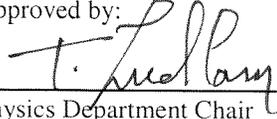
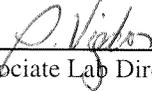


Approved by:		1/7/11
	Physics Department Chair	Date
		01/14/11
	Associate Lab Director for NPP	Date

Physics Department, BNL

ESSH Self-Evaluation

Department Summary

Fiscal Year 2010

Self-Evaluation - Overview

The Physics Department's Self-Evaluation for FY 2010 assesses the Department's performance against the Laboratory's contractual Goals and Targets. Each of these 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 ESSH, our Tier I Program, Work Planning and Control, Environmental Management System, and our proactive ESSH Committee.

Performance Measures for Brookhaven National Laboratory as established between the Department of Energy (DOE) and Brookhaven Science Associates (BSA)

There are eight performance measures that have been established. The Physics Department helps the Laboratory achieve its institutional goals by contributing at the departmental level to those measures that are applicable to the Department. Some performance goals are truly institutional and are not evaluated at the Department level.

Performance Measure 1.0 – Provide for Efficient and Effective Mission Accomplishment

The Physics Department continues to do its part in achieving 'World Class Science'. Our discoveries and publications, recognition of our excellent scientists through awards and support, continues to bring recognition to BNL.

Physics Department scientists are internationally recognized leaders in their fields. They participate in developing new science initiatives at BNL and also participate in scientific endeavors at other facilities world-wide and in establishing direction with their global counterparts for the next generation of initiatives and research tools.

Performance Measure 2.0 – Provide for Efficient and Effective Design, Fabrication, Construction and Operations of Research Facilities

The Physics Department provides the expertise for design, fabrication, and construction of the major detectors for RHIC. These plans are reviewed at the laboratory level and with the DOE to ensure their effectiveness and efficiency. The funding received to accomplish these reflects the confidence of the DOE developed through the past projects we have been successful with.

The Physics Department operates the Accelerator Test Facility (ATF), a proposal-driven Program-Committee-reviewed Users'-Facility dedicated for long-term R&D in Physics of Beams. ATF users, from universities, national labs and industries, are carrying out R&D on Advanced Accelerator Physics and are studying the interactions of high power electromagnetic radiation and high brightness electron beams, including laser acceleration of electrons and Free-Electron Lasers. Other topics include the development of electron beams with extremely high brightness, photo-injectors, electron beam and radiation diagnostics and computer controls.

Operations at the ATF are reviewed annually by the Department and the DOE. DOE and Laboratory approvals for the upgrades, operations, and new capabilities demonstrate continued commitment to this facility for its remarkable achievements.

Performance Measure 3.0 – Provide Effective and Efficient Science and Technology Program Management

The Physics Department accomplishes this in partnership with the Laboratory management. The Laboratory Director, Deputy Director for Science and Technology, Deputy Director for Operations, the Associate Director for Nuclear and Particle Physics, the Associate Director for Policy and Strategic Planning work with the Physics Department Chair and Associate Chairs to achieve this measure.

The Department works with Laboratory Management to develop new programs aligned with the DOE Mission and the scientific strengths of the Laboratory and participates in major projects at other laboratories world-wide. These programs are always well received by our scientific partners and reviewers, globally, demonstrating the excellence of our personnel and programs. The ability to get funding for some of these underscores their relevance to both the scientific community and the DOE.

Projects that have been previously approved and funded in prior years receive continued funding attesting to their effectiveness and efficiency. These projects undergo rigorous annual reviews internally and externally.

Performance Measure 4.0 – Provide Sound and Competent Leadership and Stewardship of the Laboratory

The Physics Department's Chair, Deputy Chair, and Associate Chair assist the laboratory in achieving this measure by ensuring that Group Leaders and scientists are globally recognized as leaders in their fields. Additionally, the support personnel are chosen and retained for their demonstration of their quality of performance in supporting their leaders and commitment to excellence in stewardship of the Departments programs and assets.

Performance Measure 5.0 – Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environment Protection

The Physics Department continues to provide a work environment that protects workers and the environment. The Department strives to keep its DART rate below the Laboratory average and below the DOE Office of Science expectation of 0.25 cases per 200,000 hours worked. We also work to keep our OSHA total recordable case rate below the laboratory average and below the Office of Science interim goal of 0.65 cases per 200,000 hours worked.

The Physics Department integrates ESSH into its policies and procedures providing a management system that enhances the safety and well-being of our personnel and the environment. We meet all the requirements established by the Laboratory and in addition have instituted proactive measures to control or eliminate risks. By measuring our own performance and soliciting feedback through our Group Safety Coordinators and Department members we can continuously improve that performance.

The Department is participating in the Laboratory's Human Performance initiative and has already implemented some elements into our programs. The Physics Department will ensure worker, scientist and technician participation in hazards assessment, evaluation and mitigation at the "task level." Job Risk Assessments will be reviewed and updated as deemed appropriate.

The Physics Department has developed an accident/incident management program where all incidents and accidents including first aid cases are investigated. First aid cases are reviewed by the Physics Department's Manager of ESSH&T Programs to determine the level of the investigation. The Group Leader owning the accident or incident has the responsibility to perform the initial investigation. The ESSH Committee reviews and provides further investigation, if necessary, develops corrective actions and lessons learned which are subsequently shared with Group Safety Coordinators and the entire Department at an 'all-hands' meeting.

The Physics Department effectively manages its waste effectively and efficiently and participates in identifying 'Pollution Prevention' projects and 'Safety Solutions' projects. The Department has had success in attempts to find funding within these Laboratory programs but will also fund others on its own.

The Department maintains its ISO 14001 and OHSAS 18001 registration.

Performance Measure 6.0 – Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of Laboratory Missions

The Physics Department performs its part in helping the Laboratory achieve this measure through its participation in acquiring and developing the Laboratory business systems that meet its needs and by providing feedback to the business division for the programs in place.

