



PROJECT SAFETY, HEALTH AND ENVIRONMENTAL PROGRAM

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**Brookhaven National Laboratory
National Synchrotron Light Source II Project**

Upton, NY Torcon Project No. 09003

Tom Moon, Safety Manager

Record of Revisions

Rev. #	Effective Date	Section & Page(s) Affected	Reason for Revision
New	3/13/09		New Doc, Torcon submittal #0006
1	3/19/09	Various	Minor editorial changes to submittal #0006
2	4/06/09	Section 6; Page 8	Removed requirement for pre-employment alcohol testing
3	6/09/09	Section 26; Page 26	Modification to the distribution of the Major Long Term Safety Incentive

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Section 1: Safety Policy and Values

Torcon, Inc., the Construction Management Firm for this project, is a national leader in construction safety and health, having achieved more OSHA VPP Star Site projects than any other firm in the country over the past 15 years. Our client, the Brookhaven National Laboratory (BNL), shares this all-out commitment to safety. The value of safety in all operations, including construction, is well-expressed by the Laboratory Director in the BNL Safety Policy on the following page.

The goal of the construction team, including Torcon, contractor companies, the union construction trades and the BNL Safety Department, is to work together to carry out these values throughout the National Synchrotron Light Source II Project to achieve zero accidents. We ask for your cooperation and efforts to achieve this high standard for the safety of our dedicated workers and the environment.

Environmental, Safety, Security, and Health Policy

Brookhaven National Laboratory

This document is a statement of BNL's ESSH policy. BNL is a world leader in scientific research and strives to demonstrate excellence in protecting people, property and the environment.

I expect every employee, contractor, and guest to take personal responsibility for adhering to the following principles:

Environment: We protect the environment, conserve resources, and prevent pollution.

Safety: We maintain a safe workplace and we plan our work and perform it safely. We take responsibility for the safety of ourselves, coworkers and guests.

Security: We protect people, property, information, computing systems, and facilities.

Health: We protect human health within our boundaries and in the surrounding community.

Compliance: We achieve and maintain compliance with applicable ESSH requirements.

Community: We maintain open, proactive and constructive relationships with our employees, neighbors, regulators, DOE, and our other stakeholders.

Continual Improvement: We continually improve ESSH performance.

In addition to my annual review of BNL's progress on ESSH goals and adherence to this policy, I invite all interested parties to provide me with input on our performance relative to this policy, and the policy itself.

Signed



Sam Aronson, Director

September 6, 2006

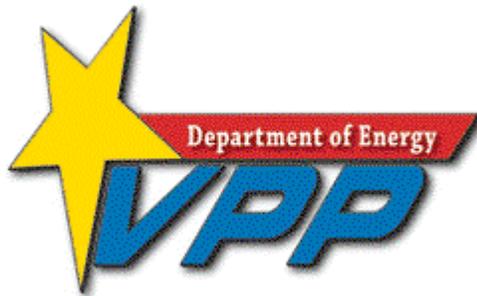
Section 2: Safety Programs Governing this Project

This construction project is governed by the Standards Based Management System of Brookhaven National Laboratory, the Torcon Safety, Health & Environmental Program Policies and Procedures Guide, the U.S. Department of Energy (DOE) Worker Safety and Health Program (10 CFR Part 851), and the OSHA standards for construction (29 CFR Part 1926).

This Project-Specific Safety Program discusses how these requirements will be implemented and managed on the National Synchrotron Light Source II (NSLS-II) Project. In some sections, this program will reference the more detailed requirements in either Torcon's or DOE's safety program manuals. If your scope of work on the project will require you to follow these detailed procedures, the Torcon Safety Manager can provide copies of these policies and any related forms.

Feel free to contact Tom Moon, the Torcon Safety Manager at tmoon@torcon.com or (973) 277-7227 with any questions.

Section 3: Department of Energy Voluntary Protection Program Commitment



Torcon, Inc., the Construction Manager on this project, is committed to the highest standard in workplace safety and health, with a goal of zero accidents. The safety program of this project is based on the principles of the DOE Voluntary Protection Program (DOE VPP). This program sets a high standard, by which the goal is not merely compliance with regulations, but giving workers the safest workplace possible each day. This requires

consistent communication, lines of accountability for safety, thorough pre-planning and daily monitoring of the work as the project progresses.

The principles laid out by the DOE for the VPP Program include:

- Management leadership for safety and employee involvement in safety
- Worksite analysis to identify safety and health hazards
- Hazard prevention and controls
- Proper safety training and information to supervisors and employees

By following these principles, Torcon and all of their contactors are committed to a safe and healthy workplace through all phases of this project.

Section 4: Integrated Safety Management System (ISMS)

In order to live up to the safety commitments above, Torcon and BNL will follow a system that integrates safety into every phase of the project, from concept through finish construction.

The project will achieve this by using the Integrated Safety Management System (ISMS) set forth in the BNL Construction Safety Plan. This system lays out clear responsibilities and lines of authority for safety in all BNL operations. The core functions of the ISMS are:

- Defining the scope of work
- Identifying and analyzing the hazards involved
- Developing and implementing controls to eliminate or minimize hazards
- Performing the work utilizing the identified controls
- Providing feedback for continuous improvement in safety

Section 5: The BNL Stop Work Policy for Safety

All personnel (workers, visitors, and guests) 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 orientation are deemed to have been trained in this policy.

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

If you see a situation that is immediately dangerous to life, health or the environment, simply state: "**Stop work! You are in imminent danger because...**" and give the reason you have seen to those you are stopping.

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. Contact the Torcon supervisor on site immediately, and the appropriate Torcon and BNL officials will assess the situation and take needed corrective action before allowing any work to continue.

Torcon will provide a Stop Work Notice form to the employee issuing the order. This is used to record the verbal Stop Work order. When corrective action has been confirmed by NSLS-II project management, the work will be allowed to continue.

Section 6: Drug-Free Workplace Policy

The Drug-Free Workplace Policy will be covered with all employees during orientation. All project participants are subject to pre-employment drug screening prior to start of work on site. A post-incident or post-injury screening may also be conducted at Torcon's or BNL's discretion.

All subcontractor companies are responsible for having their workers and supervisors drug tested and the cost of the testing prior to arrival on site with a **ten-panel drug screen**. Torcon

will recommend a testing laboratory. The worker must present the card or record of the test when first reporting to the site for orientation.

BNL Policy Statement: The unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in this workplace. A single violation of such prohibition shall result in the offending individual being removed from the jobsite . . . and 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.

Employee Medicines and Medical Conditions: If you have a medical condition that could affect the safety of others or yourself in the workplace, or if your condition requires you to bring medication with you to work, it is suggested that you notify the Torcon Safety Manager. Arrangements can be made for you to have access to your needed medications without penalty under this policy, and your medical privacy will be respected.

Knowledge of your medical condition may also assist in your treatment, should you have a medically-related incident on site.

Section 7: Occupational Medicine Program

The DOE Worker Safety and Health Rule (10 CFR, Part 851, Appendix A, Section 8) requires all workers and supervisors on the project over 30 days in a twelve-month period to be covered by the Occupational Medicine Program (OPM) to ensure their health throughout the job. This program is under the direction of a licensed medical doctor, and carried out by licensed medical professionals.

