NSLS-II ESH Program

FY 09 Management Review

January 11, 2010

Steve Hoey

Scope of Review

- Purpose of Review
- ESH Management Systems
- ESH Performance Measures
- Goals for FY 10

Purpose of Review

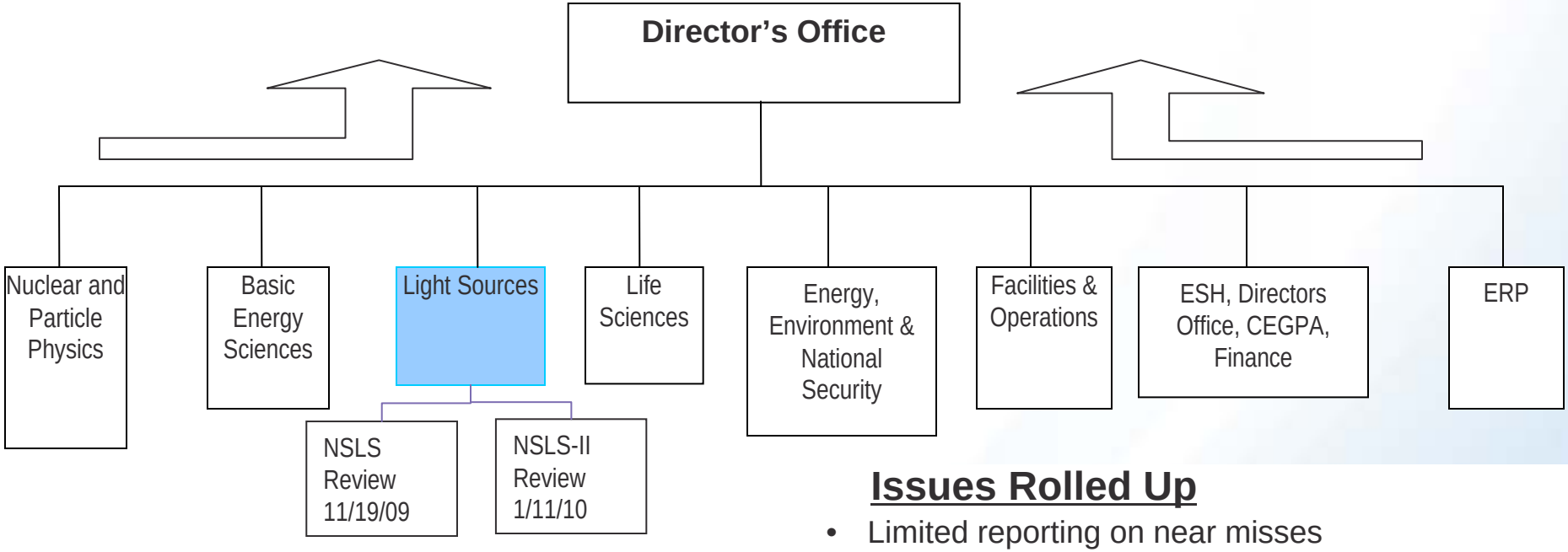
- ***"Top management shall"…*****Evaluate the EMS&OSH Program**
  - Adequacy – does it meet requirements & is it implemented appropriately?
  - Suitability- does it "fit" BNL operations & systems?
  - Effectiveness- is it achieving the desired results?

- **Review performance of key system components including:**
  - Follow-up actions from previous management reviews
  - Results of audits, assessments, corrective and preventive actions
  - Performance, including changing circumstances
  - Extent to which objectives and targets have been met
  - Concerns of relevant interested parties

- **Expected Outcome:**
  - Identify areas where focused improvement initiatives are needed
  - Provide feedback and direction

EMS&OSH Management Review Process
Feedback flows up and across

Institutional Level reviews roll up lab-wide performance and issues



Issues Rolled Up

- Limited reporting on near misses
- Too many assessments (EMS/OHSAS combined; collaborative with BHSO)
- Inconsistent PPE Requirements
- Staff unaware of events/issues/reporting requirements
- Moving traffic violations
- Construction coordination
- Rules too flexible, too inflexible subject to SME interpretation

- **NSLS-II ESH Management Systems**
- ESH Performance Measures
- Goals for FY 10

NSLS-II ESH Staffing & Support

External Oversight
Independent Audit & Oversight
BHSO Construction
C. Seniuk
DOE/BHSO Fac Rep P. Kelly
Liberty Mutual Insurance
Project Review Committees

External Support
Construction – F. Kornegay SNS
Project Advisory Committees

ESH and F&O Directorate Support

D. Bauer & R. Lee – Environmental
P. Pohlot – Pollution Prevention
M. Gaffney – Cryo & Comp Gas
J. Durnan & J. Biscardi – Electrical
C. Weilandics – Industrial Hygiene
T. Conrad – Construction
F. Zafonte – Radiological (PS)
J. Hynan – Hoisting & Rigging
M. Kretschmann – Fire Protection

NSLS Support
Keith Klaus -Safety Engineer
Lori Steigler - Safety Coordinator
Bob Chmiel – Safety Officer
M. Corwin Training Coordinator

ESH Manager
Steven Hoey

Authorization Basis Coordinator
Nick Gmur (3/5)

