

“Occupational Safety & Health” Management Review

BNL Site

12/17/07



Management Review Scope

- Review the BNL Site OHS management system to ensure its continuing suitability, adequacy and effectiveness.
- Scope includes facilities, experiments and operations to determine that they are managed in accordance with the OSH Management Systems.
- Topics (per OHSAS 18001)
 - Overview of Management System and Financial Investments
 - Evaluation of Completeness of Hazard evaluations
 - Review of OSH Performance –
 - **Audits and Assessments**
 - **Leading and Trailing Indicators**
 - **Review of Performance on Injury and Illness Reduction & Improvements Initiatives**
 - **Review of Performance on FY07 OSH Objectives**
 - Communication, participation and consultation
 - Changing Circumstances
 - Planned Injury and Illness Initiatives & Objectives for FY08
 - Management Review Questions

Agenda of Topics (per OHSAS 18001)

Section 1: Overview of Management System and Financial Investments

Section 2: Evaluation of Completeness of Hazard Evaluations

Section 3: Review of OSH Performance - Audits and Assessments

Section 4: Review of OSH Performance - Leading and Trailing Indicators

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Section 6: Review of Performance on FY07 OSH Objectives

Section 7: Communication, Participation and Consultation

Section 8: Changing Circumstances

Section 9: Planned Injury and Illness Initiatives & Objectives for FY08

Section 10: Management Review Questions

Overview of the OSH Management System

| OHSAS 18001- OSH Representatives | |
|--|---------------------------------|
| Site OSH Representative | Patricia Williams |
| Basic Energy Science | John Taylor |
| Collider Accelerator Department | Edward Lessard |
| Support Organizations Reporting to the Director's Office | Nicole Bernholc |
| Energy, Environment, and National Security | Patricia Carr; Patrick Sullivan |
| Environment, Safety & Health Directorate | Robert Selvey |
| Facilities and Operations | Raymond Costa |
| Instrumentation Division | Robert DiNardo |
| Life Science Directorate | Ann Emrick |
| National. Sync. Light Source | William Casey |
| Physics Department | Ronald Gill; Michael Zarcone |
| Superconducting Magnet | Kenneth Krasner |

Changes in FY07: marked in yellow

Financial Investments

OHSAS 18001 Program Resources/Cost

| OHSAS 18001 Program | Persons in this role | Person-hours /year in FY07 | Estimated Cost |
|--|----------------------|----------------------------|----------------|
| Site OSH Management Representative | < 1 | ~60 | ~ \$6,500 |
| Site OHSAS 18001 Project Manager | < 1 | ~ 300 | ~ \$30,000 |
| Line Organization OSH Representatives and POCs | 19 | (~ 3000) | (~ \$300,000) |
| Registration Fees | -- | -- | \$15,000 |
| Total | -- | -- | \$351,500 |

Financial Investments

Worker Safety & Health Program Resources/Cost

| OSH Oversight and Consultation at BNL | FTE | Estimated Cost |
|---|------------|-----------------------|
| SHSD Safety & Health Representatives | 6.4 | \$2.98 M |
| SHSD Program Professionals | 10.8 | |
| Material Costs of SHSD (meters, equipment, calibrations, analysis, MST) | | \$0.82 M |
| RCD Facility Support Representatives | 32 | \$4.88 M |
| RCD Program Professionals | 21 | |
| Material Costs of RCD (meters, equipment, analysis, calibrations, dosimetry, MST) | | \$1.13 M |
| Work Control Managers and Coordinators | 290 | --- |
| ESH Coordinators | 55 | --- |
| Training Coordinators | 36 | --- |

Financial Investments

Worker Safety & Health Program Resources/Cost

FY07 Spending on Special Projects

| | |
|--|----------------|
| IH Baseline Monitoring | \$250K |
| NRTL Electrical Equipment Inspections | \$40K |
| 10 CFR 851 (consultant for Fire Safety Gap, CAP Development, Program Plan) | \$135K |
| ISM (consultants) | \$331K |
| Safety Solutions (S2) Program | \$21K |
| Arc Flash | \$1200K |
| Emergency Services (Baseline Needs Assessment) | \$65K |
| Fire Hazard Analysis | \$145K |
| Fire Alarm Upgrades | \$395K |
| Emergency Planning | \$921K |
| Total | \$3503K |

Overview of the OSH Management System

Written OSH Program: Centralized at Site level

- Site OHSAS Web Site
- Objectives
- Internal Audit
- **OHSAS 18001 Interim Procedures:** Extended from 12/15/08 to 1/30/08. Being replaced with SBMS Subject Area: Draft prepared & team reviewed; SBMS Comment period 12/20/07. ETA for publications: early January 2008.

Written Program: Maintained at Department/Division Level

- Division OSH Web Sites
- Objectives
- Hazard List & Risk Assessments (JRA and FRA)
- Records and Document Control Management
- OSH Program Descriptions

OHSAS 18001-2007 no longer requires unique, separate documentation that describes the OHSAS 18001 elements. BNL's Worker Safety & Health Management System and other SBMS subject areas provide adequate documentation.

OSH Program Descriptions will not be needed by most line organizations when the 18001 Subject Area is published. They can determine if they want to reduce or eliminate their *OSH Program Descriptions*.

ESSH Policy

- All Directorates and Divisions have posted copies of the Policy in their buildings.
- The Policy is also accessible from multiple BNL Web Sites
- No issues were raised in the Internal Audit or NSF Audits regarding BNL staff understanding or accessing the policy.

Output: Decision & Action Related to Possible Change

Record of Decision: No new action or changes needed in Policy

Environmental, Safety, Security, and Health Policy

Brookhaven National Laboratory

This document is a statement of BNL's ESSH policy. BNL is a world leader in scientific research and strives to demonstrate excellence in protecting people, property and the environment.

I expect every employee, contractor, and guest to take personal responsibility for adhering to the following principles:

- **Environment:** We protect the environment, conserve resources, and prevent pollution.
- **Safety:** We maintain a safe workplace and we plan our work and perform it safely. We take responsibility for the safety of ourselves, coworkers and guests.
- **Security:** We protect people, property, information, computing systems, and facilities.
- **Health:** We protect human health within our boundaries and in the surrounding community.
- **Compliance:** We achieve and maintain compliance with applicable ESSH requirements.
- **Community:** We maintain open, proactive and constructive relationships with our employees, neighbors, regulators, DOE, and our other stakeholders.
- **Continual Improvement:** We continually improve ESSH performance.

In addition to my annual review of BNL's progress on ESSH goals and adherence to this policy, I invite all interested parties to provide me with input on our performance relative to this policy, and the policy itself.

Signed


Sam Aronson, Director

September 6, 2006

Agenda of Topics (per OHSAS 18001)

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Hazard Identification, Risk Assessment and Risk Control

Evaluate the Completeness of the hazard Lists

| BNL Site Level JRA/FRA Guidance to Hazards and Controls | | Rev 1 12/05/07 |
|---|--|----------------|
| Chemicals- Hazardous or toxic material/ exposures | Ionizing radiation exposure - X-Rays, neutron, gamma | |
| Confined Space | Manual Material Handling/Lifting Heavy Objects | |
| Driving | Obstructed/tight work space | |
| Electrical Energy | Potential Energy | |
| Egress | Nanomaterials | |
| Ergonomic hazards | Non-ionizing radiation | |
| Elevated Areas | Natural Environmental Hazards | |
| Excavation | Noise | |
| Fire | Rotating parts | |
| Indoor air quality- Poor | Temperature extremes | |
| | Walking/Working surfaces | |

The BES OSH Review noted that the site level hazard list did not have “Nanomaterials”. Nanomaterials was added as a separate Hazard from “chemicals”. Posted to OSH web site on 12/05/07.

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Results of Audits

OHSAS 18001 Internal Audit



Conducted by SHSD and EWMSD - **February 2007**

Corrective action on findings were covered in ATS 3639 (2 actions)

- **OSH Major Non-conformances: None**
- **OSH Minor Non-conformances: 2**
 - One organization's FRA/JRAs not reviewed within required cycle (closed)
 - Resources for 18001 Project Management (closed)
- **Opportunities for Improvement: 19**

Results of Audits

OHSAS 18001 External Audit



- **Phase 3 by NSF** - Dec 2006 (Certified by NSF)
 - MAJOR NC: none
 - MINOR NC: 3
 - JRA form: certain columns were misused or risk was not recalculated after controls added (corrected)
 - Document Control issues (corrected)
 - SHSD was lacking certain Requirements Management drivers (corrected)
 - OFI: 3

- **Site Re-registration by NSF** - May 2007
 - MAJOR NC: none
 - MINOR NC: none
 - OFI: 4



Registered to
OHSAS 18001

Results of Audits

OSH Compliance- Internal Assessments



Industrial Hygiene

Site written program and line implementation

(Corrective actions are being tracked in ATS 3943.)

- Findings: Bloodborne Pathogens (3); Chemical Use (6); Confined Spaces (2), and Respiratory Protection (2)
- Chemical storage was problematic in research labs,
- Emergency Response Respiratory Protective equipment program had deficiencies,
- Confined Spaces and Bloodborne pathogens has minor implementation gaps, Document Control, and Out-Dated Procedures/Plans

Issue: Improper chemical storage issue in labs. Poor CMS barcode inventory accuracy (<75%). BNL should consider a Site funded CMS Representative similar to the WMR to keep barcoding and storage programs accurate.

Results of Audits

OSH Compliance- Internal Assessments



Internal Control Documentation- Questionnaire

- 29 organizations: Most indicated full implementation or delineated a path forward to achieve full implementation.
- No additional actions based on the results. Assessment scheduled in December 2007 to determine the effectiveness of implementation.

Calibration: Extent of Condition Review-

Site written program and line implementation

- Calibrations of ESH monitoring equipment received praise for program design and implementation.
- One instance of ODH sensor not calibrated.

Results of Audits



OSH Compliance- Internal Assessments

Construction Safety / Excavation Safety

Site written program and line implementation reviewed

2 findings:

- Construction Safety: Corrective actions from safety inspection reports are not followed-up and documented.
- Excavation Safety: Distinct digging permit numbers are not issued by MMC.

