

U. S. DEPARTMENT OF ENERGY
Brookhaven Site Office
Operations Management Division Assessment Report

1.0 Title: Industrial Hygiene (IH) Exposure Assessment

2.0 Scope: The DOE Brookhaven Site Office (BHSO) Operations Management Division (OMD) conducted a site wide assessment of the Brookhaven National Laboratory (BNL) industrial hygiene exposure assessment programs and processes. The assessment was conducted by a team of industrial hygienists from BHSO, the Office of Science Chicago Office (CH), the National Nuclear Security Administrations, Los Alamos Site Office (NNSA/LASO), and the Office of Environment, Safety, and Health, Office of Worker Protection Programs and Policy (EH-52).

This assessment focused on how effectively the industrial hygiene function, specifically exposure assessment and monitoring, is integrated into work planning and hazard control. An emphasis was structured on the following activities and hazards: experimental use of hazardous chemicals, construction, decontamination and demolition work, welding, cutting and brazing, and vehicle maintenance. The assessment looked at routine and non-routine work activities that have the potential to expose workers to regulated chemicals and other non-radiological occupational health hazards. Document reviews, facility walkthroughs, and interviews of workers, work control coordinators, researchers, and other professional staff were utilized in the conduct of this assessment.

3.0 Dates: June 6, 2005 through June 10, 2005

4.0 Summary

Although no situations were discovered during the assessment that indicated workers are subject to unprotected overexposure to hazardous substances, the assessment team documented a concern with the lack of institutional requirements to drive monitoring and assessment activities. Initial baseline exposure assessments based on personnel sampling for various routine occupational health hazards are lagging. In addition, routine personnel monitoring of occupational health hazards such as noise and welding fume are not consistent with regulatory requirements. This assessment has concluded that the current structure for delivering IH exposure monitoring services and conducting credible exposure assessments is largely responsible for these concerns.

The Safety and Health Services Division (SHSD) of the Environmental Safety, Health, and Quality Directorate's (ESH&Q) is responsible for occupational health policies and requirements as outlined in the Standards Based Management System's (SBMS) Worker Safety and Health Management System, which includes Subject Areas that cover a range of occupational health and industrial hygiene topics. The responsibility for implementation of the site's exposure assessment processes to address occupational health hazards resides with the line organizations. This includes the responsibility and direction for conducting initial baseline surveys, continuing or periodic monitoring and personnel exposure assessments. The line organizations, safety and health personnel rely on their individual expertise during their work planning to decide whether or not personnel exposure monitoring and exposure assessments are to be conducted. These decisions are driven by the experience of the individuals involved and not always by institutional requirements completely

consistent with regulatory requirements.

In addition, the line organization selects who provides IH services from a range of options. SHSD, which has considerable IH expertise and is responsible for the posture of the overall IH program, is just one option. Worker exposure monitoring can also be performed by the Radiological Control Division (RCD), private consultants, or by personnel hired by the line organization. Issues with the effectiveness of the RCD personnel for performing these tasks are documented in this report. This impacts the level of confidence and credibility the institution and DOE can place on some of the monitoring results. The organization (SHSD) assigned the responsibility for IH programs is structured to act as a consultant to line organizations with generic guidance instead of being field deployed to maximize their role in providing clear standards based direction on specific facility issues needed to assure meeting regulatory requirements. The overall structure and delivery of the IH program and service is a concern that senior management at the Lab needs to address.

Despite these concerns and observations, there were many positive practices and noteworthy items observed at BNL during this assessment. Staff interviewed exhibited a great deal of understanding of institutional requirements. The overall suite of procedures developed by SHSD for IH and occupational health are web accessible, comprehensive, and well written for use by safety and health professionals as well as non-technical staff. The work planning process outlined in SBMS is well understood and effectively implemented. The current execution of the planning process for addressing IH hazards and issues has been implemented in a conservative fashion. Work Control Coordinators for the activities and work packages reviewed have sought the input from a range of expertise in identifying hazards and taking a conservative approach toward hazard controls. However, some caution should be exercised on the sustainability and efficiency of this current approach to making decisions on IH exposure assessments in lieu of specific institutional direction for an integrated, site wide exposure assessment program.

