

Management Review of Occupational Safety and Health (OSH), Environmental (E) and Self Assessment (SA) Management Systems

Ed Lessard

Joe Falco

Ray Karol

Mel Van Essendelft

Dave Passarello

Joel Scott

Senior Managers and Others

Collider-Accelerator Department
September 15, 2004

Purpose

- Annually senior C-A management shall review its environmental and occupational safety and health performance, both qualitatively and quantitatively, for the purpose of identifying key improvement opportunities in these management systems
- C-A managers shall conduct an annual review of organizational performance versus objectives and measures defined in their self-assessment program

Management Review Agenda

- Ed Lessard (Introduction)
- Joe Falco (Noise Exposure and Repetitive Strain Injuries)
- Ed Lessard (Overview of Management Systems and Performance)
- Ray Karol (Performance of Tier 1 and Similar Programs)
- Mel Van Essendelft (Environmental Performance)
- Ray Karol (Groundwater Issues)
- Dave Passarello (Results of Audits and Self Assessment)
- Joel Scott (Waste Management Performance)
- Ed Lessard (Management Systems Costs)

- Senior Managers and Others (Senior Manager Evaluation)

Introduction

FY04 Contract Critical Outcome

- **Science and Technology**

*BNL will deliver innovative, forefront science and technology aligned with DOE strategic goals in a **safe, environmentally sound, and efficient manner**, and will conceive, design, construct, and operate world-class user facilities*

FY04 Contract Objectives

Objective 1.1 Quality in Research

- Science Success:
 - Produce original, creative scientific output
 - Achieve sustained progress and impact on the field
- Technology Success:
 - Show solid technical base for the work
 - Show intrinsic technical novelty of the research
 - Achieve important technical contributions
 - Achieve recognition from the technical community

FY04 Contract Objectives

Objective 1.3 Success in Constructing and Operating Research Facilities

- Construct new facilities on time and within budget
- Provide the next generation of research tools
- Ensure user access program is effective
- Effective leadership in SNS Project

FY04 Contract Objectives

Objective 1.4 Research Program Management

- High quality research plans
- Technical risks are adequately considered
- Optimal use of personnel, facilities, and equipment
- Success in meeting budget projections and milestones
- Effective decision-making in managing projects
- Success in overcoming technical problems
- Effective communication of technical results
- Effective transfer of intellectual property to industry
- Customer and stakeholder expectations are met

FY04 Contract Objective

Objective 3.4.1 Pollution Prevention

- BSA will continue to develop and promote programs that improve environmental performance, effectively and efficiently managing and/or reducing environmental risks

FY04 Contract Objective

Objective 3.4.4.1 Safety Implementation Path Forward

- For FY 2004, the Director's Safety Committee will develop and conduct a review process to determine improvements in the BNL Safety Programs against the DuPont Benchmark

Objective 3.4.4.2 OSHA Reportable Injury Management

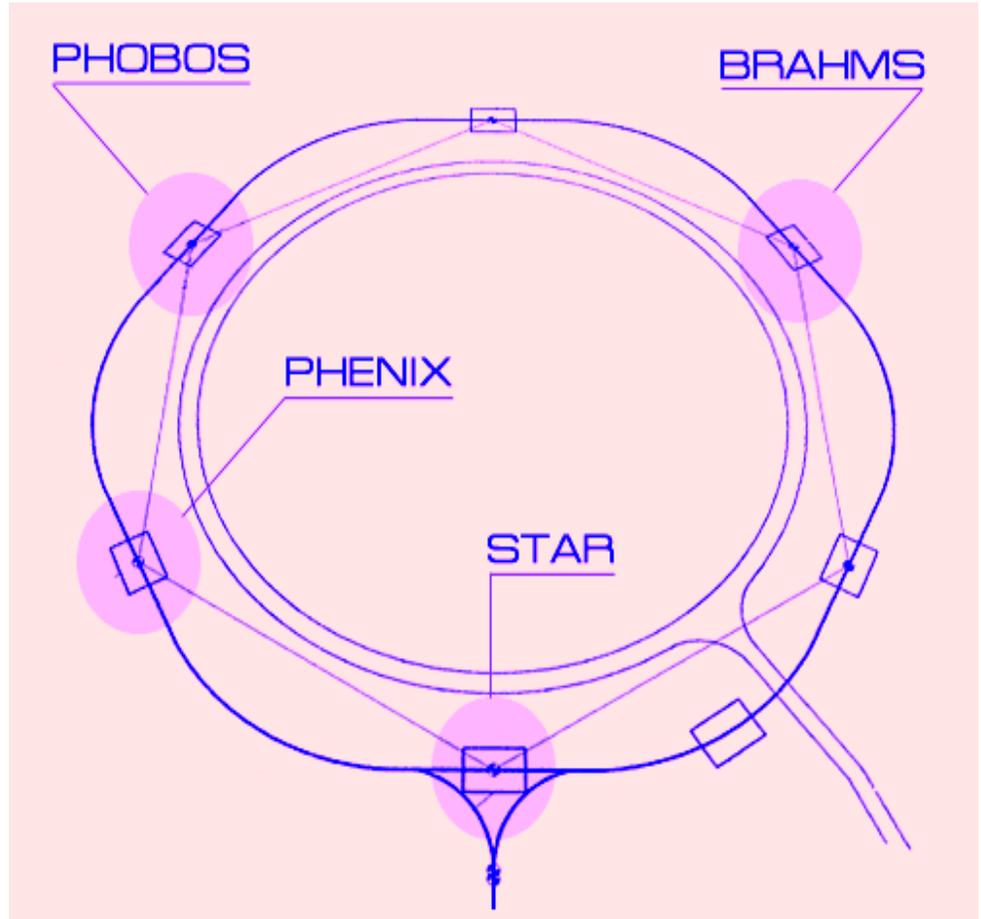
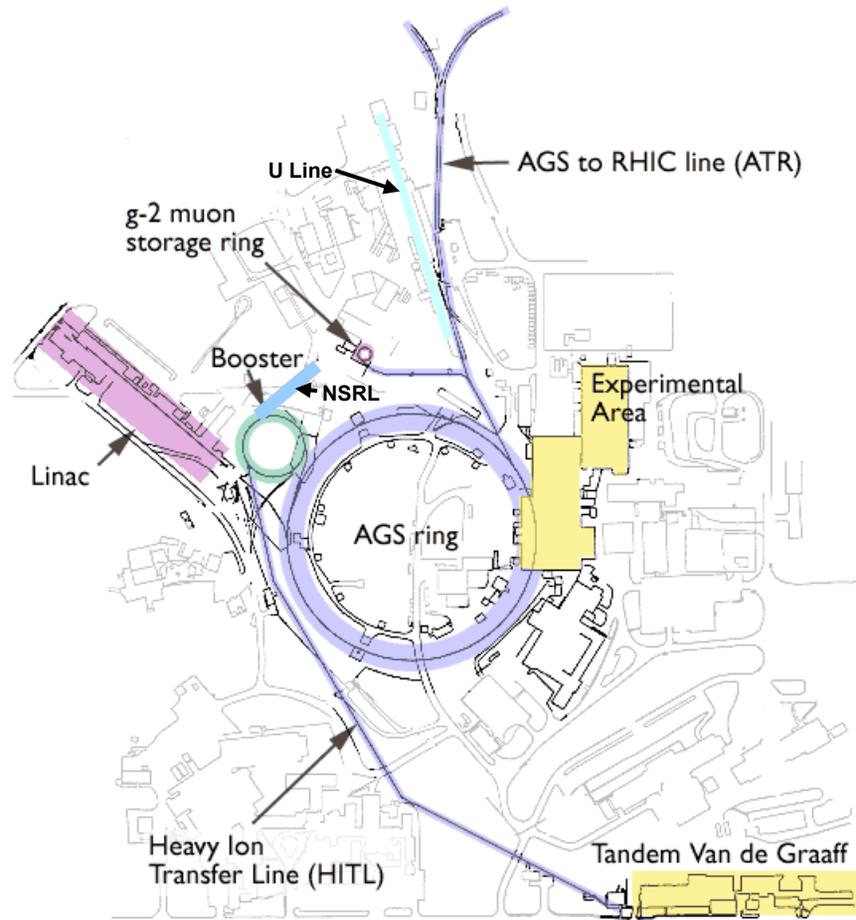
- The FY 2004 BSA occupational injury management performance metric will use a DART rate = 0.66 as the performance measure target rate

C-A Department Mission

▪ Mission

- Develop, improve and operate ion accelerators
- Support the experimental program
- Design and construct new accelerator facilities
- Excellence in environmental responsibility and safety

C-A Department Facilities



C-A Department Demographics

Category	Number of people	
	FY03	FY04
Scientific	48	49
Postdoctoral Fellows	2	6
Professionals	158	144
Technical	227	196
Administrative	25	24
Users	1528	1348
Others (Students)	11	8
Total	1999	1775

Joseph Falco, M.D. Interim Manager, OMC

Occupational Noise Exposure and A Few Words About Repetitive Strain Injury

Occupational Noise Exposure

Role of Medical Surveillance in Mitigating and Preventing Noise-Induced Hearing Loss (NIHL)

A Little Background On

- Human hearing characteristics
- Nature of hearing loss

Human Hearing-Frequency Range

- Humans can hear broad spectrum of noise frequencies-
 - ~ 20 Hz - ~ 20 kHz
- Especially important is perception of human speech-
 - Requires sensitivity on 500 - 2000 Hz range

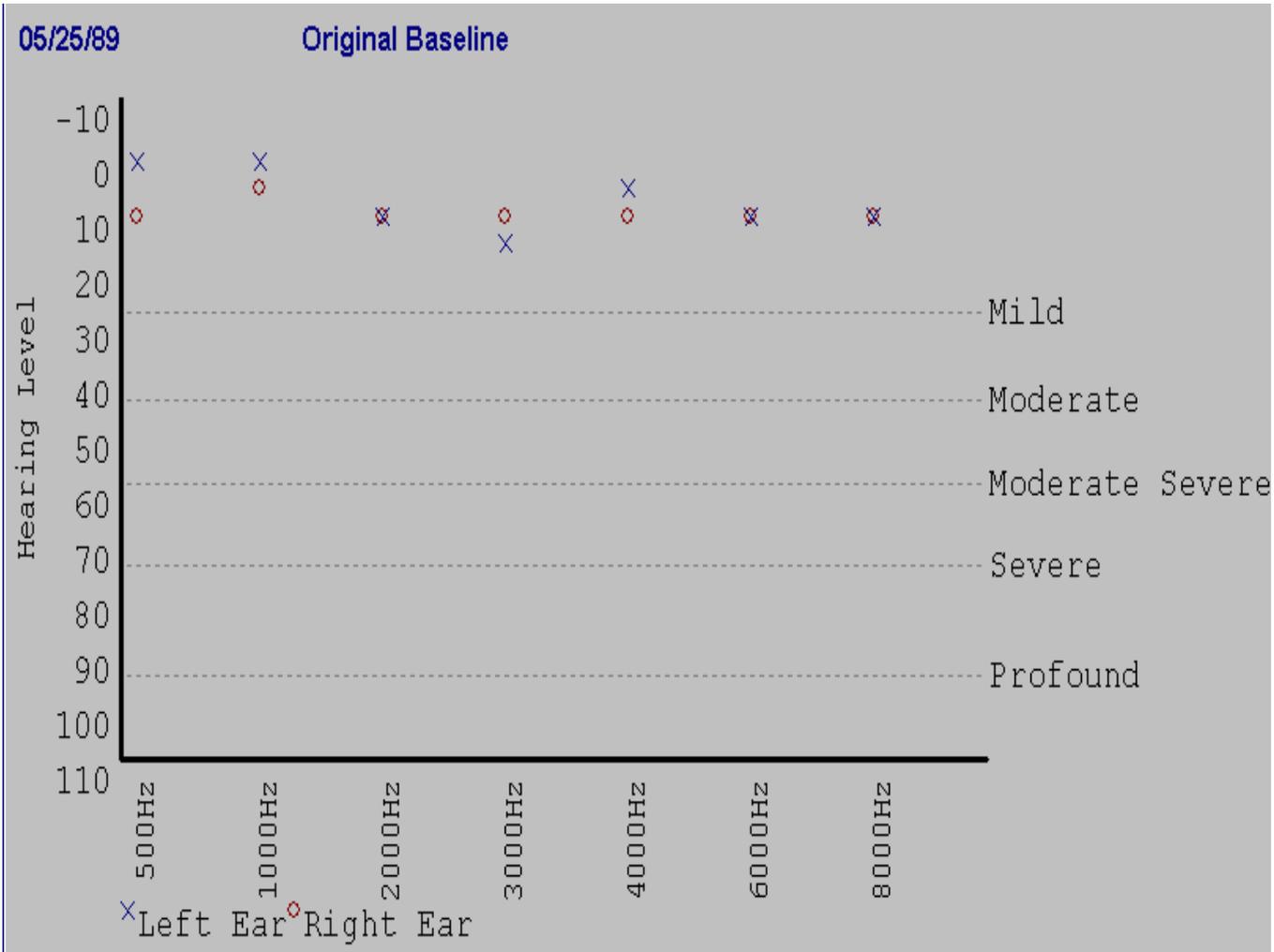
Hearing: Human Ear Can Safely Perceive Huge Range Of Noise Pressures

- Threshold of normal hearing
 - 0 decibels= noise pressure of 2×10^{-4} dynes/cm²
- Threshold of pain & damage from impact (very short duration) noise
 - 140 decibels= noise pressure of 2×10^{10} dynes/cm²
- 100 trillion-fold range of noise pressures

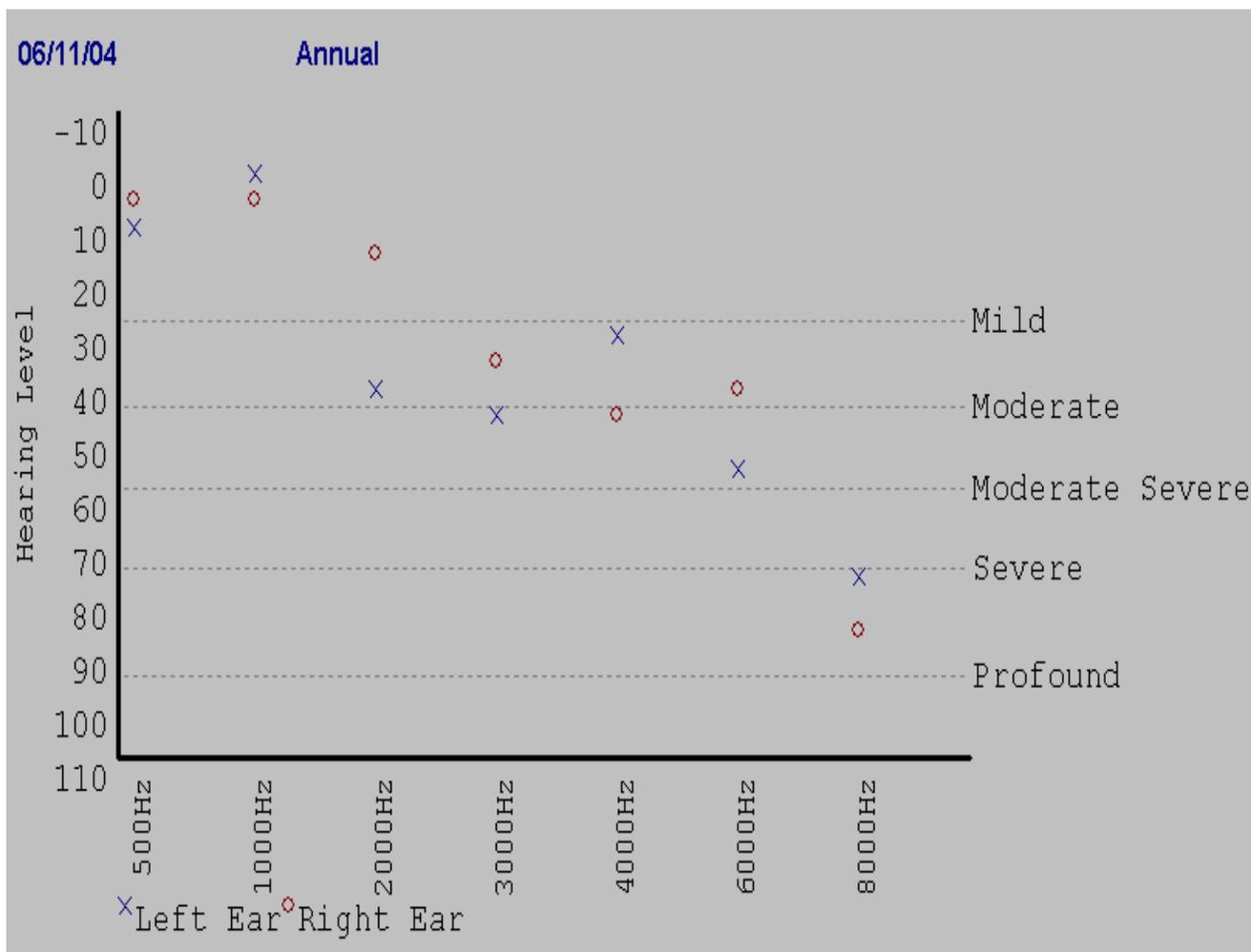
Hearing Loss- How Quantified

- Described in terms of dB of “threshold shift” from ideal hearing across the hearing frequency spectrum (usually test hearing at 500 Hz – 8000 Hz)
- Decibel (dB) scale= log scale
 - 10 dB shift in hearing threshold = 10-fold loss of noise sensitivity at a particular frequency
 - 20 dB shift in hearing threshold = 100-fold loss of noise sensitivity at a particular frequency
 - Threshold \leq 25 dB considered normal

Audiogram – Normal Hearing



Mid / High Frequency Hearing Loss ("Neural" loss)



Characteristics of Noise-Induced Hearing Loss (NIHL)

- Can be temporary (Temporary Threshold shift- TTS) or permanent (Permanent Threshold Shift- PTS)
- Represents noise-induced damage to a portion of the inner ear (cochlea)



Characteristics of Noise-Induced Hearing Loss (NIHL)/ctd.