Results of Audits



OSH Compliance- Internal Assessments

Lockout / Tagout –

Site written program and line implementation reviewed-

Findings: none

Recommendations:

- Update BNL's contract to include the proper standards.
- Update Lockout/Tagout Subject Area in certain sections dealing with training and the definition of requirements.

Contractor/Vendor Orientation Training –

Findings: 1

- No training evaluations provided to attendees.

Recommendations:

- Instructors take OSHA 10-hour construction industry course.
- Revise CVO video to include material on OHSAS 18001, 10 CFR 851 and work planning.

Results of Audits



OSH Compliance- Internal Assessments

Injury Management –

Site written program and line implementation reviewed

Findings: 3:

- Communicate Return-to-Work meetings;
- Provide training for line managers and supervisors; and
- Revise the *Injury Management* Subject Area to clarify elements not understood.

Incident Investigation –

Site written program and line implementation reviewed

Findings: 3

- Revise the investigation form;
- Provide training for investigators; and
- Revise the *Investigating Incidents, Accidents and Injuries* Subject Area.

Results of Audits

OSH Compliance- External Audits



DOE- BHSO Exhaust Ventilation: Q1 (no report issued yet)

- Anticipated Corrective Action will be needed based on observations by the BNL counterpart: *Repair of aging exhaust ventilation systems may have major cost impacts on BNL.*

ISSUE: Line organization “ownership” of exhaust ventilation systems (lab hoods) rather than the BNL site “landlord” causes maintenance issues for programs with limited funding. BNL should investigate making toxic exhaust ventilation systems a landlord function in the space charges.



ES&H Ratings



Core Functions of ISM

| | CF#1 – Define Scope of Work | CF#2 – Analyze Hazards | CF#3 – Develop and Implement Controls | CF#4 – Perform Work Within Controls |
|---------------|-----------------------------|------------------------|---------------------------------------|-------------------------------------|
| NLSL | Effective Performance | Effective Performance | Effective Performance | Needs Improvement |
| Small Science | Effective Performance | Needs Improvement | Needs Improvement | Needs Improvement |
| Maintenance | Effective Performance | Needs Improvement | Needs Improvement | Needs Improvement |
| Construction | Effective Performance | Needs Improvement | Needs Improvement | Effective Performance |

Feedback and Continuous Improvement (CF-5)

SC and BHSO

Needs Improvement

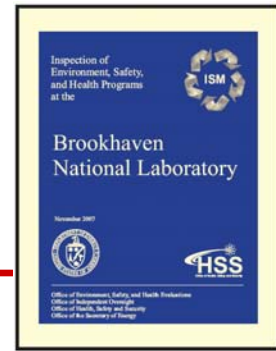
BSA

Needs Improvement

Results of Audits

External Audit

DOE: Integrated Safety Management



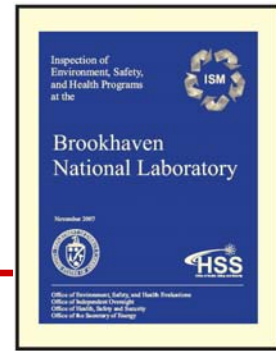
Positive

- BNL senior management has effectively used a structured, project management approach to implement corrective actions from the 2006 readiness review.
- BNL organizations have developed processes that, when implemented with sufficient rigor, are effective in defining the scope of work, analyzing hazards, and identifying needed controls, and have enhanced several ES&H programs.
- BNL has established and implemented a noteworthy program for inspection of heavy equipment.

Results of Audits

External Audit

DOE: Integrated Safety Management



Weaknesses (4 Major Issues, 7 Findings in Appendix B)

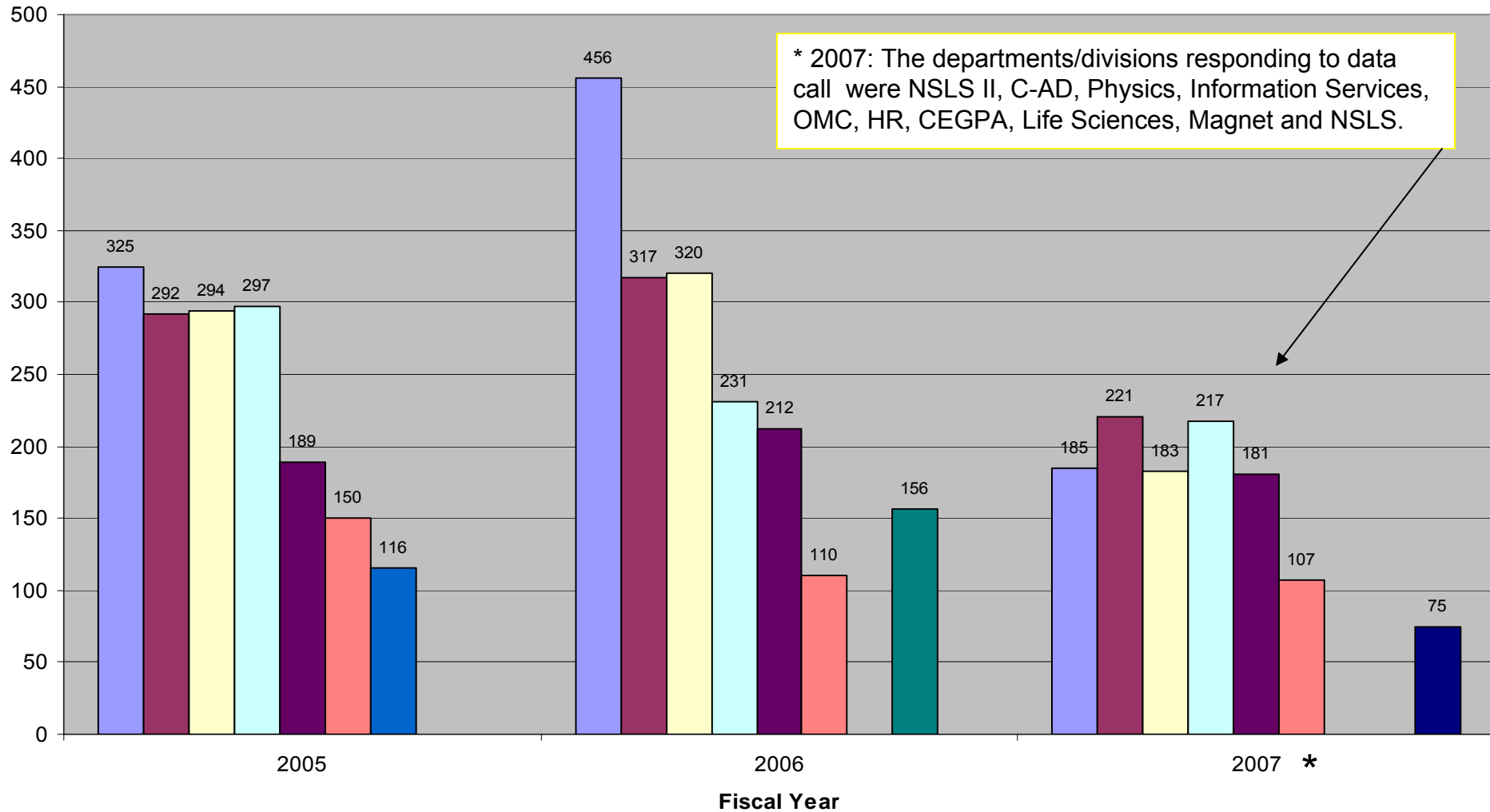
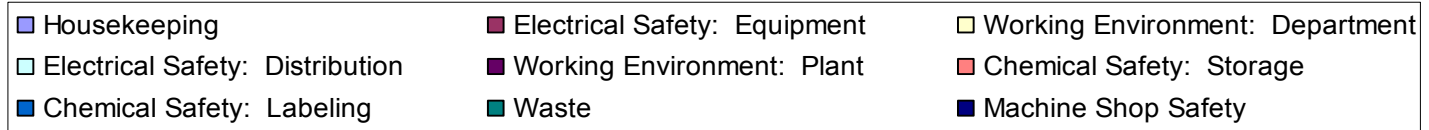
- BNL has not ensured that unambiguous ES&H requirements are established at the institutional level and accurately communicated to BNL personnel through organizational implementing procedures that align with those requirements.
- BNL managers and supervisors have not always ensured that established safety controls are implemented by workers, particularly activities in experimental and research facilities and laboratories.
- Some workplace and construction hazards have not been adequately analyzed.
- BNL has not established and rigorously implemented effective contractor assurance systems in a manner that sufficiently communicates expectations and requirements, ensures effective implementation, and effectively drives continuous improvement in safety performance.