The Department has set up an efficient means of reviewing acquisitions and maintaining its property that meets all laboratory requirements and incorporates additional reviews for safety and management.

Personnel in the Physics Department are our most valuable resource. Much time is devoted to recruiting and hiring excellent people, and to mentoring and assisting them in their development, both professionally and personally. The Physics Department strives to enhance its diverse population

in its hiring practices to ensure global participation in creating new ideas and tools that serve the needs of researchers world-wide.

The Physics Department invites external review from subject matter experts from Laboratory and DOE resources at BNL and participates openly in reviews from external agencies. The Department values these audits as validation of our excellent programs using any corrective actions or recommendations to provide the safest and healthiest working environment in the Laboratory and DOE complex.

Performance Measure 7.0 – Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs

The Physics Department uses its resources in a most efficient and effective manner to maintain its infrastructure. We are involved in working with Laboratory Management to keep our operations in a safe and reliable condition. Our Tier I program includes inspection of infrastructure, developing any corrective actions, and relaying our needs to management.

Performance Measure 8.0 – Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems

The Physics Department participates in preparations for emergencies in concert with the Emergency Services Division. We keep them informed of our hazards and emergency needs for our people and equipment. Hazard placards are well maintained and people are trained as local emergency coordinators to assist as necessary. Experimental Safety Reviews require the principal investigator to list any emergency preparations or responses required for their work.

DOE property and equipment are properly managed. The Department also complies with all cyber security requirements. While the Department is not directly involved with classified or sensitive information, we strive to keep all our information and materials as secure as is reasonable. The Department has appointed its Manager of ESSH&T Programs as the ISSM point of contact to ensure effectiveness of this program.

ESSH Areas Assessed

This year a comprehensive review was undertaken in the following areas: Communications, Training, Leadership, Tier I Inspection Program, Industrial Hygiene Monitoring, ESSH Committee and Work Planning, Security, Cyber Security, Accident and Incident Management, Emergency Management, Corrective Action Management, Accelerator Test Facility (ATF) issues, Memoranda of Understanding (MOUs), Group Safety Coordinator (GSC) Program, Environmental Performance, Summer Student Monitoring Program, and Safety Observations. Additionally, we work with the Condensed Matter Physics and Materials Science Department of the BES Directorate to assess our performance in handling many of their ESSH functions as outlined in MOUs established last year.

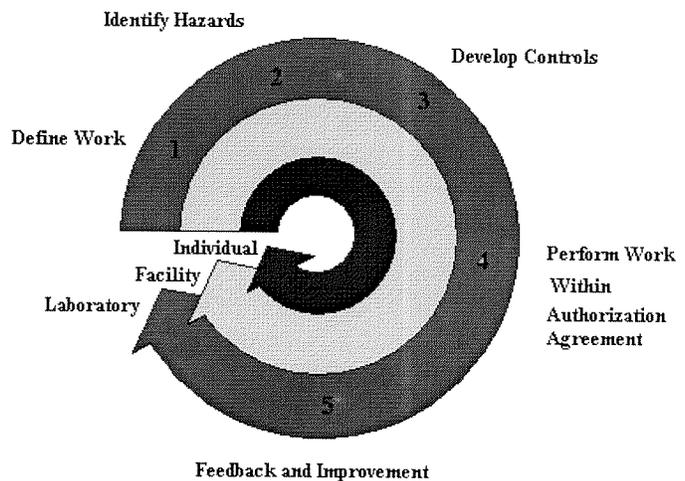
Evaluation of our OHSAS and EMS performance is addressed separately.

Overall ESSH Performance

The Physics Department's performance with respect to ESSH in FY 10 has been excellent. There was an enormous amount of time put in by the safety personnel to keep the Department in compliance, in addition to the BNL or external audits. In spite of this, many of the goals and objectives have been accomplished with only one incident (Stolen Laptop - SCBNL), one DOE (OSHA) recordable injury (Chipped Tooth - SCBNL), a DART rate of 0.00 (number of cases/200,000 hours worked), a TRC rate of 0.0 (number of cases/200,000 hours worked) and no first aid cases.

Integrated Safety Management

The Physics Department has embraced the core functions of Integrated Safety Management (ISM) in its conduct of work planning and control for operations and experiments. The Experimental Safety Review Form is organized into sections that are aligned with the 5 core functions – Define the scope of the Work, Identify the Hazards, Develop Controls for the Hazards, Work within the Approved Safety Envelope, and Provide Feedback to improve or fine tune the processes.



As a Department, we continue to assess and improve the process in response to the feedback received from the Laboratory, assessments and audits, incorporation of OHSAS, Group Safety Coordinators, and from the workers. The Physics Department has assessed how we are doing with conformance to the Seven Guiding Principles of Integrated Safety Management. These are presented below. In summary, we believe we have fully integrated ISM in our Department and are looking to continuously assessing what we are doing and to continuously improve.

7 GUIDING PRINCIPLES OF INTEGRATED SAFETY MANAGEMENT ...AND HOW THE PHYSICS DEPARTMENT IMPLEMENTS THEM

Line Management Responsibility for ESSH.

Responsibilities are well documented (Physics Department Policies, SBMS, etc.)

Weekly Management discussion of safety as first item

Group Leader involvement in any incident/accident investigation

Department Management and Group Leader participation in Tier I Inspections

Department Line Management participation in Safety Observations

Department Chair directs Group Leaders to appoint a Group Safety Coordinator, and Group Leaders allow that person to spend time on ESSH issues

Clear Roles and Responsibilities

All employees have R2A2s

Safety Responsibilities well defined by Department Policies

JTAs reviewed annually or as jobs change

MOUs for interdepartmental work

Competence Commensurate with Responsibilities

Authorized Worker Lists

Users receive hands-on training (where applicable)

Workers are required to read and sign ESR or Work Permit

Balanced Priorities: on the grand scale, are the hazards being appropriately addressed?

