Conduct of Operations for Hall C Installations
Experiment G0 - April 08, 2002

Contents

1 Preface

As part of its mission, JLab provides the resources necessary for international collaborations of scientists to carry out basic research in nuclear physics and related disciplines. This research must be conducted in a manner that ensures that environmental, health and safety (EH&S) concerns are addressed as an integral part of planning and conducting this research. The integration of EH&S activities into work planning and work activities, i.e. integrated safety management, supports the programmatic goals of the laboratory: the highest quality physics results with efficient, safe, and environmentally responsible operation.

This document outlines how all personnel will conduct operations in a safe and effective manner during the time period that experiment G0 is being installed. Commissioning and running periods are not covered by this document. This document is directed to physics users, physics staff, contractors, and both user-supported and regular JLab technical staff. It must be read, understood, signed, and followed by all persons involved in the installation.

2 Personnel Training

All personnel involved in any activities in Hall C during an installation period are required to have successfully completed and be current in the following JLab safety training:

- EH&S Orientation (SAF 100)
- Radiation Worker Training (SAF 801)
- Oxygen Deficiency Hazard Training (SAF 103)
- Hall C Safety Awareness Walk-Through (SAF111)

All personnel will be required to read and abide by the rules described in this document and will verify this by their signatures. The master copy of this document will reside in the Hall C Counting House. A copy will be available at the Main Control Center. The signature sheets will be posted at the bulletin board at the entrance to Hall C. All personnel are required to wear JLab issued radiation dosimeters during their work in Hall C. The Safety Awareness Walk-Through will emphasize any hazards that are peculiar to the current installation. All personnel will be required to inform the Hall C Work Coordinator, Walter Kellner or his designated alternate, of their planned tasks in the Hall on a daily basis before commencing the work.

In addition, experiment personnel must familiarize themselves with the sections of the JLab EH&S Manual relevant for their work in the Hall. The JLab EH&S Manual points to the need for a process of hazard analysis, identification and installation of mitigating safety measures, and evaluation and documentation of their effectiveness for a particular task or set of tasks. Technical work documents (SOPs, OSPs, TOSPs, etc.) contain the outcome of this process. A reference copy of the JLab EH&S Manual is available in the main hallway of the Counting House (or http://www.jlab.org/ehs/manual/EHSbook.html) and copies of technical work documents are available through the Hall C Work Coordinator.

Finally, JLab Lock and Tag[1] training is required for all staff/users who will be performing maintenance on electrical and mechanical equipment which cannot be physically and verifiably isolated from an energy source.

Events at a Glance on the Jefferson Lab Web Pages can point you to training opportunities for the month and give information about each class (http://www1.jlab.org/ul/calendar/calendar_main.cfm).

3 Organization and Administration

The operation of the experiment installation is directed by the Hall Leader, Rolf Ent in consultation with the Project Manager, Allison Lung. The general management structure of the G0 Experiment is outlined in the "G0 Management Plan" (http://www.npl.uiuc.edu/exp/G0/management/management.html). Here we detail the Hall C organization structure, and the user interface to it, during the experiment installation phase. An organization chart for the experiment installation is found in Figure 1.

3.1 G0 Project Manager

The G0 Project Manager is the immediate on-site manager of the experiment. The G0 Project Manager has overall responsibility for execution of the hardware project including cost, schedule, and performance control for both Jefferson Lab and outside collaboration groups.

The Project Manager will refer issues significantly affecting the G0 Experiment cost, schedule, and scope to the G0 Spokesperson, the Associate Director for Physics at JLab, and the Executive Committee and/or the funding agencies as outlined in the "G0 Management Plan".

The Project Manager also ensures that regular progress reports will be given at meetings of the G0 Executive Committee, at collaboration meetings, and at weekly Hall C meetings.

3.2 Spokesperson

The G0 Spokesperson has overall responsibility for planning and executing the experiment. This includes oversight of the physics program and its scope, and overall coordination of the experiment as well as overall management of the collaboration.

[1]The EH&S Manual provides Lockout/Tagout information in Chapter 6110.

