

Person: Wei, Xiangdong (xwei@jlab.org)
Org: PHALLB

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Operational Safety Procedure Review and Approval Form # 62556
(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-16-62556-OSP

Issue Date:

9/20/2016

Expiration Date:

9/20/2019

Title:

Re-integrate/test newly purchased/refurbished Electronic Instruments in the HDice Lab

Location:
(where work is being performed)

Test Lab - 1142

Location Detail:
(specifics about where in the selected location(s) the work is being performed)

[Building Floor Plans](#)

Risk Classification:

Without mitigation measures (3 or 4): **2**

(See [ES&H Manual Chapter 3210 Appendix T3 Risk Code Assignment](#))

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

Reason:

This document is written to mitigate hazard issues that are :
Not Applicable

Owning Organization:

PHALLB

Document Owner(s):

Wei, Xiangdong (xwei@jlab.org) Primary

Supplemental Technical Validations

Machine Tools (Bert Manzlak, Paul Collins)

Document History

Revision <input type="checkbox"/>	Reason for revision or update <input type="checkbox"/>	Serial number of superseded document <input type="checkbox"/>
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Comments for reviewers/approvers:

Clone

Attachments

Procedure: **HDice OSP for Testing Electronic Instrumentations--2016-09-15.pdf**

THA: **HDice THA for Testing Electronic Instrumentations--2016-09-15.pdf**

Additional Files:

[Convert to PDF](#)

Review Signatures

Person : Physics ES&H Liaison **Signed** on 9/15/2016 9:47:32 AM by Bert Manzlak (manzlak@jlab.org) .

Subject Matter Expert : Machine Tools **Signed** on 9/15/2016 9:47:24 AM by Bert Manzlak (manzlak@jlab.org) .

Approval Signatures

Division Safety Officer : PHALLB **Signed** on 9/15/2016 9:50:50 AM by Ed Folts (folts@jlab.org) .

Org Manager : PHALLB **Signed** on 9/15/2016 10:08:01 AM by Volker Burkert (burkert@jlab.org) .

Safety Warden : Test Lab - 1142 **Signed** on 9/20/2016 4:34:43 PM by Douglas Higinbotham (doug@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

Title:	Re-integrate/test newly purchased/refurbished Electronic Instruments in the HDice Lab		
Location:	HDice Lab---Building 58, Room 1142	Type:	<input checked="" type="checkbox"/> OSP <input type="checkbox"/> TOSP
Risk Classification (per Task Hazard Analysis attached) (See ESH&Q Manual Chapter 3210 Appendix T3 Risk Code Assignment.)	Highest Risk Code Before Mitigation		2
	Highest Risk Code after Mitigation (N, 1, or 2):		1
Owning Organization:	Hall-B	Date:	09/15/2016
Document Owner(s):	Xiangdong Wei		

DEFINE THE SCOPE OF WORK

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

The purpose of the procedure is to provide a general guideline for the Detector Supporting Group (DSG) to integrate and test the newly purchased/refurbished electronic instruments with existing HDice equipment. The instruments mentioned above are in three categories: 1. Newly purchased commercial electronics, 2. Fixed commercial electronics, and 3. DSG built units. Those instruments would be tested at DSG shop prior to the work described here. The goal is to re-integrate them into the HDice working equipment. The trained HDice personnel will operate cryostat and magnet, if needed.

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

Operations:

1. Power off and disconnect the rack.
2. Install components on the rack.
3. Connect components with power switch off.
4. Turn on instrument power.
5. Test the integrated equipment with dummy load.*
6. Switch dummy load to the real load (cryostat).*
7. Test the integrated equipment with real load.
8. Turn off instruments.

**Step 5 and 6 are not always needed/possible, in that case, skip them.*

The DSG people will only check the electronics alone or connected to a warm dewar. The HDice personnel with dewar-specific training will operate the cold cryostats if necessary.

People:

Members of the HDice Group and DSG working near the instrument rack (NMR rack) in HDice Lab and the cryostat connected to any tested unit will be affected.

3. Description of the Facility – include building, floor plans and layout of the experiment or operation.

Test work will be done on the ground floor of HDice Lab in Test Lab, Rm. 1142, Bldg. 58. The work mainly involves the HDice NMR racks and cryostats (at both room temperature and liquid helium temperature).

