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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.)

Click

DEFINE THE SCOPE OF WORK

Title:	Operation of HYCAL		
Location:	Experimental Hall B	**Type:**	☒ **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:	Experimental Nuclear Physics	**Date:**	March 16, 2016
Document Owner(s):	Eugene Pasyuk		

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Revision:	Reason for revision or update:	Serial number of superseded document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

This document describes the procedures for operating the HYCAL which includes HV control and operation of the HYCAL transporter

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

The operations are:

1. HV controls
   These operations are performed by trained shift personnel in accordance with Run plan and instructions from the Run Coordinator.
2. Turn OFF HV for maintenance and repair work inside the HYCAL enclosure. Use Lock/Tag/Try procedure.
3. Operation of HYCAL transporter.
   a. Transition from the storage position to operational position. This operation is limited to those individuals listed in the attached document *HYCAL transporter procedures*.
   b. Normal operation of the transporter on the beam line is performed by trained shift personnel in accordance with Run plan and instructions from the Run Coordinator

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

The detailed description of the HYCAL can be found in attached document *HYCAL manual*

HYCAL is located on the space frame of the Hall B. For the running configuration is sitting on a stationary support cart on the level 1 of the space frame. For calibration and storage configuration is place on the HYCAL transporter between levels 1 and 2.

4. Authority and Responsibility:

4.1 Who has authority to implement/terminate

Hall B engineer or designee

4.2 Who is responsible for key tasks

Hall B engineer or designee The individuals approved for these operations listed in the attached document.

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

Hall B engineer

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

- Read the OSP
- EH&S orientation (SAF100)
- Hall B safety awareness training (SAF111)

5. Personal and Environmental Hazard Controls Including:

5.1 Shielding

N/A

5.2 Interlocks

Detail description of the interlocks can be found in attached document ***HYCAL manual***

5.3 Monitoring systems

- Software controls of the HV system
- EPICS controls of the transporter
- Video monitoring of HYCAL motion

5.4 Ventilation

N/A

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

N/A

6. List of Safety Equipment:

6.1 List of Safety Equipment:

N/A

6.2 Special Tools:

N/A

DEVELOP THE PROCEDURE

1. Associated Administrative Controls

- Appropriate training, as described in 4.4

- Written procedures included in the attached document ***HYCAL manual*** and ***HYCAL Transporter Procedures***

2. Operating Guidelines

Hall work coordinator, in concert with the PRad Run Coordinator, shall determine the appropriate time for HYCAL transition between normal, calibration and storage positions
Run Coordinator shall determine which HV control operations to be performed and when.

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

Hall work coordinator or designee shall notify PRad Run Coordinator before and after each operation involving transition of HYCAL between calibration, operational and storage positions

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

1. HV controls
   These operations are performed by trained shift personnel in accordance with Run plan and instructions from the Run Coordinator.
   a. Make sure HYCAL enclosure is closed.
   b. Set boundary around HYCAL
   c. Turn ON chiller
   d. Check temperature
   e. Turn ON HV power supplies
   f. Turn ON additional power supplies
2. Operation of HYCAL transporter.
   a. Transition from the storage position to operational position. This operation is limited to those individuals listed in the attached document *HYCAL transporter procedures*.
      i. Setup a barrier around the transporter area and clear the area from personnel and equipment
      ii. Inspect drive train, hardware interlocks
      iii. Turn on VME crate and motor driver box
      iv. Assign observer to watch motion and handle dead-man switch. To move HYCAL outside of normal operation mode the dead man switch must be depressed. The motion stops if the switch is released
      v. Use EPICS GUI to control motion
      vi. Move HYCAL horizontally to Home position
      vii. Start vertical motion
      viii. Push nearest Stop Button if something goes wrong
   b. Normal operation of the transporter on the beam line is performed by trained shift personnel in accordance with Run plan and instructions from the Run Coordinator
      i. Inspect drive train, hardware interlocks
      ii. Turn on VME crate and motor driver box
      iii. Set boundary on the space frame around HYCAL location
      iv. Remove all unnecessary items
      v. Use EPICS GUI to control motion
      vi. Visually monitor motion If motion is controlled locally in the hall, or monitor using video camera if motion is controlled from the counting room.
      vii. Push nearest Stop Button if something goes wrong

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

1. Transition from the operational position to storage position. This operation is limited to those individuals listed in the attached document *HYCAL transporter procedures*.
    - viii. Inspect drive train, hardware interlocks
    - ix. Turn on VME crate and motor driver box
    - x. Set boundary on the space frame around HYCAL location
    - xi. Remove all unnecessary items
    - xii. Assign a person to watch motion and depress dead-man switch
    - xiii. Use EPICS GUI to control motion
    - xiv. Move HYCAL horizontally to Home position
    - xv. Start vertical motion
    - xvi. Push nearest Stop Button if something goes wrong
    - xvii. Turn OFF VME crate and Motor drive box
2. For maintenance and repair work inside the HYCAL enclosure
    a. Turn OFF additional power supplies
    b. Turn OFF HV power supplies
    c. Use Lock/Tag/Try procedure: unplug power cords of all power supplies and apply LTT devices.
    d. Turn OFF chiller

6. Special environmental control requirements:

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

N/A

6.2 Abatement steps (secondary containment or special packaging requirements)

N/A

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

In case of emergency while HYCAL is moving pus Emergency stop button.

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

N/A

9. Inspection Schedules

PRad group will inspect HV control system and interlocks prior to each use
Hall B engineering group will inspect HYCAL transporter prior each use.

10. References/Associated Documentation

Attachment A: HYCAL Task Hazard Analysis
Attachment B: HYCAL manual
Attachemnt C: HYCAL Transporter Procedures

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

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

Qualifying Periodic Review – 02/19/14 – No substantive changes required.
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 DATE	REV.
ESH&Q Division	Harry Fanning	02/19/14	02/19/17	1.3

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