

PS FY 14 Management Review



Andrew Ackerman
EMS/OSH Management Review
January 07, 2015

Purpose of Review

- **“Senior Management shall”...Evaluate ESH program**
 - Adequacy – does it meet requirements & is it implemented appropriately
 - Suitability- does it “fit” Photon Science operations & systems
 - Effectiveness- is it achieving the desired results
- **Review performance of key system components including:**
 - Changing circumstances
 - ESH program performance
 - Results of audits, assessments, corrective, and preventive actions
 - Extent to which objectives and targets have been met
 - ESH communications
 - Follow-up actions from previous management reviews
- **Expected Outcome:**
 - Identify areas where improvements are needed
 - Provide feedback and direction

Agenda

- PS Facility
- ESH Management Systems
- Changing Circumstances
- ESH Performance
- FY15 Goals
- Summary / Feedback

2014: A busy and productive year

- NSLS operations
- NSLS II accelerator commissioning
- Project beamlines (6) commissioning

Photon Sciences Facilities FY14 Floor Area (square feet)

421	Offices/Labs	971
463	Offices/Labs	716
526	Offices/Labs	1,195
535	Offices/Labs	16,329
725	National Synchrotron Light Source	87,384
726	Mechanical Support	3,316
727	Mech/Magnet Measurement	3,912
729	Source Development Lab	7,098
902/905	Magnet test and assembly, vacuum	7,787
801	Machine Shop	650
820	Storage	6,622
703	Exp. Facilities Div.; 9 labs	15,303
945	Vacuum lab	4,600
832	RF, magnetic measurement	6,934
820	Front Ends Diagnostics	3,848
740	NSLS II Ring Building	348,625
740+	Injector, RF, Service, Compressor	86,800
741,3,4,&,5	Offices and labs	69,043

FY 10; 224,925
FY 11; 534,845
FY 12; 845,625
FY 13; 669,044
FY 14; 671,133

ESH Program Responsibilities

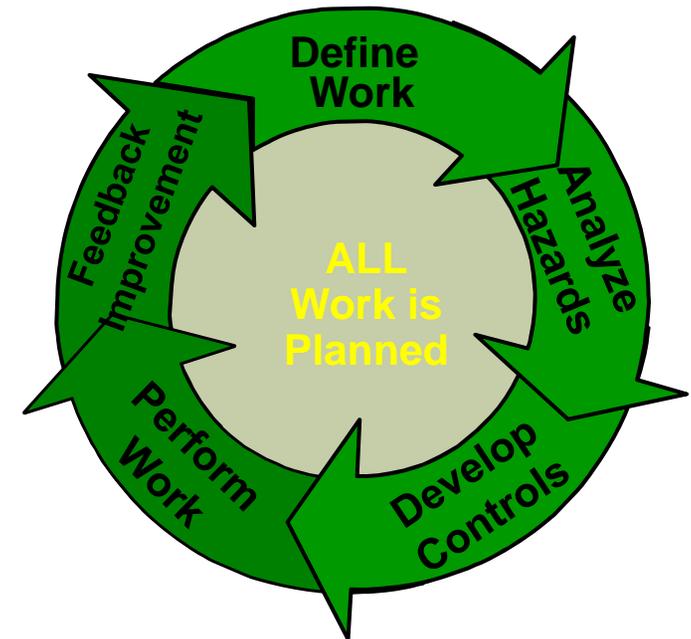
- Experiment safety review
- Work planning support
- Emergency planning
- Environmental management
- Hazardous waste management
- Industrial hygiene
- Industrial safety
- Radiation safety
- Construction Safety
- Safety system configuration control
- Self-assessment
- Risk assessment
- Interlock certification (rad & laser)
- Tier I inspections
- Compliance audits
- Training
- Configuration management
- Readiness Planning

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FY 14 Work Planning

- Operations (includes installation, testing, and maintenance)
 - ~40 Enhanced Work Plans; 100's reviewed
 - Manager & Work Control Coordinators
 - Primary Reviewer (ESH)
- Science
 - NSLS
 - ~ 1200 Safety Approval Forms
 - Experiment Review Coordinators (ESH)
 - Operations Coordinators (Operations)
 - NSLS II
 - Commissioning Activity Approval Forms
 - **PASS II is coming!**
- Science Facility
 - NSLS & NSLS II laboratories; BNL ESR's
 - Beamline BNL ESR's



Photon Sciences Directorate EMS/OHSAS Documents and Links

The Photon Sciences 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 Photon Sciences Directorate follows the [PS Environmental, Safety, Security and Health Policy](#) derived from the [BNL Environmental, Safety, Security and Health \(ESSH\) Policy](#)

Planning

- ▶ [Photon Sciences Significant Environmental Aspects Matrix](#)
- ▶ [Photon Sciences QA Procedures](#)
- ▶ [Management System Guide](#)
- ▶ [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 Photon Sciences QA Procedures listed above.

- ▶ [Photon Sciences Process Assessments](#)
- ▶ [Photon Sciences Training Program Procedures](#)
- ▶ [Photon Sciences Training Courses](#)
- ▶ [EMS/OHSAS Group](#)
- ▶ [Work Planning and Control](#)
- ▶ [Local Emergency Plans](#)

Checking and Corrective Action

- ▶ [Photon Sciences QA Procedures](#)
- ▶ [Assessment Tracking System](#)

Management Review

- ▶ [Presentation](#)
- ▶ [Notes](#)

EMS / OHSAS

FY14 Activity

- EMS/OHSAS/ISM Review group meetings
- Process Assessments reviewed / revised
- Web page updated
- Internal Multi-Topic Compliance Audit (NSLS)
- External Surveillance Audit

No Significant Findings

ESH Communication

- NSLS
 - Weekly User meeting
 - Tri-annual UEC Town Meetings
 - NSLS 'End of Run' forms
- NSLS II
 - Project Reviews
 - Advisory Committees
 - Daily Installation Planning (plan of the day)
 - Weekly
 - Installation Planning
 - Maintenance
 - Operations
 - Beam Line Management
- BNL Lessons Learned



Agenda

- PS Facility
- ESH Management Systems
- **Changing Circumstances**
- ESH Performance
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Changing Circumstances

Change	Impact to PS
NSLS II transition: Installation to commissioning / operations.	<ul style="list-style-type: none">• 10 IRR / ARR's completed. Significant effort from: PS, BNL, other SC Labs (ORNL, ANL, SLAC)• Authorization basis documentation development.
NSLS transition: End of operations; repurposing	<ul style="list-style-type: none">• Equipment inventory completed.• Much cleaning and sampling for surface Lead surface contamination.