ANALYZE THE HAZARDS and IMPLEMENT CONTROLS

4. Hazards identified on written Task Hazard Analysis

Personal injury, like back injury, foot injury or pinched finger, could be resulted if not handling correctly. Cryogenics are often used in the HDice lab, the ODH information is marked on the entrance door and the ODH/PSS alarm system was installed/reviewed/tested on 04/07/2010 (See item 18 for details). Cryostats with built-in superconducting magnet are often used, so the static magnet field in some part of the room is higher than 5 gauss.

5. Authority and Responsibility:

4.1 Who has authority to implement/terminate

X. Wei, M. Lowry and A. Sandorfi

4.2 Who is responsible for key tasks

P. Bonneau, B. Eng and members of HDice group and DSG

4.3 Who analyzes the special or unusual hazards including elevated work, chemicals, gases, fire or sparks (See [ES&H Manual Chapter 3210 Appendix T1 Work Planning, Control, and Authorization Procedure](#))

David Kashy analyzed ODH issue for the HDice lab, and the ODH/PSS alarm system was installed/reviewed/tested on 04/07/2010 (See item 18 for details).

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

General Employee Trainings, Contractor Trainings, SAF103(ODH), SAF104(LT&T) and trainings required to enter the HDice lab.

6. Personal and Environmental Hazard Controls Including:

5.1 Shielding

N/A

5.2 Barriers (magnetic, hearing, elevated or crane work, etc.)

The safe boundaries of static magnetic field ($B=0.0005$ Tesla) are clearly marked on the floor. The field-on indication beacon will be turned-on when the magnetic field is on.

5.3 Interlocks

N/A

5.4 Monitoring systems

The existing HDice ODH/PSS and fire.

5.5 Ventilation

A large blower is linked to the ODH monitoring system. This blower is part of the existing HDice ODH/PSS system, installed and reviewed on 04/07/2010. For power failure case, the large roll-up door in HDice lab will automatically open to let fresh air in.

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

None.

7. List of Safety Equipment:

7.1 List of Safety Equipment:

ODH monitors and alarms installed on main floor, mezzanine, workroom, and pump room. Standard fire alarm system, fire sprinklers and fire extinguishers are also installed throughout the HDice lab.

7.2 Special Tools:

N/A

8. Associated Administrative Controls

General Employee Trainings, Contractor Trainings and trainings required to enter the HDice lab. A permission to enter HDice lab is encoded on the ID badge.

DEVELOP THE PROCEDURE

9. Operating Guidelines

Read related operation manuals for safety and test procedure. Call X. Wei or A. Sandorfi for locating manual locations. The OEM Manuals are located on the only gray half-bookshelf in the room. The operation manuals for HDice cryogenic equipment are also linked in field 17 of this document.

10. Notification of Affected Personnel (who, how, and when include building manager, safety warden, and area coordinator)

Notify X. Wei (x-5266) or A. Sandorfi (x-5457) prior to start the work and after work is done. Notify people in the room when entering and when leaving the HDice lab.

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

1. Power off and disconnect the rack.
2. Installing components on the rack.
3. Connecting components with power switch off.
4. Turning on instrument power.
5. Testing the integrated equipment with dummy load.*
6. Switch dummy load to the real load (cryostat).*
7. Testing the integrated equipment with real load.
8. Turning off instruments.

**Step 5 and 6 are not always needed/possible, in that case, skip them.*

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

Call X. Wei (x-5266), A. Sandorfi (x-5457), or M. Lowry (x-7432) for instructions on restart the rack, after finishing the work.

13. Special environmental control requirements:

13.1 List materials, chemicals, gasses that could impact the environment (ensure these are considered when choosing Subject Mater Experts) and explore [EMP-04 Project/Activity/Experiment Environmental Review](#) below

None

13.2 Environmental impacts (See [EMP-04 Project/Activity/Experiment Environmental Review](#))

N/A

13.3 Abatement steps (secondary containment or special packaging requirements)

N/A

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

In case of power lost, abort the test and call X. Wei (x-5266) or A. Sandorfi (x-5457) for recovery instructions.