The program requires a pre-employment physical examination for each covered worker, which will determine the worker's fitness for duty, and any baseline exposure monitoring that may be required by the physician, based on the worker's job duties. These examinations and

the cost are the responsibility of each subcontractor. Torcon will recommend the Occupation Medicine Physician.

In the event of injury or work-related illness, these physicians will evaluate and treat the worker and facilitate an appropriate return to work, with any restrictions necessary. This team of health professionals may also assist in exposure monitoring or advising on workplace hazards.

In addition, Torcon will also provide a project nurse's station, staffed during normal working hours, for first aid when there are more than fifty workers on site. Many of the Torcon and subcontractor personnel are also trained in first aid. First aid kits are to be provided by the contractors in their work areas or offices.

Section 8: Contractor Pre-Qualification and Certification Letter

All contractor companies must meet safety pre-qualification standards set forth by Torcon and BNL before being allowed to work on the project. In order to meet the high safety standards of this project, firms must consider safety an integral part of their mission and corporate values.

Contractors at all tiers must submit a completed Certification Letter with all required information to the Torcon Safety Manager before they can commence work on the project. The letter commits your company to follow all required safety procedures, and must be signed by an officer of the company. A copy of this letter is Article 1 in the Appendix. Pre-qualification documents submitted with the letter must include:

1. Your OSHA 300 Logs and 300A Summaries for the past 3 years
2. A copy of your Corporate Safety, Health and Environmental Program and Hazard Communication Program
3. Environmental compliance records for the past five years (if applicable) including any fines or Violation Notices received

4. A letter from your insurance carrier confirming your experience modification ratio for the past 3 years.

The Certification Letter and the additional information above should be submitted two weeks prior to your company's start of work on site for review and approval by the Torcon Safety Manager. Work by the contractor may not begin until all information is submitted and approved.

Section 9: Contractor Pre-Construction Safety Submittals

In addition to the information above, BNL and Torcon safety procedures require safety-related submittals to be **received and reviewed** by the Torcon Safety Manager or Superintendent **before each contractor may commence their work on site**. These are required to ensure:

- Proper pre-planning of all work for safety
- Adequate safety training of all workers and supervisors
- All required safety information is available onsite during the work

These should be submitted **at least five (5) working days in advance** to allow time for review by Torcon. Late submittals can cause a delay in the start of work activities on site.

Five Safety Submittals Required of ALL Contractors

1. A written **Project-Specific Safety Plan**. This will include a statement of your scope of work on the project and Phase Hazard Analyses (also called Job Safety Analyses) for all major tasks involved in your company's scope of work on the project. This plan also includes naming your responsible supervisor(s) for safety issues.
2. One copy of your company's written **Corporate Safety Program**. This should also include your written **Hazard Communication Program** for firms using any chemicals on the site. (This may **not** be substituted for #1 above. A *project-specific plan* is also required.)
3. A letter on your company letterhead including the following **four** statements:

That all of your workers have received all required safety training for their jobs (including fall protection and hazard communication training if applicable). Be sure to mention any other specific training applicable to your work.

Your company's agreement to participate in the DOE VPP Star Site program on this project. If the project meets the requirements after one year of construction, it may apply to DOE to become a **VPP Star Site**. This is a prestigious program, and requires all firms working on the project to agree to participate. The VPP program is discussed in Section 3 of this program.

Name of your representative to the Labor/Management Safety Committee for the project. This committee will meet weekly throughout the project. ALL contractors on site must send a field supervisor or union shop steward to this weekly meeting. This should be a field person, not an office person.

Name your competent supervisor(s) for safety issues on site. This supervisor must possess the OSHA 30 Hour Course. Include his/her cell phone number and an off-hours emergency telephone number. Also provide the **name and phone number of your company's Safety Director** or chief safety officer.

4. A binder of **Material Safety Data Sheets** (MSDS's) for all chemicals you will be using on site including an inventory list of these chemicals in the front of the book. This list is required by the hazard communication standard. No chemicals may be delivered to the site until this information is received.
5. Documentation that your competent supervisor for safety issues on the site has received the **OSHA 30 Hour Course in Construction Safety**. A copy of the **training card** is required, and may be furnished when the supervisor arrives on site.

Required of all contractors if they pertain to your operations:

1. Individual **worker training cards or records** – Copies submitted to the Torcon Safety Manager before the worker begins working for these or other types of work:
 - Powder actuated tools (model-specific)
 - Confined space entries
 - Erecting, dismantling or using scaffolds
 - Forklift operation
 - Excavations

- Lasers
2. For Crane Lifts – A written **Lift Plan** including layout diagrams, maximum load to be lifted, rigging procedures, copy of annual crane inspection, and percentage of crane capacity must be submitted at least 48 hours in advance. **Lifts may not exceed 75% of rated crane capacity on the load chart**. Crane requirements are discussed specifically in Section 37 of this program.
 3. For Crane Operators – When the crane arrives on site, the contractor supervisor is to provide copies of the **operator's state and national licenses, medical clearance card and annual and daily crane inspections** to the Torcon safety manager before lifting begins.

Section 10: Pre-Construction Meetings with Torcon

The Torcon Superintendent or Safety Manager will schedule a pre-construction meeting with each subcontractor's Project Manager or Superintendent. The NSLS-II Construction Safety Engineer will also attend. **This meeting cannot be held until the contractor has submitted his Project-Specific Safety Plan with his phase hazard analyses (PHA's) to the Torcon Safety Manager.**

At this meeting, safety requirements for the contractor's scope of work will be discussed and guidance will be provided for any changes needed in the PHA's provided by the contractor. Any contractor questions regarding safety or administrative aspects of the job will be clarified. This prevents delays when contractor personnel arrive on site to begin work.

Section 11: Pre-Planning of All Construction Work (PHA's)

Each contractor superintendent will break his scope of work down into major jobs to be performed by his workers and write a Phase Hazard Analysis (PHA) for each job. (These are sometimes known as Job Safety Analyses).

The PHA is commonly a three-column analysis. It lists the steps involved in the work on the left side, the hazards involved with each step in the center column and the preventive or

protective measures to be implemented with each step in the right column. A sample PHA form is Article 2 in the Appendix. This PHA form is also available electronically from the Torcon Safety Manager (tmoon@torcon.com). Contractors are free to use the form provided or another format so long as it contains all of the same information, including signoffs by Torcon, the supervisor and the workers.

PHA's should be submitted to the Torcon Safety Manager at least three working days in advance of the pre-construction meeting to provide time for review and changes if necessary. Once reviewed and signed off by Torcon, the PHA must be reviewed by the foremen in the field with their workers. Each worker will sign off on the PHA form indicating that he has reviewed the requirements and will abide by them during the work.

Copies of all completed and signed PHA's will be submitted to the Torcon Safety Manager for the project records. **Work for any given job may not begin until all affected workers have read and signed the applicable PHA.** PHA's will be displayed near the work areas so the requirements can be reviewed by workers or supervisors periodically as needed.

