Person: Camsonne, Alexandre (camsonne@jlab.org) Org: PHALLA	Status: PROCESSED Saved: 9/11/2014 12:00:54 PM Submitted: 9/11/2014 12:00:53 PM

Jefferson Lab
Thomas Jefferson National Accelerator Facility

Operational Safety Procedure Review and Approval Form # 43091

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

Type:	*OSP* Click for OSP/TOSP Procedure Form Click for LOSP Procedure Form
Serial Number:	***ENP-14-43091-OSP***
Issue Date:	***10/7/2014***
Expiration Date:	***10/7/2017***
Title:	***Hall A Deeply Virtual Compton Scattering Experiment OSP***
Location: (where work is being performed) Building Floor Plans	Location Detail: (specifics about where in the selected location(s) the work is being performed) ***Between beamline and Right HRS***
Risk Classification: (See ES&H Manual Chapter 3210 Appendix T3 Risk Code Assignment)	Without mitigation measures (3 or 4): ***3*** With mitigation measures in place (N, 1, or 2): ***1***
Reason:	This document is written to mitigate hazard issues that are : ***Determined to have an unmitigated Risk code of 3 or 4***
Owning Organization:	***PHALLA***
Document Owner(s):	***Camsonne, Alexandre (camsonne@jlab.org)*** Primary

Supplemental Technical Validations

50V or Greater: Diagnostic Type Operations (Paul Powers, Todd Kujawa)
Other (David Kausch, Tim Minga)
Fall Protection (Bert Manzlak, George Perry)

Other Hazards:
Detector motion (Ed Folts)

Document History

Revision	Reason for revision or update	Serial number of superseded document
1	*1*	*1*

Comments for reviewers/approvers:

Attachments

Procedure: ***3310T1FormDVCS12GeV-Sept10.pdf***

THA: ***3210T1FormDVCS12GeV-Sept10.pdf***

Additional Files: ***12GeVDVCS-OSP.pdf***

Convert to PDF

Review Signatures	
Person : Physics ES&H Liaison	**Signed** on 9/26/2014 8:56:24 AM by Bert Manzlak (manzlak@jlab.org)
Person : Subject Matter Expert : Detector motion	**Signed** on 9/12/2014 6:56:38 AM by Ed Folts (folts@jlab.org)
Subject Matter Expert : Electricity->>50 amps OR >50 Vac OR 60Vdc AND >5 mA	**Signed** on 9/12/2014 9:37:19 AM by Todd Kujawa (kujawa@jlab.org)
Subject Matter Expert : Fire Protection->Other	**Signed** on 10/7/2014 10:05:19 AM by David Kausch (kausch@jlab.org)
Subject Matter Expert : Working at Elevations->Fall Protection	**Signed** on 9/26/2014 8:55:52 AM by Bert Manzlak (manzlak@jlab.org)

Approval Signatures	
Division Safety Officer : PHALLA	**Signed** on 10/7/2014 6:16:43 PM by Javier Gomez (gomez@jlab.org)
Org Manager : PHALLA	**Signed** on 10/7/2014 6:24:57 PM by Cynthia (Thia) Keppel (keppel@jlab.org)
Safety Warden : Experimental Hall A - A100	**Signed** on 10/7/2014 4:25:13 PM by Ed Folts (folts@jlab.org)

Operational Safety Procedure Form

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

Click For Word Doc

DEFINE THE SCOPE OF WORK

Title:	Hall A DVCS Calorimeter Operation		
Location:	Hall A	**Type:**	[X] **OSP** [ ] **TOSP**
Risk Classification (per Task Hazard Analysis attached) (See *ESH&Q Manual Chapter 3210 Appendix T3 Risk Code Assignment*.)		**Highest Risk Code Before Mitigation (3 or 4):**	3
		Highest Risk Code after Mitigation (N, 1, or 2):	1
Owning Organization:	Jefferson Laboratory	**Date:**	09/10/2014
Document Owner(s):	Alexandre Camsonne		

Document History (Optional)

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

ANALYZE THE HAZARDS

1. Purpose of the Procedure – Describe in detail the reason for the procedure (what is being done and why).

The Hall A Deeply Virtual Compton Scattering is using an additionnal lead fluoride calorimeter to detect a real photon from the DVCS in addition to the standard equipment. It is constituted of a 13x16 matrix of Lead Fluoride blocks readout by PMTs.

