

<b>National Grid Safety Procedure</b>		Rev. No.	9
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## FOREWORD

National Grid's vision is to be a world-class safety organization with zero injuries every day. This includes working to help ensure the safety of our employees, contractors and the community. National Grid is committed to delivering operational excellence, including excellent levels of safety internally and in cooperation with the external contractors we rely on.

The Executive Safety Committee provides review and input for Safety Policies and Procedures through the Safety Policies and Procedures Subcommittee.

The Safety department is the owner of this procedure and is responsible for maintaining and implementing this procedure, soliciting comments from stakeholders and revising as necessary.

This document, "Contractor Safety Requirements", represents the current contractor safety requirements that are unique to operations and various functional groups at National Grid. This document does not specifically reference actions that are required by OSHA, other laws, rules, or regulations. These are requirements that should be understood by the contractor and contractor compliance with all applicable federal, state and local laws, rules, and regulations is expected by National Grid as a contractual condition.

Questions regarding this procedure should be referred to the National Grid Safety Department.

This document will be updated as necessary to communicate all aspects of National Grid's contractor safety to bidders, current contractors and to reflect changes in National Grid's Safety Policies and Procedures.

Date of Review/Revision:

Revision	Date	Description
1	08/5/2004	Initial
2	3/2/2005	Additions
3	01/30/2007	Additions
4	08/01/2008	Additions
5	08/01/2010	Additions
6	02/01/2011	Audit recommendations included

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Date of Review/Revision Continued:		
Revision	Date	Description
7	09/11/2013	Additions included OH; technical changes; Compliance Monitoring; Ethics; Job Briefs
8	11/02/2015	Additions include Audit & IA recommendations; ISN alignment; technical changes, 1910. 269 updates
9	8/17/2016	Format update and technical changes

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## 1.0 CONTRACTOR SAFETY AT NATIONAL GRID

### 1.1 Definitions

#### ***Adverse Public Impact***

Incidents that disrupts service to the public or results in adverse public reaction.

#### ***Compliance Assessments (CAs)***

An act of observing and engaging in discussion with employees at a job site or work area locations. Compliance Assessments are documented using the Compliance Assessment checklist for each segment of operation and are not considered anonymous. Compliance Assessments are utilized to comply with internal policy and external regulatory requirements.

#### ***Contracted Services***

Contracted Services refers to any activity that is conducted by an organization or individual under the terms of a purchase order. Contracted services may include all types of construction and maintenance services, tree trimming, building maintenance and demolition, electrical structure dismantling, site restoration, engineering design, recycling and waste disposal, drilling, rigging, electrical, and utility pole/structure maintenance.

#### ***Contractor***

An independent person or company that undertakes a contract to provide materials or labor to perform a service or do a job and are responsible for the safety of his/her employees and subcontractors.

#### ***Contractor Orientation***

Contractor orientation is intended to serve as a resource in order to provide the contractor with the tools necessary to educate their employees and subcontractors. The session is not intended to train the contractor management, their employees or subcontractors. The extent and content of the orientation session shall be commensurate with the scope and type of the contractor's activities.

#### ***Hazardous Conditions***

A condition that can and is rectified immediately by the person who identified the hazard.

#### ***Incident***

An unplanned event that has a human component and results in or could potentially result in harm to people, damage to property and/or adverse public impact.

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***Incident Management System (IMS)***

National Grid’s online incident management tool that allows the company to report safety, environmental and asset-related incidents, perform incident analysis, generate safety reports and monitor the organization’s safety performance.

***ISNetworld, Inc. (ISN or ISN System)***

Third party contractor that is a global resource for connecting Hiring Clients with safe and reliable contractors and is a contractor information management system currently contracted with National Grid.

***Job Brief***

A planned interactive discussion with all contractor employees, sub-contractors and team members working on a job that occurs just prior to a job, task, project, prior to a change in planned work or when a new person arrives on site.

***Operator Qualification (OQ)***

As defined in the Code of Federal Regulations, Transportation, 49 Subpart 192.801 through 192.809 and/or DOT pipeline qualified for gas contractors doing work at National Grid. Additional state requirements pursuant to the state the contractor is working may be required.

***Process Safety Management***

Method of focusing and mitigating concerns of major hazards impacting safety, environmental damage and business losses. It is an organized effort to identify and analyze the significance of hazardous situations associated with a process or activity to aid management in making critical safety decisions

***Project Representative***

National Grid Owner’s Representative or designee who is assigned to certain contracted projects and communicates regularly with the contractor during the course of the contracted service. This person also ensures the work is being performed in accordance with the contract, including the safety requirements.

***Purchase Order (P.O.)***

An agreement/contract between National Grid and a contractor to provide services and/or materials. The P.O. is set up by Procurement. The term “Contract” and “P.O.” are similar and may be used interchangeably. A “Blanket P.O.” is set up for contractors whose work is on-going. A “one-time P.O.” is set up for project work.

***Qualified Electrical Worker***

Those who are knowledgeable in the construction and operation of the electric power generation, transmission and/or distribution equipment involved, along with the associated hazards.

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***Qualified Gas Worker***

Any contractor who performs covered tasks in accordance with National Grid's Operator Qualification Program and the Northeast Gas Association are required to be knowledgeable and meet all regulatory standards.

***Risk Assessment***

A risk assessment is the process of identifying hazards and calculating or ranking the associated risks according to: the likelihood of occurrence, the severity of the harm from the hazard, and the amount of time of exposure to the hazard.

***Safe/Unsafe Act (SUSA)***

The act of observing and engaging in discussion with employees at a job site or work area location. SUSA Visits focus on observation of behaviors and result in obtaining a commitment to working safely. SUSA Visits are conducted by members of management and safety personnel on a routine basis and are a vital part of managing the company and developing a safety culture. SUSA Visits are not announced and they are anonymous. For trending purposes, SUSA Visits will be documented by the observer after the discussion is complete and the observer has left the job site. SUSA Visits should focus on prevention of soft tissue injury as well as other at-risk behaviors.

***Safety Observer***

A person who is responsible for alerting the work team to any potential unsafe conditions or lack of compliance with approved work practices, procedures or guidelines.

***Transportation Advisor***

Third party agency specializing in federal and company mandated drug and alcohol testing programs.

**1.2 Introduction**

Safety performance is a prime consideration in the selection of contractors. National Grid will stipulate safety performance requirements and responsibilities in our contracts, purchase orders (POs) and will hold the contractor accountable for meeting the contractual requirements.

National Grid's goal is to establish a long-term working relationship with contractors who share the same safety values and demonstrate those values through their work performance.

Contractor safety at National Grid involves three broad areas:



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**1. The Contractor Procurement (Selection) Process**

Contractor safety begins with the selection of contractors who have demonstrated a strong safety record. National Grid will complete a review during the procurement process that involves determining a contractors' risk and the scope(s) of work involved. National Grid currently uses ISNetworld, Inc. as a third (3<sup>rd</sup>) party assessment process for assisting with contractor procurement. The 3<sup>rd</sup> party entity will vet and continually monitor individual contractors' compliance with applicable safety and/or risk and insurance program requirements.