Radiation Physicist
P.K. Job

ESH Professional
Bob Casey (3/5)

Training
Ray Roberts (.5) MOU

Construction Safety
Towney Anschutz
Ken Krasner
Vacancy (LOB) (contractor)

Vacancy Construction Safety Engineer 1/18/10

Matrixed and MOU personnel are represented by dashed boxes
PS= Purchased Service

Scope of ESH Program Responsibilities

- Design Review & Support
- R&D Safety Review
- Work Planning Support
- Emergency Planning
- Industrial Hygiene
- Industrial Safety
- Fire Safety
- Readiness Reviews
- Radiation Protection
- Interlock Safety Review
- Self-assessment
- Risk-assessment
- Tier 1 Inspections
- Training
- Document Control
- Safety Documentation
- Construction Safety
- Environmental Management
- Hazardous Waste Management

Overview of EMS & OSH Program

- Workplace hazards identified and controlled via PSRFs and Work Permits

  -Supplemented by Job Risk Assessments (JRAs) and Facility Risk Assessments (FRA)

  -NSLS JRAs and FRAs adopted as appropriate for NSLS-II activities and appended to PSRF's

- Construction Hazards identified via ESH Plan, construction procedures.
- and PHA's.
- System design hazards identified and controlled via ESH design reviews, SAD's, hazards assessments

http://www.nsls.bnl.gov/esh/EMS-OHSAS/

FY09 Activity

- Developed/Maintained 18 PSRF's
- Maintained 13 PSRF related procedures
- 18 work permits (3 remain open)
- ORE's for new space
  - 703 (labs and conference/office)
  - 945 (vacuum)
  - 832 (RF & Pulsed Magnet)
  - 905 (clean room tent)
- Construction
  - ESH Model Plan developed
  - ESH Management Plan developed
  - 10 Construction ESH SOP's developed
  - Contractor Selection
  - Contractor Mobilization
  - Staffing

Light Sources Directorate EMS/OHSAS Documents and Links

The Light Sources Directorate follows the BNL requirements in the SBMS Program and Subject Areas for EMS and OHSAS. The links below contain information that is specific to the Directorate in these areas.

The Light Sources Directorate follows the BNL Environmental, Safety, Security and Health (ESSH) Policy.

Planning

- NSLS Significant Environmental Aspects Matrix
- NSLS-II Significant Environmental Aspects Matrix
- NSLS QA Manual
- NSLS-II QA Manual
- Policies and Requirements Manual
- EMS, FUA and SAD/ASE Checklist for Directorate Reviews
- Job Risk Assessments
- Facility Risk Assessments
- ESH Improvement Plans

Implementation and Operation

Each employee has an associated Roles, Responsibilities, Accountability and Authority (R2A2) listing for their position. Control of Documents is governed by the NSLS QA manual listed above.

- NSLS Process Assessments
- Worker Qualification Matrix
- NSLS Training Requirements
- NSLS-II Training Requirements
- NSLS Job Specific Environmental Training
- Outline of Light Sources Directorate EMS/OHSAS Communication
- Key Contacts List
- EMS/OHSAS Committee
- EMS FAQs
- OHSAS FAQs
- Work Planning and Control
- Local Emergency Plans

Checking and Corrective Action

- NSLS QA Manual
- NSLS-II QA Manual
- Assessment Tracking System
- PRM 1.2.0 Environmental, Safety, and Health Inspections
- PRM 1.1.1 Injury and Incident/Accident Investigations, Critiques and Occurrence Reports

Management Review

- Management Review presentations and minutes

- NSLS ESH Management System
- **ESH Performance Measures**
- Goals for FY 10

NSLS-II ESH Performance Measures

- **Progress on ESH Targets**
- Assessments and audits
- Tier I
- Traffic violations
- Training
- Injuries
- Events
- Management Observations
- Hazardous waste generation

ESH Improvement Plan

- Goals (derived from)
  - PEMP
  - Institutional OHSAS / EMS
  - Audits
  - Other department specific issues (Strategic Planning)
- Annual Improvement Plan
  - Tracked in Family ATS
  - Targets for each goal
  - Assigned (personnel performance appraisal; Due date)
- FY09 NSLS-II Improvement Plan
  - 6 goals
  - 19 targets

ESH Improvement Plan

Status of FY09 Objectives and Targets;

6 Goals with 19 Targets*:

- Continue Human Performance implementation (training and procedures). *(Continuing)*
- Develop a World Class Construction ESH Program. *(Continuing)*
- Improve energy conservation at the NSLS-II. *(Continuing)*
- Increase awareness to accidents and injuries and traffic violations. *(Continuing)*
- *Maintain a comprehensive work planning and control program to cover all aspects of NSLS-II activities (Complete)*
- *Evaluate the NSLS-II Training program to identify additional metrics to measure for improved performance (Complete)*

- **FY 09 was NSLS-II's first set of Objectives and Targets,**
  - **broken down into OHSAS/EMS O&T's and "Other FY09 Project Targets"**

Human Performance Improvement Initiative (HPI)

"Making BNL a more productive and safer place by reducing errors in the workplace"

HPI uses knowledge of human behavior to help us understand and better manage the interaction of people, processes, equipment, work environment, and organization to reduce errors and foster continuous improvement