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Tier 1 Inspections

Top 7 Tier I Findings by Category



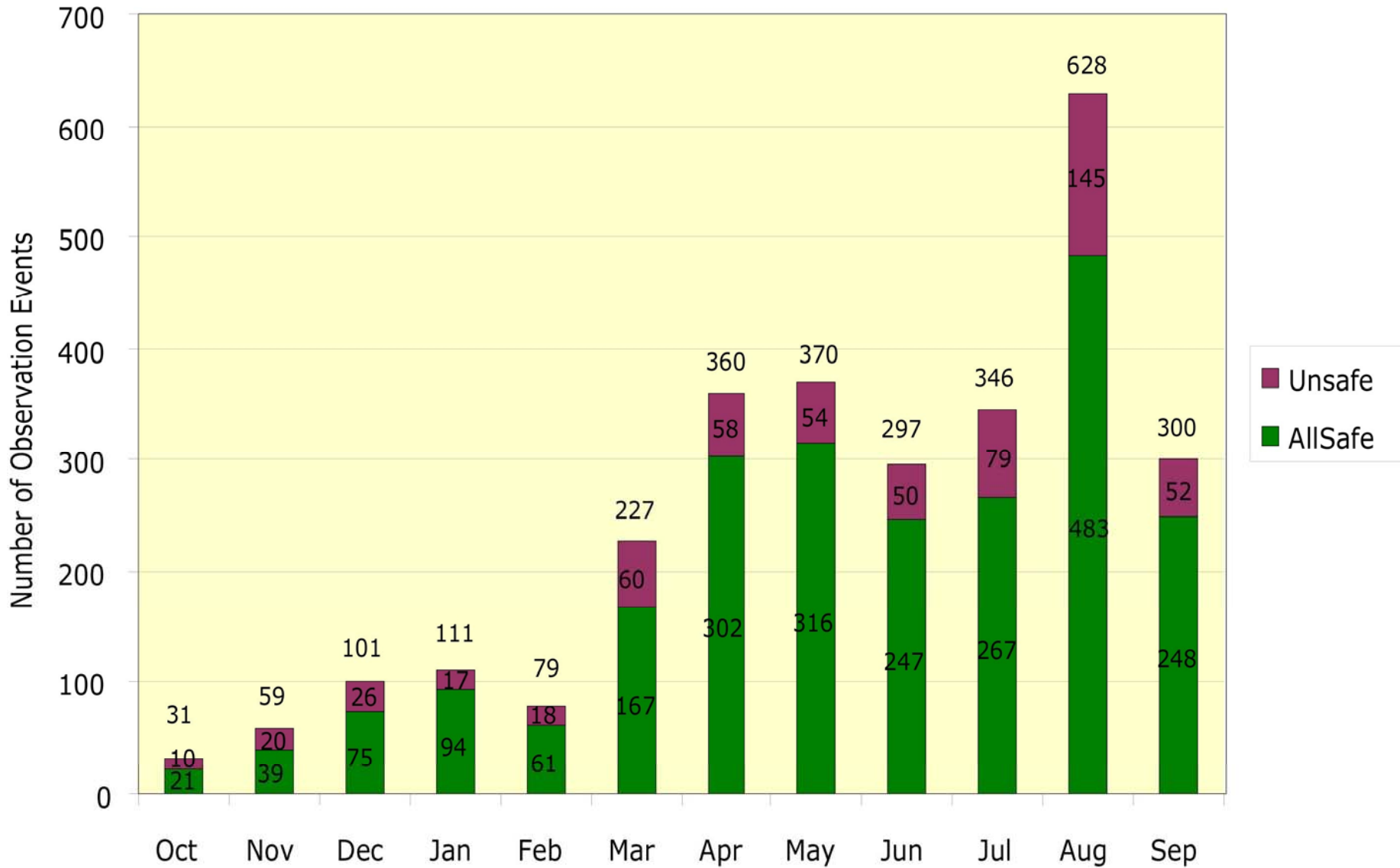
Tier I Inspections

ISSUE: Various Tier 1 reporting formats are in use at BNL. That makes it very difficult to trend data and review for areas of concerns.

Action: BNL needs to develop a centralized database. (SORD OSH Management Review & ISM Review) **Action: Being addressed by Tier I Working Group.**

Safety Observations - FY07

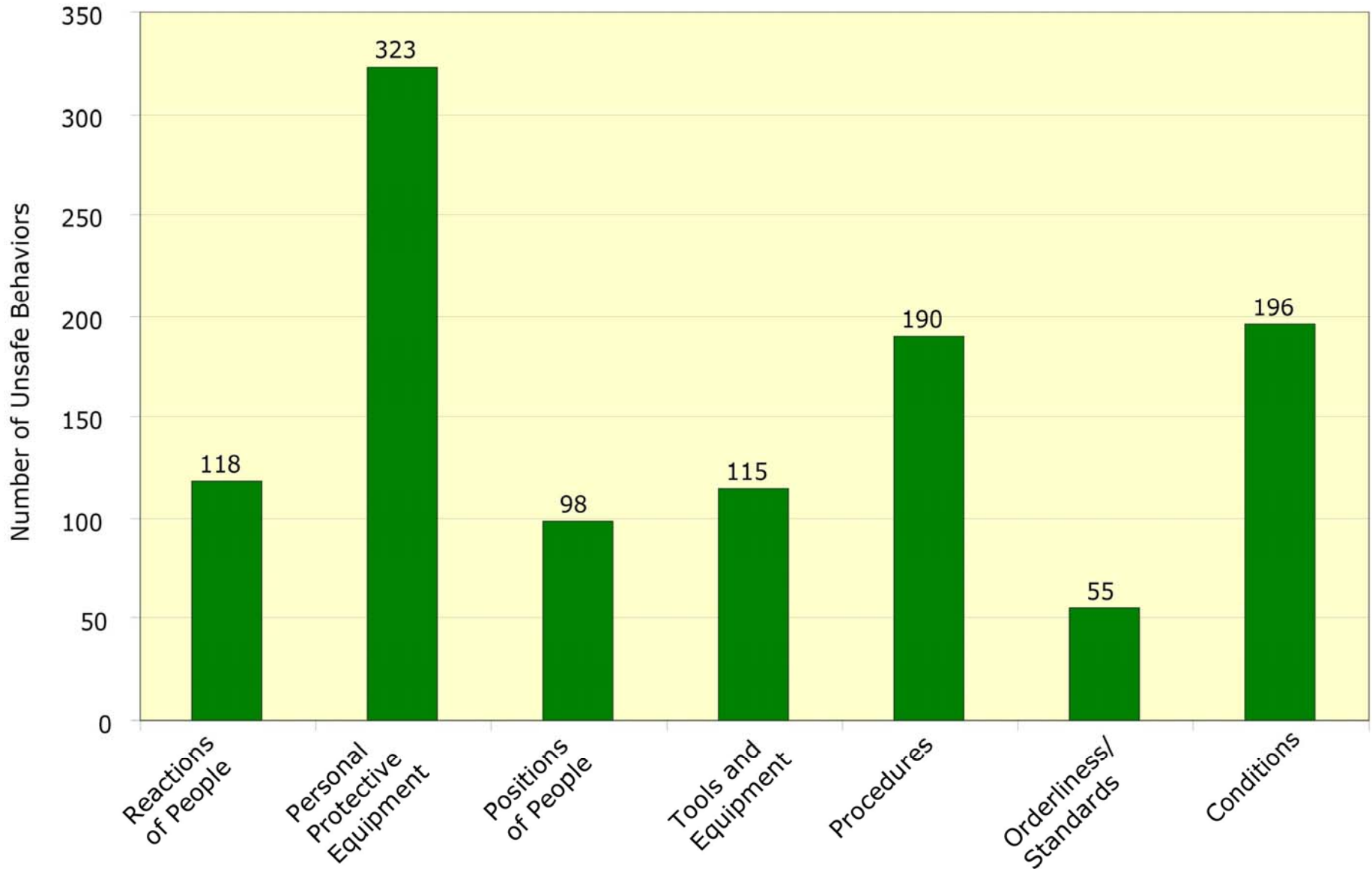
(Total observation events 10/1/2006 - 9/20/2007 = 2612)



Unsafe Behaviors Observed - FY07

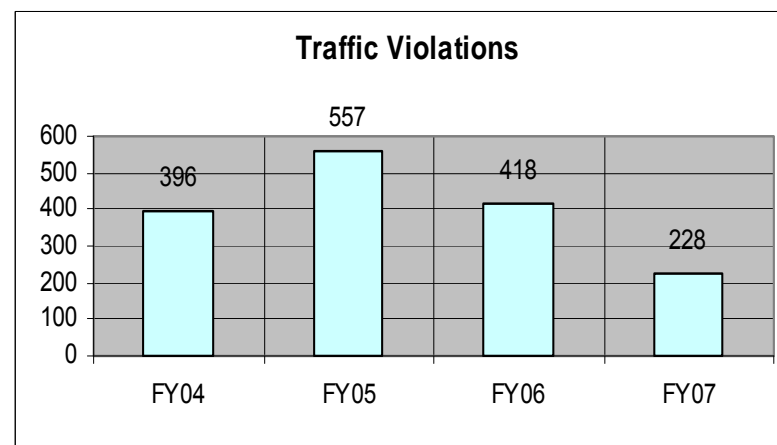
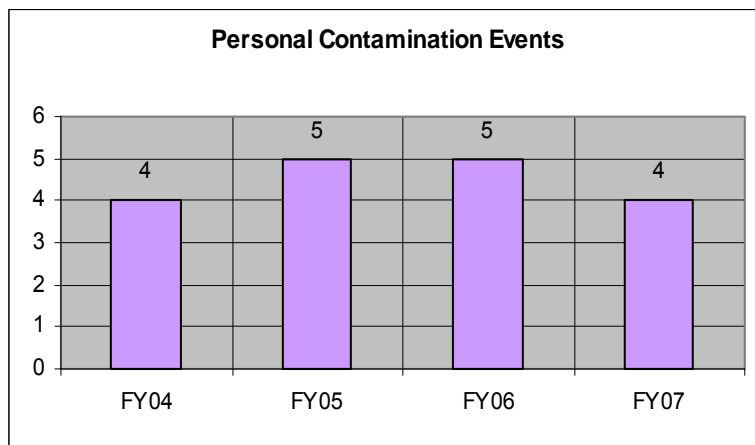
(Total Observations With One or More Unsafe Behaviors 10/1/06 - 9/20/07 = 540)

(Total Unsafe Behaviors 10/1/06 - 9/20/07 = 1095)



