

PRAD DOCUMENTATION

E. Pasyuk



COMMENTS AND RECOMMENDATIONS ON CHARGE #8

Charge:

8) *Are the formal documentation requirements and reporting (run coordinator □ shift leaders) procedures for running the experiment adequate, appropriate and complete (COO, ESAD, RSAD, ERG, OSP's, general equipment operation manuals, etc.)?*

Findings: The formal documentation is mostly in place. For example, design, review and factory testing documents for vacuum vessels are adequately prepared.

Comments: Formal OSP documentation must be provided for all new equipment. Procedures for running the experiment should be complete (COO, ESAD, RSAD, ERG, OSP's, general equipment operation manuals, etc.) and submitted with a cover letter by the hall leader to the division safety officer, *a minimum, ten days prior to the scheduled run date.*

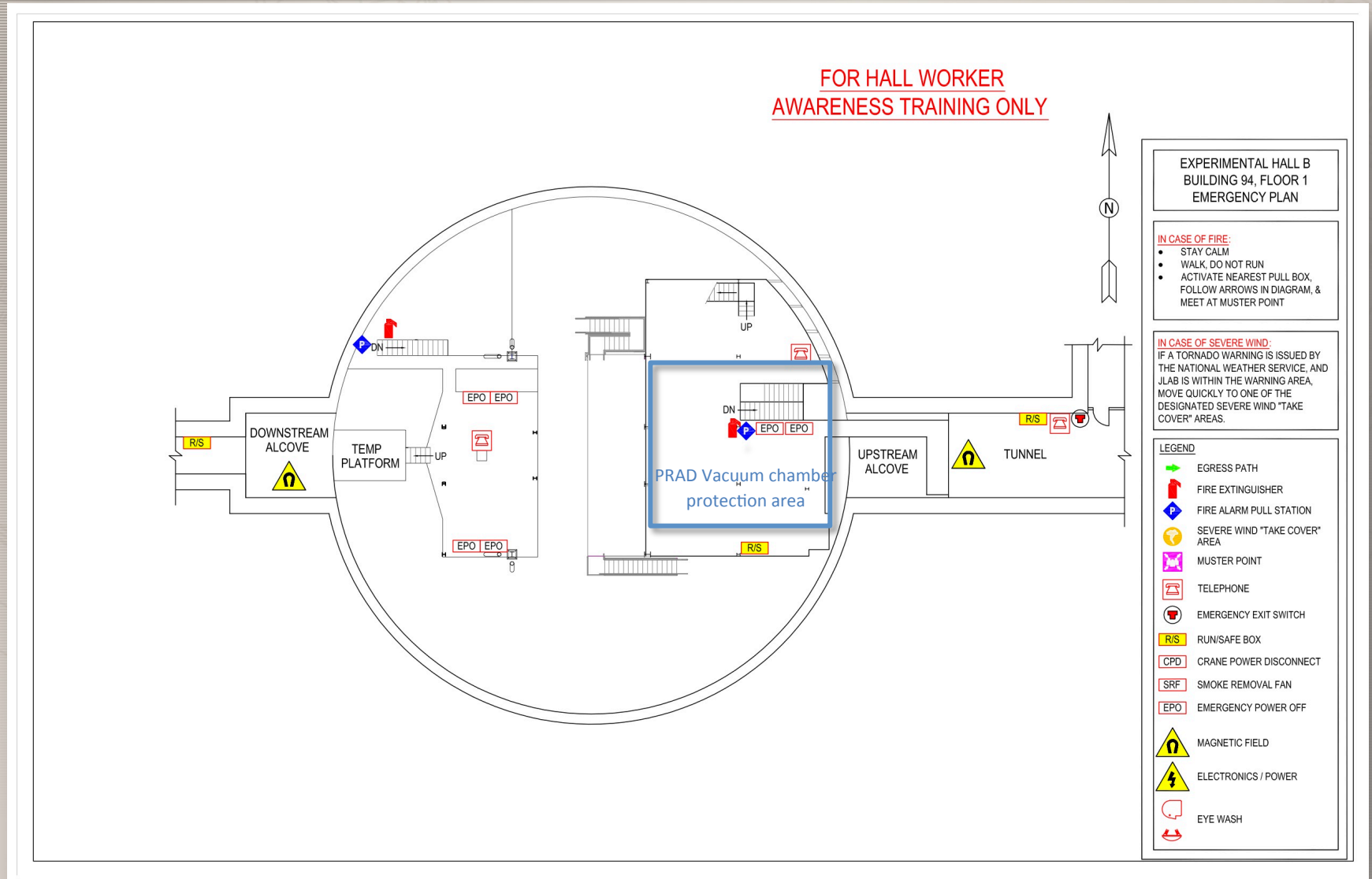
Recommendations:

8.1 Provide OSPs for: GEM, Vacuum system, Target, and HyCal.

8.2 Update the ERG document, namely the section on the Vacuum protection areas.

8.3 Provide a pre-run checklist. Submit a reference to this list along with the COO, ESAD and other documents.

8.2 UPDATE ERG DOCUMENT, NAMELY THE SECTION ON VACUUM PROTECTION AREA



8.3 PROVIDE PRE-RUN CHECKLIST

PRad related subsystems are added to the global HCO system

Hot Checkout

Readiness Signoff Checklists Links Reports Help

Choose... **Readiness**

Components {8,738} (67 Masked)

- ✖ JLAB
- ✖ CEBAF
- ✖ LERF
- ✔ Cryo
- ✔ Facilities
- ✔ Hall A
- ✔ Hall B
 - ✔ Hall B Beamline
 - ✔ Hall B Collimator
 - ✔ Hall B Faraday Cup
 - ✔ Hall B Halo Counters
 - ✔ Hall B Harps
 - ✔ Hall B LCW
 - ✔ Hall B Magnets
 - ✔ Hall B Targets
 - ✔ CLAS12 Target
 - ✔ HPS Target
 - ✔ PRad Target
 - ✔ Hall B Vacuum
 - ✔ Hall B Viewers
 - ✔ Hall B Detectors
 - ✔ Hall B HPS Detector
 - ✔ Hall B PRad Detector
 - ✔ HyCal Transporter
 - ✔ HyCal Transporter
 - ✖ Hall B Controls
 - ✖ Hall B Engineering
 - ✔ PRad GEMs
 - ✔ PRad GEM Gas flow
 - ✖ Hall B PRad GEM
 - ✔ PRad GEM HV
 - ✖ Hall B PRad GEM
 - ✔ PRad HyCal
 - ✔ HyCal Chiller
 - ✖ Hall B HyCal
 - ✔ HyCal HV
 - ✖ Hall B HyCal
 - ✔ HyCal LMS
 - ✖ Hall B HyCal
 - ✔ HyCal Temp Monitor
 - ✖ Hall B HyCal
 - ✔ Hall B CLAS12 Detector
 - ✔ Hall B Acceptance
 - ✔ Hall B DAQ
 - ✔ Hall B Slow Controls
 - ✔ Hall B Sweep
 - ✖ Hall C
 - ✔ Hall D

Status Key

 - ✔ Ready
 - ✔ Checked
 - ✖ Not Ready
 - Masked
 - NR Not Applicable

Node Key

 - Category/System
 - Subsystem
 - Component
 - Group

Recent Activity

22 Mar 09:19 - meyers - Upgrade - Moeller
Quads - MQF3M01
New field map uploaded to CED
Magnet Measurement - Ready

22 Mar 09:18 - meyers - Upgrade - Moeller
Quads - MQF3M01
New field map loaded to CED
Magnet Measurement - Checked

21 Mar 09:13 - meyers - Upgrade -
Correctors (iron core) - MAP3H07H
New AP Field map loaded into CED.
Magnet Measurement - Ready

21 Mar 09:12 - meyers - Upgrade -
Correctors (air core) - MFR3H04V + 1 more ...
50A=4000G-cm air core
Magnet Measurement - Ready









18 Mar 14:18 - robertsn - Upgrade - PSS
BCMs - SBC3C05
SSG - Checked

[More ->](#)