2. Scope – include all operations, people, and/or areas that the procedure will affect.

Shift workers, users of the calorimeter.

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

The calorimeter is on a cart on horizontal rails to allow to push the detector back for calibration purpose. The stand with rails is itself sitting on an stand linked to the target pivot and on a rail to allow rotation of the detector always point to the target.

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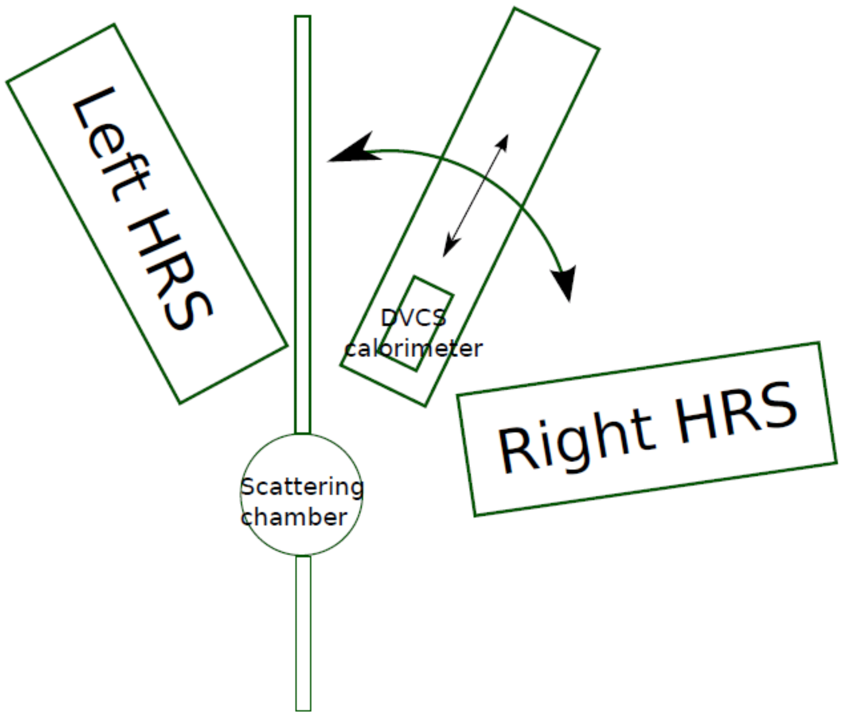

4. Authority and Responsibility:

4.1 Who has authority to implement/terminate

Douglas Higinbotham, Ed Folts

4.2 Who is responsible for key tasks

Alexandre Camsonne

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

Bert Manzlak

4.4 What are the Training Requirements (See http://www.jlab.org/div_dept/train/poc.pdf)

Hall A required training + this OSP

5. Personal and Environmental Hazard Controls Including:

5.1 Shielding

5.2 Interlocks

5.3 Monitoring systems

5.4 Ventilation

5.5 Other (Electrical, ODH, Trip, Ladder) (Attach related Temporary Work Permits or Safety Reviews as appropriate.)

High Voltage (less than 900 V less than 1 mA)

6. List of Safety Equipment:

6.1 List of Safety Equipment:

Railing on detector stand

6.2 Special Tools:

DEVELOP THE PROCEDURE

1. Associated Administrative Controls

This OSP will have to be read by the people operating the Hall A DVCS calorimeter and shift takers.

