

Start of Experimental Program

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From Construction to Running Experiments

No formal running of experiments yet!

Experiments are not yet "scheduled" by the Experiment Scheduling Committee but run opportunistically during 12 GeV upgrade commissioning activities taking place under the guidance of a "Commissioning Board" (Arne's talk)

Regardless, Experiments/Hall Commissioning subject to two reviews:

1. Experiment Readiness Review (ERR)
2. Accelerator Readiness Review (ARR) - multiple phases

Experiment Readiness Review Process

(experiment scheduling is part of this process)

Process is directed, among other things, to help experiments to,

- a) be ready by their scheduled beam time window,
- b) have their detector systems perform safely to meet physics goals,
- c) receive beam with parameters meeting experiment specifications (e.g. energy, polarization)
- d) receive necessary utilities (e.g. cryogenics)
- e) run the experiment safely, efficiently and timely within the parameters & guidelines given by DOE.

WHY? – multiple halls operating simultaneously but energies available are discrete and correlated:

- a) if one hall takes a given pass (energy), the other halls can not use that pass.

Experiment Readiness Review ... (II)

- b) Available energies are: E, 2E, 3E, 4E, 5E & 5.5E (for Hall D only). Polarization is also correlated

Details of ERR process

http://www.jlab.org/user_resources/PFX/NP-PFX/

- ✓ "6 GeV era" experiments reviewed using this general process.
- ✓ Lessons learned folded into an updated process - e.g. tighter constraints on experiment readiness (i.e. design and fabrication of components before experiment is scheduled for floor time)

The HPS review scheduled for July 10th is part of this process

Accelerator Readiness Review

Required by contract with DOE (DOE Order 420.2B)

"Accelerator Readiness Reviews (ARRs) must be performed before approval for commissioning and routine operation and as directed by the DOE cognizant Secretarial Officer/NNSA Deputy Administrator or a DOE/NNSA field manager."

There will be a review to send beam to HPS & commission Hall D (Tagger already done) in late August.

Accelerator Readiness Review (II)

