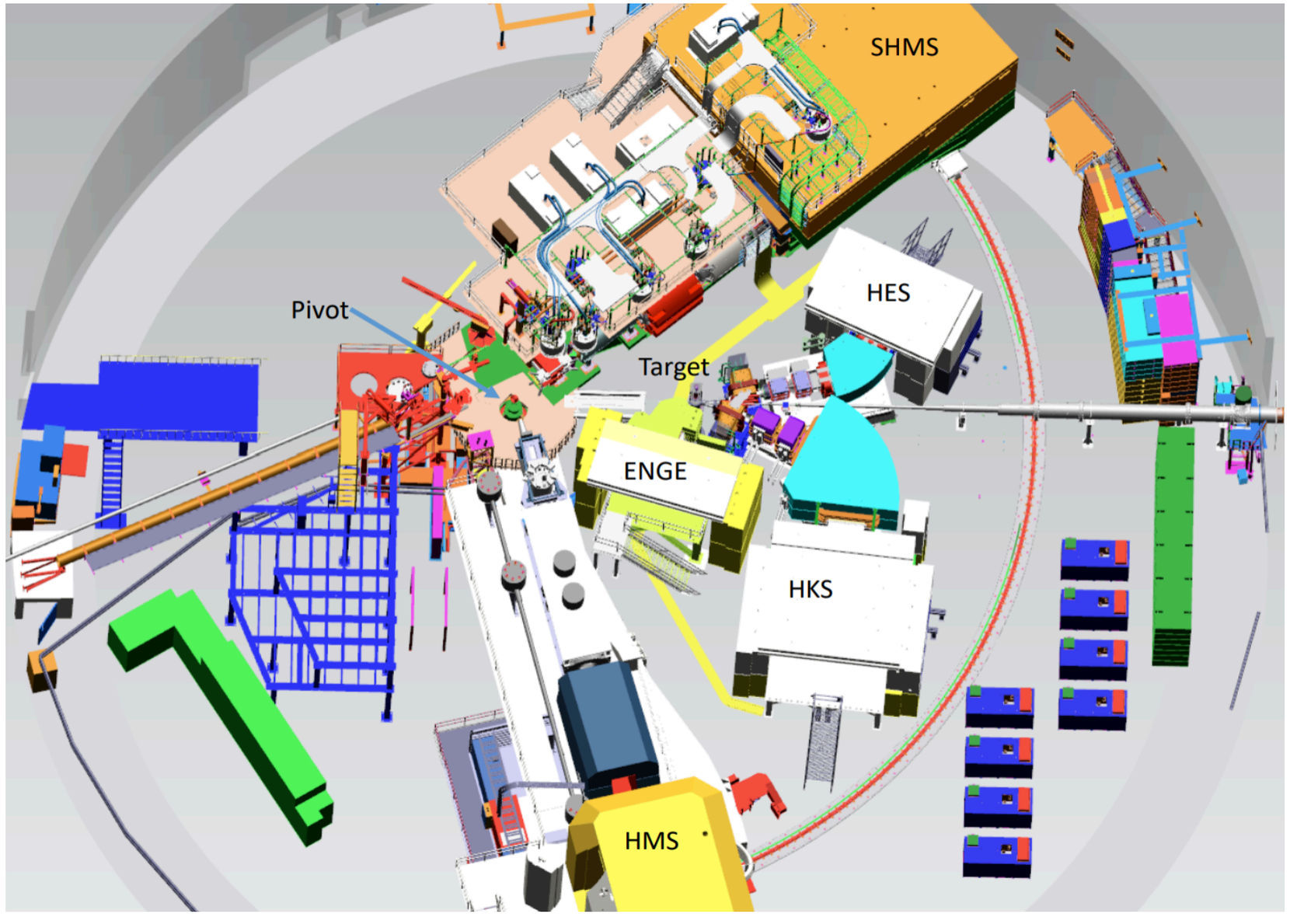
ePass Policy and List of Required Documents



