

E.W. HOWELL COMPANY., LLC

Health & Safety Plan

For

Brookhaven National Laboratory
NSLS-II LOB Project

September 13, 2010
Revised October 20, 2010

TABLE OF CONTENTS

| | |
|--|----|
| INTRODUCTION..... | 5 |
| 1.0 CERTIFICATION LETTER..... | 6 |
| 2.0 EWH SAFETY POLICY STATEMENT | 6 |
| 3.0 PURPOSE & INTRODUCTION..... | 7 |
| 3.1 Definitions | 7 |
| 3.2 General Information | 7 |
| 3.3 All Tier Subcontractor Safety Program | 8 |
| 4.0 INTEGRATED SAFETY MANAGEMENT SYSTEM..... | 9 |
| 4.1 Principles of the Integrated Safety Management System | 9 |
| 4.2 Core Functions of Integrated Safety Management System..... | 10 |
| 4.3 Roles and Responsibilities for Integrated Safety Management System Implementation..... | 11 |
| 5.0 DOE RULE FOR WORKER SAFETY AND HEALTH (10 CFR 851) | 12 |
| 5.1 Safety and Health Standards..... | 12 |
| 5.2 Occupational Medicine Program | 12 |
| 6.0 EWH RESPONSIBILITIES..... | 13 |
| 6.1 Emergency Services and Equipment..... | 13 |
| 6.2 Job-Site Orientation | 13 |
| 6.3 Security and BNL Site Access..... | 14 |
| 6.4 Disciplinary Policy | 14 |
| 6.5 Operation of Equipment and Machinery | 14 |
| 6.6 Evacuation of the Work Area..... | 15 |
| 6.7 Accident Investigation and Reporting | 16 |
| 6.8 Personnel Protective Equipment | 16 |
| 6.9 On-Site Safety Inspections..... | 17 |
| 6.10 Weekly Tool-Box Meetings and Pre-Job Briefings..... | 17 |
| 6.11 Protection of Work Area | 18 |

| | |
|---|----|
| 6.12 Working and Storage Areas | 18 |
| 6.13 Hazardous Material and Hazardous Waste | 18 |
| 6.14 EWH Stop-Work Policy | 19 |
| 6.15 Occupational Medicine Program | 19 |
| 6.16 On-Site Medical Services | 22 |
| 6.17 Sanitation | 22 |
| 6.18 Drug Free Workplace | 23 |
| 6.19 Substance Abuse Program | 24 |
| 7.0 JOB-SPECIFIC WORK REQUIREMENTS..... | 44 |
| 7.1 Phase Hazard Analysis | 44 |
| 7.2 Compressed Gas General Safety..... | 44 |
| 7.3 Confined Spaces..... | 45 |
| 7.4 Electrical Safety | 46 |
| 7.5 Working from Heights, Fall Protection | 47 |
| 7.6 Scaffolds | 48 |
| 7.7 Excavations and Trenches | 49 |
| 7.8 Fire Protection..... | 51 |
| 7.9 Hand and Power Tools..... | 52 |
| 7.10 Hazard Communication..... | 52 |
| 7.11 Heat and Cold Stress | 53 |
| 7.12 Hoisting and Rigging | 54 |
| 7.13 Lock-Out/Tag-Out (LO/TO)..... | 58 |
| 7.14 Respiratory Protection..... | 62 |
| 7.15 Sources of Radiation..... | 62 |
| 7.16 Industrial Hygiene Monitoring | 63 |
| 7.17 Penetrations..... | 64 |
| 7.18 Steel Erection..... | 65 |
| 7.19 Concrete and Masonry Operations..... | 65 |

| | |
|---|----|
| 8.0 ENVIRONMENTAL PROTECTION AND WASTE MANAGEMENT | 66 |
| 8.1 Storm water Pollution Prevention and Control | 66 |
| 8.2 Erosion Prevention and Sediment Control..... | 66 |
| 8.3 Spill Prevention and Control..... | 67 |
| 8.4 Waste Management..... | 67 |
| 8.5 Dust Control..... | 67 |

Appendices

- A. Certification Letter
- B. Safety Incentive Program
- C. Organizational Chart
- D. Project Orientation
- E. Disciplinary Policy
- F. Equipment Inspection
- G. Emergency Action Plan
- H. Accident Investigation
- I. Site Inspection Form
- J. Phase Hazard Analysis (PHA)
- K. Confined Space Entry
- L. Lock Out/Tag Out
- M. Fall Protection
- N. Scaffold Program
- O. Digging Permit
- P. Excavation Checklist
- Q. Competent Person List
- R. Hot Work Permit
- S. Hazard Communication Program
- T. Lifting – Hoisting and Rigging
- U. Critical Lift Form
- V. Energized Electrical Work Permit
- W. Respiratory Program
- X. Assessment Record Keeping

INTRODUCTION

The Safety and Health of its employees and the protection of the environment is the prime concern to E.W. Howell Company., LLC. To best serve employee safety, health and environmental protection, E.W. Howell Company., LLC at the Brookhaven National Laboratory, NSLS-II LOB Project establishes and endorses a Safety Program which will provide a safe and healthy workplace for each employee and protect the environment. Each employee is expected to work towards accomplishing the goals of the Safety Program and act responsibly in accordance with established policies and procedures. E.W. Howell Company., LLC believes that all accidents are preventable, and ZERO ACCIDENTS is our prime goal.

To this end E.W. Howell Company., LLC will utilize the following principles in the construction of the NSLS-II LOB project:

ATTITUDE: Safety is the prime concern in the construction of the facility. This applies to E.W. Howell Company., LLC personnel and all workers including subcontractors. A safe project is one that is completed with quality, on time and within budget. Management and workers will be required to maintain a positive attitude toward safety at all time.

AWARENESS: Beginning with the planning of our work activities, orientation of workers and construction activities we will utilize the Phase Hazard Analysis (PHA) and Integrated Safety Management Systems processes to foster safety awareness. We will hold management and workers accountable to the commitments stated in these processes.

ABILITY: Management and workers will be required to display the highest level of competence and we will employ only those who meet this standard of excellence. Risk taking and failure to comply with or follow established rules and practices will not be tolerated.

ACTION: Management and workers will be held accountable for their actions. They will be mentored and required to do their daily tasks in a safe, healthy and environmentally correct manner. Everyone will be held accountable for conformance and compliance with Phase Hazard Analysis (PHA) and Integrated Safety Management Systems processes which are supported by best practices means and methods and regulatory agency compliance.

This is how E.W. Howell Company., LLC will construct the NSLS-II LOB Project.

1.0 CERTIFICATION LETTER

E.W.Howell Company., LLC (EWH) maintains a comprehensive environmental, safety and health program whose standards are communicated to all contractors and all levels of subcontractors. The EWH commitment to environmental, safety and health excellence is the premier communication to all employees and subcontractors working at this project and is the opening of the site orientation program which all workers and visitors must complete before entering the project.

EWH requires that each contractor working at BNL agree to these standards and certifies their intent. **Appendix A** is an example of such a certification letter. This letter is signed by the President and Chief Operating Officer and is part of the Environment, Safety and Health (ES&H) Plan submitted for this project. This requirement will be part of any contracts to each of the subcontractors performing work on this project.

2.0 EWH SAFETY POLICY STATEMENT

The safety of all personnel is recognized as a primary concern to all participants at BNL's National Synchrotron Light Source II (NSLS-II). Unsafe conditions and unsafe behavior can result in injuries and deaths as well as impact schedules, cause financial losses, and damage professional reputations. As such, it is our goal that all project participants plan, manage, and execute their respective operations with the ultimate goal of conducting their operations injury-free on a daily basis.

It is the responsibility of each contractor and all tiers of subcontractor to adhere to the requirements of this plan. Each contractor and all tiers of subcontractor shall incorporate safety into the planning of each task, assure the safety of their personnel, provide all safety devices necessary for their employees, establish a safe and drug-free work environment, and confirm that their equipment meets the applicable safety standards. Each contractor and all tiers of subcontractors are responsible for any actions of their personnel that may endanger or otherwise expose other participants to potential hazards on the project site.

The Integrated Safety Management System shall be used to achieve these goals. The ISMS is a practical approach to the prevention of accidents with an emphasis on line management responsibility for safety. A central premise is that work planning starts with a focus on the nature of the job to be performed and assessment of the hazards involved in each step. Through the use of self-assessment continuous improvement in EWH and all tiers of subcontractor's safety process is expected.

Project participants are required to supervise and direct the work, using their best management skills and technical expertise. The contractor will be solely responsible for all work means, methods, techniques, sequences and procedures. This includes all safety precautions and programs in connection with the work, as well as coordinating all portions of the work. Each lower-tier subcontractor is likewise required to be responsible for all safety precautions and programs in connection with the work under the contractor's contractual agreement.

All personnel working on the project, including DOE and BSE employees of the general contractor, who have been properly trained, have stop work authority for any task that represents an imminent threat to safety. Training is available via an on-line training course. Only BSA (or designee) can authorize a restart of the identified task.

All levels of subcontractors will acknowledge in writing and comply with the requirements of this Environment, Safety and Health Plan.

In this document where a specific person is mentioned, it could also be his designee.

3.0 PURPOSE & INTRODUCTION

3.1 Definitions

Brookhaven National Laboratory (BNL): A research facility owned by the Department of Energy (DOE) located in Upton, New York

Brookhaven Science Associates (BSA): The prime contractor for operating BNL

Contractor: EWH is the General Contractor and is responsible for the overall construction of the NSLS-II LOBs and has a direct contractual relationship with BSA.

Contractor Vendor Orientation (CVO): Mandatory BNL-provided training for all contractor and sub-tiered employees.

Project Executive Manager: This is the EWH employee who has overall project controls, including budget and schedule, and has authority to speak for EWH on all contractual matters.

Project Safety Manager: This is the EWH senior on-site safety representative.

Project General Superintendent: This is the senior EWH field representative who has overall day-to-day responsibility for the project.

Subcontractors: All subcontractor management and their employees working on the NSLS-II project.

The Plan: This document, the Environment, Safety and Health Plan.

The Project: All work associated with the construction of the NSLS-II LOBs.

Project Team: The EWH organization responsible for ensuring the successful completion of the project.

3.2 General Information

The objective of this plan is to emphasize that the protection of people, the environment, and property is of paramount importance to the success of this project. To accomplish this objective, the project is committed to implementing the principles and functions of the Integrated Safety Management System described in the DOE Policy 450.4 and discussed in detail in Section 4 of this document.

While it is the responsibility of each individual to work safety, it is ultimately the contractor's and each tier subcontractor's management's responsibility to see that safety and health policies and practices are followed and enforced. The project expects each contractor's and subcontractor's supervisory personnel to be actively involved in promoting the safety and health program that they have agreed to implement on this project.

The project's goal is that of ZERO ACCIDENTS. The contractor and each tier subcontractor's line management are expected to promote this concept and develop, implement, and enforce a safety and health program that will result in a safe work environment. Safety is not to be compromised for production and must be considered an integral part of the work planning process.

EWH will administer a Safety Incentive Program. See **Appendix B**.

3.3 All Tier Subcontractor Safety Program

All subcontractors shall also abide by the Environment, Safety and Health Plan submitted by the EWH. Each subcontractor will submit a letter to EWH stating that they understand the requirements of the Environment, Safety and Health Plan and will comply fully with its requirements.

EWH has budgeted to establish and maintain a safety and health program that meets or exceeds the requirements contained in this Plan and the applicable sections of 29 Code of Federal Regulation (CFR) 1910 and 1926 and 10 CFR 851, Worker Safety and Health Rule.

EWH and each sub-tier subcontractor are solely responsible for carrying out their safety and health program. Therefore, EWH and each subcontractor have designated a competent on-site employee to carry out this responsibility. Along with the EWH management team and all tier subcontractors' line managers, these employees' are directly responsible for ensuring that the safety program and employee actions comply with the minimum safety standards required by this Plan.

All workers on the site are required to possess all safety training applicable to their jobs, and the OSHA 10 Hour or 30 Hour Course in Construction Safety. The competent person for safety issues must possess the OSHA 30 Hour Course in Construction Safety. All cards will be submitted to EWH for the file before the worker enters the site, and made available to LT.

Workers must submit to EWH documentation of their training prior to being involved in any types of work which involve special training such as; steel work, excavations, powder actuated tools, confined space, forklift operations, scaffolds or lasers.

All workers using hazardous chemicals shall be trained in 20 CFR 1910.1200 Hazard Communication. Training documentation will be given to EWH prior to work and maintained in the file. The EWH Hazard Communication program is discussed in Section 7.10 and **Appendix S**.

On a weekly basis EWH will conduct a Foreman Meeting. The purpose of the meeting is to review safety issues and discuss the ES&H Plan, plan work activities and discuss schedule and coordination of work activities.

In addition to relevant weekly "tool box safety talks" EWH shall organize a Site Labor and Management Committee. This Committee shall meet monthly and facilitated under the direction of the EWH Project Safety Manager. The Committee shall be co-chaired by the Project Superintendent and a trade representative on a rotating basis. Membership will be on a rotating basis and include representation from craft and subcontractors. The meeting will have an agenda followed periodically by a field inspection. The purpose of the committee is to establish open lines of communication for safety among EWH, subcontractors and craft workers. This includes but is not limited to; discussion of accidents and near misses, safety inspection processes and procedures, coordination of work activities affecting safety, topical safety issues, suggestions for improving safety and discussing safety concerns and any BNL concerns. The EWH Project Safety Manager shall maintain and publish minutes of this meeting and tract action items to completion. Quarterly reports will be available for review.

4.0 INTEGRATED SAFETY MANAGEMENT SYSTEM

EWH recognizes and supports the concept that the Project has adopted the Integrated Safety Management System (ISMS) by contract as the overarching philosophy and approach to systematically integrate safety into work activities. The ISMS is the formal, organized process whereby the BSA NSLS-II Project plans, performs, assesses, and improves the safe conduct of work. The ISMS for the BSA NSLS-II Project is based on the fundamental principles and core functions discussed in DOE Policy P 450.4. The contractor and all subcontractors are committed to these fundamental principles and functions through contractual agreement. The use and implementation of this Plan is verified through the self-assessment and independent assessment processes.

EWH, and subcontractors are committed to ensuring the health and safety of workers and the public and to protecting the environment. All work shall be performed safely and shall adhere to all applicable laws and requirements. Integral to this being accomplished is the workers' commitment to work safely and to work to the requirements. Implementation of our assessment plan will be verified through monthly audits to ensure that our programs are being followed. These audits will be performed by EWH's CSP, in conjunction with our EWH management. Reference Appendix X.

4.1 Principles of the Integrated Safety Management System

The fundamental principles described in DOE P 450.4, which are discussed below, are incorporated into the NSLS-II Project's processes to help ensure that facilities are adequately preserved, that work is conducted safely, and that suitable accident prevention and mitigation measures are in place.

Worker and Line Management Responsibility for Safety

Line management is accountable for empowering workers with the training and authority necessary to establish and maintain safe operating methods commensurate with their assigned duties. Management expectations are clearly communicated to all personnel, personnel are empowered, their feedback is solicited, the tools necessary to accomplish the work safely are provided, and personnel are held accountable for their actions. Each individual, in turn, is responsible for his or her actions.

Line managers are responsible for training, motivating, and enabling their workers to understand and comply with the Project's commitment to safety, and for ensuring that work is accomplished within the authorization basis. Line managers are also responsible, by personal example and by involving their workers, for providing a working environment in which everyone is dedicated to meeting the commitment to safety.

Clear Lines of Authority

The Project's organizational structure provided as **Appendix C** focuses on management and worker involvement, and is centered on work planning and execution. Clear and unambiguous roles and lines of responsibility, authority, and accountability at all organizational levels must be established. Environment, Health, and Safety (ES&H) responsibility will be integrated into the Project work activities, and interfaces for processes and organizations will be clearly established to provide for good understanding and communication.

Personnel Experience, Knowledge, and Skill

EWH and each tier subcontractor must commit to using a workforce on the Project that has the ability to work safely and efficiently. Each individual associated with the Project shall possess the experience, knowledge, skills, and abilities necessary to discharge his or her responsibilities. Through the hiring and training process, line managers shall ensure that their workers are competent to safely accomplish the work. Line management must ensure that training and qualification requirements are flowed down to their personnel, and are responsible for the performance of their personnel.

Balanced Priorities

The Project ensures a "Safety First" culture by effectively allocating, training, and monitoring resources to ensure that work is performed safely. A Safety First attitude is a must for all personnel. Stop Work authority is given to each employee to use when he or she believes an activity is unsafe and poses and imminent danger to personnel, property, or the environment. Restart approval is given at the appropriate management level. Specific job tasks are planned with appropriate worker involvement, and the work plan is required to be followed to ensure safe operation and environmental compliance.

Work and Associated Hazards

Before work is performed, the associated hazards (Phase Hazard Analysis) are evaluated as stated in Section 7.1 and an agreed-upon set of controls is established which, if properly implemented, provides adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

Administrative and Engineering Controls

Administrative controls and engineering controls are essential elements of the ISMS. Wherever feasible, engineered controls are designed into the Project, and administrative controls are used to supplement engineered controls as appropriate. These controls are established through the work planning process.

Authorization Agreement

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed on by the EWH Project Manager, the EWH Project Manager, and the management of all tier subcontractors.