**2. Safety Communication**

Safety communication covers all the avenues and forums in which National Grid and the contractor communicates safety. Communication begins early in the bidding phase and is on-going as an integral part of the contractor-customer relationship. The goal is to ensure clarity, transparency and to limit misunderstandings.

**3. Safety Compliance**

Safety compliance is the process of ensuring that the necessary technical provisions of the contract are being followed. National Grid will assign a project representative or other designee to provide guidance and oversight. The Contractor is responsible for their employees and subcontractors and shall be held accountable for ensuring compliance with all applicable safety rules while working on National Grid property, rights of way (ROWs) and our assets.

**1.3 Risk Ranking of Work**

1. National Grid characterizes and ranks risk by the scopes of work performed. The categories are classified as high, medium or low risk. Prior to being considered for work at National Grid, contractors who perform High or Medium Risk work must be pre-qualified in ISN. See Appendix A for more information regarding the National Grid Risk Matrix.
2. Activities that are designated as "high risk" means that catastrophic event can result if safety measures are not followed. Activities designated as "medium" risk present certain opportunities for moderate to significant injuries, property or reputational damage, and/or loss of service and/or possibly business continuity. Activities designated as "low" risk may still require safety compliance and control measures, although the contractor performing the work does not necessarily need to be enrolled in ISN, if that is the only classification of work that contractor performs for National Grid.

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3. The designation High Risk, Medium Risk, or Low Risk, refers only to the inherent risk associated with the work activity and is not an opinion on the ability of a contractor to work safely.
4. The Procurement Agent will notify the bidder/contractor at the beginning of the procurement process if their contracted service has been ranked as high or medium risk.

#### **1.4 Bidder Information Request – High and Medium Risk Work**

1. Any contractor bidding on high or medium risk work shall be required to complete a questionnaire regarding the Contractor’s safety program, compliance and history of occupational illnesses and injuries (ISNetworld New Vendor Onboarding application form). Contractors will also be required to demonstrate that all employees, including subcontractors, are qualified.
2. ISNetworld then thoroughly reviews contractors’ qualifications against a prerequisite list of National Grid criteria. National Grid has established that contractors performing high or medium risk work MUST HAVE and MAINTAIN a grade of “C” or better in the ISN system to perform work and services for National Grid. ISN will track and manage the National Grid pre-qualified contractor bidder lists. This bidder list is the first step for a contractor in establishing a working relationship with National Grid. For active ISN contractors, ISN will request updated information monthly. Contractors who do not have a current PO, contract, or authorized scope of work with National Grid will be considered as a Prospective bidder and will be asked to submit information quarterly. It is understood that insurance may not be maintained within National Grid standards, however, once a contractor is awarded a contract, proper and adequate insurance must be provided to ISNetworld to achieve a passing grade. Lack of insurance or inadequate insurance is an immediate “F” grade in the ISN system per National Grid criteria.
3. Project representatives may request an exemption or variance from requiring a contractor to be placed in ISNetworld for various reasons. A Supplier Exemption Request form shall be completed, documented and signed by the business unit VP and Safety prior to contract award.
4. The information that the Bidder provides National Grid via ISN serves as the basis for assessing safety qualification. For this reason, it is important for contractors to maintain transparency throughout the process. National Grid and ISN will review all submitted information. Any effort in avoiding

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complete disclosure will disqualify the Bidder from bidding work at National Grid.

## 1.5 Safety Compliance

1. National Grid representatives evaluate contractor compliance by conducting routine site visits, Compliance Assessments (CA's) Safe/Unsafe Acts (SUSA) visits and attending periodic contractor safety meetings. Contractors should also perform and document safety self-assessments to ensure compliance to federal, state, local and National Grid regulations. This combined effort enhances, solidifies safety compliance and has the added benefit of quality control / quality assurance of the work performed.
2. Contractors bidding on new work shall provide worker qualifications to the National Grid procurement representative via the "Bidder Information Request" form and/or ISN National Grid On-boarding form.
3. If a safety violation is observed by a National Grid representative, the violation will be discussed with the contractor at the time of discovery.
4. Contractor employees enrolled in ISNworld that are involved in any accident, incident or significant near-miss event, will be required to lead an investigation and root cause determination process. In addition, the contractor must implement corrective actions and establish measures to prevent a recurrence through an incident investigation process and document the details within ISN.
5. Individual contractor personnel who habitually violate any safety rules should be identified, and the contractor should remove the individual(s) from the project. National Grid reserves the right to remove any contractor employee(s) who violate safety rules or procedures; pose a safety risk to themselves, other contractors; our employees; or the general public.
6. If a contractor is observed to be operating in a manner that creates an imminent danger to persons or property, it is the responsibility of all individuals observing the hazard to cease the hazardous operation impacted until the issue has been resolved to the satisfaction of National Grid, the Owners Representative or Safety Representative.
7. Contracts/POs shall require the contractor to immediately forward any citations, notices, or OSHA reportable cases per 29 CFR 1904.39 from a National Grid project, upon receipt to the appropriate project representative and/or ISN. The project representative shall distribute copies of the citation or notice to senior management, Safety, Procurement, and the Legal Department.

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8. Willful and/or repeat violations of safety requirements by the contractor may be considered a breach of the contract and reason for contract termination.
9. If the contractor's overall safety performance is viewed as being unsatisfactory or noncompliant with contract provisions, and if the contractor is unwilling to demonstrate satisfactory program improvement, the result may be considered a breach of the contract and reason for contract termination.
10. National Grid project managers and/or construction supervisors shall document safety compliance by completing a "Contractor Performance Evaluation" for each project. This documents both positive and negative safety performance or behaviors and this feedback will be used in the decision process for awarding future contracts.

## **2.0 GENERAL SAFETY REQUIREMENTS**

### **2.1 Introduction**

1. All contractors are required, and expected to comply with all applicable requirements of the Occupational Safety and Health Administration (OSHA), and all other applicable federal, state and local laws, ordinances, regulations, and other project and site-specific permits unless superseded by identified National Grid procedures.
2. This document represents policies and safety-related work methods unique to National Grid and they may be more stringent than OSHA regulations. Contractors must follow these requirements as well as their own rules or regulations that meet or exceed OSHA and other regulatory requirements.
3. National Grid will provide more detailed information and guidance regarding specific procedures prior to commencement of work.

### **2.2 Applicability**

*Applies to: All contractors, as needed*

1. In any contracted task, where a safety observer is required, it is the responsibility of the contractor to provide that person and ensure that he/she is qualified to perform the role when needed.
2. A 4:1 pitch shall be maintained when using an extension ladder or the ladder shall be tied off and/or secured and 3 points of contact shall be maintained

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by the climber. If both hands are needed to perform work, then fall protection is required.