JLab Hypernuclear Collaboration Meeting
May 16th, 2025
William Henry

Jefferson Lab

Trainings

View your training status

Please see the list below of frequently required courses and their term expiration. Please visit the web based training link to access trainings.		
Course	**Skill Code**	Term Expiration
Annual Security Awareness	GEN034	Annually (January)
ES&H Orientation	SAF100	3 years (36 months) from date taken
Cyber Security Awareness	CST001	Annually
Working Safely at Jefferson Lab During Elevated MedCon Levels	SAF003	Currently Required
Physics Division Work Governance	SAF116kd	Annually (January)
Oxygen Deficiency Hazard	SAF103	2 years (24 months) from date taken
RadWorker 1 Classroom	SAF801C	Current unless expires for 2+ years
RadWorker 1 Test Schedule with Radcon or walk-in at ULO in CC (see onsite schedule)	SAF801T	2 years (24 months) from date taken
RadWorker 1 Practical (Schedule with Radcon)	SAF801P	Current unless expires for 2+ years
Hall A Safety Hall B Safety Hall C Safety Hall D Safety	SAF110 SAF111 SAF112 SAF113	B. Michaels E. Pasyuk and D. Insley J. Beaufait M. Dalton
General Access RWP	SAF801kd	Annually (December)

Trainings required to get you to Hall C

GEN034: Annual Security Awareness
SAF100: ESH Orientation
CST001: Cyber Security Awareness
SAF116kd Physics Division Work Governance
SAF103 Oxygen Dificiency Hazard
SAF800: GERT
SAF801C: Rad Worker 1
SAF801T: Rad Worker Test
SAF801P: Rad Worker Practical
SAF112: Hall C Safety
SAF801kd: General Access RWP

https://www.jlab.org/physics/user-liaison

Electrical Trainings

Table 1. How to determine the training requirements for electrical safety and lock out / tagout

If the answer to questions below is yes, you are required to successfully complete the course(s) to the right of the question.			
		Title	**Code**
1.	Does the work involve non-electrical hazardous stored energy (e.g., compressed gasses, hydraulic or pneumatic, thermal, chemical, or mechanical)?	Lockout/Tagout (LOTO)	ESC007
		Safety Practical Application	ESC008
2.	Does the person in this position operate electrical equipment other than using a light switch, for example, turning appliances or common office equipment on or off?	Basic Electrical Safety	ESC001
3.	Is the person a TJNAF employee, subcontractor, or user who performs all modes of work on Class 1 electrical or electronics equipment?	Basic Electrical Safety	ESC001
		LOTO	ESC007*
		Safety Practical Application	ESC008*
4.	Is the person in this position responsible for energizing and de-energizing electrical equipment at the source of electrical power (such as operation of circuit breaker, knife switch, etc.)?	Basic Electrical Safety	ESC001
		Arc Flash & PPE	ESC002
		Safe Switching of Electrical Equipment	ESC005
		Electrical Contact Release	ESC006
		LOTO	ESC007
		Electrical Safety Practical Application	ESC008
5.	Is the person a TJNAF employee, subcontractor, or user who performs work on Class 2 or higher electrical or electronics equipment?	Basic Electrical Safety	ESC001
		Arc Flash & PPE	ESC002
		Electrical Work Site Safety	ESC003**
		Work Planning & Documentation	ESC004**
		Safe Switching of Electrical Equipment	ESC005
		Electrical Contact Release	ESC006
		LOTO	ESC007
		Electrical Safety Practical Application	ESC008
		Capacitor Safety	SAF603B.KD

* If you are required perform hazardous energy control or administrative/configuration control, the LOTO Competency (ESC007 & ESC008) is required to be current.

** ESC003 & ESC004 are still included in the QEW competency and are being removed from LMS due to the implementation of ePAS. Credit will be given upon request to maintain competency.

Non-NRTL Equipment

NRTL: Nationally Recognized Testing Laboratory

If your equipment does not have one of the above, it must be inspected and registered with electrical safety.

Non-NRTL Equipment

NRTL: Nationally Recognized Testing Laboratory

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Non-NRTL Inspection Guidelines

Objective

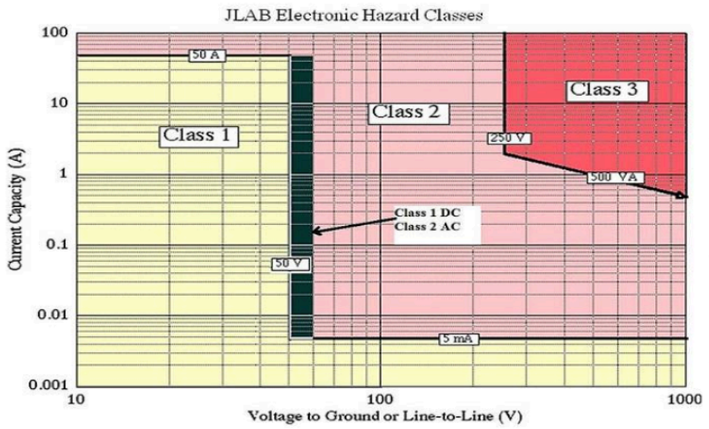
To ensure that all new and legacy electrical and electronic Non-NRTL equipment is compliant with DOE standards.