2. Operating Guidelines

3. Notification of Affected Personnel (who, how, and when)

Alexandre Camsonne

4. List the Steps Required to Execute the Procedure: from start to finish.

See attached file Hall A Deeply Virtual Compton Scattering Operating Safety Procedure

5. Back Out Procedure(s) i.e. steps necessary to restore the equipment/area to a safe level.

None

6. Special environmental control requirements:

6.1 Environmental impacts (See EMP-04 Project/Activity/Experiment Environmental Review)

None

6.2 Abatement steps (secondary containment or special packaging requirements)

None

7. Unusual/Emergency Procedures (e.g., loss of power, spills, fire, etc.)

None

8. Instrument Calibration Requirements (e.g., safety system/device recertification, RF probe calibration)

9. Inspection Schedules

Initial EHS inspection

10. References/Associated Documentation

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

Operational Safety Procedure Form

Authorized/Trained Individuals

Print Name/Signature	Date
Alexandre Camsonne	
Carlos Munoz	
Julie Roche	
Norman Israel	
Camille Desnault	
Mongi Diamini	
Douglas Hinginbotham	
Paul King	
Charles Hyde	
Lee Allison	
Norman Israel	
Hashir Rashad	

Authorized/Trained Individuals

Print Name/Signature	Date

Click
To Submit OSP
for Electronic Signatures

Distribution: Copies to: affected area, authors, Division Safety Officer
Expiration: Forward to ESH&Q Document Control

Form Revision Summary

Revision 1.3 – 11/27/13 – Added "Owning Organization" to more accurately reflect laboratory operations.
Revision 1.2 – 09/15/12 – Update form to conform to electronic review.
Revision 1.1 – 04/03/12 – Risk Code 0 switched to N to be consistent with 3210 T3 Risk Code Assignment.
Revision 1.0 – 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	REVIEW REQUIRED DATE	REV.
ESH&Q Division	Harry Fanning	12/01/11	12/01/14	1.3

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Task Hazard Analysis (THA) Worksheet

(See ES&H Manual Chapter 3210 Appendix T1
Work Planning, Control, and Authorization Procedure)

Click

Author:	Alexandre Camsonne	**Date:**	09/10/2014	**Task #:** If applicable	

Complete all information. Use as many sheets as necessary

Task Title:	Hall A DVCS calorimeter operation			**Task Location:**	Hall A
Division:	Physics	**Department:**	Hall A	**Frequency of use:**	Daily
Lead Worker:	Alexandre Camsonne				
Mitigation already in place: Standard Protecting Measures Work Control Documents	Hall A training and PPE				

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	DVCS calorimeter operation /servicing	M	M	3	OSP/ PPE / Engineered	Railing around detector, monitoring of current and temperature, motion procedure	1

Highest Risk Code before Mitigation:	3	**Highest Risk Code after Mitigation:**	1

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.)

Form Revision Summary

Revision 0.1 – 06/19/12 - Triennial Review. Update to format.

Revision 0.0 – 10/05/09 – Written to document current laboratory operational procedure.

ISSUING AUTHORITY	TECHNICAL POINT-OF-CONTACT	APPROVAL DATE	REVIEW REQUIRED DATE	REV.
ESH&Q Division	Harry Fanning	06/19/12	06/19/15	0.1

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Hall A Deeply Virtual Compton Scattering Operating Safety Procedure

Alexandre Camsonne

September 11, 2014

1 Scope

This document describe the additions to the standard equipment relevant to the Hall A DVCS experiment. It will be kept with the experiment documents in Counting House and MCC. The signed copy with list of authorized people for motion of the detector will be kept at the counting house.

2 Equipment description

2.1 Hall A Deeply Virtual Compton Scattering calorimeter

The Hall A Deeply Virtual Compton Scattering is using an additional lead fluoride calorimeter to detect a real photon from the DVCS in addition to the standard equipment. It is constituted of a 13x16 matrix of Lead Fluoride blocks readout by PMTs. Each module weight about 3 pounds giving a full calorimeter weight of about 600 lbs. The calorimeter is placed on a cart on horizontal rails to allow to push the detector back for calibration purpose. The stand with rails is itself sitting on an stand linked to the target pivot and on a rail to allow rotation of the detector always point to the target.

2.2 Electronics

A custom electronics will be used for the readout consisting of a VME trigger module associated with an analog sampling readout modules. The electronics will be located in the Left Spectrometer at the first level in a rack containing 3 VME64X crates, one trigger module, a NIM crate and a mini VME crate. The signal is sent from the calorimeter to the spectrometer using RG213 cables.

