

Thoughts on Preparations of Documentation for Final Readiness

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NPS Collaboration Meeting

2-3 February 2023

NPS ERR Status

- ❑ Initial ERR passed in July 2019
- ❑ Documents and links available here: https://www.jlab.org/physics/experiment_process/previous-err

2019-5-15	C	NPS, E12-13-010, E12-13-007, E12-14-003, E12-14-005	90%	Review Data	WIKI Location
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JLAB DOCS - VIEW COLLECTION

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NPS E12-13-010, E12-13-007

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Recommendations from the NPS ERR 2019

❑ Running conditions for the experiments

- ...it is recommended to draft a run plan for individual run groups [...]. Priorities between the settings of individual experiments must be defined.

❑ Status of the NPS

- The test of the magnet in the hall to full current must be scheduled.
- operating parameters of the magnet must be provided e.g. LCW pressure for the magnet
- radiation hardness test of dividers and LED

❑ What are the controls in place to assess the operational performance of the Neutral Particle Spectrometer

- Clarify what the threshold energy for individual modules should be for required energy resolution and what the rates of each channel is expected with that thresholds.
- Develop a commissioning plan for the calorimeter.

❑ Has the entire beam line, spectrometers, detector configuration been defined, including ownership, maintenance and control during beam operations?

- Ownership and the controls of the sweeper magnet and the corrector coil are not clearly defined. Procedures, and who and how will control the magnet for safe operations must be provided.

Recommendations from the NPS ERR 2019

- ❑ Are the responsibilities for carrying out each job identified, and are the manpower and other resources necessary to complete them on time in place?
 - ...identify people who will work on [the integration of NPS into Hall-C offline analysis framework] tasks
- ❑ Are the beam commissioning procedures and machine protection systems sufficiently defined for this stage?
- ❑ Are the radiation levels expected to be generated in the hall acceptable? Is any local shielding required to minimize the effects of radiation in the hall equipment?
 - Activation levels should be modeled to evaluate residual dose rate fields.
 - Specific simulations to evaluate the radiation dose to the calorimeter electronics should be conducted.
- ❑ What is the simulation and data analysis software status? Has readiness for expedient analysis of the data been demonstrated? What is the projected timeline for the first publication? Please provide a documented track record from previous experiments.
 - Define/present a plan for developing software for simulation of the NPS trigger and complete its validation during the NPS calorimeter commissioning

Recommendations from the NPS ERR 2019

- ❑ What is the status of the specific documentation and procedures (COO, ESAD, RSAD, ERG, OSP's, operation manuals, etc.) to run the experiments?
 - NPS part is missing from ESAD (just started to implement).
 - No RSAD ready yet, but preliminary boundary dose calculations are complete.
 - A list of new OSPs has been presented, most are in motion but not complete yet.

Final ERR Requirements

- ☐ The experiment is ready to be safely and effectively executed.
- ☐ The experiment is ready for expedient data analysis towards publication.
- ☐ The experiment is ready for the issuance of the Experiment Readiness Clearance.

Final ERR REQUIRED Documentation

- ☐ ESAD, RSAD, COO, ERG, Operational Manual
- ☐ Safety Check lists
- ☐ Experimental procedures both for shift leaders and shift takers and for experts
- ☐ Proof of readiness for expedient data analysis towards publication.

ESAD, RSAD, COO, ERG, Operational Manual

❑ Drafts are available – need to be finalized.

- NPS part is missing from ESAD (just started to implement).
- No RSAD ready yet, but preliminary boundary dose calculations are complete.
- A list of new OSPs has been presented, most are in motion but not complete yet.

Documentation Drafts [\[edit\]](#)

- [Conduct of Operations \(COO\)](#) [📄](#)
- Current version: [Experiment Safety Assessment Document \(ESAD\)](#) [📄](#). Pre-draft of NPS version: [NPS ESAD](#) [📄](#)
- [Standard Equipment Manual](#) [📄](#)
- [Emergency Response Guidelines](#) [📄](#)
- NPS How-To and references [Base Equipment Howtos](#) [🔗](#)

Checklists [\[edit\]](#)

Miscellaneous [\[edit\]](#)

- Installation Plans
- Beamline and equipment responsibility

Safety Checklists

- ❑ Use a combination of Hall C standard equipment checklists and those for Hall C DVCS as starting point

Example: KaonLT

KAON-LT Pre-beam Checklist

August 17, 2018

Several days before beam:

1. Make sure WC gases are turned on, that there is a sufficient supply of WC gas bottles, and that there is plenty of alcohol in the bubbler. Contact Joe Beaufait if we need to order more gas.
2. Verify installation of small angle downstream beam pipe, and that it is at vacuum.
3. Check the water level on the beam dump diffuser.
4. Verify certification of HMS rotation to 10.50° . Limit switches set?
5. Verify certification of SHMS rotation to 5.50° . Limit switches set?
6. Procedures on who to call and when need to access hall when going to smallest angle for both spectrometers need to be clarified. Steve Lassiter?
7. Procedures on who to call for beam dump steering studies when SHMS is put at small angle need to be clarified with Program Deputy and Jay Benesch.
8. Verify that SHMS Dipole Polarity switch works.
9. Confirm that Simona has repaired misc. hodoscope channels.
10. Set HMS Gas Cerenkov pressure to less than 0.5 atm (if window has been replaced). Otherwise, it should be filled with 1.0 CO₂.
11. Set SHMS Heavy Gas Cerenkov pressure to 1.0 atm.
12. Confirm aerogel index of refraction in SHMS Aerogel Cerenkov - $n=1.011$.
13. Complete all arrangements for exchange of SHMS Aerogel trays during experiments, i.e. extra trays stored safely in hall, all required tools available and in safe place, etc.
14. Check that the air conditioning in the HMS and SHMS detector huts are working and that

Experimental procedures both for shift leaders and shift takers and for experts

- ❑ Combine Hall C standard information with Hall A DVCS and add as needed

Information for Shift Takers

Counting house: 6000(*), 5503, 6666 | Run coordinator: 757-270-8916 | MCC: 7047(*), 7046, 7048 | Crew chief: 7045 | Guard house: 8522 | Regina Virtual Counting House: 6613

Before the start of your shift: read and understand the Safety Documentation (either hard copy, or from the [Hall C Main Page](#) for this experiment.

- You must then sign in the Yellow Binder in the Hall C Counting House!

Detailed instructions for Shift Takers are available on the [How-to](#) page.
If you encounter problems, look first at those instructions for assistance.

Current Run Plans

- Experts on call
- Beam Time Accounting quick link
- Shift Checklist quick link
 - Shift Checklist Help

Contents [hide]

- 1 Current Run Plans
- 2 Your Responsibilities
 - 2.1 Shift Leader
 - 2.2 Target Operator
 - 2.3 Expert Person
 - 2.4 Instructions and How-to's for common problems

Your Responsibilities

The tasks listed below are not set in stone, you should use your own judgment

Pion-LT (E12-19-006)

Pion Electroproduction Cross Section at 11 GeV and Measurement of the Charged Pion Form Factor to High Q²

[COVID guidance for weekend shift-workers](#)

[RC Meeting Zoom Link](#) - Meeting ID: 160 710 0885

[RC Daily Meetings and Runplans \(Summer 2022\)](#)

Run period 3 (high epsilon): 06-June-2022 - 09-Sept-2022

- Shift Signup
- Shift Signup (Read only)
- Hall-C Logbook
 - KaonLT Logbook - Used for PionLT updates too
- Run Plans
- Pion-LT Redmine Wiki
- Pion-LT specific shift instructions
- Pion-LT analysis instructions
 - Pion-LT analysis instructions/adjusting cuts
- PionLT_2022_Physics_Status

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DVCS how to

Back to [DVCS](#)

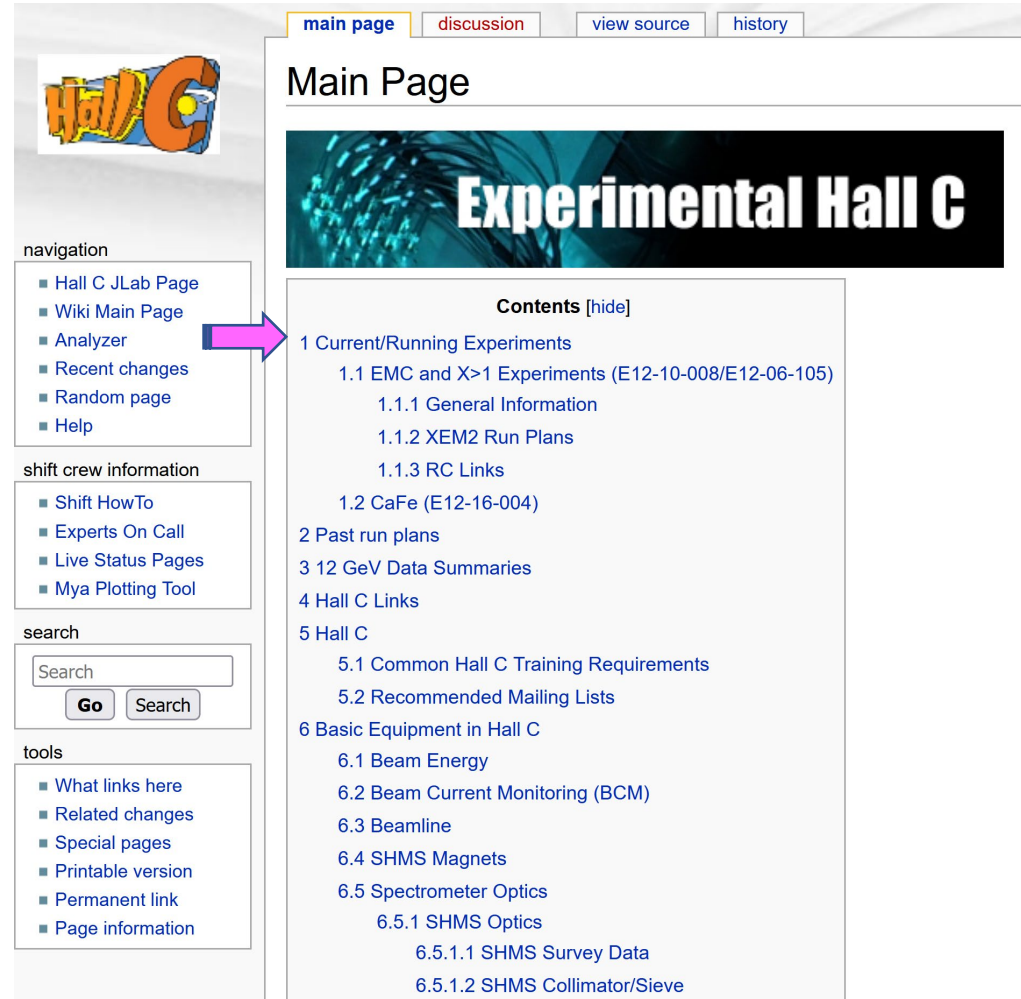
(This page is obviously in progress -- please contribute to it)