Inspection Process

Engineers/Technicians are to submit the following applicable information for electrical and electronic equipment inspections through the Non-NRTL database
https://misportal.jlab.org/equipment/registrations

- Schematics
- Build of Materials (BOM)
- Location
- Operational Safety Procedures (OSP)
- Any other requested documentation

Class 1 Electrical Equipment - requires a field inspection after installation.



Class 2 & 3 Electrical Equipment – Stationary and Portable/mobile equipment requires a bench inspection before installation and a field inspection is required after installation for stationary equipment.

After the equipment is approved, the electrical inspector will place a QR code label on the component, a green QR code for class 1 electrical/electronic

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equipment and a blue QR code for class 2 & 3 electrical/electronic equipment.
The QR code information is based on information in the Non-NRTL database.

A Green QR Code will be given to class 1 Non-NRTL Equipment

A Blue QR Code will be given to class 2 & 3 Non-NRTL Equipment

Note

New equipment- classified as any electrical or electronic equipment that is newly designed, fabricated or modified except for the replacement of like-for-like parts in or after 2021.

Legacy equipment -classified as any electrical or electronic equipment designed, fabricated or modified in or prior to 2020.

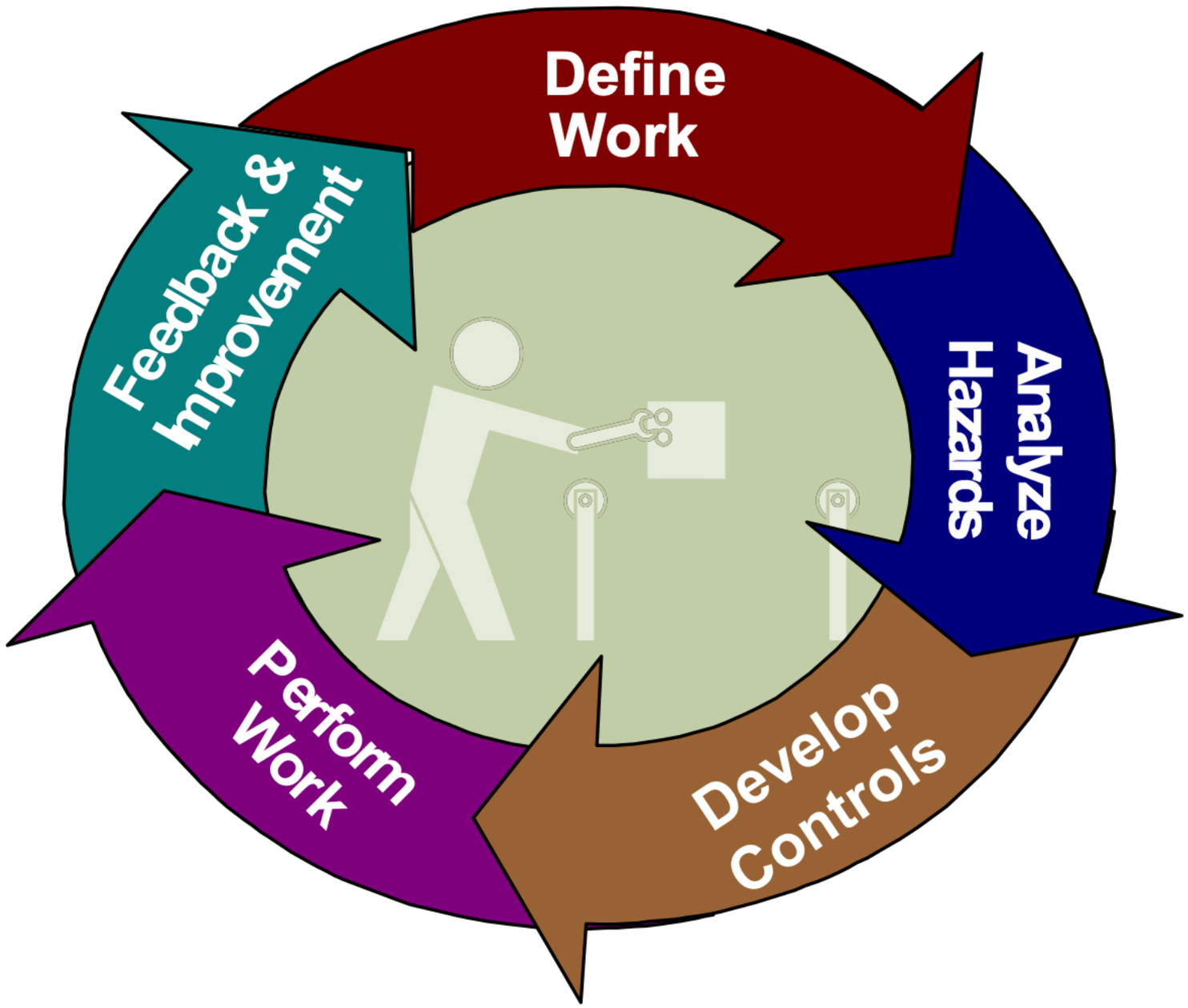
Multiple units- multiple unit of equipment that are precisely the same, may have 1 set of documents upload for all pieces. All units must be entered separately specifying the unit's individual location.