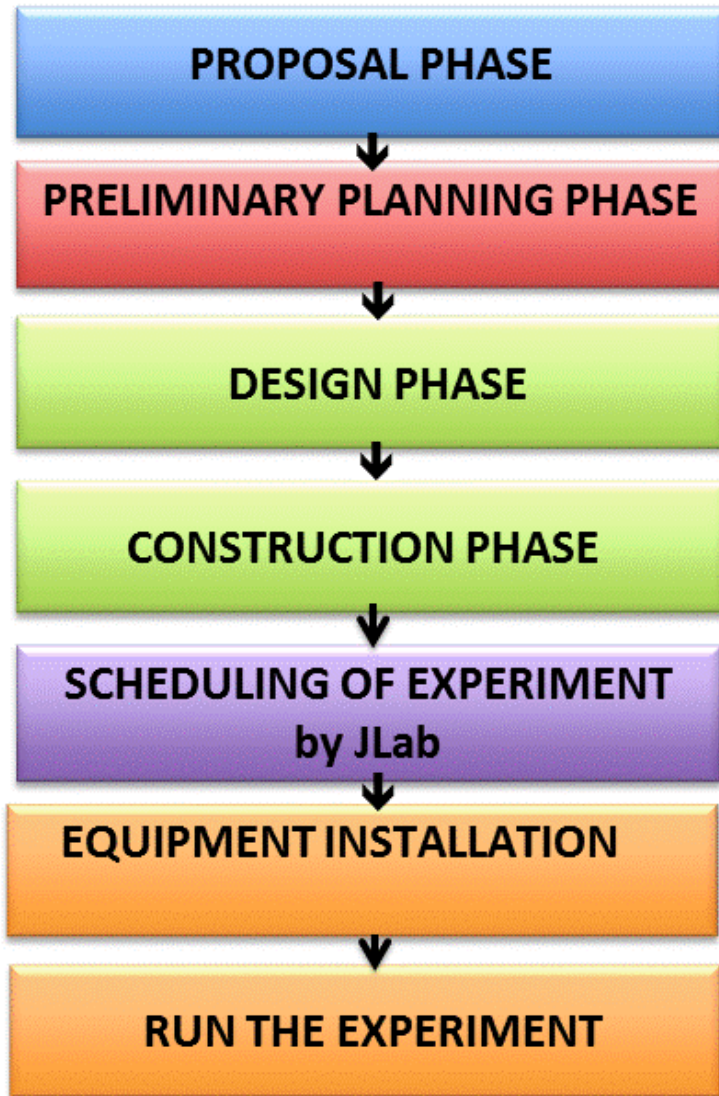
We expect HPS to be treated as,

- a) an experiment "re-using" the Hall B "6 GeV era beam line" ($E < 6$ GeV),
- b) will not use the new Hall B equipment (otherwise requires a commissioning review similar to Hall D)
- c) equipment was on the floor during last "6 GeV" run period, before the upgrade (expired OSPs)

As of now, we only expect small involvement/
presentations from HPS during the next ARR

mostly presentation of the July 10th ERR report & of the material used for that review

READINESS REVIEW PROCESS - FLOWCHART



- Submitting Proposals PAC&TAC
- Director's Decision

- Exp. Description and Requirements
- Exp. Readiness Review Calendar

- PESAD, specific equipment reviews
- Complete Conceptual Designs & "1st" Readiness Review

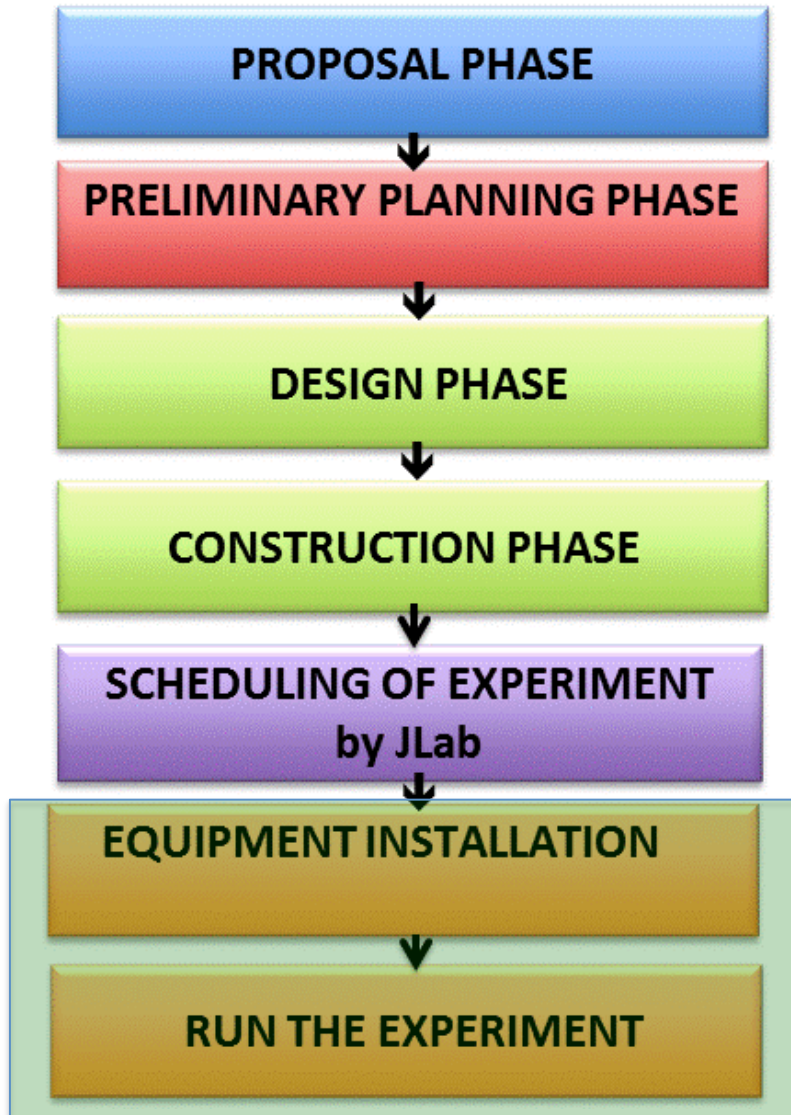
- Fabrication of the equipment
- Test of the individual elements of the equipment (OSP/TOSP)

