



Civil Structural and Environmental Engineering
Structural Engineering and Earthquake Simulation Laboratory
UB-NEES Equipment Site



UB-NEES/SEESL Safety Plan

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(Revision-8)

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Forward

This Safety Plan is an integral part of the management and operations of the UB-NEES Structural Engineering and Earthquake Simulation Laboratory (SEESL), applied to all its services.

This document was originally prepared for the NEES Consortium, Inc., P.O. Box 74065, Davis, California 95617 in partial fulfillment of the Subaward Agreement for the Operation and Maintenance (OMSA) with the UB-NEES Equipment Site commissioned on October 1, 2005. This revision of the “Safety Plan” is prepared for NEEScomm, 207 S. Martin Jischke Drive, West Lafayette, IN 47907, in fulfillment of the Subaward Agreement requiring annual updates to the NEES site Safety Plans. This document summarizes the safety policies and practices that have been developed by and implemented at the SEESL/UB-NEES Equipment Site one of the services of the Structural Engineering and Earthquake Simulation Laboratory.

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1. Introduction

Since the development of the original “Structural Engineering and Earthquake Simulation Laboratory (SEESL) at UB in 1981, safety was and continues through today, at the UB-NEES equipment site, to be of the highest priority. The combination of large load, high speed testing capabilities, combined with the testing of large specimens to failure, requires special measures and precautions for safety. Through this period, the faculty and staff at UB have acquired over 25 years of experience in the operation of complex and potentially dangerous laboratory equipment and machinery that has translated into a successful record for safety. While the faculty and staff, at the UB-NEES Site, have extensive experience in laboratory operations and safety practices, they are constantly vigilant and continue to review these practices and modify them, as necessary, to maintain the highest level of laboratory safety.

The UB-Department of Civil, Structural and Environmental Engineering (CSEE) has a comprehensive safety program in place that encompasses all laboratories within CSEE, including the UB-NEES/SEESL facility. This program includes a comprehensive Safety Training Manual that was developed based on applicable OSHA regulations. This safety plan requires safety training of all employees, students, visitors who work or are engaged in activities within any of the laboratories. Moreover, it requires periodic inspection of the laboratories and other spaces, for identification of unsafe conditions and for instituting corrections. This plan covers all the operations of the UB-NEES/SEESL facility The Site (NEES node at UB). The Site Operations Manager (SOM) is the person responsible for implementing the safety plan and for coordinating the training of employees, students and visitors in the UB-NEES facility.

Employees and students of the University at Buffalo who completed safety training are covered by the university’s global insurance against injuries that may result from work in the UB-NEES facility. The NEES researchers from other institutions, who perform research at the UB-NEES facility, would be covered by insurance provided by their institutions. UB-NEES/SEESL Equipment Site can provide all necessary documentation on safety practices in support to insurance requests.

This document summarizes the safety policies, rules, regulations and practices that have been developed and implemented at the UB-NEES Site.

2. Facility Description and Summary of Capabilities

The SEESL/UB-NEES Laboratory is capable of conducting testing of full or large-scale structures using dynamic or static loading. This is enabled by the availability of two shake tables that can easily be relocated in a 125 foot long trench, used in combination with large-scale dynamic and static servo-controlled actuators that have a cumulative capacity to apply forces of up to 7800 tons, a 3,400 square foot strong floor, and a 30x60 foot reaction wall. To achieve the high loading rates required for seismic simulation,



the test equipment is supported by a high-capacity, high-performance hydraulic supply and distribution system (capable of supplying up to 6000 lpm), and operated by numerous high-performance digital control systems. The SEESL/UB-NEES laboratory is housed in a new 13,000 square foot building addition and is serviced by a 40-ton capacity crane.

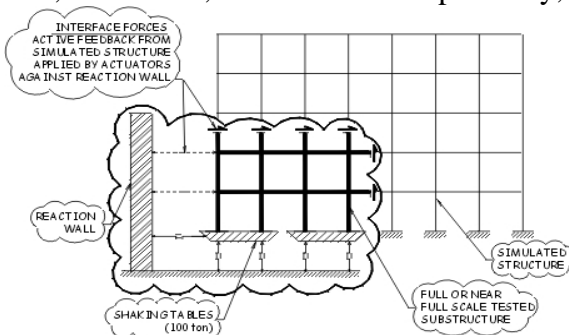
The two shake tables of the UB NEES facility are six degrees-of-freedom simulators, which can be rapidly (within 2 days) repositioned, from directly adjacent to one another, or in various positions at 3.05 m c/c, up

to 30.5 m apart (center-to-center of the tables). The nominal payload for each of the table is 20 metric-tons, but specimens up to 50 metric-tons can be tested on each table, albeit at reduced levels of shaking (maximum overturning moment capacity is 46 ton-meter). Together the tables can support specimens of up to 100 metric-tons and as long as 36 meters. Table motion excitations can be fully in-phase or totally uncorrelated dynamic excitations.



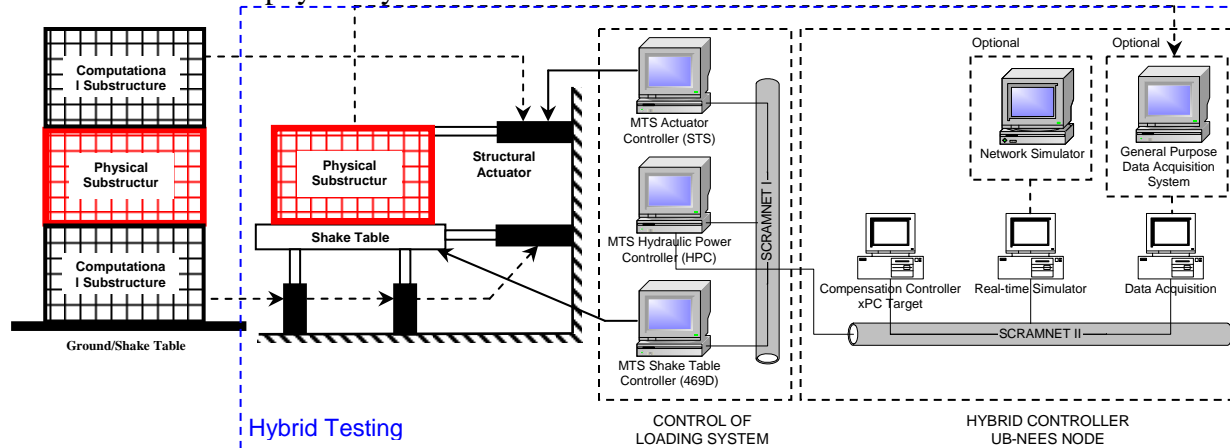
The platform of each shake table is 3.6 meters x 3.6 meters. The maximum horizontal (2-axis) and vertical displacements are ± 150 mm, ± 150 mm, and ± 75 mm respectively, maximum velocities are 1250 mm/sec, 1250 mm/sec and 500 mm/sec, respectively, and maximum accelerations are ± 1.15 g, ± 1.15 g and ± 1.15 g, respectively, for a 20-ton specimen. The maximum frequency of operation is 50 hertz at the nominal payload, and 100 hertz maximum.

The mounting area of the shake table platforms has been increased to 7 meters x 7 meters by the installation of extensions allowing for the testing of larger test specimens with no appreciable



change in performance. The extensions can be removed to access the original platforms as required.

The use of modern testing techniques, such as Pseudo-Dynamic and Real-Time Dynamic Hybrid Testing are possible, along with conventional Dynamic, Quasi-static, and Static Force techniques. *Real-Time Dynamic Hybrid Testing* is a new form of testing being developed at UB in which shake table and/or dynamic force experiments on substructures are combined in real-time with computer simulations of the remainder of the structure. This provides a more complete picture of how earthquakes would affect large structures, including buildings and bridges, without the need to physically test the entire structure.



A major equipment system at UB-NEES is the large-scale Geotechnical Lamina Box designed for soil-foundation-structure interaction studies at or near full scale. The lamina box and the soil contained within deform in a manner that simulates free ground response under simulated seismic excitations. The lamina box can be assembled to a maximum height of six meters. The nominal internal dimensions are 5 meters long x 2.75 meters wide. The enclosed volume can be filled with a saturated sand or soil to a maximum capacity of 82.5 cubic meters, using a hydraulic slurry pump and distribution system. A supply of Ottawa (F-55) sand is stored in three 50 cubic yard outdoor storage containers and may be available for use. The structure consists of 39 rings or laminates (I-beam-cross sections) stacked vertically to form a rectangular box. Two base rings are available: 1) a level ring for assembling and testing a vertical soil column, and 2) a sloped ring that allows the testing of a soil column with a 2-degree incline. Each laminate is supported by ball bearings that are mounted within the depth of the laminate below. The laminates are separated by a 5 mm gap, allowing



them to freely displace relative to each other. The stacked laminates are mounted on a sliding steel base assembly that is supported by 288 ball bearings. The sliding base is installed on a steel plate that is tied to the strong floor. Two 110-kip dynamic actuators are connected between reaction blocks and the sliding base. These actuators impose seismic motion on the sliding base. The lamina box assembly is surrounded by a safety restraint system consisting of steel beams and columns with adjustable spring-loaded over-travel bumpers. The bumpers along the sides of the box are designed to prevent transverse motion of the laminates during testing. The bumpers

on the east end of the box (opposite the actuators) can be positioned to limit displacement of the laminates, which is critical for tests with a sloping ground configuration.