Courtesy Inspections: Device Owners may request a courtesy inspection to verify the equipment is within the regulation standard.

References:

https://www.jlab.org/ehs/ehsmanual/6220.htm

Integrated Safety Management Awareness Training



EPAS

1. **Why ePAS?**
    a. **Short Answer**

ePAS provides a single portal for uniform hazard identification and control across the lab
ePAS provides for work review, release, and authorization by line-management
ePAS facilitates the pre-job briefing process

    b. **Long Answer**

In 2019, Jefferson Lab experienced three notable hazardous energy events that resulted in an overhaul of the way the lab recognizes and addresses protective measures. The events pointed to an informal and sometimes inaccurate approach to identifying hazards and controls. This caused an erosion of safety margins and an increase in incidents at the lab. After a thorough investigation by the lab, by an independent review committee empaneled by JSA, and by the Department of Energy's Office of Enforcement, the lab was required that the lab put in place a plan to ensure such notable events do not recur. After a measured evaluation, the lab decided to purchase the program ePAS (Electronic Permit Administration System), that improves, simplifies and centralizes lab processes. We are rolling it out…

External review/oversight groups have been following the Lab's progress on ePAS implementation:

"Roll out of ePAS is critical to establishing a common risk/safety framework and needs to become a common management expectation through the supervisor level". (3/23 JSA Operations and Safety Committee), "Accelerating ePAS adoption is critical to advancing integrated risk assessment and mitigation" (Ops and Safety Committee FY 22 Assurance Review), and Ops& Safety Committee FY23 Assurance Agenda: "Continued progress on ePAS system for hazard assessment and work planning deployment".

EPAS

Permit to Work

RE-PRINT

Jefferson Lab

JLab-PTW-7111
PERMIT TO WORK

PERMIT DETAILS

Permit Request No:	JLab-PR-7111	**Permit Prepared By:**	William Henry
Work Group:	HALLC	**Issue Date:**	04/30/2025 14:13
Area:	Bldg 23 - Experimental Staging	**Expected Expiry Date:**	09/ 1/2027 16:00
Task Number:		**Organisation:**	PHALLC
Project Title:		**Outage:**	
Account Code:			
Has Simple LOTOs:	No		
Notes:			
Special Requirements:			

PLANT & WORK

Title: Hypernuclear Drift Chamber Commissioning

Primary Plant Item: 23 - EXPERIMENTAL STAGING

Work Scope

Job Description: Hypernuclear Drift Chamber Commissioning.

Repair, preparation, and testing of drift chambers for the hypernuclear collaboration. Tasks include, repairing broken wires, HV test, powering detector, cosmic testing, and connecting to a Data Acquistion (DAQ). Operation includes a supply of Argon/CO2 from a pressurized gas cylinder.

Tools & Equipment:

Equipment Number	Description
23	23 - EXPERIMENTAL STAGING

CONTROL CERTIFICATES

Certificate#	Description	State	Issue Date

ATTACHED DOCUMENTS

Name	Doc Type	Attached Date

APPROVALS

I confirm that the control measures specified on this permit and the Task Hazard Analysis (and the references attached) are sufficient and that I have reviewed the work as specified on this permit and authorize it to proceed .

PTW Issuer **Sign:** David Gaskell **Date:** 04/29/2025 12:32

This Permit applies only for the occasion specified. No person may leave the site with this JLab-PTW-7111 in his or her possession.