If job conditions change during the work, requiring a deviation from the original PHA, the Torcon Superintendent or Safety Manager will require an addendum or new PHA to be completed, reviewed, and signed before work can continue.

The NSLS-II Construction Safety Engineer will also review all PHA's. This review will be coordinated by Torcon.

Section 12: Worker and Supervisor Training Requirements

All workers on the project are required to possess all safety training applicable to their jobs, **and the OSHA 10 Hour or 30 Hour Course in Construction Safety.** Each subcontractor must have on site a competent supervisor responsible for safety issues. This supervisor must possess the OSHA 30 Hour Course in Construction Safety, and a copy of this training card must

be submitted to Torcon. A sample letter designating a competent supervisor is Article 19 in the Appendix.

Workers must submit documentation of their training to the Torcon Safety Manager prior to beginning any of the following types of work, or others as applicable:

- Excavations
- Powder Actuated Tools
- Confined Space Entries
- Forklift Operation
- Erecting, Dismantling or Using Scaffolds
- Lasers

All workers using hazardous chemicals on this project must be trained in Hazard Communication (29 CFR 1910.1200). Each subcontractor using any chemicals in their work is required to submit a letter to the Torcon Safety Manager stating that their workers are Hazcom trained. Hazcom requirements are discussed in detail in Section 22 of this program.

Section 13: Site Access and Safety Orientations

In order to receive a site Security Badge, each employee must present the following credentials:

- A government-issued photo ID, such as a driver's license or passport
- Proof of Social Security Number, such as the Social Security Card, a pay stub, or bank statement with the employee's name and SSN on it.

Security badges must be worn visibly at all times on lab property. Every worker and supervisor on the project is required to attend the BNL Contractor Vendor Orientation (CVO) and the Torcon Project Safety Orientation on his/her first day of work on the project.

Pre-employment drug/alcohol testing and Fitness for Duty physical examinations, if required, must be completed before reporting to the site. This is discussed in detail in Section 6 of this program.

No one will be permitted on the project site before going through both orientations, except approved and escorted visitors. These presentations cover the safety requirements of

both BNL and Torcon. Safety, security, health and environmental expectations, rules and accountabilities are also discussed.

New workers must report to the Main Security Gate at 8:00 am to be escorted in for orientation. New workers not arriving in time for the orientation will not be allowed to enter the construction site that day.

Section 14: Initial and Daily Inspections of Heavy Equipment

The first time a piece of heavy equipment or machinery is brought onto the BNL site, it must be inspected for safety and leaks prior to entering the site. Be sure to allow time for this inspection by BNL before the arrival of your equipment to the work area. BNL prefers to perform this inspection off site for larger equipment and cranes, before it is brought to the BNL facility. Please contact Torcon to coordinate this inspection as early as possible for larger equipment or cranes.

BNL requires at least 48 hours advance notice of all equipment being brought in to arrange for the inspection. This inspection applies to equipment such as generators, manlifts, and compressors, as well as larger equipment.

Once on site, each piece of machinery or equipment is also to be inspected daily by the contractor for leaks and good working order, including safety guards, backup alarms, etc. **This daily inspection is documented on the Daily Inspection Form for Contractor Equipment.** A copy of this form is Article 11 in the Appendix. Each day, this form is to be filled out and turned in to the Torcon Safety Office. Forms are available from the Torcon Safety Manager.

All vehicles and equipment must be parked overnight on a hard surface road or on tarps to capture any leaks from the equipment.

Section 15: Labor/Management Safety Committee

Each contractor company active on the project is to designate a field supervisor or shop steward to attend the weekly Labor/Management Safety Committee meetings. This committee is co-chaired by the Torcon Safety Manager or Superintendent, and trade representatives on a rotating basis. These meetings last about 30 minutes each week, and are sometimes followed by a group inspection of the jobsite by committee members.

The purpose of the committee is two-way communication on safety issues between Torcon and the subcontractors, including inspection findings, near misses or injuries, suggestions for improvement of safety on the job and any BNL safety concerns. Subcontractors can also coordinate their upcoming operations with each other at this meeting to avoid safety conflicts in the coming week's work.

Written minutes of this meeting provide information to be shared with the workers at the weekly Tool Box Safety Meetings and the project management team.

Section 16: Weekly Tool Box Safety Meetings

Each week, at the Labor/Management Safety Committee meeting, the Torcon Safety Manager distributes the topic for the weekly Tool Box Safety Meeting. Each contractor supervisor is to hold this brief meeting with his workers, including any relevant information from the Safety Committee meeting that pertains to his workers. The subcontractor supervisor is free to use a different safety topic for the meeting if desired, in order to keep the topics relevant to the work. Current job tasks and conditions should also be discussed in this meeting.

The workers are encouraged to give any feedback, suggestions or questions in this meeting, so they can be addressed by subcontractor or Torcon management. The

documentation of this meeting, including worker signatures, is to be turned in to the Torcon Safety Manager by the end of each week.

Section 17: Personal Protective Equipment (PPE)

Engineering controls and administrative procedures should be used as the first lines of defense in protecting workers. When these are not adequate or feasible, which is often the case in construction, personal protective equipment must be used.

On this project, in all construction areas, all workers must wear:

- **ANSI-approved hard hats**
- **ANSI-approved safety glasses**
- **Reinforced-toe safety work boots** (marked ASTM F2413)
- **Bright, reflective vests or shirts** for visibility of workers
- **Task-appropriate gloves** - Lacerations constitute almost 50% of all injuries in construction. Task-specific gloves are to be provided by each contractor for their employees. Each contractor must furnish appropriate hand protection to their workers on the project. **Gloves are to be worn for all work unless a specific exemption is given in writing by Torcon in the approved PHA** for the work (discussed in Section 11 of this program). Selection of the proper types of gloves is the responsibility of each contractor to protect from cuts, chemicals, temperature or other hazards in their work. Gloves without fingertips may be approved by Torcon for jobs requiring high manual dexterity.

Compliance with PPE requirements will be enforced by the subcontractor supervisors and Torcon management. Supervisors who allow their workers to work without required protective equipment will be disciplined under the Project Disciplinary Program (Section 20) up to and including dismissal from the project.

Additional PPE must be provided by the contractor and used by the workers for applicable hazards, such as face shields, ear plugs, ear muffs, respirators, etc. Required PPE for each job is to be identified in the PHA for that job.

Appendix D of the OSHA Respiratory Standard must be reviewed by each employee who voluntarily wears dust masks on the project. This information sheet is included in the Appendix of this plan (Article 20.)

Section 18: Emergency Evacuation Procedures

Two different types of emergency evacuations can take place on the project: A **BNL Laboratory-Wide Evacuation**, or an **NSLS-II Project Site Evacuation**.

BNL LABORATORY-WIDE EVACUATION SIGNALS

There are two different lab-wide siren signals for site-wide emergencies:

- A **complete evacuation** of the lab site - **intermittent siren tone for five minutes**.
- Evacuation to our **indoor assembly areas** - **steady siren for five minutes**.

For a complete site evacuation, personnel will be required to evacuate the entire BNL site via the quickest route or as directed by BNL police or other emergency services personnel.