4.2 Core Functions of Integrated Safety Management System

DOE P 450.4 describes the core functions of ISMS. These five functions are not independent and not necessarily sequential. Rather, they are linked and interdependent such that outcomes during the accomplishment of one may affect others. In particular, identifying and implementing opportunities for improvement may arise at any stage of the work process. The five functions are *Define the Scope of Work, Identify and Analyze Hazards, Develop and Implement Hazards Controls, Perform Work within Controls, and Provide Feedback and Continuous Improvement*.

EWH and subcontractor line management will commit to these core functions of integrated safety management in the manner described below.

Define the Scope of the Work

Defining the scope of work entails identifying and defining **all** the steps, each task and sub-task element, needed to complete a particular job safely. Defining the scope of work is a critical element of the safety management system, since it sets the stage for the scope and depth of hazard identification and analysis.

Identify and Analyze Hazards associated with the Work

Hazard identification includes defining those hazards to workers or property expected to be encountered during the course of performing a particular task, and those that are introduced from concurrent work tasks. A Phase Hazard Analysis (PHA) shall be performed for each major task, to address such hazards. There is also a potential that unexpected hazards may be encountered or the nature of the known hazards might change as work activities proceed. Should this occur the PHA shall be revised to incorporate the new conditions.

Develop and Implement Hazard Controls

The development and implementation of hazard controls includes identifying controls to prevent and mitigate hazards, establishing the safety envelope (what conditions require what response) and performing periodic hazard assessments.

Confirm Readiness and Perform Work Within Controls

Confirmation of readiness is an effort to verify that safety controls have been implemented before starting work. Performing work within controls entails adherence to work controls in a manner such that activities remain within the safety envelope. Readiness assessments are conducted at multiple levels—from each worker assessing his or her readiness to start a task, to whatever is necessary to demonstrate Project readiness to DOE and the regulators.

Provide Feedback on Adequacy of Controls

Feedback and continuous improvement are based on the premise that all work activities can be planned, performed, assessed, and improved. Continuous improvement entails proactive focusing on problem prevention and performance improvement to prevent unsafe practices from occurring. The capability to prevent minor problems from becoming major risks or events relies heavily on feedback from workers; observations from those not directly involved with the work, and adequate metrics to assess trends in performance.

4.3 Roles and Responsibilities for Integrated Safety Management System

Implementation

Senior Management

The EWH Project Manager has the overall responsibility for assuring a safe workplace and for maintaining safe operations. The Project Manager approves all project plans, ensures implementation by conveying to line management their responsibilities for integration of safety performance into all work activities, and confirms management responsibility for integration of safety performance into all work activities. The Project Manager also has responsibility for evaluating the progress and status of the ISMS and adjusting resources as necessary based on feedback regarding ISMS implementation. This promotes continuous improvement in safety performance, and communicates its importance to the Project's success.

Line Organizations

All EWH and subcontractor field managers and supervisors constitute the focus of "line manager responsibility" for the protection of workers, the public, and the environment within the ISMS framework for all work conducted by their assigned employees, and visitors in their assigned operating facilities.

Line managers provide the primary operating interface for employees and visitors. Within the framework of the ISMS, they contribute to work planning, pre-job communication of hazards and controls, work monitoring, and evaluation of results.

Phase Hazard Analysis submittal for certain features of work will allow feedback from the workers and preparatory meetings reviewing such PHA's will also enhance that.

Effective integration of support from ES&H professionals into line activities is essential to achieving excellence in ISMS. Line management is responsible for defining and providing an adequate level of subject matter expert support, either from its own staff, or from external sources, as appropriate for the particular line organization and ES&H discipline involved.

ES&H Organization

As noted above, effective integration of ES&H into line activities is needed for success of the ISMS. The EWH Project Safety Manager is responsible for providing overall policy and guidance on ES&H issues, and for working with the line organizations to make available necessary and agreed-upon input from ES&H professionals and other support. ES&H personnel are responsible for ensuring that the standards, requirements, and ES&H policies are effectively translated into suitable controls for work activities.

Workers

All employees of the on-site contractor and all subcontractors are responsible for becoming knowledgeable of and maintaining awareness of the hazards associated with their work, for contributing to the formulation of hazard controls, and for conducting their work safely in accordance with those controls. They are encouraged to identify ES&H issues in their workplace, to work with their management to provide input for improvements and to resolve concerns, and to exercise stop-work authority in cases of imminent danger to health and safety of workers or the public, or threat to the environment.

5.0 DOE RULE FOR WORKER SAFETY AND HEALTH (10 CFR 851)

The worker safety and health program required by this rule establishes the framework for a comprehensive program that will reduce or prevent injuries, illnesses, and accidental losses by providing DOE contractors and their workers with a safe and healthful workplace. DOE has structured the rule this way for two main reasons: (1) To take advantage of existing and effective comprehensive worker protection programs that have been implemented at DOE facilities and (2) to minimize the burden on contractors by clarifying that they need not establish redundant worker protection programs to protect workers from occupational safety and health hazards. EWH understands that this rule flows down to all BSA contractors and all tiers of subcontractors working at the BNL site.

5.1 Safety and Health Standards

EWH and subcontractors will comply with the following safety and health standards that are applicable to the hazards at the workplace:

- Title 29 CFR, Parts 1904.4 through 1904.11, 1904.29 through 1904.33; 1904.44, and 1904.46, "Recording and Reporting Occupational Injuries and Illnesses."
- Title 29 CFR, Part 1910, "Occupational Safety and Health Standards," excluding 29 CFR 1910.1096, "Ionizing Radiation."
- Title 29 CFR, Part 1926, "Safety and Health Regulations for Construction."
- American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices," (2005) when the ACGIH Threshold Limit Values (TLVs) are lower (more protective) than permissible exposure limits in 29 CFR 1910. When the ACGIH TLVs are used as exposure limits, contractors must nonetheless comply with the other provisions of any applicable expanded health standard found in 29 CFR 1910.
- American National Standards Institute (ANSI) Z88.2, "American National Standard for Respiratory Protection," (1992).
- ANSI Z136.1, "Safe Use of Lasers," (2000).
- ANSI Z49.1, "Safety in Welding, Cutting and Allied Processes," sections 4.3 and E4.3 (1999).
- National Fire Protection Association (NFPA) 70, "National Electrical Code," (2005).
- NFPA 70E, "Standard for Electrical Safety in the Workplace," (2004).

5.2 Occupational Medicine Program

EWH will establish and provide comprehensive occupational medicine services to workers employed at a covered work place who: (1) Work on a DOE site for more than 30 days in a 12-month period; or (2) Are enrolled for any length of time in a medical or exposure monitoring program required by this rule and/or any other applicable federal, state or local regulation, or other obligation. A detailed Occupational Medicine Program is found in Section 6.15.

The occupational medicine services will be under the direction of a graduate of a school of medicine or osteopathy who is licensed for the practice of medicine in the state of New York.

Occupational medical physicians, occupational health nurses, physician's assistants, nurse practitioners, psychologists, employee assistance counselors, and other occupational health personnel providing occupational medicine services will be licensed, registered, or certified as required by NY State law.

EWH will provide the occupational medicine providers access to hazard information by promoting its communication, coordination, and sharing among operating and environment, safety, and health protection organizations.

6.0 EWH RESPONSIBILITIES

6.1 *Emergency Services and Equipment*

If a serious or life-threatening injury occurs, EWH understands that BSA will provide emergency ambulance and fire fighting services. Employees must phone 911 or 2222 from any internal BSA telephone or 631-344-2222 from a cellular phone.

In the event of a less-serious injury, employees will be sent to the EWH on-site medical facility to be treated by the Project medical professional. In addition to injury recordkeeping required by OSHA, each subcontractor shall inform the EWH Project Safety Manager of any injury requiring first aid and all more serious occupational injuries and illnesses within one hour of the classification of the injury.

6.2 *Job-Site Orientation*

All EWH personnel, subcontractors and visitors at the NSLS-II Project will be required to attend an orientation provided by the Project Manager before working at the jobsite. The orientation program will consist of an audio, visual and written presentation in a classroom environment presented by an experienced construction professional. The program content and sign-off forms are included in **Appendix D**.

Newly employed, promoted, and/or transferred personnel shall be fully instructed in the safety practices required by their assignments. All employees must receive orientation prior to starting work. Visitors must also receive orientation prior to leaving the office areas, or be escorted while on the site.

In addition to the contractor's safety and health policies including the Stop Work policy, the orientation will include but is not limited to:

- employee safety requirements and policies specific to the project; including site logistics and coordination of activities,
- site-specific safety and health requirements (PHA, PPE, fire prevention and protection, confined space, electrical, fall protection etc.)
- permitting procedures (if applicable), including but not limited to work permits, confined space permits, electrical permits, penetration permits, hot work permits, etc,
- hazard communication on a multi-employer work site,
- emergency and medical procedures,
- evacuation procedures,
- security plan,
- drug and alcohol program including testing, and
- other topics as circumstances require.

All employees will complete an Orientation Acknowledgment form at the end of the orientation. A copy will be maintained in the project file. After employees complete orientation they will be given a site-specific sticker to wear on their hardhat, which indicates that they have completed EWH orientation.

6.3 Security and BNL Site Access

Brookhaven National Laboratory is owned by the Department of Energy and is operated by Brookhaven Science Associates. All personnel entering the site must either be escorted by a EWH employee or have obtained a BNL photo identification badge. Identification badges are obtained by attending the Contractor Vendor Orientation (CVO) given daily at 8:30 a.m.

Badges will be in the possession of the individual at all times, and conspicuously displayed. EWH is responsible for collecting badges of all employees who are laid off or otherwise terminated from the project, and returning them to the EWH Project Safety Manager. They will then be returned to BNL.

EWH will ensure that access roads to the site for delivery of equipment and materials are safe and in good condition. Where holes, divots and other low points on the access road occur, EWH will take action to immediately repair the road.

6.4 Disciplinary Policy

The purpose of this policy is to state EWH's position on administering equitable and consistent discipline for unsatisfactory conduct on the jobsite. This policy ensures fair treatment of all employees in making certain that disciplinary actions are prompt, uniform, and impartial. The primary purpose of any disciplinary plan is to correct the problem, prevent recurrence, and prepare the employee for satisfactory service in the future.

The Policy is provided as **Appendix E**.

We recognize that employees, on the whole, normally govern their activities while at work in the same high standards of conduct that they use for their personal affairs. But we recognize that errors in judgment may occur and when they do we wish to address them in a fair, impartial, and consistent manner. By using progressive discipline, it is our hope that most employee problems can be corrected in the early stages, thus benefiting both the employee and the Project. Open and clear communications between the employee and the supervisor promotes understanding, and is the key to preclude the need for any disciplinary action.

Disciplinary action may call for any of the four following steps: Verbal warning, written warning, temporary suspension from the Project site, and denial of access to the Project site for a period of one year or more, depending on the severity of the problem and the number of occurrences.

All disciplinary actions are based on incident-free time periods (rolling date). After an active employee has gone for a time period of one year (365-days) without a reoccurrence of any progressive disciplinary action, all prior disciplinary action records will be removed from their personnel file. However, records associated with terminations will not be purged from the files.

All disciplinary actions resulting in suspension or termination shall automatically be reviewed by the appropriate Business Agent (if applicable), the EWH representative and the Project Safety Manager.

Employees terminated for safety violations will not be eligible for re-employment on the Project for 12 months. Employees terminated a second time for safety violations are ineligible for re-employment. BSA may permanently ban the worker from entering laboratory property.

6.5 Operation of Equipment and Machinery

Workers will be trained in the operation, inspection, and maintenance of the equipment and the safety features and procedures to be utilized during operation, inspection, and maintenance of the equipment. This training shall be based on the equipment operating manual and the hazard analysis for the activity.

Before any machinery or mechanized equipment is brought on site and placed in use for the first time, it shall be inspected and tested by a NSLS II and certified to be in safe operating condition and documented on an Equipment Inspection Form (**Appendix F**).

All machinery and equipment shall be inspected daily (when in use) to ensure safe operating conditions. Competent person(s) will be designated to conduct the daily inspections and tests. Tests shall be made at the beginning of each shift

during which the equipment is to be used, to determine that the brakes and operating systems are in proper working condition and that all required safety devices are in place and functional. Inspections and tests shall be in accordance with the manufacturer's recommendations and shall be documented.

Records of tests and inspections shall be maintained at the site by EWH, shall be made available upon request, and shall become part of the official project file. Inspections shall include as a minimum;

- Control and drive mechanism
- Proper fluid levels
- Safety devices
- Hooks and safety clips for cranes, fork lifts, hoists and other lifting devices
- Tire condition and inflation
- Ground conditions, donnage and outriggers (level) for cranes, forklifts, hoists and other lifting devices
- Load chart and hand signal chart
- Any dirt or contaminants

Whenever any machinery or equipment is found to be unsafe, or whenever a deficiency that affects the safe operation of equipment is observed, the equipment shall be immediately taken out of service, tagged and its use prohibited until unsafe conditions have been corrected. A tag indicating that the equipment shall not be operated, and that the tag shall not be removed, shall be placed in a conspicuous location on the equipment.

Machinery and mechanized equipment shall be operated only by designated qualified personnel. It shall not be operated in a manner that will endanger persons or property, nor shall the safe operating speeds or loads be exceeded. Persons who take prescription medication should not operate such equipment if such medication may impair their judgment or reflexes. Utilize equipment only for the purpose for which it was designed and in accordance with the manufacturer's instruction and recommendations. Modifications, extensions, replacement parts, or repairs of equipment shall maintain at least the same factor of safety as the original equipment. Modifications shall be authorized in writing by the manufacturer.

Workers who are exposed to operating equipment will be required to wear as a minimum a Class 2 safety vest.

When necessary as indicated in the PHA or as directed by EWH, flaggers and spotters will be used. Radio communication may also be used to facilitate safety of personnel.

A line of sight will be maintained by workers and equipment operators whenever the workers are about equipment. It is our plan to avoid as much as practical scheduling work which places workers in the same area as mechanical equipment.

6.6 Evacuation of the Work Area

Workers shall observe and participate in notices to evacuate the work area.

BNL site-wide emergencies requiring site evacuation are signaled by an intermittent siren tone for five minutes. All personnel will be required to evacuate the BNL site via the quickest route or as directed by police or other emergency services personnel. A steady site siren signal for five minutes indicates the need for personnel to seek shelter in the nearest building.

EWH will develop and implement an emergency action plan (**Appendix D & G**) that is to include methods to alarm workers, specify evacuation routes, assembly area(s) and worker accountability procedures All personnel working at the jobsite will be trained in this action plan as part of their initial job orientation.

6.7 Accident Investigation and Reporting

All incidents involving illness/injury or property damage must be immediately reported to the EWH Project Superintendent and a designated NSLS II safety personnel. Incidents involving near misses will also be reported to the EWH Project Superintendent and investigated. This official shall immediately notify the Project Safety Manager, who will in turn make the appropriate notifications to EWH Management and NSLS II ESH Manager. Investigations shall be conducted for all events that result in either an OSHA reportable or OSHA recordable event, or result in a Days Away Restricted or Transferred (DART) case. Such incidents will be investigated by the Project Safety Manager or designee, and shall be documented on an Incident Investigation Report (**Appendix H**). The report must be completed and submitted to the EWH Project Manager and EWH project team within 24 hours of the incident. DOE and NSLS II also reserves the right to conduct an independent investigation of any incident.

An incident investigation committee will investigate all major incidents. This includes, but is not limited to, any incident resulting in a medical case, lost-time injury, fatality, or significant damage to property or equipment. The committee will review the incident scene, collect photographs and defective equipment, interview all involved or witnessing parties, review all facts pertaining to the accident, and file a report with the EWH Project Manager of the findings and conclusions as well as recommended measures to prevent re-occurrence. EWH will ensure that the scene and any equipment involved in the incident remains in its current condition and that nothing is removed from the site. The incident investigation committee will be comprised of, but not limited to:

- the person(s) involved in the incident,
 - the first-line supervisor of the person(s) involved in the incident,
 - the superintendent of the emp
 - loying subcontractor, -the EWH Project Safety Manager or designee,
 - the Contractor Safety Representative or designee, and
 - other personnel deemed appropriate by EWH.
-
- NSLS II ESH Representative. Release of the accident scene is responsibility of the ESH Manager.

6.8 Personnel Protective Equipment

EWH and the subcontractors are respectively responsible for providing the appropriate personal protective equipment (PPE) in all operations/tasks where there is an exposure to hazardous conditions or where there is the need for using such equipment to reduce hazards to the employees.

PPE and safety equipment shall be tested, inspected, and maintained in serviceable and sanitary condition as recommended by the manufacturer. Users of PPE and safety equipment shall be trained in the use, limitations, inspection, testing, and maintenance of the equipment.

As a minimum, all employees on this project must wear eye protection, head protection, foot protection, appropriate high-visibility reflective clothing. Other PPE shall be worn depending on the hazard(s) present.

Basic Eye Protection—This Project is a 100% eye protection location. Employees and visitors must wear ANSI Z87 approved safety glasses with side shields 100% of the time. When exposed to hazards from flying particles; molten metal, liquid chemicals, acids, or caustic liquids; chemical gases or vapors; or potentially injurious light radiation appropriate face shield or other protection will be worn.

Contact Lenses—Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments might represent an additional hazard to contact lens wearers. Hazardous environments include, but are not limited to, those in which a respirator may be required or where welding is being performed.

Face Shield and Goggles— When workers may be exposed to splashes, mists, etc., either goggles or a face shield must be worn, depending on the situation. With a face shield, basic eye protection must also be worn.