Friday, May 16, 2025 13:26 Printed By: William Henry (7431) Page 1 of 3

Task Hazard Analysis

RE-PRINT

Jefferson Lab

Task Hazard Analysis Checklist

PERMIT No: JLab-PTW-7111

Summary

Site:	Jefferson Labs	**Responsibility Group:**	Physics	**Issue Date/Time:**	
Area:	Bldg 23 - Experimental Staging				
Title:	Hypernuclear Drift Chamber Commissioning				

Work Scope

Job Description: Hypernuclear Drift Chamber Commissioning.

Define Work

Repair, preparation, and testing of drift chambers for the hypernuclear collaboration. Tasks include, repairing broken wires, HV test, powering detector, cosmic testing, and connecting to a Data Acquistion (DAQ). Operation includes a supply of Argon/CO2 from a pressurized gas cylinder.

Tools & Equipment:

Functional Location	Description
23	23 - EXPERIMENTAL STAGING

Task Details

Item No	Task Description	Work Categories	Hazards Identified	Control Measures
1	**Repair and maintenance of drift wire chambers**			
1.1		• Moveable Apparatus - Hall Equipment	Moveable - Pinch Points	
1.2		• Moveable Apparatus - Hall Equipment	Moveable Apparatus - Electrical	**Administrative** • A qualified electrical worker is required for resetting panel breakers
1.3		• Moveable Apparatus - Hall Equipment	Moveable Apparatus - Impact to Personnel	**Administrative** • Prior to movement of moveable apparatus, warn people working in immediate area and utilize spotters, if required • Flashing lights will be visible, and horns will sound when spectrometer is moving
1.4		• Machine Tool - Other	Over exertion due to manual material handling	**Engineering** • Utilize material lifts / mechanical assist devices to move materials
1.5		• Machine Tool - Other	Slips, trips, falls - Machine Tools	**Administrative** • Ensure that the area is cleaned after completing work • Ensure that the work area is orderly and that there are no tools or parts that could be dislodged and fall or roll

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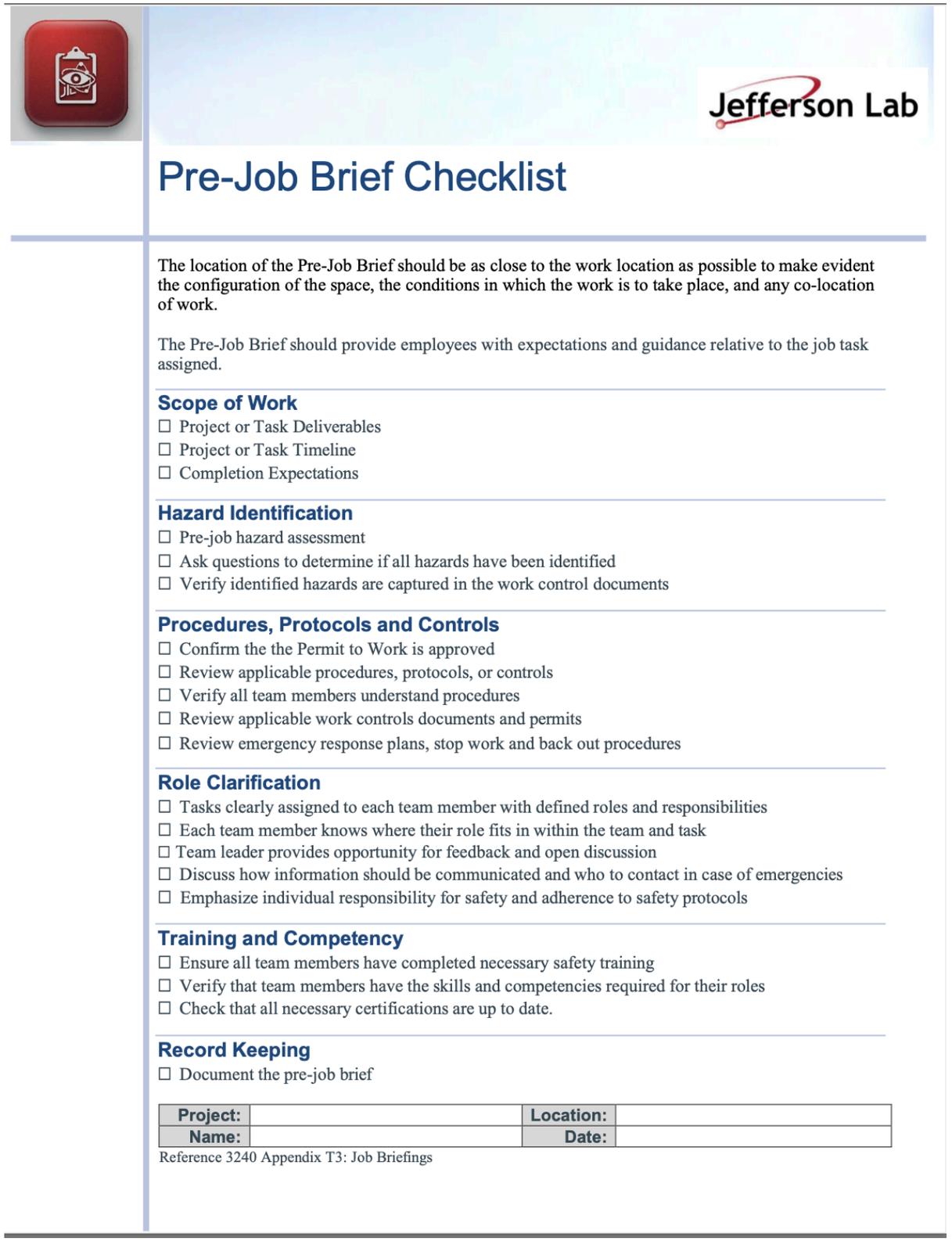
Analyze Hazards