Readiness Reviews FY14 10 Total

- Booster Commissioning IRR 09/2013
- Booster Commissioning ARR 11/2013
- Storage Ring Commissioning IRR 01/2014
- Storage Ring Commissioning ARR 02/2014
- Routine Operations IRR 06/2014
- Routine Operations ARR 07/2014
- Project Beamline Preliminary IRR 07/2014
- Super-Conducting Cavity IRR 07/2014
- 23ID & 28ID Beamline IRR 09/2014
- 03ID, 05ID, 10ID, & 11ID Beamline IRR 10/2014

Get Ready

- Installation (hardware)
 - Design review (PDR, FDR)
 - QA (travelers)
- Documentation
 - Records
 - Procedures
- Training

Review

- Tailored review plan
- Instrument readiness plan
- Plan of action
- Lines of inquiry
- Report (findings)
- ATS

Readiness Reviews FY14

Findings

NSLS-II Reviews	Pre-Start Findings			Post-Start Findings		
	Total	Open	Closed	Total	Open	Closed
Booster IRR	50	0	50	55	0	55
Booster ARR	13	0	13	16	0	16
Storage Ring IRR	36	0	36	35	8	27
Storage Ring ARR	10	0	10	11	0	11
Routine Ops IRR	31	0	31	21	6	15
SCRF Cavity IRR	8	0	8	11	1	10
Routine Ops ARR	9	0	9	4	1	3
Preliminary Beamline IRR 3, 5, 10, 11, 23, & 28	23	0	23	32	21	11
Beamline IRR 23 & 28	12	0	12	5	5	0
Beamline IRR 3, 5, 10, & 11	32	0	32	41	41	0
Total	224	0	224	231	83	148

Changing Requirements

Change	Impact to PS
LOTO (SBMS)	<ul style="list-style-type: none">• New Tag• Service and maintenance distinct from, “Centrally Controlled” LOTO; 2nd Tag• Training; Job Performance Measures• Surveillances
Conduct of Ops; commissioning to operations	<ul style="list-style-type: none">• Enhanced procedure development• Enhance USI process

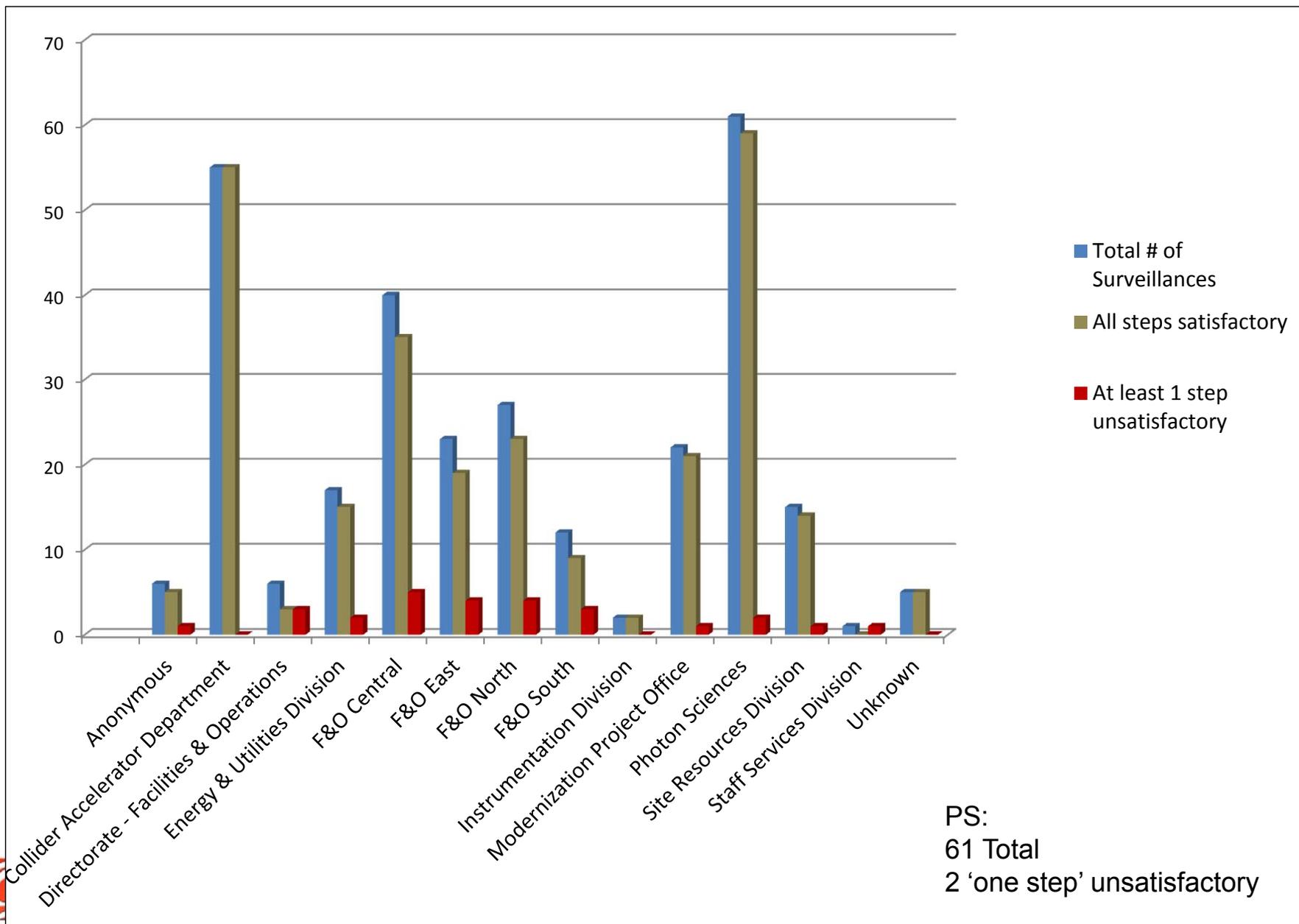
LOTO

- PEMP Goal – Implement new LOTO requirements and measure performance
 - **LOTO Practices Working Group (LPWG)**; PS engaged
 - Deploy new Service and Maintenance tags; Centrally Controlled separate
 - Use Job Performance Measures (JPM) to evaluate staff's ability to successfully complete the required LOTO steps.
 - Complete field surveillances (checklist; database entry)