5.0 References :

- SBMS Management System Description: Worker Safety and Health, 09/15/03
- SBMS: Working with Chemicals, 04/05/05
- SBMS: Work Planning and Control for Experiments and Operations, 04/05/05
- BNL Occupational Safety & Health Management System: OHSAS 18001, 05/2005
- BHG Assessment of BNL's Chemical Safety Program, 03/05/1999
- FY2005 BNL Self-Assessment (BAO Observing) of the BNL Industrial Hygiene Multi-Topic Programs, 01/2005
- DOE/BHG letter from G. Malosh to J. Marburger dated March 5, 1999; Subject: BHG Assessment of BNL's Chemical Safety Program
- DOE/BHG letter from G. Malosh to J. Marburger dated May 3, 2000; Subject: Lead Safety Assessment
- BNL Work Permit form BNLF3093Erev3/05 (04/2005)
- BNL Memo from R. Selvey to J. Wishart and S Howell dated May 05, 2000; Subject: Lead exposure monitoring in the LEAF facility
- BNL Memo from L Stiegler to R. Colichio dated May 6, 2004, Subject: Micro-MRI Magnetic Field Measurements from 5/5/04

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- BNL Memo from P. Cirnigliaro to R. Karol dated November 17, 2004, Subject: Lead Monitoring during C Line Work
- BNL Memo from J. Peters to J. Bond dated August 24, 2004, Subject: Monitoring Old Incinerator Project
- BNL Memo from J. Peters to J. Durnan dated March 21, 2001, Subject: Silica Monitoring Results (revised)
- BNL Memo from R. Travis to R. Colichio dated September 22, 2004, Subject: Operational Readiness Evaluation (ORE) Report – Building 490, Lab 9-807 – Use of a Chemoconvulsant Inhalant
- Letter from Liberty Mutual Insurance Group to R. Wilson, dated June 8, 2005, metals analysis results of sample set 0506052
- Industrial Hygiene Monitoring Report for Plasma Cutting and Grinding Operations—Building 1008, dated 3/6/02, Document No. IH 96SR.02
- Industrial Hygiene Monitoring Report for Airborne Aluminum, Copper and Zinc—Building 479, dated April 2, 2003, IH Project Number: 3828, Document No. IH 75SP.02.
- Industrial Hygiene Air Sampling for Welding Fumes—Building 452-Maintenance Metal Shop, dated March 4, 2003, IH Project Number: 3821, Document No. IHSR97.03
- Summary Report of Biological Monitoring Results for BNL Workers by BNL Occupational Medicine Clinic (OMC) Medical Surveillance Examinations in Calendar Year 2004 (CY04), dated March 24, 2005
- OMD Surveillance dated 8/20-8/25, Subject: Building 428 (Waste Incinerator) Demolition and Associated Work Planning Activities
- BNL Lessons Learned Communication: Multiple Work Permits Needed on Multi-Work Crew Jobs, dated July 25, 2000, Identifier: 2000-CH-BNL-EP-001
- PowerPoint presentation, Silicosis in Construction Awareness Presentation for Plant Engineering, J. Peters, May 2002
- Job Risk Assessment 16-05 Working with PCBs, beryllium, lead, asbestos and mercury
- Subject Area policy document: Lead
- Material Safety Data Sheet: Cerrobend-500-7 (158)-Low Melt Alloys.
- Collider-Accelerator Department Operations Procedures Manual—Attachment—2.28.d Work Screening Guidance
- Collider-Accelerator Department Operations Procedures Manual—Attachment—2.28.h Screening Guide Card for Work Planning
- Collider-Accelerator Department Operations Procedures Manual 2.28 C-A Procedure for Work Planning and Control for Operations
- Form, Collider-Accelerator User Proposal and Request for Beam Time for 2005, Rev. 10/2002
- Life Sciences ES&H Review of Experiments, Project Id:MO05-RR-Rubidium, Issue Date: 1/03
- Activity Safety Review Form ASR Control #13, dated 05/02/03, Title: Semiconductor Detectors Processing
- Experiment Safety Review Form, Review Number (supplied by ERC): 6, title: Solid State Synthesis
- Experiment Safety Review Form, Review Number (supplied by ERC): 29. title: Metal-environmental Interactions
- FS-SOP-1200 Face Velocity Measurements of Laboratory Hoods

