Accelerator Division
EH&S Activities
For September 2002

VTA PSS Upgrade
The safety systems group spent the majority of their time in September installing new equipment as part of the vertical test area PSS upgrade. As of September 30, all work that could occur without disrupting VTA operations was complete. The upgrade was scheduled to coincide with a planned maintenance shutdown of the test lab central test facility (CTF). As of September 30, 2002, the critical path item remains the RF Switchbox. The RF Switchbox is designed to allow VTA users to connect any of several RF sources to a test dewar while retaining PSS configuration control and shut down capability. The minimum number of units required for VTA start up are 2 of 6.

ODH System
The Safety Systems Group addressed the fluid leak of some cells with manufacturer. Sample cells were returned to manufacturer for analysis and replacement. Five of the new style cells were removed and inspected. All had leaky electrolyte. The manufacturer identified the material as potassium carbonate. The manufacturer will replace the leaky cells.

FEL PSS Upgrade
FEL PSS re-commissioning was completed on September 30, 2002. Several devices were not ready for functional testing. Entries were made to the FEL ARR tracking system under "Instrumentation." FEL PSS is now under configuration control. Several jumper requests have been completed to enable continued testing of high voltage supplies. We added three new sub-systems to the FEL matrix: Laser Safety System (LSS), Personnel Safety System (PSS), and RadCon. Original FEL ARR matrix did not previously segregate major safety-related subsystems as they were considered integrated components to all other sub-systems. Sub-system owners will be working on bringing the matrix up to date regarding their sub-system's ARR status.

EH&S Tracking System
Provided training to EES managers, Medical Services staff, and safety wardens on how to use the EH&S Tracking System for corrective actions tracking. We added a new feature on Safety Alerts and Notices. The link takes you to EH&S Information section in Docushare where alerts and notices, such as the vacuum cart electrical issues, LOTO devices alert, and dewar gauges, are saved. Another new feature, that was added to both the EH&S and FEL Tracking systems, allows authors of records to receive an email whenever someone has updated one of their records in the system.

Test Lab Electro polishing Room Stop Work
LOTO investigation was completed. A copy of the report is at:
IMAP://mail.jlab.org?fetch>UID>|Inbox>18325/;section=2&part=1.2

Accelerator Site Lighting Problem
Many of our staff have to perform work on second shift. For EES group, this can involve going out to somewhat remote areas to reset circuit breakers after power failures or equipment failures. In follow-up to an employee complaint about burnt out exterior

lighting, found a few issues that could be improved, we rode the site with Plant Engineering and Ed Strong. A list of burnt out lights was generated, and a list of lights whose photovoltaic sensors have failed (lights on all the time). Conventional light switch can't be seen at night. It will be replaced by a motion detector light switch.

TOSP for 1 MW Klystron Test Area
Radiation control improvements were detailed in the SOP that was intended to replace the now expired TOSP. When the Accelerator Division EH&S Officer r received the SOP for review and approval, he discovered that the radiation control improvements had in fact, never been implemented. RadCon revised the document to reflect this change. As a result of this change, TLD badges are again required for entry into the 1MW Test Stand area.

R&D Chem Room Access
The R&D Chem Room will be placed on the CANS system by the end of October 2002. Employees who intend to continue using the R&D Chem Room must take the HF First Class, otherwise CANS will permit them to enter. Additionally, if a safety shower is activated, a green light and buzzer with appropriate signage will come on outside the room, and the doors will unlock. A list of first aid responders will also receive an alpha numeric page through the CANS interface indicating the problem and the area. A R&D Chem Room CANS meeting is scheduled for Friday October 6, 10:00-11:00, where Dave Kausch will present the proposed functions of the CANS for the R&D Chem Room.

Welding Machine Safety
The Electrical Safety Subcommittee (ESS) concluded that small portable welding machines designed to operate from 110VAC single phase wall outlets should be included in the requirement for annual inspection. A procedure has been written and will be integrated into Interim Appendix 6122-T3. The ESS recommended the Nelson Stud Welders and Plasma Arc Welders also undergo inspection for proper ground and isolation. Electricians should inspect Stud Welders & Spot Welders for the integrity of line cord ground connection to chassis. Diesel Generator Welders and Fine Wire Butt Welders require no inspection at this time.

Safety Warden Meeting
Safety warden quarterly meeting was held on 9/5/02. Approximately 20 SW attended. Topics included a short class on SW roles & responsibilities followed by a discussion on SW inspections. A team was formed to develop a division SOP on SW inspection protocol. Demonstrated the EH&S tracking system and EHSLOG. A power surge brought the demo to a premature close. John Kelly talked about the impact of external regulation on SW roles.