Develop Controls

EPAS

Before starting work, a prejob brief must be completed. And Documented



Jefferson Lab

Pre-Job Brief Checklist

The location of the Pre-Job Brief should be as close to the work location as possible to make evident the configuration of the space, the conditions in which the work is to take place, and any co-location of work.

The Pre-Job Brief should provide employees with expectations and guidance relative to the job task assigned.

Scope of Work
- ☐ Project or Task Deliverables
- ☐ Project or Task Timeline
- ☐ Completion Expectations

Hazard Identification
- ☐ Pre-job hazard assessment
- ☐ Ask questions to determine if all hazards have been identified
- ☐ Verify identified hazards are captured in the work control documents

Procedures, Protocols and Controls
- ☐ Confirm the the Permit to Work is approved
- ☐ Review applicable procedures, protocols, or controls
- ☐ Verify all team members understand procedures
- ☐ Review applicable work controls documents and permits
- ☐ Review emergency response plans, stop work and back out procedures

Role Clarification
- ☐ Tasks clearly assigned to each team member with defined roles and responsibilities
- ☐ Each team member knows where their role fits in within the team and task
- ☐ Team leader provides opportunity for feedback and open discussion
- ☐ Discuss how information should be communicated and who to contact in case of emergencies
- ☐ Emphasize individual responsibility for safety and adherence to safety protocols

Training and Competency
- ☐ Ensure all team members have completed necessary safety training
- ☐ Verify that team members have the skills and competencies required for their roles
- ☐ Check that all necessary certifications are up to date.

Record Keeping
- ☐ Document the pre-job brief

Project:		Location:	
Name:		Date:	

Reference 3240 Appendix T3: Job Briefings

Jefferson Lab

EPAS: To-do

		Commissioning	Installation	Running	Repairs Maintenence
HKS			Hall Techs and Engineers	Procedure!!	
	Magnets				
	TOF				
	Drift Chambers	Complete			
	Water Cerenkov				
	Aerogel Cerenkov				
HKS					
	Magnets				
	TOF				
	Drift Chambers	Complete			
ENGE					
	Magnets				
	TOF				
	Drift Chambers	Complete			
	SciFi				
	Alpha Source				

EPAS will be required for commissioning, installation, running and repairs for all subsystems