For the indoor assembly area evacuation, workers will report to the designated indoor areas on the site evacuation map (Article 3 in the Appendix) which is posted conspicuously on site.

When the siren is heard, all workers must:

- Secure their work area by turning off compressed gas bottles or generators, shutting down mechanical equipment, securing any material that could fall, etc.
- Proceed immediately and quickly (without running) to the nearest building exit and then to the plant exit or indoor assembly area indicated in the Emergency Plan Diagram.
- Workers are to gather by company with their supervisors. Supervisors will report any missing workers to Torcon, and BNL Police will be alerted to conduct a search for anyone missing.

NSLS-II PROJECT SITE EVACUATION

If you discover any emergency situation, **do not call 911**. Call the . . .

BNL Emergency Number
(631) 344 – 2222 from a cell phone
or Ext. 2222 from a Lab Land Line Phone

This call notifies BNL Security, Fire and Rescue, and Safety Department of the situation. **All supervisors must program this number into their cell phones.** After this call, be sure Torcon and your supervisor are notified of the situation. **Air horns** (repeated long blasts) will be used as the emergency evacuation signal during construction until the building alarm systems are installed and functional. They have been placed near entrances to the Ring Building, along with fire extinguishers for general use.

Upon hearing the evacuation signal, secure your area as stated above, and quickly leave the building (without running) by the nearest exit. Report to the muster area as indicated on the evacuation map in the Appendix (Article 3).

Gather with your supervisor for the head count. Supervisors will report their head counts to the Torcon Superintendent or Safety Manager. Anyone missing from the head counts will be reported to BNL Fire and Rescue, who will perform a search for missing workers in the building. Do not re-enter the building area until you are given the all-clear by a member of the BNL Safety Department, Fire Department or Police.

Torcon will conduct random evacuation drills during the project to confirm that everyone understands and follows these procedures. BNL also holds lab-wide emergency drills randomly, so honor any siren signal, unless informed otherwise in advance by Torcon.

Section 19: Procedures for Injuries, Near Misses, and Fires

All injuries and near misses, and other incidents, such as fires or vehicle accidents, must be reported to Torcon immediately. The first priority will be to ensure that any needed first aid or medical treatment is administered and the scene is secured. Torcon will report the incident to the NSLS-II Construction Safety Engineer.

Any minor injuries on site will be reported to the Project Nurse's Station for followup or first aid treatment. BNL has an on-site Fire and Rescue Department, which can be reached at the emergency number below.

Injury and Incident Investigations

Injury and incident investigations will be conducted by the Torcon Safety Manager, the NSLS-II Construction Safety Engineer and the subcontractor supervisor to identify causes, contributing factors and lessons learned from the incident.

The Torcon Subcontractor Report of Injury/Illness form (Article 4) or the Report of Incident or Near Miss without Injury form (Article 5 in the Appendix) is to be submitted to Torcon by the subcontractor supervisor within 12 hours of the incident. The Torcon Safety Manager will forward this report, along with the BNL Accident/Incident Investigation Report, to the NSLS-II Construction Safety Engineer within 24 hours of the incident. A supplemental report may also be requested if the investigation requires more than 24 hours of followup.

If injuries or near misses are found to have arisen from safety violations, disciplinary action may also be taken against individual workers or supervisors if warranted. Anyone involved in a near miss or injury situation may be required to get substance-abuse tested at the discretion of Torcon or the NSLS-II Project Management. The Drug-Free Workplace policy is discussed in Section 7 of this plan.

All injuries and near misses will be discussed with the Labor/Management Safety Committee at the next meeting so that lessons learned can be applied as the work progresses.

The Torcon Safety Manager will investigate and report on any fires on site. All fires, no matter how small, must be reported to Torcon immediately. A lesson learned from a small fire may prevent a catastrophic fire down the road.

Use the BNL Emergency Number to report any emergency:

(631) 344 – 2222 from a Cell Phone

or Ext. 2222 from a Lab Land Line Phone

Medical

Security

Fire

Section 20: Project Disciplinary Program

Torcon's approach to safety seeks to build a cooperative teamwork between project management and subcontractors in which everyone pulls together to achieve a safe workplace.

Through implementing the DOE Voluntary Protection Program principles, discussed in Section 3 of this program, our goal is to achieve a safe job emphasizing a good, proactive safety attitude rather than punishments.

Safety Violations can be issued by Torcon managers or BNL Safety Engineers when unsafe acts, unsafe conditions or a rule violation is discovered. Violation notices are given in two forms:

- **Safety Concern Form** – This form documents a less-serious safety problem and how it was corrected. A copy of this form is given to the worker and his supervisor. (Appendix Article 6)
- **Safety Violation Form** – Documents a more serious or repeat violation that is more likely to cause injuries. Whenever this form is issued, a meeting is held by

the Torcon Safety Manager with the worker and his supervisor to discuss prevention of further violations. If violations are issued to a supervisor, the meeting is held with the contractor Superintendent or Project Manager. (Appendix Article 7)

A worker or supervisor can be removed from the project for his first, second or third violation depending on the seriousness. A third violation automatically removes the worker or supervisor from the project.

Certain types of safety violations can result in very serious injury or death. These are known as **Zero Tolerance Violations**. A first violation of these rules will result in immediate removal of the worker from the project.

Zero Tolerance Violations include but are not limited to:

- **Violation of Six-Foot Fall Protection**
- **Confined Space Violations**
- **Lockout/Tagout Violations**
- **Drug Policy Violations**
- **Possession of Drugs, Alcohol or Weapons on Site**
- **Theft of Property or Materials**

This disciplinary program will be explained to all workers at New Hire Orientation, including the zero tolerance policy for the above categories of violations. In accordance with Torcon and BNL policies, safety compliance is a condition of employment on this project.

Section 21: Housekeeping

A cluttered work area is an invitation to trip and fall injuries, as well as fires. It is the responsibility of each trade to maintain its work areas in a neat and orderly fashion. This requires continuous cleanup of trash, scraps and debris as the work progresses each day. Walkways must also be maintained free of debris, material and equipment. All construction debris is to be placed in provided containers on a daily basis.

Torcon will provide cleanup of the general common areas of the project, but contractors will be held responsible for their work areas and materials. Backcharges to contractors may be made if Torcon finds it necessary to use its employees to clean up contractor debris. A high standard of housekeeping is expected of all contractors on this project.

Section 22: Hazard Communication (Hazcom)

Prior to the start of work every contractor is to submit their Hazard Communication Program and Material Safety Data Sheets (MSDS) for this project. This will ensure that information necessary for the safe use, handling and storage of hazardous chemicals is provided and made available to the employees on the job site.

Contractors' Hazcom programs must include these required elements:

- Chemical inventory list of chemicals on this project
- Container Labeling
- MSDS sheets for all chemicals on site
- Employee Training
- Emergency response procedures
- Hazards of non-routine tasks
- Informing other employers of hazardous chemicals in use

All subcontractors are required to have their MSDS sheets on site in their offices or trucks, available for distribution on request to any employee. Torcon will also keep copies of MSDS in the Safety Office.