3. Although not preferred, if hard hats are worn backwards, the suspension adjuster must always face the rear. Class E hard hats are required for all electrical work.
4. 20KV EH overshoes are required when:
  - Workers on the ground are working within 50' of the master ground connection point to earth.
  - Operating a wire trailer and pulling/tensioning machine.
  - Operating a winch truck or reel trailer with its payout in an energized area that may result in inadvertent contact.
  - Hand digging in close proximity to energized cables within the tolerance zone.
  - Making repairs in a trench to a faulted primary cable without de-energizing any adjacent energized primary cables within close proximity.
  - Using approved live line tools to move energized primary cables in a trench.
  - If removing underground cable rubber covering or arc suppression blankets from an energized cable.
  - Working within minimum approach distance (MAD) of downed electrical wires or foot patrolling for such wires.
  - If setting poles in proximity to energized lines or equipment and using truck controls from the ground.
5. National Grid expects that all cargo will be secured in accordance with U.S. DOT requirements.
  - As of January 2004, the Federal Motor Carrier Safety Administration (FMCSA) within the U.S. DOT published Cargo Securement Rules 393.100-136 Subpart I – Protection Against Shifting and Falling Cargo.
6. Chaps are required to be worn by ANY person using a chainsaw to make a cut on the ground or assisting in that cut and within striking distance. Chaps shall also be worn when using portable electric or gas powered demo/target saws and when using hand tools that may slip from the hand and/or can inadvertently make contact with the leg.
7. All applicable contractors must meet the requirements of drug and alcohol testing in accordance with FMCSA DOT 49 CFR Part 40 and Pipeline and

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Hazardous Materials Safety Administration (PHMSA) DOT 49 CFR Part 199. National Grid shall monitor contractor compliance to the drug and alcohol regulatory requirements through Transportation Advisor or ISNetworld as needed.

8. Contractors who drive regularly in delivery of service for National Grid shall:
- a. Have a safe motor vehicle operations policy which must be communicated to their employees before they begin driving for company business. The contractor is expected to follow National Grid's *Safe Motor Vehicle Operations* policy to include the following:
    - Prior to moving any vehicle, the driver shall perform a "circle of safety" inspection. This is to confirm not any person, animal, equipment, or property will be injured or damaged when the vehicle is moved.
    - Drivers should back into or pull through a parking space so that when you re-enter the vehicle, the first move is forward.
    - No driver shall use a hand-held mobile telephone while driving a vehicle for National Grid business.
    - The driver shall eliminate or minimize sources of potential driving distractions to include, eating, smoking, reading, writing, grooming, use of any electronic devices, mirror or seat adjustment. These shall be done when the vehicle is not in motion.
  - b. Comply with all requirements of all federal, state and local regulations regarding safe motor vehicle operations.
  - c. Ensure that new and existing employees have a valid Driver's License in accordance with requirements of specific job duties and classification/type of the vehicle they are operating. Contractors must have an acceptable driving record. If their driving record is unacceptable, the driver shall not be permitted to operate a vehicle on behalf of National Grid.
  - d. Provide vehicles in safe operating condition, in accordance with federal state and local regulations. The vehicle should be equipped with proper safety equipment as appropriate for the vehicle type and its intended use.

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- e. Track and evaluate any vehicular accidents or incidents experienced by their employees. Corrective actions, such as driver coaching, corrective action driver training and medical/vision tests should be recommended and acted upon where appropriate. All accidents or near misses while performing work for National Grid shall be communicated to the National Grid project representative or designee and documented in the ISN system.
  
- f. For more information, contact a National Grid representative for a copy of the National Grid Safety Policy *Safe Motor Vehicle Operations*
  
9. All contractors that require the use of heavy equipment shall ensure that competent, appropriately licensed, skilled and qualified personnel are in control of this equipment at all times. In addition, contractors shall ensure the following:
  - Equipment is inspected for safety and use at the beginning of the work period of shift. All failing or defective equipment and components shall be removed from service.
  
  - Equipment is under the control of trained operators who are always aware of their location and the locations/presence of persons working near the equipment, its swing zones and blind spots.
  
  - Operators shall ensure that no loose clothing or jewelry is present that could inadvertently get caught equipment controls.
  
  - Equipment is kept free of debris, water, oil, grease, mud or anything that could create a slip/fall hazard inside the cab.
  
  - Keep hands, feet, and clothing away from power-driven and moving parts.
  
  - Equipment cab windows should be kept clean and free of mud, ice, snow and/or fog for maximum visibility.
  
  - Never carry passengers on heavy equipment or any equipment unless it is equipped to do so.
  
  - Ensure that stabilizers are extended prior to starting a task.

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- Before making a swing, operators shall always look out the windows and mirrors for confirmation that the area is clear. If visual confirmation is impaired or the operator is unsure due to weather, lighting or other interferences, the operator cease operation until an independent spotter can check the swing area and confirm it is clear.
  - All excavations shall have signs posted, demarcation and controlled to prevent unauthorized persons from entering and falling inadvertently into the excavation. Excavations shall only be opened under the supervision of a competent person for excavation.
  - All pot holing/test holing and exploratory excavations shall utilize vacuum excavation whenever near known or the possibility of unknown hazards such as live electrical or gas conveyances. When using vacuum excavation in combination with air blowing/air knife tools, all persons in the immediate area shall be wearing safety glasses in addition to a full face shield.
  - No one is to work under a suspended load.
  - Never use a bucket to lift personnel.
  - Ensure stabilizers are in the upright and stored position before moving equipment.
  - Operators shall not exit heavy equipment until the engine is shut off.
  - All lifts that occur on National Grid properties, ROWs or near critical assets require formal lifting plans developed by the contractor and reviewed with the National Grid project representative. Some lifts will also require formal critical lifting plans and this may include PE or geotechnical assessments to ensure a stable lifting base for the crane or other apparatus.
10. All temporary, metal fencing installed or located under transmission lines shall be grounded and have signage according to National Grid grounding standards. Contact a National Grid representative for a copy



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of the Engineering Documents ST 03.05.001ST 03.06.001 and SP 08.00.001.

### **3.0 ADMINISTRATIVE SAFETY REQUIREMENTS**

#### **3.1 Worker Qualification Assurance**

1. In order to meet National Grid safety requirements, the contractor must describe how workers, including subcontractors, are qualified. The contractor must supply information concerning the type of skills assessment performed, training programs and how they ensure that employees demonstrate competencies. National Grid reserves the right to review this information and request additional training requirements. The contractor shall provide management personnel qualifications through resumes or other documents. National Grid may interview and/or approve management personnel if considered necessary.
  
2. For work on Process Safety assets (Gas Transmission, Generation, LNG, LNG Transportation and CNG), contractors shall provide a description of their experience in the business asset and specific tasks including similar projects, lists of licenses/certifications, and references from previous similar projects. Contractors shall be made knowledgeable of National Grid process safety requirements that are relevant to their specific work activities by the business hiring them.

#### **3.2 Meetings**

*Applies to: All contractors; as needed*

1. The pre-bid meeting is coordinated by National Grid Procurement to provide bidders with an opportunity to become acquainted with contractual requirements and specific safety issues concerning the project, including company-specific safety rules and known site conditions.
  