PRAD TARGET OSP

Person: Keith, Christopher (ckeith@jlab.org)		Status: PROCESSED				
Org: TARGET		Saved: 3/3/2016 10:04:32 AM				
		Submitted: 3/3/2016 10:04:32 AM				
Jefferson Lab <small>Thomas Jefferson National Accelerator Facility</small>						
Operational Safety Procedure Review and Approval Form # 57080 <small>(See ES&H Manual Chapter 3310 Appendix T1 Operational Safety Procedure (OSP) and Temporary OSP Procedure for Instructions)</small>						
Type:	OSP	Click for OSP/TOSP Procedure Form Click for LOSP Procedure Form				
Serial Number:	ENP-16-57080-OSP					
Issue Date:	3/10/2016					
Expiration Date:	3/10/2018					
Title:	PRad Target					
Location: (where work is being performed)	Experimental Hall B Hall B Gas Shed Floor 1	Location Detail: (specifies about where in the selected location(s) the work is being performed)	Beam alcove above tagger magnet. Hall B Gas pad.			
Risk Classification:	Without mitigation measures (3 or 4):		3			
	(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 : Determined to have an unmitigated Risk code of 3 or 4					
Owning Organization:	TARGET					
Document Owner(s):	Keith, Christopher (ckeith@jlab.org) Primary					
Supplemental Technical Validations						
Flammables (Dick Owen, Jennifer Williams) Cryogenic Material - Gas or Liquid (Jonathan Creel, Kelly Dixon) Gas Cylinders (Ed Douberly, Tim Munga) ODH 0 and 1 (Dick Owen, Jennifer Williams) Pressurized Tanks, Containers, and Vacuum Vessels (Dave Meekins, Kelly Dixon, Timothy Whitlatch, Will Oren) Pressurized Vacuum Lines and Piping Systems (Dave Meekins, Kelly Dixon, Timothy Whitlatch, Will Oren)						
Document History						
<table border="1"> <tr> <td>Revision#</td> <td>Reason for revision or update#</td> <td>Serial number of superseded documents</td> </tr> </table>				Revision#	Reason for revision or update#	Serial number of superseded documents
Revision#	Reason for revision or update#	Serial number of superseded documents				
Comments for reviewers/approvers:						
Attachments						
Procedure: PRadTarget_OSP.pdf						

THA: PRadTarget_THA.pdf	
Additional Files: Operation_PRad_Target.pdf HazardAnalysis_PRadTarget.pdf Convert to PDF	
Review Signatures	
Person : Physics ES&H Liaison	Signed on 3/8/2016 2:04:26 PM by Bert Manziak (manziak@jlab.org)
Subject Matter Expert : Chemicals->Flammables	Signed on 3/8/2016 10:47:05 AM by Jennifer Williams (jennifer@jlab.org)
Subject Matter Expert : Cryogenic Material - Gas or Liquid	Signed on 3/7/2016 3:47:42 PM by Kelly Dixon (kdixon@jlab.org)
Subject Matter Expert : Gas Cylinders	Signed on 3/8/2016 8:01:03 AM by Tim Munga (munga@jlab.org)
Subject Matter Expert : Oxygen Deficiency Hazards (ODH)->ODH 0 and 1	Signed on 3/3/2016 1:15:19 PM by Dick Owen (dowen@jlab.org)
Subject Matter Expert : Pressure Systems->Pressurized Tanks-> Containers-> and Vacuum Vessels	Signed on 3/3/2016 3:30:48 PM by Will Oren (oren@jlab.org)
Subject Matter Expert : Pressure Systems->Pressurized Vacuum Lines and Piping Systems	Signed on 3/3/2016 3:30:39 PM by Will Oren (oren@jlab.org)
Approval Signatures	
Division Safety Officer : TARGET	Signed on 3/8/2016 2:37:38 PM by Ed Folts (folts@jlab.org)
Org Manager : TARGET	Signed on 3/9/2016 8:43:47 AM by Christopher Keith (ckeith@jlab.org)
Safety Warden : Experimental Hall B	Signed on 3/10/2016 9:56:37 AM by Doug Tilles (tilles@jlab.org)
Safety Warden : Hall B Gas Shed Floor 1	Signed on 3/10/2016 9:10:13 AM by George Jacobs (jacobsg@jlab.org)

Person: Pasyuk, Eugene (pasyuk@jlab.org)		Status: PROCESSED	
Org: PHALLB		Saved: 3/21/2016 3:29:52 PM	
		Submitted: 3/21/2016 3:29:52 PM	
 Operational Safety Procedure Review and Approval Form # 57095 <small>(See ES&H Manual Chapter 3310 Appendix T1 Operational Safety Procedure (OSP) and Temporary OSP Procedure for Instructions)</small>			
Type:	OSP	Click for OSP/TOSP Procedure Form Click for LOSP Procedure Form	
Serial Number:	ENP-16-57095-OSP		
Issue Date:	3/23/2016		
Expiration Date:	2/23/2019		
Title:	Operation of Hybrid Calorimeter		
Location: <small>(where work is being performed)</small>	Experimental Hall B	Location Detail: <small>(specifies about where in the selected location(s) the work is being performed)</small>	Space Frame
Risk Classification: <small>(See ES&H Manual Chapter 3310 Appendix T3 Risk Code Assignment)</small>	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:	PHALLB		
Document Owner(s):	Pasyuk, Eugene (pasyuk@jlab.org) Primary		
Supplemental Technical Validations 			
Mode 1: Class 1, 2, and 3 Electrical Equipment (Paul Powers, Todd Kujawa)			
Document History 			
Revision  Reason for revision or update  Serial number of superseded documents 			
Comments for reviewers/approvers: 			
Attachments 			
Procedure: HYCAL_OSP.pdf THA: HYCAL_THA.pdf Additional Files: HYCAL transporter procedures.pdf HYCAL_manual.pdf Convert to PDF			
Review Signatures			
Person : Physics ES&H Liaison		Signed on 3/21/2016 3:36:05 PM by Bert Manzlak (manzlak@jlab.org)	
Subject Matter Expert : Electricity->Mode 1: Class 1-> 2-> and 3 Electrical Equipment		Signed on 3/22/2016 8:25:09 AM by Todd Kujawa (kujawa@jlab.org)	
Approval Signatures			
Division Safety Officer : PHALLB		Signed on 3/23/2016 9:05:13 AM by Ed Folts (folts@jlab.org)	
Org Manager : PHALLB		Signed on 3/22/2016 10:47:57 AM by Volker Burkert (burkert@jlab.org)	
Safety Warden : Experimental Hall B		Signed on 3/22/2016 8:35:43 AM by Doug Tilles (tilles@jlab.org)	