Section 23: Job Site Inspections

Documented safety inspections will be performed on the project by Torcon, NSLS-II Construction Safety Engineers, and contractor supervisors. These inspections are carried out

to ensure compliance with all safety procedures and PHA's. Torcon's safety inspections are performed by the Safety Manager, Superintendents, Project Manager and Project Executive.

Experience has shown that the higher the level of compliance with safe work practices, the fewer near misses and injuries occur. The bottom line goal of all safety inspections on the project is keeping our workers safe and preventing damage to property or the environment during the work.

Each active subcontractor company will also perform a daily safety inspection of their work areas, done by a supervisor, using the form provided in the Appendix (Article 9). This safety inspection form must be completed each day that the contractor is active on the site. The completed form is to be turned in to the Torcon Safety Manager on a weekly basis.

Any deficiencies found in the safety inspections are to be corrected, with the date of correction noted on the form. If a deficiency is found that is the responsibility of Torcon or another contractor company, immediately report the situation to the Torcon Safety Manager and he will coordinate the correction of the problem.

The daily subcontractor inspection reports will be reviewed by the Torcon Safety Manager to identify trends or problem areas to be addressed by training or other action.

Section 24: Site Logistics Plan

This project is being built in the operating National Laboratory facility. The project Logistics Plan has been designed to facilitate effective construction operations with as little disturbance as possible to ongoing BNL operations or the environment.

The Logistics Plan diagram is provided as Article 10 in the Appendix. Contractors must abide by this plan throughout the project. Torcon will discuss this plan in detail with each subcontractor at the pre-construction meeting for their work. All required laydown and storage areas will be designated by the Torcon Superintendent for safety and to minimize environmental impact from the project.

Section 25: The LEED Green Building Commitment

The **Leadership in Energy and Environmental Design (LEED)** Green Building Rating System involves a set of standards for environmentally sustainable construction. Brookhaven National Laboratory would like to achieve **LEED Certification** for the National Synchrotron Light Source II facility when it is completed.

As BNL's partner in achieving this high standard for their project, Torcon will implement procedures to limit the environmental effects of the project, including:

- Proper storage and handling of construction materials
- Parking vehicles and construction equipment on non-porous surfaces to prevent leaks into the soil
- Separation and recycling of construction debris wherever possible
- Protecting against soil erosion and runoff from construction operations

Locations for recycling dumpsters are in the Site Logistics Plan. All contractors must place recyclable debris in the appropriate labeled dumpsters for removal from site.

Section 26: Safety Incentive Programs for the Project

Major Long-Term Safety Incentive:

Brookhaven National Laboratory has provided for a generous long-term safety incentive for the project totaling **up to Two Million Dollars (\$2,000,000.00)** over the life of the project. Earning this incentive requires an extremely low number of injuries, and a very high level of safety compliance throughout the job.

This incentive, if achieved, is paid as follows: Fifty percent (50%) will go to the union tradesmen, apportioned to the workers based on their manhours worked during the incentive period. Twenty percent (20%) of any incentive will go to the contractor companies, and five

percent (5%) to Torcon field supervision. The remaining twenty-five percent (25%) will be distributed to Torcon. Any workers or contractor companies receiving a violation during the incentive period will be disqualified from receiving a safety incentive payment.

Short Term Safety Incentives:

Over the course of the three-year project, Torcon will also implement short-term incentive or reward programs for outstanding safety leadership or compliance. The Labor/Management Safety Committee will be given input into what programs are offered.

These may include:

- Monthly safety awards
- Above and beyond awards
- On-the-spot awards
- Safety suggestion awards
- Safety awareness luncheons
- Team safety awards

Torcon uses these programs to reward workers and supervisors for showing the extra diligence and professionalism it takes to achieve high levels of safety on a large and complex project such as the NSLS-II facility.

Section 27: Fall Protection

All subcontractors whose workers will be using fall protection on the project must provide a letter on company stationery confirming that all such workers have had fall protection training (a safety submittal required in Section 9 of this program).

All workers on this project exposed to a fall of six (6) feet or greater shall be protected by an appropriate fall protection system. There are NO EXCEPTIONS to this rule, including steel erection or metal exterior panel installations. Anyone needing to move while using fall

protection must use a double lanyard, horizontal lifeline, or equivalent to afford 100% protection while moving at height.

Anyone needing to remove a fall protection device already installed, such as a guardrail or hole cover, must submit the Torcon Fall Protection Removal Permit (Article 16 in the Appendix) and have it approved by the Torcon Safety Manager or Superintendent before the removal of the protection. This is to ensure that other workers will not be exposed to a fall hazard by the removal, and that protection is replaced as needed before the permit is cancelled.

Section 28: Confined Space Entries

Confined space work will be conducted in accordance with OSHA standard

29 CFR 1910.146 and Torcon procedures. Requirements include, but are not limited to:

- Specific, documented training for all entrants, attendants, and entry supervisors
- Atmospheric monitoring prior to and throughout the entry
- An attendant present at the entrance at all times
- Rescue arrangements coordinated with the BNL Fire and Rescue Department
- An approved PHA customized to the conditions of the confined space
- A signed confined space entry permit will be posted at the entry site for the duration of the entry. These are issued by Torcon and approved by the Torcon Safety Manager.

Confined space permitting violations will be dealt with in accordance with the Disciplinary Program (in Section 20 of this program)

Section 29: Manlifts

On this project, all workers using a scissor lift, boom lift or vertical lift must be trained in the use of the lift and in fall protection. **All workers in manlifts must be tied off at all times in**

the lift using a harness and lanyard anchored to an engineered anchor point in the lift. This includes scissor lifts.

All manlifts must be regularly maintained, with copies of maintenance records available for inspection by BNL or Torcon upon request. Spill kits must also be furnished by contractors using manlifts in case of leaks from hydraulic lifts. All lifts will be inspected by the BNL Heavy Equipment Inspector or Construction Safety Engineer prior to entry into the site, as described in Section 14 of this program.

After this, the contractor must inspect the lift each day using the procedure in Section 14.

Section 30: Hazardous Work Permits

Work permits are required for certain hazardous and critical operations on the job. This is to ensure that all necessary safety precautions have been taken. The permit issuer may require pertinent training documentation to be shown before a permit is issued.

These permits are issued by Torcon, and require at least 24 hours advance notice:

- Hot Work – 20 lb. ABC fire extinguisher required
- Excavations (Digging Permit – 48 hours notice)
- Confined Space Entries
- Penetration Permits (such as core drilling)
- Fall Protection Removal Permit (for removal of guardrails)
- Line Breaking Permit (for opening charged piping systems)

All permits are to be returned to the Torcon Safety Office upon completion of the work. All permit conditions must be followed unless a variance is granted **in writing** by Torcon stating the reason for the variance and any alternate protective measures to be used. Permit form copies are included in the Appendix, Articles 12 - 17.

Section 31: Scaffolding

Anyone using any type of scaffolding on the project must be trained in the use of that type of scaffold. Scaffold erectors and dismantlers must have documented scaffold erection training. Training documentation for users or erectors of scaffolds must be submitted to Torcon prior to beginning work.

All scaffolds must be completely braced and erected on a solid, level surface. This includes base plates on all stationary scaffolds as a minimum. **All scaffolds on the project, six feet or greater in height, must have a full guardrail system with toeboards for the protection of workers.** This includes Baker Scaffolds if six feet or higher.