- > 90% of LS staff have received HPI training addressing
  - Human performance fundamentals
  - Recognition of error traps and error likely situations
  - Use of tools to reduce likelihood of error
- HPI elements used in event investigation
- HPI elements used in safety reviews
- HPI elements used in procedure development

NSLS-II ESH Communication (Internal & External)

Increase Awareness

- Weekly meetings with Project Director and direct reports
- Monthly management meetings
  - ESH Topic
- New Employee Briefings
- Annual “All-Hands” meeting
- Specific “All-Hands” meetings (stand-down 11/09)
- Strategic Planning “All-Hands” (ESH Task Force)
- Monthly E-News
- Management Observations
- ESH Highlights
- BNL Lessons Learned

External

Project’s major interested party is DOE via frequent project reviews and specific document reviews and routine meetings

DOE reviews of required ESH documentation; (i.e, construction ESH Plans; PSAD)

Extensive use of ESH external technical reviewers; (project advisory committees)

NYS DEC – construction site legacy contamination; Environmental Assessment

NYS Fish and Wildlife – construction site wildlife

SCDHS - EA

Follow-up from previous management review

- "Add NSLS-II Project Manager's direct reports to the Lab STOP data base with the FY-09 goal of one observation per month for the remainder of the year"
  - Complete – eight NSLS-II managers added to program under the "stretch goal" category

FY 10 NSLS-II Project moves to regular PEMP goals (3/qtr – 12/yr)

Changing Circumstances: Accelerator Safety Order (420.2B)

- ASO Assessment will drive changes/enhancements to the Order and Guidance document including;
  - Alignment of “guidance doc” to the order
  - Software Quality Control – to assure that accelerators use appropriate Safety Software QA requirements. Likely to implement ANSI/ISA 84.01
  - Crediting Mitigative Controls – not well defined; may impact the SAD’s and ASE’s
  - Define the scope/content of the hazard analysis
  - Pressure/vacuum safety design requirements

Issue: ASO is a significant requirements driver for the Project, changes may lead to new requirements. Changes are expected as result of DOE requirements evaluation in 09.
Action: Stay actively involved in assessment and ASO mods & coordinate strategy with BHSO (Aug workshop)

Changing Circumstances: NSLS-II Construction Site

- **Previous reviews suggested BNL should conduct environmental assessment of proposed site prior to construction**
  - To ensure no issues that could impact construction schedule
- **Assessment completed in October**
  - Sampled former drywells, tank locations, hazardous material storage areas
- **Soil sampling showed no impacts that would preclude NSLS-II construction**
- **Results of investigation presented to Lehman committee in October for CD-3 review**
- **Actual field experience has been manageable and has had minimal impacts**

Issue: Still potential to uncover unknown materials during site excavation –diminishing due to major excavation nearly complete

Action: Being tracked on Risk Registry - Systems in place for mitigation

NSLS-II ESH Performance Measures

- Progress on ESH Targets
- **Assessments and audits**
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Audits/Assessments (20+)

- Operations:
  - 2009 Environmental Multi-topic Assessment
  - IH Multi-Topic Assessment
  - EMS/OHSAS Internal Assessment
  - NSF EMS/OHSAS Registration Audit
  - Well House "Extent of Condition"
  - Arc Flash/Label Audit
  - NSLS-II Self-Assessment on Fire Safety
  - IAO Review of NSLS-II Construction Safety
    - Phase 1
    - Phase 2
    - Phase 3
  - NSLS-II Training Self-Assessment
  - Emergency drill(s)

- Project/Design:
  - Project Review (Lehman) 2
  - External Independent Review
  - Conventional Facilities Advisory Committee
  - Accelerator Facilities Advisory Committee
  - Experimental Facilities Advisory Committee
  - Project Advisory Committee
  - DOE Accelerator Safety Order Assessment

•Minimal findings
•Overall results support that ESH programs are functioning well
•Value = Assessment/Review prep improves programs

Issue: Construction Accident Investigation identified a need to increase frequency and scope of construction program assessments; BHSO Surveillances also increasing
Action: Upgraded frequency from quarterly to monthly, Contractor implementing a programmatic assessment program; consolidate tracking

Status of corrective and preventative actions

- Project Related ESH corrective actions:
  - Tracked by Project (QA Office)
  - Periodically Statused
  - Accessible on Share Point
  - Reviewed at Project Reviews (Lehman)
  - Lessons Learned system/database established
- Operational (R&D) related ESH corrective actions:
  - Tracked by ESH Coordinator
  - Documented via family ATS (PSRF's & Construction CAP)
  - Tier 1's documented using NSLS database
  - Share Point Design Review notes
- Construction related corrective actions:
  - Tracked by CSE's

