



Experiment Readiness Review
on July 10 at JLAB

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JLAB



From proposal to run

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Program Advisory Committee (PAC)

([See Flow Chart](#))

Basic Steps:

- I. [Proposal Phase](#)
- II. [Approved Proposal: Preliminary Planning Phase](#)
- III. [Design Phase \(Users and Experimental Hall responsibility\)](#)
- IV. [Construction Phase \(Users and Experimental Hall responsibility\)](#)
- V. [Scheduling of Experiment by Jefferson Lab](#)
- VI. [Equipment Installation \(Users and Experimental Hall responsibility\)](#)
- VII. [Preparation for Running the Experiment](#)
- VIII. [Commission equipment \(following written procedures documented in COO\)](#)
- IX. [Run the experiment \(following written procedures documented in COO\)](#)
- X. [Decommission the equipment \(if appropriate\) and store or dispose of target and/or contaminated apparatus properly](#)
- XI. [For apparatus that will/may be used again \(e.g. the Base Equipment in the Halls\), review experience to date and, as appropriate:](#)



VII. Preparation for Running the Experiment

- A. Submit to the Jefferson Lab DSO documentation on personnel and procedures at least one month before the start of the experiment:
1. Submit final ESAD.
 2. Submit final [RSAD](#).
 3. Submit COO (Conduct of Operations Document). In the COO describe Experiment Responsibilities, Collaboration Organization, Operations Personnel, Training Required, etc.
 4. Submit Safety Check lists.
 5. Submit ERG (Emergency Response Guidelines).
 6. Submit experimental procedures, both for shift leaders and shift takers (in the form of how-to's or on wiki pages) and for experts (in the form of an operations manual and/or OSPs).

(Note: The bulk of the experiment procedures will be in the form of an operations manual for the major experimental equipment that will be referenced by the COO.)

- B. Pre-operation checkout of equipment installation and procedures by experiment collaboration can be done with work control documents. This serves to verify operability after installation and to review integration to the extent possible without the use of beam.
- C. Jefferson Lab review of the safety of the installed equipment prior to its use with beam.
(This review will be carried out by Division Safety Officer in collaboration with subject matter experts, further EH&S Personnel, and the assigned Liaison Physicist, verifying conformance to the ESAD and checking functionality of safety aspects of the apparatus and items and issues specifically identified on the Experiment Installation Checklist by the RC review.)
- D. Experiment Readiness Clearance (ERC) issued by AD for Physics.
(Note: This will include a verification that all reviews are in place, as denoted in the Experiment Readiness Checklist. It also verifies that the experiment installation check has been completed, as documented on the Experiment Installation Checklist, and that all issues and concerns have been satisfactorily resolved, as detailed in the Issue/Concern Checklist.)



Heavy Photon Search (HPS) Experiment Readiness Review

July 10, 2014 – CEBAF Center A110

This review includes:

- Readiness for Beam Delivery to Hall B
- Experiment Readiness for HPS experiment

HPS Experiment Readiness Review Committee:

Roger Carlini (chair, machine protection)

Vashek Vylet (radiation control)

Bert Manzlak (EH&S)

Dave Kausch (fire protection)

Mike Spata (accelerator operations)

Ronald Lipton (FNAL) (SVT detector)

Dave Mack (12 GeV, calorimetry)

Hyekyoung Park (engineering)

Jennifer Williams (environmental)



Charge to the committee

1. Are the HPS specific equipment, documentation and procedures to run the experiment in place and adequate? This includes demonstrated readiness for full rate capability and expedient analysis of the data.
2. 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.)?
3. Has the entire beamline, target, detector configuration been defined (including ownership, maintenance and control during beam operations)? Is all the necessary equipment installed and operable? If not, what are the completion/commissioning schedule and procedures?
4. Are the anticipated beam emittance, halo characteristics and general stability likely to be within the required specification to perform this measurement?
5. Has transmission of the primary beam and generated secondaries been evaluated for unexpected beam restrictions (e.g. too small of a beam pipe acting as a secondary target), background sources (e.g. large number of produced photons hitting the beam line) or paths (e.g. primary and/or secondary steering from a magnet fringe field)?
6. 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?
7. Are the local shielding and the machine protection system required to minimize the effects of radiation in the HPS detector in place?
8. Have all the jobs that need to be done to mount the experiment/s been identified and defined adequately?
9. Have conflicts with the 12 GeV Upgrade in Hall B been examined and resolved?
10. Are the responsibilities for carrying out each job identified, and are the manpower and other resources necessary to complete them on time in place?