- Fume Hood Face Velocity Measurement Data Sheet, Bldg 480, Room 1-4, Location Hood #1, dated 11/24/04
- Life Sciences ESH Review of Experiments: Project ID MO05-Kolksy1, 11/27/01
- NSLS Safety Approval Form: Beamline X26C, ID 1812, 01/08/05
- Training Course Description: IH Monitoring for the Facility Support Technician, RP-RCT-390, 10/05/04
- Screening Guidelines for Work Planning & Control and Application of the Quality Graded Approach, 10/2002
- F&O Job Risk Assessment List (Central Fabrication Services and Plant Engineering), JRA Assignment List and Status, 05/2005
- IH Sampling Record, Noise Dosimeter 6/02/05
- IH Sampling Record, Niton LBP X-Ray Fluorescence Meter 03/28/05
- IH Sampling Record, Jerome 03/31/05
- IH Sampling Record, Lead air sampling 5/23/05
- IH Sampling Report, Mercury 05/24/05
- Employee Exposure Monitoring Notification Records
- BHSO Surveillance Report: Bldg 428 (Waste Incinerator) Demolition and Associated Work Planning Activities, 08/2004
- BNL Performance Indicators for C-A Department for First Two Quarters of FY05, 04/13/05
- Instrumentation Division Tier 1 ES&H Inspection Report OBG00.57, 8/20/02
- Physics Dept. Experiment Safety Review PO2005-096, 01/18/05
- NSLS Worker Qualification Matrices #LS-ESH-0039, 3/4/05

6.0 Personnel Interviewed:

John Peters, Safety and Health Services Division
Robert Selvey, Safety and Health Services Division
Nicole Bernholc, Safety and Health Services Division
Fred Horn, Safety and Health Services Division
David Robbins, Safety and Health Services Division
Firoza Zaroni, Safety and Health Services Division
Dennis Ryan, Radiological Control Division, Manager
Chuck Schaefer, Radiological Control Division
Kathryn Clifford, Radiological Control Division
Nate Foster, Radiological Control Division
Steve McAlary, Building Manager, Chemistry
Cheryl Burns, Radiological Control Division
Don Farnam, Radiological Control Division
Brian Heneveld, GSC (contractor to Environmental Management Division.)
Tom Doyle, Environmental Management Division
Nick Gmur, NSLS
Gerry VanDerlaske, NSLS
Andrew Ackerman, NSLS
Michael Zarcone, Physics Department

Bob DiNardo, Instrumentation Division
Frank Marotta, Assistant Laboratory Director for Facilities & Operations Directorate
John McGowan, Instrumentation Division
Rich Scheidet, Plant Engineering
Patricia Bender, Facility and Operations
Tom Roza, Plant Engineering
Ray Karol, Collider Accelerator Department
Joel Scott, Collider Accelerator Department
Asher Etkin, Collider Accelerator Department
Diane Cabelli, Chemistry Department
Steve Howell, Chemistry Department
Robert Sabatini, Materials Science Department
Nicholas Contos, Radiological Control Division
John Boccio, Energy, Environment, and National Security Department
Robert Colichio, Life Sciences Directorate
Lori Stiegler, Radiological Control Division
Stephen Townsend, Radiological Control Division
Joe Vignola, Radiological Control Division