Welding Shield—When welding, both basic eye protection and hard hats must be worn with a welding shield. This is to

protect employees from popping hot slag when the shield is raised and from overhead work exposures. If welding goggles are worn, basic eye protection is not required while welding.

Head Protection—All persons working in or visiting hard hat areas shall be provided with and required to wear protective headgear. Hard hat areas are those with the potential for head injury: all construction-designated areas are considered hard hat areas. All hard hats must be worn with the adjusting device toward the rear.

Hearing Protection—The safety representative or designee will monitor work areas to identify and post high-noise areas and ensure that appropriate hearing protection is correctly worn.

Foot Protection—All personnel must wear leather ASTM F2413.05 protective work shoes or boots. No one is permitted to wear sneakers, tennis shoes or athletic shoes of any type, sandals, high heels, or thongs on the project site.

Clothing—Employees shall report to work properly attired. The Project's requirements include:

- Clothing in good repair. (Frayed or tattered clothing can be hazardous to employees and will not be permitted.)
- No tank tops or sleeveless shirts. (Shirts must have at least 4" sleeves and tails must be tucked in at all times.)
- Long pants only. (No short pants, cutoffs, sweat pants, etc.)
- If working around moving machinery, no neckties, gauntlet type gloves, or baggy, loose, or ragged clothing.
- No loose, dangling jewelry. (Jewelry such as rings, watchbands, necklaces, earrings, and the like can cause or contribute to accidents.)
- Shoulder-length or longer hair must be tied back and put under the hard hat or worn in a hair net. (This will keep it from impeding vision, becoming entangled in machinery, or preventing the use of personal protective equipment.)

6.9 On-Site Safety Inspections

The EWH Project Safety Manager or designated Safety Representative shall conduct and document daily inspections of the site. An example of an inspection daily checklist is included in **Appendix I**. Inspection checklists must be provided to the BSA project staff upon request.

DOE representatives shall audit and document site safety activities periodically, and communicate any deficiencies to EWH for corrective action.

Subcontractors are to conduct a weekly review of their areas and forward a copy of the report to the EWH Project Superintendent and to the Project Safety Manager or designee.

Audits/Inspection reports and related abatement actions shall be documented and maintained in the project safety file.

Corrective actions of all safety infractions will be assigned to a specific individual with an expected completion date. Subsequent safety inspections will pay particular attention to previously identified infractions and verify that the corrective action plan has been implemented.

6.10 Weekly Tool-Box Meetings and Pre-Job Briefings

Weekly tool-box meetings will address general issues of safety. This will be the opportunity for individuals on the Project to identify safety issues and concerns of a general nature. It is also the opportunity to coordinate the control of recognized hazards and promote safety awareness. A valuable tool to instill a Safety First culture among employees is to review lessons learned from this job or from another job. Weekly toolbox meetings may be accomplished in a single or multiple sessions and may address different topics for different work crews. The weekly toolbox meetings are to be documented and forwarded to the EWH Project Superintendent. Documentation should include the following:

- time and date of meeting,
- attendees (attendees must sign the attendance sheet and include their BNL ID number),
- topics/comments must be task specific
- assignments – party responsible/date corrected (if applicable), and
- person conducting the meeting.

- Third party inspection/assessments shall be made available to NSLS II designated safety representative.

The documentation shall be kept on the jobsite and shall be available for audit by BNL.

Prior to the start of each new job or task or when conditions change significantly from the start of the work, a pre-job briefing will be conducted by the foreman or superintendant of the craft. All workers who are involved or may become involved in the future must attend, and attendance documentation, similar to above must be maintained. The pre-job briefings must include the tasks anticipated and the hazards associated with the work. If a PHA was prepared, it must be reviewed. Any lessons learned from prior day's work must also be discussed.

6.11 Protection of Work Area

The Contractor shall ensure that the work areas and storage areas are conspicuously identified or flagged and barricaded, as needed, prior to initiation of work. EWH shall furnish, post, erect, and install safety devices, equipment, signs, barricades, flagging, and any other item necessary to give adequate warning and caution of hazards, and to provide instructions and directions to workers, DOE or BSA personnel.

6.12 Working and Storage Areas

Housekeeping is a general indicator of a contractor's performance on site, including safety performance. Each contractor has the responsibility to maintain their area of operations in an orderly condition free of materials that could create slip/trip or fire hazards. In addition, the contractor's supervisors shall ensure a daily walk-down of their work area is conducted, that any deficiencies are immediately corrected, and the condition of the site is reported to the EWH Project Superintendent.

All materials and equipment in storage, lay-down, staging, or work areas must be properly secured so that they are stable and secure against sliding or collapse. All materials storage and loading/unloading areas must be established at a safe distance from walkways, aisles, and traffic areas to avoid personnel injury should materials slide or collapse.

6.13 Hazardous Material and Hazardous Waste

All contractors shall provide to the EWH's Project Superintendent a list of hazardous materials along with a copy of the relevant Material Safety Data Sheet (MSDS) for each material that will be used on the project site. All MSDSs shall be maintained by the Project Superintendent in a notebook in the construction office, and the information will be readily accessible to all employees.

The U.S. Environmental Protection Agency (EPA) ID number shall be obtained for the hazardous wastes produced by the contractors.

All hazardous wastes produced by the Project shall be packaged, transported, and disposed of by a licensed entity. Such loads shall be manifested and a copy of the manifest sent to the EWH Project Superintendent. All hazardous materials must be properly labeled and stored until removed from the project site (by a licensed hazardous waste hauler).

Hazardous materials or hazardous wastes stored in 30-gallon or 55-gallon drums shall be placed on spill containment pads, be properly labeled/placarded, and protected from damage and weather.

Report all accidental releases of a hazardous material or hazardous waste promptly to the EWH Project Superintendent. All spills, regardless of the volume, must be reported to BSA Emergency Services by calling extension 2222 or 911. All reporting will be done by BSA; however, the party (i.e. EWH or subcontractor) responsible for the spill will be obligated for all costs incurred as a result of the cleanup effort.

The responsible party will properly clean up accidental releases of hazardous materials waste. Cleanup is to be done by properly trained personnel (meeting the requirements of 29 CFR 1926.65 (q) (6)). Hazardous waste from the cleanup must be hauled away by a licensed hauler to an approved waste disposal site permitted to accept such waste. The EWH Project Superintendent must be given a copy of the hauler's manifest and shall retain a copy of the waste transporter's permit and the disposal facility's permit.

Depending on the hazardous materials spilled, EWH may use outside qualified consultants or service providers or hire a certified laboratory to take an appropriate number of soil samples to test at their laboratory. A copy of the results is to be

given to the EWH Project Manager.

Contractors shall inspect their hazardous material and waste storage areas at least weekly to ensure they are properly maintained. All inspections are to be documented, with records retained in the project files.

EWH shall randomly audit the labeling and storage of hazardous material and waste and the disposal of hazardous waste to verify that all contractors, at any tier, are fulfilling their roles as responsible parties.

- Prior to obtaining an EPA ID number, the Laboratory will be contacted.
- A copy of the waste manifest must be sent to the NYSDEC.
- A copy of the executed manifests (received and accepted by the disposal facility) are to be submitted to the NSLS-II ESH Manager.

6.14 EWH Stop-Work Policy

All personnel (contractors and employees) at BNL who have been trained in this policy have the right to stop their own work or the work of others if they deem that the task poses an imminent danger to themselves, their co-workers, property, or the environment. Personnel who have completed CVO are deemed to have been trained in this policy.

There will be **no reprisals** by anyone for issuance of a stop-work order.

To issue a stop-work order if you observe imminent danger, state the following:

"Stop work! You are in imminent danger because..."

Any person receiving a stop-work order must stop work immediately, if that can be done safely, or at the first opportunity to stop safely.

The person issuing a stop-work order **must not** verbally or physically interfere, whether or not the recipients of the stop-work order continue to work. If someone refuses to stop work, the employee issuing the stop-work order will immediately contact his/her supervisor, the EWH Project Superintendent, or the Project Safety Manager.

The person initiating a stop-work order also shall contact his/her own supervisor.

After the work is stopped, the recipient of the stop-work order notifies his/her supervisor that (s)he has been ordered to stop work and describes the reason why the work was stopped.

The EWH Project Superintendent, along with the Project Safety Manager and NSLS-II ESH manager, determine the conditions that must be met before work may resume.

Authorization to restart work may only be given by the NSLS-II project director, and only after corrective actions and safety reviews are completed.

6.15 Occupational Medicine Program

To ensure the continued health of employees, EWH maintains a comprehensive occupational medicine program (OMP) in full compliance with all provisions of Section 8, "Occupational Medicine," of Appendix A of the Federal Regulation 10 CFR 851 "Worker Safety and Health Rule." This program is under the direction and control of a NYS-licensed occupational medicine provider. This program covers all EWH employees and all employees of all subcontractors. Subcontractors may wish to use their own program in lieu of the EWH program. In that event, those programs must be reviewed and approved by the Project Safety Manager.

The Occupational Medicine program covers employees who

- work at BNL for 30 or more days in a 12-month period, or
- work for any length of time at BNL and are required by statute to be enrolled in a medical or exposure monitoring program.

EWH affirms that these services are fully compliant with all provisions of Section 8 ("Occupational Medicine") of Appendix

A of the Federal Regulation 10CFR851, including the following provisions:

- Services are provided by an occupational medicine provider that plans and implements the occupational medicine services;
- is under the direction of a physician licensed in the state of New York; and
- is staffed by health care professionals with valid New York State licenses in their respective professions.

OMP Information

Dr. John Folan and Dr. Michael Ryder
Health Source
3001 Expressway Dr. No., Suite 200C
Islandia, NY 11749

Phone: 631-435-0110
Facsimile: 631-435-4583

The OMP determines the content of the worker health evaluations in accordance with current sound and acceptable medical practices and all pertinent statutory and regulatory requirements. At a minimum, these services include:

- Medical surveillance and medical certification examinations in compliance with all OSHA, DOE, or other statutory or contractual requirements for such examinations applicable to the work to be performed and the type and level of workplace exposures. Frequency of such examinations will be determined by statute, contractual requirement, or best medical practice as determined by the OMP.
- Prior to the employee's 30th day of work at BNL, an occupational medical examination shall be conducted for workers involved in physically demanding tasks, tasks that involve potential exposure to workplace hazards, or exposure to adverse environmental conditions.
- Evaluation at the time of potentially work-related illness, potentially harmful exposure, or injury at BNL to determine work-relatedness, any need for medical restrictions or work removal, and referral for definitive care, if indicated.
- Return-to-work evaluations where a worker has been absent for 5 or more workdays due to illness or injury.
- Restricted duty as medically indicated.
- Creation and retention of a medical record that complies fully with all requirements specified in paragraph 8(f) of Appendix A 10 CFR 851 for each employee for whom the OMP has provided occupational medicine services.
- Verbal and written communication to each employee as to the purpose, nature, and results of all medical evaluations and tests performed, and documentation of this communication in the medical record.
- Timely submittal of the results of health evaluations to EWH where such information will facilitate the mitigation of worksite hazards. Such communications will not include the release of confidential, personally identifiable medical information, other than in exceptional instances where there is a compelling, overriding public health or public safety need.

The following occupational medicine services may also be provided by the OMP, except where the OMP determines that they are not applicable or not feasible. Such a determination is documented in writing for each service that will not be provided, with sufficient explanation:

- Participation in worker protection teams, as well as worker safety and health team meetings and committees as defined, respectively, in paragraphs 8 (e)(2) and 8(d)(3) of 10 CFR 851.
- Case management of ill or injured workers to facilitate rehabilitation and safe return to work.
- A health promotion program to include disease and risk factor screening for the major causes of morbidity and mortality within the employee population, if determined to be cost effective. If deemed not cost effective, the OMP's decision and its basis must be documented in the outline of comprehensive occupational medicine services.

- EWH health and disability insurance claims data (de-identified) is used by the OMP in determining the major causes of morbidity and mortality within the EWH workforce, if such information is available to EWH.
- Cost effectiveness shall be judged by available evidence, published medical studies, demonstration projects at other institutions, or internal analyses.
- Review and approval of the medical and behavioral aspects of the EWH-sponsored or the EWH supported programs (if they exist).
- Employee Assistance Programs (EAPs)
- Alcohol and substance abuse rehabilitation programs
- Wellness programs
- If the work requires immunization, a hazardous waste program, or involves exposure to blood-borne pathogens, the OMP shall review the medical aspects to assure their conformance to applicable guidelines.

The contractor provides to the OMP:

- Access to information (de-identified) from health, disability, and other insurance plans appropriate for determining the major causes of morbidity and mortality among the contractor's employees.
- Information on the physical demands and working conditions that are associated with each contractor employee's job.
- Employee job-task and hazard analysis information, including actual or potential worksite exposures of each employee. BSA will provide potential radiological hazard exposure information, if applicable.
- Notification when an employee has been absent because of an injury or illness for more than 5 consecutive workdays.
- Referral of employees about whom the supervisor has concerns regarding their ability to safely perform job duties.
- The opportunity to participate in worker protection teams, as well as worker safety and health team meetings and committees (where applicable).

For every Occupational Medicine Program there must be an accompanying acknowledgment by the physician.

PHYSICIAN'S ACKNOWLEDGMENT

I _____ affirm that the services which I provide are
(Name of Physician)

fully compliant with the provisions of Section 8 (Occupational Medicine) of Appendix A of the Federal Regulation 10CFR851, including the following:

- Plan and implementation of the occupational medicine services.
- I am a physician licensed in the State of New York.
- My office is staffed with health care professionals with valid New York State licenses in _____, _____, and _____.
- I will provide medical surveillance and medical certification in compliance with OSHA, DOE, or other statutory or contractual requirements.

 Signature

 Date

6.16 On-Site Medical Services

EWH recognizes that BSA employs a full-time staff of emergency medical technicians who can provide emergency medical care and ambulance transport to any one of several area hospitals. BSA can be reached by calling 2222 or 911 from any BSA internal telephone or 631-344-2222 from a cell phone.

EWH will maintain a competent emergency health professional (registered nurse, licensed practical nurse, NYS licensed EMT, or a physician's assistant) on site whenever there are 25 or more employees on the jobsite. This professional will maintain a fully functional first aid station and attend to minor injuries. The professional will coordinate back-to-work approval in conjunction with the Occupational Medicine provider. The health professional will receive standing orders from the Occupational Medicine Provider. A Bloodborne Pathogens Program complying with 29 CFR 1910.1030 will be maintained by the medical technicians.

6.17 Sanitation

Contractors shall establish and maintain basic sanitation provisions for all employees on the NSLS-II construction site as specified in the following paragraphs.

Drinking Water

An adequate supply of drinking water shall be provided in all places of employment. Cool water shall be provided during hot weather.

Only approved potable water systems shall be used for the distribution of drinking water. Drinking water shall be dispensed by means that prevent contamination between the consumer and the source.

Portable drinking water dispensers shall be designed, constructed, and serviced to ensure sanitary conditions; shall be capable of being closed; and shall have a tap. Containers shall be clearly marked as "**DRINKING WATER**" and shall not be used for other purposes. Water shall not be dipped from containers.

Use of a common cup (a cup shared by more than one worker) is prohibited without the cup being sanitized between uses. Employees shall use cups when drinking from portable water coolers/containers. Unused disposable cups shall be kept in sanitary containers and a waste receptacle shall be provided for used cups.

Toilets

When sanitary sewers are not available, one of the following facilities shall be used: chemical toilets, recirculation toilets, combustion toilets, or other toilet systems as approved by state/local government.

Provisions shall be made to assure that there are sufficient toilet facilities available for both male and female employees. The number of toilet facilities shall be in accordance with 29 CFR 1926.51(c) (1).

Each water closet shall occupy a separate compartment with a door that can lock from the inside, and walls or partitions, between fixtures, of sufficient height to assure privacy.

Provisions for routinely servicing and cleaning all toilets and disposing of the sewage shall be established before placing toilet facilities into operation. The method of sewage disposal and location selected shall be in accordance with federal, state, and local health regulations.

6.18 Drug Free Workplace

Policy Statement

The unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace. A single violation of such prohibition shall result in the offending individual being removed from the jobsite and recommendation of participation in an approved drug abuse assistance or rehabilitation program, and/or reporting to the civil authorities for criminal prosecution.

All employees shall abide by the rules of this program, and shall notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 10 days after such conviction.

Program Elements

An ongoing drug-free awareness training program includes:

- Mandatory participation by all employees
- Classroom and/or toolbox discussions that shall include:
 - The dangers of drug abuse in the workplace
 - Distribution and discussion of the EWH policy of maintaining a drug-free workplace
 - Any available drug counseling, rehabilitation, and employee assistance programs
 - The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace
- Intervention Procedures involving the employee and supervisor
- Information on identification - signs and symptoms
- Corrective actions
- Personnel actions - program enforcement, disciplinary options, and employee assistance
- Legal or criminal actions
- Disciplinary actions up to and including termination
- Drug abuse or rehabilitation programs that are available
- Brookhaven National Laboratory's Contracting Officer shall be notified in writing within 10 days after receiving notice of an employee's conviction under a criminal drug statute for a violation occurring in the workplace. Notification shall include the position title of the employee and the appropriate personnel action to be taken within 30 days under the requirements of this Program.