GEM TASK HAZARD ANALYSIS



Task Hazard Analysis (THA) Worksheet

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

Click
For Word

Author:	Eugene Pasyuk	Date:	03/23/2016	Task #: If applicable	
Complete all information. Use as many sheets as necessary					
Task Title:	Operation of PRad GEM detector	Task Location:	Hall B		
Division:	Physics	Department:	Hall B	Frequency of use:	Daily
Lead Worker:					
Mitigation already in place: Standard Protecting Measures Work Control Documents	Standard Hall B protective measures and appropriate personnel training including but not limited to SAF111 PRad COO, PRad ESAD				

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	GEM chambers will use 70/30 ArCO ₂ gas mixture. The gas is not toxic and not flammable. Gas cylinder will be located in Hall B gas shed. The volume of the chamber is small. ODH conditions are not possible.	L	EL	N	No mitigation is necessary		N

GEM TASK HAZARD ANALYSIS



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	Consequence Level	Probability Level	Risk Code (before mitigation)	Proposed Mitigation (Required for Risk Code >2)	Safety Procedures/ Practices/Controls/Training	Risk Code (after mitigation)
2	GEM uses HV up to 4 kV. The HV power supply can provide maximum current of 1 mA. Therefore it is classified as Class 1 electronic equipment hazard.	L	L	1	All the component of the GEM chamber that can carry HV are inside the sealed volume and they are not accessible by the personnel. The only accessible point the connection of the cable to the chamber. SHV connectors are used, They have very low risk of touching pin with the HV.	Any work on the chamber must be done with the HV power supply OFF and HV cable disconnected. Trained personal has negligible risk of the exposure to the HV.	N

Highest Risk Code before Mitigation:	1	Highest Risk Code after Mitigation:	N
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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](#).)

The highest Risk code is 1. A formal OSP is not required

VACUUM CHAMBER OSP



Task Hazard Analysis (THA) Worksheet

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

Click
For Word

Author:	Eugene Pasyuk	Date:	03/24/2016	Task #: If applicable	
Complete all information. Use as many sheets as necessary					
Task Title:	Operation of PRAD Vacuum chamber	Task Location:	Hall B		
Division:	Physics	Department:	Hall B	Frequency of use:	weekly
Lead Worker:	Denny Insley				
Mitigation already in place: Standard Protecting Measures Work Control Documents	Standard Hall B protective measures and appropriate personnel training including but not limited to SAF111 PRad COO, PRad ESAD				

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)
	PRad experiment a large ~5m long vacuum chamber extending from the target to the PRad detector system. There is a 1.7m diameter 63 mil Al window at one end of the vacuum chamber, just before the PRad detectors. When this chamber is under vacuum it has very large stored energy. The accidental rupture of the window causes a release of large stored energy. This present hazard to the personal and equipment	H	L	3	A window cover has been fabricated from 1/8" thick aluminum to protect the window from damage due to something falling into the window. This cover will be attached to the window at all times except when the experiment is running. The window will be installed or removed only when there is no vacuum in the tank. This will remove the stored energy in the tank so people can work near the window.	The PRad experiment is set up on level 1 of the Hall B Space Frame. This area will be roped off whenever the tank is under vacuum and safety glasses and hearing protection will be required to enter level 1. All operations near the window should be performed by authorized personnel only. The operations include but not limited to installation and removal of window cover, connection of the beam pipe to the window.	2

Highest Risk Code before Mitigation:	3	Highest Risk Code after Mitigation:	2
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COMMENTS AND RECOMMENDATIONS ON CHARGE #8