7.0 BNL-Wide Assessment Results:

7.1 BNL-Wide Concerns

C-IH-0605-01: Adequate exposure characterizations of noise have not been performed. BNL is engaged in a special emphasis effort for noise safety which is reflected in their Subject Area policy document *Noise and Hearing Conservation*. Controls listed on specific Job Risk Analyses (e.g., JRA-EP-GEN-CONCRETE PENETRATION), and several industrial hygiene monitoring studies of specific work evolutions involving potential excessive noise have been identified. This effort was the result of a self-assessment conducted in 2003 of the BNL noise and hearing conservation program. The self-assessment discovered that noise monitoring had been sharply curtailed in recent years. In addition, several cases were discovered in reviewing occupational surveillances of hearing losses. However, BNL has not included in their procedures the OSHA requirements (1910.95(d)(1)) to implement a monitoring program when measured noise exceeds the level that requires a hearing conservation program (29 CFR 1910.95(c)(1)). Radiological Control Division (RCD) and SHSD have jointly developed an exposure monitoring plan but have not as of this assessment completed monitoring. BNL procedures should explicitly include the OSHA requirements to help assure awareness of the need for periodic monitoring by those responsible for work planning.

C-IH-0605-02: An adequate exposure characterization of potential exposure hazards posed by welding, cutting and brazing has not been performed. DOE Order 440.1A, requires initial or baseline surveys of all work areas. In addition, it also requires periodic resurvey or periodic monitoring of potential hazards. Some personal exposure monitoring of welding has been undertaken. However, this sampling is minimal and not representative of all types of exposure hazards from welding activities at the site. Exposure monitoring of welding activities are primarily conducted in response to employee concerns or audit findings and not driven by requirements or an institutional process for establishing baseline exposure data. OSHA 1910.134(d)(1)(iii) also requires

the employer to identify and evaluate the respiratory hazards in the workplace which shall include a reasonable estimate of employee exposures to respiratory hazards. Too little monitoring of welding activities has occurred at BNL to meet these requirements. Of special concern are OSHA requirements for welding, cutting, or brazing activities where cadmium could be present. Vulnerabilities may exist with regards to work covered by OSHA exposure monitoring requirements in 29 CFR 1910.252, 29 CFR 1910.1027 and 29 CFR 1926.1127.

7.2 BNL-Wide Findings

None

7.3 BNL-Wide Observation:

O-IH-0605-01: Personnel exposure monitoring for chemicals is driven by the planning process, employee concerns or management requests and not requirements. Many of the standards for specific hazardous substances (e.g. cadmium, lead, silica, methylene chloride) in Subpart Z of 29 CFR 1910 have specific requirements for initial personal exposure monitoring as well periodic personal or area monitoring. BNL has not established requirements for personnel monitoring consistent with these requirements. BNL conducts exposure monitoring on work evolutions throughout the site as the need is identified through work planning or employee or staff concerns. However, BNL has not established a policy or direction for conducting routine exposure assessments to establish and maintain job exposure profiles for routine activities. This situation is appropriate for unique, *one-of-kind*, infrequent research or other work activities which are not routine. However, routinely conducted work should be subjected to an appropriate level of periodic monitoring to comply with relevant requirements and to assure safe working conditions. Examples include, but are not limited to, lead, silica, welding fume, and noise discussed in separate paragraphs in this evaluation. BNL should establish the policy of identifying routine activities with potential hazardous exposures and conduct initial and routine monitoring consistent with requirements and not left to decisions made by staff in the work planning process.

O-IH-0506-02: There is no institutional requirement to enter all industrial hygiene monitoring data into a centrally managed database. Currently, the results of industrial exposure monitoring are maintained primarily by SHSD in Compliance Suit®. However, Compliance Suit® has not yet been completely deployed. Line organizations that conduct their own IH monitoring have the option of entering the data into Compliance Suit®, however, there is no institutional requirement to mandate compliance. In addition, work conducted by subcontractors on construction projects is not provided to SHSD for inclusion in Compliance Suit®. This information resides within the project plans if it has been provided by the subcontractors. It is critical for accurate site industrial hygiene characterization of potential exposure profiles that all work activities funded by DOE and conducted at BNL be maintained at the institutional level.