The UB-NEES Site includes a unique Nonstructural Component Simulator (NCS). The NCS is a modular and versatile two-level platform for experimental performance evaluation of nonstructural components and equipment under realistic full scale floor motions as shown. The



NCS can provide the dynamic stroke necessary to replicate full-scale displacements, velocities and accelerations at the upper levels of multi-story buildings during earthquake shaking. Both displacement sensitive and acceleration sensitive nonstructural components and equipment can be experimentally evaluated under full-scale floor motions to understand, quantify and control their seismic response.



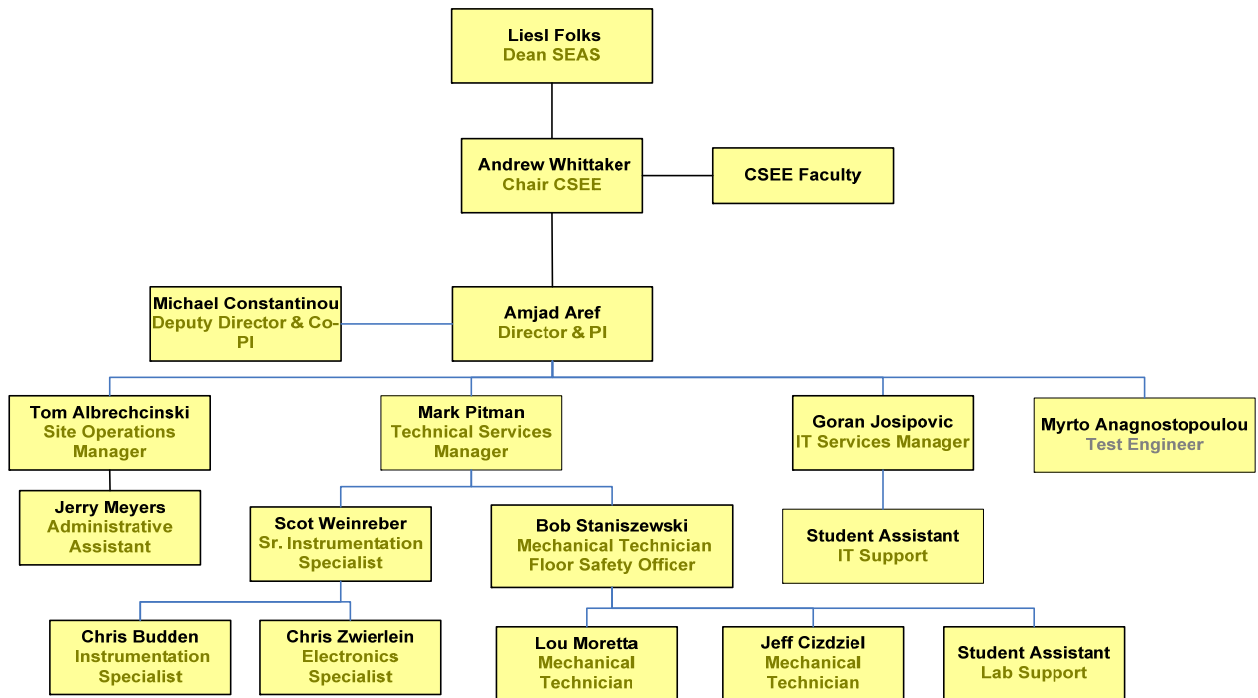
Networked tele-experimentation capabilities using modular and expandable tele-observation and tele-operation equipment, tied to the testing systems using discrete and global sensors, including high-resolution digital video and imaging capabilities, make it possible for remote collaborators to use the UB NEES facility, as well as for all to remotely observe these activities. A NEES collaboration room located adjacent to the laboratory is equipped with NEES-Grid enabled equipment to supports the NEES collaborative activities.



3. Laboratory Safety; Infrastructure, Management and Practice

3.1 Management

The SEESL/UB-NEES site was developed by a team of faculty, who will continue to operate as a team. The PI Professor Amjad Aref, is the laboratory director providing the overall leadership, for the team, and is closely supported by Professor Michael Constantinou serving as the deputy director and chair of the UB-NEES/SEESL Safety Committee. The CSEE structures group including Professor’s Michel Bruneau, Andre Filiatrault, Mettapalayam Sivaselvan and Andrew Whittaker continue to serve as technical consultants. Mark Pitman, the laboratory Technical Services Manager, is responsible for the oversight and supervision of the major functions and day-to-day operations within the laboratory. Louis Moretta, a Mechanical Technician, serves as the day to day laboratory floor safety officer and is responsible for administering the mandatory safety training course. Thomas Albrechcinski, the Site Operations Manager, provides liaison the other NEES sites and serves as the point of contact for visiting researchers. Goran Josipovic, the site IT-Systems Manger oversees the operation and function of the laboratory IT networks, computing and telepresence systems. These and the other technical members of the laboratory full time staff; Scot Weinreber, Christopher Budden, Christopher Zwierlein, Robert Staniszewski, Jeff Cizdziel, Louis Moretta, Myrto Anagnostopoulou are all responsible for laboratory safety and work collectively to insure that safety policies and procedures are enforced. The organization chart for UB-NEES/SEESL is shown below.



3.2 Laboratory Infrastructure and Environment

The infrastructure of the UB-NEES/SEESL laboratory was designed incorporating numerous operational systems and equipment that support the overall safety of the staff and facility. These include:

- Line of sight optical smoke detectors and integrated audible alarms that alert the building occupants, the campus emergency response center.
- Fire extinguishers and sprinkler system strategically located throughout the facility.
- An emergency phone linked to the emergency response center that connects upon lifting the handset.
- A roof mounted ventilation system activated by the smoke detector system.
- Fire sprinkler systems.
- Entrance doors secured by a programmable card access system restricting entry to authorized personnel only.
- Designated visitor entrances and 3rd floor observation deck to view tests in safety..
- Eyewash stations and first aid kits placed at strategic locations throughout the laboratory.
- AED for CPR rescue support
- Hardhat cabinets located at select laboratory entrances.
- Restricted access areas.
- 2-way radio sets to maintain communication during testing and operations where line of sight contact is not possible.
- Safety signs and postings located strategically throughout the laboratory ([Appendix C](#)).
- Manual and automated equipment emergency shutdown switches and software.
- Test in progress warning lights stationed at the shake tables and strong floor test specimens (as required).
- Reconfigurable-fixed post and chain barriers surrounding the perimeter of the shake table trench. Portable post and chain barrier system for strong floor test specimens.
- Portable posts, allowing 110v power and Ethernet connections that can be positioned at discrete locations on the strong floor eliminating the possibility of cords and wires lying on the floor that would otherwise pose a trip hazard.
- Fixed high resolution video cameras allowing 24/7 viewing of laboratory operations accessed via the website <http://www.nees.buffalo.edu>.

3.3 Safety Training

Safety training at the SEESL/UB-NEES site is administered both through formal and informal instruction directly relating to laboratory safety and indirectly through instruction in the proper and safe use of facility equipment, tools, machinery and hardware. This training is administered to faculty, staff, students and visiting researchers working in the laboratory and includes:

- Mandatory CPR/AED/First Aid training
- An on-site mandatory comprehensive safety training course administered by the laboratory safety officer and is required of all personnel working in the laboratory.
- Formal training and certification courses for crane, sling and forklift operations.
- Informal training in the use of laboratory machinery and tools.
- Formal and informal training in the use of laboratory test equipment.

- Website based training and equipment manuals, equipment performance specifications and operating limitations.
- Formal Course (CIE 616), “Experimental Methods in Structural Engineering” that provides students with the opportunity to work on class projects in the laboratory thereby providing training in safety and equipment operation.
- Specialized internship onsite hands-on training of use of local equipment provides an in-depth use of testing facility and planning safety procedures.

3.4 Laboratory Operations and Practice

Safety is a priority in all laboratory operations and functions starting with project proposals, test planning, test specimen design and construction, installation, testing and removal. The entire SEESL/UB-NEES team is responsible for safety as are all faculty, staff, students, and visiting researchers working in the laboratory. The following summarizes the safety practices associated with the laboratory operation:

- Safety Committee; A safety committee, chaired by the deputy director, meets on a regular basis to discuss all aspects of laboratory safety, note and address any safety violations and implement or revise safety policies and practices as necessary. Meeting minutes and agenda are archived on the UB-NEES/SEESL repository
- Safety Apparel; Wearing hardhats is mandatory at all times. Safety shoes are required when working on the test floor. Long pants are required apparel. Safety glasses, ear protection and gloves are worn as required. Safety harnesses are required when free climbing on test specimens or laboratory equipment.
- Buddy System; Individuals working on test structures must be within sight of other members of the staff or employ two way radio communications when this is not possible. A minimum of two personnel are required to be in the laboratory when any power equipment is in use.
- Test Plans and Pretest Activities; Test plans are required of all resident and visiting researchers. These test plans are to include the design of the test specimen and must be approved by a registered engineer to assure that it meets minimum factors of safety. These designs must also be approved by the UB-NEES/SEESL management team. The plan must also include a discussion and address any relevant safety issues. These plans are reviewed by the Site Operations manager and management team as required. A pretest meeting is held with the principal investigator (and his/her team) with the UB-NEES/SEESL staff to review the test plan, test procedures, requirements, and risk assessment-mitigation plan. A pretest walk through is held if required.
- Test Operations; Immediately to a test an audible alarm is sounded and flashing amber lights located immediately in front of the shake tables are activated. No personnel are allowed on the test floor in the vicinity of the test in progress. Visitors, faculty, students, and staff not directly involved in the testing are allowed to witness tests from the safety of the 3rd floor observation deck. If access to the test specimen is necessary during testing, the shake tables or actuators are placed in an inactive mode.
All of the MTS servo-hydraulic systems are configured providing for an emergency shutdown of the actuators and/or shake tables during testing operations. A shutdown is activated automatically if certain hazardous or potentially equipment damaging conditions occur. In addition, emergency manual shut down “red buttons” are located immediately adjacent to each control station allowing the operator to shut down the equipment in response to a perceived or actual hazardous condition.
- Laboratory and Test Equipment; The technical staff performs the operations necessary to prepare the test infrastructure and will operate the large complex equipment when necessary. Technical staff will also maintain the complex electro hydraulic systems and

instrumentation perform calibrations and develop the interfaces of networks and equipment in custom-made installations. Crane, scissors and forklift equipment are operated by trained personnel only. Laboratory machinery and power tools are used only by those who have received proper training by the laboratory full time staff.