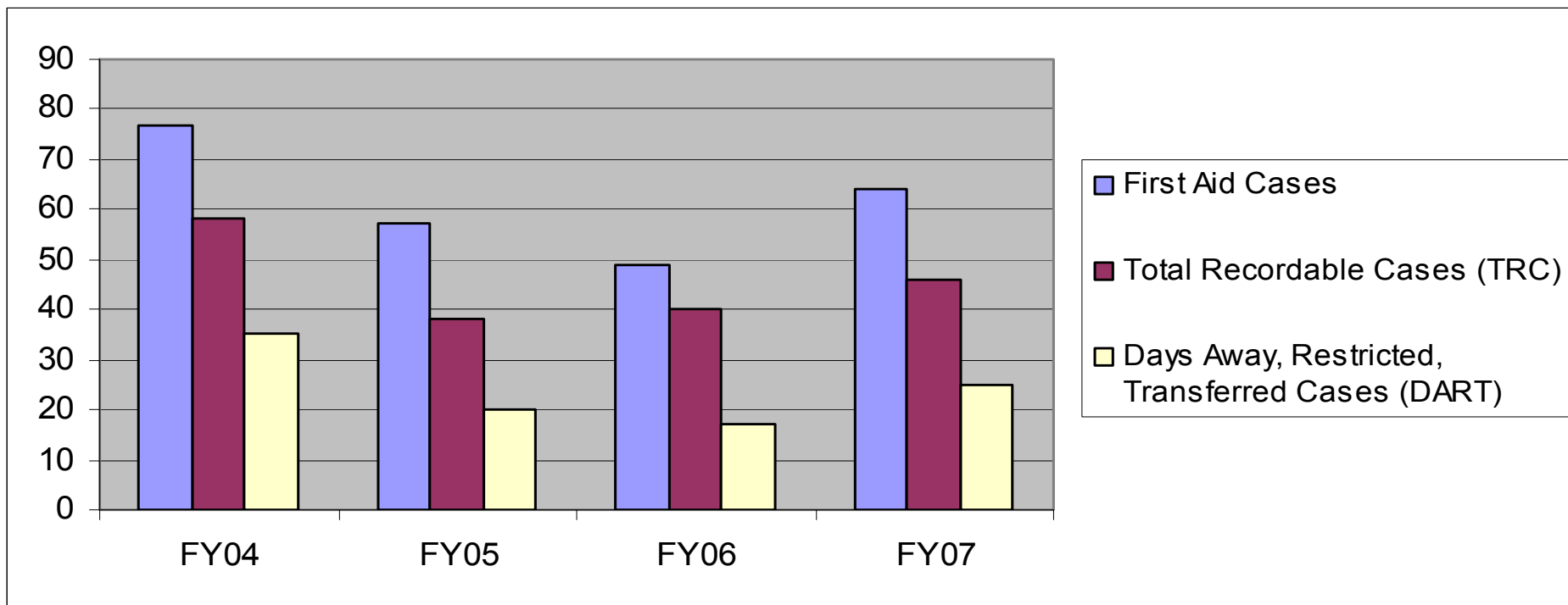
FY 07 OSH Performance

| Actual Number | FY04 | FY05 | FY06 | FY07 |
|---|-------------|-------------|-------------|-------------|
| Personnel Contamination Incidents | 4 | 5 | 5 | 4 |
| BNL Traffic Violations (parking, speeding, moving) | 396 | 557 | 418 | 228 |



FY 07 OSH Performance

| Actual Number of Cases | FY04 | FY05 | FY06 | FY07 |
|--|-------------|-------------|-------------|-------------|
| First Aid Cases | 77 | 57 | 49 | 64 |
| Total Recordable Cases (TRC) | 58 | 38 | 40 | 46 |
| Days Away, Restricted, Transferred Cases (DART) | 35 | 20 | 17 | 25 |

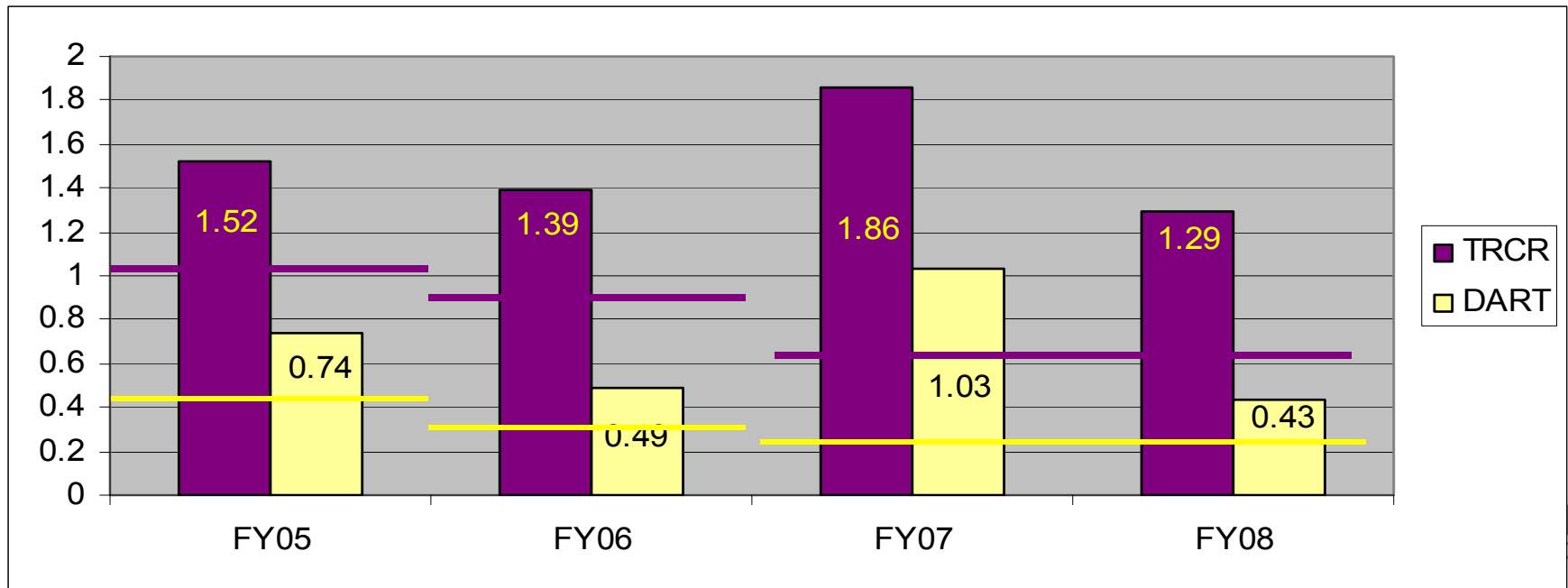


FY 07 OSH Performance

DART = Days Away, Restricted, Transferred (Rate)

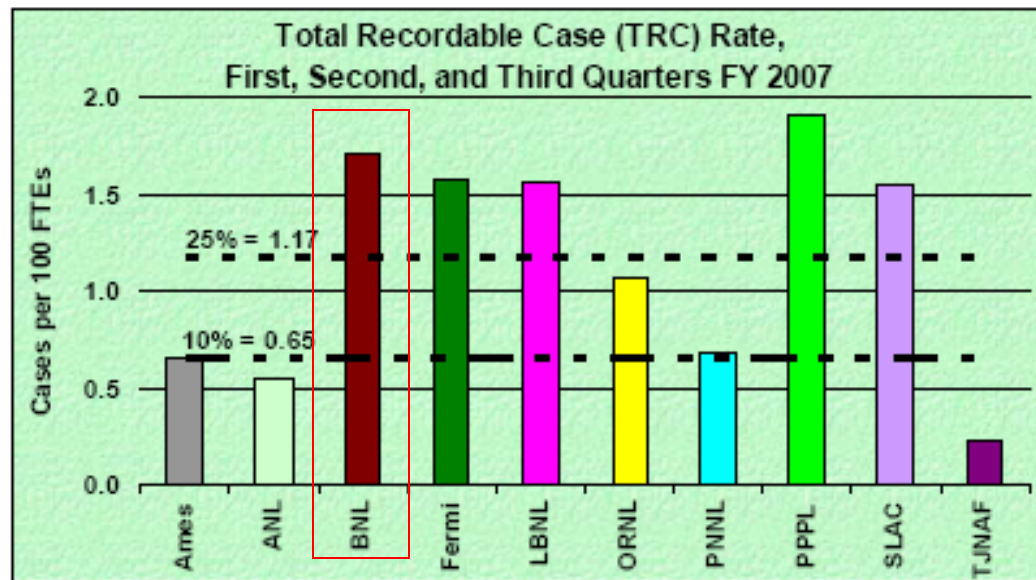
TRCR = Total Recordable Case Rate

| Rates | FY05 | | FY06 | | FY07 | | FY08 GOAL | |
|-------|------|--------|------|--------|------|--------|-----------|------|
| | Goal | Actual | Goal | Actual | Goal | Actual | Goal | YTD |
| TRCR | 1.05 | 1.52 | 0.87 | 1.39 | 0.65 | 1.86 | 0.65 | 1.29 |
| DART | 0.45 | 0.74 | 0.37 | 0.49 | 0.25 | 1.03 | 0.25 | 0.43 |

