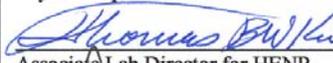


Approved by:	
	11/24/04
Physics Department Chair	Date
	11/30/04
Associate Lab Director for HENP	Date
	12/05/04
Associate Lab Director for BES	Date

## Physics Department, BNL

### ES&H Self-Evaluation

#### Department Summary

#### Fiscal Year 2004

#### Self-Evaluation - Overview

The Physics Department's Self-Evaluation for FY 2004 is based on a Self-Assessment Plan that assesses the Department's performance against the Laboratory's Critical Outcomes.

The three Critical Outcomes for this year are in the areas of *Basic Science and Technology*, *Environmental Management*, and *Laboratory Management and Operations*. Each has a number of objectives and performance measures linked to those objectives. The Department assesses the elements that are relevant to its internal strategic plans, operations, and objectives, with the goal of enhancing the performance of the Physics Department and contributing to meeting or exceeding its part for the Critical Outcomes of the Laboratory.

At the heart of this strong program of self-evaluation is the strong management commitment to ES&H, our Tier I Program, Experimental Safety Review Process, Environmental Management System, and our proactive ES&H Committee.

#### Critical Outcome – Basic Science and Technology

The Physics Department recognizes that a commitment to excellence in science and technology requires an equal commitment to the environment, worker and infrastructure safety, and health. The Department's management exploits every opportunity to remind its people of their responsibilities to themselves, each other, and the Department. It does this through the Department-specific briefing, Experimental Safety Reviews (ESRs), Training, Department communications i.e. Department meetings, and electronic messages, and the use of R2A2s.

#### Critical Outcome – Environmental Management

The Physics Department has disposed of nearly all legacy items. Those that remain have been reported to laboratory management and are being properly managed. The remainder of the Department's commitment to the environment consists of Environmental Management System for identifying hazards, ESRs for controlling them and our Tier I and other inspections for monitoring them. A pollution prevention initiative replaced PCB laced oil at the ATF

## **Critical Outcome – Laboratory Management and Operations**

### **Management Systems**

The Department used all the applicable management systems introduced by BSA in handling ES&H matters in the Department. Specifically, these included the Environmental Management System (EMS), Integrated Safety Management, (ISM), the Brookhaven Training Management System (BTMS), and the Standards Based Management System (SBMS) for the subject areas that govern our operations.

### **ES&H Areas Assessed**

This year a comprehensive review was undertaken in the following 13 areas: Communications, Training, Leadership, Tier I Inspection Program, Work Planning, Security, Accident and Incident Management, Accelerator Test Facility (ATF) issues, Memoranda of Understanding (MOUs), Group Safety Coordinator (GSC) Program, Environmental Performance, Center for Functional Nanomaterials (CFN) issues, and Summer Student Monitoring Program.

### **Overall ESSH Performance**

The Physics Department's performance with respect to ESSH in FY 04 has been excellent. Most goals and objectives have been accomplished with fewer incidents and a DART rate of 0.39.

### **Details of the Assessment**

The ES&H Committee Chair and the ES&H Coordinators performed the initial assessment. The draft was distributed to the Group Safety Coordinators and Line Management for comment. The results are as follows.

#### **Communications**

There is a strong Line Management Commitment to safety through the discussion and review of ESSH topics at each Department Administration Meeting (weekly), Department Group Leader Meetings (1), Department Group Meetings (varies, depending on group), and at Department 'All Hands' Meetings (CMP – 1, Physics Department – 2). These meetings have been enhanced with an increased safety focus, with a goal of reaching every employee. The meetings included safety issues as a principal component of discussion, always first.

The Department's ES&H Committee met 11 times to assess the performance of the Department, review radiological and environmental compliance, review and update ESSH documentation, and establish, track, and ensure the implementation of corrective actions related to the reviews and incidents.

There were 2 Group Safety Coordinator Meetings. These meetings were solely focused on safety and provided feedback on safety to Line Management.

The Physics Department established the dissemination of the ESH&Q monthly newsletter to all personnel. In addition information on accidents, recalls of products, timely safety messages, and lessons learned were also distributed.

## **Training**

The Physics Department reached a new level of >99.5% of required training completed for employees and 94% for guests as of 9/30/04.

The building manager and the ES&H Coordinator attended the OSHA 10-hour course.

All employees and guests received and reviewed their JTAs.

## **Leadership**

The Department has representation on these ES&H Subject Area Development Groups - Tier I Inspections, Working with Chemicals, Laser Safety, Lifting Safety, Radiation Generating Devices, RF/Microwave Radiation, Noise and Hearing Conservation.