- **Supervision and Monitoring:** All members of the laboratory full time staff are responsible for supervision and oversight of lab operations and safety. Visitors are required to be escorted by a full time member of the staff. Restricted areas in the laboratory are identified by posted signs (**Appendix C**).
- **Accident, Incident and Injury Reporting:** All accidents, incidents or injuries are to be reported immediately to a member of the full time staff for immediate response and treatment. First aid kits and eye wash stations (noted earlier) are available at strategic locations throughout the laboratory. The university emergency response phone number is posted at all laboratory entrances. An emergency phone that connects directly to the campus emergency response center is also available. It is activated simply by pushing the red emergency button.

All accidents and/or injuries are to be reported in compliance with OSHA regulations (reference chapter 17 in the UB-NEES “Safety Training Manual”; <http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf>), and all local university and state agency policies. An accident-incident-injury report form (**Appendix D**) is to be filled out for all accidents, incidents or injuries and forwarded to the university office of Environment, Health and Safety (EH&S). A copy is retained in the UB-NEES/SEESL administrative office. Notice of the accident-incident-injury is also to be reported submitted to NEEScomm, in full compliance with the NEES Network-Wide Safety Policy.

The UB-NEES safety committee will review the accident to ascertain the cause was related to a deficiency of the safety program and implement new or revised procedures as required.

4. Documentation

4.1 On Site and Web Documentation

All safety related training materials, practices, policies and procedures, developed at the UB-NEES Site, are documented and archived in hard copy and electronic versions for publication, distribution, posting on the UB- NEES website <http://www.buffalo.nees.edu> and posting in the laboratory (as required). This includes:

- The CSEE UB-NEES “Safety Training Manual” (Appendix A); This manual was developed for the Department of Civil, Structural and Environmental Engineering (CSEE) and is applicable to all of the departments laboratories and facilities. It serves as the primary text for a formal training program that is required of all faculty, staff, students and visiting researchers that work in the UB-NEES facility. The manual was revised in 2009 incorporating updates to OSHA’s procedures and regulations as prescribed by the Risk Management Consultants hired by NEESInc to audit the NEES site Safety Programs and Plans.
- Certificates of Safety Training (Appendix B); A certificate of satisfactory completion is issued to all those who take and successfully pass the mandatory safety training program described above and allows them access to work in the laboratory. A copy of the certificate is filed for the permanent record.
- Safety postings and Signs (Appendix C); A summary of the UB-NEES laboratory access and safety rules are posted at all entrances into the laboratory. These serve as a constant reminder to all entering the facility to adhere to all of the safety rules and policies at all times and reinforces the overall philosophy that safety comes first. In addition, safety signs, warnings, cautions, and those relating to specific work requirements are posted at strategic locations throughout the laboratory. These are listed in Appendix C.
- Test Protocol and Safety Plan Template (Appendix D); If projects or laboratory operations require the use of materials or involve specific tasks that affect safety or may have associated health risks not covered by existing safety policies and practices, a “Test Protocol and Safety Plan” is developed specifically tailored to the task or project identifying all of the associated risks, defines responsibilities and lists all steps and procedures to safely perform the specific task or project. These plans are reviewed by the SEESL safety committee and forwarded to the UB office of Environment Health and Safety for review and approval.
- Site Access Plan (Appendix E); The UB-NEES Site has developed a Site Access Plan that is posted on the website <http://www.nees.buffalo.edu>. This plan details all of the access policies and rules required of all visiting researchers that will be working in the laboratory. Appendix E contains excerpts, from the plan, that specifically relate to laboratory safety. This document provides all prospective researchers with advance information aiding in the development of proposals and project planning.
- Release and Indemnification Forms (Appendix F); All visiting researchers or other visitors, that will be working in the laboratory, are required to sign the referenced release and indemnifications forms shown in the appendix. These forms are retained on file.

4.2 Distribution of Documentation

All long term and short term visitors who will be working in the laboratory or participating in projects involving the laboratory are provided with all safety and related instructional information via the website at:

<http://nees.buffalo.edu/>

This site provides links to the:

- Description of the Facility and Major Equipment
- Laboratory Manual
- Access Plan
- Safety Plan
- Safety Training Manual
- Staff and Management Organization Chart

Hard copies of these documents or copy on CD can be provided upon request.

5. Risk Management

Large-scale testing of the size and scope possible at the UB NEES laboratory is inherently dangerous. Risk will be managed to the degree possible consistent with policies of the University at Buffalo and the State of New York and the operations and maintenance support provided by NEES Inc. to the University. The table below summarizes the UB plan for risk management.

The key strategy for risk mitigation is safety training. The UB NEES site will train faculty, staff and students to function safely in the laboratory and will enforce all safety rules promulgated by OSHA, the University, and the State of New York. Further, to protect the NSF-investment at UB and the University and its personnel, non-UB personnel will be required to obtain insurance as described in the table below.

Risk Mitigation Summary Plan

Risk	Consequences	Likelihood	Severity	Mitigation/Management Strategy
Major damage to equipment during NEES research by UB faculty	Impact on schedule of current and future NEES and non-NEES work	Low	Critical	In-house review by UB faculty of test specimens and testing protocols per current SEESL practice. Repair or replacement of damaged equipment by NEES Inc.
Major damage to equipment during NEES research by non-UB faculty	Impact on schedule of current and future NEES and non-NEES work	Moderate ¹	Critical	Repair or replacement by NEES Inc. if damage related to cumulative use of equipment for NEES-related projects. Insurance coverage in the amount of \$2M will be required of non-UB faculty to repair or replace equipment damaged due to negligence or errors
Major damage to equipment during non-NEES use by UB faculty	Impact on schedule of current and future NEES and non-NEES work	Low	Critical	Repair or replacement of damaged equipment by University if damage attributed to errors/negligence by UB faculty, staff, or students.
Major damage to equipment during non-NEES use by non-UB faculty	Impact on schedule of current and future NEES and non-NEES work	Moderate	Critical	Insurance coverage in the amount of \$2M will be required of non-UB faculty to repair or replace damaged equipment
Injury of ES staff member	Injury to staff member; moderate to major impact on work schedule	Low	Moderate	Mandatory safety training and use of OSHA-approved safety equipment per Section E.

Injury of ES student	Injury to student; major impact on work schedule	Low	Moderate	Mandatory safety training and use of OSHA-approved safety equipment per Section E.
Injury of ES faculty	Injury to faculty member	Low	Moderate	Mandatory safety training and use of OSHA-approved safety equipment per Section E.
Injury of 3 rd party by ES staff	Injury to third party member	Low	Moderate	Mandatory safety training and use of OSHA-approved safety equipment per Section E.
Injury of non-ES student	Injury to student; major impact on NEES work schedule	Moderate	Low	Mandatory safety training and use of OSHA-approved safety equipment per Section E.
Injury of non-ES faculty	Injury to faculty member	Low	Low	Mandatory safety training and use of OSHA-approved safety equipment per Section E.
Legal action against University	Legal action against University due to (a) injury/death of non-ES students, faculty, and staff and third parties, (b) changes in work schedule	Moderate	Moderate	All non-UB students, faculty, and staff, and third-parties must be insured to cover personal injury, medical expenses, injuries to others and equipment damage. All non-UB students, faculty, and staff, and third-parties must sign a UB-prepared legal agreement to hold the University and all of its employees harmless for all acts, errors, omissions, and negligence related to (a) construction, installation, and removal of test specimens and all testing, and (b) specimen instrumentation and testing.
Legal action against ES faculty	Legal action against ES faculty member due to (a) injury or death of non-ES students, faculty, and staff and third parties, (b) changes in work schedule	Moderate	Moderate	All non-UB students, faculty, and staff, and third-parties must be insured to cover personal injury, medical expenses, injuries to others and equipment damage. All non-UB students, faculty, and staff, and third-parties must sign a UB-prepared legal agreement to hold the University and all of its employees harmless for all acts, errors, omissions, and negligence related to (a) construction, installation, and removal of test specimens and all testing, and (b) specimen instrumentation and testing.

Legal action against ES staff member	Legal action against ES staff member due to (a) injury/death of non-ES students, faculty, and staff and third parties, (b) changes in work schedule	Moderate	Moderate	<p>All non-UB students, faculty, and staff, and third-parties must be insured to cover personal injury, medical expenses, injuries to others and equipment damage.</p> <p>All non-UB students, faculty, and staff, and third-parties must sign a UB-prepared legal agreement to hold the University and all of its employees harmless for all acts, errors, omissions, and negligence related to (a) construction, installation, and removal of test specimens and all testing, and (b) specimen instrumentation and testing.</p>
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1. A likelihood of Moderate was assigned to non-UB users of the NEES equipment to recognize that the experience of such users will vary widely, with the likelihood being low for experienced users and substantially higher for novice users.