Agenda

8:00 – 8:30	Executive Session	
8:30 – 9:30	Overview of HPS equipment and readiness, documentation, procedures, equipment completion and commissioning schedule (charge elements #1 and part of #3, #8 and #10)	John Jaros
09:30 – 10:00	Machine status and expected beam properties (charge element #4)	Arne Freyberger / Mike Tiefenback
10:00 – 10:30	Coffee break	
10:30 – 11:15	Hall-B beamline and run documentation (beamline completion, commissioning, schedule, EH&S documentation) (charge elements #2, #9 and part of #3, #5, #7, #8 and #10)	Stepan Stepanyan
11:15 – 11:45	Radiation aspects of the experiment (charge elements #6, #7 and part of #5)	Pavel Degtiarenko*
11:45 – 12:30	HPS construction and installation schedule (charge element #10 and part of #8)	Marco Oriunno
12:30 – 13:30	Executive session – working lunch	
13:30 – 14:30	Option for Hall B tour or Executive session	
14:30 – 16:00	Executive session – report writing	
16:00	Closeout	



1. Are the HPS specific equipment, documentation and procedures to run the experiment in place and adequate? This includes demonstrated readiness for full rate capability and expedient analysis of the data.
 - The main task here is to get HPS subsystem documentation, “*how to’s*” and “*procedures to run*”, together by **end of June** in order to meet the requirements for July 10 review (LaTeX is a preferred format)
 - At least few pages per subsystem will be needed
 - beamline (monitor beam delivery, perform harp scenes, ...)
 - ECal (monitor HV/LV and temperatures, control HVs, ...)
 - SVT (monitor HV/LV and temperatures, control HV/LV, ...)
 - DAQ (start-stop runs, set and monitor trigger settings, ...)
 - controls (launch GUIs, set and control magnet currents, ...)
 - Nothing is ready yet for “*how to’s*”. There are few ideas on how to present the subsystem operations document, the simpler the better. So far what Hall-D has done seems is satisfactory and is simple enough, e.g. [BCAL](#)
 - From procedures – beamline has a good start with “HPS beamline commissioning document” (perhaps must be updated and if possible to transfer into LaTeX). Other systems do not have anything yet
 - The documentation will be, eventually, stored in JLABs *GitHub* repository



For the last part of the charge #1, a statement from DAQ/offline review on Wednesday will be needed

Heavy Photon Experiment engineering run DAQ/offline readiness review

Committee: Graham Heyes (chair), Sandy Philpott, Chris Cuevas

Observers: Veronique Ziegler (Hall-B), Mark Ito (Hall-D), David Lawrence (Hall-D), Gagik Gavalyan (Physics)

Charge to the review committee

- Is hardware in place for high rate data acquisition? If not is there an acceptable completion and commissioning schedule?
- Has the DAQ system demonstrated readiness for high rate data acquisition? If not is there an acceptable completion and commissioning schedule?
- Are available JLAB resources adequate to transport and store the data?
- Is the software for data calibration, alignment and quality checks ready? Is the reconstruction software ready? If not is there an acceptable completion and commissioning schedule
- Do the required resources match with the available JLAB computing resources? If not what is needed?
- Are adequate plans in place for rapid data analysis?