NSLS-II ESH Performance Measures

- Progress on ESH Targets
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- **Tier I**
- Traffic violations
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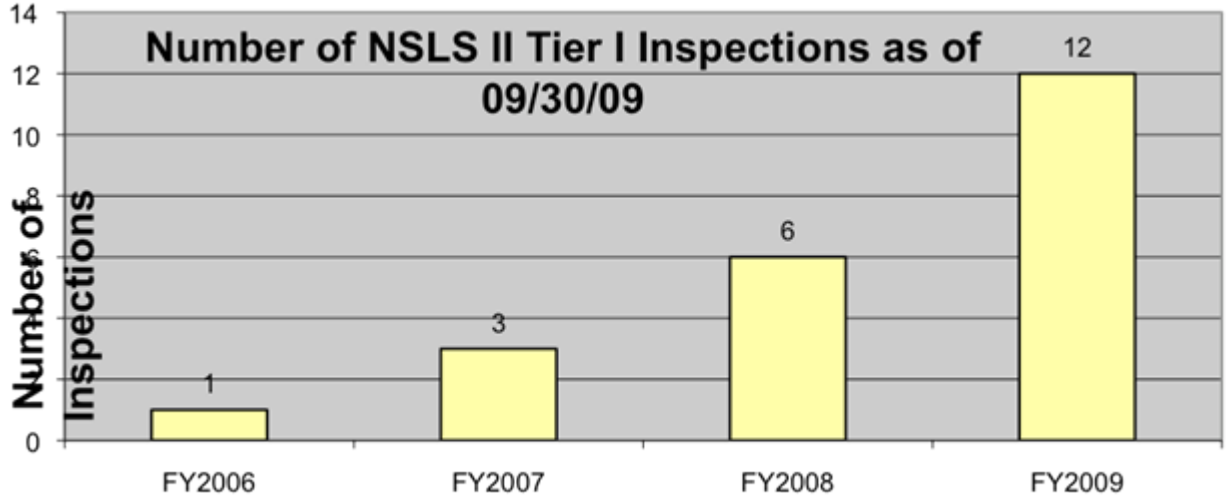
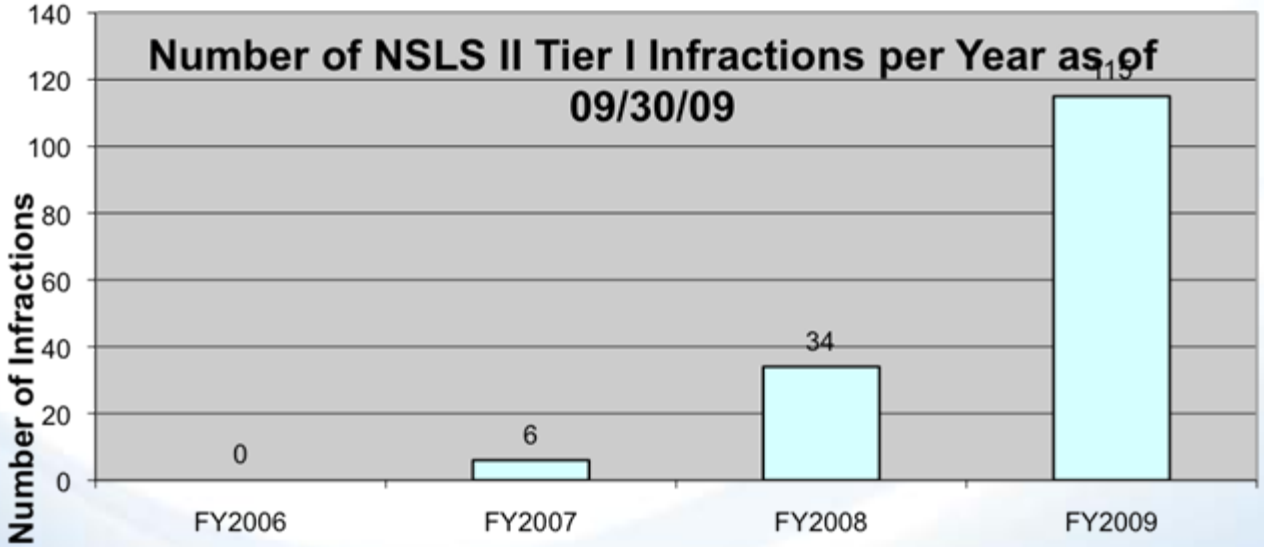
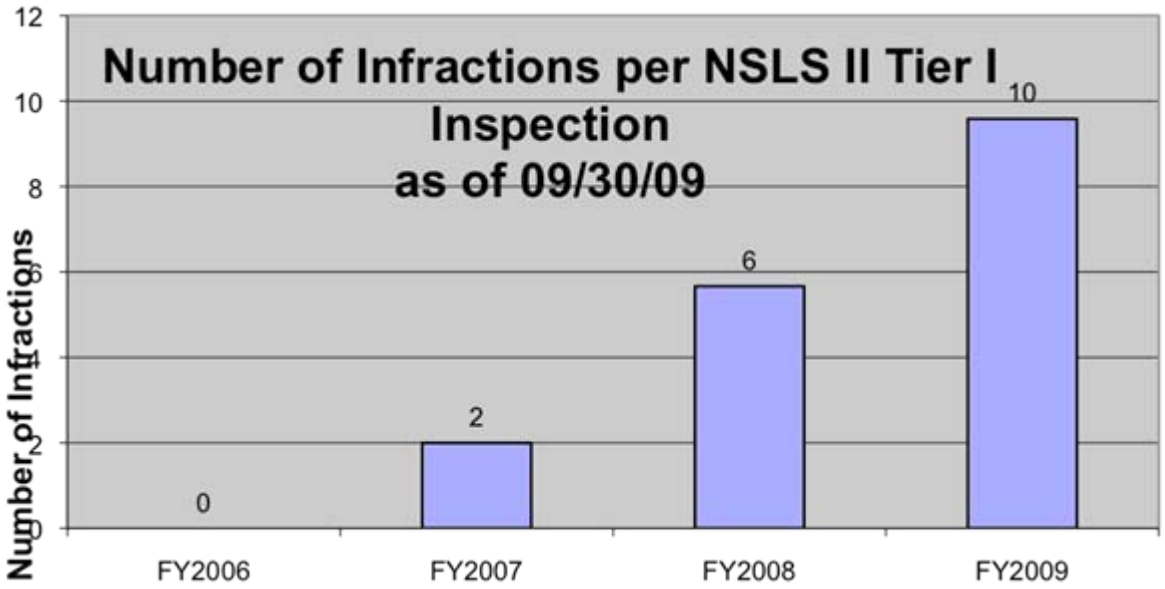
Tier 1 Data