Photon Science JPM Evaluators & Surveillance Team

Boerner Jr, Albert	Harder, David	Santana, Michael
Cupolo, John	Iaccarino, Richard	Scheuerer, Robert
D'Alsace, Roy	Marino, Philip	Sikora, Robert
De Boer, Walter	McCaffrey Jr., John	Singh, Pooran
Dilgen, Thomas	Nintzel, Gary	Usack, Victor
Fliller, Raymond	Oldham, Daniel	Wilson, King
Gallagher, John	Rambo, Wayne	Zigrosser, Douglas
Ganetis, George	Ramirez, Gloria	Zitvogel, Emil

LOTO Surveillances



PS:
61 Total
2 'one step' unsatisfactory

Procedures FY14

- Procedures that support procedure development
 - Development, issuance, implementation, and use of procedures POP
 - Format, author, reviewers, approval, validation, USI, training.
 - Records management
 - Minor change

- 322 Total
- ~ 500 workflows for new or revised procedures
- ~ 125 people involved

Process (2 – 3 weeks)

- Author generates
- Procedure Support Group:
 - Formats and works with author – final draft
 - Distributes draft; schedules review meeting
 - Schedules technical procedure validation (field or desk)
 - Incorporates final comments
 - Gathers review and approval signatures (electronic)
 - Releases procedure
- Training Group defines target audience; training development form
- Target audience reads and signs (electronic)

UnReviewed Safety Issue (USI)

- Procedures that support USI's
 - USI determination (USID)
 - Management of NSLS II safety and authorization bases
 - 18 NSLS II procedures (design, planning, configuration management, installation, reporting)

01/2014 – 10/2014

- 570 Issues screened
- 20 Evaluated
- 1 positive USID:
ODH Monitoring Requirements (ASE)

Process

- Procedures listed above trigger USI screening (Authorization Basis Manager; Qualified Screeners)
- Screen negative – form filed; work continues with no further review
- Screen positive – moves to evaluation
- Evaluation negative – reviewed by ABM; distributed; filed; no further review
- Evaluation positive – issue evaluated; continue? Yes – LESH, ALD ESH, & DOE Approval

Staff training

- 99 Awareness
- 16 Screening
- 5 Evaluator

Discoveries

- Stop
- Inform
- Make safe
- Plan restart

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- **ESH Performance**
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ESH Performance Measures

- Audits
- Injuries
- Events
- Tier I
- Radiation exposure
- Hazardous waste generation
- Progress on ESH Goals

Audits / Assessments

- Fork / Aerial Lift Inspections
 - Hoisting / Lifting Devices Inspections
 - LOTO Surveillance
 - LOTO Self-Assessment
 - DOE IG Nano-Science
 - DOE Triennial
 - EMS/OHSAS Multi-Topic Internal
 - Lasers, Mag. fields, non-ionizing rad
 - Comp. gas, cryo, ODH, pressure
 - Competence, training, awareness
 - Communication
 - Documentation / Document control
 - Operational control
 - Emergency preparedness
 - Significant aspects / Process assessments
 - EMS/OHSAS External Surveillance
 - Planning
 - Training
 - Operational control
 - Emergency preparation
 - Monitoring and measurement
 - Ten ARR / IRR
 - 224 Pre-Start findings
 - 231 Post-Start findings
- Few findings (except readiness review)
 - Value
 - Preparation
 - Bringing in additional expertise

ESH Performance Measures

- Audits
- **Injuries**
- Events
- Tier I
- Radiation exposure
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PS Injuries (Staff & Users) FY 14

2 Total; 0 User

- Tool drop; fractured finger Staff Recordable Feb
- Fall; wet surface; knee; (off-site) Staff First aid May



PS Related Injuries (BNL Staff & Job Shopper) FY 14

6 Total

- | | | | |
|-------------------------------------|-------------|-----------|-------------|
| • Fall; shoulder, arm | Staff (BNL) | DART | Dec '13 |
| • Fall; ice slip, back | Staff (BNL) | First aid | Dec '13 |
| • Mechanical stress; Injured finger | Job Shopper | First aid | Jul |
| • Numbness; hand | Staff (BNL) | DART | Apr/Jul/Sep |
| • Bee sting | Staff (BNL) | First aid | Sep |
| • Material handling; finger bruise | Staff (BNL) | First aid | Sep |