6. Internal and External Inspections and Audits

The UB-NEES/SEESL laboratory is subject to both internal and external safety inspections and audits that are performed on a regular basis. This process starts at the “grass roots” with the SEESL safety committee that was described in Section 3. This committee scrutinizes the day to day laboratory operations and serves as an action committee to immediately rectify any safety violations or even perceived violations of safety. The department of Civil, Structural and Environmental Engineering also has two representatives that serve as liaison to the School of Engineering and Applied Sciences (SEAS) safety representative, the representative from the UB office of Environment Health and Safety (EH&S), OSHA and the EPA. These individuals are:

Mr. Scot Weinreber
Mr. Todd Snyder

These individuals have has extensive expertise and working knowledge of OSHA’s and the EPA safety regulations and policies and is the prime author of the CSEE “Safety Training Manual”. Mr. Weinreber has extensive experience in laboratory operations and safety and serves as the departmental representative during safety inspections of UB-NEES/SEESL.

The office of Environment Health and Safety (EH&S) performs periodic inspections (at less than six months intervals) followed by detailed requirements for correction of deficiencies and for improvements. The findings and summary of these inspections will be forwarded to NEEScomm as required.

By virtue of having these resident experts, regular communications and liaison with OSHA, EPA and EH&S representatives, and the many years of cumulative experience, represented in the faculty and staff, the practices and policies that have been established and practiced in the laboratory, no or minimal safety deficiencies or violations have been identified as a result of the formal inspections. Any reported deficiencies are corrected immediately.

In addition to the external and internal EH&S safety inspections and audits, internal laboratory and equipment safety and maintenance inspections are performed by the floor safety officer on a monthly basis. These comprehensive inspections include all laboratory equipment and hardware, laboratory space, emergency and first aid equipment and resources, intended to assure maximum safety for personnel and equipment. A copy of the inspection checklist is provided in [Appendix G](#).

In 2007, NEESInc contracted to Risk Consultants Inc. to audit and review the Safety Plans and Programs of the 15-NEES Sites vs. governmental safety regulatory requirements and commonly used industry “best practices” for safety. Each site was required to complete a “Facility Hazard Inventory” that listed common hazards, per OSHA guidelines, requiring a statement how these were handled and addressed by the site. The consultants used the responses to the Hazard inventory and an assessment of the respective safety plans to score the sites on a scale of 0 to 5. UB-NEES achieved the highest score of 4.7 which was later raised to a perfect 5.0 as minor corrections and clarifications were documented. This Hazard Inventory is attached as [Appendix H](#) to this Safety Plan.

7. Site Access and Visiting Researcher Policies

The Structural Engineering and Earthquake Simulation Laboratory at University at Buffalo is the host for the UB-NEES site of the George E Brown Jr. Network for Earthquake Engineering Simulation (UB-NEES) which provide services to the NEES engineering research community. The UB-NEES services are operated with support from NEESinc, which in turn is supported with a grant from the Division of Critical Mechanical Systems of National Science Foundation (NSF/NEES).

The SEESL/UB-NEES Access Policies are posted on the website <http://www.nees.buffalo.edu>. These access policies provide prospective visiting researchers with all of the information aiding in the development of proposals and, more importantly, to plan and execute their research and test programs at the UB-NEES Site. This includes:

- A description and specifications of the facility and equipment including reference to more detailed information posted on the website.
- Project planning and work plan content and requirements.
- Safety requirements, policies and training information.
- Contact information including staff titles and responsibilities.
- Facility access policies and special access information
- Project scheduling information
- Reference to fee and recharge rates
- Agreements, constraints and limitations.
- Release and indemnification form requirements
- Certificates of self insurance requirements
- Reference to resources including:
 - -Lab Manual
 - -Safety Training Manual
 - -Site Specifications Data Base
 - -Release Forms
 - -Fee Schedule

Sections of the UB-NEES Site Access Plan relating to safety have been excerpted and are provided in [Appendix E](#).

8. Summary

This “Safety Plan” documents the safety policies and procedures that have been developed, documented and practiced at the SEESL/UB-NEES Site. Key to the successful implementation of any safety plan and program rests with the expertise and constant vigilance of all of the faculty and staff of the laboratory. This plan has evolved over an extended period, based on the 25+ years of experience associated with the operation of the original Structural Engineering and Earthquake Simulation Laboratory and the detailed knowledge of the new facility equipment and the inherent risks associated with large-scale structural testing. This safety plan will continue to evolve as we acquire new knowledge, through operational experience, and as we strive to perfect our safety program.

Appendix A: Safety Training Manual

The UB-NEES/SEESL Safety Training Manual can be found at the following web address:

<http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf>

Appendix B: Certificate of Safety Training

Following self training using the web distributed documentation any user of the laboratory should complete and sign a document indicating the completion of the safety training and willing to follow all the safety requirements. The document is defined as Certificate of Safety Training and is enclosed here.



Department of Civil, Structural, and Environmental Engineering

SAFETY TRAINING SELF-CERTIFICATION

This is to certify that I have received a copy of, or electronic access to, the CSEE Department Safety Training Manual. I have read it, understood it, and I hereby agree to abide by all of the instructions and advisories provided therein.

I understand that, 'Unsafe Acts' contribute to 88% of all accidents. I further understand that my unsafe acts can endanger my safety as well as the safety of others. I shall perform safely at all times. I agree that all of my co-workers and laboratory technicians are authorized to instruct me to perform safely whenever deemed necessary and I am obligated to execute all such instructions.

I shall immediately report any unsafe conditions, that I encounter in the course of my work, to the SEESL Safety Officer, the CSEE Department Chair and my Principal Investigator.

I am aware that this certificate will be placed in my personnel file at the University at Buffalo Department of Civil, Structural and Environmental Engineering and that it allows me to work in the SEESL Laboratory and further that I am obligated to abide by and support all of the safety rules and regulations of the laboratory.

Name _____

Signature _____

Date _____

Affiliation _____

Person No. _____

This is to verify that the above signed person has satisfactorily completed all of the requirements of the Safety Training Self-Certification

Duane Kozlowski, SEESL Field Safety Officer _____

Appendix C. Safety Postings and Safety Signs



ACCESS TO THE SEESL LABORATORY

1. SEESL's hours of operation are between 8:30 am to 4:30 pm, Monday through Friday, when the university is officially open. Authorized personnel and visitors are allowed in the laboratory during these hours of operation and must abide by the published and posted safety rules.
2. Access to the laboratory at times other than normal operation hours between 8:30 am to 4:30 pm is restricted as follows:
 - a. Only authorized personnel are allowed enter
 - b. Authorization is provided only by a member of the permanent staff, of the laboratory, and upon approval by the laboratory director or deputy director, the department chair, or the laboratory technical services manager.
 - c. Students may work in the laboratory provided they:
 - i. pass the required safety training course and receive authorization from the safety officer
 - ii. work with at least one other colleague
 - iii. have been instructed on the use of lab equipment
 - d. Outside contractors may work in the laboratory provided they:
 - i. pass the required safety training course and receive authorization from the safety officer
 - ii. work with at least one other colleague
 - iii. have a valid certificate of self-insurance and a signed indemnification and waiver form (waiver forms can be obtained at laboratory administrative office)
 - iv. they are properly trained and have received written authorization by the permanent staff of the laboratory
 - e. Unless accompanied by a member of the laboratory staff, all visitors must enter the laboratory through the visitor entrance located at the south-west end of the building or the 150 door entrance. All visitors are restricted to the 3rd floor mezzanine unless escorted by permanent member of the laboratory staff. Hard hats are required at all times.
3. The permanent staff of the laboratory, the Safety Officer, the Director or Deputy Director, and the Department Chair may order any person to leave the laboratory if they determine that person poses a safety threat to him/her self or others.

Prof. A. Whittaker
CSEE Chair

Mr. S. Weinreber
CSEE Safety Officer

Mr. Louis Moretta
SEESL Floor Safety Officer

Prof. A. Aref
SEESL Director



SEESL SAFETY RULES

All personnel, students, faculty and staff working in the laboratory must pass a safety course consisting of three parts: (1) a lab survey session with the safety officer; (2) a self study of the [Lab Safety Training Manual](#) located on the SEESL website (see <http://nees.buffalo.edu/>) and (3) an oral examination administered by the safety officer. Upon successful completion of the safety course, a certificate of satisfactory completion will issued allowing the individual to work in the laboratory. ***The following summarizes the laboratory safety rules which must be obeyed at all times.***

1. All personnel working in the laboratory or visiting the laboratory must wear a hardhat at all times.
2. All personnel working in the laboratory must wear safety shoes.
3. All personnel working in the laboratory must wear appropriate apparel including long pants and socks.
4. Personnel must wear gloves if there is any possibility of abrasion or laceration. When in doubt, gloves should be worn.
5. Personnel must wear safety glasses when operating machine tools or power equipment.
6. All welding operations must be shielded from view. Any volatile materials must be moved to a safe distance before welding is performed.
7. Grinding is covered by of the same rules of welding. In addition, a non-flammable shelter must be built around the grinding operation to contain sparks.
8. Safety harnesses must be used when climbing. Climbing is defined as any activity, which results in the person being more than four feet above the floor. The use of safety harnesses while working on ladders is optional.
9. The overhead cranes are to be used for lifting and moving. They are not to be used for pulling or breaking. *Only authorized personnel* are allowed to use crane.
10. The operation and use of overhead cranes, testing machines, machine tools and power equipment is restricted to only those *personnel who received proper training and authorization*. These operations can only take place when a member of the full-time staff, or another authorized person, is present in laboratory.
11. Additional safety rules are detailed in the [Lab Safety Training Manual](#).
12. All personnel must be familiar with the location of all exits, emergency alarms, the emergency phone, eyewash stations and first aid kits. **In case of an accident or injury, immediately notify a member of the permanent staff, call 9-2222, or use the emergency phone to notify campus emergency response services.**