O-IH-0506-03: Walkthroughs of laboratories indicated that in some laboratories the storage of chemicals in fume hoods where experiments are being conducted and used to control exposures is becoming excessive. BNL appropriately relies on chemical fume hoods as a critical defense against hazardous exposure in its many bench scale research activities. The small scale, high variability, and low frequency of these activities typically render exposure monitoring unwarranted or impractical as

a regular means of assuring that exposures are under control. Consequently, assuring the performance of the chemical fume hoods is essential for assuring a sufficient level of personnel protection. BNL's has implemented an aggressive program of annually certifying the performance of chemical fume hoods with Procedure FS-SOP-1200 as performed by the RCD. In the Chemistry Division, fume hoods which contained stored equipments or chemicals had been identified on Fume Hood Survey Forms by diagram and description or by written description. This was not the case in other divisions. The Chemistry Division has taken some administrative steps to contact RCD for retesting the fume hoods if additional materials are placed in the fume hoods which may impair face velocities and the ability of the fume hood to provide the adequate protective factor controlling exposures. However, flow rate measurements do not take into account the position of the researcher's body and motion on air flow dynamics. Therefore, even the best fume hood velocity measurements are not exact duplications of conditions the researcher may be exposed to. Every effort should be made to minimize storage of unnecessary material in active fume hoods.

Along with this practice for minimizing storage in fume hoods, BNL's fume hood performance certification procedure can be enhanced. The current procedure requires the use of a visual smoke test of the inward movement of air but also should require the surveyor to affirm the successful completion of the smoke test on the measurement data sheet. The procedure requires the surveyor to test the hood with the experimental set-up in place but also should require documentation and ready access to the configuration of the set-up so that others can easily verify that it has not appreciably changed in ways that could have degraded the performance of the hood (e.g., diagram drawings, a posted photo showing the set-up). While visual smoke testing for inward movement is an acceptable practice, a quantitative fume hood performance method (ASHRAE Standard 110-1995 -- *Method of Testing Performance of Laboratory Fume Hoods*) is available and would provide additional assurance of the hoods' performance.

O-IH-0506-04: BNL does not have an institutional policy which clearly states the requirements for working with carcinogens. DOE Order 440.1A requires policies and procedures to mitigate the hazards posed by occupational exposure to carcinogens. The policy or procedure should address the requirements of 29 CFR 1910.1450 to include but not be limited to defining designated areas and use of containments such as fume hoods. These requirements are being incorporated by many research organizations into the ESRs' and discussed in both institutional and work specific training. However, there is no institutional policy which clearly states the requirements for working with carcinogens.

O-IH-0506-05: The charge back system for purchasing personnel exposure monitoring services from RCD may inhibit organizations from requesting services and overburdening SHSD resources since SHSD resources are not charged back. Currently, line organizations have the option of requesting industrial hygiene services from SHSD, purchasing their service from RCD, hiring their own personnel to conduct industrial hygiene monitoring, or purchase their services from a private vendor. RCD radiological technicians (RCTs) can provide monitoring on a charge back. However, their expertise and training limits them to primarily delivering the exposure equipment to the personnel being monitored and assuring that the equipment is working and placed appropriately on the worker. In discussions with RCD management, they pointed out that their RCTs were not sufficiently qualified to do more according to their interpretation of SHSD policies. In addition, they pointed out that as part of the charge back system the additional costs to line organizations for more

RCT time for monitoring could be prohibitive. Additionally, issues over who would pay to upgrade the RCT's qualifications were uncertain. Some organizations have been requesting services directly from SHSD which has placed additional demands on resources. In addition, some organizations discussed going to outside vendors for IH services because of issues they perceived in terms of the quality of RCD services and issues of getting timely services from SHSD.