6.19 Substance Abuse Program

Introduction

EWH is committed to providing a safe workplace for the workers assigned to the NSLS-II LOBs construction project, promoting high standards of employee health, and fostering productivity that satisfies their quality expectations. Consistent with the intent and spirit of this commitment, EWH at the NSLSII project has established a substance abuse testing specification for the project with the goal of maintaining a work environment that is free from the effects of the use of illegal drugs and alcohol.

This specification is not intended as a substitute for the EWH complete written substance abuse policy. Normally, such policies include other important features, including, but not limited to, an employee education and awareness program, a supervisor-training program, and an employee assistance program.

Program Requirements

All tier subcontractors must have and enforce a written substance abuse program incorporating the testing requirements, terms, and conditions set forth below. This plan is applicable to all employees, current and prospective, in order to be eligible to perform work at the project site. The subcontractor must comply with this plan. Suppliers, vendors, and visitors are subject to confirmation of their abstinence from the possession or use of substances indicated in this plan. A copy of the substance abuse program must be submitted to EWH for approval prior to commencement of work on the project site.

The substance abuse program must apply to the employees of all tier subcontractors working on the project site. This includes workers, new hires, replacement workers, and supervisory personnel. No employee or prospective employee of a contractor shall be permitted to work on the project site unless such employee has submitted to testing as required by this plan and unless the results of such testing are negative as hereinafter defined. Subcontractors must provide the Project Safety Manager with a monthly summary report of the substance abuse program compliance.

All EWH and subcontractors will train their respective employees in methods that will allow them to recognize substance abusers. Supervisory employees shall be trained to take action, and to confront a substance abuser in a manner consistent with generally accepted safety training procedures.

The EWH project management reserves the right to audit any substance abuse program required by this plan, to verify compliance, upon 24-hour notice to EWH of intent to audit. EWH project management shall have free right of access to all relevant records of the contractor and their subcontractors and suppliers for this purpose, provided such record disclosures are within the scope of guidelines pertaining to the confidentiality of employee records.

The subcontractors' pre-engagement employees who receive a positive test result shall immediately leave the project site. Transportation of employees receiving a positive test result is the direct responsibility of the employing contractor. Furthermore, pre-engagement employees receiving a positive test result shall not be permitted to return to the project site earlier than 90 days from the date of the positive test. At that time the employee may begin the process outlined by this specification again.

If a current employee who tested positive qualifies and successfully completes the contractor assessment /substance abuse treatment program, a program approved by the Project, the employee will be exempt from the 90-day requirement if said employee agrees to the following:

- submit to substance abuse testing as described in this specification and receive a negative test result; and
- agree to random substance abuse testing not to exceed one test per 500 work hours over a 3-year period from the date of return to the project site.

Testing Requirements

The EWH Project Management requires:

- pre-engagement drug testing;
- drug and alcohol testing for reasonable suspicion of illegal use;
- post accident / incident drug and alcohol testing; and
- drug testing following the discovery of illegal or unauthorized drugs or paraphernalia.

All drug testing must be conducted by a laboratory certified by the National Institute of Drug Abuse (NIDA), with test results interpreted by a licensed medical review officer.

Tests for alcohol shall be performed by using either a saliva test or a Breathalyzer test comparable to the type used by state or local law enforcement officials. Furthermore, alcohol confirmatory tests shall be performed by using either a blood alcohol test or a Breathalyzer test comparable to the type used by state or local law enforcement officials. The collection site(s) and collection practices shall meet the requirements outlined by NIDA.

NOTE

**Alcohol testing for pre-engagement is not required.
However testing for reasonable suspicion or following an incident
will require the full panel of tests.**

Substance abuse testing shall be conducted in accordance with specified requirements found in 10 CFR 707. Initially, the substances that will be screened will consist of the "NIDA 5." However, the Project reserves the right to expand the test panel to include the following substances, should the need be established:

Definitions

Positive Tests: Test results that indicate the presence of legal or illegal substances at or above the threshold limit as set forth in this plan.

Negative Tests: Test results indicating that legal or illegal substance are at levels below the threshold limits as set forth in this plan.

Pre-engagement Testing: Drug testing for all substances as set forth in this plan conducted by subcontractors (including lower-tier subcontractors) for their employees or prospective employees prior to arrival on the project site.

For-Cause Testing: Testing for all substances set forth in this plan conducted by the respective subcontractor for their employees whose behavior on the project site causes either the Project Manager/Project personnel or the respective subcontractor supervisory personnel to reasonably conclude that such behavior may result from substance abuse.

Post-Accident / Incident Testing: Testing for all substances set forth in this plan conducted by the respective subcontractor for their employees involved in an injury producing accident or a "near miss" in which injury is avoided or in events resulting in damage to property as determined by the Project Manager/ Project personnel or the respective subcontractor supervisory personnel.

SUBSTANCE ABUSE POLICY:

E. W. HOWELL CO., LLC

Project Title: National Synchrotron Light Source II Laboratory Office Buildings

Location: BNL, Upton, NY

ALCOHOL AND SUBSTANCE ABUSE POLICY

1. Contractual Requirements

E. W. Howell Company's Substance Abuse Policy must apply to the employees of all tier contractors working on the project site. This includes workers, new hires, replacement workers, and supervisory personnel. The substance abuse testing requirements are outlined in this section and the following E. W. Howell Company's Substance Abuse Prevention Program. The E. W. Howell Company's Project Team reserves the right to amend this specification upon written notice to the Subcontractor.

The use of drugs and alcohol and their effects produce a serious threat and *ARE NOT TOLERATED* on this project. All Subcontractors must have and enforce a written Substance Abuse Program incorporating the testing requirements, terms, and conditions set forth in this specification. This specification is applicable to all employees, current and prospective, in order to be eligible to perform work at the E. W. Howell Company's Project site.

The E. W. Howell Company's Project Management Team requires:

- Pre-site-entry drug testing.
- Drug and alcohol for Reasonable suspicion testing.
- Post accident and post incident drug and alcohol testing.
- Drug testing following discovery of illegal or unauthorized drugs or paraphernalia.

The Subcontractors shall submit their alcohol and substance abuse program for review within ten (10) days of the execution of this subcontract, or ten (10) days before mobilizing on the project, whichever occurs first. Should a Subcontractor not have a written Substance Abuse Program, it agrees to abide by the minimum requirements established in the E. W. Howell Company's Substance Abuse Program.

The Substance Abuse Program must be a written program that includes:

1. A written policy statement regarding drug use and alcohol misuse.
2. An employee training and education program.
3. Prohibited employee behavior.
4. A testing program for covered employees.
5. Establishment of a substance abuse professional's role in employee counseling.

If a Subcontractor has a more stringent policy that meets or exceeds the Project's substance abuse policy the following policy can be disregarded upon approval of the E. W. Howell Company's Project Management Team.

The Alcohol & Substance Abuse Program must include workers, new hires, replacement workers, and supervisory personnel. The cost of implementing the Substance Abuse Program shall be borne by each respective Subcontractor affected by this specification.

Each employee of each Subcontractor shall read and sign (**Attachment A – Drug Policy Verification Statement**) prior to the pre-employment drug/alcohol screen.

DEFINITIONS

Accident – Any event resulting in an injury to a person or to property to which an employee contributed as direct or indirect cause.

Approved Laboratory – An independent laboratory identified by the Company, who meets state/federal requirements and is licensed to provide analysis of testing, and complies with all prescribed procedures to ensure validity and confidentiality.

Company Premises – All property, facilities, land, parking lots, buildings, structures, vehicles and any customer premises while performing E. W. Howell Company's business.

Employee – All part time, casual and full-time employees assigned to the project.

Fit For Duty – The state of being drug and alcohol free and not subject to mental or physical impairment that would prevent the individual from safety and competently completing required job functions.

Incident – Any event which has all the attributes of an accident, except that no harm was caused to person or property.

Medical Review Officer (MRO) – Licensed physician contracted by the company to review the drug testing results. After the approved laboratory has tested an applicant's or employee's specimen, it will direct the results to the MRO who will interpret and evaluate any positive test results together with the employee's/applicant's medical history and any other relevant information.

Negative Test – The results of the initial screening or confirmatory tests which establish that the levels of prohibited substances are below the threshold values.

Periodic Testing – Employees may be required to submit to periodic testing as a part of a routine physical, as required by federal, state, or local requirements.

Positive Test – The result of the initial screening and confirmatory tests which establish that the level(s) of one or more of the prohibited substances are above the established threshold values.

Post Rehabilitation Program – An established program developed by an EAP or counselor which is designed to assist an employee in overcoming substance abuse. Employees completing a required chemical dependency rehabilitation program will be subject to a post treatment follow-up monitoring for up to two years or as required by federal, state, or local regulations.

Prohibited Substances/Items – All illegal drugs and any controlled substances, alcoholic beverages or drug paraphernalia in the possession of or being used by an employee on the company premises or during working hours.

PROCEDURES

All Subcontractor new hires and all current employees who will be working at the project work site will be subject to drug and/or alcohol testing in the following circumstances and under the following procedures:

A. Pre-Employment Testing

1. A Pre-Employment drug test shall be conducted on all employment candidates, before an individual begins work at the BNL –LOB Work Site.

Exception: Those Subcontractors that have an established and effective alcohol and substance abuse program, which includes at minimum, testing as described herein.

- a. Prior to the commencing of work, the Subcontractor shall provide a list of personnel who will be assigned to the project. The list of personnel will be on the Subcontractor's letterhead, with a company official's signature. This list will be updated each time personnel are added or deleted from the project.
 - b. To ensure the validity of the test, the Subcontractor shall select a National Institute of Drug Abuse (NIDA) certified/approved Laboratory to conduct the tests with test results interpreted by a licensed medical review officer (MRO). All drug testing must be conducted by a National Institute of Drug Abuse (NIDA) Laboratory.
 - c. The E. W. Howell Company's Project Management Team shall be authorized at any time during contract performance to compare the Subcontractor's list of personnel certified to enter the project against the Subcontractor's payroll. Failure to correct discrepancies within (2) working days of written notification by the E. W. Howell Company shall constitute grounds for termination of the Subcontractor for default.
2. No confirmation offer will be made to an applicant that refuses to test or refuses to submit a urine sample for testing.
 3. Applicants will receive a notice of the testing at the time of their application. Applicants will also receive a Notice of the Test Results as the Company receives them. If they have tested positive, their conditional offer of employment will be withdrawn.
 4. This policy applies to any classification of the Subcontractor employee (part-time, casual or full-time), and to rehires as well as new hires.
 5. Applicants who test positive for drugs or controlled substances will not be considered for assignment to an E. W. Howell Company project at that time and also for a period of twelve (12) months following the test.
 6. All Subcontractor employees must acknowledge their review and understanding of the policy by signing **(Attachment B (Page 35) – Notice to Applicants)**

B. Reasonable Suspicion Testing

1. If a Subcontractor employee exhibits inappropriate behavior, demonstrates performance problems or there is other evidence to suspect an employee is under the influence of controlled substances, (See **Attachment C – Reasonable Suspicion Report**, to assist and document) the employee may be subject to a drug screen/test. If the employee is requested to be tested and refuses to submit to such a drug test, their test result will be considered positive. Disciplinary action based on a positive drug result will be in compliance with the Federal/State Regulations and the Company policy.

Subcontractor employees shall submit to a drug/alcohol screening where there is cause to believe this policy has been violated. Examples of sufficient cause include, but are not limited to:

- a. Known possession of controlled substances.
- b. Involvement in a drug related incident, on or off company premises.
- c. Employees exhibiting drug or alcohol symptoms.
 - Lack of balance, unsteady or staggered walk or muscle twitching.
 - Red, watery or glassy eyes; dilated or constricted pupils or having difficulty focusing eyes.
 - Disorientation, uncoordinated movement of body and hands.
 - Face/cheeks flushed, face sallow.
 - Slurred speech, memory loss or drowsiness.
- d. Has violated the substance abuse policy or work rules.
- e. Has sustained a personal injury or has caused another person to sustain a personal injury.
- f. Has caused a work-related accident or was operating or helping to operate machinery, equipment, or vehicles involved in a work-related accident or incident.

To assist supervision further in the determination of a reasonable suspicion related case, (Attachment D) contains guidelines.

C. Post Accident and Incident Testing

Testing will be required immediately following an on-the-job injury requiring medical treatment or following a potentially serious incident, including near misses, in which safety precautions were violated, unsafe instructions, or orders were given, potentially serious accident occurred where vehicles/equipment/property was damaged, unusually careless acts were performed, or where the cause was due to failure to wear prescribed personal protective equipment. Individuals involved or that may have contributed in the incident/accident may also have their urine and/or blood tested. If it is impossible or impractical, because of the physical condition of the individual(s) involved in the accident/incident to give a urine sample and/or blood sample, and if in subsequent medical treatment the person(s) blood or other bodily fluid will be drawn, then the blood or other bodily fluids will be analyzed for prohibited substances.

If an alcohol test required is not administered within (2) hours following the accident/incident, the Subcontractor shall prepare and maintain on file a record stating the reasons the test was not promptly administered. If a test required is not administered within eight hours following the accident/incident, the Subcontractor shall cease attempts to administer an alcohol test and shall maintain the same record. Records shall be submitted to the E. W. Howell Company upon request of the Contracting Officer.

The Subcontractor shall ensure that individuals required to be tested for drugs are tested as soon as possible and within 2 hours of the accident/incident. An individual who is subject to post-accident testing who fails to remain readily available for such testing, including notifying the Subcontractor or E. W. Howell

Company Representative his or her location if he or she leaves the scene of the accident/incident prior to submission to such test, may be deemed to have refused to submit to testing.

D. Refusal to Submit to a Drug/Alcohol Screen

- If an individual receives a request to be tested and refuses to submit to such a test, their result will be considered positive. Any individual who refuses a drug/alcohol test shall sign (**Attachment E – Refusal to submit to a Drug/Alcohol Screen**).

E. Notification of Employees:

- The appropriate management personnel or designee will notify the employee to be tested to report to the collection site at a specified time.
- The individual will not be notified of the test until after reporting for duty.
- Individuals shall report immediately to the collection site or to the collection site within 30 minutes, plus travel time, once notified by the appropriate management personnel or designee.

F. Notification of Prescribed Medication

- Any Subcontractor employee undergoing medical treatment, which requires the use of a prescribed controlled substance, shall notify (**Attachment F – Employee Notification of Medication**) their supervisor since the use of that substance may effect the safe performance of their work. Failure to notify one's supervisor of the use of a controlled substance may result in disciplinary action.

G. Discipline

When an individual submits to pre-employment testing and the required test proves negative, he/she will be eligible for further project assignment consideration. Evidence of the negative test results of the individual employees required by this shall be furnished to the E. W. Howell Company's Project Team prior to the commencement of work by the individual employee and promptly after performance of any subsequent testing that is required by this specification.

Acceptable negative test results formats include:

- a) A certificate signed by the testing laboratory, setting forth the nature and results of tests performed; or
- b) An identification card signed by the respective Subcontractor and issued to the individual employee, setting forth the employee's name and the date, nature and results of testing laboratory. The name of the testing laboratory shall also appear on the identification card provided the affected employee authorizes the issuance of such an identification card.

If the Individual's test results are positive, he/she may reapply for consideration after a period of no less than 12 months has elapsed. The Subcontractor will waive this 12-month waiting period if the individual completes an acceptable drug/alcohol rehabilitation program (at the individual's expense) and presents proof of completion of the program to the work place personnel/safety office. An applicant who fails a second test will not be considered for assignment to an E. W. Howell Company project for a period of no less than one (1) year.

All individuals who fail to pass a drug/alcohol test will be suspended from the project for a period of thirty (30) working days. During this time the individual has the opportunity to enter an approved drug/alcohol rehabilitation program. If the individual fails to enter such a program within this period, he/she will be terminated from assignment to all E. W. Howell Company projects. (Exception: For those who may be injured and incapable of entering a program, or for other good cause as determined by the E. W. Howell Company/Subcontractor, the thirty (30) day time limit may be extended).

When an individual enters an approved rehabilitation program, and provides their employer with proof of entrance, he/she will be placed on an inactive project assignment status. At the time of successful completion of the program, and proof of completion has been represented to the E. W. Howell Company/Subcontractor, the individual will be eligible for reinstatement if a position for which he/she is qualified is available.

Nothing in this Policy and these Procedures shall limit the Subcontractor in the discipline of their employees.

Substances

5-Panel Test Plus Alcohol

| Threshold Limits | 5 Panel Test Plus Alcohol | |
|-----------------------|---------------------------|--------------------------|
| | Initial Limit | GC/MS Confirmation Limit |
| Alcohol | 0.02% | 0.02% |
| Amphetamines | 300 ng/ml | 300 ng/ml |
| Cocaine Metabolites | 300 ng/ml | 150 ng/ml |
| Marijuana Metabolites | 20 ng/ml | 10 ng/ml |
| Opiate Metabolites | 300 ng/ml | 150 ng/ml |
| Phencyclidine | 25 ng/ml | 25 ng/ml |

DRUG POLICY VERIFICATION STATEMENT

I certify that I have received a copy of the Drug/Alcohol Policy. As an employee of _____ (Company Name), I agree to abide by this policy which states that the use, possession, distribution, transportation, sale, or manufacturing of a prohibited substance and/or alcohol is prohibited on the BNL – Work Site. Also, no employee shall report for work while under the influence of a prohibited substance.

The BNL – Work Site includes all property, facilities, land, parking lots, buildings, structures, vehicles, and any customer premises while performing company business.