Members of Physics Department involved in safety also have membership in the following Laboratory level committees - BNL Director's Safety Committee, PAAA Committee, Cryogenic Safety Committee, Laboratory ES&H Committee, Working with Chemicals Working Group, Training & Qualifications Steering Committee, Laser Safety Committee, Nuclear Safety Committee, and the Radiation Protection Working Group

The Physics department recognizes its Group Safety Coordinators with a 'Thank You Luncheon' each year for the leadership they provide do in bringing safety issues to their groups and group safety issues to management.

## **Tier I Program**

The Tier I program worked very well this year. No situations involving 'imminent danger' were discovered. Housekeeping, electrical issues, and machine tool items were the most prominent issues. Corrective Actions were assigned and tracked to completion. Responses to the corrective actions were timely.

Last year an OSHA team identified 250 items during the inspection of the Physics Department. Of these, 56 were duplicates, and 8 were too vague to identify the location, nature of the violation, or belonged to another Department. Of the remaining items, approximately 45 belong to either Plant Engineering or Central Shops. Most of the OSHA violations belonging to the Department were 'quick fixes' all of which were completed.

Participation was good with Chairs, PIs, Group Leaders, and Group Safety Coordinator participation. Additionally, the BES ALD and his assistant performed quarterly walkthroughs.

## **ES&H Committee & Work Planning**

The ES&H Committee consists of a Department of Energy Facility Representative, a member of the Physics Department's Management (a scientist), a Radiological Controls Division Technician, the Department's Environmental Compliance Representative, the two ES&H Coordinators (one also serves as the Training Coordinator), an engineer from the ATF, the Building Manager, and a project manager with a quality control background. Additionally, the Department Chair, an Associate Chair, an Acting Associate Chair, and a Radiological Controls Division Representative are informed of all issues. Finally, subject area experts and other laboratory personnel are invited as needed.

The Committee reviewed and approved all ESR that were brought to it this year. Presentations to the Committee were made for some new and ongoing experiments that have higher risk hazards.

Work Permits have been established in the Department for Machine Shops, Winding Machines, and the routine work performed by staff at the ATF.

All Department Policies were reviewed. Some policies were combined, some deleted, and some reissued.

An annual Lockout Tagout audit has been established and performed for the ATF.

There were great improvements in the area of document control. We established a numbering system, determined which documents need official numbers, reviews, and headings, and published them.

There was also concern last year that the Physics Department's ES&H web pages were not being used in the Department. A more prominent link was established to increase visibility.

### **Security**

The Department added security issues to its ESR form. To date, no new issues have been identified that need attention. Security Issues are presented at All Hands meetings.

The Physics Department is in compliance with SECON security requirements. In particular, all laboratory and office doors are locked outside of working hours. Noncompliance reports have been given to the Department Chair and Group Leaders of the responsible individuals. This information is available for inclusion in performance evaluations.

### **Accident and Incident Management**

There were four incidents for the fiscal year 2004 as compared to ten in 2003 and three each in 2002 and 2001.

They were:

2003-10: **ORPS Report** - Source use not logged in book when removed from source box

2004-01: Failure to follow an established work plan checklist

2004-02: **Lost Workday** – Technician twists ankle walking on uneven pavement

2004-03: Interlock tests overdue by 23 days

There were no definite trends noted for these incidents. These incidents were discussed with the Department at All Hands meetings and with the GSCs.

Current DART is 0.35 (from information provided by J. Ellerkamp) but there is 1 pending DART case that does not look like it will be reportable.

The Department celebrated a new record for days worked without a time-lost accident/incident (710 days exceeding the old record of 636 days) although the lost workday of incident 2004-02 reset the board.

### **Accelerator Test Facility Issues**

All ATF documentation has been reviewed, updated, and integrated into the Physics Department. This consisted of 11 sections from the ATF Handbook that included the Conduct of Operations (COO) and the Safety Assessment Document (SAD) and 22 ATF procedures for operations and maintenance.

### **Memoranda of Understanding**

There were nine Memorandums of Understanding that were reviewed, updated, or generated. These MOU establish the responsibilities for Work Planning and Control of Experiments and Tier I Inspections. They are:

#### *Completed*

MOU with C-AD and Chemistry for the RHIC Experiments (updated)  
MOU with C-AD for the Advanced Accelerator Group's space in 901A (updated)  
MOUs (2) with the NSLS for their use of space in Building 510 (updated)  
MOUs (2) with ITD for our use of Building 515 (updated)  
MOUs (2) with the CFN for their use of space in Buildings 510 and 703 (created)

#### *Not yet completed*

MOU with C-AD and NSLS for their use of space in Building 820 (generated – being negotiated)

### **GSC Program**

The GSCs have had increased visibility this year as their pictures and short bio has been posted on the Physics Safety Pages. Additionally, a 'thank-you' luncheon and meeting was held in October. The discussions were very productive and have helped shape future ESH plans.