Failure to follow safety roles is grounds for suspension of laboratory privileges and removal from the laboratory

Prof. A. Whittaker
CSEE Chair

Mr. S. Weinreber
CSEE Safety Officer

Mr. Louis Moretta
SEESL Floor Safety Officer

Prof. A. Aref
SEESL Director

Laboratory Safety Signs and Warnings

Sign text	Locations
“AUTHORIZED PERSONNEL ONLY”	At all lab entrances & entrances to basement
“HARD HATS REQUIRED”	At all entrances & strategic locations in the lab
“SAFETY GLASSES AND EAR PROTECTION REQUIRED IN THIS AREA”	Shop & test preparation areas
“SAFETY GLASSES REQUIRED IN THIS AREA”	Shop & test preparation areas
“SAFETY SHOES REQUIRED IN THIS AREA”	Test floor
“USE HAND RAIL”	At all stair landings
“EYE WASH”	At eye wash
“FIRST AID KIT”	At first aid kit location??
“EMERGENCY PHONE”	At emergency phone??
“REPORT ALL INJURIES AT ONCE”	At strategic locations in lab
“THINK SAFETY WORK SAFELY”	At strategic locations in the lab
“VISITOR ENTRANCE”	At man door for visitor access
“SHIPPING AND RECEIVING PLEASE RING BELL”	At dock-man door entrances
“FLASHING AMBER LIGHTS TEST IN PROGRESS KEEP AWAY”	Shake tables & test floor
“<u>ALL VISITORS</u> *RING BELL AND WAIT FOR ESCORT *HARD HATS REQUIRED”	At visitor entrance
“THINK SAFETY FIRST”	At strategic locations in lab
AED	Single location per AED/CPR Staff Training

Appendix D. Test Protocol and Safety Plan Template

Test Protocol and Safety Plan

Title:	DRAFT Document No.: Revision No.: 00
Nature of Change: New Procedure	

1.0 Purpose

2.0 Scope

3.0 Materials/Equipment

4.0 Responsibilities

- 1. Investigator**
- 2. Student and Staff performing work**

5.0 Procedures

6.0 Document Management

This procedure shall be reviewed once every two years, or as changes require.

7.0 Associated Documents

7.0 Document Revision History

Revision: 00

Date of Last Revision: None

Last Approval

Date: Draft

Document Author: TBA	Document Approver: TBA	Document Manager:
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9.0 Reason for Change

Revision	Sec/Para Changed	Change Made:	Date
00			

Appendix E. Site Access and Safety Plan

The following has been excerpted from the “UB-NEES Site Access Plan” as it specifically relates to safety policies, rules and requirements associated with access to the UB-equipment site. The entire SEESL/UB-NEES Site access plan is available on the website:

<http://nees.buffalo.edu>.

Project Planning / Work Plan:

All researchers planning to access the SEESL/UB-NEES site must follow the NEES Inc guidelines for access of research facilities developed by the NEES Site Operations Committee. The following are minimum requirements for the access of SEESL/UB-NEES site:

The key element to safe and efficient use of the SEESL equipment, the lab space and the associated facilities is the project **WORK PLAN**. A detailed **WORK PLAN** will need to be prepared by all researchers in NEES and non-NEES projects that should be approved by the [Site Operation Manager](#) prior to any project related work occurring in the SEESL. The work plan will be incorporated into a contractual agreement between the NEES and non-NEES researchers and the University at Buffalo in behalf of SEESL for the research project and will be the governing document to control the project as it moves through the facility.

During the award process the researchers must submit the **WORK PLAN** indicating the test set-up, the equipment and instrumentation required, the testing protocol intended, the specimens removal actions, detailed information concerning the individual work tasks to be performed, the duration of the tasks, the order in which the tasks are performed, identification of who will perform the tasks, and the resources required to perform the tasks. and a comprehensive schedule with milestones related to the project schedule. The plan should cover also needs of data management, and archiving information. The following is an itemized list of issues to be covered by the **WORK PLAN**:

1. A list of tasks to be performed
2. Specimen and fail safe system drawings
3. Calculations of the specimen and failsafe system
4. An instrumentation plan
5. A testing plan
6. List of equipment, materials, supplies, tools and personnel to carry out the work tasks
7. Space requirements including lab and office space
8. A rigging plan including disposal of specimens after testing
9. A plan for data management and IT requirements
10. Schedule of tasks including duration and timing

All experiments to be performed using the SEESL/UB-NEES equipment should be carefully planned to assure safety of equipment, operators, and all other users of the laboratory. All researchers should develop detailed plans for the tests set-ups which must include provisions for fail safe of experiments and equipment. Detailed construction plans for all specimens and test fixtures designed by the visiting researchers must be provided. The plans must include detailed design of **the fail-safe system**. Each testing arrangement and specimen must be reviewed and certified (stamped) by a Professional Engineer with experience in dynamic testing (or with demonstrated equivalent qualifications). The SEESL/UB-NEES [Site Operation Manager](#) (OM) will review **completeness** of submittal. The [Site Operation Manager](#) will work with the visiting researchers and review the testing plans and help the visiting researchers demonstrate and document that their testing apparatuses satisfy the OSHA, State and Campus safety requirements. The [Site Operation Manager](#) will be the point of contact and provide the additional information needed by the visiting researchers and review teams to develop their plans. Note the safety of the test set-up and the equipment will remain the responsibility of the researcher.

The researchers will have to negotiate with the NEES Inc. staff a schedule which will be jointly agreed with the UB-NEES Site. For any excess of time needed beyond the negotiated schedule with NEES Inc., fees for use of UB-NEES facility will be charged at rates charged to Non-NEES projects. The scheduling for NEES researchers will be negotiated with the NEESinc Operations Manager and with the SEESL / NEES Site Operations Manager. Non-NEES researcher will negotiate their schedule directly with SEESL [Site Operation Manager](#).

Once activity begins in the SEESL/UB-NEES facility, the researcher (NEES or non –NEES) must update the **WORK PLAN** weekly and submit any changes for review and approval by the [Site Operation Manager](#).

Failure to follow policies regarding safety or **WORK PLAN** will result in the following consequences:

- First offense – verbal reminder

- Second offense – written notification of out of scope work or safety violation to researcher (NEES or non-NEES)
- Third offense – suspension of work and a mandatory safety review or **WORK PLAN** review. Results of the review of NEES research projects will be submitted to the NEESinc for further action. Non-NEES research may be interrupted directly by SEESL management.

Lab Personnel have the right to stop, alter, or refuse any task or operation of any piece of equipment that is being performed by any Lab User.

Safety Requirements:

Laboratory safety is of the highest priority at the SEESL/UB-NEES facility which is part of SEESL. The combination of large load, high speed testing capability with the testing of large specimens to failure at SEESL/UB-NEES, requires special measures for safety.

The CSEE Department has in place a **SAFETY PLAN** that covers the operations of the SEESL/UB-NEES facility. This **SAFETY PLAN** requires safety training of all employees, students and visitors. Moreover, it requires periodic inspection of laboratories and other spaces for identification of unsafe conditions and for instituting corrections. The SEESL/UB-NEES **Site Operation Manager** (OM) is the responsible person for implementing the **SAFETY PLAN** and for coordinating the training of employees, students and visitors in the NEES facility. The SEESL **Deputy Director** is in charge with development of rules and policies or resolving safety issues in absence of such policies which cover all operations of UB-NEES Site. A **Field Safety Officer**, who serves on the technicians staff of the laboratory, serves as the floor supervisor. The safety implementation staff is empowered to suspend work or visit of any person who does not comply with the safety requirements.

All researchers (either short or long term) must undergo safety training prior to starting work in the laboratory. The training may start at the home institution by studying the CSEE **Safety Training Manual** (available on the website: <http://nees.buffalo.edu/> . Upon arrival to SEESL / UB-NEES, the research visitors must take the 6-hour training class, which includes a walk through the facilities and an examination (described below). Each person will be issued a certificate for accessing the facility.

All researchers planning to work in the laboratory must wear personal protection equipment (PPE), which includes:

- **Hardhats** are mandatory for all who access the testing floors in the laboratory. Hardhats are not required on the observation deck at third floor.
- **Steel toe boots** are required in all areas of the testing floors. Safety shoes are not required on the observation deck.
- **Gloves** are required whenever assembling or disassembling test specimens or test fixtures.
- **Eyeglasses** are mandatory when grinding, impacting, drilling, mixing, or hammering.
- **Earplugs** or earmuffs are recommended and available from Lab Personnel when grinding, impacting, or drilling.
- A personal **safety harness** shall be used when required by Lab Personnel.

The laboratory will provide for short term visitors hard hats, gloves, eye protection goggles, earplugs and safety harnesses. Safety Shoes should be provided by the researchers.

Insurance and Liabilities:

Employees and students of the University at Buffalo who completed safety training are covered by the university's global insurance against injuries that may result from work in the SEESL/UB-NEES facility. This does not apply to NEES or non-NEES researchers from other institutions, who perform research at the SEESL/UB-NEES facility.

Visiting researchers must carry an **insurance certificate** from their home institution. Each visiting researcher shall provide prior to the work at SEESL/UB-NEES a certificate of insurance before access is permitted to the NEES facility. The insurance shall cover personal injury and injury to others that the researcher is responsible, and damage to equipment that is caused by the researcher.