2. 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.)?
- ❑ There is Hall-B run page: <http://www.jlab.org/Hall-B/run-web/>, with links to the current run information:
 - formal documentation
 - information on the run group or collaboration
 - shift schedule
 - logbook entries
 - experiment run page (wiki, no ready yet)
 - ❑ For the most part required formal documentation is ready and posted on the web (checklists and (T)OSTs are missing)
 - ❑ Unified experiment run page, wiki, for all Hall-B experiments (not ready yet). Will be maintained by the Run Coordinator:
 - day-by-day operations
 - long range plans
 - operations manuals
 - links to experiment specific pages (MCC whiteboard, slow controls archive, monitoring pages ...)



3. Has the entire beamline, target, detector configuration been defined (including ownership, maintenance and control during beam operations)? Is all the necessary equipment installed and operable? If not, what are the completion/commissioning schedule and procedures?
- Beamline and detector configurations are defined, target is the only thing has not been finalized (officially), but it is a simple target should not be a problem
 - Ownership of subsystems is clear, some coordination is needed to determine some of maintenance aspects, e.g. maintenance of the cooling systems – will it be under the Hall-B engineering control or under subsystems
 - Clearly we will not have much installed in the hall by the review, and perhaps nothing operational. It is important to present clear plan and schedule for completion and commissioning
 - This is connected to charge items #8 and #10, well defined plan will cover them as well



4. Are the anticipated beam emittance, halo characteristics and general stability likely to be within the required specification to perform this measurement?
 - Presentation from Arne or Michal will cover the machine status
 - Will need to present beam profile studies from 6 GeV and CLAS experience with small-size and stable beams (Arne)

5. Has transmission of the primary beam and generated secondaries been evaluated for unexpected beam restrictions (e.g. too small of a beam pipe acting as a secondary target), background sources (e.g. large number of produced photons hitting the beam line) or paths (e.g. primary and/or secondary steering from a magnet fringe field)?
 - Beamline design and simulations from Kyle, Sho and Holly will suffice
 - Ecal vacuum chamber may be sticky point, having old simulations based on which chamber design has been made will help
 - Back-spray from the photon beam dump in the new configuration have not been studied, we may need study this



6. 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?
- There have been two meetings and the walkthrough in the hall with Radiation Control group
 - No issues with expected level of radiation or shielding have been found
 - Radiation Safety Assessment Document (RSAD) will be present to them for evaluation (hopefully next week)
 - The only concern that has been raised so far (Pavel Dektiarenko) is the neutron radiation damage to the electronics (addressed by Takashi Maruyama)
7. Are the local shielding and the machine protection system required to minimize the effects of radiation in the HPS detector in place?
- Requirements for MPS/FSD has been defined and communicated with accelerator engineering group.
 - If shielding is needed on beam left side before SVT vacuum box, it must be finalized and included in RSAD