ESH Performance Measures

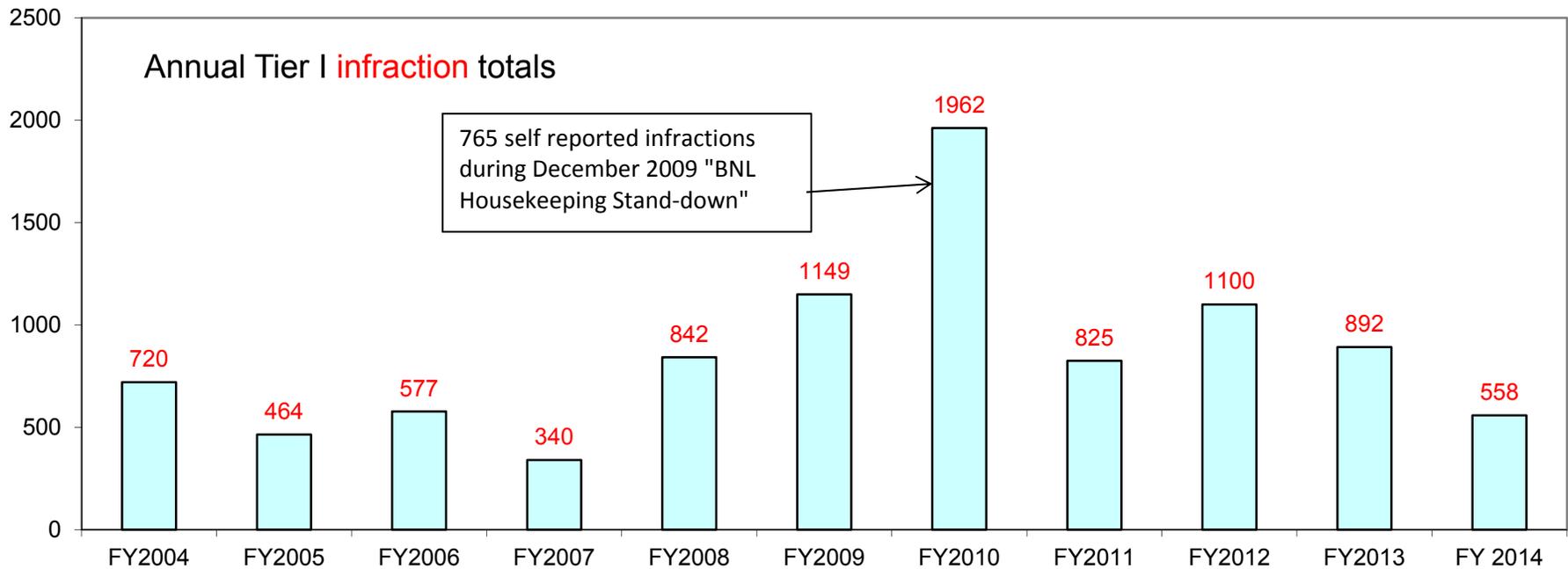
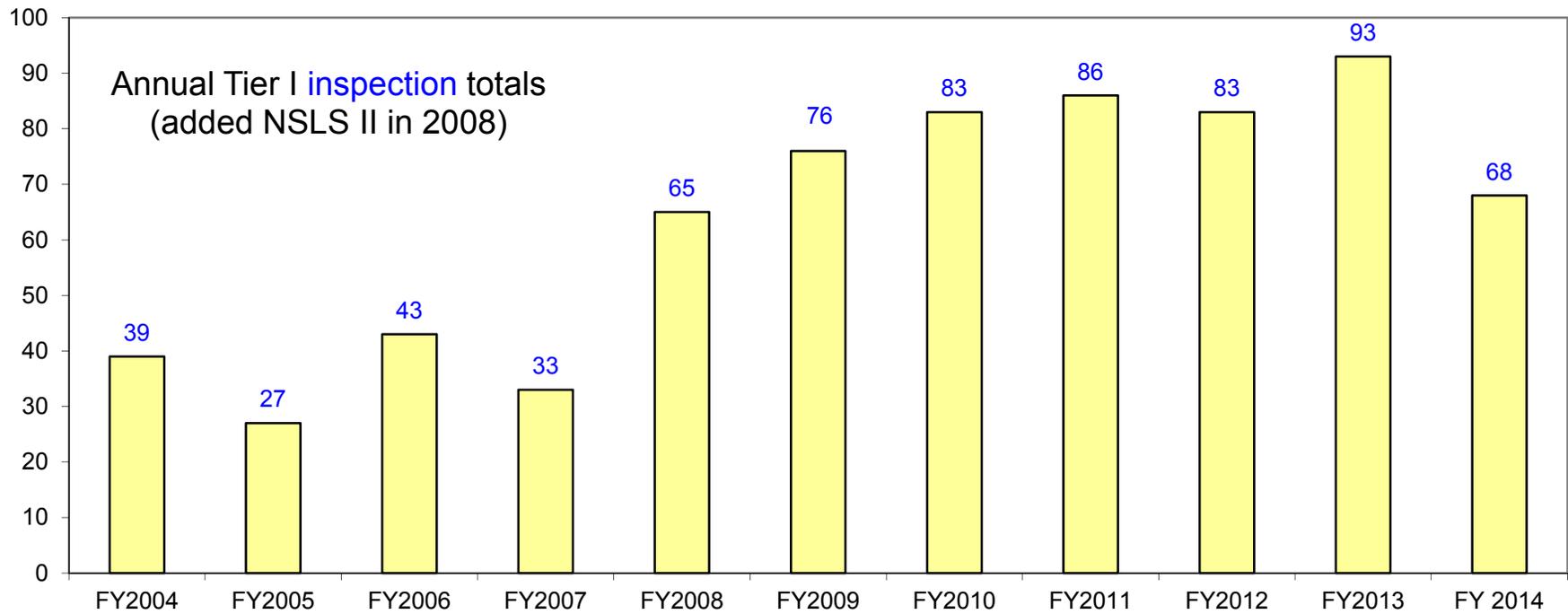
- Audits
- Injuries
- **Events**
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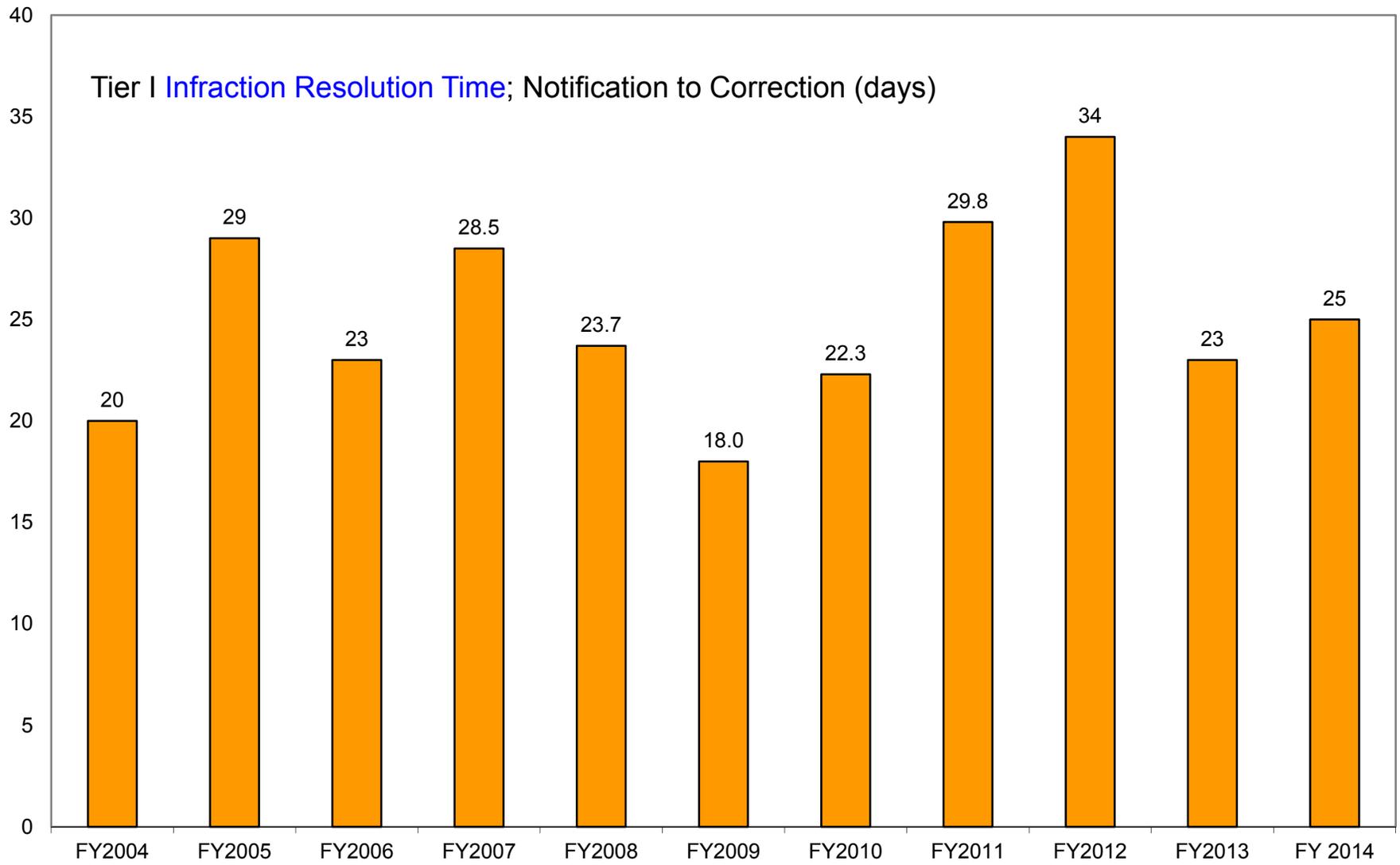
PSD Events (No Injuries); 17 Total FY 14