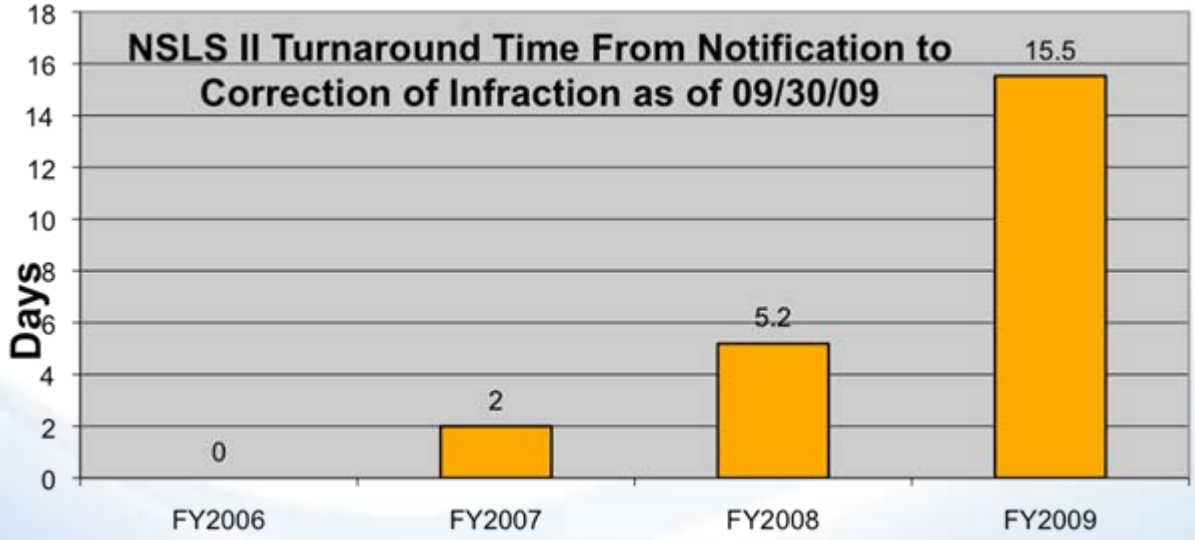




- Program is comprehensive and growing as NSLS-II expands
- Expert core team and staff involvement
- All findings tracked to closure
- Excellent Trending capability
- Lab wide improvement effort to roll up data for statistical analysis

Tier 1 Data





Top 5 typical NSLS-II Infractions include:

1. Cascaded extension/power strips
2. Emergency contact info on phones
3. Electrical Equip not labeled
4. Missing safety posting
5. Antiskid material on steps, feet and step stools

Increase in inspection and Number of infractions increasing due to increased real estate and complexity