- Classically associated with hearing loss at certain high frequencies “4 kHz notch”

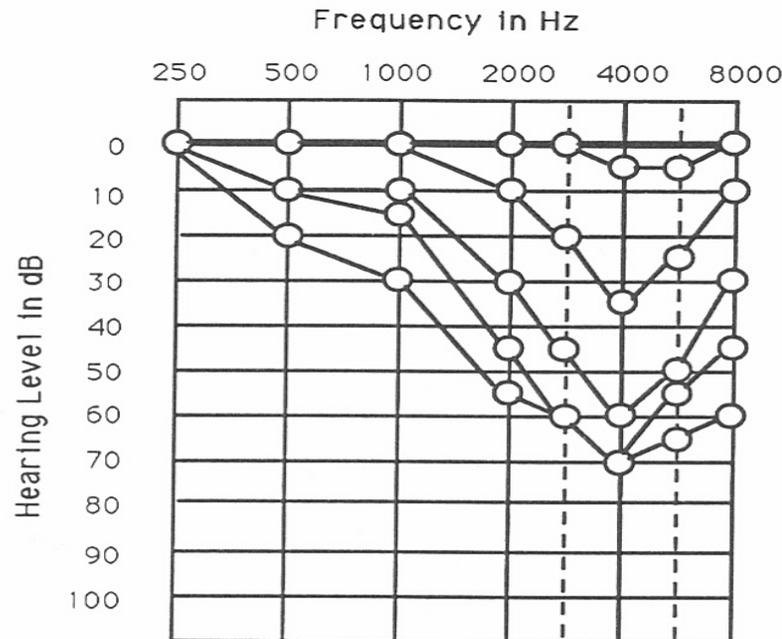


FIGURE 7 An audiogram showing the progression of noise-induced hearing loss, from a mild high-frequency impairment to a severe hearing impairment.

Characteristics of Noise-Induced Hearing Loss (NIHL)/ctd.

- Considerable overlap in NIHL pattern of high frequency (“neural”) hearing loss and hearing from other causes, notably age-related hearing loss (“presbycusis”).
- Thus, NIHL diagnosis hinges on
 - Accurate assessment of noise exposure at BNL and elsewhere (Moonlighting, hobbies)
 - Medical history (e.g.; head trauma, antibiotics, solvents / neurotoxins, smoking, family history)

Regulatory Efforts at NIHL Prevention OSHA Noise Standard

- OSHA Occupational Noise Exposure Standard– 1910.95
- Intent: “Protection against the effects of [occupational] noise exposure”
- SBMS & Hearing Conservation subject area– implementation of OSHA noise standard at BNL

SBMS

Forms Contact List SBMS Instructions Help Desk

Find Subject Areas: Index Categories Alpha

Search Subject Areas & Legacy Documents:

Contents: Noise and Hearing Conservation

Effective Date: January 2004
Point of Contact: [Noise and Hearing Subject Matter Expert](#)

Section	Overview of Content (see section for full process)
Introduction	
Sections	
Exhibits	
Forms	

OSHA Noise Standard Exposure Limits

- 90 dB TWA over 8 hour shift
- Progressively shorter permissible exposure times for louder noise:
- Rule of 5 (dB)– permissible exposure time halved for each 5 dB increase over 90 dB:
 - 95 dB - 4 hrs.
 - 100 dB- 2 hrs
 - 105 dB- 1 hr, etc.

C-AD Noise Sources / Area

- Compressors, fans, blowers, power equipment
- Areas of concern
 - Cryogenics—compressor building
 - RF area

OSHA Action Level 85 dB TWA

- 90 dB TWA permissible exposure limit not sufficiently protective against NIHL
- Most protection & monitoring requirements of OSHA standard kick in at 85 dB TWA
 - Noise monitoring
 - Hearing protectors
 - Training
 - Audiometric testing program

Audiometric Testing Program

- Described in paragraph (g) of OSHA Noise Standard
- Constitutes medical surveillance for workers w/noise exposure \geq Action level
- Looking for early evidence of noise-induced hearing loss in sequential (annual) audiograms (hearing tests)
- Intent– to provide early warning of inadequate worker noise protection

Audiometric Testing Program Requirements

- Baseline audiogram within 6 months of first exposure \geq Action Level
- Annual audiogram thereafter as long as exposure continues at/above Action Level
- 14 hour noise-free period before testing

At BNL, It Is The Responsibility Of Supervisor & ES&H Coordinator To

- Determine need for audiometric testing, for each noise-exposed worker, based upon whether exposure \geq OSHA Action Level
- Request audiometric testing by submitting “Additional Medical Surveillance” form to OMC



Employee Name:
Life:

Occupational Medicine Clinic

Additional Medical Surveillance

Instructions to Supervisors and Safety Coordinators. Use this form to request medical surveillance and testing of employees for items that are not on the OMC JAF (Job Assessment Form).

These items are related to specific workplace exposures and/or time periods. Their timing and frequency may not necessarily coincide with routine exams. Whether an employee requires the types of medical surveillance listed on this form should be determined and documented by Industrial Hygiene.

Please check item(s) requested. If you have questions you may contact John Heinrichs, OMC ESH Coordinator at 344-3675 or Michael Thorn, at 344-8612.

OSHA Noise (29CFR1910.95). A 14-hour noise free period is required prior to exam.

AMS Form: Available At OMC Web Site www.bnl.gov/hr/occmed



Employee Name:
Life:

Occupational Medicine Clinic

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What Does OSHA Consider Significant Hearing Loss?

- Standard Threshold Shift (STS)
 - Average loss of 10 dB at 2,3 & 4 kHz in either ear, relative to employee's original OSHA baseline
 - Employer has option of requiring confirmatory retest within 30 days
 - STS is OSHA-recordable if:
 - Determined work-related
 - Results in abnormal hearing (Avg hearing threshold \geq 25 dB at 2,3,4 kHz in either ear)

STS Triggers Several Required Actions

Re: Worker Protection & Monitoring

When a work-related STS is found, employer is required to take several actions:

- Provision of hearing protectors, instructions on use, and requirement to wear them
- If already using hearing protectors-- refitting, retraining on use, upgrading if indicated
- Referral for further audiological/otological (ENT) evaluation if medical pathology suspected (related or unrelated to hearing protectors).

Take Home Lessons

1. If an employee has begun work in a noisy environment and needs audiometric testing (noise exposure \geq Action level), don't wait to receive annual/periodic exam notice before requesting audiometric testing--**submit AMS form (and employee) to OMC ASAP for audiometric testing**
 - Should not exceed OSHA's 6 month limit between first exposure & audiometric testing
 - Items on AMS form are time-sensitive— may be due before regular exam (e.g; asbestos, lead, cadmium, noise)

Take Home Lessons/ctd.

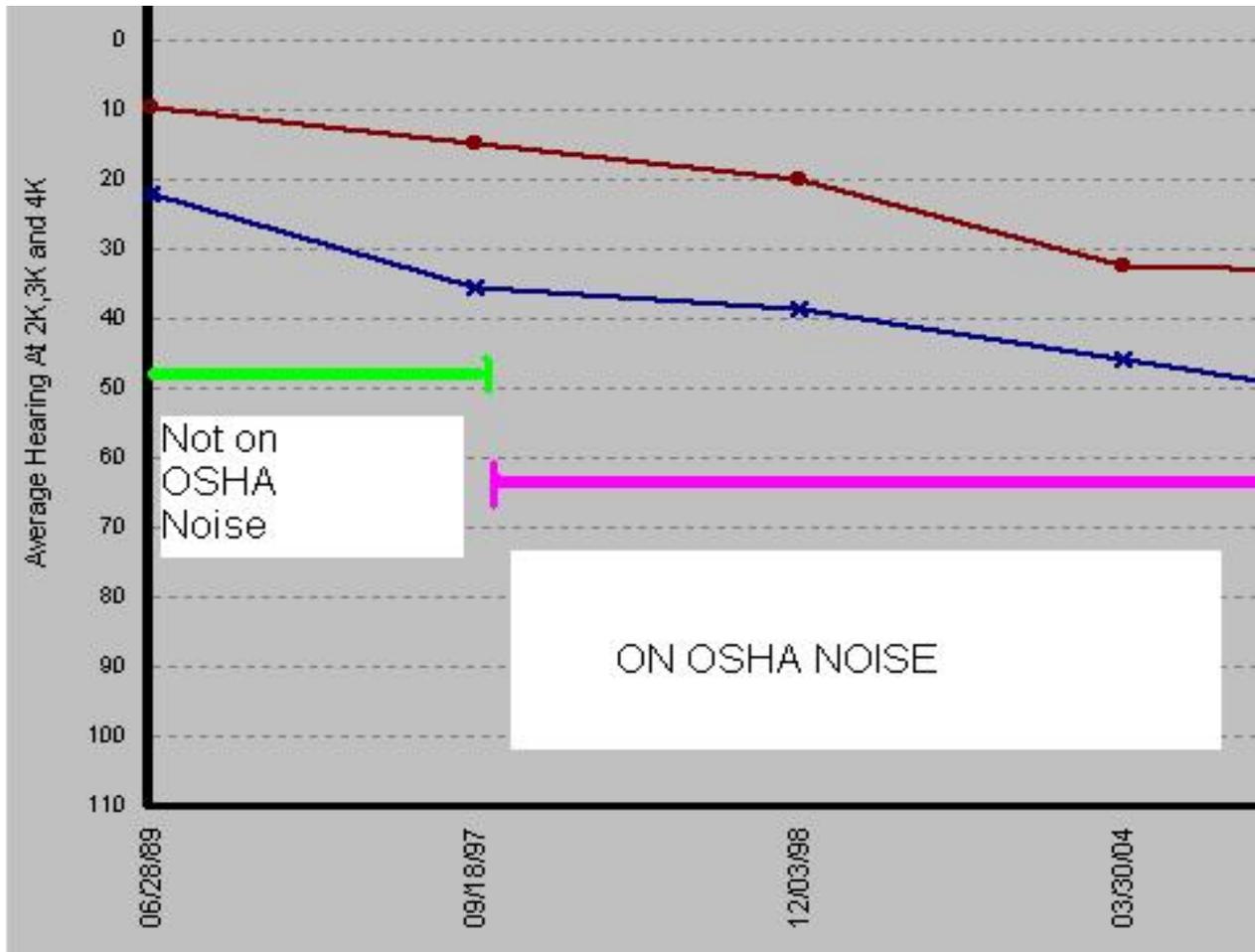
2. Decision to place employee in hearing conservation / audiometric testing program should be based upon accurate exposure assessment (based upon workplace noise monitoring)
 - There are adverse consequences to:
 - Erroneously excluding from program
 - Erroneously including in program.

Erroneous Exclusion From Hearing Conservation/Audiometric Testing

- Employee not afforded controls that might preserve hearing in noisy environment
- No early warning of NIHL– relevant to employee and co-workers

Erroneous Inclusion In Audiometric Testing Program

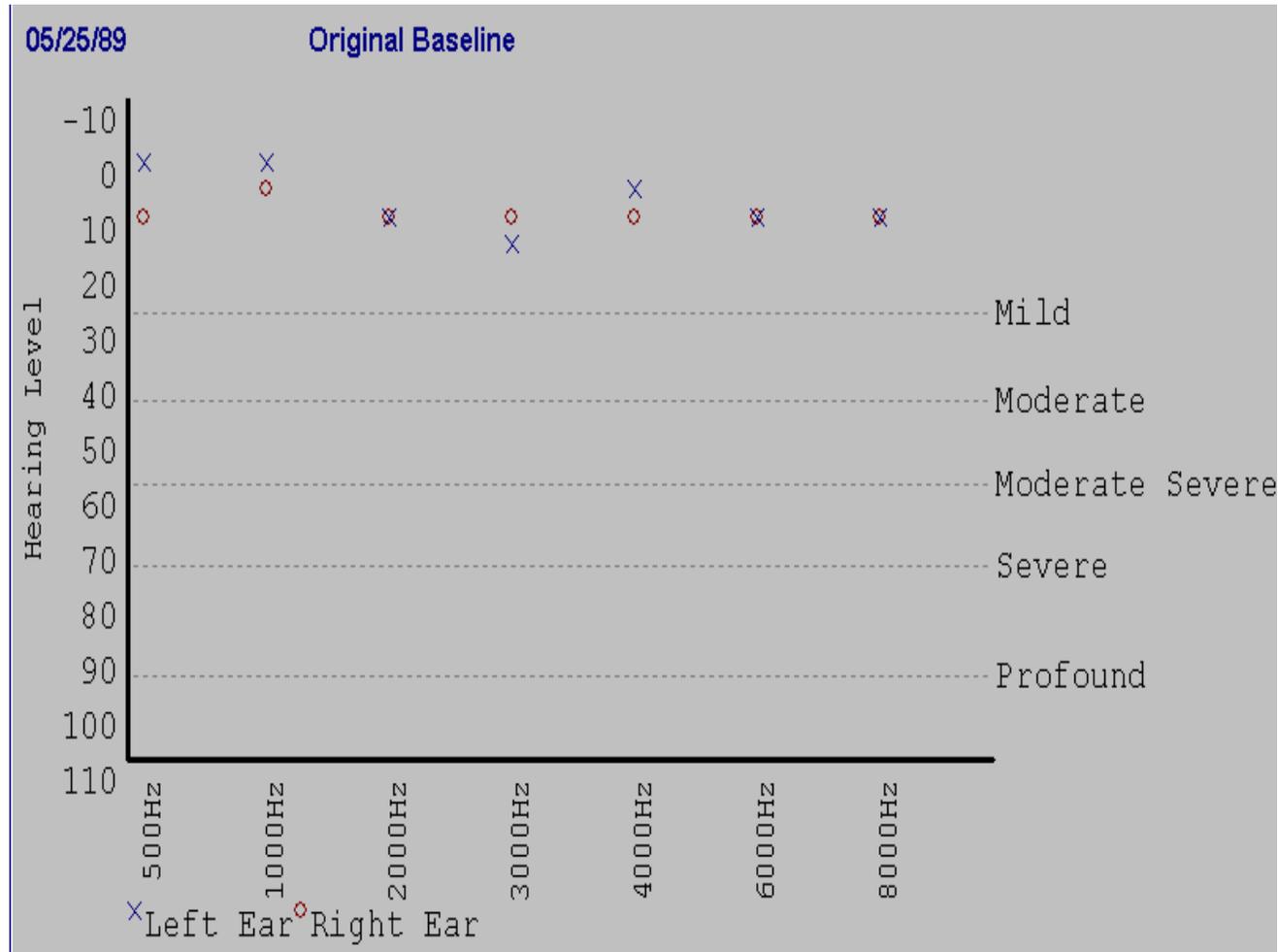
- BNL can be erroneously held responsible for hearing loss from other causes:
 - Non-BNL noise exposure (moonlighting, hobbies)
 - Hearing loss from other causes (aging, other ear pathology, etc.)



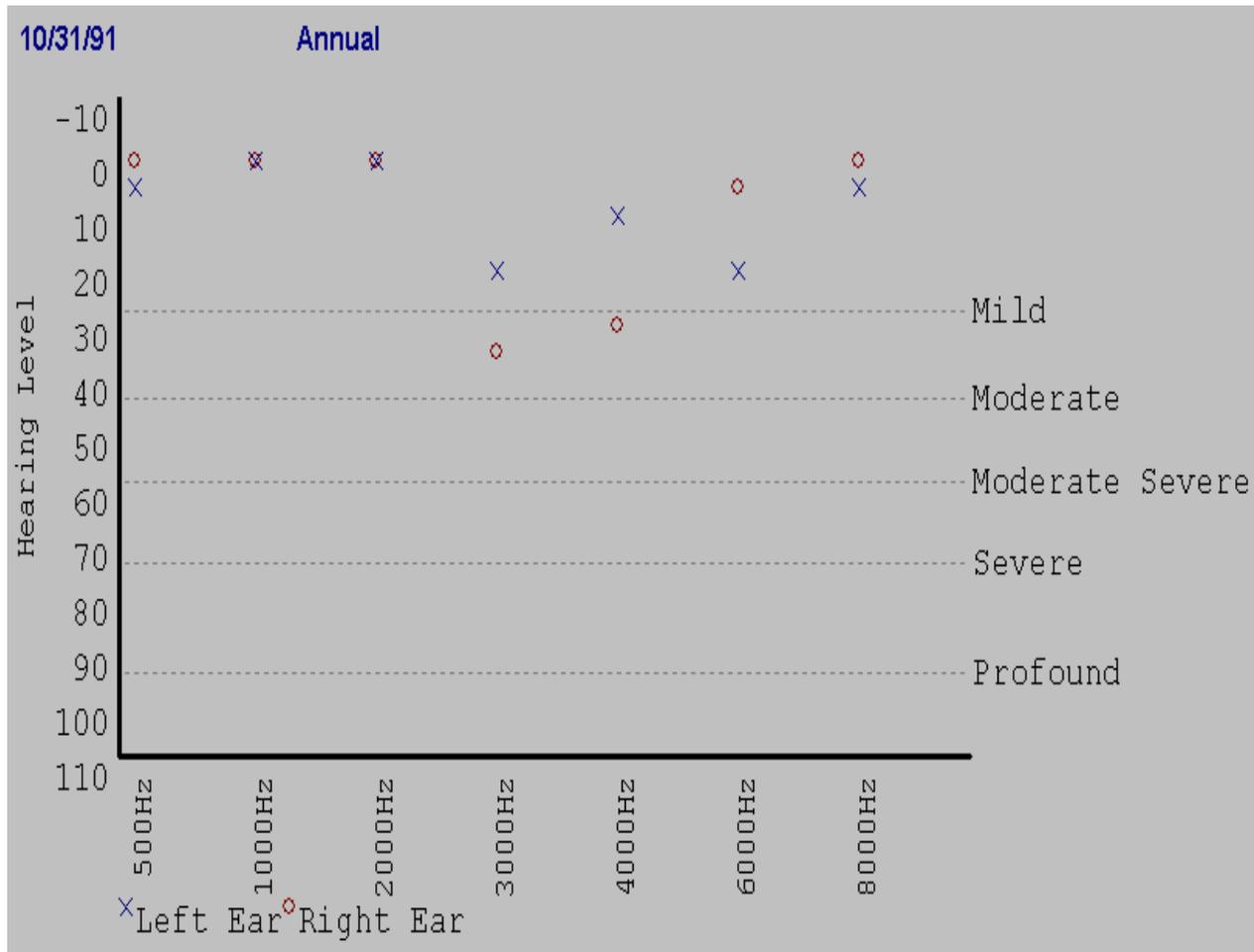
Take Home Lessons/ctd.