- Vacuum leak; NSLS Booster to VUV transport line shutter; **SCBNL** Nov '13
- Switch gear failure; Power interruption to Bldg. 740 Nov '13
- Motor Vehicle Accident; Parked car struck; Bldg. 743 parking lot Jan
- Shelter in Place; NSLS II; Flam. gas release bldg. 522 Jan
- Damaged PPS door switch, NSLS II; **ORPS SC4** Jan
- **Smoke event**; vacuum bake out; Bldg. 740; partial evacuation Feb
- Fork lift propane leak; Bldg. 740 Feb
- X27 Water leak; vacuum loss; NSLS April
- X21 Water leak; vacuum loss; NSLS May
- Hydraulic fluid leak; Bldg. 744 loading dock; truck hydraulic line May
- Sprinkler head break; water leak; Bldg. 744; partial evacuation May
- LOTO; NSLS II; ion pump electrical supply; **ORPS SC4** Jun
- Electrical spark; No ground; NSLS II booster septum Jul
- Damaged compressed air line; Bldg. 740 Jul
- Vacuum relief valve fail; NSLS II RF cavity; **SCBNL** Jul
- Circuit breaker trip; pinched AC cord; NSLS II Jul
- **Smoke event**; Bldg. 725; electrical panel Sep

ESH Performance Measures

- Audits
- Injuries
- Events
- **Tier I**
- Radiation exposure
- Hazardous waste generation
- Progress on ESH Goals





ESH Performance Measures

- Audits
- Injuries
- Events
- Tier I
- **Radiation exposure**
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Radiation Dose Measurements