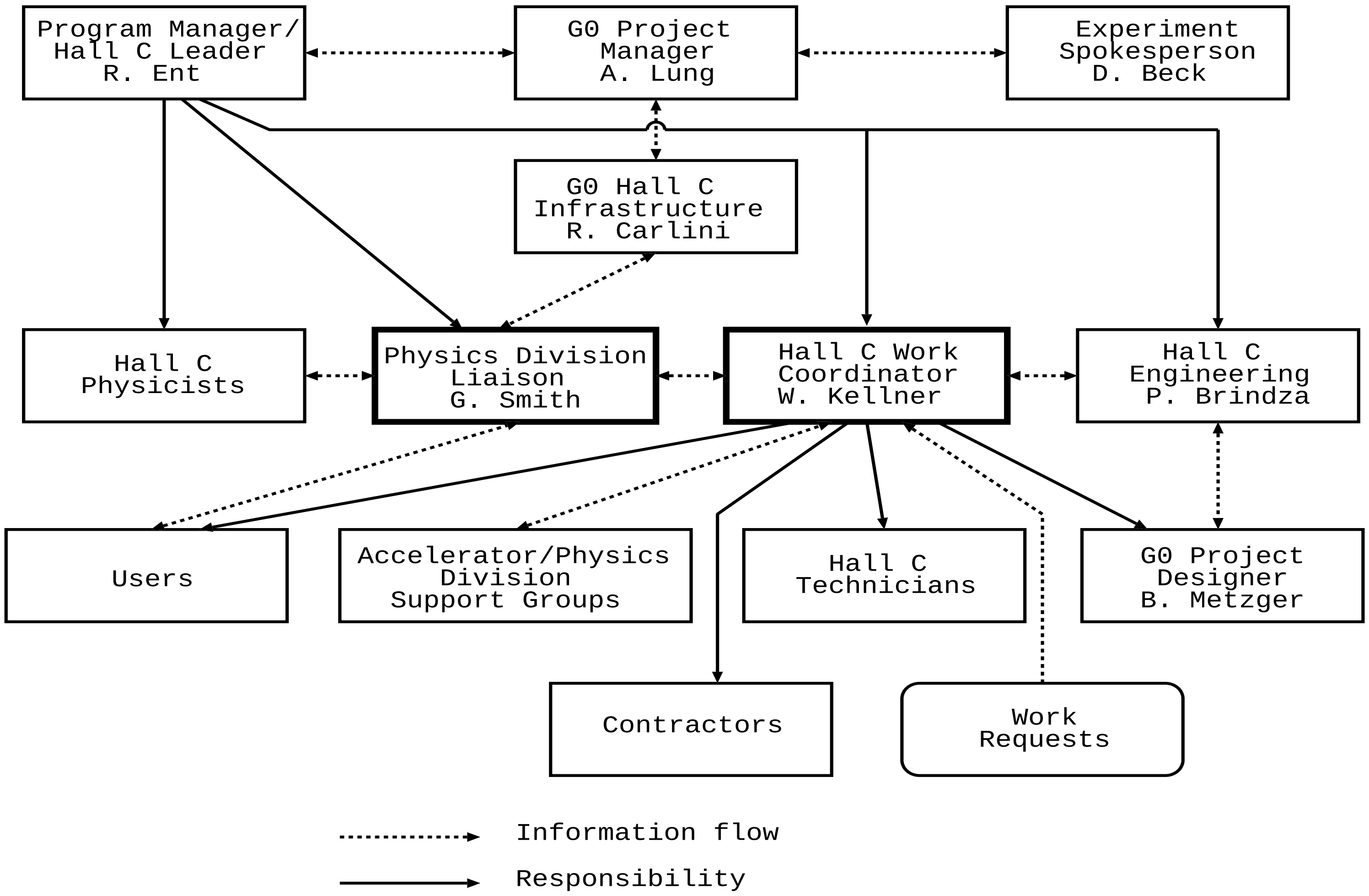

Figure 1: Functional Organization of the Hall C Team. Dashed lines indicate information flow, solid lines indicate responsibility.

The Spokesperson acts on behalf of the collaboration in interactions with JLab management, the JLab Program Advisory Committee, and with the funding agencies. The Spokesperson chairs the Executive Committee.

3.3 G0 Hall C Infrastructure Subsystem Manager

The roles of G0 Subsystem Managers are outlined in the G0 Management Plan. They are responsible for coordinating and integrating all sublevel projects within their subsystem, and overseeing their budgets and schedules. In the case of the Hall C Infrastructure subsystem the sublevel projects include installation, beamline, cryo services, and electrical work. Thus, the G0 Hall C Infrastructure Manager plays a direct role during the G0 installation with line supervision of these sublevel projects.

3.4 Hall Work Coordinator

The Hall Work Coordinator is the **single point of contact for all installation work in the Hall**. The responsibilities of the Hall Work Coordinator are to:

- act as the **single point of contact** for any problems encountered in the experiment installation, and find solutions in conjunction with the physics staff and the Hall C project designer dedicated to work on the specific G0 project (G0 Project Designer).
- track the progress of the installation work.
- ensure that the complete installation schedule is up-to-date. This task is done in coordination with, and may be delegated to, the Physics Division Liaison.
- consult with the Hall Engineer as necessary, and to keep the Project Designer and the Hall Engineer informed on any major modifications to the mechanical installations.
- coordinate and schedule **any** activities in order to optimize productivity. This will be done on a daily basis in a short meeting with representatives of the various groups working in Hall C.
- act as the **single point of contact** for any EH&S issues that arise during the installation.
- determine if the scheduled activities in the hall can be done safely. These activities shall be coordinated with the Physics Division Liaison.
- ensure that workers are properly trained, are familiar with all significant hazards, and are aware of all applicable work control documents associated with the project.

