhang is responsible for this measurement.
Jack Segal is responsible for the power supply.

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

There is no radiation hazard in this measurement. No one will stay on the platform during operation. The hazard level should be the same as any normal operation of the septum magnet. The safety of septum magnet and its power supply were analyzed by Jack Segal and described in septum OSP(PHY-11-038).

6. Personal and environmental hazard controls including:

6.1 Shielding

Plastic electrical shieldings.

6.2 Interlocks

Hardware interlock between the power supplies and the gate.

6.3 Other

Flashing lights, 5-gauss-field-contour-fencer and platform gates.

7. Monitoring systems

N/A

8. Ventilation

N/A

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

Safety procedure for power supply and septum magnet.

10. Associated administrative procedures

Described in 2 – 5.

11. Operating guidelines

Have the septum power supply checkout.
Following the septum measurement commissioning plan.

12. Notification of Affected Personnel (How and Who)

ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05/12	0	3 of 5

DOCUMENT ID:

**3310 Appendix T2
Operational Safety Procedure Form**

Serial Number:

(Assigned by [ESH&Q Document Control](#) x 7277)

Inform other works nearby.

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

Described in 1.

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

Turn off the power supplies and pack the gaussmeter and probes.

15. Special environmental control requirements:

N/A

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

N/A

17. Abatement Steps – Secondary Containment, or Special Packaging requirements

N/A

18. Training requirements

All personnel working in Hall A need to satisfy the standard training requirements (RAD work I, Hall A safety walk through, ODH).

19. Unusual/Emergency procedures e.g., Injury, Fire, Loss of power

In emergency, turn off the power supplies. Follow standard emergency procedure (call 911 if fire).

20. Instrument calibration requirements, e.g., safety system/device recertification, RF probe calibration

N/A.

21. Inspection schedules

N/A.

22. References/Associated Documentation

23. List of Records Generated (Include Location / Review and Approved procedure)

All records and data will be recorded in disk.

ISSUING AUTHORITY

APPENDIX AUTHOR

APPROVAL DATE

EFFECTIVE DATE

EXPIRATION DATE

REV.

Page
4 of 5

ESH&Q Division

[Harry Fanning](#)

10/05/09

01/01/10

10/05012

0

DOCUMENT ID:

**3310 Appendix T2
Operational Safety Procedure Form**

Serial Number:

(Assigned by [ESH&Q Document Control](#) x 7277)

Authorized/Trained Individuals

Print Name/Signature	Date
J. Gomez	12/6/11
Jixie Zhang (Gatekeeper)	
All works should read and sign this documents:	
Jack Segal (Gatekeeper)	12/6/11

ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05/12	0	5 of 5

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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-11-011

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

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☒ **OSP** ☐ **TOSP**

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

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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	<i>Roger Carlini</i>	10/13/11

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&Q LIASON:	BERT MANZLAK	<i>Bert Manzlake</i>	11/3/11
Document History:			
Revision:	Reason for revision or update:		Serial number of superseded document
	New installation in hall to run experiment		

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ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05/12	0	1 of 8

This document is controlled as an on line file. It may be printed but the print copy is not a controlled document. It is the user's responsibility to ensure that the document is the same revision as the current on line file. This copy was printed on 10/24/2011

DOCUMENT ID:

3310 Appendix T2
Operational Safety Procedure Form

Serial Number:

(Assigned by ESH&Q Document Control x 7277)

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

ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	<i>HARRY FANNING</i>	10/05/09	01/01/10	10/05/12	0	2 of 8

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Jefferson Lab Thomas Jefferson National Accelerator Facility	TITLE:	ES&H Manual
DOCUMENT ID:	3310 Appendix T2 Operational Safety Procedure Form	

Serial Number:

(Assigned by ESH&Q Document Control x 7277)

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 #: If applicable		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				

ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05/12	0	4 of 8

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Jefferson Lab <small>Thomas Jefferson National Accelerator Facility</small>	TITLE:	ES&H Manual
DOCUMENT ID:	3310 Appendix T2 Operational Safety Procedure Form	

Serial Number:

(Assigned by ESH&O Document Control x 7277)

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 expose electrical. 	<ul style="list-style-type: none"> Lock Tag and Try (SAF104) Electrical Safety (SAF603A) Fire Protection(SAF603 N) 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.)

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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ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05/12	0	5 of 8

This document is controlled as an on line file. It may be printed but the print copy is not a controlled document. It is the user's responsibility to ensure that the document is the same revision as the current on line file. This copy was printed on 10/11/2011

Jefferson Lab <small>Thomas Jefferson National Accelerator Facility</small>	TITLE:	<u>ES&H Manual</u>
DOCUMENT ID:	3310 Appendix T2 Operational Safety Procedure Form	

Serial Number:

(Assigned by ESH&Q Document Control x 7277)

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.

ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05/12	0	6 of 8

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Jefferson Lab <small>Thomas Jefferson National Accelerator Facility</small>	TITLE:	<u>ES&H Manual</u>
DOCUMENT ID:	3310 Appendix T2 Operational Safety Procedure Form	

Serial Number:

(Assigned by ESH&Q Document Control x 7277)

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	

ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05012	0	

ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page 7 of 8
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05012	0	

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Jefferson Lab <small>Thomas Jefferson National Accelerator Facility</small>		TITLE:	<u>ES&H Manual</u>
DOCUMENT ID:	3310 Appendix T2 Operational Safety Procedure Form		

Serial Number:

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ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05/12	0	8 of 8

This document is controlled as an on line file. It may be printed but the print copy is not a controlled document. It is the user's responsibility to ensure that the document is the same revision as the current on line file. This copy was printed on 10/24/2011

Jefferson Lab <small>Thomas Jefferson National Accelerator Facility</small>		TITLE:	<u>ES&H Manual</u>
DOCUMENT ID:	3310 Appendix T2 Operational Safety Procedure Form		

Serial Number:

(Assigned by ESH&Q Document Control x 7277)

beam steering problems.	
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> 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 <u>EMP-04 Project/Activity/Experiment Environmental Review</u>)	

ISSUING AUTHORITY	APPENDIX AUTHOR	APPROVAL DATE	EFFECTIVE DATE	EXPIRATION DATE	REV.	Page
ESH&Q Division	Harry Fanning	10/05/09	01/01/10	10/05012	0	3 of 8

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