EEL Machine Shop Particulate
The IH Group received complaints about particulate falling from the covering over ceiling tiles onto workbenches in the Machine Shop and Stockroom. The IH Group

conducted air monitoring and took surface samples that were then sent out for analysis. The analysis report indicates that the particulate does not present a safety hazard. The source of the particulate is believed due to high intensity lighting that is melting a polypropylene covering on the ceiling in both areas. The pieces then fall onto the work surfaces. Since the safety concern has been ruled out, only the QA concern remains. Currently the Machine Shop technicians are working on FEL upgrade jobs that must be done under low particulate conditions. Plant Engineering cannot resolve the problem until February 2003. In the interim, the IH Group recommended that a plastic clean room area be set up, much like the one in the Test Lab magnet test area.

Experimental Halls
RadCon continued to support work on Hall A target assembly. The target assembly is essentially complete. The chamber should be closed up within the next 12 hours. We recovered about 1.5 gallons of tritiated glycol coolant from Hall A. We will require an assessment of disposal options.

Hall C continues its target exit beamline window upgrade. We're making last minute enhancements to the tunnel wall concurrent with this. The changes involve a He purge to the spool piece that is the transition between the G0 exit beamline and the wall interface.

The FEL CARM Monitoring System
The FEL CARM monitoring system is functional. One or two units are under investigation for erratic response and occasional communications problems, but PSS interface and safety function test is satisfactory. We have made plans to place detectors in FEL vault for upcoming commissioning activities. The shield wall at the FEL truck ramp door may not be in-place during early RF commissioning.

Accident Investigation – Employee Injures Foot
An EES worker was removing a 15-20 lb. cable spool from her workbench in Bldg. 87. When she lifted the spool, the top connector piece dislodged and the spool fell on the worker's foot. The worker reported to Medical Services and received OSHA defined medical treatment. The worker returned to work on September 26th. The investigation includes a follow up with 3M regarding the spool construction given that the spool's integrity was not maintained under normal use.

Hall A Cryotarget Vent Line
The IH Group Leader was asked to evaluated the Hall A the cryotarget vent line. The hydrogen vent line connects in to the N2 vent line for the hall. It is physically the last connection before the line leaves the hall. The vent line has a cap that provides a resistance of a few psi. In the event of a N2 failure, or vacuum condition created due to maintenance, if the cryotarget vented, the hydrogen could backfill the N2 vent line back towards the cryogenically cooled magnets. The concern is real; however, during steady state operations the risk is very low for this failure to occur. The risk would increase during maintenance associated with the N2 line. The solution that was proposed to Physics EHS was to install a check valve in the N2 line before the hydrogen vent

connection as soon as reasonably possible. It was also strongly recommended to review all other hydrogen systems to ensure that this setup doesn't exist anywhere else.

Gun Powder Use in Science Demo

Due to all of the increases in security at airports, a visiting scientist, who will be participating in our fall science series, decided to ship his gunpowder to our facility instead of taking it on the airplane. Interesting, since hazardous materials have always been banned from carry on or checked luggage! The problem arose here when the gunpowder arrived: it was first stored in a flammables cabinet. Gunpowder is incompatible with flammable liquids and it must be stored in a cool area by itself. Luckily, the Beams staff notified the Safety Lab that the powder was stored onsite. It was removed and is being stored in an appropriate location until the demonstration.

Hazardous Waste Program Inspection

State inspection of Hazardous waste areas for Jefferson Lab took place on Thursday. The inspection covered all satellite accumulation areas and the central accumulation area. There were no findings. Thanks for ongoing quality management by Steve Singleton and all of the satellite generators. A discussion of our generator status followed the inspection. With the start-up of the Electropolish cabinet, Jlab expects to generate greater than 1000 kg per month of hazardous waste several times next year. There are two options:

1. declare ourselves Large Quantity Generators
2. report months in which we generate more than the allowable 1000 kg as “episodes” of large quantity generation.

The second option is preferable, since it will trigger less oversight from the EPA. It is imperative that the plans for the acid neutralization system continue on track for the April 2003 installation. With this installation date, we estimate only 3 “episodes” (months when we exceed 1000 kg of hazardous waste generation).

Notable Event – Hall B Magnetic Lock Failure

Hall B Door 1 magnetic lock emergency ingress bypass switch did not function when power was restored after a power outage due to a lightning storm.. The root cause of the failure of the switch to operate is unknown. The power up condition of the CANS system that engages the door lock is a contributing factor. Personnel unfamiliarity with the actuation of the emergency bypass switch may have been a contributing factor. A copy of the Notable Event report will be available from the EH&S Tracking System home page.