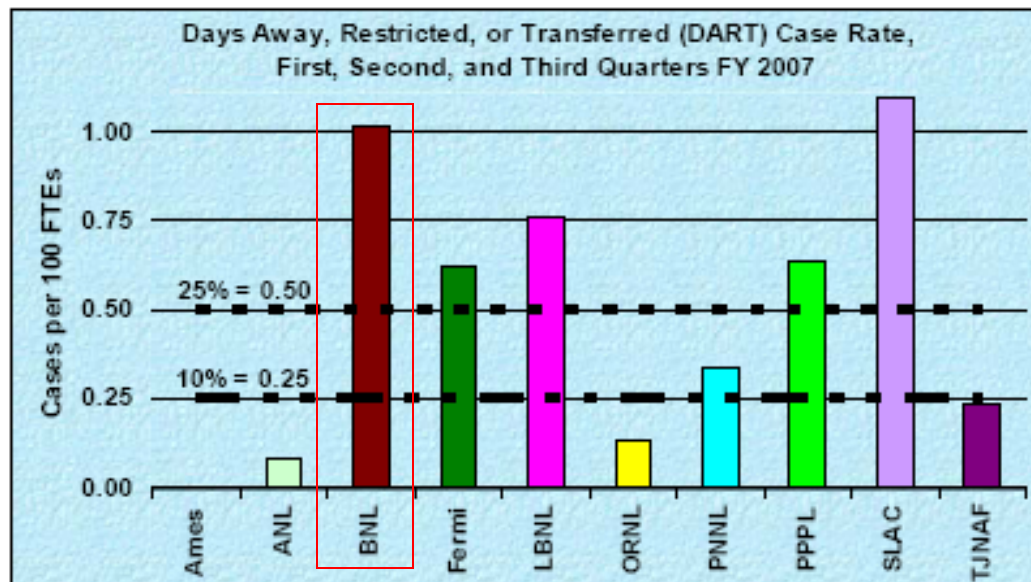


FY07 Office of Science – Comparison to others

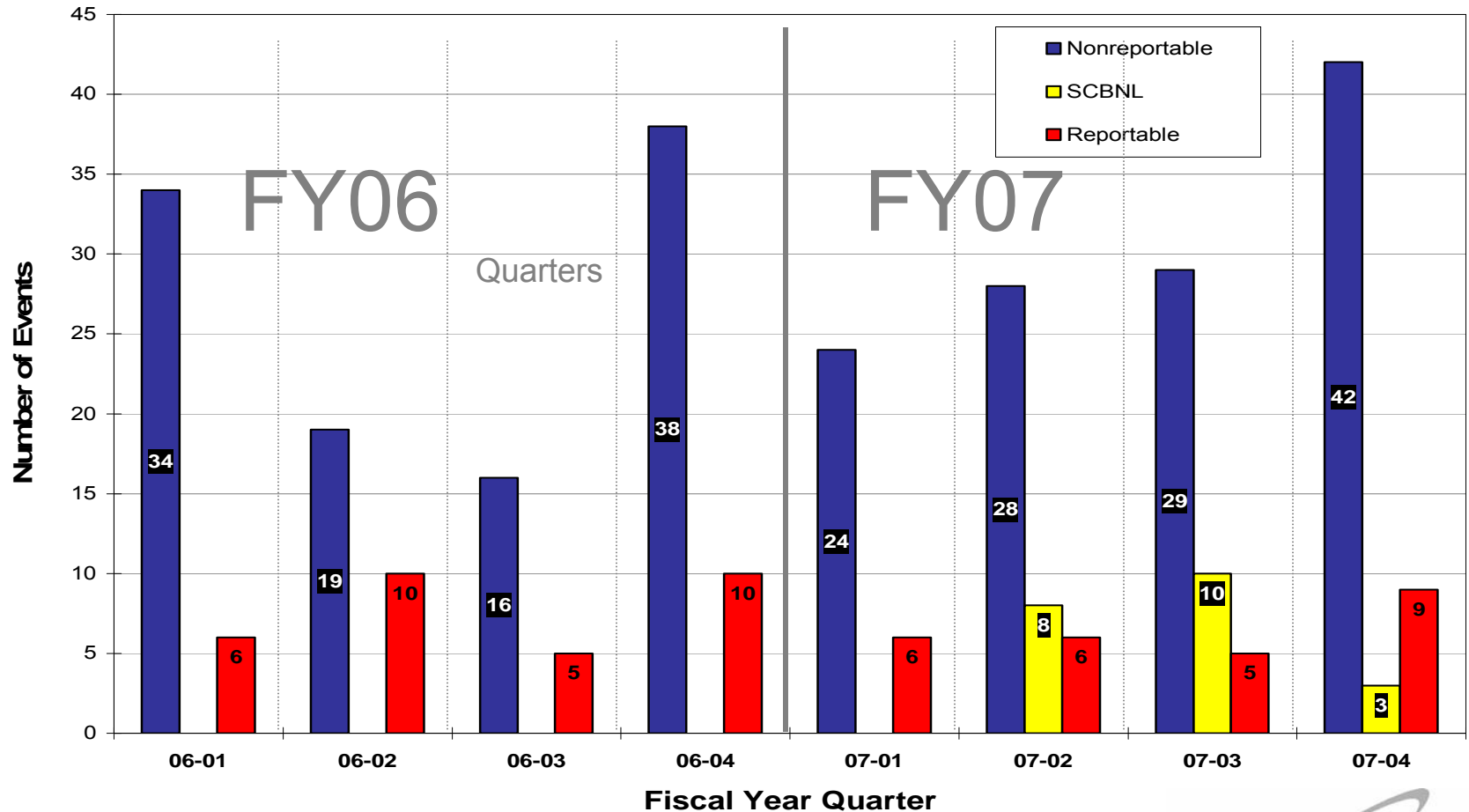
TRC



DART



ORPS Events “Reportable” versus “Nonreportable”





CY 2007 ORPS Reports (22)

- Coffee-Room Microwave Oven Fire Causes Building Evacuation
- Security Patrol Officer Injures Knee
- Copper Sheets Pin Worker Against Work Bench
- Irritant in Air from Cleaning Floor Tile - Bldg 400 Lobby
- Employee Grazed by Truck
- PISA and USQ for DOE review of Waste Management Facility Documented Safety Analysis
- Firefighter drops exercise weight plate on left foot causing fracture
- Ungrounded Neutral Discovered in wye connected output of 13.8kV/208V Transformer
- Laser Status Indicators at the Accelerator Test Facility (ATF) Not Functioning Properly
- Operational Emergency - Severe Weather
- Cable Fault Causes Power Outage
- Firefighter's Hand Injured during Patient Transport
- Bunsen Burner Ignites Disposable Lab Coat
- Unexpected Discovery of an Uncontrolled Electrical Energy Source in Building 490
- Simultaneous Degradation of Fire Alarm System and Water Supplies for the Apartment Area
- Researcher Contamination (Nitrogen -13)
- Employee Trips and Fractures Left Foot
- Minor Electrical Shock
- Employee Fractures Rib During Pick-up Truck Lift Gate Operation
- Site Wide Fire Alarm Communications Malfunction
- Tree Felled onto Power Lines
- A/C Unit Falls out of Window after being Dislodged by Lawnmower Roll Bar

Status of incident investigations, corrective actions and preventative actions in FY07

PAAA Issues:

| | |
|----------------------------------|---|
| NTS--BHSO-BNL- BNL-2006-0002 | Painter's Spackling Knife Contacts Abandoned Live Electrical Wire |
| NTS-BHSO-BNL- BNL-2007-0001 | Silica Exposure during Concrete Crushing Machine Operation |
| NTS-BHSO-BNL- BNL-2007-0002 | Positive Un-reviewed Safety Question at BNL Waste Management Facility |
| NTS--BHSO-BNL- BNL-2007-0006 | Subcontractor Noncompliance with 10CFR851, Occupational Medicine Requirements |
| NTS--BHSO-BNL- BNL-2007-0003 | Fire Protection Program Deficiencies |
| NTS--BHSO-BNL- BNL-2007-0004 | Programmatic Deficiency Involving Industrial Hygiene Exposure Monitoring |
| "NTS--BHSO-BNL- BNL-2007-0005 | Programmatic Deficiencies Involving Electrical Safety |

Compliance Status and Trends

Industrial Hygiene Exposure Monitoring

IH Monitoring Contractor: Monitoring in “Small Science” Phase 1 Final Report

“Without exception, [bench scale chemistry work] exposures did not approach ACGIH, BNL and /or OSHA exposure limits for chemical tasks performed within functioning chemical fume hoods.”

“[Future] Sampling priority would likely be low for compounds with vapor pressure up to 200-mm mercury and quantities up to 6-liters when used in a chemical fume hood or a closed system.”

“An exception could include a material with a very low exposure limit, i.e., 1-ppm or less, and reasonably high vapor pressure, i.e., 100-mm of mercury, when handled in quantities greater than 100-mls.”

BNL’s path forward on IH Exposure Monitoring:

- An “independent” laboratory-scale science ESH expert confirms the logical expectation that **bench-scale experimentation exposures are low when done in hoods.**
- After completing the baseline in FY08, BNL will target the bulk of our monitoring resources on “facility operations”, “services” and “construction”, with a continued but significantly lower emphasis on “bench scale science”.

Compliance Status and Trends

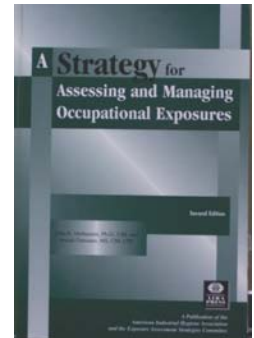
Industrial Hygiene Baseline Monitoring

DOE: 10 CFR 851 Section 6: “*Contractor must implement...Initial or baseline surveys and periodic resurveys and/or exposure monitoring as appropriate of all work areas or operations to identify and evaluate potential worker health risks.*”

American Industrial Hygiene Association:

A Strategy for Assessing and Managing Occupational Exposures:

*“Ideal strategy for defining the exposure profile ... monitor each worker’s exposure each day... generally not possible, **a subset of workers and days** ... is chosen”*



Representative Sampling Approach

BNL: *Every type of operation will be monitored using a **Representative Sampling Approach** and a risk based prioritization. The highest risk gets monitored first and most often.*

Compliance Status and Trends

Industrial Hygiene Sampling



BNL Risk Ranking - Exposure Monitoring Priority

| Risk Category | Exposure Level | Frequency of Monitoring |
|---------------|---|--|
| A | Worker exposure exceeds DOL limit on TWA_8 | All workers in SEG during each job until PPE requirements characterized, then all workers <u>quarterly</u> |
| B | Area exposure level exceeds DOE limit but worker exposure is $<TWA_8$ based on duration in area | 25% of workers in SEG, <u>quarterly</u> |
| C | Area/worker exposure is $>10\%$ of DOE limit to DOE limit | 10% of workers <u>once per year</u> |
| D | Area/worker exposure $<10\%$ of DOE limit. | 1 representative sample per year for three years, then one sample per <u>3 year cycle</u> |
| U | Unknown area/personal exposure | Sample on next operation(s) until characterized as A-D |

Compliance Status and Trends

Industrial Hygiene Exposure Monitoring

119 events were sampled in FY07.