2. At this time, Procurement will notify the prospective bidders of the following:
  - a. If they are required to submit a project safety plan (HASP) prior to the pre-constructive meeting
  
  - b. The cost of specific safety equipment, practices and personal protective equipment shall be factored into their bid/proposal.

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### 3.3 Project Health & Safety Plan (HASP)

*Applies to: Contractors performing high or medium risk work*

1. Contractors who perform high or medium risk-ranked services shall submit a project-specific HASP plan prior to the start of the project and/or at pre-construction meeting. Your National Grid project representative will provide you with specific requirements of the format and/or forms to be completed.
2. For typical work that can be completed in 1-2 days, a documented job brief is sufficient to address the hazards and proper mitigations. Ask your National Grid project representative for details.
3. The *Short Version* plan shall be used for work that generally last 3-5 days. This plan shall include a completed safety hazards checklist and the Emergency Contact Sheet. Proper mitigation shall be documented in the safety hazards checklist for any applicable hazards. For examples of the Safety Hazards Checklist and the Emergency Contact Sheet, a National Grid representative can provide related forms under the *Contractor Safety* website in the Infonet.
4. The *Long Version* plan shall be used for work that will take at least 6 days or complicated projects. At a minimum, the *Long Version* safety plan shall include the following elements:
  - a. Roles and Responsibilities
  - b. Scope of Work
  - c. Task and hazard identification and risk assessment of the hazards
  - d. Hazard mitigation/control procedures and work methods
  - e. Incident investigation and reporting
  - f. Compliance and monitoring

The HASP shall to be submitted to the National Grid project representative for review and approval before work commences. The National Grid project representative shall ensure the HASP meets National Grid criteria and includes all aspects of the project prior to a review by Safety. For an example of a Long Version HASP, a National Grid representative can provide related policies and procedures under the *Contractor Safety* website in the Infonet.

Every contracted and subcontracted employee performing work on the project shall review the HASP to ensure steps in the plan are adhered to mitigate hazards

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during the pre-job orientation. These mitigation steps shall be incorporated into daily job briefs.

In addition, all workers shall sign an attendance sheet during the pre-job orientation that they have reviewed the plan, will adhere to the mitigation steps and they fully understand the plan. This document will be kept at the job site and available for review as needed and if requested by any National Grid representative, or any other parties.

#### **A. Roles and Responsibilities**

The HASP shall identify who is providing project oversight and how they are qualified. For example, if the work requires excavation, there must be someone on-site who is qualified as an excavation competent person. Training documentation shall be provided to ISN.

For multi-employer work-sites, the general contractor is responsible for all their employees and subcontractors. The safety plan shall clearly state this responsibility.

If requested to do so, Contractors shall designate a competent person to participate in or conduct a process hazard analysis (PHA) regarding a portion or the entirety of the project. National Grid will not be responsible for training the contractor on the PHA methodology.

#### **B. Scope of Work**

The Contractor shall clearly and briefly state the scope of work as provided by National Grid. The plan must specifically address the project or services requested by National Grid.

#### **C. Task and Hazard Identification and Risk Assessment**

The contractor shall perform a risk assessment by identifying all significant tasks, the anticipated hazards and hazard mitigation procedures.

The contractor's cost to provide adequate safety measures and to comply with National Grid requirements must be considered and budgeted in the bid/proposal.

#### **D. Hazard Mitigation Procedures and Work Methods**

For each hazard, the contractor shall specify measures that will be taken to eliminate, control or mitigate these hazards.

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A table below is an example of a method to simply and clearly organize and present the task, hazard, and mitigation steps:

<b>Location: Substation Yard</b>		
<b>Task</b>	<b>Hazard</b>	<b>Mitigation Steps</b>
Material Handling	Contact with overhead energized lines/equipment	Off load in the clear and have a safety observer present

### **E. Incident Investigation and Reporting**

All work related incidents involving injury or illness to employees, the public or property damage (including contractor vehicle accidents) shall be reported to the National Grid project representative and documented in the ISN system.

### **F. Compliance Monitoring**

To ensure that both contractor employees and subcontractors will achieve safety compliance, jobs with over 100 workers at any point in time or in excess of \$1 million will require a full time safety professional hired by the contractor. This safety professional must be qualified, competent and be on site anytime work is performed. Qualifications of this safety representative must be acceptable to National Grid prior to hire by the contractor and may be documented in the ISN system.

### **G. Environmental Compliance**

Unless otherwise specified and based on the scope of work, any potential environmental risks shall be determined and addressed by the contractor following all applicable National Grid procedures. For more information, contact a National Grid representative regarding Environmental Procedure No.6 *Contracted Services* and Environmental Procedure No.25 Appendix A, *Environmental Screening Checklist*.

### **3.4 Contractor Orientation/Pre-Construction Meeting**

*Applies to: All contractors, as needed*

1. A National Grid project representative, construction supervisor, or other designated National Grid representative may hold a contractor orientation or

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pre-construction meeting prior to the start of a project/service. Other attendees may include; the Safety department, Environmental representatives, as well as contractor management as needed.

2. It is intended to serve as a method to provide the contractor with the tools necessary to educate their employees and subcontractors. The session is not intended to train the contractor management, their employees or subcontractors.
3. All contractors are required to attend a National Grid orientation program specific to the type of work they will be performing. Contractor management representation shall also be present meeting and all documentation of attendance shall be kept at the job site and available to any National Grid representative.
4. The contractor's Project Health & Safety Plan will be discussed at this meeting including a final review of the safety hazards checklist to ensure proper hazard identification and mitigation plan has been implemented.
5. These hazard mitigation measures shall be reviewed and work shall not commence until these hazards have been adequately addressed. The National Grid project representative will discuss the methods by which compliance will be achieved to National Grid safety requirements with the contractor.
6. An Emergency Call List shall be exchanged with the National Grid project representative for high or medium risk projects or as applicable. This list must contain 24-hour contact information for key contractor and project personnel, including the project representative and Safety representatives. This list should be distributed to all concerned, as determined by the project team, prior to the start of work.
7. For routine maintenance services, a review of associated safety issues and specific facility issues, restrictions or practices, such as evacuation procedures, shall be discussed with the contractor upon initial hiring. Any changes in the facility that may affect the safety of contractor or National Grid employees or third parties must be communicated immediately.
8. Upon completion of the contractor orientation or preconstruction meeting, the contractor management official shall certify in writing that: (1) the contractor has been informed of National Grid safety requirements; (2) that employees and subcontractors have the appropriate qualifications to perform the work, and; (3) the contractor agrees to comply with all applicable safety requirements. The certification shall be completed annually in ISNetworld as an acknowledgement of the above requirements.