I understand that by signing this agreement, I am stating my understanding of the policy and am agreeing to take a drug test as outlined in this policy. I also understand that I can refuse to take a drug test at any time, but failure to comply with a drug test request or a positive result may result in termination.

In addition, I understand that under federal law and as a condition of employment, if I am convicted of any violation of any criminal drug statute in the workplace, I must report this conviction to my supervisor within (5) days of the conviction.

Employee Name _____

(Type or Print)

Employee Signature _____

Date _____

Witness Name _____

(Type or Print)

Witness Signature _____

Date _____

NOTICE TO APPLICANTS

_____ (Company Name) is committed to maintaining a drug-free workplace. Consistent with that objective, we require that all applicants accepted for employment pass a drug test, and a physical examination if required by federal, state, or local regulations, as part of our employment process. Please be advised that all offers of employment are contingent upon satisfactory results of the drug screening test and the physical examination, if applicable. All applicants who are considered for employment will be required to sign a Drug Screening Agreement authorizing the Company to have its designated laboratory perform the drug screening test. Applicants who refuse to sign the Agreement will not be considered for employment. Those applicants who test positive for drug usage or do not satisfactorily pass the physical examination, will not be considered for employment at the Company for one (1) year.

DRUG SCREENING AGREEMENT

I understand and agree that any offer of employment to me by _____ (Company Name) is contingent upon the outcome of drug testing and the physical examination, if required, to be arranged at the Company's expense. I agree to supply a specimen of my urine for analysis as part of the Company's drug screening program. I understand that if I fail to pass the pre-employment drug screen, e.g., if my urine specimen is positive for prohibited substances or if my urine specimen shows any evidence of adulteration or substitution, I will be disqualified from further employment consideration with the Company for one (1) year. I understand and agree that my failure or refusal to sign this Drug Screening Agreement or to provide said specimen for analysis at the time requested will also disqualify me from further employment consideration with the Company.

Employee Name _____

(Type or Print)

Employee Signature _____

Date _____

Witness Name _____

(Type or Print)

Witness Signature _____

Date _____

REASONABLE SUSPICION REPORT

Date: _____ Time: _____ Interview Location: _____

Name: _____ Address: _____

Payroll/Badge # : _____ SS # : _____

Interview: _____

Are you ill? _____ Have you been to a doctor/dentist recently? _____

Are you presently taking medication? _____ If so, what? _____

Last dose: AM/PM _____ Do you have diabetes? _____ Are you taking insulin? _____

Are you hurt? _____ Where? _____

Examination: (Check words describing observed conditions. Add other words which may be appropriate.)

Breath: Odor of alcohol or liquor: None Faint Moderate Strong

Attitude: Polite Excited Hilarious Talkative Carefree
 Sleepy Cooperative Indifferent Antagonistic Combative
 Insulting Other _____

Eyes: Normal Watery Bloodshot

Pupils: Normal Dilated Constricted Poor Reaction to Light

Balance: Fair Sure Swaying Wobbling
 Falling Swaying Knees Other _____

Walking: Fair Sure Swaying Uncertain Stumbling
 Staggering Falling Other _____

Speech: Fair Slurred Stuttering Confused Incoherent
 Choice of words, clearness and correctness of enunciation abnormal for individual

What first led supervisor to suspect influence of intoxicant? _____

Disposition or action: _____

Interviewed by: _____ Date: _____ Time: _____

Decision concurred with by: _____

Name: _____ Title: _____

RECOGNITION AND REFERRAL

An employee's immediate supervisor is usually the first member of management to notice or deal with conduct indicating an emotional or behavioral problem, including alcoholism or drug abuse. Supervisors are expected to be familiar with an employee's appearance, behavior and work habits, and to be alert for negative changes.

It isn't possible or desirable for a supervisor to determine whether the changes observed are the result of emotional illness, physical illness, alcoholism or drug abuse. Changes could result from illness, properly prescribed drugs used as directed, or fatigue. In other words, the supervisor shouldn't make a diagnosis – leave that to qualified professionals – but he should be able to spot significant changes in behavior patterns.

Extremes in behavior of an employee may suggest the individual has a problem that should receive medical attention, or be brought to the attention of the personnel department. Marked changes in behavior and job performance are key signals.

Symptoms may arise suddenly or gradually, may be short-lived or continuous. Some signs and symptoms suggesting possible alcoholism or other drug abuse are:

- Deterioration of job performance – decreased productivity, damaged work, lack of interest in carrying out assigned tasks, difficulty in understanding instructions or taking direction, poor memory, bad judgment.
- Long, frequent visits to the washroom or unexplained absences from the work area.
- Non-work related visits by strangers or employees from other areas.
- Increased absenteeism (often with a Friday and Monday pattern or following a holiday weekend). Constantly showing up late for work.
- Frequent change in mood, ranging from agitation, excitement, nervousness and irritability to undue fatigue, drowsiness, inattentiveness.
- Clinging dependency on supervisor or fellow employee.
- Rebelliousness, contempt for authority.
- Complaints from co-workers about employee's behavior.

- Deterioration in dress and appearance (may include marked weight loss).
- Long periods of staring into space.
- Unsteady gait, trembling of hands and mouth.
- Excessive sweating, heavy cigarette smoking.
- Inappropriate wearing of sunglasses.
- Disorientation, impaired coordination, slurred speech.
- Coming to work drunk or with a hangover, morning drinking before work, evidence of drinking during working hours, drinking at lunch time, mood changes after lunch, sensitivity about references to his or her drinking, use of breath purifiers.
- An inclination to put things off. Neglect of details, tendency to blame fellow workers, asking the company or associates for loans.
- Avoiding the boss or associates, becoming intolerant and suspicious of fellow workers, a tendency to talk loudly.
- Increased number of lost-time accidents off the job, accidents on the job, or near miss accidents on the job.

REFERRAL

The presence of any or all of those signs or symptoms may not be the result of an alcohol or drug problem – they may be symptoms of medical or other problems that require immediate attention. However, when such signs are evident or alcohol or other drug misuse is suspected, the employee should be interviewed confidentially.

The supervisor should make clear that the discussion arises from unsatisfactory work performance, unsafe practices, excessive absence or lateness, attitude or behavior. The subject can be approached discreetly by asking the employee if he or she has a health problem or is taking any prescribed medication or drug.

One useful technique is to have the supervisor:

- Discuss the employee's deteriorating work performance, asking if he or she knows any reason for the change.

If no valid reason is given or apparent, suggest employee be seen by the plant physician, and –

- Escort the employee to the medical department.
- If he or she refuses to cooperate and refuses a second request to do so, ask the employee to reconsider because he or she is risking insubordination.
- If the employee still refuses, notify personnel and medical departments.
- Document the discussion and any observations.

It's necessary to be sure there is no other explanation for the symptoms before concluding the employee is an alcohol or drug abuser. Drugs may have been prescribed by an employee's personal physician, with no abuse or illegal activity involved. Excessive fatigue can cause a number of symptoms similar to those caused by depressants, including alcohol.

In any event, the plant physician or medical personnel should be called in when the employee appears in need of medical care or assistance.

I, _____, hereby refuse to provide a specimen to appropriate medical personnel so that a drug screening test can be performed. I recognize that this refusal constitutes a presumption of a positive result which will result in disqualification and discipline up to and including termination.

Date: _____ Employee: _____

Time: _____

Supervisor: _____ Date: _____

Comments: _____

Employee Refusal to Sign ()

(Supervisor)

Employee Notification of Medications

EMPLOYEE'S PORTION

Employee Name: _____

Date: _____ Time: _____ a.m. / p.m.

Describe Medication: _____

Describe warnings contained on the medication which may affect your ability to safely perform your position.

Time medication taken: _____ a.m. / p.m.

Stated time medication side effects remain: _____

Employee's signature: _____ Date: _____

SUPERVISOR'S PORTION

Based on the review of medication information provided above and a discussion with the employee's physician, if necessary, the employee is:

Allowed to continue to perform current duties:

Date: _____ Time: _____ a.m. /p.m.

Temporarily reassigned to non-safety sensitive duty: _____

Date: _____ Time: _____ a.m. /p.m.

Temporary reassignment in place until: _____

Sent home as no non-safety sensitive duties are unavailable. Pay will be handled as appropriate under the sick pay policy.

Date: _____ Time: _____ a.m. /p.m.

To report back to work:

Date: _____ Time: _____ a.m. /p.m.

Supervisor's Signature: _____ Date: _____

7.0 JOB-SPECIFIC WORK REQUIREMENTS

7.1 Phase Hazard Analysis

A Phase Hazard Analysis (PHA) (**Appendix J**) shall be developed for each major phase of the Project to be performed on site. The PHA shall identify the task and the steps necessary to complete the task, the hazards associated with each step of the task, and the means to protect the workers performing the task from those hazards.

Examples of major phases of the project include but are not limited to:

- Excavation, Steel Erection, Concrete Placement, Interior Wall Erection, and Finishing Work, Work involving Heavy Equipment, (e.g., cranes), Earth Moving Equipment, Work involving Mechanical Material Handling, e.g., LULLs, Forklifts.

Supervisors and employees are responsible for developing the PHA of their work activities. The supervisor is also responsible for:

- ensuring that hazard analyses are developed and reviewed by the employee before work begins, and
- seeking advice of the safety officer or designee as appropriate.

PHA's shall be submitted to the Project Safety Manager (or designee) and the BSA for review and approval. The completed and approved PHA shall be reviewed with all personnel involved in the task. This can be done as a tool-box talk or job preparation meeting. The PHA shall be updated whenever there are changes in the work plan, changes in material used, or a new crew or subcontractor is assigned to conduct the work. PHA worksheet/guidelines are presented in **Appendix J**.

7.2 Compressed Gas General Safety

Requirements

- Ensure that containers are not defective or leaking any product and have backflow preventers.
- Prescribed stamped markings on the container shall be located on the shoulder of the cylinder.
- The labels applied by the gas manufacturer or authorized supplier/vendor to identify the container contents shall not be defaced or removed.
- Containers may be painted by the gas suppliers to permit the suppliers to help recognize their contents and to segregate them more readily in their handling operations. However, the primary identifier is the container label. Color shall not be used to exclusively identify container content.
- Containers not bearing a legibly written, stamped, or stenciled identification of the contents shall not be used.
- Compressed gas cylinders shall not be used as rollers, supports, or for any purpose other than to contain and use the content as received.
- The container valve shall be kept closed at all times (charged or empty), except when the container is in use.
- All compressed gas cylinders are to be marked "empty" or "MT."

Transporting Cylinders

- Compressed gas containers shall not be rolled in the horizontal position or dragged. A suitable hand truck, forklift, or similar material handling device should be used, with the container properly secured to the device.
- Containers shall not be lifted by using the container cap or magnets. In cases where hand trucks are designed to lift containers using the cap, the containers shall not be lifted higher than 6 inches, or for longer than it takes to properly position the container on the hand truck.

- Ropes, chains, or slings shall not be used to suspend containers unless provisions have been made on the container for appropriate lifting attachments, such as lugs. Where appropriate lifting attachments have not been provided on the container, suitable cradles or platforms to hold the containers shall be used for lifting with the containers being adequately secured.

Storage

- Cylinders shall be stored in designated cages that are identified as to the content of the cylinders. NO SMOKING signage will be attached to cages of flammable and oxidizer cylinders.
- Containers are not to be stored near readily ignitable substances, such as gasoline, oil, or scrap material.
- All compressed gas cylinders shall be secured and stored and used valve-end up.
- The cylinders shall be secured at all times to prevent instability. Chains are the preferred method of securing the containers; however, heavy rope or heavy-gauge wire may also be used.
- Valve protection caps shall always be in place and hand tight, except when cylinders are in use or connected for use.
- Flammables and oxidizers shall be stored with a minimum separation of 25' or with a one hour rated five foot high fire barrier in between.

7.3 Confined Spaces

A "confined space" means a space that: -is large enough and so configured that an employee can bodily enter and perform assigned work, -has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry), and -is not designed for continuous employee occupancy.

A "permit-required confined space" has one or more of the following characteristics: -contains or has the potential to contain a hazardous atmosphere, -contains a material that has the potential of engulfing an entrant, has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section, or contains any other recognized serious safety or health hazard.

EWB has a written Confined Space Entry Program, **Appendix K**, which complies with OSHA and BNL standards. The program requires the Competent Person (as defined by OSHA) to:

- Establish procedures and practices for safe entry and to determine if a permit is required,
- Have air monitors to check concentration of oxygen, explosive/flammable gases and the specific contaminants of concern (e.g., hydrogen sulfide in sewer utility holes),
- Test and monitor conditions to identify and evaluate hazards, and prevent unauthorized entry,
- Provide adequate non-entry retrieval systems (tripods, winches, harness and ventilation equipment),
- Station an attendant outside permit spaces during entry,
- Post procedures to summon rescuers and prevent unauthorized personnel from attempting rescue, and
- Develop a system for preparing, issuing, using, and canceling entry permits.

All personnel who enter into a confined space will be trained in the hazards and procedures for entry. They must be able to recognize signs and symptoms of exposure. They must also be familiar with any emergency equipment in the confined space. Where a hazardous atmosphere is or may be present, all entrants must also be trained in the use of respiratory protection.

For entry into non-permit spaces, a job safety analysis, work guideline, or a standard operating procedure is required identifying necessary controls for atmospheric testing, continuous forced ventilation, and certification of safe atmosphere. Entry into a permit-required space requires a confined space permit (**Appendix K**). Permits must include an identification of the confined space: its hazards, a list of authorized entrants, the purpose of their entry and the date and duration of their permits; the current attendants and entry supervisor; and both the results of tests performed and any measures

necessary to isolate the permit space and eliminate or control the hazards. The permit must also describe the acceptable entry conditions, emergency equipment, and the means to summon rescue and emergency services.

Operations involving a confined space entry require an evaluation of work by the contractor and the Project Safety Manager to classify the space as permit-required or non-permit.

Retrieval equipment shall be provided to facilitate non-entry rescue for all permit-required spaces unless evaluation of the permit-required confined space determines that the use of retrieval equipment creates greater health and safety hazards. In this case, rescue services shall be notified that entry into the confined space will be necessary to perform rescue operations.

All subcontractors will comply with BNL's Confined Space Training Program, as well as OSHA's Procedure Atmospheric Testing.

7.4 Electrical Safety

EWH subcontractor will conduct installation, service, and maintenance or construction of electrical equipment in accordance with requirements in 29 CFR 1926 Subpart K, applicable requirements in 29 CFR 1910 Subpart S, and the National Electrical Code, including NFPA 70 E 2004.

Ensure electrical work is performed by qualified persons. All electricians performing work "on or near" energized circuits must be fully trained in NFPA 70E requirements, Lock-Out/Tag-Out (LO/TO) and also in CPR or other resuscitative techniques. (**Appendix L** contains EWH LO/TO program.) Training and qualifications of electricians must be verified and documentation to that effect retained on file.

Provide temporary lighting hung from insulators rated for the circuit's voltage. Remove temporary lighting when no longer required.

Provide a ground fault circuit interrupter for all cord sets, receptacles, and electrical tools including plug and cord connections to generators and equipment for employee use. An assured equipment grounding program is not acceptable to EWH.

All unfinished circuits are to be tested for energy, capped with wire nuts, and pushed into the box by an electrician. All employees are to be instructed that any wires not capped are assumed to be live, and are to be reported to an electrician.

Provide three-wire extension cords, continuous length without splices, and designed for hard or extra-hard use. Protect electrical extension cords from pinch points, sharp edges, pedestrian or vehicle traffic, or other potentially damaging configurations. Do not fasten extension cords with staples, hang with nails, or suspend on wires. Arrange extension cords in a manner that avoids creating tripping hazards. No daisy chaining of cords is permitted.

Notify the Project Safety Manager prior to any work being done near overhead lines. Overhead lines shall be de-energized and grounded or other protective measures (guarding, isolating, insulating, etc.) shall be provided, before work is performed in the vicinity of overhead lines. This preparation will be accomplished by BSA Plant Engineering personnel. Any vehicle operated in proximity to overhead lines shall maintain the following minimum distance:

- 10 ft (305 cm) for voltage of 50 kV or below;
- 10 ft (305 cm) plus 4 inches (10 cm) per 10 kV for voltage greater than 50 kV
- 4 ft (122 cm) for vehicles in transit, with its structure lowered, for voltages 50 kV or below, with clearance increased 4 inches (10 cm) for every 10 kV over that voltage.

Live parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee works on or near them, unless the de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations.

Energized parts that operate at less than 50 volts to ground and containing less than 10 Joules of stored electrical energy are not required to be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

The phase hazard analysis (see Section 7.1) is utilized to ensure workers understand their role in the work to be performed, as well as what others involved in that project or task will be doing. Supervisory approval for “working on or near” or “working hot” shall be given in the Permit (**Appendix V**). Working “on or near” or “working hot” requires approval by the EWH Project Superintendent, the Project Safety Manager, and the BSA Electrical Safety Officer. EWH as a minimum shall follow the guidelines presented in NFPA 70E-2004, Standard for Electrical Safety in the Workplace.

See Section 7.13 for additional information on LO/TO and “working on or near” energized electrical components.