Administration Division
EH&S Activities
For September 2002

Flawed Execution of Lockout/Tagout in Test Lab

During a regular EH&S walkthrough inspection in the Test lab, an Accelerator Division EH&S staff member witnessed an electrical subcontractor employee pulling on cables that were routed through a junction box containing existing wiring. He questioned the subcontractor and his colleague about their lockout precautions. There was only one lock and tag on the circuit breaker, and the subcontractors indicated that they were unaware they both needed to apply LO/TO since one was pulling new cable only. Further questioning confirmed that neither had yet taken JLab LO/TO training, but that they understood they could use their company LO practices until they were JLab trained. This exception applies only to emergency work.

The incident did not place anyone in danger. The apprentice (who did not have his own lock in place) was pulling new, un-energized wire. It would have taken several improbable additional events to expose him to hazardous voltage. The primary concern was his and the journeyman's misconceptions about acceptable lockout practices at JLab. E. Hanson and J. Kelly investigated the event and submitted a Notable Event report.

Medical Services

New Service: Allergy Injections

Often the best way to manage chronic allergy symptoms is to undergo a desensitization process –*immunotherapy*. Commonly called "allergy shots," these are a series of progressively stronger injections of the offending allergen(s). This gradually reduces the immune system's reaction to the material (dust, mold, pollen, animal dander, etc.). Typically, these injections are administered in the immunologist's office, which necessitates weekly visits and time away from work. Medical Services, with the concurrence of your physician, now is equipped to administer your injections in the clinic. Call the clinic (6269) for more information. Please note that making and keeping appointment times for injections will be very important.

Risk Management

Insurance Renewals

J. Kelly is compiling the customary information for the annual renewal of our insurance policies. Underwriters are especially nervous in the post-9/11 insurance market, and we have been asked by our broker to provide additional information to help assuage anxieties. An example: How many people are typically in each of our major buildings?

EH&S Training

B. Ullman and J. Kelly are modifying some web-based electrical safety training modules developed by LLNL (with their permission). They offer to be a promising resource for just-in-time training or periodic knowledge reviews.

Emergency Management

K. Burrows and J. Kelly collectively have assumed the bulk of T. Hassler's activities and responsibilities as Emergency Manager.

Occupational Foot Protection

I have had a couple of questions posed to me recently concerning regulatory requirements (think OSHA) for foot protection. The following is a good overview of the topic:

According to 1910.136(a), "Each affected employee shall wear protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards." Appendix B to subpart I identifies the following occupations for which foot protection should be routinely considered: shipping and receiving clerks, stock clerks, carpenters, electricians, machinists, mechanics and repairers, plumbers, assemblers, drywall installers and lathers, packers, wrappers, craters, punch and stamping press operators, sawyers, welders, laborers, freight handlers, gardeners and grounds keepers, timber cutting and logging workers, stock handlers and warehouse laborers.

In terms of what constitutes "protective footwear" under 1910.136(b) OSHA requires that the footwear comply with ANSI Z41 (1991), American National Standard for Personal Protection--Protective Footwear, or shall be demonstrated by the employer to be equally effective.

Requirements of ANSI Z41-1991

ANSI Z41-1991 defines performance measurements and test methods for protective footwear. The standard contains performance measurements for impact and compression protection for the toes, metatarsal protection for the toes and metatarsal area (top of foot), electrical hazard protection, conductive protection and protection against punctures and penetration.

An important point to remember is that the ANSI standard does not allow for the use of add-on type devices (strap-on foot, toe or metatarsal guards) as a substitute for protective footwear. According to part 4.1.1 of the standard, "The toe box shall be incorporated into the footwear during construction and shall be an integral part of the footwear."

While ANSI excludes add-on devices, it doesn't necessarily mean they're not acceptable to OSHA. This paradox exists because OSHA states under 1910.136(b) that the footwear shall comply with ANSI or shall be demonstrated by the employer to be equally effective. This means that if an employer can provide documentation, such as testing data proving their add-on devices provide protection equivalent to ANSI performance standards, then the add-on devices are acceptable to OSHA. Most manufacturers of add-on devices have submitted their products to independent laboratories for testing. This data and its results can be obtained upon request.

Protective footwear can meet all the requirements of the ANSI standard or specific elements of it. A steel-toed work boot that meets the impact and compression requirements of the ANSI standard may not provide protection for metatarsal, electrical or penetration hazards. All footwear manufactured to ANSI specifications will be marked with the specific portion of the standard with which it complies.

The ANSI standard incorporates a coding system that manufacturers use to identify the portions of the standard with which the footwear complies.

EH&S Reporting Activities for September 2002

- As of September 30th, Jefferson Lab had achieved **53** consecutive days without a lost-time injury. The Lab record is **455** consecutive days without a lost-time injury.