The Department does address the hazards associated with work and recognizes its need to allocate resources to address safety, through its programs and operations.

Job Risk Assessments are used to evaluate hazards or risks

Identification of ESH Standards and Requirements

The Department follows the SBMS for all the standards and requirements it operates under.

Hazard Controls Tailored to Work Being Performed

The Department has comprehensive SOPs and ESRs that list and describe all the hazards and provide controls for each. This is a dynamic system that changes with feedback or as experiments evolve.

Operations Authorization

For the User

Comprehensive Check-in procedures and forms

Site specific training by PIs (or his designee) is an individual training providing an excellent platform for interaction and evaluation of competence.

Authorized User Lists (Electrical Workers, LO/TO, Laser Operators, ATF Linac Operators, Modulator Operators, Machine Shops, Material Handlers, MPMS, Rotating Anode)

For the Experimental Laboratory

ESR or Work Permit that is comprehensive

For the ATF

ATF Specific training

SAD, ASE, COO, ATF Procedures

Details of the Assessment

The Physics Department's Safety & Training Office performed the initial assessment. Input was solicited from Group Leaders and members of the Department, statistics were generated by the ESH Coordinators and the report written by the Manager of ESSH&T Programs. The draft was distributed to the ESSH Committee, 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 Management Meeting (usually weekly), Department Group Leader Meetings, Department Group Meetings, and at Department "All Hands" Meetings. 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, usually first.

Group Leaders remain committed to providing their personnel a safe working environment and encourage communication in their group meetings. Groups meet at different frequencies depending on the nature of their work. The following have been reported by Group Leaders for this self-evaluation.

The **Electronic Detector Group** has weekly meetings with safety as a regular agenda item. They discuss ORPS reports, ESRs and observations from their everyday work experience. This group is taking the primary responsibility for developing safety policies for the Daya Bay project and the Long Baseline Neutrino Experiment's Water Cherenkov Detector.

The **PHENIX Group** has group meetings the first and third Thursdays of the month for scientific staff where safety is always a topic on the agenda. The PHENIX technical support team has weekly meetings to discuss safety, work planning, and jobs for the upcoming week. This includes all technicians, engineers, scientific associates, and PHENIX physicists involved in operations. In addition, the engineers and techs on PHENIX discuss the work plan in 1008 at the beginning of each working day. This involves CA-D engineers and safety personnel before the start of all major tasks and scheduling the necessary safety reviews with the various safety review committees when appropriate.

The **Physics Applications Software Group** holds weekly meetings where safety is discussed as relevant to computer engineers and scientists.

The **RHIC and ATLAS Computing Facility Group** holds weekly group meetings where safety and cyber security matters are discussed

The **Accelerator Test Facility Group** has engineering meetings each Monday morning to discuss safety related to the ATF (any corrective actions related to ATF, interlock work, documentation, rack grounding, etc.), and Friday meetings where safety is also discussed.

In the **STAR Group** there are three primary vehicles for communication:

Regular group meetings at which safety is a recurring item for discussion; regular (weekly during the Shutdown) Scheduling and Coordination meetings to review tasks planned to be carried out in the STAR experimental hall and associated buildings, in which work planning is one of the objectives; STAR Skill of the Craft Training.

The first item above is targeted to maintain high awareness on the part of BNL employees who work on STAR that safety is integral to every task they perform and that it has first priority. Ten to fifteen minutes is spent at each group meeting (approximately 1 per month) discussing an aspect of safety (e.g. work planning), reviewing the lessons learned from incidents that have occurred, etc.

The second vehicle above is intended to insure that all work performed at the STAR site by BNL employees and non-BNL guests and visitors goes through the appropriate work planning process before work begins.

The third item is the way in which STAR visitors, collaborators, and guests are informed about their responsibilities related to work planning while working at the STAR site. All STAR Collaborators are further required to take and pass C-AD user training before going to the STAR hall. This training they are aware of the potential hazards they may encounter while at RHIC/STAR, what their response should be if they do encounter such hazards, and what their rights and responsibilities are regarding safe conduct of operations at the STAR hall.

The **Advanced Accelerator Group** has roughly 2 group meetings per year where safety is discussed. Most of the group's work is computer based.

The **OMEGA Group** is a diverse group working in physics analysis, software development, computing, detector construction and operation, and research and development in labs. As such, regular meetings are not held for the entire group but, work planning meetings are held, when necessary, for each of the areas we are involved with. Safety is discussed during the meetings involved with construction and lab work. In addition, lessons learned discussions take place along with follow-ups to our tier 1 inspections. When work planning involves working at other locations (CERN, Fermilab etc.) the staff are required to conform to the safety policies of the locations in addition to the policies instituted by Brookhaven.

The **Medium Energy (RHIC Spin) Group** encompasses three working sub-groups: STAR, PHENIX, Polarimetry. The STAR subgroup discusses safety regularly in its weekly work planning meetings. The Polarimetry subgroup meets weekly during the running of RHIC and as needed during the other periods. Safety is an integrated part of the meetings and included in the work planning. The PHENIX subgroup includes safety discussions and training in preparation for shift duties.

The Department's ESSH Committee reviewed our ESRs electronically not requiring meetings since much of the work is on-going from year to year.

There was one Group Safety Coordinator Meeting to focus on groups' safety and provide valuable worker feedback on safety to Line Management. These discussions are very productive and help to round out the ISM cycle. Additionally, regular communication is maintained with the GSCs conveying safety bulletins and alerts, lessons learned, and soliciting input on various policies and issues.

There are good lines of communications between the ATF and the Physics Department's ESSH personnel. The ATF ESH Officer is the Group Safety Coordinator for the Accelerator Test Facility Group and is a member of the ESSH Committee. This ensures ATF representation in all ESSH activities in the Department. The ATF Group Leader includes the Manager of ESSH&T Programs on the distribution list for the weekly Engineering Meeting notes.