- remain in the local area and be available by cell-phone/pager at all times. (If temporarily unavailable the Hall Work Coordinator must appoint a qualified Hall staff member as his designate. The name of such designate should be clearly posted at the Hall entrance.)
- report, in coordination with the Physics Division Liaison, on the progress of the installation in weekly Hall meetings.

3.5 Physics Division Liaison

The Physics Division Liaison is a Hall C Staff Member who is the immediate on-site manager of the G0 installations. The Physics Division Liaison is designated by the Hall Leader and is responsible for ensuring that the goals of the installation are met. The Physics Division Liaison shall ensure that the Hall Group Leader and the Project Manager are aware of all pertinent issues. The Physics Division Liaison shall promote an environment in which the highest safety standards are maintained. The functions of the Physics Division Liaison are:

I. To manage daily operation of the installation:

- to define the installation requirements appropriate for the goals of the experiment.
- to ensure, in coordination with the Hall Work Coordinator, that the complete installation schedule is up-to-date.
- to determine if the scheduled activities in the hall can be done safely. These activities shall be coordinated with the Hall Work Coordinator.
- to inform the Hall Leader of any problems encountered during the installation and suggest solutions to these problems.

II. To coordinate interactions between the Hall staff and the experimental collaboration. This entails:

- reporting, in coordination with the Hall Work Coordinator, on the progress of the installation in weekly Hall meetings.
- informing the experiment spokesperson and G0 Project Manager of the status and plans of the installation.
- in conjunction with the Hall Work Coordinator, coordinating work with the various Accelerator Division and Physics Division support groups.
- in conjunction with the Hall Work Coordinator, scheduling work by groups outside the collaboration such as contractors and physics and accelerator division support groups.

3.6 G0 Project Designer

The G0 Project Designer is a member of the Hall C engineering/design group who is selected by the Hall Leader and the Hall Engineer to assist the Hall Work Coordinator during the installations. Presumably, this is a designer who has been involved with the specific G0 project during the early designs, under the supervision of the Hall Engineer. The supervision of this G0 Project Designer will temporarily lie with the Hall Work Coordinator, for the duration of the G0 installation.

The responsibilities of the G0 Project Designer include:

- providing the Hall Work Coordinator with all information related to the design, assembly, and installation drawings for the G0 experiment.
- being as needed available to interact with the Hall Work Coordinator to directly act on any needed modifications to these designs or drawings.
- keeping both the general Hall C and the detailed G0 drawing database up-to-date and as closely as possible reflecting the actual situation in Hall C.
- doing in situ measurements in case hardware has to be altered before final G0 installations in Hall C, and incorporating the measured modifications in the general Hall C drawing database.
- keeping the Hall Engineer informed, and using the Hall Engineer as a source of technical information, for any large modifications.

3.7 Hall Engineer

The Hall Engineer is the central contact person for all design and engineering projects for Hall C before the actual installation period occurs. The Hall Engineer will work on the design of experiments before the final installation of these experiments. It is the responsibility of the Hall Engineer to:

- commission dedicated engineering projects that fall under the Hall Engineer's responsibility. The scope of such projects shall be defined by the Hall Leader.
- closely interact with staff and users to incorporate physics demands, where feasible, in the design and engineering work.
- advise staff and users on easier and more cost-effective solutions to reach similar physics goals.
- make sure that all relevant parties are well informed on design and engineering work for Hall C experiments. This includes arranging meetings with users and physics and/or accelerator support groups to discuss the conceptual idea of the design and engineering work, and to arrange the

general assembly drawings to be signed off by the relevant personnel, in a timely fashion. It is understood that the Hall Work Coordinator needs to sign off on **any** general assembly drawings related to Hall C installation work.

- arrange, in consultation with the Hall Leader, an internal review of the conceptual design of major-scale construction and installation projects.
- report on the progress of the design and engineering projects in weekly Hall C meetings.
- assign, in conjunction with the Hall Leader, one or more members of the engineering/design staff to be the responsible Hall Project Designer(s), for any experiment installation project in the Hall.
- be available as source of information for Hall Project Designer(s), Work Coordinator and Physics Division Liaison, once the experiment installation starts.