3. Control of noise exposure preserves hearing

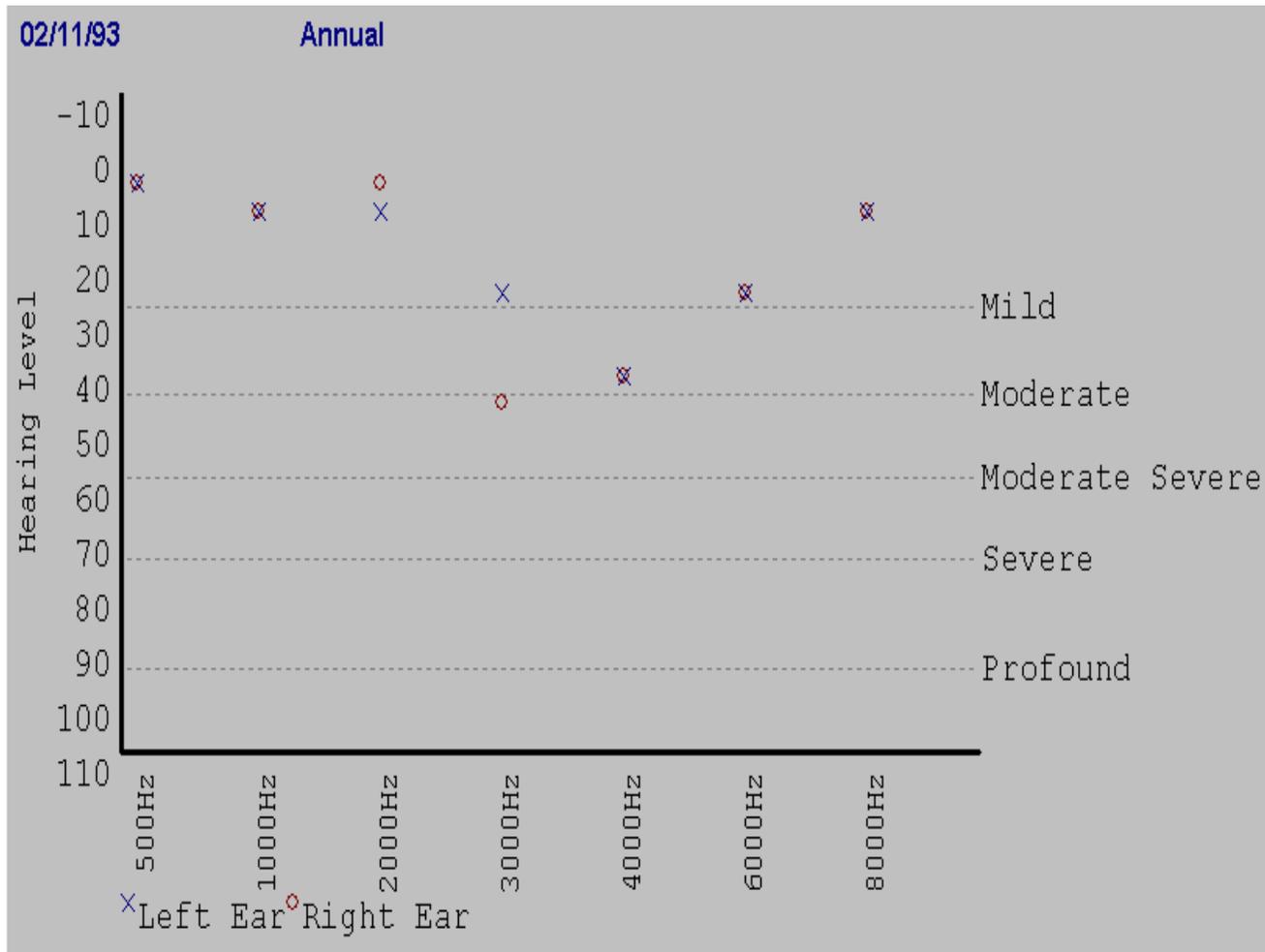
Carpenter (baseline, 1989)



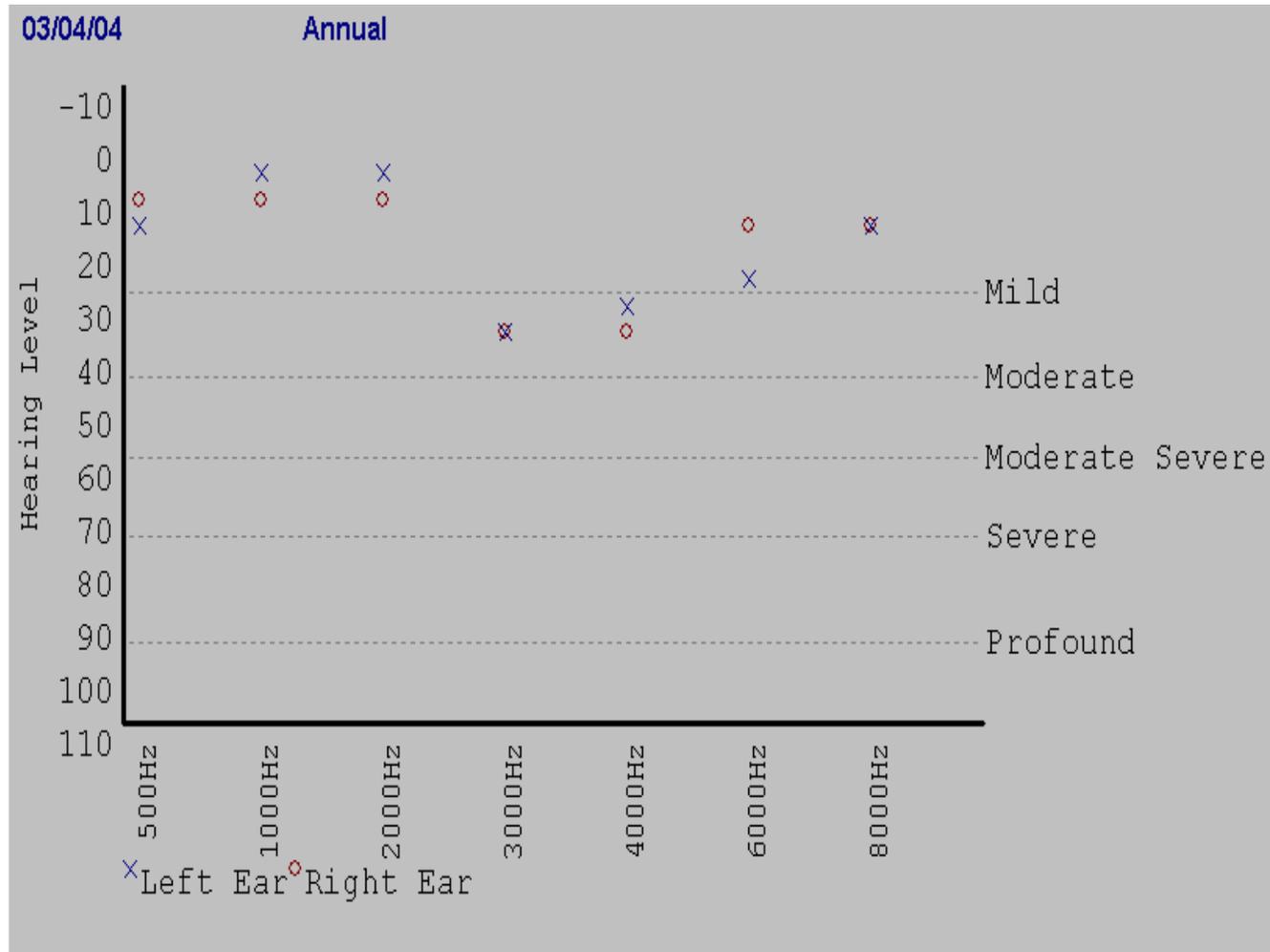
Carpenter (1991)



Carpenter (1993)



Carpenter (2004)

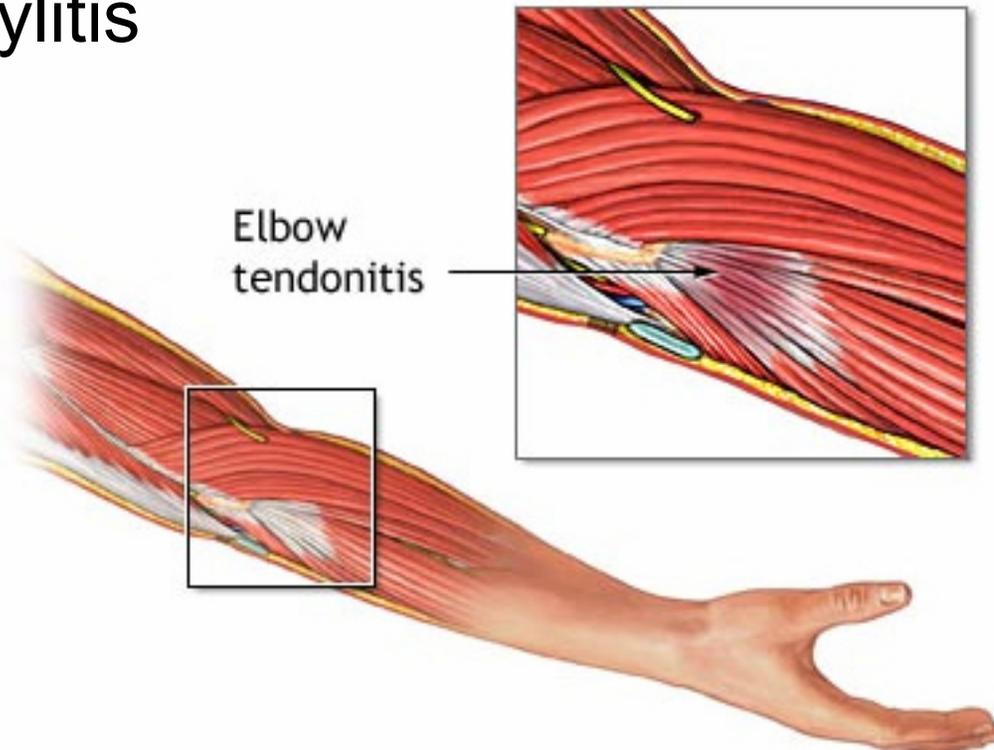


A Few Words About Repetitive Strain Injury (RSI)

- Upper extremity disorder associated with work activities involving force + repetition
- Synonym– cumulative trauma disorder
- Additional contributing factors
 - Awkward postures
 - Vibration
 - Temperature extremes
- Some RSI's are considered “Occupational Illnesses” by OSHA (e.g.; carpal tunnel syndrome)

RSI's Often Involve Tendonitis

“Tennis elbow”-
lateral epicondylitis



Tendonitis of
Flexor carpi
radialis muscle

Complications Can Complicate Recovery

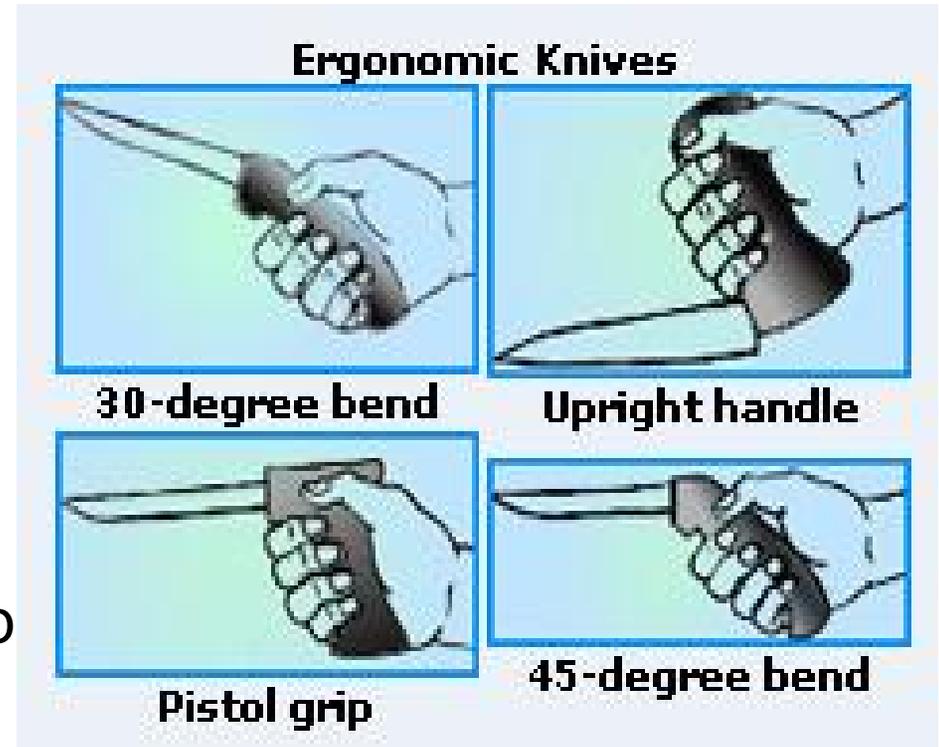
- Nerve impingement— e.g.; median nerve impinged in carpal tunnel syndrome. Associated with tasks involving repetitive flexion/extension of wrist and/or fingers
- Tears/scarring: e.g.; rotator cuff disorders of shoulders— overhead work

RSI Risks at C-AD

- Cases of carpal tunnel syndrome & tendonitis of hand/forearm reported in workers involved in extensive cable pulling and wiring operations
- Potential risk for intensive keyboard users

RSI Preventive Measures

- Engineering and administrative controls to reduce amount of force and/or amount of repetition
- Comfortable work environment, avoiding temperature extremes
- Ergonomic tools (specific to task)—keep hand/wrist/arm in neutral position



Also Important For RSI Prevention

- Frequent rest breaks
 - Ideally 5-10 minutes per hour
 - Job enlargement/job rotation
- “Psychosocial factors”
 - Morale / job satisfaction
 - Sense of control

Ed Lessard

Overview of Management Systems and Performance

- OSH and E management systems
- OSH and E related improvements
- Questions answered:
 - What activities have significant hazards and environmental aspects?
 - What are the FY04 objectives and targets?
 - What was the performance on the FY03 Record of Decision?
 - What are the results of FY04 OSH and E performance measures?
 - What are the concerns of stakeholders?
 - What about security?

Significant Environmental Aspects

- Regulated industrial waste
- Hazardous waste
- Radioactive waste
- Mixed waste
- Atmospheric discharges
- Liquid effluents
- Storage/use of chemicals or radioactive material
- Soil activation
- PCBs
- Environmental noise
- Water consumption > 650 K gals/day
- Power consumption > 58 M kW-h/year

FY04 Environmental Management Objectives

- Implement corrective actions to achieve Article 12 conformance
- Meet Federal and State air program requirements
- Reduce the use of ozone depleting substances
- Conduct regulatory compliance assessments on a three-year cycle
- Integrate pollution prevention into the work planning processes
- Evaluate and implement pollution prevention opportunities
- Reduce or prevent generation of non-routine waste, including spills
- Fully implement groundwater protection program
- Protect groundwater quality from further chemical and radiological releases
- Remediate existing contaminated groundwater in a cost-effective and practical manner

FY04 Environmental Management Targets

- Review all experiments for air and water emissions
- Obtain approval for 100% of liquid discharges
- Close out all Article 12 audit corrective actions
- Review all accelerator emission points for compliance
- Participate in the Laboratory-wide compliance assessments
- Monitor waste generation and report on a quarterly basis
- Evaluate experiments for pollution prevention opportunities
- Submit two pollution prevention project proposals
- Ensure preventive maintenance is adequate and performed on all environmental-related systems
- Ensure that appropriate spill materials are available
- Track, report and reduce spill costs

Processes Evaluated for Environmental Aspects

- Beam-line construction and disassembly
- Cooling water systems
- Electronic assembly operations
- Tech-shop operations
- Mechanical assembly operations
- Metal cleaning operations
- Plating operations
- Cryogenic system maintenance
- Vacuum lab operations
- Beam stops and beam collimators
- Magnet cleaning operations
- NSRL operations

Environmental Improvements

- Significant reduction in PCB capacitors at Linac
- Cap installed at Linac
- Archival mapping of activation areas initiated
- Soil coupon program expanded
- Bulb crusher used to reduce waste volume
- Suspect RHIC soil (2000 yards³) determined to be clean
- Reduced power consumption for RHIC helium refrigeration system
- Neutrino horns, depleted uranium shielding, legacy steel and components from Inner Mongolia removed
- Hydrogen and deuterium gases vented
- Resealed PHOBOS, BRAHMS, & STAR cooling tower basins
- Added ATR extraction magnets cooling to SEM system
- Altered storm-water buildup in piping under H-10

Planned Environmental Improvements

- Continue to replace PCB capacitors at Linac
- Cap all of AGS Ring
- Add secondary containment to outside water piping for AGS RF system
- Continue to remove legacy waste from C-AD
- Restore water flow near AGS for fire protection
- Disconnect AGS fast-quad and add chillers
- Split buss cooling to reduce/eliminate tritiated F-10 water
- Complete the archival mapping of activation areas
- Eliminate open-vented tank on AGS cooling system
- Pave AGS steel-yard
- Repair B912 roof

Significant Safety and Health Hazards

- Ionizing and non-ionizing radiation
- Hazardous, radioactive or toxic materials
- Electrical energy
- Magnetic fields
- Flammable, combustibile and explosive gases and liquids
- Oxygen deficiency
- Kinetic and potential energy
- Thermal energy
- Cryogenic temperatures
- Noise
- Protracted/irregular hours
- Housekeeping