The Physics Department continues to disseminate information on accidents, recalls of products, timely safety messages, and lessons learned to its personnel.

Training

The Physics Department maintained a level of 99% of required training completed for employees and 94% for guests as of 9/30/10.

All employees and long term guests received and reviewed their JTAs.

This year there were new trainings, "Information Security Awareness Qualified" required for all personnel who have an "exempt" status and "Ethical Behavior and Professional Conduct at Brookhaven" required for all employees lab wide.

The Physics Department Chair has mandated the "Introduction to Human Performance Principles" course for all Department members. This has been viewed by about 2/3 of our employees and will be completed for all this fiscal year.

The ATF ESH Officer performs monthly training database and ESR audits of all ATF staff and experimenters. He also gives the Department specific training in addition to the ATF Facility training.

Leadership

The Department ensures it has representation on all the SBMS Subject Area Development Groups for those areas affecting the Department. The Manager of ESSH&T Programs is the SBMS POC (Point of Contact) to ensure all relevant changes to existing Subject Areas or the development of new ones are properly reviewed and/or passed to appropriate Department members for their review.

Members of Physics Department who are involved in departmental and laboratory safety committees or SBMS Subject Areas:

Marcus Babzien - **Laser Safety Committee**

Dana Beavis, - **Chair, C-AD Radiation Safety Committee, C-AD Experimental Safety Committee, Laboratory ES&H Committee**

Bill Christie – **RHIC Experimental Safety Committee, HP Advocate, NPP Safety Council**

Ron Gill, **ESH Coordinator, Laboratory ES&H Committee, Working with Chemicals Working Group, Small Science Working Group, Physics Department ESSH Committee, HP Advocate, Group Safety Coordinator, Electronic ESR Development Team, Daya Bay Safety Officer**

Brant Johnson - **ESSH Committee Chair - BNL Director's Safety Committee, PAAA Committee, NPP Safety Council**

Karl Kusche - **ESSH Officer at the ATF, Public Access AED SBMS Subject Area, Group Safety Coordinator, Physics Department ESSH Committee**

Mike Zarcone – **Event Categorizer (ORPS), Emergency Response Organization, Training & Qualifications Steering Committee, Laser Safety Committee, Operations Forum, Radiation Protection Working Group, NPP Safety Council, Physics Department's ESSH Committee, EEO Representative, Diversity Committee, HP Advocate. Management of Change, Supplemental Oversight of Research Operations**

The Physics department recognized its Group Safety Coordinators with a 'Thank You Luncheon' again this year for the leadership they provide do in bringing safety issues to their groups and group safety issues to management. Additionally, those who perform sweeps during emergency evacuations were also recognized at this luncheon.

Cyber security issues are included in our weekly Management Meeting with one or both of our two Cyber security representatives, Brett Viren and Tom Throwe attending and giving weekly updates. The Department demonstrates leadership as Tom Throwe was the former head and Martin Purschke

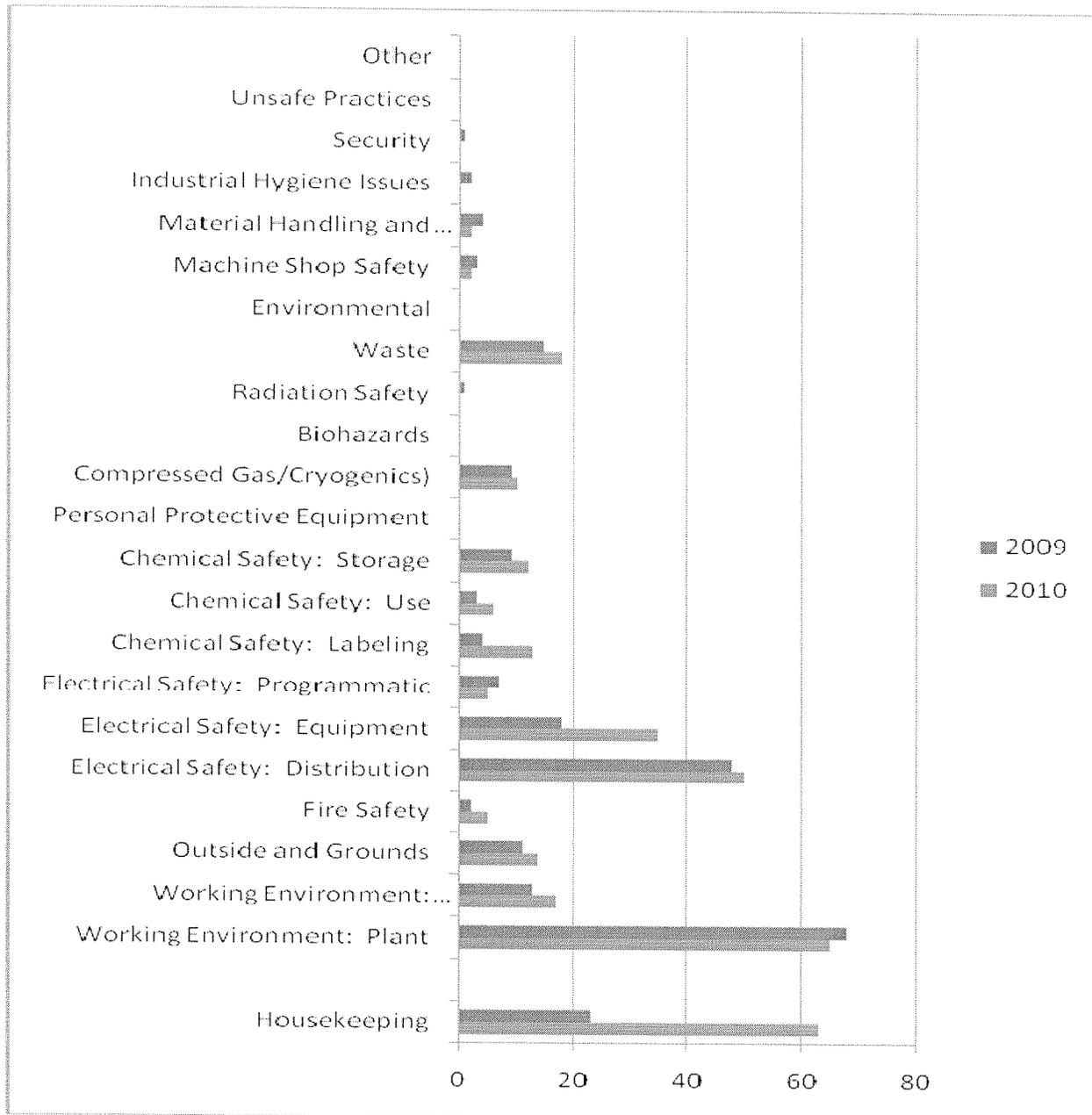
is the current head of CSAC (Cyber Security Advisory Council). The Department has a total of seven representatives in CSAC.