Issue: Time to correct infractions is increasing,

Action: not an issue at this time but will need to be watched

NSLS-II ESH Performance Measures

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- **Traffic violations**
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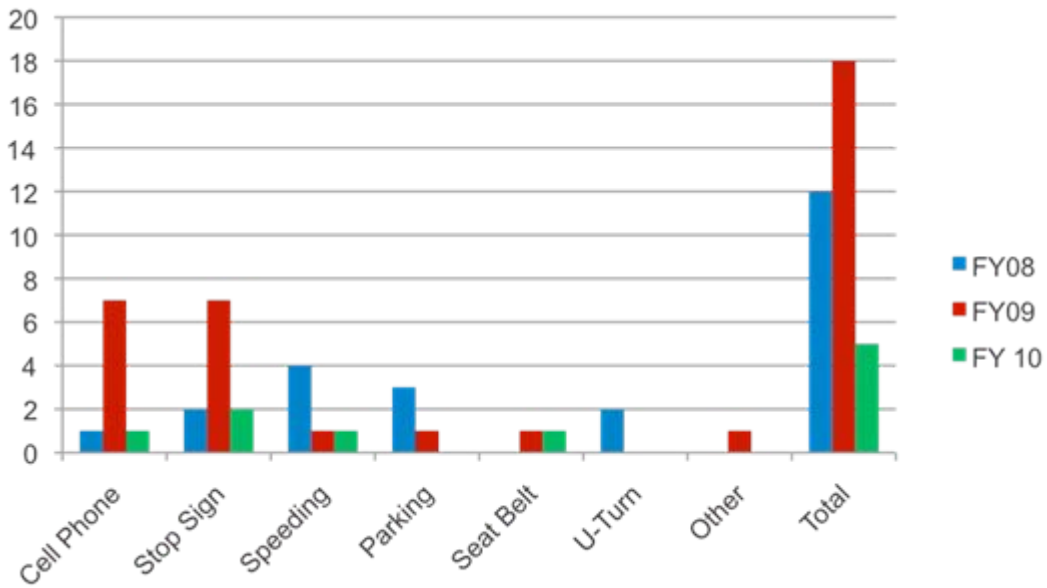
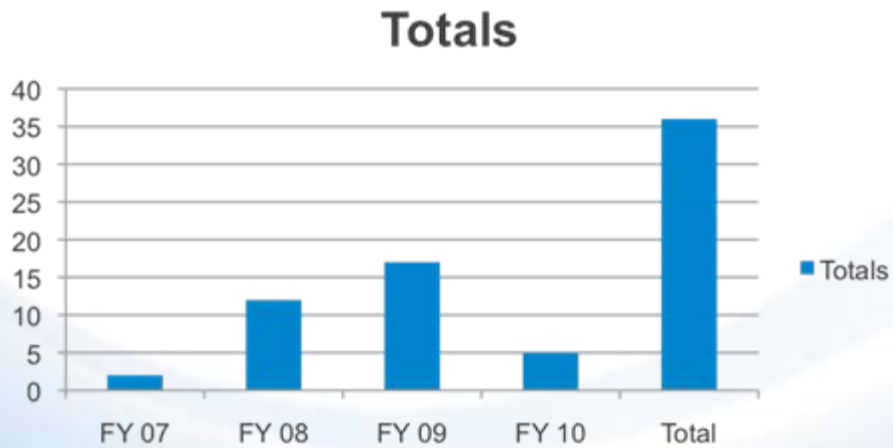
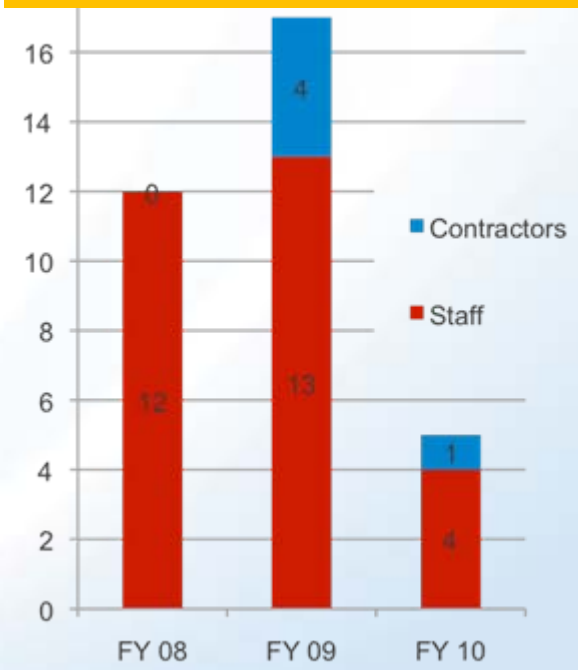
NSLS-II Traffic Violations



Issue: Traffic Violations will continue to be a challenge with increasing staff and 300+ contractors

Action: Periodically emphasize policy; hold staff and contractors accountable; engage Safeguards and Security for focused enforcement





NSLS-II ESH Performance Measures

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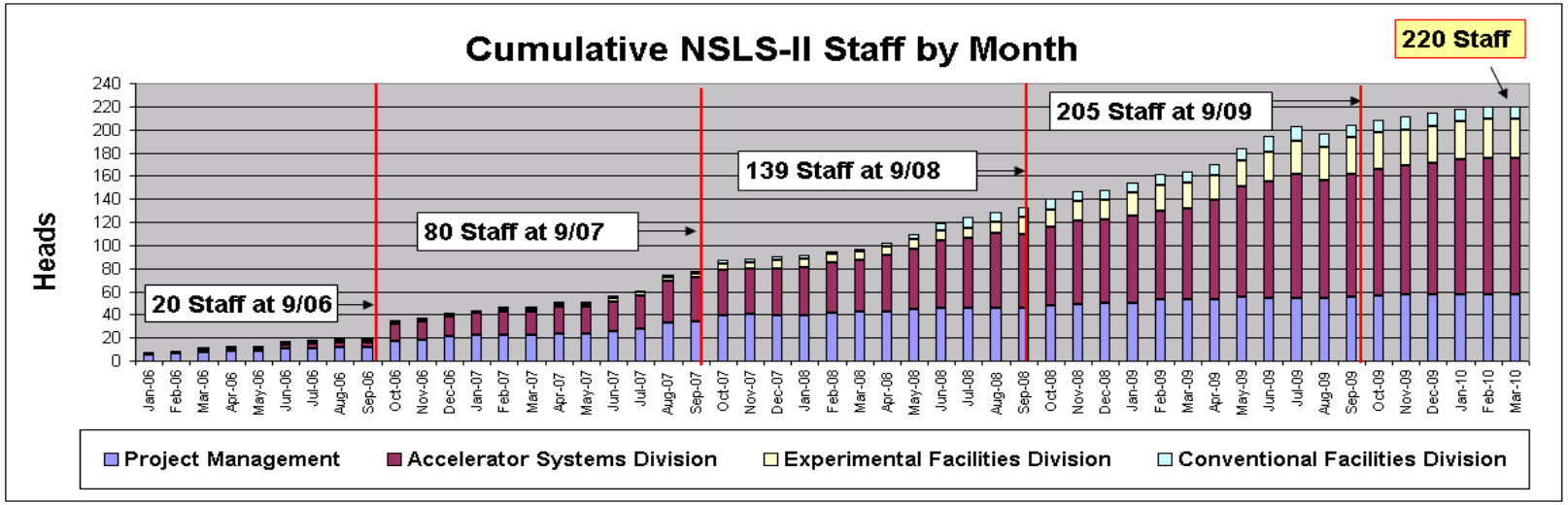
EMS and OSH Performance – Training