January to November 2014

- Neutron Dose 15 mrem on 2 TLD's
- Deep Dose: 74 mrem on 3 TLD's

TLD Badge counts

- ~ 519 issued each month
- ~ 6145 issued for the year

Collective Dose = 89* Person – mrem

* Investigation in progress; 69 mRem from medical procedure

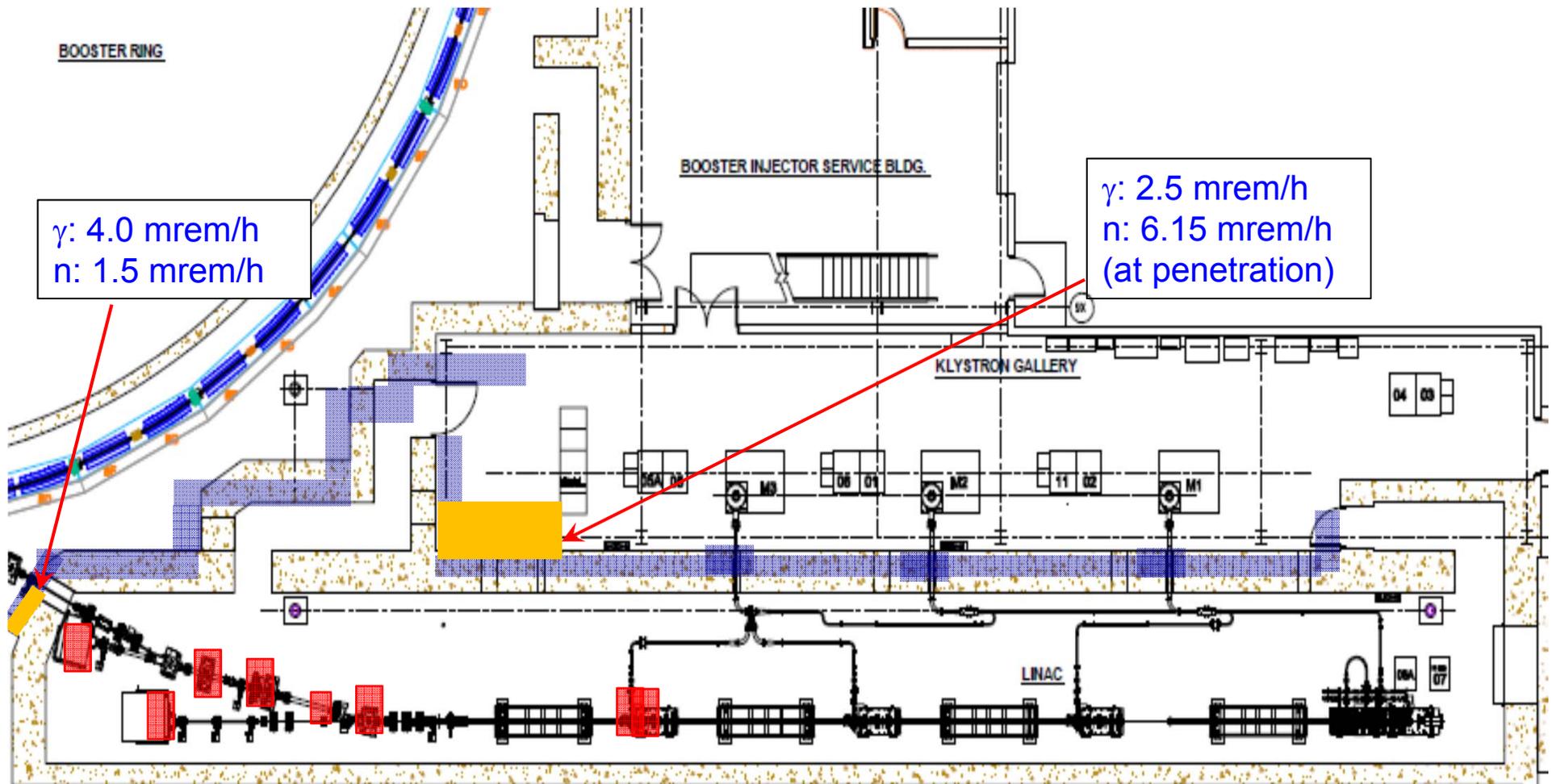
- 2013: 54 person-mrem (*most = background accumulation; late badge return; NSLS*)
- 2014: All measured dose from NSLS (725)

NSLS II

- 45 interlocked ARM's
- 100 Passive area monitors (TLD's)
- Personnel dosimeters on all

Map of the Linac Fault Studies (measured dose rate values; reduced charge and rate)

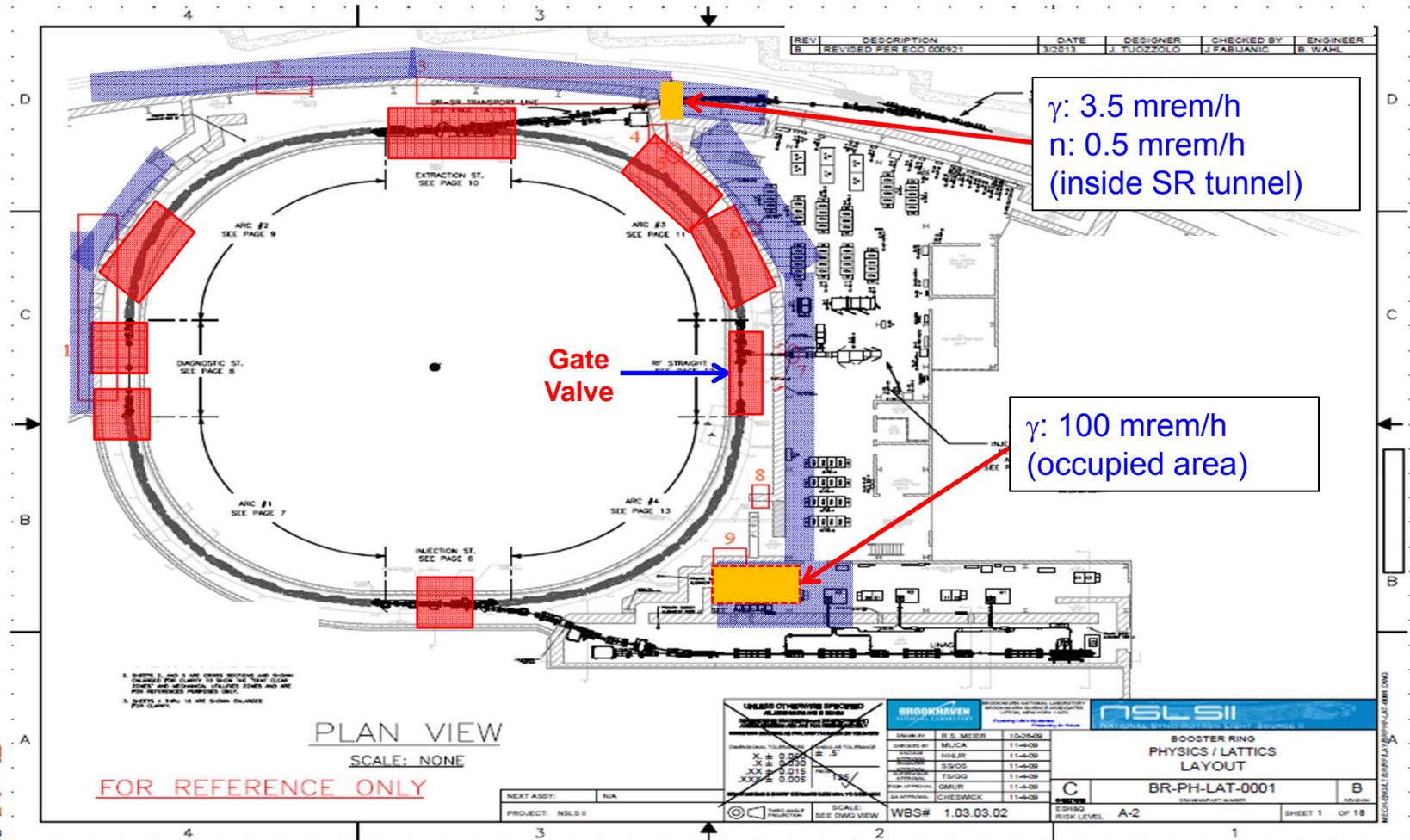
- Red indicates the location of the intentional electron beam loss
- Blue indicates survey locations.
- Orange is the areas of highest dose rate.