O-IH-0506-06: The corrective action plan for the FY2004 BNL Self-Assessment (BAO Observing) of BNL Industrial Hygiene Service Provider's Internal Control Documentation Programs (ICD Assessment) does not address the more significant structural issues raised in the BNL assessment and the RCD factual accuracy report:

- Decentralized IH program
- SHSD policy is that organizations that conduct exposure monitoring will write the hazard assessment report – *however they frequently lack the expertise*
- Some service providers do not have formal qualification programs
- Differing organizational interpretation of “cognitive Industrial Hygiene professional”

The ICD Assessment had identified findings related to the confined space program as well as some training issues. These findings are addressed in the BNL corrective action plan to this ICD assessment. However, issues concerning the qualification and services provided by RCD were identified as observations. No corrective actions addressing these structural issues were included in the corrective action plan. Many of the observations noted in this IH Exposure Assessment Report (O-IH-0506-05, O-IH-0506-07, O-IH-0506-08, and O-IH-0506-09) are similar to the issues documented in the ICD Assessment and/or the RCD Factual Accuracy response to the ICD Assessment. In addition, it is the opinion of this assessment team that these structural issues are at a minimum, contributing factors to the Concerns (C-IH-0605-01 and C-IH-0605-02) noted in this report and some of the other Observations (O-IH-0605-01 and O-IH-0506-02). The highly diversified (decentralized) nature of the IH program was mentioned as a potential barrier to having an effective site wide, integrated, IH program in the FY 2005 BNL Self-Assessment (BAO Observing) of the BNL Industrial Hygiene Multi-Topic Programs.

7.4 BNL-Wide Noteworthy Items

Noteworthy Item

Work Permit (Green Form) was well documented in all work packages reviewed. Information clearly identified the potential industrial hygiene hazards encountered in the various work activities. Decisions to provide monitoring were documented.

Noteworthy Item

Chemistry, Physics, EENS, and Life Science ESR's were well documented with the specific chemicals involved in the covered research well identified. In addition, clear experiment description with appropriate controls and required training were well documented. Other organization in BES did not provide the level of detail in their ESRs that was consistently observed in these organizations.

Noteworthy Item

BNL staff was very knowledgeable about SBMS. In all interviews with work control coordinators,

work requestors, ES&H coordinators, and researchers, the staff named and described the requirements (such as Subject Areas) and forms in the SBMS system appropriate for the work being assessed.

Noteworthy Item

Work Control Coordinators, ES&H coordinators, and SHSD staff were well aware of lessons learned related to work planning, work hazards and control information from past internal events or incidents and information from across DOE or private industry. One example was an event in private industry that resulted in a researcher fatality from exposure to Di-methylmercury. The Chemistry Division had taken specific actions to get information out and help assure that this type of occurrence would not occur at BNL. In discussions with staff on how hazards were identified, controlled and monitored, information was openly shared about modification or improvements made to processes or hazard controls from lesson learned internally or from external sources. They also discussed improvements made as a result of internal and external assessments. It was clearly demonstrated to the audit team that BNL is open to suggestions and actively trying to incorporate lesson learned from others into improvements to their processes and procedures.

8.0 BNL Facility Specific Concerns (Divisions/Departments):

None

8.1 BNL Facility Specific Findings (Divisions/Departments):

None

8.2 BNL Facility Specific Observations (Divisions/Departments):

O-IH-0506-07: The assessment team is concerned whether the lesson plan for Course RP-RCT-390 “IH Monitoring for the Facility Support Technician” can effectively cover the learning objectives. The lesson plan for Course RP-RCT-390 “IH Monitoring for the Facility Support Technician” outlines the content of instruction and learning objectives which cannot effectively be completed in the time allotted. To create credible exposure monitoring results, the technician must understand how the equipment responds to challenge environments, including deposition principles, interferences, and false readings. The technician must also understand and document workplace conditions that alter the equipment readings and personnel exposure, including equipment positioning and orientation, environmental influences, time-in-motion activities and other worker behaviors.