Additionally, the Physics Department makes up approximately one-third of the Cyber Security Policy Working Group (Brett Viren, Jerome Lauret, Wayne Betts, Martin Purschke, and Tom Throwe) with one-third from ITD, and the remainder from other BNL Departments. Tom Throwe and Brett Viren organized a working group to improve the network based security scanner. This group includes representation of ITD's Cyber Security, Unix and Windows groups.

Tier I Program

The Tier 1 program worked very well this year but the number of findings rose by about 30% from last year. This is mostly attributed to the > 80 repeat violations mostly attributed to the infrastructure. No situations involving 'imminent danger' were discovered. As can be seen from the data and the chart below, Housekeeping, Working Environment Plant (lighting), Electrical Safety Distribution (daisy chaining, blocked breaker panels), and Electrical Safety: Equipment issues (bad cords) make up 2/3 of the issues, same as last year. Corrective Actions are assigned and tracked to completion. Participation was good with Department Chair, Associate Chairs, ESSH Committee Chair and members, PIs, Group Leaders, and Group Safety Coordinator participation.

Cat.#	Code	Category	1 st Qtr	2 nd Qtr	3 rd Qtr	4 rd Qtr	Total Findings 2010	Total Findings 2009
1	HK	Housekeeping	11	21	14	17	63	23
2	WEP	Working Environment: Plant	6	28	21	10	65	68
3	WED	Working Environment: Department	3	4	4	6	17	13
4	OG	Outside and Grounds	0	1	0	13	14	11
5	FS	Fire Safety	1	2	0	2	5	2
6	ESD	Electrical Safety: Distribution	11	15	10	14	50	48
7	ESE	Electrical Safety: Equipment	8	15	4	8	35	18
8	ESP	Electrical Safety: Programmatic	0	0	0	5	5	7
9	CSL	Chemical Safety: Labeling	4	2	2	5	13	4
10	CSU	Chemical Safety: Use	3	3	0	0	6	3
11	CSS	Chemical Safety: Storage	6	2	0	4	12	9
12	PPE	Personal Protective Equipment	0	0	0	0	0	0
13	CG	Compressed Gas/Cryogenics	2	2	4	2	10	9
14	BH	Biohazards	0	0	0	0	0	0
15	RS	Radiation Safety	0	0	0	0	0	1
16	WT	Waste	0	8	5	5	18	15
17	EM	Environmental	0	0	0	0	0	0
18	MS	Machine Shop Safety	0	2	0	0	2	3
19	MH	Material Handling and Equipment Safety	2	0	0	0	2	4
20	IH	Industrial Hygiene Issues	0	0	0	0	0	2
21	SEC	Security	0	0	0	0	0	1
22	UP	Unsafe Practices	0	0	0	0	0	0
23	OT	Other	0	0	0	0	0	0
		Total	57	105	64	91	317	241



RED = 2009

BLUE = 2010

Industrial Hygiene Monitoring

The Physics Department has continued its use of our Industrial Hygienist this year with sampling (lead, cadmium, chromium, beryllium, etc.), reviews of flammable cabinets and chemical storage areas for incompatibles and compliance, and sampling for legacy contaminants (radiation & perchlorates) in our hoods scheduled for replacement/removal in the refurbishing of the 3-story wing of Building 510.

ESSH Committee & Work Planning

The ESSH Committee consists of a Department of Energy Facility Representative, a member of the Physics Department's Management (a scientist), a Radiological Controls Division Technician, our Department's Environmental Compliance Representative, two ESH Coordinators, an engineer and ESH Officer from the ATF, and the Building Manager. Additionally, the Department Chair, the Deputy Chair, 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 ESRs that were brought to it this year. Work Permits have been updated in the Department for Machine Shops, computer room, and the routine work performed by staff at the ATF.

All Department Policies were reviewed and some reissued.

The ATF ESH Officer reviews all ESRs, ensures compliance with the Generic Work Permits for day-to-day ATF maintenance, machine shops, and operations. The ATF has its own Work Control Coordinator and generates job specific work permits as needed. Much of the operational procedures are governed by the Conduct of Operations, ATF Handbook, Accelerator Safety Envelope, and ATF task-specific procedures. ATF personnel consistently work within their approved work authorization.

ALARA - Dose Rates

Whole body exposures continue to be very low with a total cumulative exposure of 28 mRem for the entire year. This has been the case for the last 5 years where the annual exposures in mRem were 22, 28, 24, 0, and 56 for the calendar years 2009, 2008, 2007, 2006, and 2005 respectively. Doses at the ATF for the complex continue to remain below 100 mRem as seen on the area monitors.

The storage and radiological footprint for several laboratories where students occupy desks in the lab for long periods of time was reviewed and rearranged. Two of the students from the Medical Department, doing work in our labs had received a dose of 19 mRem each for 2010.

Our source inventory has been reviewed to ensure we are not keeping sources that we have no use for in the Department.

Security

Security issues and information 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 (doors left open) have been given to the Department Chair and Group Leaders of the responsible individuals.