7.5 Working from Heights, Fall Protection

EWH requires appropriate 100% fall protection for its employees working **6 ft or more** above the work surface. The EWH Fall Protection Plan and Checklist is included in **Appendix M**. The completion of a PHA is required for the fall protection plan. This includes all tasks associated with steel erection. The EWH Project Superintendent must fully evaluate the work conditions and environmental factors (including seasonal weather changes) before selecting the appropriate fall protection system (active, passive, or a combination of measures, as appropriate). Such evaluation is to be included in the Phase Hazard Analysis (PHA) for the task.

Employees shall be trained in the selection and safe use of fall protection systems before the equipment is used as required by 29 CFR 1926.503 sub-part-M. Employees who receive fall protection training are to be certified in writing by the trainer. The written certification record shall contain the name or other identify of the employee trained, the date(s) of the training, and the signature of the person who conducted the training.

Workers within a Controlled Decking Zone must also be equipped and wearing appropriate fall protection.

Under no circumstances will anyone ride a load suspended from a crane or ride the “headache ball.” Walking up or sliding down columns is strictly forbidden. Violation of these safety rules will result in immediate termination from the job with no ability to return to BNL.

The unloading of trucks where material to be unloaded is above the height of 6 ft. will be evaluated in PHA’s attributed to such tasks.

Types of Fall Protection Systems

- **Personal fall arrest system (PFAS):** used to arrest an employee’s fall from a work level. It consists of an anchorage, connectors, and a body harness and will include a lanyard, deceleration device, lifeline, or a combination of these. Anchorage shall be capable of sustaining static loads, applied in the directions permitted by the PFAS, of at least 5,000 lbs per user attached.
- **Restraint:** The full body harness is used as a component of a restraint system to prevent the user from reaching a fall hazard. Anchorage must support a minimum of 3,000 lbs per person attached.
- **Work Positioning:** The full body harness is used as a component of a work positioning system to support the user at a work position. Anchorage must support at least 3,000 lbs per person attached.
- **Warning line system:** a barrier erected to warn employees that they are approaching an unprotected edge. It also designates an area in which work may not take place without the use of a guardrail, personal fall arrest system, or a safety net to protect employees.
- **Guardrail system:** a barrier erected to prevent employees from falling to lower levels.
- **Controlled access zone:** an area in which certain work (e.g., overhead brick laying) may not take place without

the use of guardrail, personal fall arrest, or safety net system, and access to the zone is controlled.

- **Controlled decking zone:** an area in which certain work (for example, initial installation and placement of metal decking) may take place where access to the zone is controlled.
- **Safety net system:** can be used when workplaces are more than 25 ft above the ground, water surface, or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or a safety harness is impractical.

7.6 Scaffolds

The EWH scaffold program is provided in **Appendix V**.

All scaffolds and platforms require the completion of a PHA and will meet the following requirements:

General Requirements

OSHA requires that scaffolds are to be erected, moved, altered, and dismantled only under the supervision and direction of a qualified Competent Person experienced in scaffold erection and maintenance. The scaffolding Competent Person shall not have other responsibilities that could take his or her attention from the scaffolding work.

The Competent Person shall assure that all personnel engaged in the erection and/or dismantling of scaffolding have been trained in the proper scaffold procedures and precautions. The Competent Person will also assure through tool box training at the site that all personnel working on or from the scaffolds have been trained in the proper procedures and precautions with using scaffolds.

Each working level or platform of scaffolds must be in compliance with OSHA 29 CFR 1926 and be completely decked and have handrails, mid-rails, and toe boards installed. If for some reason a platform or working level cannot be equipped with standard handrails or completely decked, safety harnesses must be worn and properly tied off to an acceptable attach point meeting OSHA requirements.

Chain guardrails on scaffolding are not allowed.

If scaffolds will be higher than 30 ft with a working load exceeding 50 lb/ft², a licensed professional engineer must complete sealed and signed design drawings, including load calculations. Examples are scaffolds erected for plasterers, masons, or any other trades who routinely store material on the platform.

Supported scaffolds with a height to base width (including outrigger supports, if used) ratio of more than four to one (4:1) shall be restrained from tipping by guying, tying, bracing, or equivalent means. Restraints shall be at a minimum of every 30 feet horizontally and every 26 feet vertically for scaffolds 3 ft or greater in width or every 20 ft vertically for scaffolds less than 3 ft in width.

Scaffolds must be inspected prior to each shift and tagged for the workers. Tagging must designate the requirements of the user and the conditions of the scaffold by the qualified Competent Person. The EWH EHS Manager will be contacted if any special scaffolding issues arise.

Rolling Scaffolds

No one is to ride on a rolling scaffold while it is being moved.

All materials and tools must be secured prior to moving a rolling scaffold.

No rolling scaffolds will be utilized to support other scaffolds.

All rolling scaffolds are to have lockable wheels.

Scaffold Planking

Paint using a stencil or stamp scaffold planks within 12" of each end or edge to denote use for scaffold decking only. Use only 2" • 10" or 2" • 12" scaffold grade material for scaffold planking.

Scaffold Tagging

The scaffold tagging procedures are as follows:

- Under the direction of the qualified Competent Person, the crew that erects the scaffold must complete and attach the appropriate scaffold tag.
- The scaffold tag must be placed at eye level on or near the access ladder so it is easy to locate and plainly visible.
- A Competent Person needs to ensure that the scaffold is erected properly and the tag attached is proper and completely filled out.
- If the scaffold needs to be altered in any way, the person who signed the tag must be contacted to authorize the change and re-tag if necessary.
- An untagged scaffold must not be used.
- A Competent Person must inspect it prior to each shift.
- Tagging Color System:
 - A green tag is completed and attached by the erecting crew to scaffolds that have complete handrails, mid-rails, toe boards, and decking.
 - A yellow tag is completed and attached to scaffolds that cannot be erected with all the components complete. The yellow tag allows the erecting crew to note what portion of the scaffold is incomplete and cautions the user. A yellow tag also informs the user fall protection is required.
 - A red tag means the scaffold is being dismantled, is not yet completely erected, or for some reason not safe and shall not be used.
 - Under rare circumstances non-traditional scaffolding techniques such as needle beam scaffolds, ladder scaffolds, suspended scaffolds etc, which may be required must also comply with OSHA requirements and will be tagged as determined by the Project Safety Manager (or designee).

7.7 Excavations and Trenches

The digging permit process is utilized to provide for the safety of personnel and protection of existing utilities and facilities during work activities requiring excavations. A PHA will be required for excavation or trench work.

Prior to excavation, the estimated location of utility installations (e.g., sewer, telephone, water, fuel, electric lines) underground and in walls, floors, etc. shall be determined and protected from damage or displacement. The BSA Plant Engineering group shall be contacted to locate the installations and issue the digging permit (**Appendix O**). The digging permit shall be posted at the work site. The EWH excavation checklist (**Appendix P**) will be utilized for daily inspection purposes.

A competent person shall be maintained by the EWH Project Manager. **Appendix Q**, Competent Person List, will record the name of the competent person assigned to the task and his/her credentials maintained on file with the List.

Excavation Plan

The proposed method to prevent undermining existing structures and to protect personnel from potential cave-ins is described below.

- The soil for this project is to be considered type-C, unless another classification is determined by one of the methods described in 29 CFR 1926 Subpart P Appendix A **and** all cave-in protection shall conform to the applicable OSHA requirements.
- Methods intended for supporting existing utilities and maintaining surface appurtenances such as roadways, sidewalks, and other anticipated encumbrances are briefly described below.
- A contingency plan for notifying NSLS-II ESH upon suspicion or discovery of any contaminated soils, live munitions, or other materials shall be implemented.
- For excavations 5 ft or deeper or where there is a risk of cave-in, where sloping is to be used as cave-in protection, the slopes shall be no greater than one to one and one-half, rise to run, or approximately 34 degrees from the horizontal.
- Satisfactory lumber/timber shall be used (i.e., badly cracked/broken timber shall not be used for bracing or support of excavations). All shoring material(s) must comply with OSHA requirements.
- An adequate number of ladders shall be present in the excavation for access. OSHA requires no more than 25 ft of lateral travel between ladders in excavations 4 ft or greater in depth. Ladders shall extend 3' above grade.
- Excavated materials shall be placed a minimum of 2 ft away from the excavation cut in order to decrease additional loading on the support system as well as decreasing the potential for excavated material to slough off into the cut.
- Inspections shall be done and documented by the competent person to monitor the condition of the excavation and support system. Inspections shall be conducted daily at the start work, as necessary during the day, and after a rain storm or other hazardous situations arise.
- A plan for proper de-watering and an excavation plan that fully describes the method used to protect workers from cave-in is required to be submitted.
- Proper permits shall be filled out and approved before beginning work (i.e., digging, confined space entry permits, etc.).
- There shall be barricading against people and vehicles to eliminate the possibility of introducing any hazards

Cave-In Protection Equipment

- Cave-in protection equipment shall be provided if 5ft or deeper. For excavations greater than 20 ft in depth, the protective systems shall be designed and approved by a registered professional engineer with a specialty in soil mechanics.
- Where shoring, shielding, or systems other than sloping are proposed, there shall be a submittal of manufacturer's or engineer's data on the system to be used, the depths of the excavations where it shall be applied, and the system configurations to be utilized.
- Sub-type of soil as defined by the manufacturer's or engineer's specifications shall be determined; and there shall be a submittal of soil type determinations and the system configuration selections to the Project Safety Manager for approval prior to work being performed in the excavation/trench.

7.8 Fire Protection

Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved safety cans or Department of Transportation approved containers shall be used for the handling and use of flammable liquids in quantities of 5 gallons or less (this does not apply to those liquids which are extremely hard to pour, which may be handled in original containers). For quantities of 1 gallon or less, the original container may be used for storage, use, and handling of flammable liquids. Storage areas will be readily identified by signage including NO SMOKING signs. All storage cabinets will be an approved type.

Containers of flammable and combustible liquids shall be tightly capped when not in actual use. Containers shall be approved DOT with functioning self closing tops and flame arrestors. The uses of "residential" type flammable liquid containers are prohibited.

Flammable liquids may be used only where there are no open flames or other sources of ignition within 50 ft of the operation, unless conditions warrant greater clearance.

All sources of ignition shall be prohibited in areas where flammable and combustible liquids are stored, handled, and processed. Suitable No Smoking or Open Flame signs shall be posted in all such areas. At least one BC-rated portable fire extinguisher with a minimum 12-pound rating shall be mounted at the entrance to the area where flammable liquids are handled or stored.

During vehicle refueling operations, appropriate grounding precautions must be taken to prevent sparks from causing a fire.

A fire extinguisher, rated not less than 10B, shall be provided within 50 ft of wherever more than 5 gallons of flammable or combustible liquids are being used on the jobsite. This does not apply to the integral fuel tanks of motor vehicles.

Portable fire extinguishers with at least a 2A rating are to be deployed in every 3,000 ft² of floor space with a maximum travel distance of 100 ft.

All fire extinguishers must be inspected monthly and a record of these inspections are retained on file. All fire extinguishers mounted in such a location where they are exposed to freezing conditions, will be protected from the elements, and unobstructed access to them will be maintained at all times. All fire extinguishers will have weatherproof inspection tags attached.

EWH recognizes that BSA will provide fire fighting services. EWH employees must use an in-house phone to dial 911 or 2222 for emergency response. If using a privately owned cell phone, the reporting personnel must call 631-344-2222.

"Red Flag" days exist when weather conditions pose a severe threat of brush and wild land fires. On such days, the BSA Fire Rescue Group will make an announcement to the laboratory population prohibiting all outside work, e.g., welding, flame cutting, etc. Indoor work that does not pose a fire threat to the outdoors may continue.

Prior to performing any cutting, welding, burning, brazing, or other activities which may be a source of heat or ignition, the Contractor must obtain a hot work permit from BNL Fire Rescue and EWH (**Appendix R**), and from the EWH Project Safety Manager. This permit must be conspicuously posted in the area of the work. If a general permit for the project is obtained, it may be posted in the construction office or trailer.

In the event portable heaters are required in the work area, a PHA for a heating plan will be submitted and approved prior to the use of the equipment.

Wildfire Danger

Portions of the work will be performed in a wild land area of BNL, where brush fires are a real concern. The contractor shall ensure that the conduct of operations minimizes the potential of the occurrence of wild land fires.

Preventing the parking of vehicles on grassy areas with engines running, and control of disposal of smoking materials, is the responsibility of the contractor's management team.

Ensure gasoline-engine-driven portable generators and air compressors are equipped with spark arresters and that personnel are aware of fire break names if calls to the Fire Department [Ext. 2222 or (631) 344-2222] become necessary. Fire extinguishers will be available near each gasoline driven engine or generator.

7.9 Hand and Power Tools

Hand and power tools shall be used, inspected, and maintained in accordance with the manufacturer's instructions and shall be used only for the purpose for which designed.

Power tools designed to accommodate guards shall be equipped with such guards when in use. Reciprocating, rotating, and moving parts of equipment shall be guarded if exposed to contact by employees or otherwise create a hazard.

Tools and equipment showing evidence of safety hazards shall not be brought on site. Should hazards become evident after work is initiated, remove the tool from use, clearly indicate the tool is not to be used, and take the tool from the site at the end of the work shift.

Each subcontractor will color code their power tools and extension cords for easy identification and facilitate inspection. An acceptable method for identification is to use colored electrical tape on each end of the cord. The EWH Project Manager will maintain a master list of contractor ID markings.

Powder actuated tools will require the user to present his/her qualifications to the EWH Project Safety Manager before use. This equipment requires an approved PHA for use.

All power tools will be GFCI protected or double insulated.

7.10 Hazard Communication

Purpose

The purpose of this hazard communication program is to inform EWH employees and all subcontractor employees of known chemical hazards that may exist in the workplace. The EWH program is contained in **Appendix S**.

Application

This program applies to chemicals known to be present in the workplace in such a manner that employees may be exposed under normal conditions, non-routine tasks, or foreseeable emergencies.

This hazard communication program relies on Material Safety Data Sheets (MSDS) from suppliers for purposes of hazard determination.

Program Summary

The major elements of this program are as follows:

- labels and other forms of warning,
- Material Safety Data Sheets from suppliers,
- employee information and training,
- list of hazardous chemicals known to be present in the workplace, methods for informing employees of hazards of non-routine tasks, and methods for informing contractor employers of hazards their employees may be exposed to while working on the project.

Labels and Other Forms of Warning

Each container of hazardous chemicals shall be labeled, tagged, or otherwise marked with:

- the identity of the hazardous chemical(s), and
- appropriate hazard warnings.

Labels and other forms of warning shall be legible and in English, and shall be prominently displayed or readily available in the work area during each shift.

Material Safety Data Sheet

All MSDS shall be submitted with an index to EWH prior to bringing the material on site.

An MSDS shall be kept for each hazardous chemical known to be present in the workplace.

MSDSs are kept in the construction office and are readily accessible by employees during each work shift.

The EWH Project Manager is responsible for maintaining MSDSs in a complete and up-to-date manner.

Training and Information

All employees shall be trained by their employer according to a written hazard-communication training plan that is part of the company's overall hazard communication program.

Training shall extend to non-routine tasks, as necessary, and to foreseeable emergencies. All employees shall be trained on any revisions to this program.

Revisions

This program shall be amended as changes in work operations, new materials or processes, or new information dictate.

7.11 Heat and Cold Stress

Heat Stress

Heat stress is a name given to a collection of health hazards that can occur as a result of strenuous work in hot, humid environments. The effects range from minor discomfort to life-threatening implications.

The cause of heat stress is:

- metabolic heat: When we work, our body produces heat.

We LOSE most of that metabolic heat to the environment by:

- sweat (evaporation), and
- wind cooling (convection).

When environmental and/or work condition prevents losing enough metabolic heat, health consequences result = heat stress. The major conditions make us more susceptible to heat stress are:

- hot and humid weather, and
- PPE blocks evaporation and wind.

BNL will provide environmental monitoring for Heat Stress conditions in the late spring, summer, and early fall. These notifications can alert workers of environmental conditions, that when mixed with strenuous work, make the worker susceptible to heat stress. Personnel assigned to the NSLS-II LOB construction project will abide and adhere to the precautions concerning work and rest regimens determined by the EHS Manager. These instructions follow the ACGIH guidelines as required by 10 CFR 851.

Cold Stress

Prolonged exposure to freezing or cold temperatures can result in serious health problems such as trench foot, frostbite, and hypothermia. In extreme cases, including cold-water immersion, exposure can result in death. Danger signs include uncontrolled shivering, slurred speech, clumsy movements, fatigue, and confused behavior. If these signs are observed, call for emergency help.

These factors contribute to cold stress:

- Cold temperatures: A cold environment forces the body to work harder to maintain its temperature.

- High or cold wind: Wind chill is the combination of air temperature and wind speed. For example, when the air temperature is 40°F and the wind speed is 35 mph, your exposed skin receives conditions equivalent to the air temperature being 11° F.
- Dampness and cold water: Cold air, water, and snow all draw heat from the body. Cold stress can be brought about by temperatures in the 50s coupled with some rain and wind.

Anyone working in a cold environment may be at risk for cold stress. However, older adults may be at more risk than younger adults, since older people are not able to generate heat as quickly. Certain medications may prevent the body from generating heat normally. These include anti-depressants, sedatives, tranquilizers, and some heart medications. Persons with existing medical conditions that are aggravated by cold temperatures or who are taking these types of medication should be evaluated by the OMP before extended periods of outdoor work in cold weather.