Each scaffold must be inspected at the start of every work shift or after modification by the subcontractor competent person. The Torcon scaffold inspection form (copy in the Appendix, Article 8) must be filled out by the competent person each day **before** the scaffold may be used, and posted on the scaffold. Any deficiencies noted in the inspection must be corrected before workers are allowed to use the scaffold.

The inspection form must be hung from the scaffold during the work day in a visible tag holder provided by Torcon. The Torcon three-color scaffold tag system must also be used on all except baker scaffolds. The inspector attaches the appropriate color tag based on scaffold conditions:

- **Red Tag – Do Not Use. Scaffold is incomplete or under construction. Only scaffold erectors may enter.**
- **Yellow Tag – 100% Fall Protection Required.** To be used if full handrails are not possible on all areas of the work platform.
- **Green Tag – Scaffold is complete** and may be used by trained workers.

Tags and inspection forms can be obtained from the Torcon Safety Manager.

On scaffolds two levels and higher, the level below the active work platform must be fully planked. All stationary scaffolds must have a stair tower or ladder provided for access, tied off to the scaffold. Climbing of scaffold cross braces is prohibited.

One subcontractor's workers may not use another contractor's scaffolds without written permission from the scaffold owner. A copy of this permission letter must be filed with the Torcon Safety Manager.

Section 32: Soil Management

Any soil disturbed shall follow the BNL environmental requirements. Soil that will be excavated on this project MUST have prior authorization by Torcon. Authorization shall be requested at least 48 hours prior to the work. Planning phase meetings must be initiated by Torcon prior to planned work to discuss extent of work, soil concerns, disposal/reuse, personal protective equipment, sampling needs, underground utilities, permits, etc.

Soil piles will be covered with a tarp or other impervious material where necessary to prevent erosion and dust generation. Controls must be in place around the perimeter of piles to reduce the potential for soil run-off into catch basins or surrounding areas. Area catch basins must also be protected from soil run-off by utilizing fiber fabric, hay bales, or other means of protection, as designated in the PHA. Maintenance of this is the responsibility of the subcontractor.

Section 33: Excavation and Trenches

Excavations on the project will vary in depth up to twenty feet. Torcon will work with the subcontractor to complete the Digging Permit, and PHA. The subcontractor must submit workers' excavation training verification to Torcon before the work begins, including the training of the competent person supervising the excavations.

A permit is required for any excavation six inches or deeper. A copy of this permit must be posted at the excavation at all times. Prior to approval, the Soil Management process must be completed where applicable (in Section 32 of this plan).

Some excavations may require a confined space permit. All excavations will be reviewed with the Torcon project team and the BNL Safety Department to determine if the excavation is deemed a confined space based on depth and configuration. If the excavation is deemed a confined space, the subcontractor will be responsible to so identify by posting signage at the excavation and using confined space-trained workers.

Torcon will coordinate any utility markouts required for excavations. The subcontractor along with the Torcon project team shall review all BNL site underground utility drawings to determine any potential interference prior to any excavation procedure. Scanning equipment may be required to determine exact locations of interferences.

Areas to be excavated having environmental concerns shall be evaluated by specially trained personnel, and work shall be performed by certified personnel (i.e. HAZWOPER) and this certification will be verified by the Torcon Safety Manager.

All excavations will be inspected by the subcontractor's competent person daily and after rainstorms or any other occurrence that could alter the soil's characteristics for signs of danger.

Any excavation/trenching more than 5 feet deep shall be shored and/or sloped by the contractor as dictated by soil conditions, which will be assumed to be type C. Trench boxes, aluminum hydraulic shoring or designed shoring systems shall be used to prevent cave-in whenever required in the PHA.

The subcontractor's competent person shall ensure that access in and out of excavations will be provided within 25 feet of anyone working in the excavation.

All spoils shall be placed a minimum of 2 feet back from the edge of any excavation. Longer-term spoil piles may be required to be tarped if environmental impact is anticipated.

Section 34: Concrete and Masonry

The project shall conform to all OSHA, DEP, BNL requirements, and this plan. Any cutting, grinding, chipping, or demolition of concrete and/or masonry shall either utilize water for dust control or the workers must be protected by a particulate respirator. If a respirator is going to be utilized, it is the responsibility of the subcontractor to provide to Torcon verification that the workers have been medically cleared and fit tested on the respirator they will be utilizing, and provide a copy of the company's respiratory protection program to be maintained in the project file.

If workers are allowed to voluntarily use dust masks, they must be provided with the OSHA Respiratory Standard Appendix D by their employer (Copy in the Appendix, Article 20).

Concrete will be recycled whenever possible. A separate dumpster for this will be provided by Torcon.

Contractors shall guard all protruding reinforcing steel (rebar) to eliminate the hazard of impalement from falling onto it.

Contractors shall not place loads on any newly poured concrete structure, remove any forms or shoring until a qualified contractor employee and/or other person or firm as designated has made the determination that is safe to do so.

The contractor shall establish a limited access zone whenever a masonry wall is being constructed. Masonry walls must be braced by the contractor to prevent collapse or overturning. Specifics for this will be included in the PHA for the work.

Section 35: Handling and Disposal of Hazardous Materials

Subcontractor personnel shall not discharge or allow discharge of any liquids, solids, or sludge into any sewers, to the ground or any other waterway, surface or container.

Permission shall be secured by the contractor through Torcon and the BNL Environmental Protection Division for any such discharge, if deemed necessary and unavoidable.

Subcontractor personnel are required to properly dispose of hazardous waste. Hazardous waste will be placed in appropriately designated containers. No plastic fuel containers are allowed on the project. Oils, fuels, or other hazardous materials shall not be placed in normal trash containers or dumpsters nor discharged into the sewer from the site.

Any other hazardous materials to be handled must have a PHA performed designating the PPE required in handling and proper containers for storage or disposal.

Section 36: Spill/Leak Procedures

In the event of any spill or leak, call the BNL emergency phone number, (631) 344-2222. The BNL Fire Department responds to all spills on site. Also immediately notify the Torcon supervisor on site of the incident. Torcon will notify the appropriate BNL safety officials.

All spills must be immediately contained if it is safe to do so, and the spill material is identified. Spill kits are to be provided by the contractor in any area where their equipment is operating. Torcon will also provide spill kits in the project area for general use. Any cost incurred as a result of a spill shall be the sole responsibility of the subcontractor.

Notify the Torcon Superintendent or Safety Manager immediately upon the discovery of any unknown, suspected hazardous or questionable materials. Work in the area shall cease until the area has been cleared by the BNL Fire Department.

Section 37: Crane Lifts

All crane lifts must be authorized in advance and utilize a lift plan. Smaller cranes will be inspected by BNL Hoisting and Rigging Inspector or NSLS-II Construction Safety Engineer Facilities as they enter the site, and larger cranes must have an off-site inspection by BNL Facilities before they arrive on site. Contact the Torcon Safety Manager to arrange this inspection.