3 Hazard analysis and mitigation

3.1 Fall hazard from detector platform

The detector is placed on the Big Bite stand which is rotating around the pivot target. This places the detector at a height of . Railing will be placed around the detector to prevent accidental fall. They are to remain in place in standard use.

3.1.1 Electrical hazard

The detector PMT are supplied with high voltage with Lecroy 1461N. Voltage is limited by hardware to be less than 900 V. The high voltage power supply are limited to 2.5 mA. This puts the detector in class 1. The custom electronics uses 5V power supplies with current less than 50 A which also puts it in the class 1 category. High voltage power should be turned off when accessing the detector. The main supply transformer is grounded.

3.1.2 Fire hazard

The detector has powered electronics and cables that could burn in case of spark. Temperature sensor will be placed inside of the calorimeter box and monitored when in operation. The Hall smoke detector and VESDA will also detect any fire occurring. Standard cables RG59,RG213 and RG174 are used we do not anticipate additionnal issues since they are commonly used in Hall A.

3.1.3 Equipment hazard

Motion of the detector has to be done carefully by expert in order to avoid damages to equipment. A checklist and procedure to be followed will be detailed in this document. The calorimeter is on rails to allow moving it back for calibration purpose. Since it is about 600 pounds it should be moved slowly to avoid damaging the stops at each end of the rails. The calorimeter will be clamped in place after each motion on the rail.

3.2 Hazard mitigation

With the reading of the OSP and the railings in place. We do not expect major damage or injury to occur. The most hazardous part being the detector motion which will only be carried out by experts.

4 Calorimeter operation

In regular operation, the low voltage power supplies should be on. High voltage should be turned on. During the data taking the anode currents will be monitored using EPICS and anode current should be maintained at less than 30 uA to ensure the life time of the photomultipliers.

5 High resolution spectrometer motion

The BigBite / DVCS stand can interfere with spectrometer motion going to smaller angle. Check with the run coordinator if the left spectrometer has to be moved to smaller angle if an access is required to check for interferences.

6 High resolution spectrometer access

The RG213 cable are going to the DVCS electronics under the right door of the Left spectrometer. The door will be disabled closed for the running, if it is operating care should be taken when opening and closing the door in order to avoid breaking the cables at the patch panel inside of the detector hut. The patch panel taking most of the space on the beam on the right side of the spectrometer, the detector stack has to be access from the left side and from the back.

7 Calorimeter motion (expert only)

The detector is placed on a rotating platform that can rotate around the pivot axis. A come-along or motorized chain will be used to do angular motion of the calorimeter. The motion will be only be done by only expert people who were briefed on how to do the motion. The motion should be done with an expert and a spotter for interference (helper from the hall or person on shift)

- check for possible interference with Left or Right spectrometer
- check for any items which could be tied directly to the stand and scattering chamber
- actionate the come along or motor until position is reached, if the detector get stuck during the motion, stop and check for any possible interference and try again. If it gets stuck again call the run coordinator who will assess if more technical help is needed.

The list of people following are allowed to move the detector. Gatekeepers are Alexandre Camsonne, Ed Folts, Douglas Higinbotham, Jack Segal, Bert Manzlak

Name	Date	Signature	Gate keeper
Ed Folts	09/10/2014		
Jack Segal	09/10/2014		
Jessie Butler	09/10/2014		
Heidi Fansler	09/10/2014		
David Galinski	09/10/2014		
Andrew Lumanog	09/10/2014		
Mahlon Long	09/10/2014		
Alexandre Camsonne	09/10/2014		
Carlos Munoz	09/10/2014		
Julie Roche	09/10/2014		
Charles Hyde	09/10/2014		
Paul King	09/10/2014		

By signing this page, you testify that you have read, understand, and agree to abide by the procedure specified in the above referenced work control document:

Serial Number: ENP-14-43091-OSP

Title: Hall A Deeply Virtual Compton Scattering Experiment OSP

Name	**Signature**	**Date**