Significant Causes of Injury as Seen by Liberty Mutual

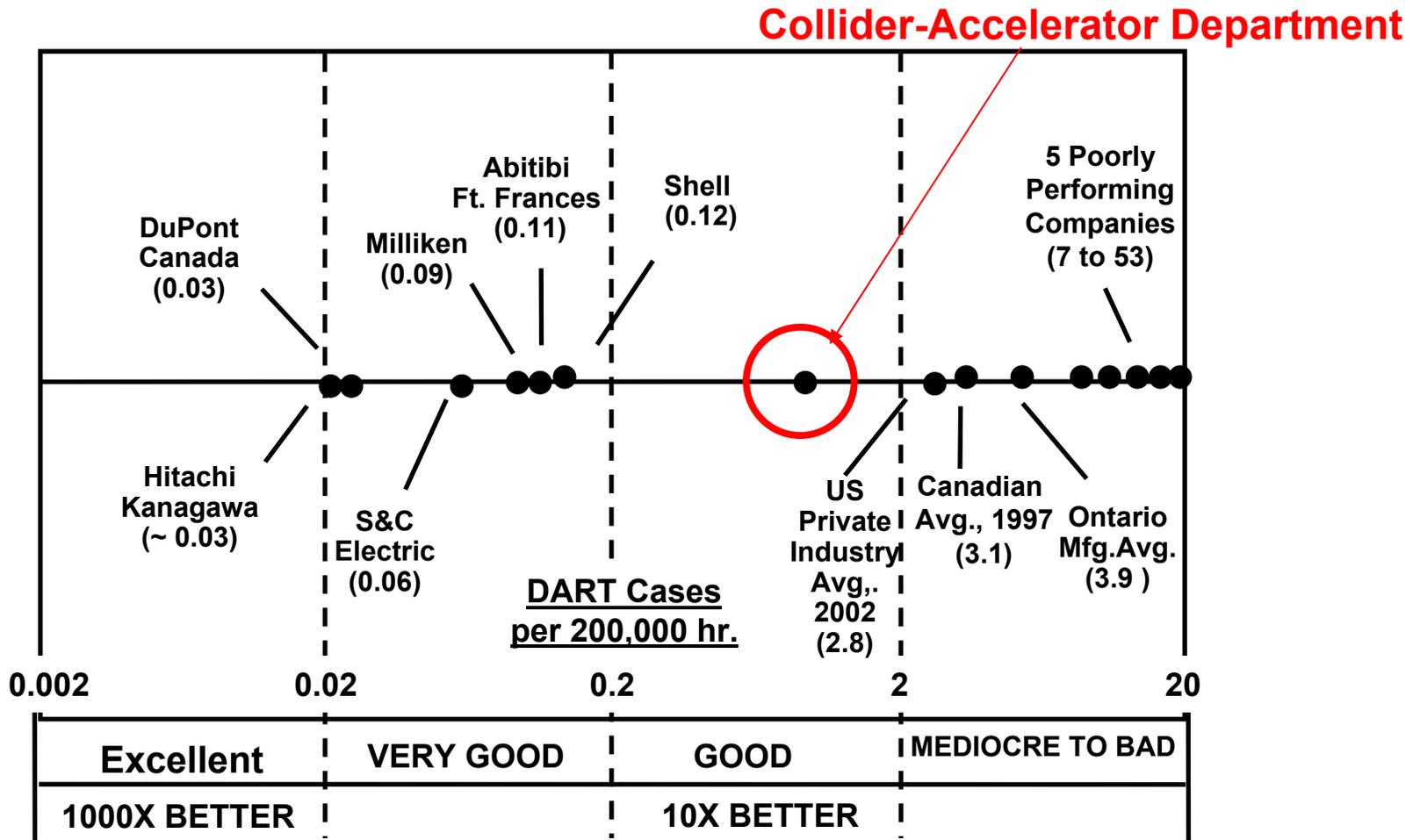
Hazard	Cost	% Total Cost
Overexertion	\$12.5B	27.3%
Falls on Same Level	\$5.7B	12.6%
Bodily Reaction	\$4.7B	10.2%
Falls To Lower Level	\$4.1B	9.0%
Struck by Object	\$3.9B	8.6%
Repetitive Motion	\$2.9B	6.3%
Highway Incident	\$2.3B	5.1%
Struck Against Object	\$1.9B	4.1%
Caught in, Compressed by	\$1.7B	3.7%
Assaults & Violent Acts	\$0.4B	1.0%

FY04 Occupational Safety and Health Objectives

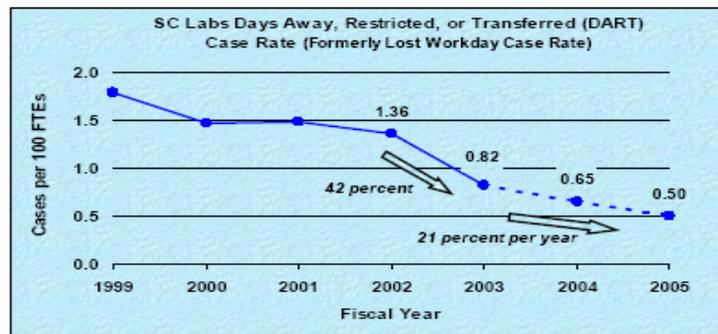
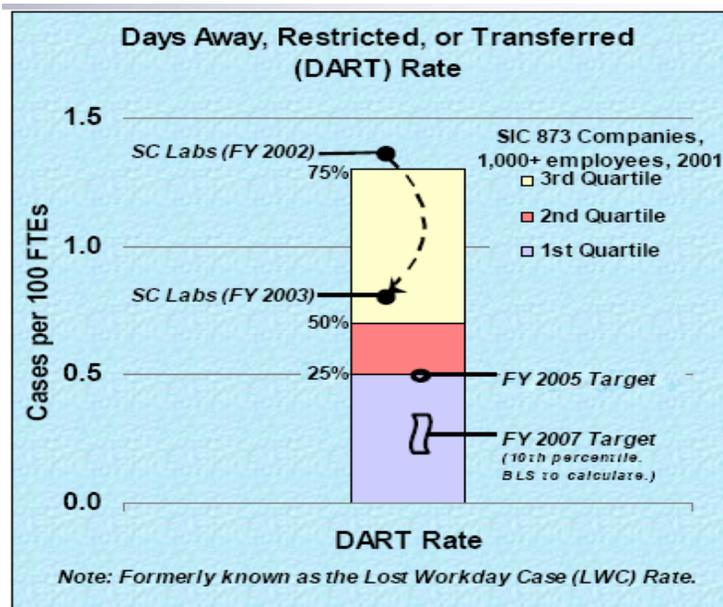
- An injury free workplace
- Compliance with OSH requirements in SBMS
- Workers consulted and encouraged to participate in Management System
- Improved performance of OSH Management System
- OSH Management System is integrated with the EMS Management System
- Move towards 3rd party registration of OSH Management System*
- Maintain staff training > 95% complete
- Closeout OSH issues in a timely manner consistent with issue's risk
- Close out Tier 1 findings in a timely manner consistent with the finding's risk
- Meet BNL requirements on closure of OSHA findings

* OHSAS 18001 Registration

How We Compare to Others



January 2004 Challenge by Roy Orbach, Director, DOE Office of Science



C-AD FY04 OSH Targets

- Maintain C-AD LWCR (DART) < 0.8
- Reduce number of first aid cases by 10% from FY03 number
- Reduce the number of findings in QA Assessments of OSH topics
- Define OSH requirements for procured items
- Coach PE/CFS in their roll-out of 18001-type OSH MS
- Complete Job Risk Assessments and Facility Risk Assessments
- Be prepared for 3rd party registration by 9/04
- Get Tier 1 Committee trained on OSHA regulations
- Begin to get Building Managers trained in OSHA regulations
- Close out OSH issues within 90 days, track in Action Tracking System (ATS)
- Close out Tier 1 issues within designated times, track in family ATS
- Implement corrective actions in Report of Electrical Ad Hoc Committee
- Implement corrective actions in Report on Improving Tier 1 Reviews
- Implement corrective actions in Report on Enhancing Electrical Work Practices

Jobs Evaluated for OSH Risks

- Transportation
- Material handling-machinery
- Material handling-manual
- Electrical work- routine
- Electrical work-high energy
- Electrical working hot
- Radiation/contamination work
- Work with lasers
- Pressurized system work
- Vacuum system work
- Biological/animal work
- Cable pulling
- Operations
- Emergency response
- Waste handling
- Work with hazardous materials
- Adding cooling tower chemicals
- Hi-pot testing
- Crane use by C-AD staff
- Forklift use by C-AD staff
- Welding/welding helper
- Tours
- Confined space work
- Machining Work (lathes, drill presses)
- Office Work

Facilities Evaluated for OSH Risks

- Siemens Motor Generator
- Westinghouse Motor Generator
- He Reliquifier
- Shops
- Offices
- STAR
- PHENIX
- PHOBOS
- BRAHMS
- NSRL
- Building 912/U-Line/g-2
- Warehouses/storage facilities
- Equipment Testing Areas
- EBIS
- eCooler
- Waste Yard
- 90 Day Area/Satellite Areas
- Accelerators
- Pre-Injectors
- Collider
- Locked Electrical rooms
- Locked Electrical Caged Areas
- Cryogenic Refrigerator Room
- Cryogenic Compressor Room

General Areas/Activities Evaluated for OSH Risks

- Electrical installations and activities
- Fire protection throughout
- Radiation areas and protection activities
- Areas with potential for oxygen deficiency
- Housekeeping throughout
- Noise areas
- Material handling activities

Benefits of OSH Risk Assessments

- Increases worker involvement
- Focuses us to address actual injuries
- Realigns OSH programs based on experience
- Reduces risk and injuries

OSH Training and Documentation Initiatives

- Authorization documents upgraded
 - C-AD Safety Assessment Document
 - Accelerator Safety Envelopes
- OSH management system documents developed
 - Job Risk Assessments
 - Facility and Area Risk Assessments
- OSH facility-specific training developed
- OHSAS 18001 awareness training developed

Worker Involvement Initiatives

- Worker Occupational Safety and Health Committee
 - Meets quarterly
 - Consists of representatives from all C-AD sections and groups, and Magnet Division
 - Reviews injury data, critiques, occurrences, worker feedback, training programs, hazard identification, risk assessments, etc.
 - Received positive recognition by DOE ISM
- Job Risk Assessments
- 5-minute safety discussions at meetings
- Suggestion box
- Safety Walk program

Occupational Safety and Health Improvements

- OSHA non-compliances identified
- Documented the safety policy
- Established OSH objectives and targets
- Performed risk assessments
- Reduced risk in material handling, cable pulling, walking/working surfaces, welding, working at heights
- Established functional worker occupational safety and health committee
- Improved machine guarding
- Repaired electrical systems and closed many electrical-related OSHA violations
- Improved processes for labeling electrical breakers and use of temporary wiring
- Implemented a Department-wide Return to Work policy
- Lasers inventoried and SOPs improved
- Increased OSHA compliance training for staff
- Completed B930 fire-alarm panel upgrade
- Developed procedures for ODH personal monitor calibration

Planned OSH Improvements

- Perform more ergonomic reviews
- Repair B912 roof
- Upgrade remaining aging fire-alarm panels at C-AD
- Perform remaining Fire Hazards Analyses and implement changes
- Improve material handling programs
- Increase awareness of injuries related to overexertion, slips and falls at same level, bodily reaction, repetitive motion
- Improve fall protection program
- Develop manual lifting guidelines to reduce overexertion injuries
- Develop a system to identify and capture PPE costs
- Develop a JRA for demolition/decontamination work (BNL QA Office)

Last Year's Management Review Decisions and Performance

- Integrate outside lessons learned
 - Lessons learned distributed to C-AD personnel based on applicability
 - Lessons learned discussed at C-A time meetings and work planning meetings
 - Lessons learned are discussed with C-AD WOSH Committee
- Improve conditions to prevent slips and falls
 - C-A staff asked to identify outside walking/working surfaces that are in need of repair
 - PE instituted a program to correct deficiencies
 - Snow shovels and salt were distributed to staff for emergency use in winter storms
 - A safety checklist: Walking and Working Surfaces was distributed to staff
 - Work Planning procedure was updated to require Enhanced Work Permit
 - Improved housekeeping

Last Year's Management Review Decisions and Performance

- Continue quarterly safety awareness programs
 - C-A continues to conduct quarterly safety awareness events
 - Safety Awareness presentation given by D. Lowenstein
 - OSHA Walk Through video
 - Reducing Injury and Accidents in the Work Place CBT
 - 18001 awareness training
- Continue to streamline OSH, SA and E management systems
 - C-A now conducts one Management Review for all three programs
 - Similar audit and records keeping

Last Year's Management Review Decisions and Performance

- Cap Linac activated soil areas
 - 'BLIP Spur' cap is in progress as of today (9/13/04)
 - Caps at HEBT water stops and Linac to Booster area will be done in 2005
- Improve housekeeping management
 - Housekeeping statement by the C-AD Chair in the C-A Particle Post
"Housekeeping ... each group set aside some time each Friday afternoon, before leaving for the weekend, to clean up their work areas and some particular office areas. Besides working safely, I am going to make good housekeeping a condition of employment in C-A."
 - Housekeeping policy on web
- Clean up legacy steel, *Inner Mongolia* and PCBs at Linac
 - Cleanup of steel at RHIC yard, Rail Yard, and 960 has been put out for bid
 - Inner Mongolia cleanup work plan and RWP are ready
 - First 1/3 of Linac PCB capacitors have been purchased

Last Year's Management Review Decisions and Performance

- Improve environmental-permit awareness for activities at RHIC
 - Memo was sent to all the appropriate people
- Advertise lost work and injury statistics
 - Appears in Particle Post each month
 - Appears on Closed Circuit TV
 - Statistics memo sent each quarter to managers and supervisors
 - Statistics reviewed each quarter by workers on WOSH Committee
- Renew emphasis to update fire protection system
 - Due to funding restraints, BNL is approaching these upgrades slowly

Last Year's Management Review Decisions and Performance

- Encourage Lab to improve lab-wide lessons learned program
 - BNL Quality Management Office has re-organized
- Encourage Lab to standardize OSH management system similar to system used for the environment
 - BNL Pilot Program in OHSAS 18001
- Encourage Lab to set high-level OSH objectives
 - C-AD, PE and CFS have set OSH objectives
 - BNL Objective 3.4.4.1 Safety Implementation Path Forward
 - BNL Objective 3.4.4.2 OSHA Reportable Injury Management
- Encourage Lab to develop a strategy to meet OSHA and NRC regulations if applicable
 - NRC no longer applicable
 - OSHA compliance is funding constrained

Performance on ISO 14001 Registration

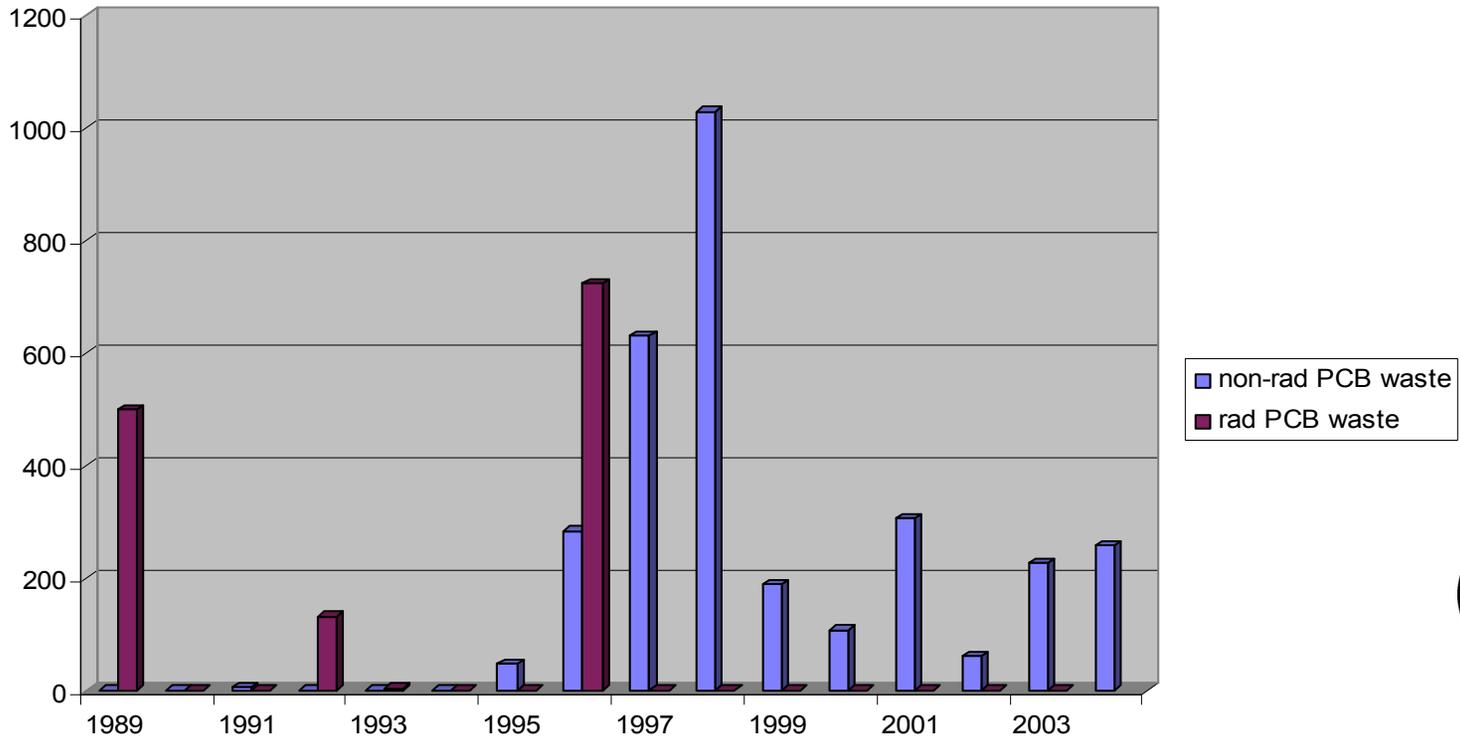
- FY 04 EMS task list completed
- Objectives and targets met
- All EMS documents updated
- All EMS documents controlled
- All EMS records identified
- Pollution prevention proposals submitted
- ISO 14001 registration maintained

Performance on OHSAS 18001 Registration

- FY 04 OSH task list completed
- Objectives and targets established
- All OSH documents updated
- All OSH documents controlled
- All OSH records identified
- OHSAS 18001 registration scheduled