Prevention and Protection

- In cold, wet, and windy conditions, workers need to wear proper clothing, including layers so they can adjust to changing conditions.
- Workers need to take frequent short breaks in warm, dry shelters to allow the body to warm.
- Try to schedule work for the warmest part of the day.
- Use the buddy system – work in pairs so that one worker can recognize danger signs.
- Drink warm, sweet beverages (sugar water, sports-type drinks) and avoid drinks with caffeine (coffee, tea, sodas, or hot chocolate) or alcohol. Eat warm, high-calorie foods such as hot pasta dishes.

7.12 Hoisting and Rigging

All rigging equipment, including cranes, fork trucks, extending fork trucks, slings, and hardware brought onto the BNL site for the first time must be inspected by NSLS-II construction safety engineer. **Appendix T** is the EWH hoisting and rigging program which includes appropriate inspection checklists. All crane operators must be qualified and must have in their possession a current New York State Department of Labor crane operator certificate of competence. All inspection documents must be available to the EWH inspector, and such documents must be current. Subsequent inspections will be made by the operator and user of the equipment. Safe operation of all equipment will be evaluated on a daily basis and appropriate action, including disciplinary and possible termination will result for repeated or egregious offenses.

Perform hoisting and rigging activities in accordance with 29 CFR 1910 Subpart N, 29 CFR 1926 Subparts H and N, the DOE Standard for Hoisting and Rigging, and the ANSI B30 and B56 Series. Provide for review by EWH Project Safety Manager, documents of certification that contractor's hoisting and rigging equipment meets the requirements in these documents. If an inspection certificate expires while the equipment is on site, re-inspect the equipment and update the inspection certificate before continuing work activities.

Equipment operators/riggers, including alternates, shall be qualified to perform their assigned functions. Qualifications shall include physical, knowledge, and skills proficiency based on job function and a valid license for the piece of equipment.

All operations that require hoisting and rigging shall have a PHA and/or an appropriate safety checklist completed prior to beginning work to ensure safety and compliance.

Each lift shall be reviewed to determine if the lift is classified an ordinary lift or critical.

All operators will inspect their equipment on a daily basis and supply records to EWH.

All lifts, with the exception of off-loading material from the delivery vehicle or moving equipment from one location to another provided the equipment is not raised more than 3 ft above the ground and does not pass over any other vital equipment, must follow an approved lift plan. Such plans are reviewed and approved by the NSLS-II Construction Safety Engineer. Ordinary lift plans usually take 2 days to approve; critical lift plans usually take about a week for approval (depending on the complexity of the lift).

Critical Lift

A lift will be considered critical when any **one** of the following conditions exists:

- The load item is unique and, if damaged, would be: (1) irreplaceable; or (2) not repairable and is vital to a system, facility, or project operation.
- The cost to replace or repair the load item or the delay in operations of having the load item damage would have a negative impact on facility, organizational, or DOE budgets to the extent that it would affect program commitments.
- The lift involves more than one crane or other motorized lifting device lifting a common load.
- The lift is 85% or more (mobile crane) or 75% for steel erection, or 90% or more (fixed crane) of the rated capacity.
- The load requires exceptional care in handling because of size, weight, close-tolerance installation, high susceptibility to damage, or other unusual factors.
- The lift has a gross weight over 50 tons.
- Collision, upset, or dropping could result in significant release of hazardous material or other undesirable conditions.

There are other conditions which might constitute a critical lift and should be evaluated by the Subcontractor. Such conditions include:

- Lifts where the load could fall on pipelines or vessels containing flammable gases or liquids, or which may result in a release of hazardous materials to the environment.
- Lifts in tight spaces.
- Lifts involving non-rigid objects like tank shells.
- Lifts with lifting points are below the center of gravity of the load.

The Critical Lift Evaluation Form (**Appendix U**) must be developed by the subcontractor, submitted to EWH and all reviews/approvals must be obtained prior to the lift being made.

Required attachments to the Critical Lift Plan include:

- Crane operator certification – All crane operators shall possess a valid NYS Department of Labor (DOL) Crane Operator's Certificate of Competence or equivalent certification if accepted by the NYS DOL. The crane operator's certification must be up to date. All operator certifications must be attached to the plan or be on file.
- Type, size, capacity, engineered designs, and manufacturer of shackles, hooks, jacks, rollers, come-a-longs, spreader bars, and slings
- Type, size, capacity rating, manufacturer, capacity certificates, and monthly inspection reports for all cranes and other lifting equipment
- Lift geometry and free body diagrams to illustrate the individual tensions of each sling involved in the lift, and any shift of weight when the load is lifted
- A complete rigging diagram must be attached to the critical lift plan. The rigging diagram must include the entire rigging process and the following minimum information, when it applies:
 - Type and capacity of lifting equipment

- Crane boom length, radius, and location of outriggers
- A plot of the path of travel including all vertical and horizontal clearances from such items as adjacent equipment, power lines, and other encumbrances or hazards
- Location, size, and capabilities of lifting lugs, slings, spreader bars and other rigging accessories, as well as the method of attachment
- Position of load in relation to the boom to show hook clearance and distance between the boom and the load
- Description, size, capacity, and location of miscellaneous equipment such as dollies, jacks, hand wrenches, rollers, etc.
- Method to determine that the location where the crane is to be placed is on stable ground prior to the placement of lifting mats or cribbing
- Location of mats and cribbing used before, during, and after the lift
- Location and orientation of equipment
- Location of underground lines (utility lines, electrical duct banks, cables, etc.), abandoned vessels and tanks, and foundations

Ordinary Lift

Any lift that does not meet the definition of a critical lift is considered an ordinary lift. The lift plan must include the following information:

- Description of lift, including weight, dimensions, center of gravity, and objects to be lifted
- Hoisting and rigging equipment with capacities
- Rigging sketches/drawings

Ordinary lift plans must be reviewed and approved by the EWH Competent Person..

Generic Lift

Generic lift plans can be prepared for lifts that occur on a routine basis, such as removing equipment and material from a delivery vehicle and landing it on the ground near the truck, and moving material from the ground level to an upper level using an extending fork truck (e.g., LULL). Generic plans are prepared and approved at the start of the job and will remain in effect for the duration of the job or until there is a change of conditions which require the plan to be revised.

Safe Lifting Practices

- Determine the weight of the load before designing the method that will be used to lift it. Consider whether vessels will contain fluid, sludge, internal equipment, etc. These items can add significantly to the nominal weight and can create dynamic motion.
- If possible, distribute the load evenly on all legs of a sling.
- When using multiple leg slings, keep in mind that the load is not always divided equally.
- The four-leg slings shall be rated as two-leg slings, since it cannot always be determined that all legs will be loaded equally. Other multiple-leg slings should be given due consideration for possible uneven loading.
- Check choker rotation to eliminate jerking or slipping while upending or laying down. -When fastening chain hoists, or snatch blocks to permanent structures, verify that the structure is strong enough to support the load. - Always refer to the manufacturer's specification chart for safe working loads of shackles.
- Never replace the shackle pin with a bolt; only the proper fitted pin shall be used.
- The crane rated loads do not account for the weight of rigging accessories, such as blocks, auxiliary boom head, hooks, slings, spreader bars, jibs, material handling equipment, and other elements of lifting tackle. The combined weight of such items must be added to the total weight.

- The maximum safe working load of cranes is determined from static loads. The capacity charts do not take into account impact loads due to the dynamic motions of the load or crane.
- Are softeners required to reduce cutting to the slings?
- Conduct a detailed investigation to identify all possible interference in the vicinity of the work whether overhead, at grade, or underground.
- Prior to lift, develop a method of unhooking and hooking up the load.
- Always assure that rigging is placed to assure proper orientation of the piece in its final position.
- Surveying equipment may be needed to insure that loads remain within vertical and horizontal limits and to assure stability during the lifting operation.

Safety Precautions for Lifting in Tight Spaces

- Plot in detail the location of the crane and/or other equipment with respect to the work, including the location of outriggers.
- Establish limits of allowable motion for the boom in both the vertical and horizontal directions for each crane location in order not to damage existing facilities.
- Devise and provide means to protect existing operating facilities. Mechanically protect small protrusions on operating equipment, such as valves, instrumentation, brackets, etc., which could be damaged if contact is made with the load.
- Consider shutting down and depressurizing operating equipment that could be jeopardized by the lift.
- Use tag lines to stabilize the load during the lift.

Method of Attachment and Handling

- If attachment points or lifting lugs are provided on the piece, verify that they are intended for handling operations, to prevent damage.
- What are the manufacturer's care and control restrictions of the object to be lifted during handling the entire piece and not a component?
- Are there any requirements for shipping skids or other handling devices and their availability?
- Review the sequence of proper assembly or disassembly when the structure consists of components.

Lifting Lug Requirements

- Lifting lugs must be engineered to withstand the load plus an additional 125% of the load as a safety factor.
- All engineering of the lugs must be done by a professional engineer of the appropriate discipline.
- Welds on both old and new lifting lugs must be magnetic-particle tested to ensure soundness.

Matting Requirements

- Matting must comply with the manufacturer's recommendations and specifications.
- Matting must be thoroughly inspected before use.

Ground Stability

- Ascertain the load carrying capacity of the soil and beware of recently excavated and backfilled areas or areas with weak soils having limited bearing capacity. Examine the rigging diagram to verify that cranes, dollies, and trailers are adequately supported and that the diagram includes cribbing or mats under the crane and outriggers where required.
- Check the entire path of movement during the lift for all holes, rocks, and soft ground.
- Check all load restrictions on floors, structures and access roads.

Tag Lines

- Always use a tag line even for smaller lifts unless the tag line increases the hazard. It is much easier to maintain control of the lift than to regain control when it is swinging or spinning.
- There shall be no knots in the trailing end of tag lines.

7.13 Lock-Out/Tag-Out (LO/TO)

Policy

It is EWH Policy that working on or near energized electrical circuits will only be allowed when all methods available to perform the work in a de-energized state have been evaluated and determined to be infeasible. Working on or near energized conductors is subject to the restrictions and provisions of the Standard for Electrical Safety in the Workplace (NFPA 70E), and the applicable OSHA Electrical Safety regulations.

The use of the LO/TO Program (**Appendix L**) is to prevent an unexpected operation or release of energy of electrical or electronic equipment. The unexpected starting of motors may injure persons working on them, or unexpected energizing of equipment can produce an electrical shock and/or damage to the equipment. The LO/TO Program combines the use of tags and locks, or other electrical or physical systems to lock out power to the equipment while it's broken, or being worked on.

Locking and tagging key points are proven methods of controlling the release of energy or hazardous materials, and an important way of safeguarding workers who operate or repair machines or processes in the plant. This document defines LO/TO, lists specific procedures to follow for LO/TO, define responsibility for LO/TO, and show the importance of both education and discipline in these procedures.

A Lock-Out/Tag-Out program shall be included in the Construction Environment Safety and Health Plan that complies with OSHA and is tailored to EWH's LO/TO program. A Lock-Out/Tag-Out Program is presented in **Appendix L**.

Introduction

Most accidents happen around machinery of some type. Often, the accident involves electrical shock, burns, or exposure to hazardous materials or moving machinery. These accidents share one thing in common: the uncontrolled release of energy.

To protect yourself and your co-workers from danger in the workplace, you must understand that energy, left uncontrolled, can be very dangerous. Energy, simply defined, is the capacity for doing work. Kinetic (moving) energy is the force caused by the motion of an object, such as a spinning flywheel. Potential (stored) energy is the unseen force inside an object when not moving, such as a spring under tension. There are many sources of energy that can provide power to machinery. The Phase Hazard Analysis (Section 7.1) identifies specific hazardous energy sources. These may include:

- Gravity
- Electrical
- Mechanical
- Chemical
- Hydraulic
- Pneumatic
- Thermal
- Nuclear

A LOCK-OUT is simply a locking device, such as a padlock, placed on a power source to prevent the release of hazardous energy that could set a machine in motion or otherwise endanger an employee working on the machine. Locks may be used with a lock-out device that holds an energy control point, such as a switch, lever or valve, in the off position, making it impossible to operate.

A TAG-OUT is a written warning tag telling all others not to operate a switch or valve that could release hazardous energy or set a machine in motion. The tag-out is placed prominently on the switch or lever so as not to be missed.

Responsibility

Locking and tagging key points are proven methods of controlling the release of energy or hazardous materials, and an important way of safeguarding workers who operate or repair equipment, or machines, and processes in the plant. This document lists specific procedures to follow to properly LO/TO, and show the importance of both education and discipline to these procedures.

It is the responsibility of the on-site EWH supervisor to enforce the LO/TO procedure and make sure the necessary equipment is provided and properly used to comply in all respects with the procedure. Transferred employees shall be instructed by their supervisor in the purpose and use of lock-out/tag-out procedure. Supervisors shall be responsible for enforcing the specific lock-out/tag-out procedures listed below.

- Production and support departments shall be responsible for being knowledgeable of and adhering to this procedure. No locks shall be removed from equipment without first consulting the Project Superintendent.
- A LO/TO shall only be removed by the person who implemented it, or in rare circumstances if that person is not available, by a committee of knowledgeable personnel per written procedure.
- If more than one individual is required to lock-out or tag-out equipment, they shall place their own lock and tag on the affected equipment in such a way as to be certain the equipment is locked out. If the affected equipment cannot accept multiple locks or tags, a multiple LO/TO hasp shall be used.

Equipment

LO/TO equipment shall consist of the following and be controlled and distributed by the contractor designated competent person:

- Padlocks. Sufficient quantities of padlocks; each lock to have an individual key, and one master key controlled by maintenance supervision.
- Multiple lock tongues. To be used in case more than one department is involved in a job.
- Danger/Warning tags. To be used wherever it is necessary to warn maintenance employees/operators of a repair.

When to LO/TO

Most equipment is designed with safe switches that disable the equipment for minor repair or calibration during normal operation. In general, these switches provide adequate protection for minor repair that is routine, repetitive, and necessary to the normal use of the equipment. LO/TO procedures shall be used for the following situations:

- Major repairs or overhaul
- When working alone, out of visual contact of the controlling switch
- Any time there is danger of injury from an unexpected release of energy
- Any situation that threatens an employee's safety

LO/TO Procedures

The following are specific procedures to be followed for LO/TO:

- Notify all affected areas and employees of the impending lockout situation, the reason for it, and the estimated start and duration times.
- Equipment shutdown and isolation. Place all switches in the "off" or "safe" position. Disconnect sources of power, ensuring all sources of both primary and secondary power to the equipment are interrupted.
- Dissipate residual energy. Shutting down equipment does not mean there is no energy left in it. Check for trapped pressure or residual electricity in the system.
- LO/TO all in-line points of control. In most cases, this may be more than one place, or more than one lock, if several people are working on the equipment.
- Lock-out verification. Take nothing for granted. Verify that the locked-out switch or control cannot be overridden. Test the equipment to be certain that the locked-out switch is de-energized and not simply malfunctioning. Press all start buttons or valves to see if the equipment starts. Ensure the system you are working on is the same one that has been locked out.
- Perform the work scheduled. Try to foresee all possible hazards. Ensure the new/repair work does not bypass the lockout and reactivate the system.
- Lock and/or tag removal. All locks and tags shall be left in place until work is completely finished. This is especially true when more than one employee is working on the equipment. A lock is never to be removed except by the person who placed it there unless emergency removal is required as stated below.

NOTE: Only immediate supervisors are to authorize emergency removal of a lock or tag. The individual who applied the tag must be notified that the tag is being removed.

- Equipment start-up. Make a final safety check before restarting equipment, to be certain it is safe to operate. Make sure of the following:
 - All tools and other items have been removed.
 - All machine guards are returned to their proper position.
 - All electric, hydraulic, pneumatic, or other systems are properly reconnected.
 - All employees are clear of equipment.

Many of the LO/TO procedures appear to be common sense, and they are. Following them will ensure safe operation calibration, maintenance, and repair of equipment and/or processes, without dangerous surprises or injury.

Working On or Near Energized Circuits

It is the policy of EWH that, except under extreme circumstances, work shall not be done on energized circuits.

Justification must be made to the NSLS-II ESH Manager and EWH to work on energized circuits. EWH will arrange for the issuance of a "Working On or Near" Permit. See **Appendix V** for a sample Energized Electrical Work Permit. The requesting party shall give EWH Project Superintendent a minimum of two business day's notice of any requirement to "Work On or Near," to allow time for the permitting process. Working on or near operations that only involve testing, diagnostic work, and/or service tasks on equipment for voltages less than 600 volts AC to ground may be covered by a testing, troubleshooting, and voltage monitoring energized work permit, which may cover the entire project period. Operations involving "Working On or Near" for voltages greater than 50 volts AC to ground may require a specific "Working On or Near" permit for each work situation required. Work will proceed when the "Working On or Near" permit is completed and all parties performing the work have been informed of the hazards involved and what PPE is to be worn. An authorized supervisor from the contractor who is performing the work and a EWH designated Line Manager must sign the permit before any work can be performed. Work with voltages less than 50 volts is not considered working on or near energized conductors. Energized parts that operate at less than 50 V to ground are not required to be de-energized if there must be no increased exposure to electrical burns or to explosion due to electric arcs. EWH will issue energized work permits.

Energized work permits shall address, as a minimum, **all** of the following elements:

- A description of the circuit and equipment to be worked on and their location
- Justification for why the work must be performed in an energized condition
- A description of the safe work practices to be employed
- Results of the shock hazard analysis
- Determination of shock protection boundaries
- Results of the flash hazard analysis
- The Flash Protection Boundary
- The necessary personal protective equipment to safely perform the assigned task;
- Means employed to restrict access of unqualified persons from the work area
- Evidence of completion of a job briefing, including a discussion of any job-specific hazards (include in Phase Hazard Analysis)
- Energized work approvals by the EWH Project Management

For all energized work, regardless of the voltages, the appropriate personal protective equipment shall be worn.