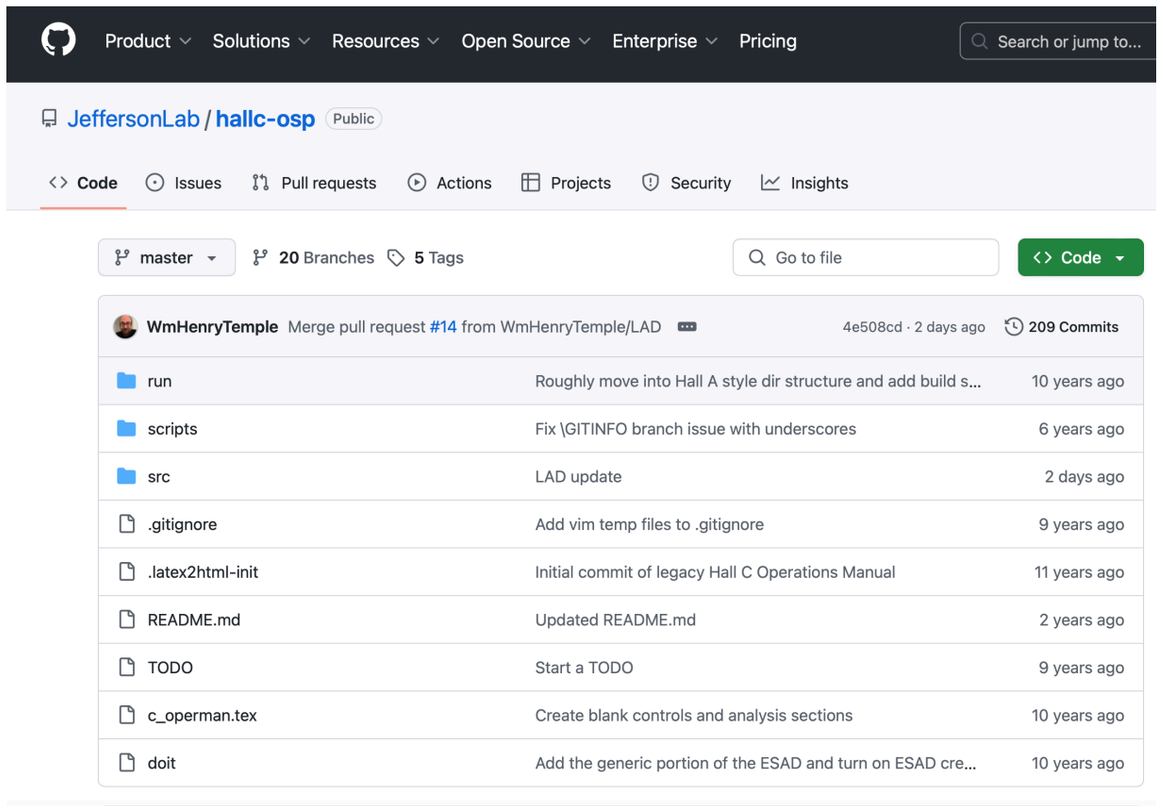
Safety Docs

Available on Hall C Webpage and Github

Run Information - Jan 2025 - Aug 2025

- LAD Shift Sign-up (Read-only Shift Schedule)
- R-SIDIS Shift Sign-up (Read-only Shift Schedule)
- Hall C Electronic Logbook
- Run Safety Documents
  - Conduct of Operations
  - Experiment Safety Assessment Document
  - Radiation Safety Assessment Document
  - SAF112 Training/Emergency Response Guidelines
- Shift Worker Information and Howtos
- Accelerator Status
- Hall C Live Status

https://www.jlab.org/physics/hall-c



https://github.com/JeffersonLab/hallc-osp

COO: Conduct of Operations

Conduct of Operations for Hall C
E12-11-107, E12-06-104, E12-24-001
January 15, 2025

Contents

https://github.com/JeffersonLab/hallc-osp

COO: Conduct of Operations

Special Procedures examples:

Powering down magnets for hall access

Working near Enge and vacuum windows

New hazards in hall (SAF112)

Staffing when beam not available

ESAD

Experiment Safety Assessment Document (ESAD)
for
Experimental Hall C Base Equipment

Contents

ESAD

Experiment Safety Assessment Document (ESAD)
for
Experimental Hall C Base Equipment

- **ESAD needs to identify all hazards and controls for each subsytem**
- **Should be straightforward to copy/paste hazards and controls from commissioning EPAS's**

RSAD: Radiological Safety Analysis Document

Contents

What is required from collaboration?

1) **Brief description of experiments**
2) **Beam time on each target with radiation length, beam energy, current, time, etc (next slide)**

1 DESCRIPTION

This RSAD covers the series of experiments scheduled for the spring-summer of 2025 in Hall C.

Three experiments will run during this period.