Contents [hide]

- 1 ioc_portserver_reboot_locations
- 2 Troubleshooting
- 3 Shift-worker responsibilities
- 4 Beam Recovery Procedure
- 5 Data Acquisition
 - 5.1 Basic Data Acquisition with CODA
 - 5.2 Triggers, Scalers, and Dead Time
 - 5.2.1 Setting prescale factor
 - 5.2.2 Starting xscaler (HRS) and checking trigger rates
 - 5.2.3 How to download and check the trigger
 - 5.2.4 How to check the dead time
 - 5.2.5 Definitions of DVCS triggers
 - 5.3 Cold Start Checklist (when beam has been off for several hours)
 - 5.4 Starting CODA From Scratch
 - 5.4.1 Reboot crates
 - 5.4.2 Start CODA
 - 5.5 How to Take a Pedestal Run
 - 5.6 How to check disk space for writing
- 6 Data analysis
 - 6.1 OnlineGUI
 - 6.2 Batch offline analysis
 - 6.3 Starting the Port Server Windows
- 7 Spectrometer detectors

Experimental procedures both for shift leaders and shift takers and for experts

- ❑ Add NPS Run Group 1 to the Hall C Wiki
- ❑ Copy over the general information and add NPS specific info
- ❑ Link to any external NPS sites, e.g., the NPS Wiki



The screenshot displays the 'Main Page' of the 'Experimental Hall C' wiki. At the top, there are tabs for 'main page', 'discussion', 'view source', and 'history'. Below the tabs is a large banner image with the text 'Experimental Hall C'. To the left of the main content area is a sidebar with several sections: 'navigation' (containing links like 'Hall C JLab Page', 'Wiki Main Page', 'Analyzer', 'Recent changes', 'Random page', and 'Help'), 'shift crew information' (containing links like 'Shift HowTo', 'Experts On Call', 'Live Status Pages', and 'Mya Plotting Tool'), 'search' (with a search box and 'Go'/'Search' buttons), and 'tools' (containing links like 'What links here', 'Related changes', 'Special pages', 'Printable version', 'Permanent link', and 'Page information'). A pink arrow points from the 'Wiki Main Page' link in the navigation section to the 'Main Page' title. The main content area features a 'Contents [hide]' section with a list of topics and sub-topics, including '1 Current/Running Experiments' (with sub-items like '1.1 EMC and X>1 Experiments' and '1.1.1 General Information'), '2 Past run plans', '3 12 GeV Data Summaries', '4 Hall C Links', '5 Hall C' (with sub-items like '5.1 Common Hall C Training Requirements' and '5.2 Recommended Mailing Lists'), and '6 Basic Equipment in Hall C' (with sub-items like '6.1 Beam Energy' and '6.2 Beam Current Monitoring (BCM)').

Proof of Readiness for expedient data analysis towards publication

❑ From previous ERR

- What is the simulation and data analysis software status?
- Has the readiness for expedient analysis of data been demonstrated?
- What is the projected timeline for the first publication?
- Documented track record for previous experiments

❑ Remaining tasks from previous ERR

- Write the fADC decoding
- Implement DVCS libraries into hcana

Summary and Outlook:

- E12-13-010, E12-13-007, E12-14-003, E12-14-005
- use HMS–NPS (modest data footprint $\lesssim 100$ TB).
- Analysis and simulation software available, mature.
- Analysis techniques tested in the 6-GeV era.
Strong publication track record.
- Anticipated timeline for publishing the first physics results:
within two years after experiment completion.