O-IH-0506-08: RCD and SHSD differences over the interpretation of “cognizant Industrial Hygiene professional” is impairing the delivery of industrial hygiene services. In the review of SHSD procedure, IH60500 rev2, Reporting Personnel Exposure Monitoring Results, criteria for Industrial Hygiene Professional is consistent with DOE expectations. The criteria are clear that a Industrial Hygiene Professional does not have to be certified to perform or direct hazard (exposure) sampling and analysis. RCD has not developed their own qualification program but has stated its

intent to follow the criteria in the SHSD procedures. This procedure *does not require* the Industrial Hygiene Professional to be certified. RCD informed the assessment team that their interpretation was that the Industrial Hygiene Professional had to be certified. RCD contends that the lack of qualifications in their staff mix precludes them from being able to credibly perform full exposure assessments other than placing the monitoring equipment on workers. The ramifications of this are further discussed in observations O-IH-0506-05, O-IH-0506-06, and O-IH-0506-09.

O-IH-0506-09: RCD personnel performing personnel exposure monitoring do not adequately observe workers to assure accurate exposure assessments are obtained. The RCTs do not make worker observations or provide other appropriate check of sampling media to assure against contaminate overloading or worker behavior. This raises concerns over the confidence of the data collected since worker exposure is significantly impacted by worker behavior, worker use of controls, and environmental conditions. (See more in O-IH-0506-07.)

O-IH-0506-10:

The pesticide application process in the Biology Department is managed as a "skill of the craft" operation. The inventory of pesticides associated with this operation in the BNL CMS includes a spectrum of chemicals that range from mildly to highly toxic. The activity has not been reviewed by the ESH Operations staff within Research Support. It is also not covered by an ESR or a work permit. Decisions on hazard controls and employee monitoring are made by the worker, who is a New York State Certified Pesticide Applicator. Based on interviews with safety staff in Biology and in the SHSD, exposure monitoring has not been performed on this operation by the Biology Department, RCD or SHSD. Qualified safety staff should perform a documented evaluation of the approved operations to determine if exposures to chemicals are below any action levels or PELs specified by OSHA.

8.3 BNL Facility Specific Noteworthy Items (Divisions/Departments):

Noteworthy Item Safety and Health Services Division (SHSD)

The SHSD IH instrument calibration and control process is an effective program. The program controls the use and calibration of industrial hygiene exposure monitoring equipment. Calibration and equipment use records are well maintained. Individuals receive training on how to use the SHSD online service request system. Once the training is conducted individuals can then go online to request the appropriate monitoring equipment. The system is designed to elicit useful exposure information to aid in selecting the right equipment. The equipment including the specific types of sampling medium (cassettes, gel tubes, etc.) and sample are attached and ready for use. Sampling blanks are also prepared. This is an efficient system which assures that the appropriate sampling equipment is available and ready for use.

Noteworthy Item Safety and Health Services Division (SHSD)

The heat and humidity conditions monitoring and accompanying web page maintained by SHSD provides real time data on the conditions that could cause worker heat stress and is easily accessible to employees, supervisors and work planners. The training, use, and maintenance of the heat stress monitoring and use of the software is well documented in SHSD procedure IH10150 (Heat Stress Notification using the Questemp 15 Heat Stress Monitor). Procedure IH10150 and its attachments provide valuable information to the employee and supervisors in interpreting and using the

information in an understandable format. The BNL employee notifications have been adopted from the ACGIH WBGT (Wet Bulb Globe Temperature) criteria.

Noteworthy Item Facility and Operations (F&O)

The chemical procurement process in F&O requires a safety review on all chemical purchase orders. F&O uses the Plant Engineering chemical product evaluation form which requires sign off by an ES&H coordinator or other safety professional prior to procurement. This aids in assuring chemicals procured are appropriate for the type of work and within the safety envelope for the facility, and aids in controlling chemical inventories and minimizing the types of hazardous substances.

Noteworthy Item Facility and Operations (F&O)

The Facility and Operations worker exposure monitoring reports are comprehensive and written in a fashion that is easily understood by supervisor and workers. The report contains relevant information on the work activity, conditions, and PPE used, and provides easy to read and understandable analysis for workers on their exposure level, including the relevant PEL or TLV to allow easy comparison between the exposure and the standard.