- Construction near-completed, designs frozen
- Exp. Operation Envelop (EOE)
- "2nd" Readiness Review before scheduling request submission

"Final" readiness review

- Final ESAD & RSAD
- COO
- Safety Checklist
- Experimental Procedures

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we are here

Detour

When a hall is already operating, a documentation "trail" already exists for most of the equipment in the hall ("Standard Hall Equipment")

- a) describing each system
- b) how to operate it (e.g. by shift takers)
- c) system owner/responsible (i.e. experts)
- d) operational parameters
- e) system has been examined for potential safety problems

Equipment can be used by experiments without having to go into details about them during the Experiment Readiness Reviews.

A new system requires the above info & it has to operate well and without incidents during an experiment before the Division Safety Officer (one of the changes to the ERR from the "6 GeV Era" - it used to be the hall leader) allows inclusion of the new system into the "Standard Equipment" of the hall.

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?

HPS ERR

The HPS experiment has,

- Mostly a 6 GeV-era beam line transport and,
 - accelerator controls devices that may affect beam delivery
 - accelerator/engineering are responsible for machine/personnel protection systems.

but it has been down for two years. Hot-checkout process used by accelerator for beam line re-commission should satisfy ARR committee (Arne, Teifenfack, ... presentations)
- Equipment specific to HPS is not "Standard Equipment" - need to show the equivalent of "Standard Hall Equipment" about the new system(s)

HPS ERR (II)

A way to accomplish this is,

- ✧ Describe a system, identify possible hazards, mitigation measures and get designated/knowledgeable people at the lab to review it and agree with your conclusions - it could be a review panel and/or Operational Safety Procedure (OSP). [Recall, for example, that custom electronics taken to labs need to be reviewed. Test run of 2011-2012 used OSPs]
- ✧ Document who is(are) the system owners
- ✧ Document who is allowed to operate the device and how are new operators trained - keep record of who has been trained
- ✧ Document operating instructions/operational range for non-experts

ERR charge points #1, #2 and bit of #3 are directed to the above.
#9 to make sure that there is no conflict with 12 GeV project (ARR/DOE)

Formal Documentation

COO = Conduct of Operation (a lot is boiler plate)

- a) required shift personnel training
- b) experiment organization & administration - roles and responsibilities of the

- 1) Run Coordinator

- 2) Physics Division Liaison

- 3) Hall Work Coordinator

- 4) Shift Leader/Member

- 5) Liaisons:

- Accelerator Operations (Brandi Cade),

- Accelerator Physicist (Michael Teifenback)

- Engineering (none needed)

- c) Operating Procedures - shift times, standby shifts, ...

Formal Documentation (II)

ESAD = Experiment Safety Assessment Document. The ESAD has two broad parts:

- **General Hazards** (Radiation, Fire, Electrical, ...)
- **"Hall Specific Equipment"** - HPS has little "Hall Specific Equipment". Pointer(s) (e.g. OSPs) to hazards identified & mitigations developed during review of HPS equipment will also be here.

RSAD = Radiological Safety Analysis Document - Radiation Control Group.
All material on path of beam: type and thickness of target and other material like windows, air.

ERG = Emergency Response Guidelines - new document. Summarizes what to do if there is an emergency - e.g. fire, extreme weather, power,

A training based on this procedures will have to be implemented and taken by all shift takers and personnel wishing to work in the hall

Formal Documentation (III)

Example documentation, as used to receive beam for commissioning of Hall A during the period March/April of this year, can be found at <http://hallaweb.jlab.org/ARR2/>

Anyone taking shifts or wishing access to the hall during HPS, must read and sign these documents (they will be located in a binder together with the run permit issued by the division)

Remaining questions on charge can be seen as directed to ensure that HPS takes data efficiently, most of them generic to all experiments & not specific to HPS - e.g.

charge#7 can be seen as partially directed to ensure that a miss-steering of the beam will not damage the experiment and take it offline.

charges#5&6 can be understood as making sure that running HPS will not damage other equipment in the hall (e.g CLAS12 electronics or detectors) - **generic charges**