Hazards:

- Noise
- 2-Butoxyethanol; Acetone; Cadmium; Hexane; Isofluorane; Mercury; Metals; Naphtha; Respirable Dust; Silica; Volatile Organic Compounds;
- Welding Fumes; Soldering;
- Asphalt Roofing
- Non-ionizing Radiation



Results: BNL workers: **22% of events sampled exceeded DOE limits** [Risk A]

Compliance Status and Trends

Industrial Hygiene Exposure Monitoring

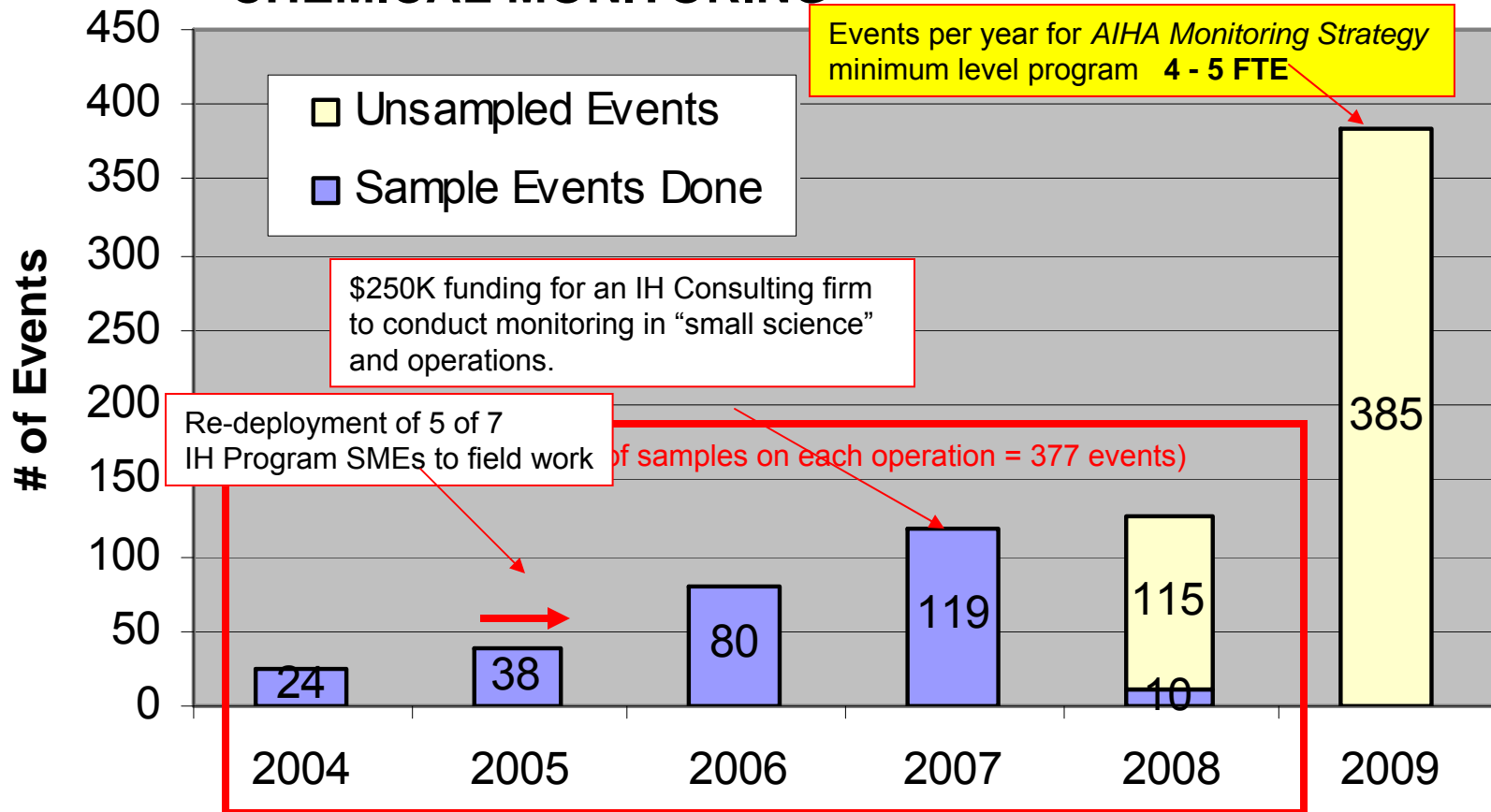
Results: 22% exceeded DOE limits for BNL workers (26/119)

- **2 events exceeded DOE Limits, no PPE used.** These were ORPS reportable.
 - Silica at Plant Engineering; Muriatic Acid in Bldg 400 during floor cleaning (FY08).
 - **24 events exceeded the DOE Limits** but were not reportable based on the use of PPE.
 - Noise: 18 of 79 samples in FY07; (2 of 13 in FY08).
 - Chemicals: Silica 6 events in FY07; 1 Mercury in WM; (Silica 3 in FY08).
 - **Multiple events exceeded DOE Limits during sampling but were not a violation because the time weighted average (TWA-8) was in compliance.** (Risk B)
-
- Several events had exposure > 10% of the DOE Limits. (Risk C)
 - Several events had exposure above background but less than 10% DOE Limits. (Risk D)
 - Multiple events had exposure at background or undetected. (Risk D)

Compliance Status and Trends

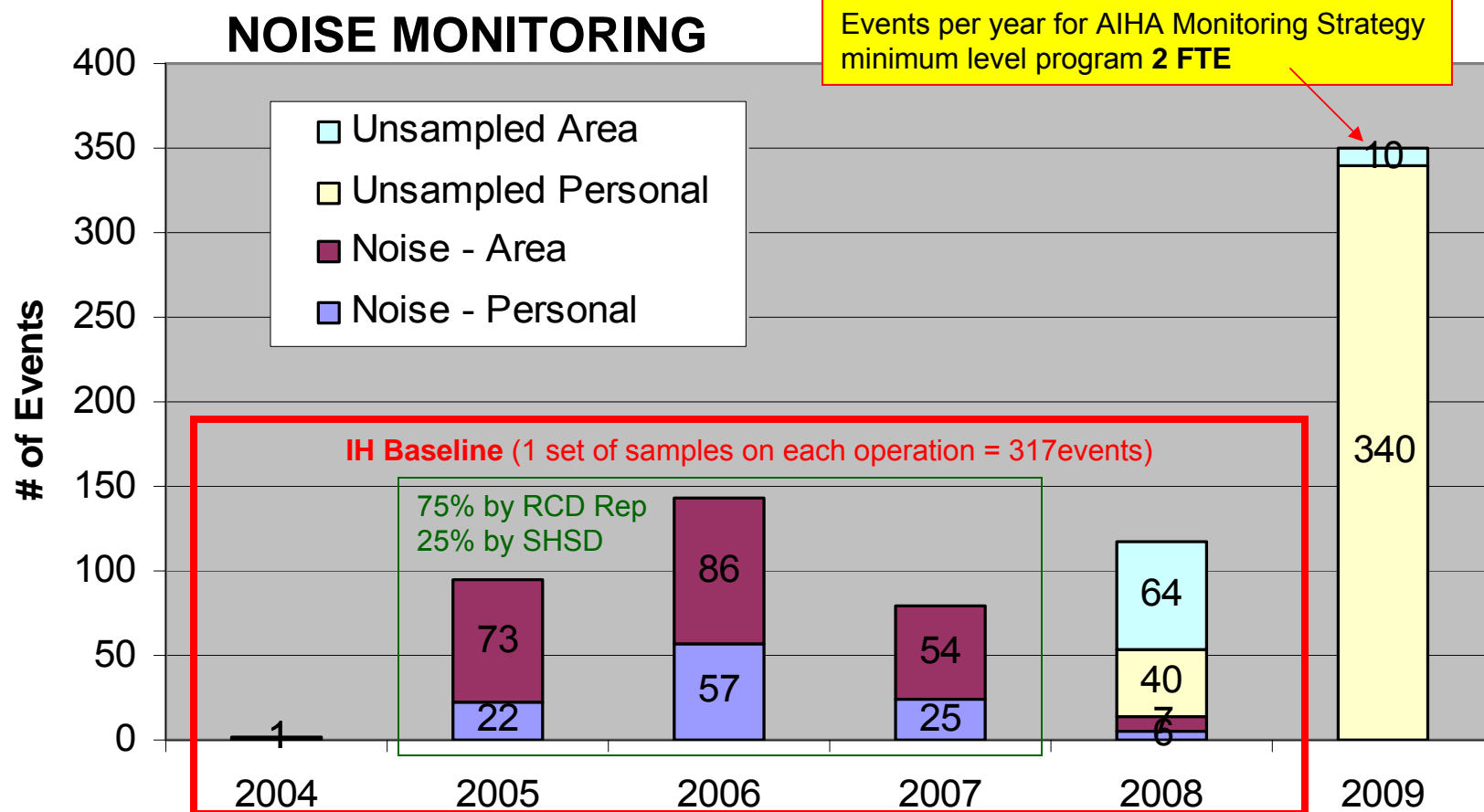
Industrial Hygiene Exposure Monitoring

CHEMICAL MONITORING



Compliance Status and Trends

Industrial Hygiene Exposure Monitoring



Compliance Status

Nationally Recognized Testing Lab (NRTL) Electrical Equipment Inspections (EEI)



- OSHA requires equipment to be listed or acceptance by the BNL Authority Having Jurisdiction (AHJ).
- Applies to equipment built, acquired, or brought onto the BNL site and connected to a source of electrical power.
- Electrical equipment is inspected to ensure it is free from reasonably foreseeable risks due to electrical hazards.
- Electrical Equipment Inspections (EEI) determines that equipment has/is:
 - Enclosed energized parts,
 - Bonded and grounded,
 - Afforded adequate over-current protection.
 - Can not cause a shock, burn or fire if used properly.