- **E12-11-107:** In Medium Nucleon Structure Functions, SRC, and the EMC effect
- **E12-06-104:** Measurement of the Ratio R=sigma_L/sigma_T in Semi-Inclusive Deep Inelastic Scattering
- **E12-24-001:** Measurement of the Nuclear Dependence of R=sigma_L/sigma_T in Semi-Inclusive Deep Inelastic Scattering

E12-11-107 will measure semi-inclusive deep inelastic scattering off the deuteron by "tagging" the DIS scattering with high momentum recoiling protons or neutrons emitted at large angle relative to the momentum transfer.

E12-06-104 will perform measurements of the ratio of longitudinal to transverse cross sections in pion electroproduction. The emphasis will be on measurements in the so-called semi-inclusive deep inelastic scattering region, with extensions into the exclusive region.

E12-24-001 will make limited exploratory measurements of a possible nuclear dependence of R in SIDIS to support hadron attenuation measurements. If a nuclear dependence is observed, this could be a sign of novel physics and would suggest further studies are merited. PAC52 approved 7 days to measure SIDIS from carbon and copper targets using the HMS and SHMS in Hall C. These data, in combination with the proton and deuteron data from the above E12-06-104 will allow precise determination of the nuclear dependence of R in SIDIS.

Proposals and additional information can be found at the web pages for E12-11-107, E12-06-104, and E12-24-001 experiments, and the Hall C Wiki.

2 SUMMARY and CONCLUSIONS

The boundary dose accumulation due to this run in Hall C is estimated to be approximately **4 mrem**, i.e., about **40%** of the annual design goal. Dose rates averaged over the run time are expected to be below the alert threshold of 200%, with the expectations that the dose rates both inside the Hall and at the boundary will be typical for the experiments in Hall C. Radiation levels will be continually recorded and periodically checked by the Radiation Control Department (RCD) to ensure that the site boundary goal is not exceeded. Radiation hazards associated with

RSAD: Radiological Safety Analysis Document

	Experiment numbers	Hall: C		name of liaison: William Henry					
	E12-11-107 LAD (40 Days)								
	E12-06-104 R-SIDIS (40 Days)								
	E12-24-001 nucR-SIDIS (7 Days) E12-11-107 LAD (40 Days)					LAD Total	40.00		
Parameter	**Unit**	**3 pass commisioning**			**5 pass production**			**3 pass production**	
setup number		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
run hours (100% efficiency)	days*	1.00	1.00	0.50	35.00	1.50	1.00	1.37	13.67
beam energy	GeV	6.40	6.40	6.40	11.00	11.00	11.00	6.40	6.40
beam current	uA (CW)	20.00	60.00	10.00	5.00	40.00	60.00	60.00	60.00
polarization	%	N/A	N/A	N/A	N/A	N/A	N/A		
exp/target ID number		3a	6	8	3	5	6	1	2
purpose		calibration	calibration	calibration	physics	dummy	calibration	physics	physics
target material (1)		LH2	C	Cu	LD2	Al	C	LD2	LH2
target thickness	mg/cm2	1420.00	2200.00	774.00	3240.00	340.00	2200.00	1620.00	710.00
target material (2)									
target thickness	mg/cm2								
target material (3)									
target thickness	mg/cm2								
cryo target window material		Al			Al			Al	Al
cryo target window thickness	mg/cm2	137.00			137.00			137.00	137.00

Critical Beamline aperature: 3.9 cm @ 5.57 m

RSIDIS NOTES:

3.125 days for checkout, kinematic and pass changes

C, and Cu running taken from Table 2 of https://misportal.jlab.org/pacProposals/proposals/1

LH2 running taken from https://hallcweb.jlab.org/elogs/R-SIDIS+Experiment/4

LD2 and dummy runs were determined from ratio to LH2 runs found in proposal https://wwv

Total days was orig. 24 production + ~ 4 days setup/Moller = 28 days. Scaled up LH2, LD2, and Al days to get 40 PAC days

Target ID	Target	mg/cm2
1	10 cm LD2	1620
2	10 cm LH2	710
3	20 cm LD2	3240
3a	20 cm LH2	1420
4	10 cm dummy	340
5	20 cm dummy	340
6	optics 5 foil	2200
7	3% C	1300
8	6% Cu	774
9	1.5% Al	363
10	Carbon Hole	-

Summary

- Understand required trainings for all tasks
- All work must be defined under an EPAS. Identify hazards. Develop controls
- COO: Minimal changes required. Need to identify special procedures.
- ESAD: Straightfoward assuming all hazards have been properly identified under EPAS
- RSAD: Requires a short description of experiments and spreadsheet with detailed beam time on each
- Hall walkthough: Not discussed here but will need to be updated