

## REQUIRED SPECIAL EQUIPMENT AND/OR CONFIGURATION MODIFICATIONS

Most of the special equipment required for this experiment and the pertinent issues related to their successful operation have been addressed in other reviews, in particular the modifications of the polarized  $^3\text{He}$  target. By the time of running of this experiment, all experimental equipment will have been tested, installed, and used at least once in the preceding experiments from the Family.

A minor engineering change needs to be done to the frame for the BigBite hadron detector package as it was recently used in the SRC experiment. A veto counter needs to be added to the existing neutron detector, thus enabling the experiment to achieve the goal of simultaneous detection of deuterons, protons (polarized asymmetries in  $^3\text{He}$  breakup) and neutrons (parasitic measurement of the neutron charge form-factor) at similar  $Q^2$ .

## MOUNTING THE EXPERIMENT

The jobs that need to be done to mount the experiment have been identified and defined adequately. The major task in immediate preparation for running is the transition in the Hall. The HRS and BigBite need to trade places at backward vs. forward angles, and the wire chambers need to be moved from the electron detector package to the hadron detector package. This major "leapfrog" move which requires a complete decabling, mechanical motion, recabling and trouble-shooting of BigBite, will be accomplished in the four weeks' shutdown preceding the running of the E05-015 experiment. Other outstanding tasks, all presently being dealt with, are: addition of the veto counters to the existing neutron detector; extensive MC simulations with folding-in of the BigBite spectrometer acceptance; trigger electronics configuration and optimization.

## PROGRESS MILESTONES

The progress milestones have been identified. The neutron detector has been successfully tested. The addition of the veto counters originally used during the  $G_E^n$  experiment to the existing neutron detector is underway and we do not anticipate significant impediments to the completion of this task. The MC simulations of the polarization asymmetries, incorporating both theory input and rotation of the target polarization direction (see below) have been initiated and are in progress. The read-out and trigger electronics, which will be largely adopted from previously running experiments, will require small modifications without major obstacles in sight.

## RESPONSIBILITIES

The responsibilities for carrying out the jobs have been identified. On the hardware side, the installation of the veto counters for the neutron detector and the electronics are covered adequately by the manpower of the collaboration. The efforts to modify and install the polarized  $^3\text{He}$  target and the corresponding responsibilities have been described in other documents of this Readiness Review. Significant effort will be needed to rewire

the neutron detector electronics once BigBite moves to the Hall for the planned first experiment of the Group (E04-007). This work will be done in the Test Lab when space is released. By June 2007 we will have a plan for electronics reconfiguration, which could be based on what has been previously used with the shower counters. Doug Higinbotham (JLab) will coordinate efforts for the "leapfrog" migration in the Hall with Ed Folts. Simon "Sirca" (U of Ljubljana) will prepare the documentation relevant to operational safety (see below). Xiaohui Zhang (MIT) will be analyzing the data.

#### ADEQUACY OF ON-SITE EFFORTS

The collaboration's plans for building up an on-site effort are adequate to meet the schedule. In addition to the manpower attending previous experiments of the Family, which is available either on-site or from off-site, we have a postdoc and a graduate student working permanently on the jobs identified above, and we expect another dedicated student by the summer of 2007. They will be on-site for the entire duration of the experiment.

#### BEAM REQUIREMENTS

The experiment requires a 2.4 GeV beam with 75 % polarization at 15  $\mu$ A beam current with standard energy and positional stability requirements, posing no exceptional problems for the accelerator or the polarized source. The exact beam energy is not crucial to the experiment, so small deviations from the nominal value can be accommodated by fine-tuning the kinematics.

#### ANCILLARY TESTS

The experiment is presently scheduled to run last in the series of BigBite/polarized  $^3\text{He}$  experiments. All ancillary tests of the beam capability, monitoring equipment, etc. are expected to be accomplished prior to the start of the experiment. In particular, a detailed trouble-shooting of the BigBite detectors and the electronics will be performed, starting immediately after the "leapfrog" transition and continuing during the two weeks' running of the E05-015 experiment which does not utilize BigBite.

#### SCHEDULED BEAM TIME

The original beam time allocation for the experiment was 15 PAC days with 35 % (75 %) target (beam) polarization. In recent polarized  $^3\text{He}$ , one was routinely able to achieve 40 % (80 %) polarizations, improving the achievable figure-of-merit. However, due to instrumental constraints in the Hall, we have been forced to move the BigBite from 1.1 m to 1.5 m drift distance, jeopardizing the attainable statistics goal of the experiment. We have asked for additional beam time to compensate for this loss. Incorporating the additional 5 days, the scheduled beam time is adequate to carry out the entire experiment.

#### COMPLETING EH&S REVIEWS AND DOCUMENTATION

The plans for completing the EH&S reviews and documentation are adequate. We will issue the appropriate ESAD, RSAD, and COO documents in due time. The experiment does not introduce unusual experimental safety hazards existing with the base equipment in Hall A, nor will it exceed prescribed radiation budgets, thus the specific measures in-

stalled for hazard mitigation in previous experiments need not be modified. Regarding the special equipment, the hazards related to BigBite (high magnetic fields) and the polarized  $^3\text{He}$  target (glass cells) will be evaluated and properly addressed in the reviews and documentation.

#### CONSISTENCY OF SCHEDULED DATES

The tentatively scheduled date is consistent with the constraints of the collaboration. All hardware and software issues are anticipated to be resolved, and documentation will be in place ahead of the commencement of the experiment.