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### 3.5 Job Safety Briefs

*Applies to: All contractors; as needed*

1. Job safety briefs shall be documented in writing. Written job safety briefs shall be available at the job site for inspection and retained for 30 days after the job is completed.
2. National Grid reserves the right to perform a safety stand-down with any contractor for purposes including, but not limited to: recent injuries, incidents or near misses; identified hazards at job site or equivalent, and for other reasons to communicate with the contractor crew.
3. Each crew shall conduct these job safety briefs prior to each day's work at the job location, when there are changes to the day's work order or plan, and when a new worker or company joins the crew additional briefs are required.
4. Each worker must have the opportunity to voice concern. The work cannot begin until each worker signs off on the job safety brief stating that they have discussed the work, raised any questions, and agree with the plan.
5. Visitors to the work site shall be asked to read and sign the job brief acknowledging they understand contents. Contractors shall review the job brief and discuss the elements of the hazards and mitigation steps with each visitor prior to entering the job site. If a visitor refuses to sign, the general foreman will note it on the brief and will not allow the visitor to enter.
6. **SITE SIGNAGE:** An assessment of the work site should be conducted by the National Grid project representative overseeing the work with the contractor to determine if site signage will be needed to protect site visitors, the public or any other persons entering the work site. If Site Signage is required at the site, the signage shall be posted at the main entrance to the work site. The sign shall direct all visitors to check in with the Person in Charge (PIC), be escorted to the designated safe area and advised of all work currently in progress. The visitor is expected to comply with all related safety requirements and sign off on the Job Brief before entering the work site.

### 3.6 Safety Meetings

1. In addition to job safety briefs, the contractor shall have regular safety meetings with their employees and subcontractors. Contractors performing

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high or medium risk work shall have weekly safety meetings, while low risk contractors, at a minimum, shall have safety meetings monthly and attendance must be documented.

2. The safety meetings shall include the following topics: statistics, incidents, near misses, updates on old business and new business raised. It will include the round table discussion by the workers and the action items discussed. Meeting minutes must be documented and shall include specific action items, their due dates, persons responsible and a completion date. This documentation shall be available for inspection during the project period, and for 30 days after the project is completed.
3. Routine Safety meetings/calls between National Grid and the Contractor shall be coordinated on a regular basis. Safety meetings may include but are not limited to SUSA/Compliance Assessments, Safety Briefs, Safety Day discussions and regularly scheduled calls to promote safety and best safety practices.

### 3.7 Incident Investigation

*Applies to: All contractors (regardless of risk ranking)*

1. All contractors are required to report any work-related incidents involving injury or illness to employees, the public or property damage to the National Grid project representative. The first priority is to ensure that anyone injured receives medical treatment. Examples of incidents may include, but is not limited to: injury, property damage, adverse public impact, near miss, a hazardous condition and road traffic collisions (RTC).
2. Contractors will then be responsible to perform an incident investigation immediately following the incident and document root cause/corrective actions in the ISN system and to National Grid.

#### Incident Response Steps

In the event of an incident, the contractor shall provide details of the incident to National Grid that follows the steps below.

1. Contractor supervisor collects basic information about the incident from the employee or witnesses:
  - What happened?
  - Who and how many people were injured?
  - What treatment was administered?
  - What was the nature and seriousness of the injury?

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- Where did the incident occur?
  - When did the incident occur (date, time of day)?
  - Were there any witnesses?
2. Contractor supervisor immediately calls the project representative or other National Grid point of contact. All incidents shall be entered into the Incident Management System (IMS) as soon as possible by the National Grid project representative or National Grid designee. When dialing 1-866-322-5594, the caller will be prompted to select option 2 for anything other than an employee injury.
  3. Contractor shall conduct an investigation within 24 hours of the incident that will identify contributing factors and root cause analysis relating to the incident and the corrective actions that will be taken to prevent future occurrence. This information will be documented in the ISN system.
  4. Contractor vehicle accidents occurring during the performance of work will also be investigated and reported to National Grid.

### **Other Reporting**

National Grid may periodically request the following annualized data for all work activities limited to National Grid operations:

- Lost Time Incident (LTI) rate for workers
- Restricted Work rate
- OSHA Recordable Incident (ORI) rate

## **4.0 TECHNICAL SAFETY REQUIREMENTS**

### **4.1 Personal Protective Equipment (PPE) Requirements – General**

*Applies to: All contractors (regardless of risk ranking)*

1. Basic PPE attire at construction sites and other similar work zones include, at a minimum: hard hat; safety shoes and safety glasses with side shields and ANSI certified Class 2 or Class 3 Hi-visibility (hi-vis) clothing / vests. Contractors shall refer to the US Department of Transportation's Manual on Uniform Traffic Control Devices (MUTCD) to determine the correct class of hi-vis clothing / vests or wear the higher class. The contractor and their employees, including subcontractors are expected to follow the same rules and protocols as National Grid personnel.



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2. The contractor shall ensure that their employees and subcontractors use protective safety toe footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards. In addition, during inclement weather conditions or adverse events, the addition of anti-slip footwear or outer foot wear may be appropriate. Electrical Hazard (EH) rated footwear is required at all times. EH rated overshoes are required when working on or near (within Minimum Approach Distance MAD) around electrical equipment over 50 volts, when working in electric substations, excavating in and around electrical duct banks or in an area of expected downed wires per OSHA 1910.136 and ASTM standard F-2413-05.
3. Guidance for additional PPE is referenced in other sections of this document.

#### **4.2 Flame Resistant Clothing Requirements**

*Applies to: All contractors; as needed*

1. Flame Resistant (FR) clothing shall be worn when personnel work on energized equipment/lines or when distance and position will expose the worker to electric arc or flame hazards. FR clothing shall also be worn during live gas work as outlined in the gas PPE Matrix (Gas Policy SHE01001) and within LNG operations locations as required. FR clothing also includes arc-resistant rain gear. This additional ensemble may also be required as part of the job for contractor personnel. Contact a National Grid representative for a copy or to view the PPE matrix.
2. FR clothing shall be worn as the outermost layer of clothing and when workers measure voltages, test or ground electrical equipment/lines.
3. FR clothing shall be worn when work requires the use of rubber protective equipment or the use of insulated live line tools.
4. FR clothing shall be worn when workers control/operate electrical equipment over 50 volts at the device location or are within 10 feet of equipment which is being physically operated/ worked on by another worker.
5. Visitors are not required to wear FR clothing in substations or production plants unless they are engaged in electrical work. The National Grid project representative will be able to determine whether FR clothing will be required based on the specific contractor task. Note: Gas contractor FR

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requirements may differ slightly. Please refer to National Grid PPE Matrix for Gas operations within Gas Policy SHE01001 as needed.

6. FR clothing shall meet a minimum arc rating of 8 cal/cm<sup>2</sup> (HRC 2) for energized electrical equipment unless otherwise specified based on increased potential exposure as indicated in the Arc Flash Tables in H-807 *Arc Flash Analysis and Mitigation* program.
7. Additional FR clothing protection is required when performing work on the distribution system in NY North and New England (legacy National Grid) stations. Contact a National Grid representative for a copy. (NG Employees: If the link does not work, copy and paste the url into your internet browser)  
[http://us3infonet/sites/eng\\_delivery\\_svcs/Pages/ArcFlashMitigation.aspx#2015](http://us3infonet/sites/eng_delivery_svcs/Pages/ArcFlashMitigation.aspx#2015)
8. Contractors who may be involved with tasks requiring the implementation of this program shall be informed by National Grid. Contractors will be required to follow all aspects of OSHA and any other applicable regulation as it applies to the tasks they perform.