### **Environmental Performance**

Physics is doing well. Over the past few years, the waste generated has been below the projections Waste Management has provided for the Physics Department.

There were two pollution prevention projects that were completed this year. There were PCBs in the oil of one of the transformers for the RF Modulators at the ATF. This oil has been removed as a Pollution Prevention Initiative for which the laboratory provided funding. Furthermore, the ATF has continued to replace bare lead bricks used for shielding with painted ones.

### **Center for Functional Nanomaterials (CFN) issues**

Ron Gill received one experiment to review. No forms for this experiment were sent to the Training Coordinator, as it should have been for the tracking of training. This issue has been communicated to the CFN.

### **Summer Student Monitoring Program**

The Physics Department recognizes the additional risk posed by inexperienced people working in areas where hazards are present. In an effort to manage this, the Physics Department's Safety & Training Office maintained a list of summer students and the Department Chair and ES&H Coordinator met with the students as a group when they arrived and halfway through the summer. The ES&H Coordinators and Building manager specifically looked for students working in laboratories throughout the summer to make sure they were working safely. On a few occasions students were spoken to regarding the ESRs they were working under and the need to wear protective equipment. One student was reminded to wear a bicycle helmet after the BNL policy added this requirement.

### **Audits**

The Department was the subject of 20 external audits/assessments covering various aspects of our ES&H programs. There are no outstanding issues that need to be resolved.

Worker Safety and Health Required Assessment Aide (March & September)

FRA for Central Shops' Machine Shop  
Third Party Evaluation of BNL's Management System Self Assessments  
CMS Audit in 2-105  
Controlled Documents Internal Audit  
BNL-BAO Hazard Waste Assessment  
ISM Audit  
EWMSD Hazardous Waste Assessment  
Lab-wide Assessment Aid for Fire Safety  
ISO 14001 EMS Recertification Audit  
BNL-BAO Injury/Illness Assessment  
BNL OSHA Compliance Audit  
NRC Assessment  
NYSDEC-RCRA Audit  
Suffolk County Article 12 Storage Tank Audit  
Emergency Management  
Liquid Effluents  
Lead in circuit board cleaning process  
Radioactive Waste Management  
EMS Management Review

**Noteworthy practices**

1. The Safety Officer at the ATF performs monthly training database and EST audits of all ATF staff and experimenters.
2. The Safety Officer at the ATF performs random TLD checks

**Accomplishments - Other than those listed in the summary table**

1. Re-registration and SOPs for all operating lasers in the Department
2. Responded to Material Handling Concerns by locking all cranes and forklifts and appointing a Point of Contact for each.
3. All OSHA 'quick-fixes' completed, all others have work orders.
4. Replaced all source box locks to ensure compliance with Department policy.
5. Reviewed all Department policies and procedures. Some re-issued, some consolidated, some updated, some removed.
6. Updated All Local Emergency plans
7. Updated 90-Day Contingency Plan
8. Regular reviews and updates of all Authorized Worker Lists (Lasers, Machine Shop, Winding Machines, Rotating Anode, ATF Qualified Operators, Crane, and Forklift)
9. Reviewed departmental dose records
10. Reduced amount of legacy storage.
11. Improved record management
12. Hazard placards updated.
13. Chemical Audit
14. LOTO Audit
15. Reduction in Department sources, all sources inventoried
16. ESRs and SOPs taken on Tier Is.
17. Unfinished training part of Performance Evaluations
18. Offered CPR training to all employees
19. Improved building access for disabled persons
20. Promoted bicycle safety to summer students