PCB Reduction

PCB Waste Disposal, lbs. per year



CA-D Occupational Injuries in FY04

- 4 First aid Cases (18 FY03)
- 4 Athletic/Recreation (5 FY03)
- 3 Lost Work Day Cases (2 FY03)
- 3 Restricted Work Cases (1 FY03)

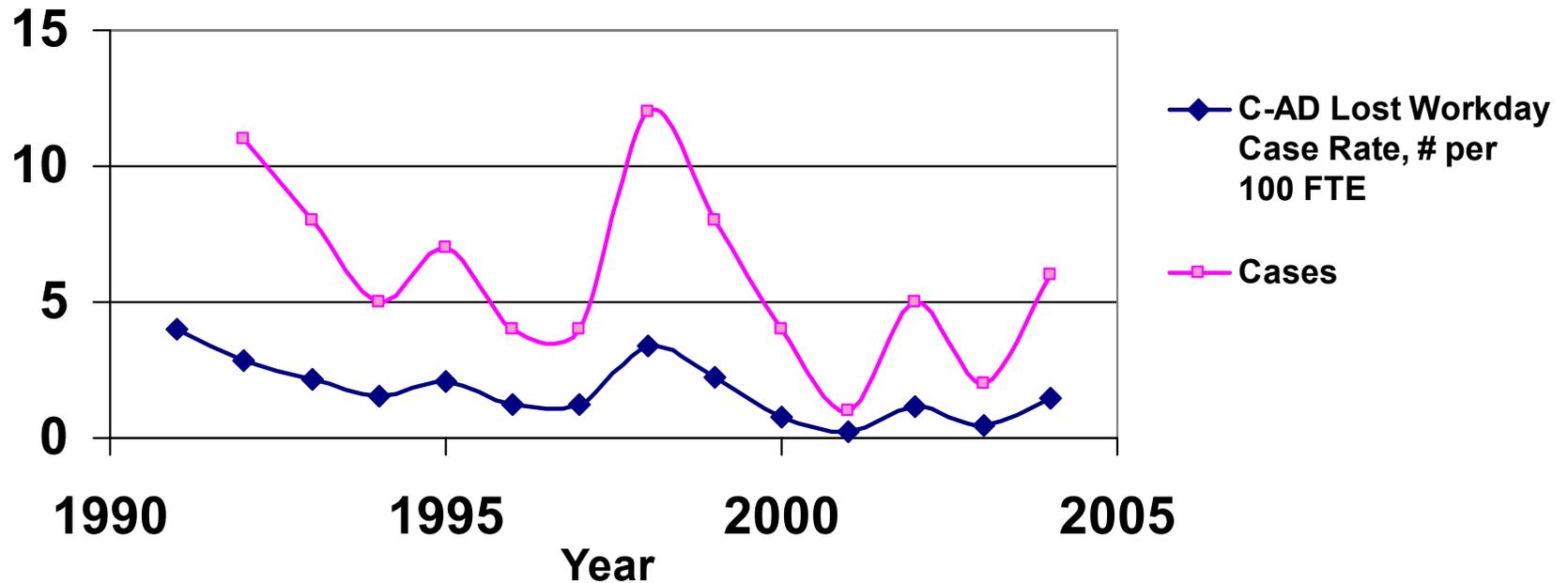


- C-AD DART 1.5 per 100 FTE
- DOE DART 0.7 per 100 FTE
- OSHA DART 4.0 per 100 FTE
- PE DART 4.1 per 100 FTE

- FY04 Goal - Maintain C-AD LWCR (DART) < 0.8

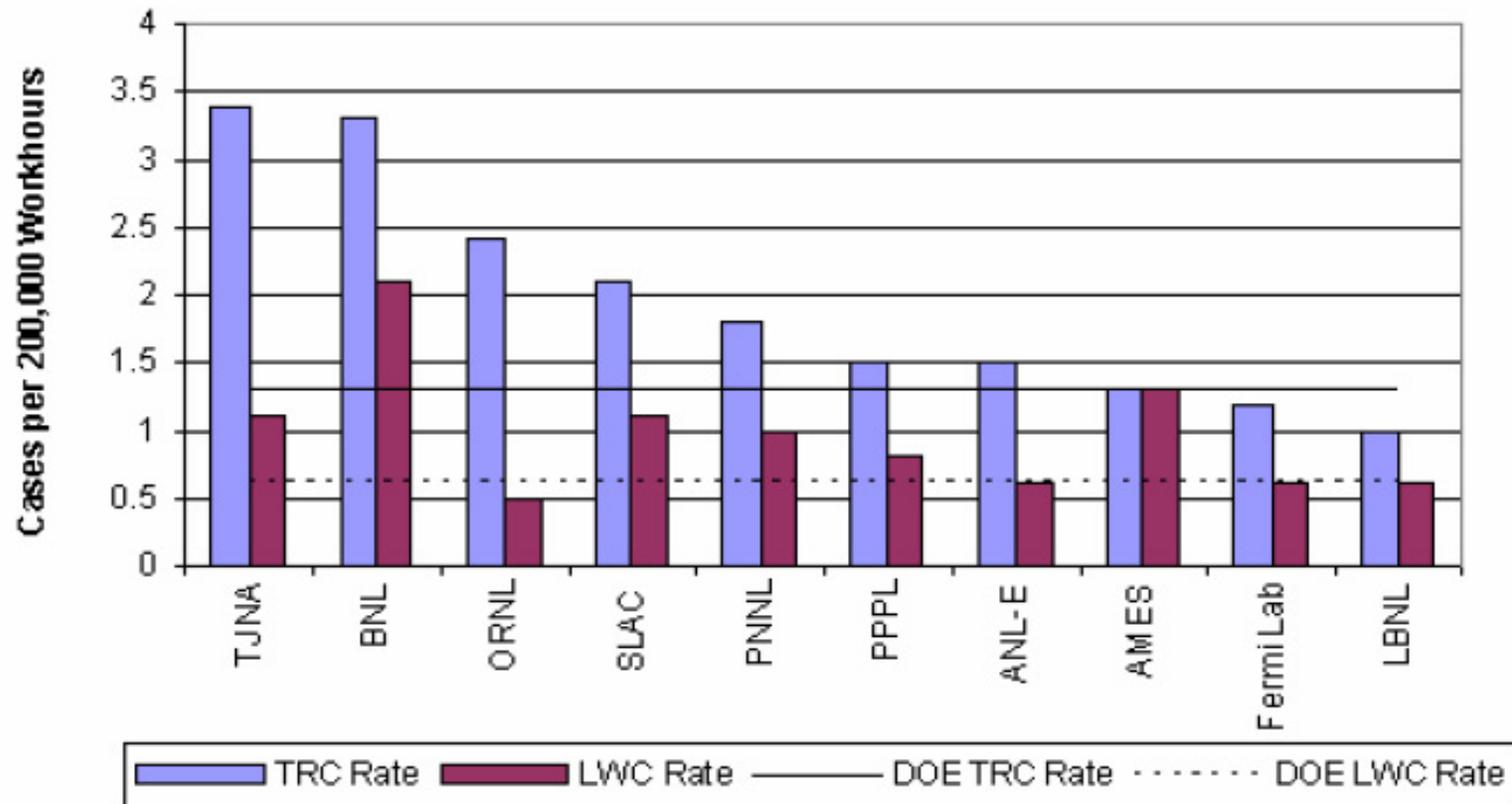
Injury / Illness Trend

C-AD DART Case Rate and Number of Cases



DOE and Office of Science Labs

TRC and LWC Ranking for SC Sites



C-AD Lost Work Day Cases

3 Cases Reported in FY 04

- Flash burn to eye from arc welding (1 day)
- Hernia pulling object from oven (22 days)
- Injured pinky in truck door (3 days lost, 12 days restricted)

C-AD Restricted Work Cases

3 Cases Reported in FY 04

- Fall on freshly wet epoxy floor (7 days)
- Employee grabbed pipe and burned hand (1 day)
- Strained wrist from wiring for seven hours (5 days)

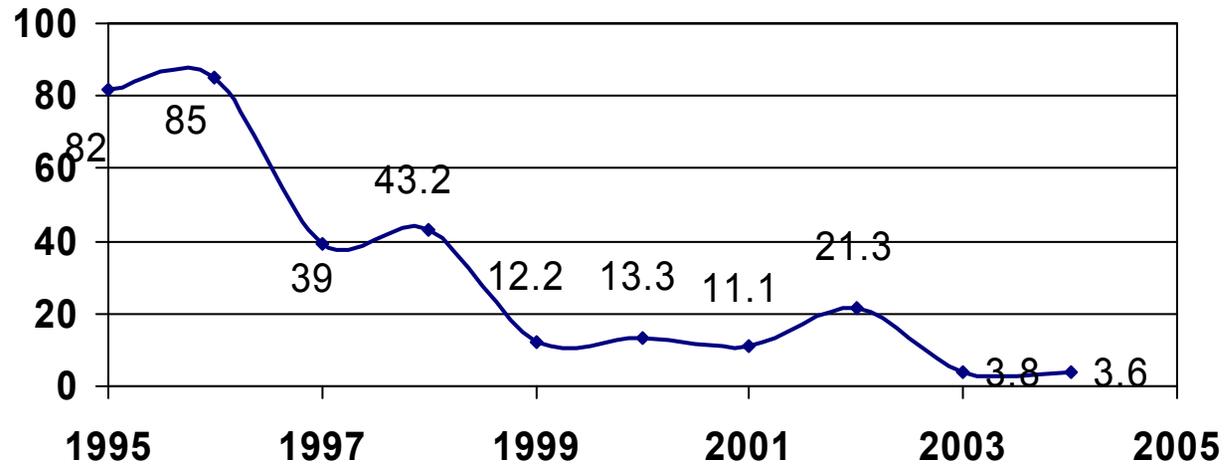
C-AD First Aid Cases

4 First Aid Cases Reported in FY 04

- Bumped head on office shelf
- Tightening bolt struck right hand on aluminum casting
- While cutting pipe oil splashed into eye
- Fell on freshly painted floor

Radiological Dose Reduction Trend

Collective Dose, person-rem

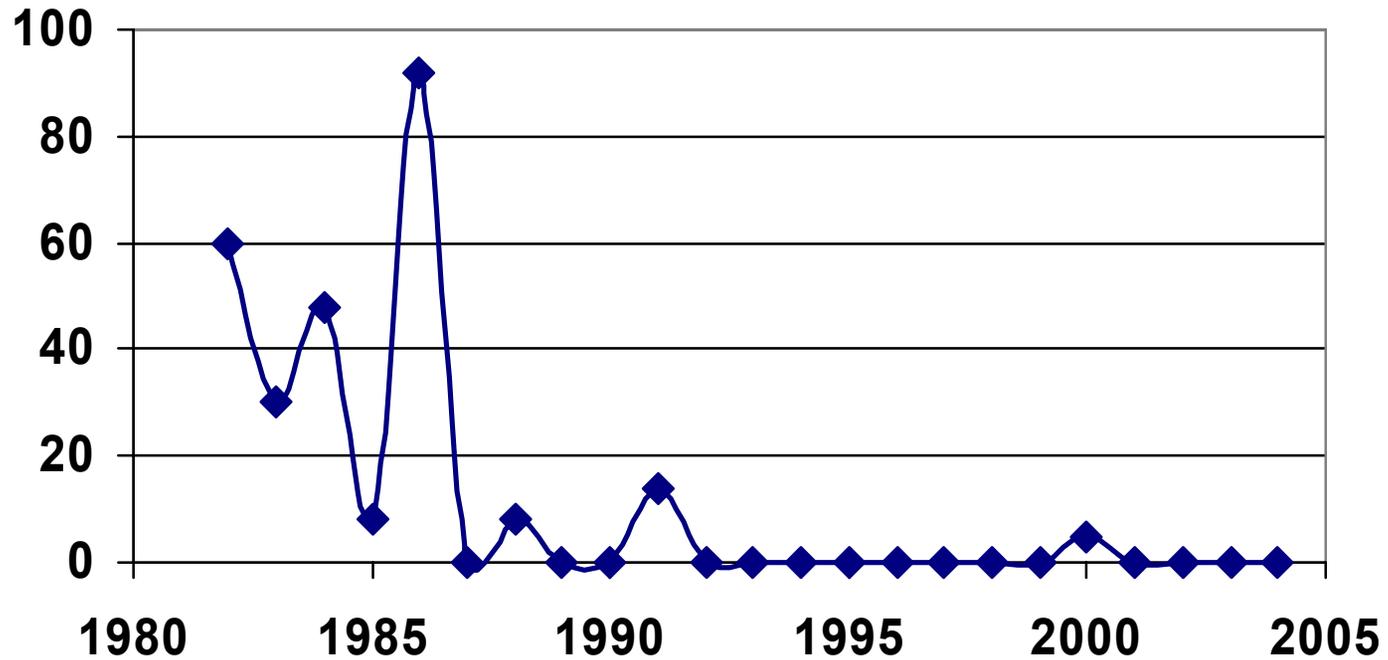


FY04 Goal < 11.75 person-rem



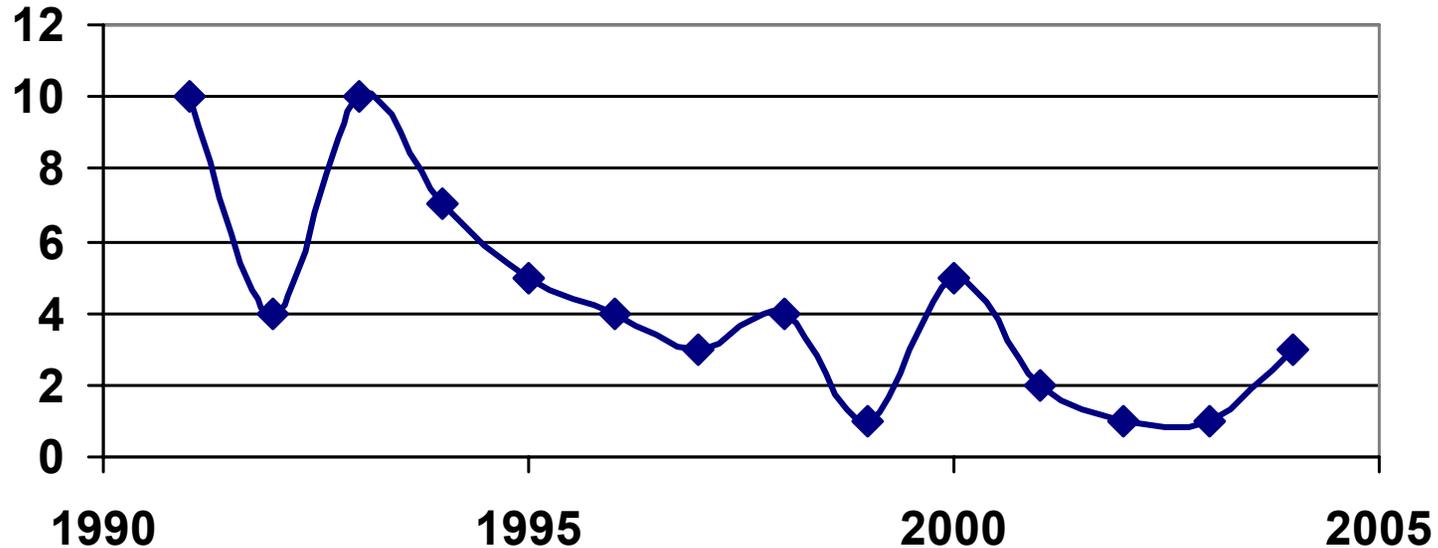
Fire Loss Trend

Fire Loss at C-A Department, \$ 1000



Occurrence Trend

Total Number of C-AD Reportable Occurrences

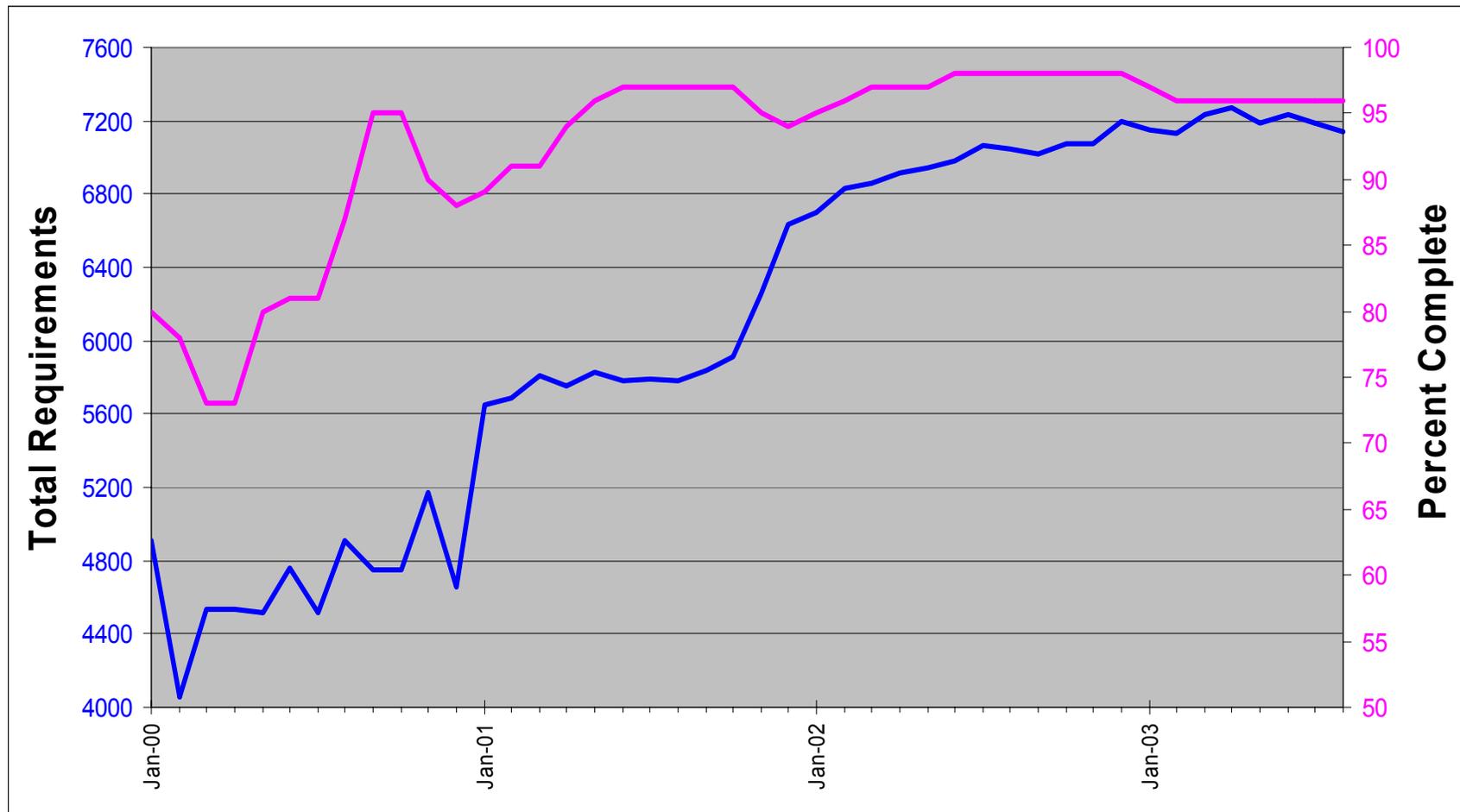


FY04 Occurrences

- Worker Breaks Ankle While Preparing for Cable Pull
- Load Falls Off Flatbed Truck During Transport
- Heating Element Inside Cryogenic Cold Box Causes Burn to Hand