One issue that has recently come to our attention is security in our High Bay in Building 510. As work is being done there and Lab assets are present, we are in the process of securing the area with timed locks. All other exterior doors will remain unlocked as usual.

Cyber Security

Cyber security receives a great amount of emphasis each year and the Physics Department has done its part to satisfy the concerns of the DOE. Cyber security issues are included in our weekly Management Meeting with at least one of our two Cyber security representatives attending.

Cyber security received a "satisfactory" rating from the DOE Chicago Office audit conducted in September of 2009. As a result of the high rating, the Chicago office will not conduct another cyber security audit for two years. The successful outcome of the audit was due, in part, to the great amount of emphasis cyber security is given by the Laboratory as a whole and by the Physics Department in particular. The Department's management and individual members continue to take the cyber security concerns of the DOE seriously.

All computers in the Department continue to have password protected screensavers activated, and DOE login banners installed. All computers running Windows based operating systems are part of the BNL Domain and all those running a form of UNIX have the Ordo host-based scanner installed. The Department continues to respond to potential findings from both the full quarterly network-based scans and the targeted continuous network-based scans. An in-house developed application gives weekly notice of any systems that are out of compliance. Typically there are on order of or less than 0.1% of the department machines with any findings. Finally, the Physics Department continues to ensure that all new and existing laptops are compliant with DOE requirements regarding encryption capability.

ITD has rolled out a project to centralize the administration of user accounts and system configuration management. The Physics Department has completed this on all existing machines and continues to bring new machines into compliance as they arrive.

Though not strictly a cyber security issue, the NUHEP computing resources, currently in Room 2-201, is expected to be moved to a new location in Room 1-89. The move is necessitated by the renovations to be done in the Physics Building and will be done as soon as Room 1-89 is itself renovated.

Tom Throwe sends out a weekly email to individuals whose computers show up on the Nessus scans. Included in the distribution are S. Aronson and P. Bond.

Accident and Incident Management

There was one incident, no ORPS reportable, for the fiscal year as compared to one in 2009, one in 2008, five incidents/accidents for 2007, four in 2006, and three in 2005. There were no PAAA violations.

The incident was a stolen Laptop which was discussed with the Group Safety Coordinators and at a Department All Hands meeting.

There was 1 DOE (OSHA) recordable case, a DART rate of 0.00 (number of cases/200,000 hours worked), a TRC rate of 0.0 (number of cases/200,000 hours worked) and no 1 first aid cases (non-sport related).

- Other non-reportable things that happened this year were:
 - Building Ventilation Impact on ODH – 10/09
 - Radioactive Sources Not in Master Site Inventory – 2/10
 - Compressed Air System Failure – 6/10
 - Smoke Emanating from Air Conditioner, Fire Department Contacted – 6/10

Corrective Action Management

This year we did not do any reviews of the corrective actions that were generated in the past as part of any ORPS reports or PAAA violations in the last few years as none seemed relevant.

Emergency Management

A successful emergency drill was completed in January for occupants of Building 510. The drill provided insight into a few deficiencies and improvements. They are given below.

1. 😊 Emergency Management was very pleased with our sweeper plan and the job the sweepers did.
2. 😊 Emergency Management was very pleased with our accountability program. It functioned well. They would like us to be a little quicker in getting the total results to the Incident Commander so they can begin the rescue process, if necessary, but they recognize the difficulty in getting everyone accounted for in a building of this size in a short period of time.
3. 😊 When the fire alarm, located next to the front door, was pulled, the emergency management people were not aware that the alarm would only sound in one of the areas of 510. There were no alarms in the Phenix or Star halls, the three story wing, or the basement. This was disadvantageous for the drill, but does not put us at greater risk since the areas not alarming are covered by fully functional alarms that would have activated, if affected, in a real fire.
4. Some things the Department can do better:
 - ☹️ We all, except the sweepers, need to leave the building by the *closest* exit then move around the building to the assembly place. A number of people walked through the building instead of going outside by the nearest exit. Some of this was my fault as I gave some people incorrect information.
 - ☹️ The evacuation took 8 minutes as people were standing outside on different sides of the building and needed to be told to go to the assembly area. Emergency Management wants us to get this down to 4 minutes.
 - ☹️ Many people left their office doors open when they left the building. Mostly, this was due to people not being in their offices at the time of the alarm and leaving the building directly from where they were. This could exacerbate the spread of a fire. We'll need to get the residents of the hallways and the sweepers to close doors of the empty offices as they go through their routes.
5. 🚫 The assembly area is not good. Had this been a real fire, the multitude of fire engines and other emergency vehicles would be filling the front circle. There is a possibility of someone getting hurt by the vehicles and we would be in the way of vehicles, fire hoses, etc. if they were needed.
6. 🚫 Two fire doors were found to be chocked open (wooden wedges propping the doors open). We need to make sure this doesn't happen as it could greatly enhance the spread of the fire.

Another drill took place in October 2010 with better results.

Accelerator Test Facility Issues

The dose to the area monitors was reviewed quarterly. The only concern was two areas that may reach 100 mR in a year requiring a higher level of posting. Documentation establishing one of these areas as a low occupancy area was completed few years ago. The other area is in an interlocked room, generally unoccupied when the beam is on, and presents no hazard to the public. An effort to map the radiological footprint in this area was conducted and found to be confined to a small area where there is no occupancy. It is noted that all TLDs of personnel at the ATF have no recorded dose.

The new laser interlock system functions well. The testing procedure continues to be updated with small refinements.

This year we updated the SAD, ASE, and Conduct of Operations Matrix. The SAD (3/1/10) and ASE (3/1/10) were reviewed by the Laboratory ESH Committee; the COO Matrix was awaiting the update to the DOE requirements. This year we will update the Conduct of Operations (COO), if required, to reflect the new DOE Order 442 once the Laboratory and BHSO determine who will need to do it and how it will be done.