The researchers must agree to hold UB and the UB faculty and staff of the SEESL/UB-NEES node harmless for any acts, errors, omissions, and negligence. A **release form** to be signed by the researcher or their HOME INSTITUTION is attached to this document.

Access to Facilities:

NEES researchers will enjoy the following privileges during the duration of the part of their project that is executed at SEESL /UB-NEES (Other researchers may have similar access if space permits).

- (a) Access to the physical site, laboratory areas and equipment, listed in Section on [Information on SEESL –UB-NEES](#) (above) are subject to the constraints listed in Section on [Constraints and Limitations](#) (below). These constraints consist of the requirements that the researchers receive safety training at SEESL/UB-NEES, and have a certificate of insurance that covers accidents in the laboratory and includes medical expenses and liability. See section on [Safety Requirements](#) above.

Access Constraints and Limitations:

Access for NEES and non-NEES researchers to the UB-NEES node facilities is subject to the following constraints and limitations:

- (a) All researchers (either short or long term) must undergo safety training prior to starting work in the laboratory. The training may start at the home institution by studying the CSEE Safety Training Manual (available on the website : <http://nees.buffalo.edu/> . Upon arrival to SEESL / UB-NEES, the visitors must take the 6-hour training class, which includes a walk through the facilities and an examination (described below). Each person will be issued a certificate for accessing the facility.
- (b) All researchers planning to work in the laboratory must wear personal protection equipment (PPE), which includes hard hat, steel-toed shoes, gloves, eye protection goggles, or glasses with synthetic lenses, hearing protection devices and respirators. (see more details in the section on [Safety Requirements](#) above)
- (c) All must obey the safety rules. Failure to comply and failure to obey the directions by the laboratory personnel will result in the denial of access to SEESL and other CSEE facilities. In cases of non-compliance, the Field Safety Officer will provide one warning, followed by immediate ejection from the laboratory if error is not corrected. Safety in Laboratory is the primary concern. Non-compliance may endanger the researchers and the lab personnel and cannot be tolerated.
- (d) Due to space constraints, the number of visiting researchers is limited to two students and one senior personnel per project for the duration of the project as described in section on [Access Information](#) (above). However, more visitors per project may be accommodated on the basis of availability of space to the maximum capacity of the NEES collaboration room and the availability of CSEE space for faculty visitors.
- (e) All researchers and visitors accessing the testing floors must be insured to cover personal injury, medical expenses, injuries to others that they may cause and damage to equipment that they may cause. Certificates of insurance must be presented to the [Site Operations Manager](#) or the [Field Safety Officer](#) before accessing the facility. (see section on [Insurance](#) above)
- (b) All researchers and visitors must agree to hold UB and the UB faculty and staff of the SEESL/UB-NEES node harmless for any acts, errors, omissions, and negligence. (see also [Liability](#) above)

Special Access Information

The following are excerpts from the [Lab Safety Manual](#). The requirements listed below are intended to provide a short – select list of “do and do-nots”.

(a) General Requirements

- Access in the laboratory is permitted when at least one other person is in the laboratories, which is informed of your presence and is in eye or communication contact with you at all times.
- Know where First Aid Kit, Eye Wash Station, Fire Exits, Fire Extinguishers, and Electrical Disconnects are located.
- Know the location of emergency phones and emergency shut off buttons for the hydraulics. Use them at the request of lab personnel or in their absence using your best judgment.
- Keep walkways (which are marked with crosshatched yellow tape) clear of all obstacles at all times.
- Do not block fire extinguishers or electrical panels.
- Clean up work area daily.
- If your work will generate dust, cover sensitive equipment before you start, and clean up the dust. Dust cleaning equipment available in the laboratory.

- At end of testing remove safely the specimens as agreed in the WORK PLAN. The researcher remains responsible of all removal operations till its end.

(b) Testing Areas

- When red strobe lights are flashing, the hydraulic system is active and testing is in progress. Unauthorized personnel should not approach within 10 feet of any hydraulic line, shake table, actuator, or test specimens. Authorization may be obtained from the lab test supervisor.
- The authorized personnel attending a live experiment must be equipped with a communication device provided by the Technical Services Manager and stay in communication with the test supervisor.
- All other project work may be limited by Lab Personnel on a test day.
- All personnel accessing the spaces under the testing floor and the service rooms in the basement must remain in communication contact with a lab supervisor working above the floor

(c) Cranes, Forklifts, Scissorlifts

- Cranes, Forklifts, and Scissorlifts may not be used unless the operator has been trained and certified by Lab Personnel.
- Heavy and/or large items are to be craned and rigged only by Lab Personnel.
- Avoid crane use above hydraulic actuators, controllers, data acquisition systems or hydraulic systems without proper help for a second person.
- Cranes shall not be left unattended while still attached to a specimen or test fixture.
- Scissorlifts must be operated / attended by a team of two users at one time.

(d) Laboratory Equipment

- Do not use any power tool unless approved by Lab Personnel.
- Do not move or modify any hydraulic actuator, accumulator, or hydraulic line. This can be done only by authorized lab personnel.
- Use of the welder or blow torch is not allowed. This can be done only by authorized lab personnel.
- All tools must be inspected before use and any defect reported to Lab Personnel.
- Return tools to the proper location at the end of each working day and when the job is complete.
- Do not use any pre-stressing Jacks. This can be done only by authorized lab personnel.
- Ladders must be properly positioned and/or tied off.

(e) Access to Tools

- The electric welder and/or cutting torch may be used by qualified professionals who are hired on a subcontract basis to either fabricate or demolish test specimens. In such cases, prior approval from the Operations Manager must be obtained.
- The subcontractor wishing to use this equipment will be required to verify professional qualifications and prior experience.

(f) Access to Instrumentation

- For safety reasons, only SEESL staff are allowed to operate much of the SEESL Laboratory equipment. Examples of this equipment include: hydraulic equipment (e.g., pump, manifolds, controllers, actuators and hoses), forklift, scissors lift, electric arc welder, oxygen-acetylene cutting torch, and all computing equipment (except as outlined in the Access to IT Section), cameras (except as outlined below), and associated cabling (except as outlined below). This policy will be enforced strictly. The only exceptions are use of the electric welder and/or cutting torch (as described in the Access to Tools Section), and data sensors and lighting not attached to robotic arms.

(g) Access to the SEESL Controllers

- For safety reasons, only SEESL staff will be allowed to operate the Shake Tables controllers and the STS controllers.
- NEES researchers may have access to the other SEESL controllers for various actuators (see list in the LAB MANUAL) after proper training by lab personnel and with their daily approval.
- NEES Researchers will have access to the Hybrid Testing System after proper training by the lab personnel with assistance of the Lab Technical Staff.

Appendix F. Release and Indemnification Forms

RELEASE AND INDEMNIFICATION FORM

Release executed by _____ , an employee or student
of (or person affiliated with) _____ [name of
institution], located at _____ ,

In consideration for being permitted to enter the grounds of the State University of New York at Buffalo ["SUNY Buffalo"] and conduct research or other education or research-related activities at SUNY Buffalo, including but not limited to its Ketter Hall or Ketter Hall Addition, the undersigned does hereby agree to assume all the risks and responsibilities surrounding my participation in any research or other activities undertaken at SUNY Buffalo, and, further, do for myself, my heirs, and personal representative(s), hereby agree to defend, hold harmless, indemnify, and release, and forever discharge SUNY Buffalo, the Research Foundation of State University of New York and the State of New York, and all their officers, agents, and employees from and against any and all claims, demands, actions, or causes of action, on account of damage to personal property, or personal injury, or death which may arise from my participation in the aforesaid activities or my presence on the SUNY Buffalo campus, and which result from causes beyond the control of, or without the negligence of, SUNY Buffalo or the Research Foundation of State University of New York, their officers, agents, or employees, during the period of my participation or presence on the campus of SUNY Buffalo as aforesaid.

[Signature of employee/student/etc]

[Name of employee/ student/ etc. Please type or print]

Date:_____

RELEASE AND INDEMNIFICATION FORM BY INSTITUTION

The _____, with its primary address at _____
_____ (hereinafter "The Institution"), in consideration for the State University of New York and its University at Buffalo ["SUNY Buffalo"] and the Research Foundation of State University of New York providing facilities, equipment, and staff for the conduct of research and testing and other services in connection with the Institution's research and other education-related activities ("the Activities") on the campus of SUNY Buffalo (including, but not limited to, SUNY Buffalo's Ketter Hall and Ketter Hall Addition), does hereby agree as follows:

1) The Institution assumes all risk incidental to the Activities and shall be solely responsible for any and all accidents and injuries to persons and property (including death) arising out of, or in connection with, the Activities and agrees to indemnify and hold harmless the People of the State of New York, the State University of New York, the Research Foundation of State University of New York, and their agents, employees, and officers, from any and all claims, suits, actions, damages and costs of every nature and description arising out of or relating to the Activities or the violation by said Institution, its agents, employees, students, or contractors, of any law, code, order, ordinance, rule or regulation in connection therewith. The Institution agrees, on being requested to do so, to assume the defense and to defend, at its own cost and expense, any action brought at any time against the People of the State of New York, the Research Foundation of State University of New York and/or the State University of New York in connection with the claims, suits and losses as aforesaid.

2) The Institution shall be responsible for any and all damages or loss by theft or otherwise of property, whether such property shall belong to State University or to others, and for injury to persons (including death) which may in any way arise from the Activities and is caused by any person affiliated with the Institution.