3.8 Users and Contractors

Users and Contractors are persons whose supervisor is not one of the Hall C staff. Users often have a member of the Hall C physics staff as local sponsor, contractors often have a member of the Hall C technical staff as subcontracting officer's technical representative (SOTR). During the time period of the G0 experiment installation, **all** users and contractors are under the direct daily supervision of the Hall Work Coordinator for any of their activities within the hall. Users may wish to use the Physics Division Liaison as their contact with the Hall Work Coordinator.

The responsibilities of each user or contractor are to:

- keep all their training up-to-date.
- read the entries posted at the safety bulletin board at the gate entrance to Hall C to be aware of changes in goals, operating parameters, and new documentation.
- carry out the goals of the experiment installation in a safe and efficient manner under direction of the Hall Work Coordinator.
- inform the Hall Work Coordinator in advance of any desired activities in the hall.

In addition, the responsibility of each user is to:

- request any modifications to the installations and/or the installation schedule through the Physics Division Liaison and the Hall Work Coordinator.

4 Operating Procedures

4.1 Work Routines

Due to the large scale of the G0 installation, many different groups will be involved. These are:

1. Hall C technical staff, under the direct supervision of the Hall C Work Coordinator
2. Hall C physics staff
3. Several university user groups
4. University-supported technical personnel responsible for major pieces of equipment
5. Contractors
6. Accelerator, Administration, and Physics Division support groups.

The standard mode of operations for work during the G0 experiment installation has been identified in the previous pages, with the Hall Work Coordinator the central point of contact for all work. It is anticipated that especially the Physics Division Polarized and Cryogenic Target Group, led by M. Seely, will interact on a daily basis with the Hall Work Coordinator and the Physics Division Liaison, as they are responsible for the installation and commissioning of the G0 cryogenic target.

The mode of operations for requests for work and plans to do work by outside groups are further detailed in the following Sections.

4.2 Collaboration Request for Laboratory Resources

The collaboration may request, in writing, additional services from Accelerator Division through the Accelerator Division Liaison, Hari Areti and the Hall C Leader, Rolf Ent . Alternatively, the collaboration may also request additional services from hall personnel through the Physics Division Liaison. Some requests may require that an SOP, OSP, or TOSP be developed.

Major, non-standard, or unanticipated configuration modifications to either Hall C Base Equipment or new G0 specific equipment, such as stacking or movement of significant shielding, unanticipated vacuum work, unanticipated beam line modifications, the replacement of a wire chamber, etc., require approval of the Hall C Leader, Rolf Ent[2], and the use of appropriate personnel. The Hall Leader may require that a SOP, OSP, or TOSP be prepared. The Hall Leader may also require that a radiation assessment be done.

[2]Configuration changes as outlined above can affect site boundary dose and the production of airborne radioactivity. They require consulting with RadCon or EH&S personnel, as appropriate.

4.3 Scheduling of Work by Outside Groups

Work in the hall that is to be performed by groups outside the collaboration such as survey and alignment, plant services, air conditioning , etc., must be scheduled so that it does not endanger personnel or equipment or interfere with the installation. The Hall Work Coordinator is the single point of contact for any work by outside groups. To maximize efficiency, the Physics Division Liaison (representing the collaboration) and the Hall Work Coordinator (representing Hall C) will concur on work scheduling. The Hall Work Coordinator's job is to coordinate activities in the hall so that work can take place smoothly and safely and to insure that multiple activities do not interfere.

The Work Coordinator and the Physics Division Liaison will meet as needed to plan the work scheduled for the upcoming period. The product of this meeting will be a list of work in the hall, appropriate work control documents, and educational or other safety measures (such as escorts) that are needed.

4.4 Control of Equipment and System Status

The operation of the base experimental equipment is documented in the Hall C Experimental Equipment Operations Manual. This document includes information on the normal response to alarms and equipment malfunctions. The document "Personnel Allowed to Operate Hall C Equipment" lists the authorized subsystem experts.

Supplementary information specific to experiment G0 may soon be found in the, as of yet preliminary, Conduct of Operations (COO) for the G0 experiment (see http://ten.npl.uiuc.edu/exp/G0/docs/docs.html).

All general equipment installation, maintenance, and testing activities are to be carried out in accordance with the JLab EH&S Manual. Note particularly the criteria for documented, reviewed procedures described in Section 3310 – "Standard Operating Procedures and Operational Safety Procedures" – of the JLab EH&S Manual. Many equipment commissioning and testing activities during the G0 installation period, e.g. commissioning of the new cryo target and superconducting magnet systems, will require written, reviewed and approved Temporary Operating Safety Procedures (TOSPs).

I have read the Conduct of Operations for Hall C Installations for Experiment G0 and understand my responsibilities and the Hall C installation work rules. Furthermore, I understand failure to adhere to my responsibilities and these work rules will result in disciplinary action.

Name	Signature	Date

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