Compliance Status

Nationally Recognized Testing Lab (NRTL) Electrical Equipment Inspections (EEI)



- Electrical Equipment Inspection Program (EEI) kicked off in 2005.
- Commitment date to complete review of “other than low hazard” equipment was missed.
- **Submitted to Nonconformance Tracking System (NTS)**
 - New due date for review of all high hazard equipment is set for 6/30/08
 - Due date to review all equipment (high and low hazard) is set for 9/30/09
 - Missing future due dates can have PAAA consequences
- **Over 30,000 pieces of equipment still need inspection.**
 - Review of equipment has been completed for **about 1/3 of the total** (at mid-point of schedule).
- Certification Program (EEI) established in FY07 has increased # of inspectors
 - Prior to program FY05: 17 → FY07: 56

Compliance Status and Trends

NRTL Inspections

of Electrical Equipment by BNL AHJ (46,600+ Items for Inspection)



| Inspected | Total | BNL Built | Commercial Equipment Mod. By BNL | Custom Built to BNL Specs | Commercial Off-the-Shelf w/o NRTL |
|--|---------|-----------|----------------------------------|---------------------------|-----------------------------------|
| Inventory w/o NRTL | | | | | |
| BOP BES, Life Science, EENS, SORD | 1017 | 263 | 272 | 32 | 450 |
| | 6019 | 263 | 272 | 32 | 5452 |
| CAD | 6400 | 3600 | - | 500 | 2300 |
| | ~20,000 | ? | ? | ? | ? |
| NSLS | 5200 | 1050 | 30 | 370 | 3750 |
| | ~20,000 | ? | ? | ? | ? |
| F&O Plant Engineering | 582 | 70 | - | 182 | 330 |
| | ? | ? | ? | ? | ? |
| Completed FY06 | 1497 | 21 | 70 | - | 406 |
| Completed FY07 | 13199 | 4983 | 302 | 1084 | 6380 |
| Remaining | 31,905+ | ? | ? | ? | 5432+ |

Compliance Status

Nationally Recognized Testing Lab (NRTL)

Electrical Equipment Inspections (EEI)



Issues:

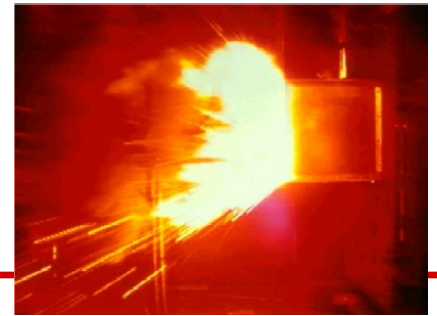
Inadequate Resources for:

- 1. Organizing and program oversight (Database)**
 - Reputable manufacturer program allows credit for acceptable equipment.
 - EEI database will provide BNL-wide sharing of “Reputable manufacturer” inspections
- 2. Completion of inspections**
 - 30,000+ pieces of equipment need Authority Having Jurisdiction (AHJ) approval
 - SHSD has committed to inspection all “Balance of Plant” equipment
 - Inventory of Facilities & Operations, NSLS, CAD still unknown (or only estimated).
- 3. Addressing growing number of items found not in compliance**

Without increased effort on inspections, a significant level of risk exists for missing the 09/30/09 commitment date. (BES OSH Management Review)

Compliance Status

Status of Arc Flash Incident Corrective Actions



- To date, **51 of the 55 deliverables completed** in the Corrective action plan developed to satisfy the Judgment of Needs resulting from the investigation of the arc flash incident. Including the completed high energy systems, the arc flash analysis and labeling effort is **estimated to be 65% complete**.
- The last item is scheduled for completion by December 30, 2008.
- Key elements completed include:
 - Implementation of high resistance grounding on floating delta systems to limit transient over voltages and installation of remote ground fault detection;
 - Verification of high energy electrical systems configuration, updated one-lines, equipment data entry and evaluation of ratings, short circuit analysis, device coordination, arc flash analysis using SKM PTW Power Tools software,
 - Modifications to reduce hazard and labeling of devices.
- Also a preventive maintenance inspection program has been developed for electrical distribution system equipment.

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Injury/Illness Reduction Initiatives

OSH FY07 Improvements

New FRA/JRAs at the site level prepared during FY07:

- Research Support Building FRA
- Travel JRA

“Injury Reduction” White Paper- corrective actions are underway and being tracked in ATS.

Safety Observation program- on going, some increase in number of participants. However, goals were not met in FY07.

Human Performance Improvement Initiative – Launched in CAD, F&O and Policy Council. 290 people trained.

ISM Improvement Actions led to favorable review by HSS.

Electrical Equipment Inspection Program- Qualification of additional inspectors. Inspections of equipment continued (30% complete).

Arc Flash Calculation Program (65% complete).

Sidewalk Replacement: 1.83 of 12 miles of sidewalks (15%)

Injury/Illness Reduction Initiatives

OSH FY07 Improvements

IH Baseline Exposure Monitoring (46% of the baseline in FY07). Included a nationally recognized expert evaluation of “small science” chemical exposure.

Electronic Soldering- Airborne Metals and Organics Exposure and Surface Wipe Characterization for “lab” scale soldering operations. Hazards: lead, rosin flux decomposition (Study completed, White-paper in development). (FY07 and FY08)

In-place Pipe Insulation - Physical Condition Survey: all buildings on site were surveyed for physically damaged insulation (asbestos content was not analyzed). (FY07 and FY08)

- EP can now address the damaged insulation in a risk priority order as funding is provided. Departments must now call-in.
- Testing of insulation for asbestos content is not funded. ADS to be developed.

Safety and Well being 24/7 Initiative- “PPE for Home Use” program launched.

OMC Annual Report: National Benchmarking of *Back-to-Work Performance*. BNL is superior to National Average on: Percent of cases with no lost time and duration of lost time.

Success Story– Back-to-Work Performance After Occupational Injuries

OSH FY07 Improvements

OMC benchmarking study of back-to-work performance for 50 Occupational injuries (2006-2007) relative to national averages and expert guidelines.

Results:

- Only 20% lost time. Proportion that lost time was significantly less than expected (38% losing time) based upon prevalent injury types
- 86% met expert guidelines re: optimal duration of lost time
- Duration of lost time was only 78% of expected

Contributing to success: Restricted Duty Policy and Aggressive Case Management directed at early return-to-work

Injury/Illness Reduction Initiatives

S2 (Safety Solutions Program)- Ideas Program



| Year | Submissions | S2 Funded | Total Expenditures | Other funded |
|---|-------------|--------------------------------------|--------------------|--------------|
| FY05 | 24 | 8 | \$ 9,728 | 3 |
| FY06 | 45 | 8 | \$24,432 | 3 |
| FY07 | 22 | 7 | \$20,700 | 1 |
| FY07 Funded Projects | | | | |
| Propane Isolation Valves in Bldg 490 | | Remote starter switch for 480V motor | | |
| AED in Bldg 423 & AED in RadTec sites | | Safety glasses dispensers for labs | | |
| Disposal Of Hazardous Waste in Small Science (P2/S2) | | Bldg 490 ramp for step hazard | | |
| Also completed from a previous year's suggestion: "Open/Closed Arrows" at Front Gate" lights. | | | | |



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Performance on OSH Site Objectives for FY07

| Site Level Objectives | Site Level Targets met |
|---|------------------------|
| 1. Improve The Occupational Safety & Health Management System (OSH) | 1 of 2 |
| 2. Improve The Occupational Safety & Health Management System | 1 of 2 |
| 3. Conduct OSHA <i>Extent Of Condition</i> Reviews | 3 of 3 |
| 4. Improve Accident And Injury Rate Performance: Improve Accident/Injury Injury Rate Performance: DART ≤ 0.25 TRCR ≤ 0.65 | 2 of 5 |
| 5. Improve The Implementation Of The Material Handling Training Program | 3 of 3 |
| 6. Compliance - Achieve Full Compliance With Applicable Occupational Safety & Health Requirements. | 3 of 6 |
| 7. Communications - Improve Communications, Trust, And Relationship With Stakeholders On Occupational Safety & Health Programs. | 1 of 4 |
| 8. Student Safety: Improve Awareness And Training Of Short Term Researchers And Students In Occupational Safety & Health Hazard Control Programs. | 1 of 1 |
| 9. Emergency Preparedness: Improve Awareness And Training Of Staff In Emergency Preparedness And Response Actions. | 1 of 1 |
| 10. Travel: Improve Awareness And Staff In Occupational Safety & Health Hazards Of Domestic And Foreign Travel. | 0 of 1 |

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Communication

OSH communications from external and internal interested parties (stakeholders)

Initiatives in communication to staff and other interested parties:

- **Safety Day**
- **Take 5 video safety minute**
- **ESSH Monthly Newsletter**
- **Radiological News**
- **SHSD webpage**
- **BNL Bulletin / Monday Memo**
- **Summer Sunday**
- **ESH Coordinator Meetings**
- **EFCOG Meetings**

Positive feedback:

- From BHSO & NSF on Industrial Hygiene procedures and Qualification program.
- From EFCOG on Chemical Storage Project in small science & Baseline IH Exposure Monitoring Project.

Negative feedback:

- Memo on PPE- long sleeve issue.
- Reaction to ISM concern on Lead in Soldering operations

Stakeholder Concerns- OSH

- **Activists:** none
- **Community:**
 - **Nanomaterials:** Community Advisory Council- addressed in FY07 and will grow in FY08
 - Summer Sunday: Safety Presentation; Healthfest Display
- **Regulators:**
 - **ISM** was a big initiative this year- overall positive outcome.
 - **10 CFR 851**- Worker S&H Program Description was approved. CAP Approach document was accepted. Working with the local office on CAP for gaps.
- **Unions:**
 - External contractors with union workers on 10 CFR 851 issues
 - RCD RASI contractor's current contract does not cover expenses of 10CFR851 medical exams. Increased cost to comply.

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Effects of Foreseeable Changes to Legislation

OHSAS 18001:



- **New Requirements published in 2007.**
- BNL will begin transition from the *1999 Specifications* to the *2007 Requirements* this year and through 2009.
- No major problems anticipated in implementation, as the elements now match very closely with EMS ISO 14001-2004.
- OHSAS 18001: 2007 elements are built into the new OSH Subject Area *OHSAS 18001* and Internal Audit Checklists.



Registered to
OHSAS 18001

Effects of Foreseeable Changes to Legislation

OSH Program Areas

- **ANSI Laser** standards are undergoing major revision. Requirements for “Research Lasers” are being broken off from “industry use”. This change will likely will improve ease of compliance and implementation. SHSD is tracking this potential change.
- **Radiological Protection: Amendment to 10 CFR 835** may have impact on BNL operations. RCD is tracking this potential change. Expected compliance date: 07/2010.