- NOTE 1: Two occurrences involved PE but were assigned to C-AD because they occurred at a C-AD facility and nearby roadway
- NOTE 2: Two occurrences were injuries, and reporting injuries in ORPs is new this year

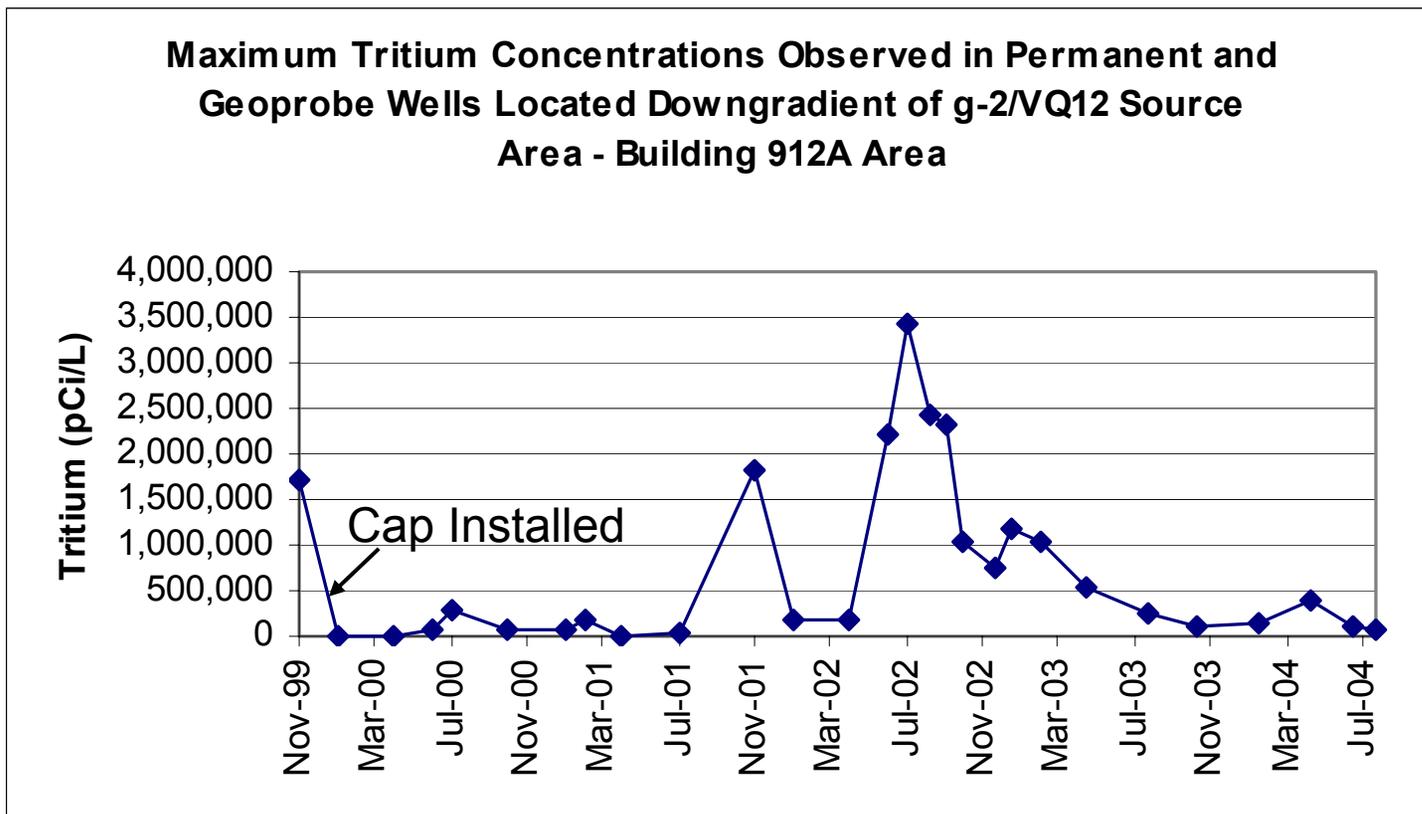
C-AD Training Requirements and Completions



Stakeholder Concerns

- Community
 - g-2 tritium plume
- Regulators
 - g-2 tritium plume
 - External regulation
- Activists
 - None

g-2 Maximum Tritium Concentrations at 150 feet from Source



Quote From Energy And Water Development Appropriations Bill, June 2005

- *External Regulation of DOE Science Laboratories*
 - Through the direction of this Committee and with the cooperation of the ten Science laboratories, the Department's principal substantive objections to external regulation (i.e., unknown cost savings and unknown transition costs) have been resolved. **When faced with mounting evidence of the efficacy and cost-effectiveness of external regulation, the Committee is unable to understand the Department's continued intransigence on this matter.**

FY04 Security Objectives for C-AD

- Reduce theft incidents to zero
- Inform WOSH Committee during quarterly meetings
- Improve information security
- Continue to improve physical security

FY04 Security Improvements

- Work plan developed to address securing of materials
- Identified all areas containing valuable materials
- All valuable materials stored in locked compounds
- Instituted tighter Compound and Rigging equipment key controls
- Increased human surveillance
- Updated theft reporting protocol to include notification of ALD
- Publicized news of thefts
- Developed inventory control program with BNL Business Systems

FY04 Security Improvements

- Green Work Permit changed to address security issues
- Work-planning screening guidance updated (OPM 2.28.d)
- C-AD is color-coding valuable radioactive materials
- NSRL and certain MCR areas require BNL ID card for access
- PPM investigating use of imbedded anti-theft devices
- Cameras and motion detectors are being installed
- New procedures:
 - OPM 1.20, C-A Policy for Valuable Materials Security
 - OPM 2.32, Access Controls - Building 911 and 1005 Property Protection Areas

Ray Karol

- Tier 1
- Self-evaluation program

C-AD Tier 1

- Tier 1 inspections are similar to Occupational Safety and Health Administration (OSHA) inspections
- Weekly Tier 1 inspections cover over 100 buildings annually
- Findings tracked in ATS

C-AD Tier 1 Committee

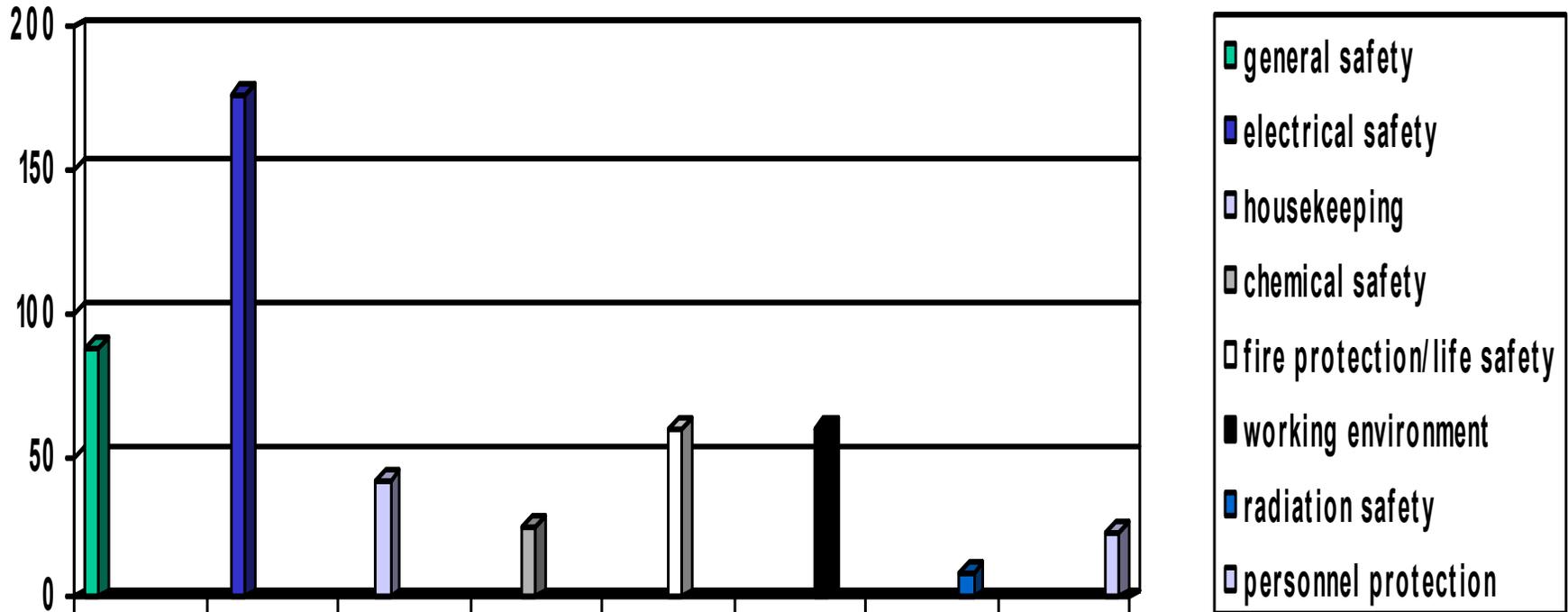
Includes individuals with expertise in the following:

- Industrial safety
- Three persons trained in OSHA 30-hour course
- 10-hr OSHA Training in progress
- Radiation protection
- Accelerators and accelerator experiments
- Mechanical engineering
- Electrical engineering
- Quality assurance
- Waste handling and environmental issues
- Building Manager
- The work (workers participate on a rotating basis)
- Increased management involvement

C-AD Tier 1 Process

- Reports distributed after inspection
- Findings assigned to responsible individual
- Fire-rescue run cards updated
- 39 Tier 1s conducted in FY2004 (to date)

FY04 C-AD Tier 1 Findings (to date)



Significant OSHA-Type Concerns

- Numerous leaks in the roof structure of building 912 create electrical hazards, trip hazards, mold and general building infrastructure problems
- Aging fire protection and electrical distribution systems create fire hazards

C-AD Self-Evaluation Program

- Individuals assess tasks associated with their work and identify areas for improvement
- Management, supervisors and technical staff participate in the program
- Program needs to be revitalized or incorporated into new OSH programs

C-AD Self-Evaluation Program

- Twenty one self-evaluations were performed in FY2004 (to date)
- Corrective actions tracked in ATS

Safety Walk Program

- Adapted from SNS
- 10 Safety Walks done to date
- Primarily a worker review of the job
- Looks at good and bad practices
- Another method to obtain worker feedback

Dave Passarello

- Assessments
- Questions answered
 - What were the internal assessments about?
 - What were the external assessments about?
 - What are results?
 - How were findings dispositioned?

FY04 Self Assessment Plan

- **Objective:** provide a systematic approach to performance management
 - Ensure C-A's performance objectives are being met
 - Ensure improvement actions are identified and implemented

FY04 Self Assessment Metrics

Critical Outcome 1 Excellence in Science & Technology

Objective 1.1: Quality of Research

Targets met by C-AD that support Objective 1.1:

1. Significant Accomplishments:

- Delivered luminosity increased by a factor of ; 21 (STAR), 15 (PHENIX), 13 (BRAHMS) and 7 (PHOBOS)
- Polarized proton collision operations had it's full compliment of Siberian Snakes and spin rotators installed and operational
- NSRL started routine research operations, joint operation of NSRL and RHIC established

2. Significant awards: 7

3. Publications: 170

4. Patents and Disclosures: 2

5. Technical Committees: 76 (Review of BNL 6, DOE/National/Regional 35, BNL 35)

FY04 Self Assessment Metrics

Critical Outcome 1 Excellence in Science & Technology

Objective 1.3: Success in Constructing & Operating Research Facilities

Targets met by C-AD that support Objective 1.3:

1. Budget & Schedule Performance:
 - All budgets were controlled and adhered to, cost plans were on target
2. Facility Performance:
 - RHIC technical goals for FY04 were all either achieved or exceeded
 - NSRL routinely operated with C, O, Fe, Ti, Si, and H beams
 - AGS provided polarized protons with 50% polarization
3. Facility Availability
 - NP (RHIC)= 80.4%
4. SNS:
 - BNL part of the SNS Project continued to meet all construction milestones at or below costs

FY04 Self Assessment Metrics

Critical Outcome 1 Excellence in Science & Technology

Objective 1.4: Effectiveness & Efficiency of Research Management

Example targets met by C-AD that support Objective 1.4:

1. Management Goals and Processes (5)
 - Continual improvement of Accelerator systems
 - Accelerator operations totally aligned with DOE mission
2. Significant Improvements in Infrastructure (6)
 - Proposal for EBIS/LINAC based preinjector for RHIC submitted, CD0 approved
3. Safety Enhancements (6)
 - Implemented the OSH Management System, C-A applying for 3rd party registration
4. Steps toward development of next generation facilities (6)
 - RHIC II, eRHIC
5. Projects/Programs Involving Collaborations with Others (11)
 - NASA radiobiology at AGS and NSRL
 - SNS Project

FY04 External Assessments

- BAO Independent (1)
 - Integrated Safety management
- BAO/BNL Collaborative (2)
 - Radiological Work Control and Injury/Illness Reporting
- Chicago Operations Office Review of BNL Laser Safety Program
- ES audit of Laboratory EMS program
- NSF audit for ISO 14001 re-certification
- NSF audit for OHSAS 18001 certification
- BNL IO Office (2)
 - NSRL Operations and Work Planning

FY04 Internal Assessments

- Department Self-Assessment
- EMS Assessment
- Environmental Management Review
- Occupational Health and Safety Assessment
- Critiques (including ad hoc reviews) 22
- QA Assessments 16
- Tier 1 21
- Worker and Supervisor Self-Evaluations 9
- Safety Walks 10
- Outdoor Storage Areas 4 scheduled
- Inspection of Satellite-Waste Stations 12 scheduled
- Tank Inspections 12 scheduled
- 90-Day Area Inspection 52 scheduled

C-A 2004 OSH Assessment

- Purpose: determine whether C-A's OSH Management System and its elements are in place and implemented throughout the Department
 - Focused on Hazard/Risk Analysis
 - Verified that actions items from BNL OSH gap Analysis have been implemented
- Results: 2 minor nonconformances identified and addressed

FY04 Internal Assessments Continued

Driver and description of required internal C-A assessments:

- Perform assessments on C-A implementation of the following BNL Management Systems:
 - Emergency Preparedness & Off-Normal Event Reporting Completed
 - Environmental Management System Completed
 - Life Cycle Asset Management System Completed
 - Records Management Completed
 - Safeguards and Security Completed
 - Work Planning and Control Completed
 - Worker Safety and Health Completed

Status of Action Items

- Internal

- Issued 782
- Percent Closed 66%

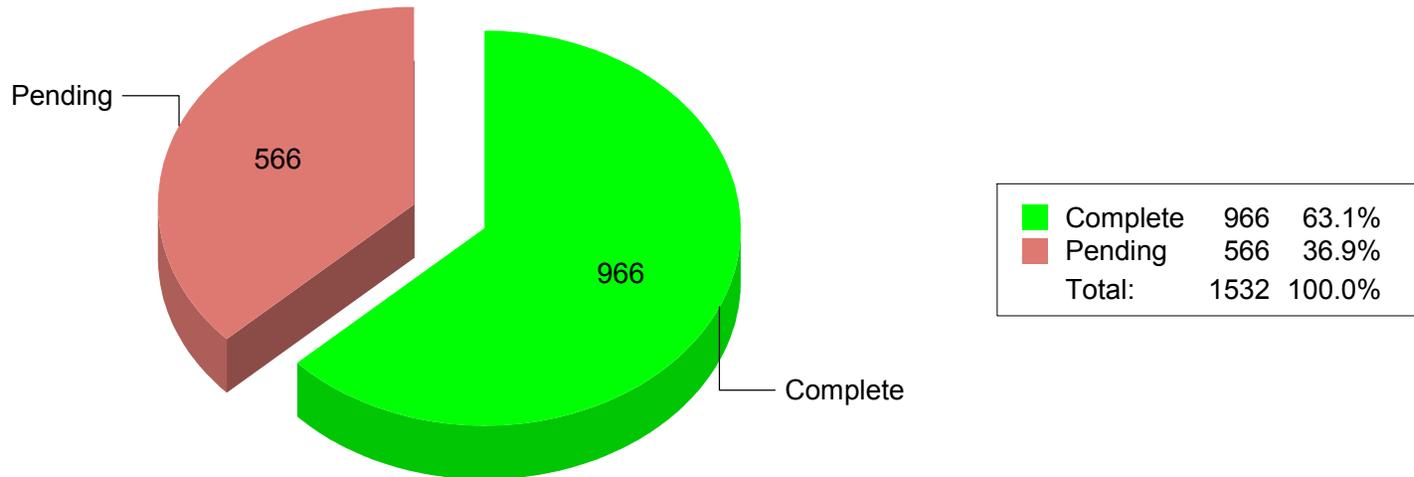
- Status of action items associated with the copper incident. 91% complete

- External

- Issued 95
- Percent Closed 94%

Status of C-A OSHA Corrective Actions

OSHA "Final" Report Abatement Status



Closeout Process for Assessments

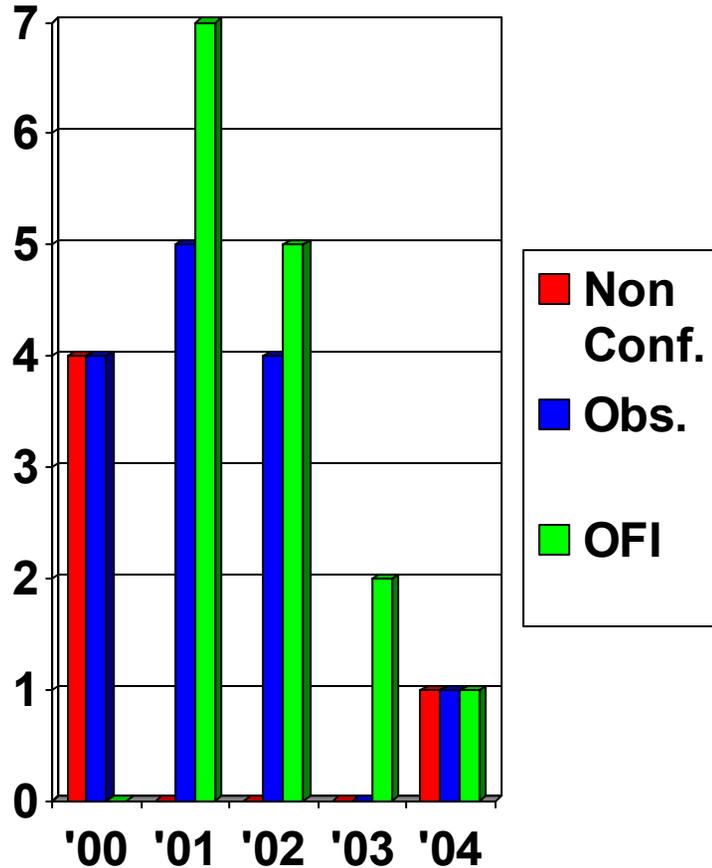
- Actions assigned to accountable individual(s)
- Internal action items entered in Family ATS
- External action items entered in Institutional or Family ATS
- Closeout requires concurrence of ESHQ Management

Environmental Audits and Performance

Mel Van Essendelft

- EMS Audits and Compliance Audits
- Pollution prevention initiatives
- Environmental performance
- Questions answered
 - What is the performance on regulatory compliance?
 - What are the pollution prevention initiatives?
 - What is the effluent/emission performance ?