Map of Booster Fault Studies

(measured dose rate values; reduced charge and rate)

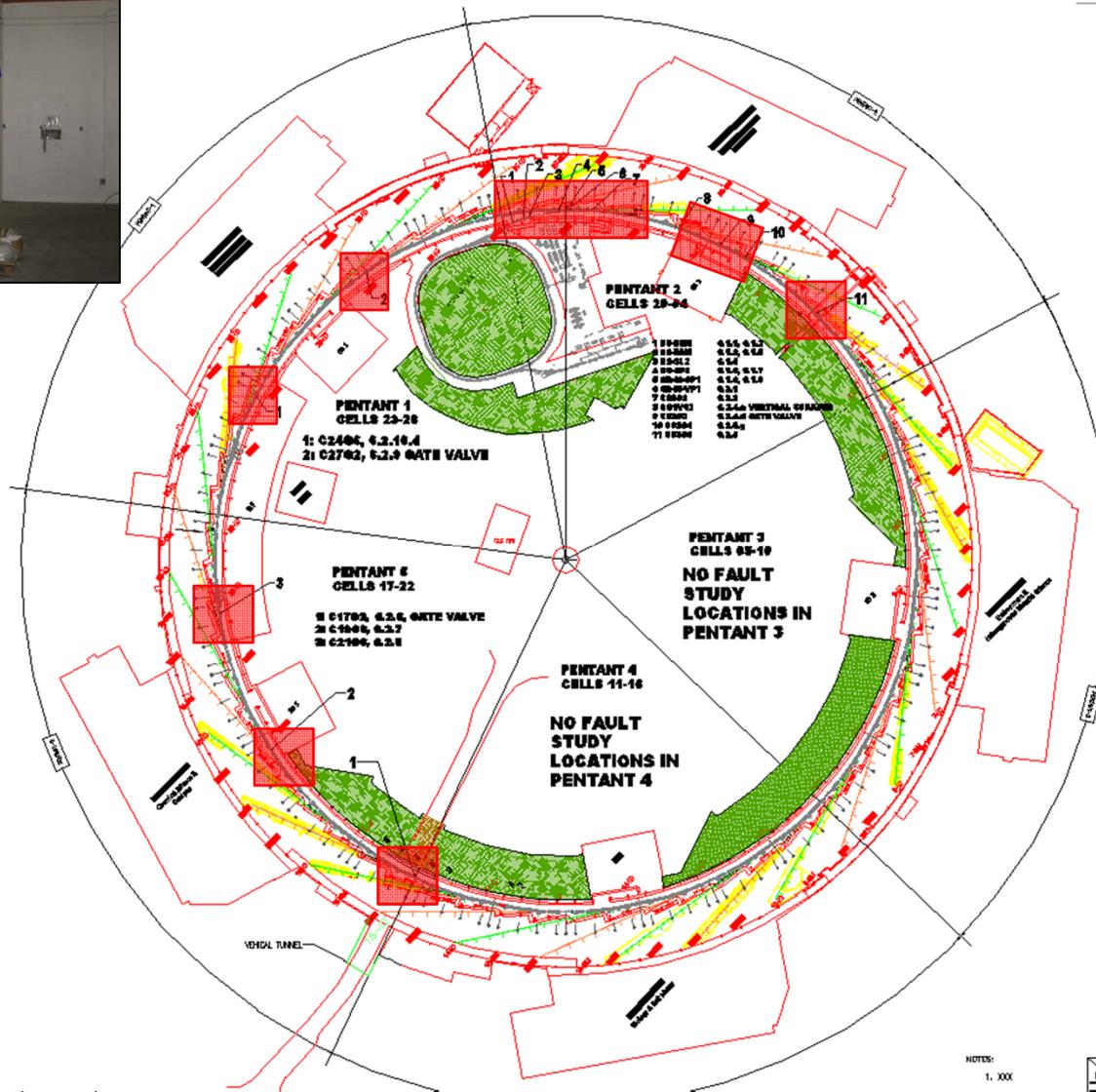
- Red indicates the location of the intentional electron beam loss
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Map of Storage Ring Fault Studies (measured dose rate values; reduced charge and rate)