- FY 09 NSLS-II Staff Training is at 97% (equals lab average) – Contractor 93% (lab avg 94%)



FY 09 Action: Evaluate the NSLS-II Training program to identify additional metrics to measure for improved performance. (e.g., time to renew training, repeat trends etc.)
NSLS-II Training project start through FY08 averaged:

Staff – 94%

Contractor 91%

NSLS-II ESH Performance Measures

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NSLS-II Injuries

Fiscal Year **2009** cases

9

(5 First Aid; 2 DART; 2 Recordable)

- **Operations:**
  - 3/09 Recordable – Technician infection from splinter
  - 5/09 First Aid – Staff exacerbated existing injury
- **Construction:**
  - 4/09 DART - sub-contractor slipped from ladder, fractured heal
  - 7/09 Recordable – sub-contractor moving conduit chipped tooth
  - 9/09 DART – sub-contractor broken leg from rebar impact
  - 8/09 First Aid – Ironworker scratched arm on tie wire
  - 8/09 First Aid – Carpenter numbness in arm
  - 9/09 First Aid – Ironworker scratched arm on rebar
  - 9/09 First Aid – Carpenter strained calf muscle

Issue: Contractor Performance & Reporting of minor injuries/near misses
Action: - Emphasize with staff via frequent communications and new employee orientations; Institute near miss program; Complete Corrective Action Plan Contractor on site first aid program

Technician Injury

Location: Bldg. 905 Vacuum R&D Area

Injury : Splinter & Infection Right Thigh

Description:

On March 10, 2009 an employee was walking down a 70" wide aisle past a wooden storage crate. He brushed up against the crate top and received a wooden splinter in his right thigh. He removed the splinter and continued working. He did not report the injury to his supervisor or the OMC at this time. On March 23, 2009 he noticed redness in the area where he had removed the splinter and notified his supervisor and reported to the OMC. Follow-up with his physician resulted in the removal of additional splinter material and prescription of antibiotics to treat the infection. This is reportable due to the prescription.

Causes:

>Rough edge on crate top stored adjacent to a walkway
>Employee did not report the injury in a timely manner

Corrective Actions:

> Lessons Learned issued to staff (NSLS ESH Highlight #46) – April 3, 2009 http://www.nsls.bnl.gov/esh/highlights/
> ESH Manager provided overview to NSLS Directorate Management at monthly meeting – March 30, 2009
> Provide overview to NSLS Directorate Staff at all hands meeting – To be scheduled
> Tier 1 inspection team specifically looks for this type of hazard

Contractor Injury

Location: NSLS-II Project Site

Injury : Fractured Right Heel

Description:

Sub-Contractor employee to ModSpace (Sub to Torcon the NSLS-II Ring Building Contractor) was descending from a eight foot step ladder after taking measurements to install an outside seal between two trailer sections. The worker missed the fourth step of the ladder and fell to the ground landing upright on his right foot. The worker was descending facing the ladder and not carrying any equipment, the ladder was on stable ground. He sustained a fractured right heel as a result of this fall. The contractor had recently gone through Contractor Vendor Orientation and the Torcon site specific training which both address ladder safety.

Cause:

> The worker missed the fourth step on the ladder as he was descending facing the ladder

Corrective Actions:

> The General Contractor conducted a tool box safety talk on this incident
> CVO training and the Torcon site indoctrination will discuss this incident
> Increased surveillance by Torcon of all site activities
> Incident will negatively impact Torcon's safety incentive for the construction project