#### **4.3 Rubber Gloves and Sleeves**

1. Rubber glove use is required for work on all electrical apparatus at 50 Volts or greater. Rubber gloves shall be donned before the worker leaves the ground and shall be worn until the worker returns to the ground (commonly referred to as “ground to ground”, “cradle to cradle”)
2. Class 0 gloves are required for exposures up to 1000 Volts.
3. Class 2 gloves are required for voltages between 1000-15,000 Volts.
4. Rubber sleeves must be worn where work is conducted within the MAD of primary electrical apparatus that is not tested, de-energized and grounded.
5. For voltages 23 kV and above, workers can use specialized equipment or work practices as long as these workers have been appropriately trained and qualified. National Grid may request training records from the contractor.
6. Rubber glove exceptions for specific jobs (other than those listed in this section) are permitted only with the dated, written approval of a Division Director.
7. It is the contractor’s responsibility to wear class 2 rubber gloves when grounding trucks or equipment due to a possible difference in potential.

#### **Exceptions**

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No rubber gloves are required:

- When working in a properly established equi-potential zone.
- When the operator remains at the same potential as the equipment by being off the ground and on the equipment.
- When a qualified worker performs transmission “hot stick” work on lines 69 kV or greater and no other energized wires are on the pole or structure below the worker.
- When work is performed on transmission structures carrying only energized conductors (115kV and above) and the Live Line Techniques are not being employed. While performing these activities, the worker shall utilize conductive clothing such as conductive gloves, boots, leg straps and/or any other applicable conductive clothing.
- When climbing a steel structure to perform structural reinforcements while maintaining MAD from energized conductors or apparatus.
- When climbing a steel structure to access an area that has been properly grounded.

#### 4.4 Isolation of Energized Apparatus

##### 1. **Non-Reclosing Criteria and Live-Line Maintenance and Construction:**

The appropriate interrupting devices (breakers, reclosers, circuit switches, etc.) will be placed on NON-RECLOSING in accordance with National Grid tagging procedures.

##### 2. **Tagging Out Lines or Apparatus**

The National Grid Construction Supervisor or designee shall coordinate all switching and tagging in accordance with the most current EOP on Clearance and Control.

Upon receipt of Clearance, the project representative will present the Contractor’s Person in Charge with the “Contractor Permission to Work Form” (Form NG0060), which states the specific apparatus that has been de-energized and that certain device(s) are tagged in the Protective Position and will remain so until the Contractor’s Person in Charge informs the

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construction supervisor or designee of the completion of the work utilizing the “Contractor Completion of Work” section of the “Contractor Permission to Work” form.

The original transferred copy needs to be returned after the completion of work section is filled out & signed. In some cases the tailboard is outside & is susceptible to elements & damage.

No work will be performed until the “Contractor Permission to Work Form” is received from the construction supervisor stating that the equipment has been de-energized and a clearance to work has been given. The Contractors Permission to Work Form shall be attached to the crews Job Briefing and be kept at the work location.

After the “clearance” is received from the National Grid Construction Supervisor, the various substation conductor bus and equipment to be worked will be tested and “Grounds” installed. Grounds shall be rated for the fault current of the line/equipment being grounded. (Note: Rubber Gloves and FR clothing are required when installing and removing grounds). The contractors “Person in Charge” (Construction Supervisor/General Foreman) shall be responsible for determining the location and number of grounds.

Vehicles and equipment may utilize a single 4/0 cu for grounding inside the substation. Employees working on de-energized lines and equipment shall always work between grounds.

Prior to the application of any personal protective grounds, the circuit to be worked on must be tested for the presence of voltage using an approved potential detector. The worker must verify the detector is in operating order prior to and after testing for voltage. MAD must be maintained during the testing, and appropriate PPE shall be worn. Testing for voltage shall be done at the point where the grounding devices are to be attached. All phases of the circuit to be worked on shall be tested at each location that grounds are installed.

When National Grid switches out lines or apparatus, any grounds that may be installed shall only be considered a visual reference, and shall not be considered a means to protect the Contractor’s employees. The Contractor is responsible to install their personal grounds, in accordance with all OSHA, Federal, State and local safety procedures. National Grid may provide guidance on the minimum size of the grounds to be used based on circuit available fault current. Refer to *Electric Operating Procedure D002*, for applicable grounding size. Ground rods shall be fully driven into the

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earth away from the workers and work area. T-Bar ground rods are not to be used on National Grid property.

The National Grid Construction Supervisor shall review the contractor's plan for the quantity and locations of grounds, ensuring that the work the contractor is performing is between grounds, covering all potential sources. All three phases shall be grounded. (In stations, from each phase to the station ground grid). Grounds shall be placed as close to the work area as reasonably possible, between the work area and all potential sources of inadvertent energization.

It is the contractor's responsibility to account for all their grounds and it is recommended that a ground cable tagging device be developed and utilized.

### **3. Grounding Mobile Equipment**

When mobile equipment requires grounding, it shall be solidly grounded by means of appropriate sized copper cable while using rubber gloves. The cable shall be fastened to a securely attached clean metallic portion of the equipment, or shall be fastened to a grounding stud provided for the purpose at one end and an adequate ground at the other end.

Non insulated booms such as digger derricks that have the possibility of encroaching the MAD shall be grounded and barricaded. The ground is to trip the circuit and the barricade is to protect anyone who may become in contact with the truck during this energization.

### **4. Minimum Approach Distance (MAD)**

Refer to OSHA 29 CFR 1910.269 for more information and details regarding qualified and unqualified workers.

#### **4.5 Appointment of a Safety Observer**

A safety observer shall be required if an employee (operator) determines that it is difficult to accurately determine the distance between the equipment (minimum approach distance) and energized parts. The Safety Observer shall never be a substitute for minimum approach distance (MAD), personal protective equipment (PPE), insulate/isolate techniques or work area identification as a form of employee protection.

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The person in charge of the work (contractor or National Grid), shall appoint a qualified employee or employees to perform the task of a safety observer. The personal in charge shall:

1. Ensure a documented job brief is completed and includes the name of the safety observer, additional subjects such as the location of gas lines, energized equipment, in or adjacent to the work area and the limits of any de-energized work area
2. Discuss the scope of work and communication techniques used to warn or notify the equipment operator of hazardous conditions.
3. Communicate any changes to work and job completion to the safety observer
4. Select another safety observer if there is a need for the existing observer to have break in service.

The safety observer is a qualified employee who has been appointed by the person in charge based on the hazard assessment and the job brief. The safety observer shall:

1. Observe the worker performing the task/activity until all hazards have been eliminated or the task/activity has been completed
2. Have shown proficiency in the task/activity being observed and have a full understanding of the job and the hazards associated with the task/activity.
3. Remain continuously focused on the task/activity being performed and not perform or assist any other job activities while observing the worker performing the task/activity
4. Notify the person in charge if there is a need to have a break in service. Work must stop until a new observer is appointed or the safety observer returns.