Work performed on or near energized circuits performed by qualified persons related to testing, troubleshooting, voltage measuring, etc., is permitted without an energized work permit, provided appropriate safe work practices and personal protective equipment in accordance with NFPA 70-E is used.

Education and Discipline

The key to worker safety is education. The purpose of this document is to ensure that everyone understands the importance of LO/TO and how to recognize when it is in use. These elements shall be covered during initial contractor/vendor orientation and during the pre-job and periodic "tool-box" talks. By educating all employees to the importance of following proper safety procedures, a safer working environment can be ensured.

As with all safety procedures, a fair, uniform enforcement of discipline must be in place. Employees are responsible for their own safety, the safety of their fellow employees, and the safety of the facility. Violating LO/TO procedures is a major safety violation and will subject the employee to immediate discipline.

EWH shall have the right to request that any subcontractor provide the appropriate documentation that clearly indicates the qualifications and training of any and/or all employees performing such work.

Each contractor shall provide their own distinct locks, lockout devices, red tags for Lock-Out/Tag-Out of energy sources(s) and personal protective equipment. A logbook shall also be maintained and kept in a designated area assigned to the competent person.

- In order to comply with this Policy, EWH shall ensure that all employees who may be required to "Work On or Near" electrical circuits and all associated equipment shall be authorized employees. An authorized employee is deemed as an individual who has been qualified in the skills and knowledge related to the service, maintenance, construction and/or operation of electrical equipment and installations, and has received safety training on the hazards involved, including the wearing of the appropriate personal protective equipment (PPE).

7.14 Respiratory Protection

Each subcontractor competent person will determine which respirator type or class will offer adequate protection, based on:

- the respiratory hazard(s) to which the worker may be exposed,
- the workplace and user factors that have the potential to affect respirator performance and reliability,
- his or her informed professional judgment (based on the material safety data sheet or personnel air monitoring results), and
- the scientific literature.

A sample Respiratory Program is provided as **Appendix W**. Contractor programs will comply as a minimum with the provisions of this program.

Respirators will be provided in accordance with the following:

- If contractor employees are required to wear negative or positive pressure, tight-fitting respirators, they shall have been medically evaluated, and the completed medical evaluation shall be retained in the EWH Project files.
- Ensure respirator wearers have completed the appropriate fit testing and respirator training. Training documents shall be retained.
- Provide respirators and cartridge type specified to protect worker from exposure to identified or suspected hazards as specified in the hazard analysis.
- Provide breathing air, if required. Submit data to the Project Safety Manager demonstrating the compressed breathing air quality supplied to the air respiratory protections systems meets the requirements of ANSI/CGA G7.1, Commodity Specification for Air.
- Provide optical corrections for appropriate respirators.
- All respirators shall be certified by the National Institute of Occupational Safety and Health (NIOSH).

7.15 Sources of Radiation

Lasers

Only lasers that are Class 2 will be permitted on the construction site.

Only qualified and trained employees will be assigned to install, adjust, and operate laser equipment. Proof of qualification of the laser equipment operator will be available and in possession of the operator at all times. EWH will have the training documentation on file or readily available.

Areas where lasers are used shall be posted with standard laser warning placards. Only those devices labeled as Class 2 (no greater than 5 milliwatts) shall be used.

Never intentionally stare into the laser beam.

Never intentionally aim the beam at oneself or another person, particularly in the facial area.

The beam will be turned off when not in use.

Avoid mirror-like surfaces when directing the laser beam. A reflected beam can act like a direct beam on the eye.

Areas where lasers are used shall be posted with standard laser warning placards. These can be obtained from the BSA Laser Safety Officer.

Beam shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, overnight, or at change of shifts, the laser shall be turned off.

When it is raining or snowing, or when there is dust or fog in the air, the operation of laser systems will be prohibited where practicable; in any event, employees will be kept out of range of the area of source and target during such weather conditions.

The laser unit in operation should be set up above the heads of the employees, where possible.

7.16 Industrial Hygiene Monitoring

All work on the project will be done within the occupational exposure limits for Industrial Hygiene hazards set in OSHA 29CFR1926, 29CFR1910, and American Conference of Governmental Industrial Hygienists (ACGIH) *Threshold Limit Values*® (TLV). These hazards include, but are not limited to, chemicals, lead, silica, asbestos, beryllium, noise, non-ionizing radiation, and heat stress hazards on the project). Compliance with the OSHA Permissible Exposure Limits and ACGIH *Threshold Limit Values*® shall be determined by representative personnel exposure monitoring and dosimetry conducted by EWH.

If data are available to support the supposition that real-time monitoring is not necessary (i.e., data from a previous job or in peer-reviewed literature showing that neither the ACGIH nor OSHA exposure limits are exceeded), then such data must be included with this Environment, Safety and Health Plan, and reviewed and approved by the Project Safety Manager.

EWH or the subcontractor representative will provide qualified monitoring and hazard assessment personnel to conduct all Industrial Hygiene monitoring. In addition, personnel who conduct exposure monitoring on workers who handle, disturb, or remove friable asbestos-containing material will maintain training and certifications required by the NYSDOL Industrial Code Rule 56 and USEPA. Copies of all monitoring personnel certifications will be maintained on file and for review.

EWH or the subcontractor representative shall monitor with calibrated equipment using analytical methods approved by NIOSH or OSHA, and will have the analysis conducted by a laboratory certified for Proficiency Analytical Testing by the American Industrial Hygiene Association (AIHA) , or by the use of National Institute of Standards and Testing (NIST)-traceable calibrated direct reading instrumentation. Prior to use in the field, all instrumentation used for surveys shall be calibrated in compliance with the manufacturer's specification.

Copies of all equipment calibration, field sampling sheets, laboratory analysis reports, and hazard assessment evaluation reports shall be submitted to the Project Safety Manager within 5 days after the receipt of results from analytical laboratories or within 5 days after analysis by direct reading instruments, meters, or monitors. The monitoring equipment to be used on this project is listed on the attached table.

Materials and conditions that require exposure monitoring include, but are not limited to:

- Asbestos
- Beryllium
- Chemicals, adhesives, or lead
- Carcinogens
- Confined spaces
- Natural hazards in the environment (for example, heat stress)
- High noise levels
- RF/microwave
- Static magnetic fields
- Silica (from grinding, drilling, core boring, jack hammering of concrete, masonry, mortar etc.)

7.17 Penetrations

Concrete and/or masonry penetrations are of specific safety concern at BNL. EWH ensures safe penetration into or through any existing concrete or masonry surface.

Applicable instructions, ESH standards, and BNL Plant Engineering policies and procedures shall be followed, including the completion of appropriate Penetration Permits and the provision and use of utility locating/detecting equipment.

In order to comply with these guides, the Contractor shall provide trained "Authorized Employees" and shall submit, for review and approval, the name and type of the utility locating/detecting equipment to be used, as well as the specific names of the trained personnel who will perform the locating task with this equipment and who will execute the penetration work.

Non-aggressive penetrations cannot be executed without first using utility locating/equipment and obtaining approval by the inspector.

Aggressive penetrations cannot be executed without first using utility locating/equipment, followed by the completion and approval of an Aggressive Penetration Permit.

7.18 Steel Erection

The erection and assembly of structural steel is perhaps one of the most hazardous aspects of a construction project. Typical hazards involve material handling, working from heights, welding, and flame cutting.

The OSHA Standard 1926 Subpart R applies to work on this project with the following notable exceptions:

- All steel work greater than 6 feet above the next lower level will require 100% fall protection.
- Fall protection within a Controlled Decking Zone (CDZ) is required.
- All ironworkers are required to provide Subpart R training documentation.

The steel erection contractor (usually a subcontractor to the steel supplier) must prepare and have approved by EWH and NSLS-II ESH Manager a comprehensive steel erection plan prior to erecting the first piece of steel. The plan must contain as a minimum the following information:

- The sequence of erection;
- Material deliveries, material staging and storage areas;
- Coordination with other trades on site;
- Description of crane selection and placement procedures including evaluation of soil conditions prior to crane deployment;
- Site preparation;
- Pathways for over head and suspended loads, and methods to designate the lift areas and pathways;
- Critical Lifts;
- Description of erection activities and procedures;
- Hazards associated with weather causing cessation of steel erection activities;
- Description of fall protection procedures that will be used on site;
- Description of procedures to prevent objects from falling off the structure at the site (other than steel being hoisted);
- Any non routine tasks to be performed;
- Certification that each worker has received training for performing steel erection operations;
- A list of qualified and competent persons (for steel erection and associated activities);
- Rescue procedures.

The steel erection plan may be included in the Phase Hazard Analysis of the Subcontractor's Construction Environment, Safety and Health Safety Plan. Additional hazards associated with steel erection must be identified in the PHA along with mitigating measures to be taken by EWH or the Steel Erector. Typical hazards include crane and lifting operations, rigging, protection of holes and openings in the decking.

All documentation relating to the erection of steel including training records and tool-box talk attendance and topics must be maintained by the General Contractor and subject to inspection by the EWH and NSLS-II ESH Manager.

7.19 Concrete and Masonry Operations

Concrete and masonry operations shall be conducted according 1926 subpart Q, Concrete and Masonry Construction. As stated in the Phase Hazard Analysis, safety is a primary consideration and as such all protruding rebar and anchor bolts shall be capped or otherwise protected to eliminate any impalement hazard. All rebar tie wires will be bent in such a manner to eliminate hazards from scratches or other such injuries. In addition to the general PPE required at this site, all pump truck hose handlers shall wear a face shield over their required safety glasses. Impervious gloves and overshoes (worn over their safety shoes) shall be worn by all concrete workers during pouring operations. All formwork, precast panels and shoring shall be prepared by a qualified designer and be inspected by that qualified engineer prior to the pour. Limited Access Zones (LAZ) shall be established around all masonry construction on the side of the wall not scaffolded. The LAZ will be entered only by the workers performing masonry wall construction. The LAZ shall remain in place until the wall is adequately supported. All concrete and masonry operations shall comply with the NSLS-II requirement of the six (6) foot fall rule.

8.0 ENVIRONMENTAL PROTECTION AND WASTE MANAGEMENT

The following sections provide environmental protection and waste management requirements for construction activities associated with the NSLS-II project.

8.1 Storm water Pollution Prevention and Control

Prior to mobilization to the site, perform an inspection of equipment containing liquid systems including, but not limited to, bulldozers, backhoes, bobcats, drill rigs, trucks, hoists, and cranes, to ensure no leaks exist. Verify hoses, tubing, and hydraulic lines are in good operating condition. Make all necessary repairs before delivery of equipment or vehicles to the site. The use of biobased hydraulic systems is encouraged.

Perform daily inspections to ensure continued good operating condition of equipment and promptly repair all deficiencies.

Store all materials indoors or otherwise protected from weather.

For outdoor painting operations, minimize overspray, and use tarps/vacuums/enclosures to contain sandblasting waste and paint chips from paint removal operations.

Minimize all potential for spills. Specifically, do not allow liquids, including (but not limited to) gasoline, diesel fuel, lubricating oil, or antifreeze, to enter the storm sewer systems, waterways, drainage ditches, or the ground.

Use due caution when operating oil-bearing equipment near aquatic resources. Where necessary, implement appropriate control measures, including but not limited to the use of physical barriers (plastic or tarps, berm, etc.) and/or absorbent materials to prevent leaks or spills from entering waterways.

Maintain a 25-ft minimum buffer zone from streams, be aware of storm drain inlets, and cover or contain debris stored outside.

Flushing empty concrete trucks or dumping excess concrete is prohibited. Transport excess concrete back to the batch plant. The truck chute may be washed at the work site. Flush the truck chute at an on-site location designated by the ESH Manager. Solidified cement waste from truck chute cleaning is solid waste and shall be cleaned up and transported to the landfill.

Conduct all pipeline sterilization, flushing, hydro-testing, etc. in a manner protective of the environment. The ESH Manager will designate the approved discharge location(s).

Water used to sterilize or flush pipelines should not be released uncontrollably to the environment, due to a possible high concentration of chlorine. The ESH Manager will determine the appropriate means of waste disposal.

Storm water that has accumulated in excavated areas, chlorinated rinse water, and chlorinated water used to sterilize/flush pipelines shall not be directly discharged or otherwise allowed to enter the storm systems, waterways, or drainage ditches without written approval from the ESH Manager.

8.2 Erosion Prevention and Sediment Control

Manage excavated soil and spoil material in a manner protective of the environment. Cover stockpiled material to prevent erosion and/or install appropriate sediment controls. Use due caution during excavation or any other soil management in the vicinity of sanitary or storm systems, waterways, or drainage ditches.

All erosion prevention measures and sediment controls (silt fence, straw bales, catch basins, etc.) shall be in place and approved by the Project Safety Manager prior to beginning land clearing, excavations, road building, etc. Sediment barriers such as silt fence and straw bales shall be entrenched and of sturdy construction.

EWH shall inspect erosion and sediment controls on a weekly schedule, prior to expected storm events, and after each heavy rainfall event. Document each inspection. Damaged control measures shall be attended to within eight hours of the time of discovery.

Where appropriate, provide temporary or permanent modifications to surface terrain gradient (soil or crushed stone berm, sediment retention basins, etc.) in order to minimize the flow of storm water into or out of excavated or otherwise disturbed areas.

All erosion and sediment control measures shall be maintained throughout the course of the project and removed at the completion of the project, and appropriate measures shall be taken to return the area to its previous state. Maintenance

shall include but not be limited to removal of accumulated sediment, repairs, and/or replacement of storm-damaged or otherwise deteriorated structures.

All disturbed areas shall be stabilized as soon as practicable by appropriate means, including but not limited to the use of mulch or other temporary cover, seeding with native vegetative ground cover, etc.

8.3 Spill Prevention and Control

All spills will be promptly reported to the Project Safety Manager. The Project Safety Manager will then notify the BNL Environmental and Waste Management Services Division, who will notify the appropriate regulatory agency.

All spills of petroleum-based materials to soil or water, regardless of quantity, must be reported to the New York State Department of Environmental Conservation. Notifications must therefore be made immediately upon spill discovery.

The responsible contractor will perform or pay for proper cleanup of accidental releases of materials. Cleanup is to be done by properly trained personnel meeting the requirements of 29 CFR 1926.65(q) (6). All waste from the cleanup must be packaged, transported, and disposed of by a licensed entity. The Project Safety Manager must be given a copy of the hauler's manifest.

Depending on the materials spilled, the NSLS-II Project Safety Manager may require the responsible contractor to hire a certified laboratory to take an appropriate number of soil samples to test at their laboratory. A copy of the results is to be given to the Project Safety Manager.

For inside work, provide a spill kit, prevent spills to floor drains and do not discharge waste into any BNL system.

For outside work, provide a spill kit, inspect equipment for leaks, and repair leaking equipment in a timely manner.

During extended periods (e.g., overnight) of non-use, construction equipment should be located over impermeable surfaces to minimize release to soils. If an impermeable surface is not readily available, the equipment should be underlain by a geomembrane or plastic tarp.

8.4 Waste Management

This project is applying for Leadership in Energy and Environmental Design (LEED) certification. To this end:

- EWH shall provide containers and/or transport vehicles for excess property for salvage, universal waste, sanitary/industrial waste, and construction/demolition debris.
- Waste Minimization principles shall be incorporated in all activities to ensure the greatest environmental benefits and minimize future liability for the waste that is generated.
- All work shall be performed in a manner that maximizes salvage. Recycling and waste disposal to landfills shall be minimized.
- Characterization methods and procedures shall be employed by all parties to the contract to ensure that the characteristics of the waste are known and adequately recorded during all stages of the waste management process.
- EWH is responsible for properly handling and disposing of all wastes generated.
- EWH will submit a Waste Management Plan for approval.

8.5 Dust Control

All subcontractors shall include the prevention of dust control in their associated PHA's. Included but not limited to: concrete cutting and chopping, tile or stone cutting, sanding of drywall compounds, sweeping, and site equipment travel.

ACRONYMS

| | |
|-----------------|---|
| ACGIH | American Conference of Governmental Industrial Hygienists |
| ANSI | American National Standards Institute |
| BNL | Brookhaven National Laboratory |
| BSA | Brookhaven Science Associates |
| CVO | Contractor Vendor Orientation |
| DART | Days Away Restricted or Transferred |
| DOE | U.S. Department of Energy |
| DOL | Department of Labor |
| EAP | Employee Assistance Program |
| ES&H | Environment, Safety and Health |
| EPA | U.S. Environmental Protection Agency |
| ISMS | Integrated Safety Management System |
| JHA | Job Hazard Analysis |
| LOTO | Lock-Out/Tag-Out |
| TLVs | Threshold Limit Values |
| MSDS | Material Safety Data Sheet |
| NFPA | National Fire Protection Association |
| NIDA | National Institute of Drug Abuse |
| NSLS-II | National Synchrotron Light Source II |
| NYS | New York State |
| OMP | Occupational Medicine Provider |
| PFAS | Personal fall arrest system |
| PHA | Phase Hazard Analysis |
| PSM | Project Safety Manager |
| PPE | Personal Protective Equipment |
| SBMS | Standards-Based Management System |