~3 mrem/hr



~7 mrem/hr

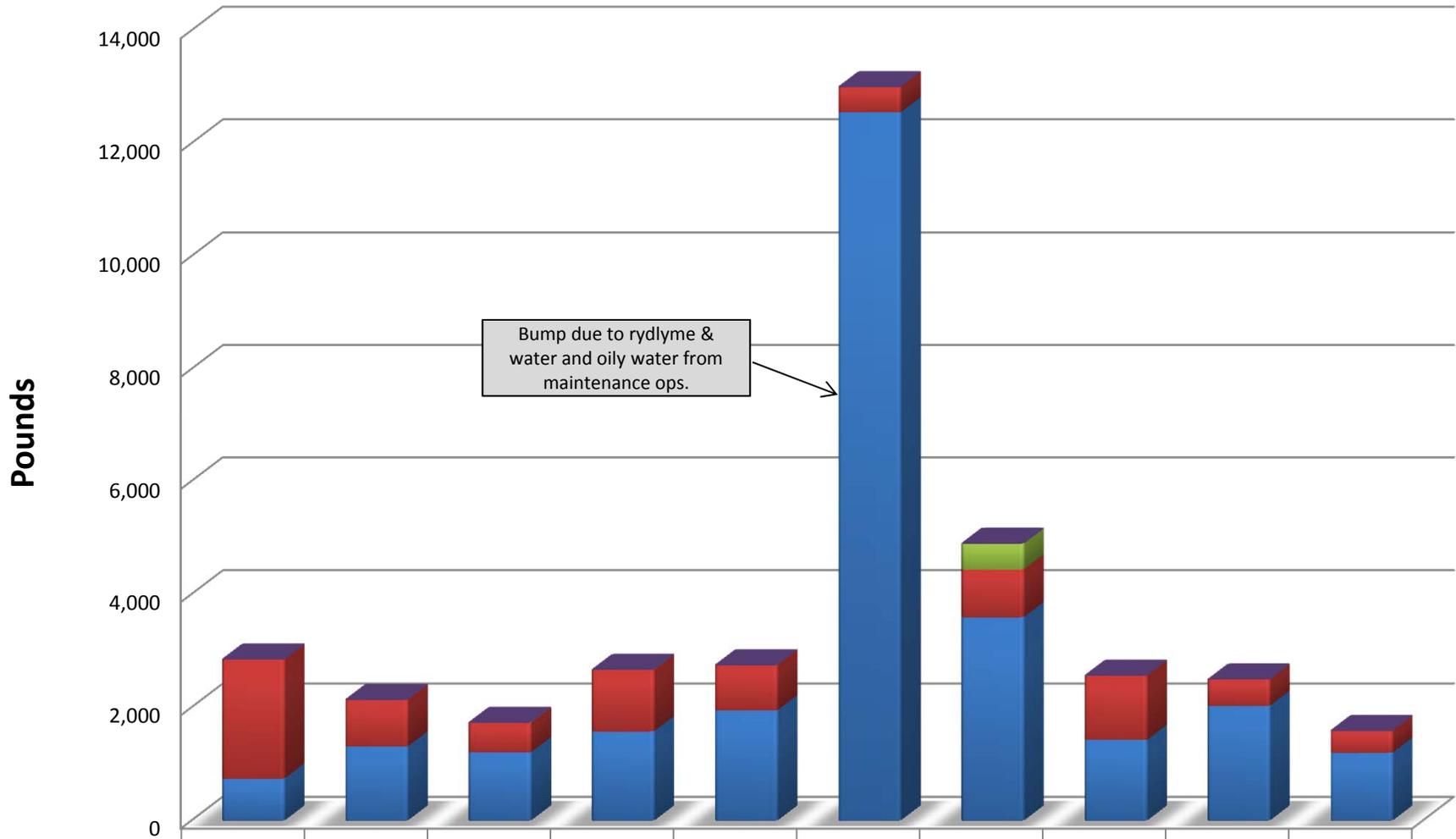
Machine Fault Study Summary

- Linac
 - Highest levels measured = ~ 8.5 mrem/hr
 - Scaled to ASE limit = ~ 70 mrem/hr
 - Existing monitoring and shielding adequate to meet PS shielding policy
- Booster
 - Highest levels measured = ~ 100 mrem/hr
 - Scaled to ASE limit = ~ **1250 mrem/hr**
 - Shielding added; scaled rate = ~ 125 mrem/hr
 - Existing monitoring and shielding adequate to meet PS shielding policy
- Storage Ring
 - Highest levels measured = ~ 7 mrem/hr
 - Scaled to ASE limit = ~ 300 mrem/hr
 - Existing monitoring and shielding adequate to meet PS shielding policy

ESH Performance Measures

- Audits
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PS Waste Totals 10 Year History



	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14
Mixed	0	0	0	0	0	0	0	0	0	0
Radioactive	0.001	0	3.91	2	0	0	455	0	0	0
Hazardous	2105.47	823.93	519.62	1082.35	796.86	446.79	845.00	1135.00	463.00	384.00
Non Hazardous	742.42	1311.06	1205.69	1579.13	1949.31	12549.52	3596.00	1427.00	2030.00	1202.00

ESH Performance Measures

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ESH Improvement Plan

FY14 Goals

- **Implement machine shop safety plan improvements.**
Ongoing (Funds allocated for emergency stops, anti-restart circuits, guarding; E-stops installed in bldg. 726 shop; future machine inventory to be defined)
- **Close building 740 BORE post-occupancy findings.**
(Complete)
- **Complete 10 surveys for prevention of slips, trips, and falls using SHSD guidance cards.**
Ongoing (8 surveys completed and documented)
- **Complete LOTO effectiveness review and resolve findings.**
(Complete) (discussed earlier)

ESH Improvement Plan

FY14 Goals

- **Complete accelerator IRR's and ARR's and resolve findings.**
(Complete) (discussed earlier; post-start items still being tracked to completion)
- **Complete project beamline IRR's and resolve findings.**
(Complete) (discussed earlier; post-start items still being tracked to completion)
- **Implement one sustainable business practice to improve environmental stewardship.**
(Complete) (improved battery recycling, receptacles and guidance placed in bldg. 740; furniture purchased for LOB's and Control Room meets environmental standards **LEED Gold**)
- **Review results of the 2013 inspection of aerial lifts and forek lifts and determine any needed corrective actions.**
(Complete) (no significant findings)

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Photon Sciences FY 15 EMS/OHSAS Goals

- Generate a summary report to characterize the radiation measurements collected during linac, booster, and storage ring commissioning. Use the data to identify any needed controls for managing personnel radiation doses.
- Implement slip simulator training; train 25% of the directorate staff.
- Participate on the BNL Ladder Working Group.
- Bring machine shops into compliance with SBMS. Configure 5 machines each month with required hardware.
- Implement an ESH review program to identify, evaluate, and control the risks presented by User experimentation.
- Implement one sustainable business practice directed at improving environmental stewardship performance. Work with ECR to identify a specific goal.

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 - Results of audits, assessments, corrective, and preventive actions
 - Extent to which objectives and targets have been met
 - ESH communications
 - Follow-up actions from previous management reviews; (no significant follow up)
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END

Presentation and Minutes will be posted at:

<http://www.bnl.gov/ps/esh/EMS-OHSAS/default.asp>

Questions / Comments

Please sign the attendance sheet