3) The Institution shall be responsible for, and shall maintain good discipline and proper behavior on the part of all students, employees, or other persons affiliated with it who are in any way involved in the Activities and agrees to remove any such person whose actions, or failure to act, shall in the sole judgment of SUNY, after consulting with *the institution* be deemed to be detrimental to SUNY.

4) The Institution agrees to provide SL NY Buffalo with a liability insurance policy naming the State University of New York, the Research Foundation of State University of New York and the People of the State of New York as additional insureds covering property damage, personal injury or death arising out of the Activities at SUNY Buffalo. The Institution further agrees to send SUNY Buffalo a copy of any notice of cancellation of such policy, renewal policy or new policy naming SUNY, the Research Foundation of State University of New York and the People of the State of New York, as additional insureds within five (5) business days of such action. The Institution shall also procure and maintain at its own expense, and without expense to SUNY, insurance, on an occurrence and not on a claims made basis, for liability for damages imposed by law, of the kinds and in the amounts hereinafter provided with insurance companies licensed to do such business in the State covering all operations in connection with the Activities whether performed by the Institution or by subcontractors or consultants. The kinds and amount of insurance are as follows:

Liability and Property Damage Insurance. Each policy with limits of not less than:

Bodily Injury Liability
Each Occurrence.....\$1,000 000

Property Damage
Each Occurrence\$1,000,000

for all damages arising during the policy period, shall be furnished in the types specified, viz:

(i) Liability Insurance issued to and covering the liability (a) for damages imposed by law upon the Institution. and (h) including in such liability insurance policy provisions indemnifying and holding the State of New York, SUNY, the Research Foundation of State University of New York, their officers, employees, and agents harmless from any suits, actions, damages and costs of every name and description with respect to all Activities carried out: and

(ii) Owner's Protective Liability Insurance issued to and covering the liability for damages imposed by law upon The People of the State of New York, the Research Foundation of State University of New York and SUNY and all their officers, employees and agents both officially and personally, with respect to all Activities_ including omissions and supervisory acts of the State or SUNY and

Prior to the commencement of the Activities, the Institution shall deliver to SUNY certificates of insurance issued by the respective insurers, evidencing the insurance as required above and bearing notations evidencing the payment of the premiums thereon or accompanied by other evidence of such payment satisfactory to SUNY. In the event any such policy furnished or carried expires on a date prior to the physical completion date, the Institution, not less than thirty (30) calendar days prior to such expiration date, shall deliver to SUNY certificates of insurance evidencing the renewal of such policies, and the Institution shall promptly pay all premiums thereon due. In the event of threatened

legal action, claims, encumbrances, or liabilities that may affect SUNY, or if deemed necessary by SUNY due to events rendering a review necessary, upon request the Institution shall deliver to SUNY a certified copy of each policy.

5) The Institution specifically agrees that if the Activities are cancelled or terminated for any reason, the Institution shall have no claim against the State of New York, the Research Foundation of State University of New York nor their officers and employees, and they and their officers and employees shall be relieved from any and all liability.

IN WITNESS WHEREOF, the Institution has caused this instrument to be sealed and signed by its duly authorized officer, and the State University and the Research Foundation of State University of New York have caused this instrument to be executed by their duly authorized officers.

STATE UNIVERSITY of NEW YORK
BY _____

THE INSTITUTION
By _____
Official Representative of Institution or
Authorized Designee

RESEARCH FOUNDATION OF
STATE UNIVERSITY OF NEW YORK
By _____

Appendix G. Safety and Maintenance Inspection Form

UB-NEES/SEESL: Monthly Safety and Maintenance Inspection Summary
 Performed by: _____
 Date: _____

Item/Area	Satisfactory		Deficiency/Comment	To be Corrected by: Person/Date
	Yes	No		
Hydraulic Distribution System (M. Pitman, S. Weinreber)				
Flex lines: chaffing/blistering/cracks				
Flex line fittings: leakage				
Manifolds & hand valves: leakage				
Accumulators & connections: leakage				
Dynamic & Static actuators: connections-leakage				
Electrical connections: fraying				
Other				
Pump Room:				
-Leakage/oil spills				
-Lighting				
-Electrical connections; fraying				
-Acoustic panels; in place				
-Fire grounding; Intact				
-Site-glass/oil level				
Basement Accumulators; leakage				
Basement hard line piping; leakage				
Other				
Shake Tables/Trench (M. Pitman, S. Weinreber)				
Post & chain barriers in place				x
Platform perimeter restraint available				
Shake Table warning lights in place and operational				
Trench planks in place				
Trench cleanliness/oil leakage				
Oil accumulation in trench				
Trench lighting				
Other				
Laboratory Floors (D. Kozlowski)				
Lug Covers and Caps in place				x
Wires, hoses, cable covered				
Floors clean and free of debris				
Other				
Basement (M. Pitman)				
Lighting				

Water accumulation				
Floors clean and clear				
Overhead wires secure				
Other				
Cranes; 40, 15 and 7.5 ton (D. Kozlowski, R. Staniszewski)				
Visually inspect and walk gantry				
Cables/wire rope free of defects				
Audio and visual warning alarms operational				
Controls operational				
Rails free of debris/obstructions				
Slings and hoist hardware free of defects				
Inspections current and logged (<i>NOTE: Performed by</i>				
<i>UB-Facilities Semi-annually</i>)				
Other				
Machine Shop (D. Kozlowski, B. Staniszewski)				
Clean and free of debris				
Safety glasses and ear protection available				
All guards/protection devices in place				
Solvents/adhesives/cleaners in containers and stored				
Tools & bits placed in storage containers and cabinets				
Other				
Electronics/Instrumentation Shop (S. Weinreber, C. Budden)				
Clean and free of debris				
Solvents/adhesives/cleaners in containers and stored				
Tools & supplies stored in containers and cabinets				
Other				
General Lab (D. Kozlowski)				
Floors clean, dry and pathways clear				
All tools and work supplies on carts				x
Solvent cabinets clean and secure				
Gas cylinders secure				
Gas cylinder storage clean and secure				
Exit signs in place/pathways marked and clear				x
First aid kits; supplies current and accessible				x
Eye wash stations; current and accessible				x
Emergency phone accessible				
Hardhats available at designated entrances				x
Test prep. areas secured with portable posts as required				
All entrances/exits clear of debris				
Other				
Other Equipment (D. Kozlowski)				

Forklift/Pallet truck: operational/inspected				
Ladders: inspected/secure				
Scissors lifts: operational/inspected				
Personnel harnesses: free of defects				
Respiratory equipment available as required				
Other				

Appendix H. UB-NEES/SEESL Hazards Inventory & Responses

NEES FACILITY HAZARD INVENTORY (Revised May 4, 2009)

Name of Facility: University at Buffalo

Person Responding: Thomas Albrechcinski

Telephone Number (with extension): (716) 645-3019

Date: May 4, 2009

The purpose of this Hazard Inventory is to help Risk Consultants, Inc. understand the hazards that may exist at your facility. Please answer the following questions **YES** or **NO**. If the answer is **YES**, or you believe further explanation is necessary, please give a brief (one or two sentence) explanation.

Please send your response via e-mail to Lewis Moseley, lewis.moseley@riskcon.com

If you have any questions, call Lewis Moseley at 770.496.0037 or Richard Aiken at 770-978-6868.

COMMON HAZARDS

#	HAZARD ITEM	RESPONSE
1	CHEMICALS, INDUSTRIAL – Does your facility store or use hazardous industrial chemicals (i.e. solvents, adhesives, coatings and other chemicals) for which a Material Safety Data Sheet is required?	Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. These items include paints, paint solvents, degreasers, etc... and are stored in OSHA approved locked cabinets.
2	CHEMICALS, LABORATORY – Do you store or use chemicals that would normally be referred to as laboratory chemicals? If so, is a chemical inventory available? (Do not send the inventory at this time.)	No

3	<p>CONFINED SPACES – Does your staff ever have occasion to enter confined spaces? ["Confined space" means a space that: (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and (2) 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 (3) Is not designed for continuous employee occupancy.]</p>	<p>Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The "Comprehensive Safety Training Manual" and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. This primarily refers to the Geotechnical Laminar Box. When access is required to the base of the assembly, a safety ladder is used in addition to crane personnel lift and observers are stationed at the top. Forced ventilation to the base is achieved by a high performance blower and flexible duct. A portable oxygen meter, with an audible alarm is worn by the individual working in the space.</p>
4	<p>DROWNING – Does your facility have water pools or similar structures that might pose a drowning risk to staff?</p>	<p>No</p>
5	<p>ELEVATED WORK – Do your employees ever work on surfaces more than 4' above ground/floor level? (Examples: elevated platforms, ladders, fixed or temporary scaffolding, elevated walkways, scissors lifts, etc.)</p>	<p>Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The "Comprehensive Safety Training Manual" and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. The site employs two-scissors lifts and an articulated arm boom lift. Personnel working at elevation employ OSHA approved safety harnesses as required.</p>
6	<p>ENVIRONMENTAL – Does your facility generate hazardous waste (as defined by the US EPA or your state EPA agency)?</p>	<p>No</p>
7	<p>EXCAVATION – Does the staff at your facility ever work in trenches or excavations 4 feet (1.22 m) or more in depth?</p>	<p>No</p>
8	<p>EXPLOSIVES – Does your facility store or use commercial explosives or blasting caps?</p>	<p>No</p>