Memoranda of Understanding

The Memoranda of Understanding were reviewed, or updated. These MOU establish the responsibilities for Work Planning and Control of Experiments and Tier I Inspections. They are:

- MOU with C-AD for Physics Personnel working in C-AD space (renewed 1/10/10)
- MOUs (2) with ITD for our use of Building 515 (8/30/10)
- MOUs (2) with the CMPMS Department for their use of Building 510 space (10/1/10)
- MOUs (2) with the Photon Sciences Directorate for their use of Building 820 space (10/1/10)

GSC Program

The GSCs were again involved as members of our safety teams. Safety information (recalls, lessons learned, etc.) is 'funneled' to groups in this way. GSCs are responsive and feedback information to the Safety & Training Office. A 'Thank-You' luncheon and meeting was held in October. Nicole Kelly, Ken Asselta, Marcy Chaloupka, Joseph Cracco, Susan Duffin, Susan Foster, Ron Gill, Harold Kirk, Karl Kusche, Richard Hogue, Bob Scheetz, Sean Stoll, and our colleagues from the CMPMS Department - Robert Konik, Al Langhorn, Fran Loeb, Bill Schoenig, and Ed Stein. Additionally, we invited the sweepers from our emergency management plan and others who have made contributions in the last year.

The discussions and interaction of this group remain productive each year. The group is instrumental in bringing safety issues to management and bringing back information to their groups.

Many of the GSCs are now part of our Emergency Response Program. They have 'sweep' routes and accountability responsibilities. They work with the Group Leaders and the LEC and have greatly improved our compliance.

Environmental Performance

Physics has an outstanding record with regard to protecting the environment. Over the past few years, the waste generated has been below the projections Waste Management has provided for the Physics Department. The Department has increased awareness for proper waste disposal which has nearly eliminated personal waste (trash and items brought from home) and improper disposal of

items (computer monitors, etc). More lead bricks in building 510 have been recycled and more at the ATF have been replaced with painted ones. Some vacuum pumps that contain oil have been replaced with dry pumps reducing the oil waste generated. We have reduced the number of chemicals and sources in the building. The Department also recycled a few thousand pounds of lead.

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. The Department Chair and the ESH Coordinator met with the students as a group when they arrived. The ESH Coordinators and Building Manager specifically looked for students working in laboratories throughout the summer to make sure they were working safely. Students were reminded to wear bicycle helmets.

The ATF does host students throughout the year. The students receive a comprehensive orientation and are monitored at all times. Their ability to work independently is governed by their achievements in their areas of expertise and demonstrated record of compliance.

Physics Department & Condensed Matter Physics / Materials Science Department

In two MOUs established last year, the Physics Department provides safety services for the CMPMS Department. Specifically, responsibilities for ESRs, Work Permits, Authorized User Lists, Web request approvals for chemicals and hazardous equipment, Radiation Generating Devices, LO/TO, FUAs, waste, training, audits, Accident/Incident Investigation, EMS, OHSAS, Self-Assessment and Evaluation, Points of Contacts, and Tier I Inspections are covered in these agreements.

This arrangement will continue until the Interdisciplinary Science Building is built and the CMPMS group moves into it.

Safety Observations

The Physics Department Chair, Associate Chair, Deputy Chair, and Manager of ESSH&T Programs participate with the ALD of NPP, Managers and Chairs from the C-A Department and others to perform monthly safety observation walkthroughs in the NPP Directorate. These have proved to be fruitful. A number of corrective and follow-up actions have resulted from these observations. Each member completed the required 12 observations. Observations were undertaken in the Physics Department, Phenix & STAR Experimental Halls this past year. No unsafe acts were observed.

A SORO (Supplementary Oversight of Research Operations) Observation was undertaken by The Manager of ESSH&T Programs, and members of the Medical Department that included the Chair, ESH personnel, and scientific staff from PET/MRI observing the work done by the medical students in building 510. A number of useful suggestions came from this.

Additionally, our DOE Facility Representative and the Manager of ESSH&T Programs also make unannounced visits to areas of the Department. During these visits, workers have an opportunity to bring safety issues to the attention of our DOE Representative who has followed up on issues to the benefit of the Department, the work area, and the morale of employees.

Audits

External

- BHSO ISM Effectiveness & ESR Audit – 12/09 *No findings*
- IH Multi-Topic Assessment – 2/10 *No findings*
- Lasers
- Static Magnetic Fields

- Non-ionizing Radiation
- EPA RCRA Inspection – 2/10 *No findings*
- BHSO Electrical Safety Assessment – 4/10
- Corrected Electrical Work Permits
- Incomplete Training Requirements – LOTO needed for >200 V
- Knockouts missing on circuit breaker boxes missing
- No MOU for Tier 1 inspections in that area
- NYS DEC Hazardous Waste Audit – 4/10 *No findings*
- EMS-OSH Surveillance Audit – 5/10 *No findings*
 - No non-conformances lab-wide
 - Science Divisions: Implementation of the ESR review process at the project or specific experiment level is commendable.
 - Science Divisions: Pilot Electronic ESR is a positive example of employee involvement in the development of tools.
- DOE Assessment of the BNL Fire Safety Program – 5/10
 - Materials in corridors impede egress
- BHSO Surveillance Software Safety – 9/10 *No findings*

BNL Internal

- Nessus Daily scans for cyber security high vulnerability
- Nessus Full Scans – Quarterly
- Building Hazard Assessment – 11/09
- Flammable Cabinet Inventory – 11/09
- Work Planning & Control Assessment – 11/09
- Lead Storage and Use Inventory – 2/10
- He-3 Inventory – 5/10
- Beryllium Use Assessment – 8/10