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

None

16. Inspection Schedules

None

17. References/Associated/Relevant Documentation

Dilution Refridgerator: <https://www.jlab.org/Hall-B/HDIce/manuals/dilution01a.pdf>
 Transfer Cryostat: <https://www.jlab.org/Hall-B/HDIce/manuals/transfer05a.pdf>
 Production Dewar: <https://www.jlab.org/Hall-B/HDIce/manuals/production01a.pdf>
 Storage Dewar: <https://www.jlab.org/Hall-B/HDIce/manuals/storage02a.pdf>
 In-Beam Cryostat: <https://www.jlab.org/Hall-B/HDIce/manuals/InBeam01a.pdf>

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

ODH Safety Review Form for HDice Lab:
https://www.jlab.org/Hall-B/HDIce/safetyDocs/Rm10A_TestLab_ODH.pdf
 ODH Analysis of HDice Lab:
https://www.jlab.org/Hall-B/HDIce/safetyDocs/JeffersonLab_HDICElab_ODH_06_04_2010_Final.pdf
 ODH Alarm Test for HDice Lab:
https://www.jlab.org/Hall-B/HDIce/safetyDocs/ODH_alarmTestMatrix.pdf

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 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 1.4 – 06/20/16** – Repositioned “Scope of Work” to clarify processes
- 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 0.0 – 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	06/20/16	06/20/19	1.4

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Task Hazard Analysis (THA) Worksheet

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

Click
For Word

Author:	Xiangdong Wei	Date:	08/23/2016	Task #: If applicable	
Complete all information. Use as many sheets as necessary					
Task Title:	• Testing Electronic Instruments in HDice Lab	Task Location:	Bldg. 58, Rm.1142		
Division:	Physics	Department:	Hall B	Frequency of use:	monthly
Lead Worker:	P. Bonneau, B. Eng, X. Wei, and members in the HDice Group and Detector Support Group.				
Mitigation already in place: Standard Protecting Measures Work Control Documents	SAF 104 – LT&T SAF 103 - ODH 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	Power off and disconnect the NMR rack. May exposure to Class 2 Hazards, current upto 120ADC, if not done.	M	L	2	<ol style="list-style-type: none"> 1. Make magnet safe. 2. Disconnect (unplug) the rack. 	<ol style="list-style-type: none"> 3. De-energize superconducting magnet to make it safe, if magnet is presented. 4. Turn-off related power supply. 5. Turn off all instruments on the rack, follow the manual. 6. Unplug the rack. 	N*
2	Install components on the rack. If not handling properly, personal injury may occur.	L	L	1		Wear PPE such as safety shoes, gloves, etc.	1
3	Connect components with power switch off. Personal injury may occur.	L	L	1		Wear PPE such as safety shoes, gloves, etc.	1

Task Hazard Analysis (THA) Worksheet

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

Sequence of Task Steps	Task Steps/Potential Hazards	<u>Consequence Level</u>	<u>Probability Level</u>	<u>Risk Code</u> (before mitigation)	Proposed Mitigation (Required for <u>Risk Code</u> >2)	Safety Procedures/ Practices/Controls/Training	<u>Risk Code</u> (after mitigation)
4	Plug-in, energize the rack and turn on the test related instruments only. Personal injury may occur.	M	L	2		The current of all superconducting magnet power used in HDice lab are 0 (by default) when switched on. Follow operation manuals and existing procedures.	1
5	Test the integrated equipment with dummy load.	M	L	2	Running tests on dummy load first to protect connected equipment.	Follow operation manuals and existing procedures.	1
6	Switch to real load.	L	L	1		Wear PPE such as safety shoes, gloves, etc. Follow operation manuals and existing procedures.	1
7	Test the integrated equipment with real load. May damage other instruments, if initial settings are wrong.	M	L	2		Follow operation manuals and existing procedures.	1
8	Turn off instruments.	M	L	2		Follow operation manuals and existing procedures.	1

Highest Risk Code before Mitigation:

2

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](#).)

For questions or comments regarding this form contact the Technical Point-of-Contact [Harry Fanning](#)

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Task Hazard Analysis (THA) Worksheet

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

Form Revision Summary

Periodic Review – 08/13/15 – No changes per TPOC

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 DATE	REV.
ESH&Q Division	Harry Fanning	08/13/15	08/13/18	0.1

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