The lift plan is a PHA specific to the crane lift. You may use the sample PHA form provided in the Appendix, Article 2, or any other format so long as all of the information is provided, including a signoff page for Torcon approval and signoffs of the crane operator and all other workers involved in the lift.

No lift plan will exceed 75% of the rated crane capacity on the load chart. **Critical lifts require special advance approval by Torcon and BNL** with a lead time of several weeks.

Critical lifts may include:

- Weight over 50 tons
- Two or more cranes involved in the lift
- Possible release of hazardous materials
- Other unusual or hazardous impacts from the lift

Request special arrangements for committee review and approval for these lifts as early as possible to avoid delay.

Cranes must be equipped with anti-two block disconnects. All cranes assembled on site must be inspected by a third party prior to start of lifting. Christmas treeing is not allowed for lifts per Department of Energy requirements.

These are the major requirements that must be covered in your lift plan to receive approval:

- Proper crane setup (including solid dunnage under fully-extended outriggers)
- Diagram of the lift (can be very simple and hand-written) showing angle and boom length, and position with relation to roads and buildings
- Weight of heaviest lift (don't forget weight of rigging)
- Percentage of crane capacity for heaviest lift at anticipated boom length and angle

- Copy of operator's national and state licenses and medical clearance card provided to Torcon on site
- Daily and annual inspections of the crane to be provided to Torcon
- Barricading of area around the crane
- Inspection of all rigging by a competent person using the Rigging Inspection form (in the Appendix, Article 18)
- Method of communication (hand signals, radio, etc.)
- Fall Protection methods if necessary for crews receiving material
- Use of tag lines to control pieces, if applicable (Christmas treeing is prohibited by DOE requirements)
- Anything else unique to this lift (such as closing of areas of the building beneath the lift or other factors)

Section 38: Rigging Procedures and Inspections

All rigging materials, including slings, shackles, chains, etc. will be inspected as they enter the site by BNL Facilities.

Once on site, they are to be inspected prior to each shift's use by the qualified rigger for the contractor, using the Daily Rigging Inspection form provided in the Appendix (Article 18.) This form, once completed, is turned in to the Torcon Safety Manager's office. Any worn or defective equipment found must be immediately noted on the inspection form, removed from service and disposed of. **DO NOT throw it back in the gang box.**

Torcon and the BNL Safety Department will perform periodic inspections of rigging equipment in use to ensure that all equipment is in good order.

Section 39: Lockout/Tagout

Reference: OSHA standard for Control of Hazardous Energy (29 CFR 1910.147)

If you have not been trained in this OSHA standard, you may not perform Lockout/Tagout on this project.

This procedure is intended to ensure proper communication and coordination of LOTO procedures between all companies' authorized employees and affected employees in the area for safety.

Contractor companies may use their own LOTO equipment and procedures **if authorized by the Torcon Safety Manager**. This will require a review of your program and training of your workers. See the Torcon Safety Manager to request this review.

Whenever locking out a system, be sure to follow all of these steps so that no requirement is missed for the safety of your crew and others working in the area:

1. Identify the system or equipment to be locked out.
2. Identify ALL energy sources into the system. There may be more than one source of electrical, chemical, thermal, hydraulic or other types of energy.
3. Plan how all energy sources will be locked out. This may require circuit breaker locks, valve locks, power cord locks, or other energy isolation devices. Combination locks are illegal for use in lockout/tagout. There must be only one key per lock, and that key must be kept in the possession of the person working on the system. If administrative lockout of an entire system is approved by Torcon, the supervisor locking out the system must retain possession of the only key to the lock.
4. Notify any workers in the area who may be affected by your locking out of the system.
5. De-energize and lock out ALL power sources to the system. This includes bleeding off pressure in hydraulic or chemical lines and de-energizing electrical capacitors, etc. Place tags indicating 'Lockout, do not use' on each isolation device. **Tags must have a contact phone number on them and the name and company of the person** locking out the system.
6. Be sure all workers are clear and attempt to operate the system or equipment to ensure that it will not operate because all sources of power are isolated. Return valves or power switches to the 'Off' position after testing. If the system does operate, you have failed to identify all power sources. Isolate any additional power sources found and re-test.
7. Proceed with your intended work on the system. Lockouts must remain in place until the last worker finishes working on the system.
8. When work is complete, notify any affected workers in the area that the system is about to be re-energized.

9. Remove locks and tags from the system. Only the worker who placed a lock can remove it.

10. Re-energize the system to normal operation.

If a lockout is forgotten, and left on a system after work is complete, and the original worker placing the lockout cannot be located at the phone number on the tag, do NOT remove the lock. **Contact Torcon Safety for instructions. Removing another person's lockout device is unsafe, and can be grounds for dismissal from the project as a serious safety violation.**

Section 40: Energized Electrical Work

All electrical work is to be done in a de-energized state unless absolutely necessary.

Any energized electrical work must be approved by both Torcon Safety and BNL Safety Department signoff on the PHA.

All requirements of NFPA 70E will be followed rigorously for any energized electrical work authorized, and specific requirements must be included in the approved PHA. These include:

- Training of electricians in NFPA 70E requirements (documented)
- Determination and maintenance of arc flash clearance distances
- Wearing of all required PPE for personnel protection from arc flash
- Barricading of all such work areas from all other personnel. This may require such work to be done off-hours.

Where the BNL Electrical Safety Program may exceed NFPA 70E requirements, the BNL requirements will be followed.

Section 41: Industrial Hygiene

Torcon has staff trained in industrial hygiene, including a Certified Industrial Hygienist. An IH consulting firm, Omega Environmental, administrates the industrial hygiene activities, monitoring and training. A protocol developed by Omega is used in determining site hazards that may need to be monitored.

Every attempt is made to avoid exposure of employees to hazardous levels of noise, dust, toxins or other such hazards during the construction work. When such exposures cannot be avoided, personal protective equipment and engineering controls will be used as specified in the PHA's for those operations to limit the exposure or protect against the hazard itself.

Torcon personnel or our industrial hygiene firm, Omega Environmental, will monitor work areas for hazards such as noise levels, respirable silica, carbon monoxide, oxygen levels, excessive heat or any other suspected hazards during the project as necessary. These tests are to ensure that protective measures in use are adequate for the hazards in the area. The ACGIH Threshold Limit Values (TLV's) will be the standards for limiting such exposures.

Heat and Cold Stress: The TLV's have established limits of exposure to heat and cold for workers. Workers are expected to dress appropriately for the weather conditions, and keep hydrated during the work day. Water will be provided by the subcontractors on site. When heat or cold exposure limits are reached, workers will be allotted additional breaks from the conditions, as dictated in the TLV's.

Results of industrial hygiene monitoring will be made available to all contractors, and discussed in the weekly Safety Committee meetings.

During the Fitness for Duty pre-employment physical, baseline tests may be done for any exposures anticipated for a given employee, based on the type of work he performs, if deemed necessary by the evaluating physician.

Subcontractor firms are also permitted to do their own IH sampling, if coordinated with Torcon and performed by competent, trained personnel using proper sampling protocols.

Section 42: Use of Lasers

Lasers are commonly used on the construction site for surveying, leveling and other functions. Only low-powered laser devices, marked as Class 2, Class 3A or 3R, will be allowed on the project (no more than 5 milliwatts).