Internal EMS Audit



'04 Audit Results

- 1 Non-conformance – C-A Self Assessment Plan not developed in accordance with the SBMS Subject Area.
- 1 Observation – C-A OPM 13.3.2 needs to be revised to reflect new SBMS subject areas.
- 1 Noteworthy Practice – C-A Training average is at 99% and JTA's have been developed for Environmental systems

Lab-Level Internal EMS Assessment

- Lab-level Assessment performed by BNL auditors with the following results:
 - 1 Non-conformance – annual work permit not issued for a contractor working with water system chemicals
 - 1 Opportunity for Improvement – the C-A EMS program description refers top an appendix for Objectives & targets that was deleted.

NSF ISO 14001 Audit

- No non-conformances, observations or recommendations at C-A from external EMS audit

This is two years in a row of excellent performance – KEEP UP THE GOOD WORK!!

Compliance Audits

- Hazardous Waste Assessment
 - 1 Noteworthy Practice – Monthly inspections of Satellite Accumulation Areas are documented in an OPM and through the use of a checklist
 - 1 Non-conformance – A number of Hazardous Waste labels don't include a listing of the hazardous constituent as specified by the SBMS
 - 4 Observations:
 - Photographic developer can be labeled as non-hazardous
 - “Ozzy Juice” degreaser, if not containing RCRA solvents or hazardous constituents, can be labeled as non-hazardous
 - Oils in satellite areas should be labeled as “used oil”
 - The 90 Day Contingency plan should have the revision level and date listed on it

Compliance Audits

- Liquid Effluents Assessment
 - 1 Noteworthy Practice
 - C-A is actively working on disposing mercury/mercury containing devices
 - 0 Nonconformances
 - 4 Observations
 - Various pieces of equipment in around the RHIC Blockyard should be checked for oil containing reservoirs
 - Two lead bricks were found in the 912 Steel Yard
 - Steel is being stored in an undesignated area adjacent to the 960 Waste Yard
 - Rigging equipment is being stored on grass with the potential for oil leaks to soil

Compliance Audits

- FRDP Closure Assessment
 - No outstanding issues
- PCB Compliance Review
 - Inspections performed and updated lists forwarded
- Air Emissions Compliance Review
 - Operating instructions and high fluid level marking on part washers updated

C-A Pollution Prevention Initiatives

In addition to the P2 items covered under Facility Improvements...

- Soil Coupon Program – Expanded to additional locations and used to justify not capping 1006 area
- NASA funding for digital equipment at NSRL is being pursued

Environmental Performance

- SPDES discharge monitoring results
- Groundwater
- Air emissions
- Ambient radiation
- Spills

Results for Wastewater Discharge to Outfalls (Table 3-4)

Analyte		Outfall 002B (RHIC)	Outfall HN (RHIC)	Outfall HO (AGS)	Outfall HT-e (LINAC)	Outfall HT-w (AGS)	SPDES Limit	No. of exceedances
pH	Min.	6.8	6.6	NA	6.9	6.8	-	0
	Max.	8.6	8.4	NA	8.2	8.3	9	
Oil and Grease (mg/L)	Min.	<5	<5	NA	<1	<5	-	0
	Max.	2	9.4	NA	<5	<5	15	
Hydroxyethylidene- diphosphonic Acid (mg/L)	Max.	<0.05	<0.05	NA	0.09	<0.05	.5	0
Tolytriazole (mg/L)	Max.	.99	<0.005	NA	<0.005	<0.005	0.2	1

Water Quality Results for Recharge Basins (Table 5-5)

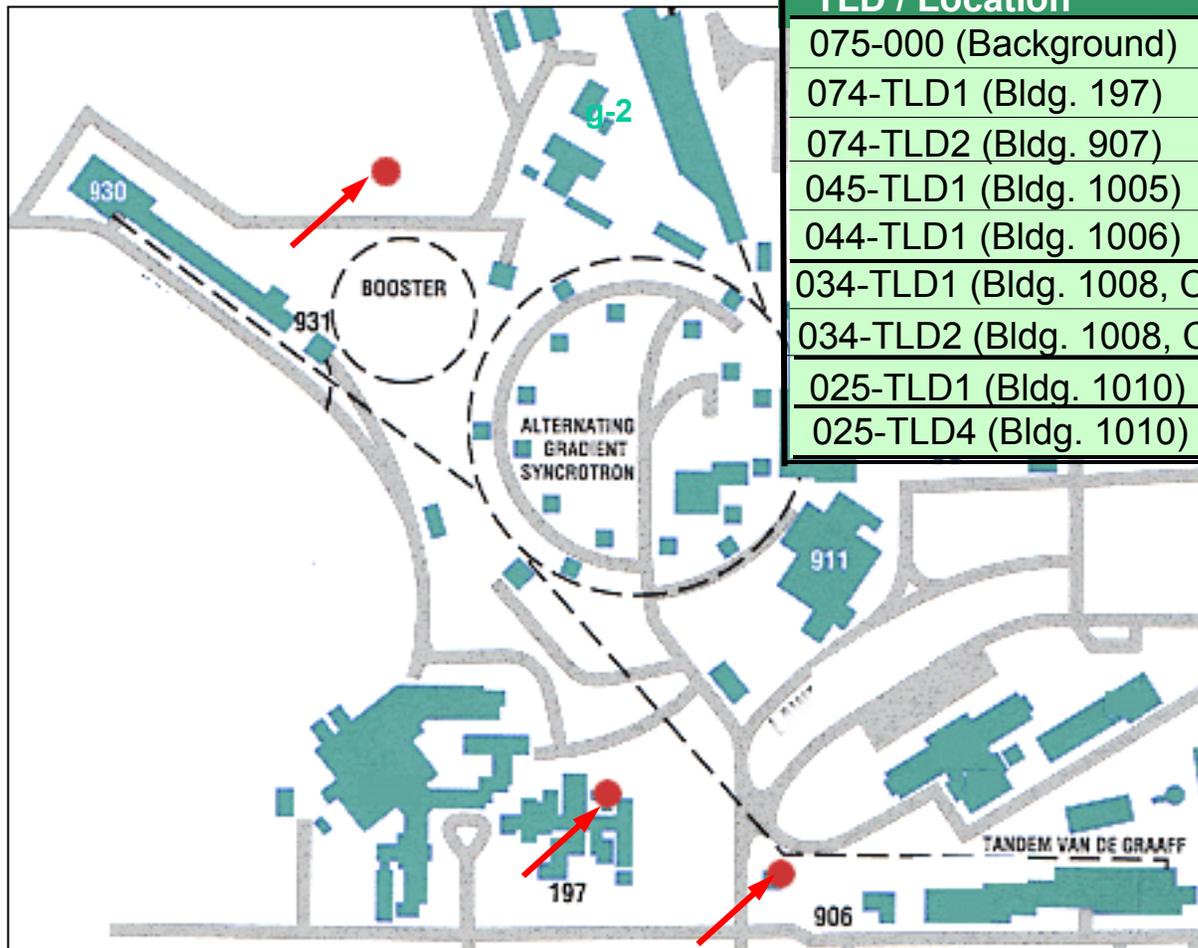
Location		Chlorides mg/L	Sulfates mg/L	Nitrate as N (b) mg/L
HN (RHIC Recharge)	Max.	130	50.6	1.7
	Avg.	66.3	28.5	1.32
HO (HFBR-AGS)	Max.	30.7	11.3	<1
	Avg.	26.8	10.1	<1
HT-e (AGS)	Max.	23.2	11.6	<1
	Avg.	12.3	7.2	<1
HT-w (LINAC)	Max.	33.0	11.8	<1
	Avg.	23.0	11.1	<1
NYSDEC Effluent Standard		500	500	10

Radiological Results for Recharge Basins (Table 5-4)

Basin		Gross Alpha (pCi/L)	Gross Beta (pCi/L)	Tritium (pCi/L)
HN	Max.	15.80 ± 1.40	13.40 ± 1.41	323 ± 240
	Avg.	4.70 ± 7.29	7.41 ± 5.48	7 ± 209
HO	Max.	< 0.577	< 1.03	< 204
	Avg.	0.13 ± 0.12	0.48 ± 0.62	12 ± 54
HT-e	Max.	1.88 ± 0.53	6.39 ± 1.26	< 270
	Avg.	1.11 ± 0.79	2.61 ± 2.99	-57 ± 140
HT-w	Max.	0.77 ± 0.36	< 1.4	< 290
	Avg.	0.49 ± 0.33	0.46 ± 1.12	-66 ± 170
SDWA Limit		15	50	20,000

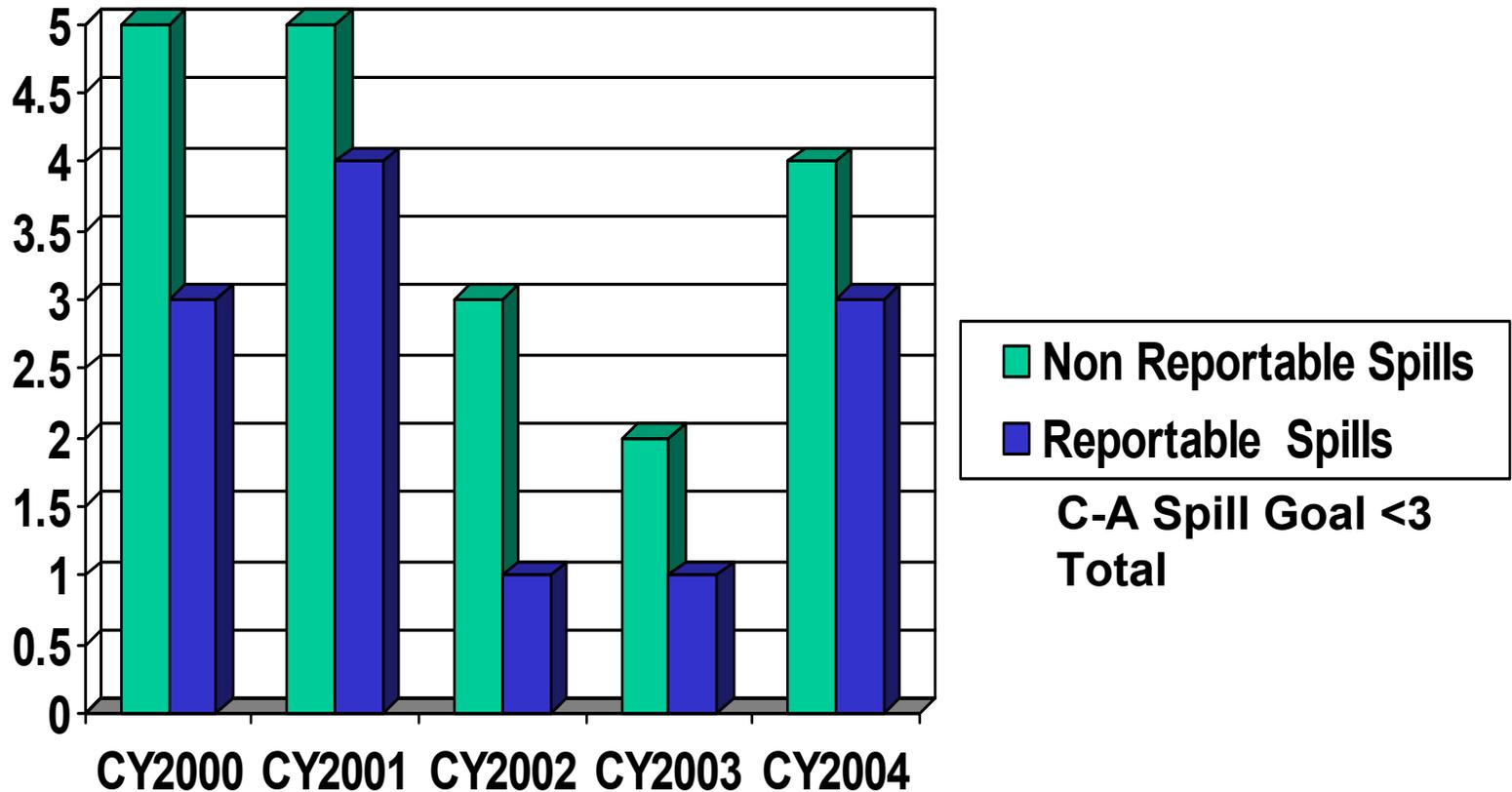
2003 Skyshine Results (mrem)

(Table 8-1)



TLD / Location	QTR 1	QTR 2	QTR 3	QTR 4
075-000 (Background)	11.5	12.2	10.4	9.4
074-TLD1 (Bldg. 197)	19.1	17.4	15.1	17.9
074-TLD2 (Bldg. 907)	16.6	15.6	15.6	16.5
045-TLD1 (Bldg. 1005)	16.4	15.3	14.6	17.8
044-TLD1 (Bldg. 1006)	20.1	15.5	14.3	16.6
034-TLD1 (Bldg. 1008, C2)	16.1	15.7	13.7	17.2
034-TLD2 (Bldg. 1008, C4)	16.3	16.1	15.0	16.3
025-TLD1 (Bldg. 1010)	16.9	13.3	12.6	15.8
025-TLD4 (Bldg. 1010)	20.0	13.2	15.4	16.3

Spill Performance



Ray Karol

Groundwater Issues

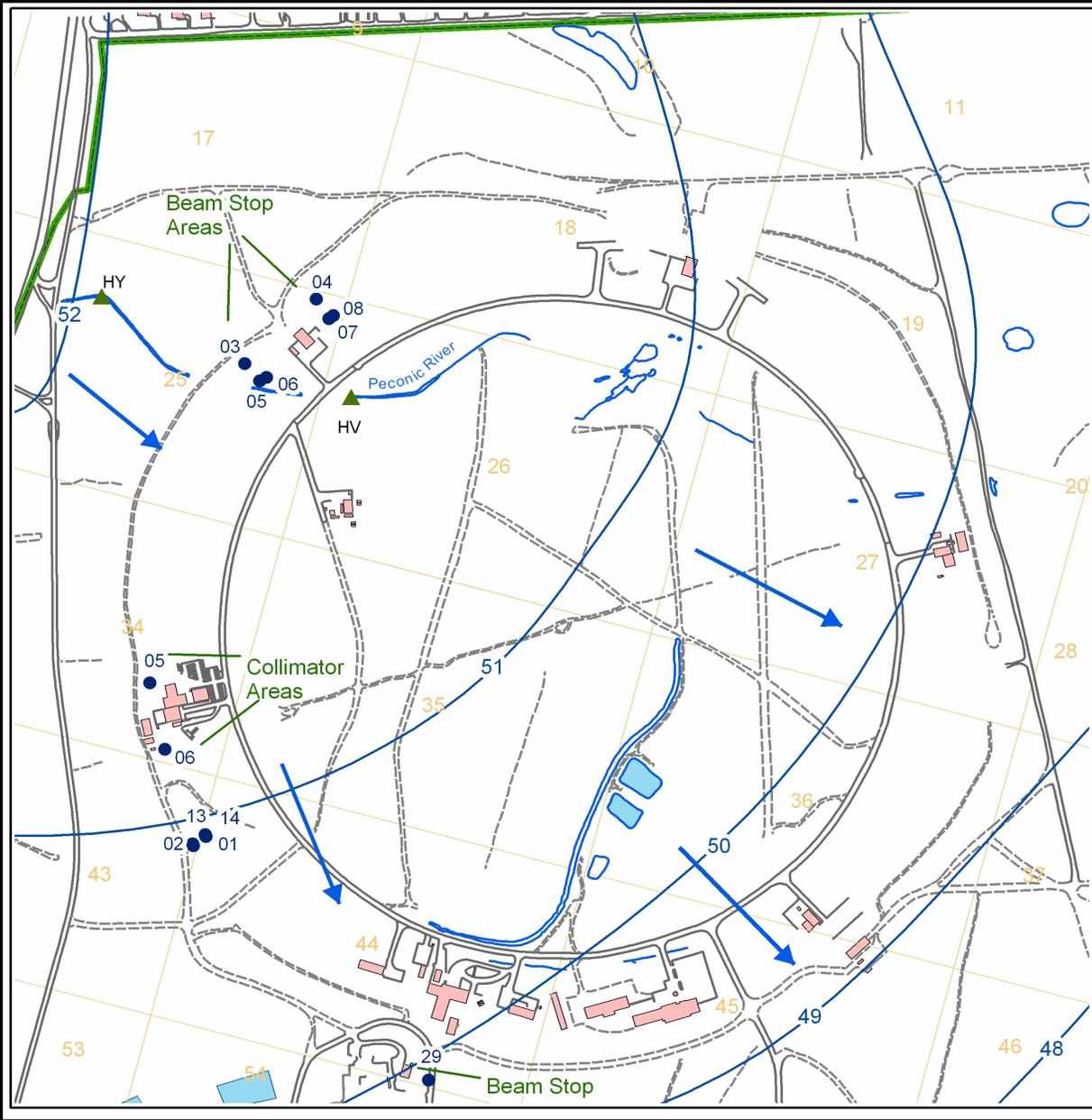
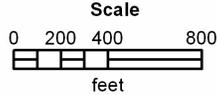
RHIC