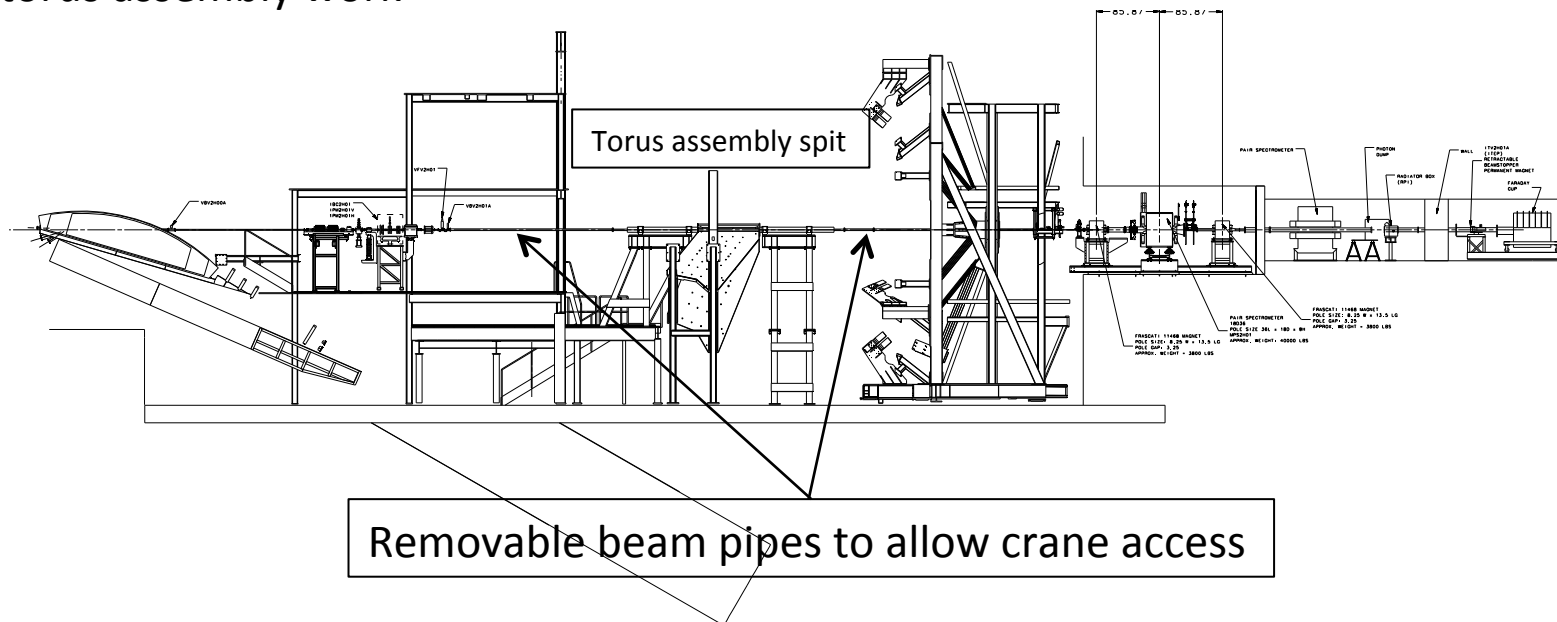
8. Have all the jobs that need to be done to mount the experiment/s been identified and defined adequately?

10. Are the responsibilities for carrying out each job identified, and are the manpower and other resources necessary to complete them on time in place?
 - While each subsystem must present where they are in terms of construction and installation schedules, these two charge items are especially important for the beamline
 - SVT and ECal are simple in terms of responsibilities, ECal may even be assembled by July 10, only mounting fixtures will be missing (Orsay's responsibility)
 - Beamline is more complicated, many inner-connected activities between accelerator and Hall-B engineering, and Hall-B/HPS physics stuff
 - Manpower and other resources must be evaluated



9. Have conflicts with the 12 GeV Upgrade in Hall B been examined and resolved?

- The main 12 GeV upgrade work in Hall-B during the run period will be the torus magnet assembly
- As it has been discussed in the “HPS implementation” document “Running would occur during evenings and weekends or during other periods when it would not conflict with the regularly scheduled assembly of the CLAS12 Torus coils.”
- Location of beamline elements and the HPS setup are designed to have no impact torus assembly work



Summary

- Realistically, only one week left [after the collaboration meeting] before deadline to have preliminary documentation in place
- While clearly everyone is super-busy with detector construction and/or software developments, required documentation for the review must be prepared
- Experiment Readiness Review is very important! Accelerator Readiness Review (ARR) is scheduled for end of August. Hall-B beamline and HPS must clear ERR before that in order to have beam delivery to Hall-B be part of ARR
- HPS is the first experiment to run in Hall-B after 12 GeV upgrade. Machine is new, beamline has many changes, detector is new. ERR committee will look every detail of the experiment and beam delivery. Without proper documentation will be hard to succeed
- High rate data acquisition and the expedite data analysis are mentioned in the charge. Hall-D commissioning and Hall-A experiment have priority over HPS, we not only have to demonstrate our readiness for DAQ and offline analysis, but also should show [on Wednesday] that JLAB resources are adequate to support HPS