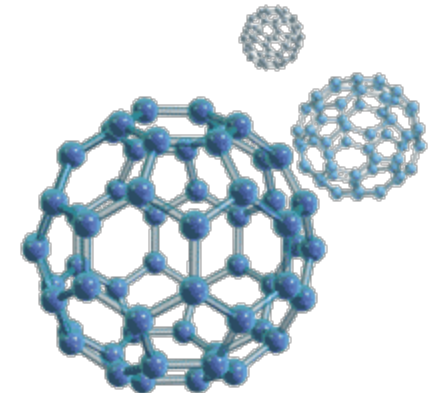
Changing Circumstances

Anticipated or Planned Changes to the Site's operations that impact OSH:

- CFN will be fully operational in Spring 2008: **Health and Safety and Radiological coverage is in-place; OHSAS 18001 shared with BES and PO.**
- Partial Demolitions of Buildings 134 and 475 being planned.
- Potential upgrade from Radiological to Nuclear for the HFBR and BGRR may impact support organization resource needs.

Project reviews and Safety documentation development for:

- NSLS II - RHIC Detector Luminosity Upgrades
- Blue Gene Project
- Interdisciplinary Science Building



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Improvement Initiatives for FY08

10 CFR 851: Worker Safety and Health Program

- Gap Analysis will be expanded with OSH Program Assessments at the site and line organization level.
- Continued effort to close gap on NTS Reported Program deficiencies:
 - IH Monitoring (on track for on-time closure)
 - Electrical Safety - EEI inspections, Cable Tray improvements, NEC inspections
 - Occupational Medicine Program

SBMS Subject Area Improvements

- All WS&H Subject Areas to be reviewed for PPE requirements - standardized format developed
- All WS&H Subject Areas to be reviewed for “should”, “shall”, “must.”
- Tier I trending and analysis
- Training to be delivered on 4 OSH Subject Areas to staff.

FY08 OSH Objectives

1. Improve accident and injury rate performance

- Improve Accident/Injury injury rate performance from previous years and meet or exceed DOE goals. PEMP 5.1.1.1
- Design mechanisms to encourage Zero Traffic violations and accidents.
- Secure funding to make the BNL *Safety Solutions* (S2) Program sustainable.
- Improve manual lifting and ergonomics training.

2. Achieve full compliance with applicable occupational safety & health requirements.

- Improve implementation of 10CFR851 requirements and SBMS OSH Subject Area programs by increasing awareness of OSH requirements.

3. Improve staff awareness of the occupational safety & health hazards of domestic and foreign travel.

- Develop organization level awareness of health and safety hazards if line organization personnel encounter unique situations during domestic and foreign travel.

4. Improve ESH document control in BNL operations and facilities.

- Improve line implementation of ESH controlled document requirements.

5. Improve ESH records management in BNL operations and facilities.

- Improve line implementation of ESH records management requirements

FY08 OSH Objectives

6. Improve BNL performance in Accident Investigations

- Improve line accident Investigations; Investigate all reported cases; Ensure that the ORPS categorizer is notified, etc.

7. Improve Injury Management in BNL operations and facilities

- Insure workers notify line Organization immediately and the OMC within 24 hours
- Provide for manager and supervisor training on case management
- Provide for transitional duties for injured workers.

Output: Decision & Actions Related to Possible Change:

OSH Objectives: These Objectives and Improvement Initiatives are adequate to address issues from Internal OSH Audits, NSF Audit, known weakness, and improvements.

Record of Decision:

Accept these Objectives

Additional Objectives or changes:

Issues that line organization brought up in FY07 OSH Management Reviews

OHSAS 18001 Documentation

1. A BNL level JRA for *“Moving Offices”* would be good. Expand the one the Finance Directorate developed for Bldg 400 move. (SORD)
2. Recommend that FRA/JRAs be located in one area on the web to facilitate sharing and elimination of redundant documents. (EP)
3. Provide guidance or a template on the “Financial Investment” slides for the OSH Management Reviews. (ERO)
4. JRA links should be added to Subject Areas. (Life Sciences)

Issues that line organization brought up in OSH Management Reviews in FY07

OSH Site Level Programs

5. Pop-up blockers interfere with access to MSDSs. [Mostly resolved. Issues that remain are cyber security based.] (BES)
6. Electronic ESR forms needs BNL level support. (BES)
7. Request BNL not implement new policies by memorandum. Managers felt the PPE memo caused confusion. (CAD)
8. Request BNL improve *Interlock, PPE, Pressure and Electrical Safety* Subject Areas. SBMS direction in these four safety areas is confusing at the operational level. (CAD)
9. Request BNL restore senior department-manager oversight committee to SBMS. Line managers are left out of the SBMS review and approval process. (CAD)
10. The Injury Investigation process causes employees to feel intimidated. (EP)

Issues that line organization brought up in OSH Management Reviews in FY07

OSH Implementation issues that occur outside the ability of the line organization to resolve

11. NRTL- EEI resources provided by overhead are questionable in terms of quantity to complete the project on schedule in “small science”. (BES)
12. Line organizations should get to provide input in what “space charges” money is used for. The line should get to prioritize the expenditures. (CAD)
13. Tier 1 findings are outstanding for over 90 days caused by backed-up work orders to EP. (SORD)
14. Pendant power cords were recently installed. This is questionable regarding NEC codes. EP needs to clarify. (IO)

Roll-up from discussions, meetings and contacts with line organizations or Audits

15. Building 463 has ongoing IAQ problems. This has resulted in several workers compensation cases and negative employee relations. (BO)
16. Potential upgrade from Radiological to Nuclear Facility for the HFBR and BGRR may impact support organization resource needs. (RCD)
17. The new CMS Administrative Assistant term position will end in May 2008. This will return the program from being on track to closure of the gap in linking the CMS inventory with MSDS hazard information. This will impact Emergency Planning and Hazard Communication compliance. (SHSD)
18. Animal Handlers are being sensitized in the BLAF from proteins from animal urine. Funding is needed for Interim control measures (\$50K) and permanent engineering controls (\$800K+). (MO)

Follow-up actions from FY06 OSH Management Review

| | |
|---|--|
| 1. Site level Risk Assessments: Adequacy of current hazard identification; Risk assessments, and risk control processes can be streamlined. | |
| Led team to centralize common Job Risks Assessments. | |
| Led team to create a site wide “Natural Hazards” Facility Risks Assessment. | |
| 2. Organizational Emergency Planning drills (not conducted by Office of Emergency Management [OEM] are either not occurring or are not being documented. | |
| OEM called for drill records from line organizations and compiles records in a centralized location. | |
| Line organizations conduct emergency preparation drills. | |
| 3. Current OSH Objectives do not address “document control”. | |
| Document Control objectives to the 2008 to the site level OSH objectives and posted on OSH web site. | |
| Line organizations incorporate improvement of “document control” of ESH documents into their Objectives for FY 2008. | |

Follow-up actions from FY06 OSH Management Review

Management Review Questions- Responses:

1. Do the objectives address the current level of risk? Yes
2. Do the objectives address foreseeable changes to legislation or technology? Yes
3. Are the objectives achieving the desired results? Yes
4. **Is there a need for changes in the objectives? Yes**
Action: Revise the FY07 Site Level Objectives based on the Phase 3 Registration Audit and actions described in the FY07 OSH Management Review. Owner: R. Selvey, Due Date: 02/28/07. done
5. **Are there adequate resources: financial, personnel, and material to meet the objectives? No**
Action: Undertake a management analysis of resources. Further discussion is necessary to determine how this will be executed. Owner: J. Tarpinian, Due Date: 03/28/07 not done

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Management Review Decisions

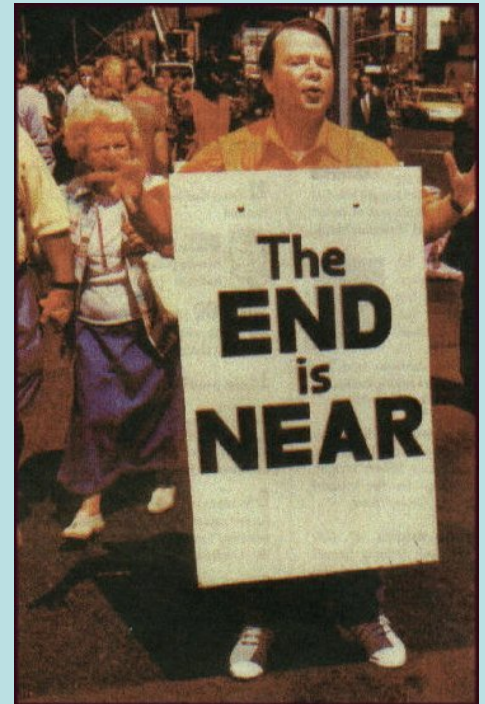
1. Is the OSH Management System effective in achieving policy commitment?
2. Is the OSHMS effective in achieving the objectives, targets and performance measures?
3. Is the OSHMS adequate in terms of:
 - a) Resource allocation?
 - b) Information systems?
 - c) Organizational issues – staff expertise; procedural requirements



Management Review Decisions

4. Are the objectives, targets and performance measures suitable, taking into account the following factors:
 - a) Injuries/illnesses?
 - b) Current and future regulatory requirements?
 - c) Business interests, technological capability?
 - d) Internal organizational or process changes?

5. Should additional objectives, targets or performance measures be established?



Any Additional Comments or Concerns ?

[Thank you for your participation](#)

- This **PowerPoint presentation** will be posted on the Site OSH Web Page
- **Minutes of this Meeting** and a **Record of Decision on Issues** will be prepared and posted on the Site OSH Web Page



Questions?

Resources for Corrective Actions

 OHSAS 0.3 FTE

- **Industrial Hygiene**

- Administrative/Group Leader: 0.4 FTE

-  IH Programs: 1.3 FTE

- IH lab: 1 FTE

- CMS/MSDS: 4 FTE

- S&H Representatives: 8.2 FTE

- **Safety Engineering**

- Administrative/Group Leader: 0.5 FTE

-  SE Programs: 6.5 FTE

- Workers Comp/RTW: 2.8 FTE

- Field Deployed: 2 FTE

 **Division Management: 2 FTE (+ temps)**

8 FTE Professionals to address current programs and new OSH initiatives

- 2 Mgmt Systems
- 1 Program Description
- 46 Subject Areas