- Caps at Yellow, Blue and W dumps and 8 o'clock collimators
- Dumps and collimators monitored by 13 wells
- New uncapped secondary collimator at 6 o'clock
- No groundwater contamination to date

**Environmental Surveillance
Monitoring Well And Surface
Water Sampling Locations
RHIC Facility Area**

Legend

-  Surface Water Collection
-  Monitoring Well
-  Site Boundary
-  Recharge Basins
-  Buildings, Facilities
-  June 2003 Groundwater
Elevation (ft AMSL)
 General Direction of
Groundwater Flow



New Uncapped 6 O'clock Collimator

- Will monitor soil coupons at inside tunnel wall for slow buildup of ^{22}Na
- RSC review
- Leachate expected to be <1 % of DWS with BNL capping guideline of 5% of DWS

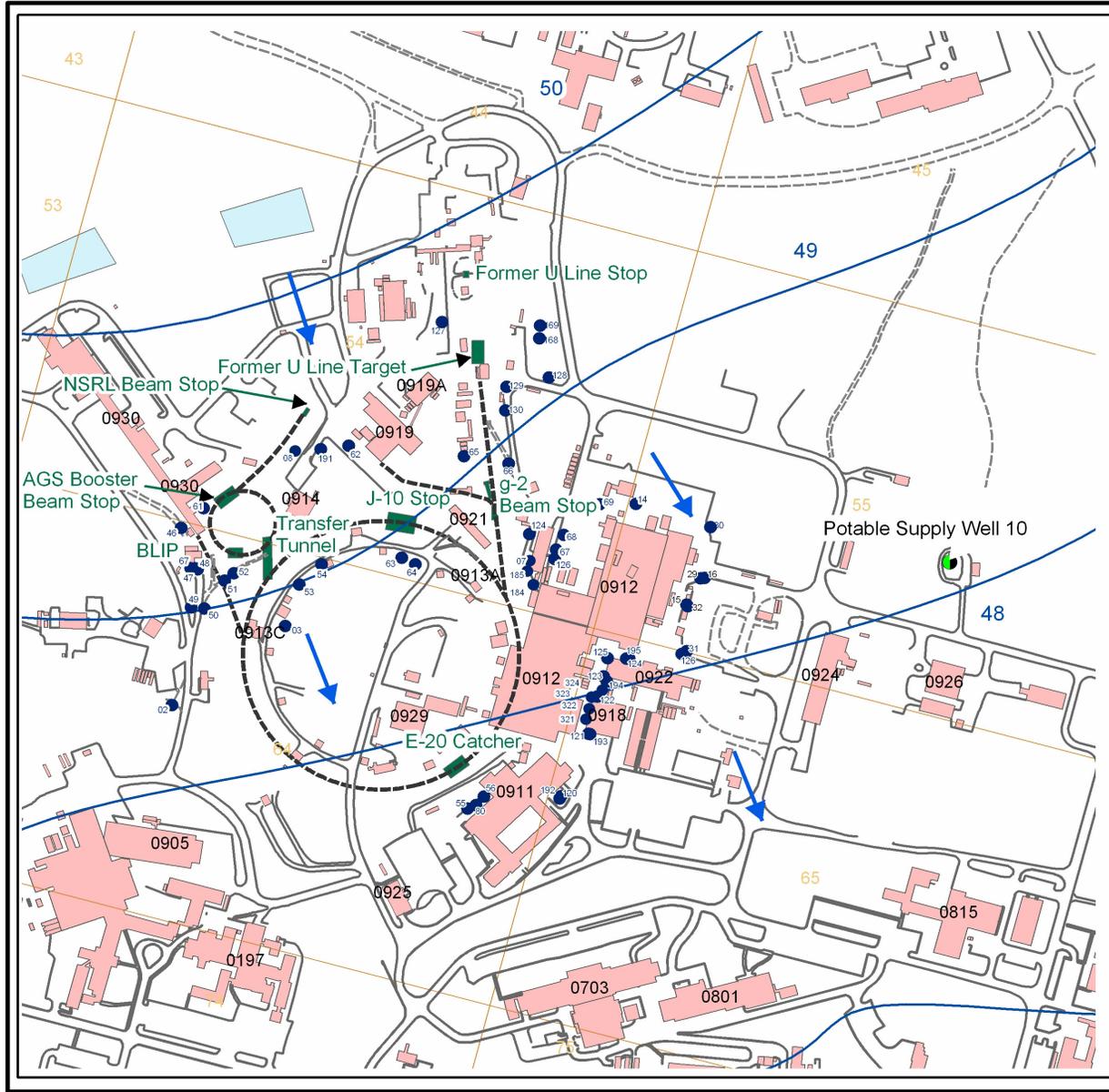
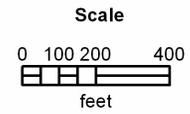
AGS

- Monitored by more than 50 wells
- Areas monitored
 - g-2 plume
 - Former AGS E-20 Catcher
 - Former U-Line Target and Beam Stop
 - Building 912 Area
 - Booster Beam Stop Areas
 - Building 914 Transfer Area
 - AGS J-10 Scraper
 - NSRL Beam Dump
 - Linac

**Environmental Surveillance
Monitoring Well Locations
AGS and BLIP Facility Area**

Legend

- Potable Supply Well
- Monitoring Well
- AGS Ring
- Potential Soil Activation Areas
- Recharge Basins
- Buildings, Facilities
- June 2003 Groundwater Elevation (ft AMSL)
- ➔ General Direction of Groundwater Flow



AGS

Location	Capped?	2003 Maximum Plume Tritium Concentration
E-20 Catcher	10/2000	3400 pCi/L
U-Line Target and Stop	Target – no Stop – 10/2000	3500 pCi/L
B912	Always	3500 pCi/L
Booster Beam Stop	Old – Always New - Always	<MDL
B914 Transfer Area	Always	820 pCi/L
J-10 Scraper	Always, 1999	450 pCi/L
NSRL Beam Dump	Always, 2003	<MDL

g-2 Plume

- VQ12 Magnet losses caused plume found in 11/99
- Capped with Gunitite
- Tritium levels at well were up to 3.5×10^6 pCi/L, source area estimated at 9×10^6 pCi/L
- Experiencing “slug” releases
- Cap integrity periodically verified
- EE/CA written in 2003
- FFS, Focused Feasibility Study (2006)
- Preferred Alternative is long-term monitoring and natural attenuation

Linac

- Examined high-energy end of Linac in summer 2002
- Soil sample results outside tunnel wall showed that leachate would be >5% of DWS
- Areas examined were BLIP Y-chamber and HEFT water stops
- Capping in progress at Linac
- HEFT water stops and LtB to be capped in the future

AGS Berm Cap

- Capping included in RSVP construction

Well Sampling Program Costs

<u>FY</u>	<u>Cost</u>
03	\$72,600
04	\$65,900
05 (requested)	\$69,900

Joel Scott

- Routine Waste
- Waste Minimization
- Legacy Waste Efforts
- Future Legacy Waste Efforts
- Pollution Prevention P2
- Concerns

Routine waste

Waste Category	Actual	Comments
Hazardous/Industrial - Lab Pak	3200 lbs.	OSHA driven cleanups. Paid directly for waste above allocation.
Hazardous/Industrial - Barreled	30,000 lbs.	Slightly above allocation but no chargeback
Low-level Radioactive - solid	1400 cu. ft.	On allocation. Also, 600 cu. ft. of legacy waste paid above allocation.
Mixed Radioactive and Hazardous	28 cu. ft.	Slightly above allocation, but no charge back.
Low-level Radioactive - liquid	900 gals.	This underage paid for small overage in other areas.

Waste Minimization Savings

- Sorting waste bags saved 150 cu. ft., \$10,000
 - Using spent resins as fill in bins was discontinued due to Hanford shutdown
- Received OK from Waste Management to use bulb crusher on activated light bulbs
 - Saves 200 cu. ft. per/year or \$100,000
- Decay in storage of air handler filters saved 100 cu. ft., \$8000
- Burned 700 gallons of oil at steam plant, saved \$3500



Legacy Waste Efforts

- With money from NP and HEP the following items have either gone to waste or are awaiting shipping:
 - Two bins of legacy steel and aluminum, 624 cu. ft. Completes old site wide legacy steel
 - Depleted uranium blocks in C line
 - Stored deuterium vented at B628 and B919
 - Old deuterium trailers and cylinders to be removed and recycled. Building 628 area to be returned to PE
 - 4 Sea-land containers of *Inner Mongolia* components
 - Work delayed until November. This effort will rid C-AD of the old neutrino horn equipment and close the all C-A Site Wide Material Disposition Project items.

Uranium Shield Blocks



Legacy Waste Efforts

- Linac Cockcroft Walton dismantled and sent to recycling
- Building 912 and Linac PCB capacitor removal project
 - Linac purchased first 1/3 of replacement capacitors and B912 has all spares it needs
- Facilities and Experimental Support Division beam line cleanup project

Pollution Prevention P2

- Bulb crusher saved 200 cu. ft. of mixed waste
- Sorting table for waste bags saved 150 cu. ft. of compactable waste
- Decay-in-storage of air handler filters saved 50 cu. ft. of compactable waste



Future Legacy Waste Efforts

- Purchase second 1/3 of Linac PCB capacitor replacements and waste replaced capacitors
- Continue with FES Division cleanup of B912
- Continue *Inner-Mongolia* waste removal and rearrange area for better storage; include 6 magnets from B209
- Purchase and replace B928 PCB capacitors
- Dispose of unneeded concrete shield blocks
- Dispose of 4 or 5 bins of lead accumulated from B912 cleanup

Concerns

- Accumulating radioactive equipment with no planned need:
 - Free to get, expensive to dispose
 - 14 boxes of CERN equipment in B209 cost from \$100,000-\$150,000 to dispose of as low level radwaste
 - SREL magnet cost \$100,000 to dispose of as low-level radwaste
- Added C-AD work due to closure of BNL Analytical Services Laboratory:
 - Time and effort to get samples analyzed increased
 - For immediate response we rely more on process knowledge
 - Time to process paperwork and set up delivery has more than doubled

Ed Lessard

- OSH and E Cost Topics
 - Management Systems Maintenance
 - Pollution Prevention
 - Clean-up
 - Fines/Violations
 - Injury/Illness
 - Monitoring
 - Backward-oriented measures
 - Future-oriented measures
 - Technical Support

FY04 Management Systems Maintenance

▪ OHSAS 18001 derived procedures	0.2 FTE
▪ OSH and environmental records	0.2 FTE
▪ Corrective action tracking (ATS)	0.5 FTE
Total	0.9 FTE

FY04 Pollution Prevention

▪ Tritiated water-system upgrades	\$250,000
▪ Filling storm pipe at Booster	\$40,000
▪ Cap at Linac	\$58,000
Total	\$348,000

FY04 Clean-Up

▪ HENP waste funds	\$650,000
▪ NP waste funds	\$2,600,000
 Total	 \$3,250,000

Fines/Violations

- None

FY04 Injury/Illness Costs

- Direct costs of \$82,050 (\$76K for 4 cases)

FY04 OSH and E Monitoring

- New g-2 geo-probes and samples \$50,000
- Routine well sampling and analysis \$65,900
- OSH measurements (noise surveys, industrial hygiene and rf measurements, etc.) 0.2 FTE

Totals 0.2 FTE
\$115,900

FY04 Backward-Oriented Measures

▪ Performance indicator program	0.1 FTE
▪ Critiques	0.1 FTE
▪ Injury/Illness investigations	0.1 FTE
▪ Occurrence investigations	0.2 FTE
▪ Tier 1 inspections	0.2 FTE
▪ NSF, OSHA and other audits	0.4 FTE
▪ Internal OSH / EMS Audits	0.5 FTE
Total	1.6 FTE

FY04 Future-Oriented Measures

▪ Management Review	0.1 FTE
▪ WOSH Committee	0.1 FTE
▪ BNL 18001 Team	0.1 FTE
▪ Safety Awareness Days	0.1 FTE
▪ ASSRC, RSC, ALARA, ESRC reviews	0.3 FTE
▪ Tier 1 and OSHA compliance improvement reviews	0.1 FTE
▪ Job and facility risk assessments	0.5 FTE
▪ Safety Assessment Document and ASEs	0.5 FTE
▪ Review of environmental process evaluations	0.1 FTE
▪ Annual OSH/EMS training	0.1 FTE
▪ Annual review of OSH/EMS management plans	0.1 FTE
▪ Annual review of OSH/EMS controls	0.1 FTE
Totals	2.2 FTE

Technical Support

▪ Environmental Coordinator	0.5 FTE
▪ Environmental Compliance Rep.	1 FTE
▪ Hazardous Waste Technician	1 FTE
▪ Work Planning Coordinator	0.5 FTE
▪ Tier 1 Coordinator	0.5 FTE
▪ ESH Coordinator	0.5 FTE
▪ Training Coordinator	0.5 FTE
Total	4.5 FTE

FY04 Cost Summary

Category	FTE	Expense
▪ Management Systems Maintenance	0.9	-
▪ Pollution Prevention	-	\$348,000
▪ Waste Costs	-	\$3,250,000
▪ Fines/Violations	-	-
▪ Injury/Illness	-	\$82,050
▪ Monitoring	0.2	\$115,900
▪ Backward-oriented measures	1.6	-
▪ Future-oriented measures	2.2	-
▪ Technical Support	4.5	-
▪ Total	9.4	\$3,795,950

Summary of Management Review Presentations

- Occupational safety and health management system is implemented
- Environmental management system is mature and part of C-AD culture
- Authorization basis documents are re-written and re-approved
- Contractual performance objectives in science and technology are met
- Continual improvement in:
 - Worker involvement
 - Electrical safety
 - OSHA compliance
 - Fire protection
 - First aid and sports injury reduction
 - Pollution prevention
 - Waste minimization
 - Legacy waste removal
 - Power savings
 - Combining and streamlining E and OSH management systems
- Areas needing improvement:
 - Injury reduction
 - Hoisting and rigging competence
 - Speed of fire protection improvements

Senior Management Evaluation

- Purpose: identify improvement actions and assign responsibility and resources to implement

Management Question 1

- Are the OSH/EMS/SA programs effective in achieving policy commitments?
 - Compliance?
 - Pollution prevention?
 - Injury/illness reduction?
 - Community outreach?
 - Clean-up?
 - Continual improvement?

- **Issues**
 - Injury rates not in line with DOE expectations
 - In the area of pollution prevention, there is a continuing need to add caps over activated soils and to remove PCB capacitors at Linac
 - Fire protection improvements are slow

Management Question 2

- Are the OSH/EMS/SA programs effective in achieving the objectives and performance measures?
- **Issues**
 - Not working well
 - Although first aid and sports injuries were dramatically reduced, a reduction in reportable injuries was not seen this year
 - Two rigging occurrences

Management Question 3

- Are the OSH/EMS/SA programs adequate in terms of:
 - Identifying significant environmental aspects and impacts?
 - Identifying significant occupational safety and health hazards?
 - Resource allocation?
 - Information systems?
 - Organizational issues
 - staff expertise?
 - procedural requirements?
- Issues
 - ESHQ resources are at absolute minimum to support expectations, need to increase productivity
 - Need to improve fire protection funding (BNL is effectively back to one fire protection engineer)
 - Liaison between C-AD and OMC needs to be re-established
 - Compliance Suite not user friendly – Jack’s monthly summaries were useful
 - Increase productivity by eliminating low-value programs (e.g., FUAs, whole-body counting, C-AD Self-Evaluation program, nuclear facilities at BNL)
 - Hoisting and rigging program needs improvement (permit systems versus Critical Lift Committee review) and certification of personnel knowledge and ability an absolute must
 - Need to reduce number and frequency of internal audits and questionnaires
 - Need to reduce number of “qualified” C-A riggers
 - Need to improve housekeeping accountability (e.g., Work Permit sign-off, work-order sign off)
 - Need to reduce stress levels prior to startup; perhaps change vacation carryover to December 31

Management Question 4

- Are the objectives and performance measures for OSH and E related programs suitable in terms of:
 - Environmental impacts and current conditions?
 - Occupational hazards and current conditions?
 - Concerns of stakeholders?
 - Current and future regulatory requirements?
 - Business interests?
 - Technological capability?
 - Internal organizational or process changes?
 - Should additional measures be established?

- Issues
 - None

Management Question 5

- Recommended revisions to:
 - OSH policy and commitments?
 - Environmental policy and commitments?
 - Self-assessment policy and commitments?
 - Objectives and performance measures?
 - Elements of OSH?
 - Elements of EMS?
 - Elements of SA?

- Issues
 - BNL needs an electrical equipment acceptance program
 - Continuing need to streamline/integrate OSH and EMS programs
 - BNL needs to expand risk-based OSH management system Lab-wide
 - BNL needs procedure for safety and health review of purchased items
 - BNL needs to streamline lab-level safety reviews; e.g., Siemens rigging