A safety observer shall also be required when a critical lift is being performed. A critical lift plan shall be required during the following circumstances:

1. An object is lifted over energized apparatuses or as assets where a failure of the lifting equipment or rigging could result in a significant safety hazard or cause significant disruption in service to national Grid customers.
2. The crane or other lifting apparatus is anticipated to be operated above 80% of its rated capacity for the specific load chart for the lift.
3. A man basket (pinned or suspended) is to be utilized. All fall protection rules shall be followed when in a man basket.
4. Two cranes will be used in concert to lift a single object

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5. Internal substation construction involving all power transformers, control houses, capacitor banks and transmission breakers.
6. Lifts in LNG or Gas plants where a hazard assessment or job brief identifies a significant risk.
7. The lifted load will be less than twice the minimum approach distance (MAD) of the nearest energized part. Until a qualified electrical worker confirms the (MAD) loads and equipment shall maintain a 20 foot distance. Once nominal voltage is established (MAD) will be according to OSHA tables.
8. The lifted load is hoisted over buildings or the general public.

#### **4.6 Work Zone Traffic Control**

1. If work activity is on or near a road, the contractor and their subcontractors shall comply with all applicable parts of the most current US Department of Transportation's Manual on Uniform Traffic Control Devices (MUTCD), state, local Work Zone Traffic Control requirements and the National Grid Work Zone Traffic Control Manual. Please contact your National Grid representative for a copy of the manual found in the Safety Homepage on the Infonet.
2. If pedestrian traffic is disrupted, pedestrians should be provided with a path that is reasonably safe, convenient and accessible. Pedestrians should not be led into conflicts with work site vehicles, equipment or operations.
3. If working in areas covered by state permits issued to National Grid, contractors shall comply with the provisions (work practices and notifications) of the permit language. These permits must be available on the job site upon request.

#### **4.7 Qualified Gas Worker**

*Applies to gas projects/activities*

1. Gas contractor employees will be operator qualified as required and defined according to the Code of Federal Regulations, Transportation, 49, Subpart 192.801 through 192.809.
2. Until these qualified employees have demonstrated proficiency in the work practices involved, they are considered employees undergoing on-the-job training and must be under the direct supervision of a qualified person at all times. According to the definition of a "qualified employee", the employee

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also must have demonstrated an ability to perform work safely at his or her level of training.

3. National Grid requires contractors with gas qualified employees to provide documentation on how they qualify their workers. This documentation shall be submitted to the ISN system.
4. Additionally any qualifications' of contractor personnel shall be in full accordance with the Company's Operator Qualification written plan, (OQ Plan) Refer to the most current list of covered tasks in accordance with National Grids' Operator Qualification Program and the Northeast Gas Association, (NGA).

#### **4.8 Qualified Electrical Worker**

*Applies to electrical projects/activities*

1. According to 1910.269(a)(2)(ii), a qualified electrical employee must be trained and competent in the following prior to starting work:
  - The skills and techniques necessary to distinguish exposed live parts of electrical equipment
  - The skills and techniques necessary to determine the nominal voltage of exposed live parts
  - The MAD specified in 1910.269 corresponding to the voltages to which the qualified employee will be exposed
  - The proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment
2. Until these qualified employees have demonstrated proficiency in the work practices involved, they are considered employees undergoing on-the-job training and must be under the direct supervision of a qualified person at all times. According to the definition of a "qualified employee", the employee also must have demonstrated an ability to perform work safely at his or her level of training.
3. National Grid requires contractors with electrically qualified employees to provide documentation on how they qualify their workers. This documentation shall be submitted to the ISN system.



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#### 4.9 Qualifying Non-Electrical Worker

*Applies to: All qualifying non-electrical contractors working near energized lines and equipment; as needed*

1. The contractor shall provide orientation for non-electrical workers entering and working within restricted areas such as a substation and those working near energized lines and equipment.
2. The information provided to these workers must meet the requirements of paragraph 1910.269(a)(2)(ii). However, the orientation and training may not be as comprehensive as the qualified electrical worker would be.

They must know:

- What is safe and not safe to touch in the specific areas they will be entering;
  - The maximum voltage of the area;
  - The MAD for the maximum voltage within the area;
  - Proper use of personal protective equipment and in the work practices necessary for performing their specific work assignments within the area.
3. Until these workers have demonstrated proficiency in the work practices involved, they are considered to be employees undergoing on-the-job training and must be under the direct supervision of a qualified person at all times.

#### 4.10 Asbestos, Lead and other Hazardous Materials

1. Asbestos and lead materials associated with electrical and gas equipment includes, but is not limited to: cement-type cable covering, cable wrap, wire coatings, coal tar pipe wrap, and transite panels and conduits. Asbestos and lead materials may also be present in building materials including but not limited to: paint, mastics, caulking, insulation and roofing materials.
2. Where asbestos and other hazardous material is present and likely to be disturbed, the National Grid project representative and contractor shall coordinate how the asbestos, lead or other hazardous materials will be managed and shall consult National Grid's Safety & Environmental department as appropriate.

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3. Removal of this material must be done by individuals specifically trained and qualified to handle asbestos and lead. Refer to National Grid Safety Procedures, F-615, F-617 and F-619 for guidance on asbestos and lead handling and removals.

**Note:** Contractors who will encounter asbestos or lead as part of their work shall reference in their safety plan how they will address this hazard.

#### 4.11 Lift Plans for Work Near Energized Electrical Equipment

1. All work involving hoists, cranes or other lifting equipment **within 10' of energized electrical equipment** must have a detailed lift plan/procedure.
2. As a minimum Lift Plans shall include the following:
  - a. Designated Operator and Signal person
  - b. Detailed travel and flight path that ensures the boom and material being raised is controlled 100% of the time and will maintain the appropriate clearance
  - c. Designated cover up and isolation to ensure employee and equipment safety in the event of an unplanned action or failure
  - d. Emergency action plan with detailed instructions to respond to unplanned/uncontrolled event during the lift or positioning of the lifting equipment.
  - e. Documented load weight and equipment lifting limits
  - f. Rigging equipment and methods that will be used during the lifting. Sign off/approval from the management official responsible for the work

#### 4.12 Fall Protection

1. Fall protection or fall restriction devices shall be used when working at heights over 4 feet with the exception of ladder use, when three points of contact are maintained. Examples of fall protection include appropriate guardrail systems, completed/approved scaffolding and personal fall arrest. For more information, see the National Grid Safety Procedure H806 *Fall Protection*.

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2. All fall protection shall be inspected before use each day to determine if equipment is in good working condition. Defective equipment shall not be used and shall be removed from service.
3. A worker may enter or exit an aerial lift (at heights above four (4) feet) provided that fall protection such as guardrails or a fall arrest system is used while the worker moves between the lift and the working surface. Before any such transfer is made, the employee shall be properly tied-off to an adequate support, the pole or structure prior to and in the direction of the transfer.

Exceptions to fall protection shall be in accordance with Federal & State requirements.