9	FLAMMABLES STORAGE – Does your facility store or use flammable liquids?	Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. All flammables such as: gasoline, solvents, thinners, cleaners, adhesives and paints are stored in compliance with OSHA CFR 1910.106
10	FORKLIFTS – Does your facility have forklifts or other powered industrial trucks? (If YES, please specify fuel)	Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. A single forklift is used employing propane fuel, see above re-storage.
11	HEAVY EQUIPMENT – Does your facility own, rent or use mobile heavy equipment (such as dozers, earthmovers, backhoes, scrapers, truck cranes, “cherry pickers”)?	Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. On occasions used, primarily outdoors to transfer sand for Geotechnical Laminar Box. If ever used indoors, exhaust is ducted outdoors via approved exhaust flexible duct.
12	LANGUAGE BARRIER – Does your facility have staff members who are not fluent in English?	No
13	LIFTING, MANUAL – Does your staff manually move or lift items that weigh in excess of 50#?	No

14	LIFTING, MECHANICAL – Does your facility have cranes, hoists or other equipment for lifting heavy materials?	Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. The site employs a 40-ton overhead crane. Only trained-certified staff use the crane. The crane undergoes routine-regular safety and mechanical inspections under university-manufacturer contract.
15	MACHINERY GUARDING – Does your facility have machinery or other equipment with moving or rotating parts?	Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. Only trained staff utilize lathe, mill, etc... which are located in a protected/fenced area requiring key access by staff. All machinery, including table saws, band saws, etc., are equipped with the required guards and safety attachments per OSHA CFR 29 general requirements 1910.212. Standard safety glasses/face shields, etc... are worn by staff operating these machines. These are inspected monthly by the SEESL safety officer and are subject to the university EH&S inspections as well.
16	NOISE EXPOSURE – Is any of the staff at your facility exposed to noise in excess of the OSHA-mandated “action level” (8-hour time-weighted average of 85 decibels or higher)?	No

17	POWER TOOLS, FIXED – Does your facility have or use fixed tools (such as bench or radial arm saws, lathes, milling machines, cut-off saws, power presses, etc.)?	Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. These tools are used in compliance with OSHA CFR 29 general requirements 1910.212. These tools are maintained and checked by the professional staff and employ OEM switches and guards as appropriate. They are used only by trained staff and students (table saw, radial arm saw, chop saw..) wearing required safety glasses, clothing, etc...
18	POWER TOOLS, PORTABLE – Does your facility have or make use of portable power tools (such as circular saws, drills, sanders, right-angle grinders, etc.)?	Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. These tools are used in compliance with OSHA CFR 29 general requirements 1910.242 and specifically 1910.243; Sanders, drills, grinders, etc... are maintained by the professional staff and employ OEM switches and guards as appropriate. They are used only by staff and trained students and employ safety glasses etc....
19	RADIATION – Does your facility make use of X-rays or radioactive materials?	No
20	REMOTE OPERATIONS – Does your facility have field operations or research activities that are remote from your main facility?	No

21	RESPIRATORS – Is the staff in your facility exposed to hazardous air-borne materials (chemical vapors, cement dust, asbestos, nuisance dusts, etc)?	NOTE: We do use “concrete mixes” on occasion and “sand” (Silica-quartz) with the Geotechnical Laminar Box. UB-NEES monitors ambient particulate concentrations and sizes and employs OSHA approved masks as required. This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam.
22	SCAFFOLDING – Does your facility make use of temporary scaffolding (i.e., built for specific jobs or tasks and then dismantled)?	No
23	TEMPERATURE STRESS – Is the staff in your facility ever exposed to high temperatures, high humidity, or low temperatures. (i.e. working outdoors or in a building that is not heated or air conditioned.)	No

24	VEHICLE EXPOSURE – Do any staff members ever drive or ride in facility-owned vehicles and/or drive their personal vehicles on facility business?	<p>Yes-Training Courses and local vendor business: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at:</p> <p>http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. If Staff required to drive their personal vehicle within the scope, conduct or performance of their job associated with laboratory business and operations, such as acquiring locally available supplies, visiting fabricators to monitor status and progress, etc...they are advised: 1) The university does not provide vehicles with the exception of special cases and they are allowed to use their personal vehicles: 2) Their personal insurance would be primary coverage and the SUNY Research Foundation's insurance would be secondary. The campus is responsible for the deductibles in all instances and it would be at the campuses discretion if they chose to pay the personal auto deductible for the individual.</p>
25	WELDING – Does the staff at your facility do any welding? (If YES, please specify electric or gas welding)	<p>Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at:</p> <p>http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. All mechanical staff are fully trained and certified in mig/tig, stainless steel and stick welding.</p>

26	WELDING, FUEL STORAGE – Does your facility store compressed acetylene and/or oxygen cylinders for welding? i.e. compressed gases.	Yes: This and all of the items noted as yes are addressed in the UB-NEES Safety Plan directly by reference to Appendix A: The “Comprehensive Safety Training Manual” and also on the UB-NEES website at: http://nees.buffalo.edu/docs/Safety%20Training%20Manual/Safety%20Training%20Manual903.pdf which is required of all staff, faculty, students and visiting researchers or contractors that work in the laboratory to read and pass a safety exam. Welding gases and propane, stored outdoors in OSHA approved locked cabinets with proper signage. Fuel and oxidizer gases are stored separately. All cylinders are secured with the original caps and valve protectors when not in use. When employed indoors, cylinders are secured per OSHA requirements and chained to welding carts. Welding and all compressed gas cylinders are delivered by the original vendor and picked up by the vendor when empty. The laboratory does not transport these materials.
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**UB-NEES OSHA Action Plan
Element A9**

The operations and practices of the UB-NEES site are monitored by a formal “Safety Committee”, chaired by the deputy director of UB-NEES with committee members including; the laboratory-floor safety officer, the laboratory Technical Services Manager, the department of Civil Engineering’s safety officer, and the UB-NEES Site Operations Manager. All faculty, staff and visiting researchers that work within the laboratory receive a formal training session based on the UB-NEES Safety Plan and the referenced “Safety Training Manual”. All faculty and staff associated with the laboratory are aware that the facility is subject to regular campus EH&S inspections and the possibility of unannounced OSHA inspections. All laboratory faculty and staff and visiting researchers, who have undergone the training session, are aware that, in the event of an unannounced OSHA inspection, they will bring it to the attention of one of the members of the UB-NEES safety committee. This member, and/or other members, as available, will openly escort the inspector through the laboratory and provide access to any safety related documentation as requested. NOTE: no visitors unannounced or otherwise are permitted in the laboratory without escort. Signage on all entrances denote authorized personnel only, with no entrance allowed other than by the designated visitor entrance

Appendix I. UB-NEES/SEESL Accident, Incident, Injury and Investigation Report Template

Title: Accident-Incident-Injury and Investigation Report	Document No. SEESL-AAI-1 Revision No.: _____
Date: _____	

This form is to be utilized to document all accidents and/or incidents, in SEESL, that may or may not have resulted in personal injury. It also is intended to summarize the cause of the accident and/or actions taken to remediate the cause as required.

This document is for internal use only.

1.0 Purpose

This form is to be utilized to document all accidents and/or incidents, in SEESL, that may or may not have resulted in personal injury. It also is intended to summarize the cause of the accident and/or actions taken to remediate the cause as required.

2.0 Check all that Apply: Accident _____ : Injury _____ : Incident _____

2.1 Summary of Accident/Injury/Incident

Provide a brief summary of the accident-incident and note if any injury occurred:

Name of Person/Persons Involved and/or Affected:

Address: _____

Age: _____ SEX: (M) (F)

Position (Staff/TA/Faculty/Student/Visitor) _____

Supervisor/Advisor: _____

Date/Time of Accident/Incident _____

Location of Accident/Incident: (specific area in the laboratory)

List & Describe Specific Equipment, Test Specimen, Tools, Chemicals, Etc., Involved in the Accident/Incident:

Describe the Cause of the Accident/Injury/Incident: (As possible, give complete details including specific information/procedures regarding equipment, tools, etc., attach additional sheets if necessary).

Did Anyone Require First Aid and/or Medical Treatment at the Scene: (if so, give name(s) and details of when/what type of treatment: _____

Did Anyone Require Medical/Hospital Treatment Following the Accident/Injury: (if so, give name(s) and details of when/what type of treatment and where)

Actions Taken by Lab/UB- Personnel at the Scene: _____

Person Reporting the Accident/Injury/Incident:

Print Name: _____

Signature: _____

Supervisor:

Name and Title: _____

Signature _____

3.0 Post Accident/Incident Investigation Summary

Summary of the Investigation and Corrective/Remedial Actions Taken: Reference Equipment-Hardware systems, operations and procedures as appropriate.

Names & Titles of Those Conducting the Investigation _____

What Workplace Condition, Practice or Equipment Contributed to the Accident/Injury/Incident?

Was the "Mandatory Safe Work Practice" Violated? (If yes: why and how) _____

Witness Names if Applicable:

Witness Statements:

What Corrective Actions have or will be implemented (if necessary) to prevent another similar occurrence?

What if any additional and/or new Safe Work Practice(s) will be needed?

Was the Unsafe Condition, Practice, Equipment or Test Specimen Problem Corrected Immediately?

(Circle one of the following) (Yes) (No)

If No; What actions have been taken to ensure correction as soon as possible (& by when).

Until Corrected, What Actions Have Been Taken to Prevent Recurrence in the Interim?

Signature of Investigator(s): _____

Date: _____

Signature of Person(s) Responsible for Corrective Actions:

Date: _____

Distribution: This report is to be retained in the SEESL files.

4.0 Document Revision/Update History

Revision No. _____ Date of Revision: _____

Revision/Update by: Name: _____	Reason for Revision/Update: _____ _____ _____ Provide Attachments as Necessary	Approved by: _____ _____ _____
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