Contractor Injury

Accidents – July 2009

Recordable Injury
NSLS-II Project
July 16, 2009

Location: NSLS-II Project Site

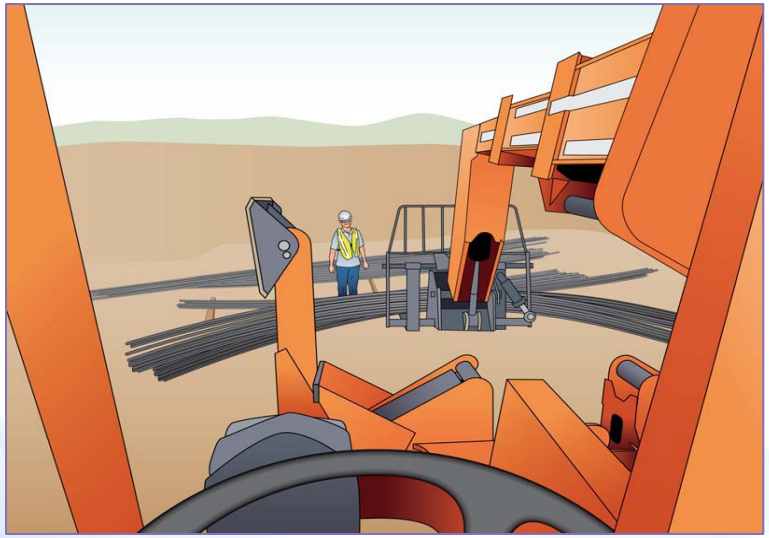
Injury : Cut Lip & Chipped Tooth

Description:
Sub-Contractor employee (Hink Electric) was unloading conduit elbow pieces from a supply truck. He was carrying a conduit on his right shoulder to a pallet located on the ground. As he started bending down to place the conduit on the pallet, his right foot slipped in the sandy soil causing him to lose control of conduit which slipped down lower to the ground. The piece landed on the pallet, flipped up on the elbow, and the end of the conduit struck him in the mouth. He sustained a cut lip and chipped tooth. This is an OSHA Recordable due to the chipped (fractured) tooth.

Cause:
> Lost footing on loose soil

Corrective Actions:
> Special meeting of the project Safety Committee was held to discuss lessons learned.
> The General Contractor conducted a tool box safety talk on this incident
> Re-evaluated the worksite to assure that ramps and walkways are properly established

NSLS II Construction Injury- September 30, 2009



- Rebar bundle struck worker
- Compound fracture to leg
- Suspended operations
- Management walk-down
- BNL/Torcon leadership meeting
- Increased contractor oversight
- Findings included
  - Inadequate training
  - Poor staging of area – trip hazard
  - Inadequate hazard ID

NSLS-II ESH Performance Measures

- Progress on ESH Targets
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- **Events**
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Events

FY 09 ORPS Categorizer Calls

- Suspect legacy shackle(s) found: SC4 (closed) NSLS-II construction
- Contractor chipped tooth: SCBNL (closed) NSLS-II construction
- Contractor fall from ladder: SC3 (closed) NSLS-II construction
- Contractor rebar injury: SC3 (open) NSLS-II construction also NTS

Not reportable

- Legacy materials excavated (NSLS-II Construction – kerosene tank and Glycol)

Issue: Are near misses adequately captured?
Action: Develop a near miss reporting process

NSLS-II ESH Performance Measures

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- **Management Observations**
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Management Observations

- New Program for NSLS-II for FY09
- Started in February (for remaining 8 months)

- Included Project Director & 8 direct reports
- 100% met the goal
- 64 individual observations
- 1280 minutes = 21.3 hours

FY10 will be included in Lab (PEMP) goals (3/qtr- 12/yr)

ESH Performance Measures

- Progress on ESH Targets
- Assessments and audits
- Tier I
- Traffic violations
- Injuries
- Incidents (2 minor; no ORPS)
- Management Observations
- **Hazardous waste generation**

NSLS-II Hazardous Waste Generation

- **FY2009 Hazardous Wastes**
- None produced during this time period
- Existing wastes were either recycled or allowed to be placed in regular trash

- **FY2010 Anticipated Hazardous Wastes**
- Mirror and crystal cleaning solvents
  - Reuse if solutions remain clean
  - Minimize quantities
- Crystal etching solutions
  - Reuse if solutions remain active
  - Minimize quantities
- Metal cleaning solutions
  - Evaporator reduces ~350 gallons of detergent to ~100 lbs dry cake
  - Transfer of de-ionized water from final clean rinse tank to initial rinse tank to detergent tank before evaporation

Issues Summary & Areas for Improvement

- Changes to ASO and DOE Audit: Stay actively involved in assessment and ASO mods; communicate strategy with BHSO.
- Potential to uncover unknown materials during site excavation: Maintain on risk registry until excavation complete
- Audits: Construction injury investigation identified a need to "step up" construction program audits – being addressed in CAP for both NSLS-II and Contractor; Increased amount of audits will require tracking effort
- Tier I Program: Monitor "time to correct infractions" and "repeats" take corrective action if necessary
- Traffic Violations: Monitor Traffic Violations as staff and contractor population increases and take corrective actions as appropriate
- Injuries: Construction injuries unacceptable, ongoing CAP, near miss program in development
- Near Misses: Injuries and events, near miss program in development

- NSLS ESH Management System
- ESH Performance Measures
- **Targets for FY 10**

ESH Targets FY10

Continued from FY09

- Advance directorate Human Performance Improvement Program
- Increase NSLS-II personnel awareness to accidents, incidents and traffic violations and maintain a “zero” injury policy for the project
- Management Observation Program (move to PEMP goals)

New for FY10

- Support BNL efforts to maintain ISO 14001 and OHSAS 18001 standards
- Establish a tracking mechanism for near miss events
- Integrate work planning (PSRF’s) and production traveler systems
- Establish a meaningful and cost-effective P2 proposal.
- Improve construction contractor ESH performance (CAP)

Questions / Comments

Please sign the attendance sheet