Anyone using lasers must have documented training furnished to the Torcon Safety Manager and presented upon request to any safety inspector during the work. **Any contractor using a laser must post signage in the area** warning to take caution not to stare into the beam. Laser devices are to be turned off when not in use or during breaks and lunch.

Section 43: Steel Erection

Steel Erection will be performed in accordance with the requirements of Torcon and the OSHA Standards for Steel Erection (CFR 1926.750-761 - Subpart R) with the following exception:

Any employee who is on a walking/working surface with an unprotected edge more than 6 feet above a lower level shall be protected from fall hazards (including connectors and deckers). This applies to all trades on the project. Torcon will review the PHA for steel erection before work begins. These important elements must be covered:

1. Fall protection systems
 - Fall Protection shall consist of floor periphery safety railing systems, guardrail systems, safety net systems, or personal fall arrest or restraint systems.

- Fall hazard training must be provided for all employees exposed to fall hazards.
- 2. All columns will be anchored by a minimum of four (4) anchor bolts and will comply with all requirements of CFR 1926.755.
- 3. Crane inspection by the third party should be done on the site prior to start of construction.
- 4. The crane should have anti two-block disconnect.
- 5. Prior to the start of each shift, perform and document a detailed visual inspection of all cranes, hoisting equipment, rigging equipment and materials. This inspection to be documented signed and provided to Torcon's safety coordinator for review prior to any work starting for that shift.
- 6. Provide a firewatch and all necessary fire protection/safety equipment at locations where burning, welding or other hot work is being performed. The Torcon Hot Work Permit will be used.
- 7. Loads shall not exceed 75% of the charted lifting capacity of the crane.
- 8. Christmas treeing of multiple pieces of steel is not allowed on the Dept. of Energy Site per DOE regulations. Tags lines must be used for control of loads.
- 9. Provide a site specific erection plan eight **(8) weeks prior to scheduled start of erection**. This plan is to include, but not be limited to the following:
 - a) A drawing showing:
 - Overall site layout showing derrick locations and swing radius for each crane.
 - Path for overhead loads.
 - Material deliveries and staging areas.
 - b) A narrative describing:
 - Sequence of erection activity.
 - Crane selection and placement procedures.
 - Steel erection activities.
 - Fall protection procedures.
 - Falling object protection.

- Special procedures for non-routine tasks.
 - Training certification, including fall protection and Subpart R.
 - List of qualified competent persons.
 - Rescue and emergency response procedures. BNL has an on-site Fire and Rescue Department.
 - Fall protection procedures for those installing guardrail systems consisting of inertia reels. Interior cable tie-off systems or other subcontractor submitted information for CM review.
10. Furnish, install and maintain two (2) line 3/8" cable at building perimeter and interior deck openings of every floor with turnbuckles. Cables are to be supported in such a way that when the cables in any bay are removed, the remaining cables in the other bays are to stay in place and not fall to the floor. Cables are not to be continuous for more than two bays. If the bay is more than 20'-00", install 3" x 3" x 5/16" x 48" high angle in the middle of the bay. Insert additional angle posts for guarding future material hoisting areas (as required). Maintenance (after subcontractor's work is complete) and removal of cables and supports we will be made by others.
11. Provide a double strand safety cable system at the roof perimeter and all roof openings using two (2) rows of 3/8" cables attached to 3" x 3" x 5/16" x 48" high angles welded approximately 15' on center to the structural steel. Cable runs to be a maximum of three (3) stanchions (removed by others).

These requirements will be discussed at the pre-construction meeting and reviewed by the steel erectors prior to start of work in the PHA. All other trades on the project will be made aware of steel erection activities and instructed to honor all barricaded areas established by the erection firm. The erection firm will be responsible to maintain these barricades to prevent entry by others during the work shift and off-hours.

Section 44: Compressed Gas Handling and Storage

Compressed gas bottles and cylinders must be handled and stored properly in accordance with OSHA standard 29 CFR 1926.350. These requirements will apply to handling of gas bottles on the project:

- No gas bottle can be considered empty. Handle and store all bottles as if they are full.
- Gauges must be removed from all bottles if they are to be stored for over 24 hours.
- Oxygen and fuel bottles must be stored separated by 20 feet or more or separated by a 5-foot high, half hour rated fire barrier.
- Bottles can only be transported on carts designed to secure them for this purpose.
- Bottles cannot be stored in a confined area without air circulation, such as a gang box.
- Never store acetylene bottles on their sides. This can result in instability in the contents, which can lead to explosion when moved.
- For any welding in confined spaces, the bottles must be stationed outside the space.
- All bottles must be secured at all times from falling or being knocked over by workers or equipment.
- All bottles must be properly labeled as to contents, including hazard labeling.

Section 45: Hand and Power Tools

Tools make construction much easier, if they are in good condition and used properly. Because we use our tools so frequently, it's easy to take them a little for granted. Keep these requirements in mind with your hand and power tools:

- Always use the right tool for the job you are doing.
- Only use a tool if you are trained to use it properly. This includes being able to tell if it is damaged or defective.
- Inspect a tool each time before you use it. If it is damaged, take it out of service and dispose of it or get it repaired.
- Make sure safety guards are present and operating.
- Temporary power is GFCI protected. If plugging a power tool into permanent building power, you must use a GFCI cord set.
- All power tools must be double insulated or have a grounded, 3-prong cord.
- Do not "borrow" someone else's tools without permission.

For your extension cords on the job:

- All must be rated Hard Service or Very Hard Service.
- They must be UL listed, with ground pin intact.
- Insulation must be undamaged, and not pulling back from the plug end.

- Damaged cords must be removed from the jobsite, cut up and disposed of. Repaired cords cannot be used. Do not take a damaged cord home and endanger your family.
- Only one extension cord can be run from the power source to the tool. Cords cannot be plugged into one another for extra length.
- Cords must be suspended over walkways and areas where they are subject to damage by being run over by equipment, carts or manlifts.
- Don't allow your power cords to become a trip hazard to those nearby.
- All cords must be marked with the company name or color. Use your own cords and inspect them as you set up to use them.

Appendix of Project Forms

Article

- 1. Contractor Certification Letter**
- 2. Phase Hazard Analysis (PHA) sample form**
- 3. Emergency Evacuation Map of the Site**
- 4. Subcontractor Report of Injury/Illness form**
- 5. Report of Incident or Near Miss without Injury form**
- 6. Safety Concern form**
- 7. Safety Violation form**
- 8. Scaffold Inspection form**
- 9. Daily Safety Inspection form for Contractor Supervisors**
- 10. Site Logistics Plan diagram**
- 11. Contractor Daily Heavy Equipment Inspection form**
- 12. Digging Permit form**
- 13. Hot Work Permit form**
- 14. Energized Electrical Work Permit form**

- 15. Confined Space Permit form**
- 16. Fall Protection Removal Permit form**
- 17. Line Breaking Permit form**
- 18. Daily Rigging Inspection Checklist**
- 19. Competent Supervisor for Safety Qualification Letter**
- 20. Respiratory Standard Appendix D for Use of Dust Masks**