Occurrence Reporting

- The Final Report for the late July Test Lab lockout/tagout event was reviewed and approved by management. The Final Report was forwarded to the DOE occurrence reporting system and has been approved by the DOE Site Office.
- EH&S Reporting provided a minor revision to the JLab occurrence reporting plan in EH&S Manual Chapter 5300, *Occurrence Reporting*. The revised wording calls for line management to provide prompt notification to the Lab Director of DOE reportable occurrences or potentially reportable occurrences.

Office of Science EH&S Information

- The initial JLab response to an Office of Science (SC) request for monthly lab injury and notable event information was prepared by EH&S Reporting for senior management review. SC has requested monthly total recordable case (TRC) and lost (and restricted workday) case (LWC) information in addition to Lab EH&S programmatic accomplishments.
- Information was prepared for a one-time SC request for significant JLab events (including near-misses) during the past six months. This information request was made during a conference call between Dr. Ray Orbach and the ten SC lab directors.

DOE External Regulation

Jim Murphy, Office of Technical Performance Director, and Bob May, Accelerator Div., attended a September 18th SC external regulation meeting at Lawrence Berkeley National Lab. Federal OSHA and the Nuclear Regulatory Commission were announced as the safety and radiation protection regulators for the ten SC labs. All SC labs are developing regulatory transition cost estimates for SC, which are due in early November.

- The Department of Environmental Quality performed a site inspection of the Lab's hazardous waste program on September 5, 2002. Accelerator Division Institute for SRF staff provided excellent support.

Work Smart Standards (WSS) Set

- Proposed changes to the WSS Set are in various stages of review, including the proposed addition of a local terrorist response plan.
- EH&S Reporting is working with the Policy and Manuals Group to ensure new or modified hazards or standards become addressed appropriately in the EH&S Manual.

National Environmental Policy Act (NEPA)

- 16 GeV and FEL Upgrade Environmental Assessment (EA)
  - The DOE Site Office is finalizing the team charter.
  - Proposed Action/Project Information Checklists are being prepared. The initial draft checklists for the CHL Facility Expansion and the new Shipping and Receiving/Warehouse Building are available for line management input.
- EH&S Reporting is working with other laboratory staff to address other NEPA items that include a major chiller plant upgrade to take place at the Test Lab and at the CEBAF service buildings.
- Six site Categorical Exclusions were approved for another year:
  - Improvements to Cooling Water Systems
  - Siting, Construction, and Operation of Small-Scale Support Buildings and Structures
  - Site Characterization and Environmental Monitoring Activities
  - Routine Onsite Storage of Activated Material
  - South Utility Access Path Upgrade
  - Siting/Construction/Operation/Decommissioning of Particle Accelerators with a Primary Beam Energy less than approximately 100 MeV

Physics Division
EH&S Activities
September, 2002

For the month - Installation and testing new and maintenance of existing experimental equipment in the three experimental halls was a major division priority.

Reviews

Reference Jefferson Lab EH&S Manual Chapter 3120 - Experimental Review.

Experiment E00-006 ("G0") EH&S Review – Part 2, and its Readiness Review IV, was held September 19th. This combined review is a portion of the ongoing process for evaluating the safety of experiments that are carries out in the Physics Division at Jefferson Lab. The G0 experiment plays a special role at Jefferson Lab in that it constitutes the largest installation to date for an experiment with dedicated equipment beyond the Hall C base equipment. Due to the large scale of the G0 installation, the EH&S Review was held in two stages. The first G0 EH&S Review took place August 14, 2002. At that meeting the committee reviewed the status of relevant GO equipment scheduled for use in the initial and the second series of beam tests scheduled in September. The second and last scheduled G0 EH&S Review assessed readiness of the completed G0 apparatus. Membership of the Committee included: Chairperson George Dodson of ORNL (Magnet), from JLab: Jian-Ping Chen (Target), Bert Manzlak (Safety), Elton Smith (Detectors), Noel Okay (Beamline) and Bill Vulcan (Electrical).

Experimental Readiness and Work Control Documents

Reference Jefferson Lab EH&S Manual Chapter 3120 – Experimental Review, and Chapter 3320 - Temporary Work Permits.

Two Experiment Readiness Certificates were prepared and issued for the run groups of new experiments: Hall A: E00-007/E00-107 and Hall B: e7. Also, two temporary operational safety procedures were prepared, one related to testing of G0 experimental equipment in Hall C and another in the EEL related to testing of experimental equipment for an upcoming experiment in Hall A.

Inspections

Reference Jefferson Lab EH&S Manual Chapter 5100 - Internal Inspections.

Four scheduled "OSHA-type" formal inspections identified 11 new recordable action items. Since first observed eight of the items have been closed. Accompanying division EH&S staff on one of the inspections were Keith Welch (Radiation Control), and Jennifer Williams (Industrial Hygiene). The Area Safety Warden, Brian Kross, participated in both inspections of Physics Division areas in the EEL.