## Summary Table

<b>AREAS</b>	<b>GOALS</b>	<b>RESULTS</b>
<b>Communications</b>	Dept. All-Hands Meetings	2 – Physics, 1- CMP
	ESH Committee Meetings	11
	GSC Meetings	2
	Safety as 1 <sup>st</sup> subject of meetings	100%
<b>Training (as of 9/30/04)</b>	Employees	>99.5% - All JTAs reviewed
	Guests	94% - All JTAs reviewed
	OSHA 10-hour Training Course	Taken by Building Manager and ES&H Coordinator
<b>Leadership</b>	Safety Subject Areas	Department participation
	Physics Department's Safety Personnel participation on Laboratory Level Committees	BNL Director's Safety Committee, PAAA Committee, Laboratory ES&H Committee, Training & Qualifications Steering Committee, Radiation Protection Working Group
<b>Tier I Inspection Program</b>	Participation	Chair, Group Leaders, PIs, Group Safety Coordinators, ECR, DOE Facility Rep., RCD Facility Support Tech.
	ESR/SOP reviews	Incorporated into Tier Is
	Tracking	Using new form
	Corrective actions	53 CAs cited
<b>Recognition</b>	Departmental	Surpassed previous record of number of workdays (636) without a lost-time accident. Department-wide celebration with coffee and photo.
	Individual	None identified
<b>Work Planning</b>	Experiments Reviewed and approved	Process has been streamlined for updating if no changes occur. PIs and workers are bringing changes to the ESRC without prompting
	ESR & SOP signature audits	Not completed
<b>Security</b>	Losses or other issues	No losses, # of doors left unlocked has been reduced
<b>Accident and Incident Mgmt.</b>	Awareness	Discussed incidents at All Hands and GSC meetings, ES&H Monthly Summary (from ESH&Q Directorate) distributed to entire Department, Lessons Learned and other DOE site incidents distributed as appropriate
	# Incidents	4 – None CMP related
	# Reportable Incidents	1 – ORPS
	# Recordable accidents	1 with 1 lost workday
	DART Rate	0.39 through 8/30/04
	Line Management Involvement	In weekly management meetings, Group Leaders involved in write-ups and reporting to ES&H Committee
	Accelerator Test Facility Issues	Completed all required ones –ATF Handbook (11 sections including the Conduct of Operations and SAD) and 22 ATF procedures for operations
	Streamlined procedure for ESRs	In progress for ATF standard experiments
	ES&H	2 weekly meetings with safety as a component including ATF, Physics department, and BNL safety and training issues and lessons learned
<b>MOUs</b>	Create or reissue	Seven of 8 complete, 1 is being reviewed by all parties
<b>GSC Program</b>	Quarterly meetings	Only 2 held
	Web pages	Improved, added photos and bios
<b>Environmental Performance</b>	Pollution Prevention	Replaced PCB laced oil at ATF Replaced a large # unpainted lead bricks at ATF with painted ones
	Accidents/Incidents	None
<b>CFN Issues</b>	Identification of problems	ESRC receives notification for his review but not the Training Coordinator
<b>Summer Students</b>	Feedback	Met with all students mid-summer for feedback
	Monitoring	Weekly walkthrough by ES&H Coordinators and Building Manager to look for students working in labs.

## **Corrective Actions from External Audits**

1. From the Record Keeping Audit – Finish the Updating of ATF documents – overdue – Completed August 2004.
2. DEC violation – battery left on shelf – Removed that day.
3. Radioactive Waste Management Internal Audit – Improved inspections and consolidated waste area.
4. Hazardous Waste Management Internal Audit – Satellite area problems fixed – problems discussed with generators.
5. EMS Re-registration Audit – Management review was late – Clarified evacuation drill requirements.

## **Incomplete Recommendations from FY 04 – These are in process but have not yet been accomplished**

1. Increase the audits of ESRs in the field.
2. Develop a streamlined ESR process for the ATF experiments.

## **Recommendations for FY 2005**

1. More emphasis on experimental work that includes field observations, ESR, and laser SOP signature audits.
2. The ES&H Committee needs to have a more formal set of procedures established for how it conducts its business. Some items to be addressed are: what consists as a quorum, formation of sub-committees, who may serve as the acting Chair when the Chair is not available, etc.
3. The Physics Department will begin working toward ISO 18001 registration.
4. The Physics Department will conduct a separate self-evaluation of the ATF covering infrastructure, day-to-day activities, experiments, and needs.
5. We need to complete the streamlined ESR process for the ATF experiments.

## **Acronyms**

ALARA	As Low As Reasonably Achievable
ATF	Accelerator Test Facility
ATS	Action Tracking System
BES	Basic Energy Sciences
BTMS	Brookhaven Training Management System
CFN	Center for Functional Nanomaterials
CMP	Condensed Matter Physics
COSA	CFN Operations and Safety Awareness
DER	Department EMS Representative (R. Gill)
DOE	Department of Energy
EAC	Environmental Assessment Committee (R. Gill and S. Ferrone)
ECR	Environmental Compliance Representative (S. Ferrone & K. Klaus)
EMS	Environmental Management System

ESH	Environment, Safety, and Health
ESH&Q	Environment, Safety, Health & Quality
ESR	Experimental Safety Review
ESRC	Experimental Safety Review Coordinator
ESSH	Environment, Safety, Security, and Health
GSC	Group Safety Coordinator (See <a href="#">GSC list</a> )
HENP	High Energy and Nuclear Physics
ISM	Integrated Safety Management
ISO	Independent Standards Organization
MOU	Memorandum of Understanding
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated biphenyl
PI	Principal Investigator
RF	Radio Frequency
SAP	Self Assessment Plan
SBMS	Standards Based Management System
SECON	Security Conditions
SOP	Standard Operating Procedures
R2A2	Roles, Responsibilities, Authorities, and Accountabilities