Physics Assessments

- Tier 1 Inspections
- Management Work Observations
- Lead & Cadmium Surface Wipes
 - Identify contamination of areas being vacated
 - Improve work practices, in collaboration with CMP
 - Clean up legacy areas, in preparation for the renovation
- Quarterly Reviews of ATF Area Dose Rates
- Annual review of Individual Dose Rate including cross-departmental workers
- Annual Policy & Procedure Reviews
- Annual Hazard Placard Reviews
- Annual LO/TO Review
- Emergency Management – 1/10
- Radioactive Source Review for reduction in unneeded sources – 1/09
- Physics Department FY09 Self Evaluation – 12/09
- Chemical Inventory Reconciliation – 3/10
- Various Ergonomic Evaluations
- Hood flow audit 5/10
- Noise Surveys Buildings 510 & 820 – 10/09

Completion of Recommendations/Goals for FY 2010

1. Continue reducing chemicals and cleaning up flammable cabinets of unneeded spray cans
 - a. Chemicals removed from former machine shop, 2-233
 - b. Removed more lead and a large quantity of paints, spray cans, oils, and epoxies – mostly non-bar-coded items
 - c. Down to 143 – mostly epoxies, oils, and solvents
2. Prepare for the renovation by reducing unneeded equipment and clean up more storage cages
 - a. The STAR and Omega cages were cleaned out and re-organized. Several other cages (Phenix, Electronic Detectors, CMPMSD) were partially done as well. The CMPMS Department vacated one of their storage rooms. A number of laboratories in the 3-story wing have been cleaned out and will not be reused at this time.
3. Sample and clean at least 2 labs for heavy metal contamination
 - a. The last tech machine shop was removed and the room tested for heavy metals. All were below laboratory thresholds.
4. Compliance with new PPE rules for chemicals
 - a. Labs all posted with rules for using and storing chemicals. Some areas were consolidated.
5. ALARA Review of new Phenix workspaces
 - a. Done.
6. Generate a MOU with NSLS and NSLS II for Building 820
 - a. Completed 12/10
7. Renew MOUs with C-AD and ITD
 - a. Done.
8. Keep up with NRTL/EEI inspections for new and brought in equipment
 - a. Department complete, new items are caught during Tier I inspections
9. Improve emergency planning by conducting and analyzing a drill
 - a. Two drills completed this calendar year at building 510.
 - b. Building 820 drill pending approval of MOU
10. Continue to suggest improvements of the network scanner through the Scanning Working Group.
 - a. After suggestions were initially considered the Group did not feel there was a need to continue at this time
11. Continue to bring eligible machines into ITD's centralization project and provide an equivalent option for other machines.
 - a. Complete
12. When the new computer room is completed, move the NUHEP computing resources to the new room ahead of the building renovation.
 - a. Room not yet completed

Recommendations/Goals for FY 2011

1. Coordinate/work plan the moving of personnel prior to renovation so that there are no injuries/accidents
2. Work with the new FCM, FPM, and lab people to improve the IFM as it relates to Physics
3. Remove remaining legacy chemical items from labs and storage
4. Sample vacated labs for lead, cadmium, beryllium, and chromium
5. Volunteered to replace Hazard Placards – Area designations and PPE required
6. Get rid of remaining oil pumps from basement
7. Complete HP introduction for remaining employees
8. Work with ITD to receive an Authority to Operate for BNL
9. Continue to meet the cyber security goals of the DOE while maintaining our ability to do science

Acronyms

ALARA	As Low As Reasonably Achievable
ALD	Associate Laboratory Director
ASE	Accelerator Safety Envelope
ATF	Accelerator Test Facility
ATS	Action Tracking System
BES	Basic Energy Sciences
BNL	Brookhaven National Laboratory
BSA	Brookhaven Science Associates
BTMS	Brookhaven Training Management System
BURF	Beryllium Use Review Form
C-AD	Collider-Accelerator Department
CA	Corrective Action
CFN	Center for Functional Nanomaterials
CMP	Condensed Matter Physics
CMPMS	Condensed Matter Physics & Materials Science
CMPMSD	Condensed Matter Physics & Materials Science Department
COO	Conduct of Operations
DART	Days Away, Restricted, or Transferred
DEC	Department of Environmental Compliance
DER	Department EMS Representative (R. Gill)
DOE	Department of Energy
DOE-BHSO	Department of Energy-Brookhaven Site Office
EAC	Environmental Assessment Committee (R. Gill and F. Craner)
ECR	Environmental Compliance Representative (F. Craner)
EMS	Environmental Management System
ESH (ES&H)	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
ESSH&T	Environment, Safety, Security, Health, and Training
EWMSD	Environmental & Waste Management Services Division
FY	Fiscal Year
GSC	Group Safety Coordinator (See <u>GSC list</u>)
IA&O	Internal Audit and Oversight
ISM	Integrated Safety Management
ISSM	Integrated Safeguards and Security Management
ISO	Independent Standards Organization
ITD	Information Technology Division
JTA	Job Training Assessment
LOTO	Lock Out Tag Out
LSO	Laser Safety Officer
MOU	Memorandum of Understanding
MPMS	Magnetic Properties Measurement System
NFPA	National Fire Protection Act
NPP	Nuclear and Particle Physics
NRTL	Nationally Recognized Testing Laboratory
NSLS	National Synchrotron Light Source

NYSDEC	New York State Department of Environmental Compliance
OHSAS	Occupational Health & Safety Assessment Series
OPSEC	Operations Security
ORPS	Occurrence Reporting and Processing System
OSHA	Occupational Safety and Health Administration
PAAA	Price-Anderson Amendment Act
PI	Principal Investigator
POC	Point of Contact
R2A2	Roles, Responsibilities, Authorities, and Accountabilities
R&D	Research and Development
RCD	Radiological Controls Division
RCRA	Resource Conservation and Recovery Act
RF	Radio Frequency
RGD	Radiation Generating Device
RHIC	Relativistic Heavy Ion Collider
SAP	Self Assessment Plan
SBMS	Standards Based Management System
SECON	Security Conditions
SOP	Standard Operating Procedures
TLD	Thermoluminescent Dosimeter