#### **4.13 Herbicide Application**

1. Vegetation spraying shall be conducted unescorted only by contractor employees who have been designated as a Qualified Electrical Worker, where applicable.
2. The spray applicator shall have ID cards issued by Security with background checks available from the contractor.
3. National Grid management shall require a schedule of the spraying in their areas.
4. Once spraying begins, the contractor must contact local management on a daily basis to inform them of progress or changes to the schedule.
5. The contractor shall post all stations with dated signs indicating when the station was sprayed. These signs should not inhibit access to the station.
6. The contractor shall ensure that any stored materials and equipment do not get covered with "overspray". Overspray represents a substantial safety hazard and cannot be allowed.
7. When applying herbicides, contractor employees shall wear goggles and other appropriate PPE to protect them from contact with herbicides and weather elements in accordance with product labels.

## **5.0 UNDERGROUND OPERATIONS WORK**

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In addition to the other requirements referenced in this document, this section covers requirements that are specific to underground operations work.

### 5.1 PPE Requirements

All contractors shall comply with the applicable PPE and WZTC requirements referenced in Section 4.0.

### 5.2 Enclosed Space Assessment, Ventilation, Entry and Rescue

Refer to the National Grid EOP-UG006 *Underground Inspection and Maintenance* and National Grid Safety Procedure I-902 *Enclosed Space Procedure* for more information regarding enclosed space requirements.

1. Contractors are required to follow all procedures in this document in regards to enclosed spaces (manholes, sidewalk vaults, etc.), including assessment, ventilation, entry and rescue.
2. Each enclosed space shall be tested prior to removing manhole lids and entry. Atmospheric testing shall be continuous for the duration of the entry using a calibrated, industry approved atmospheric tester.
3. When performing hot lead work or when indicated by atmospheric monitoring, engineering controls such as forced mechanical ventilation shall be used when working in National Grid manholes at all times.
4. All contractors who are qualified electrical workers will treat these spaces as “enclosed spaces” and follow non-entry rescue provisions.
5. In some situations a boom is allowed for retraction from an enclosed space. Refer to Safety Procedure I-902 for more information.
6. Steel cable or wire rope for non-entry rescue is prohibited.

### 5.3 Equipment Safety Inspection

1. Inspect underground facilities (manholes, vaults, hand holes, splice boxes, junction boxes, pad mount transformers, switchgear and submersible equipment, etc.) each time a crew performs work at one of these facilities. All separable components in these facilities shall be inspected by infrared instrumentation. A National Grid representative can provide details from the National Grid EOP-UG001 *Infrared – Non-Contact Thermometer Inspection Requirement for Underground Equipment* for more information.

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2. The infrared (IR) thermometer or camera shall, at a minimum, have a range of -25°F to 1400°F with a plus or minus 1% accuracy. For more details and current operating procedures, contact a National Grid representative regarding EOP UG001.
3. The format for data collected shall follow the National Grid EOP UG006 *Underground Inspection and Maintenance* requirements. Please contact a National Grid representative for more information.
4. “Touch Potential” testing of metal street lighting poles is required as a part of any maintenance work. For more information, a National Grid representative can provide a copy of the National Grid EOP G016 *Elevated Equipment Voltage Testing* and National Grid Work Methods Bulletin #04-26 *Touch Potential Testing of Metal Street Lighting Poles*.
5. Touch Potential testing results shall be recorded on the job safety brief and the manhole inspection form which shall be given to the National Grid Construction Supervisor or designee.
6. All contractors working for National Grid shall use materials and equipment in accordance with the manufacturing guidelines. It is the contractors’ responsibility to understand the manufacturers’ limits and prescribed use of their tools and equipment before each use.
7. Workers shall test and verify that the underground cable is de-energized and guillotine the cable if needed from outside the hole. Rubber gloves shall be worn at all times while performing this task.

## 6.0 OVERHEAD LINE WORK

In addition to the other requirements referenced in this document, this section covers requirements that are specific to overhead line work.

### 6.1 PPE Requirements

All contractors shall comply with the applicable PPE and WZTC requirements referenced in Section 4.0. In addition, contractors will follow ground-to-ground and cradle-to-cradle use of rubber gloves while performing work on energized overhead lines. Any foreign wire, including those on a pole or structure constitutes an energized source and requires the use of rubber gloves (ex: Cable TV, telephone, fire alarm wire, etc.).

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## 6.2 Fall Protection

All contractors who climb structures such as wood poles or transmission towers shall utilize enhanced fall protection equipment (fall arrest devices) and techniques (ex: *Buckingham Buck-Squeeze*, *Miller StopFall* or *Jelco Pole Choker*). When working on wooden and steel structures, a full body harness and lanyard shall provide 100% fall protection at all times (100% tie off, Shepperd's Hook, etc.). Climbers shall never be allowed to drop or slide down a pole or structure more than two feet.

Exceptions to fall protection shall be in accordance with Federal & State requirements.

## 6.3 Pole/Structure Inspection

Contractor shall ascertain the structural integrity of the pole or other structure prior to installation, removal, repair or modification of the equipment on the structure.

1. Prior to climbing any pole, an inspection and test of the condition of any pole being climbed shall be performed. The weight of the employee, the equipment being installed and other working stresses (such as the removal or re-tensioning of conductors) can lead to the failure of a defective pole or one that is not designed to handle the additional stresses.
2. If the pole is found to be unsafe to climb or to work from, it must be secured so that it does not fail while an employee is on it. The pole can be secured by a line truck boom, by ropes or guys, or by lashing a new pole alongside it. [29 CFR 1910.269(q)] If measures cannot secure the pole, the contractor must cease operations and notify the National Grid Construction Supervisor or designee

## 6.4 Electrical Work Methods

1. Jumpers of any type shall not be used to keep transformers, risers or transformer banks energized for the purpose of changing potted porcelain cutouts. A National Grid representative can provide information to the National Grid Electric Operation Procedure (EOP) D001 *Cutouts – Open Type* for more information.
2. Potted porcelain cutouts must be changed out when work is being completed on a pole even if this is not planned in the scope of the work provided.

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3. Properly rated and inspected slings, chains or tongs shall be utilized to move poles and equipment. Winch lines must not be wrapped around poles or looped around transformer ears to lift without a sling or chain.

## 6.5 Transmission Overhead Lines

1. For work on transmission circuits, red tape shall be placed around any energized pole, pole structure, or tower adjacent to the de-energized line.
2. When one circuit of a double circuit pole or tower line is de-energized for work, a red or orange flag shall be placed on the energized side of the pole or tower nine feet below the lowest energized conductor. In addition, a red or orange flag shall be placed on the lower cage on the side toward the energized circuit at each arm level as employees work on them or pass them.
3. All contractors using ATV's, UTV's or RTV's for transmission or forestry work, are required to follow all local OHRV requirements for PPE and driving safety. Proof of individual operator training certifications for each operator shall be available at all times. US DOT rated helmets and safety glasses/goggles are required for any vehicle that does not have a seatbelt and a roll cage. In equipment with a roll cage and seatbelt, operators can utilize a hard hat and chin strap.
4. At the end of each day, unless other arrangements have been made for an extended outage, grounds will be removed and the National Grid project representative will be notified that all personnel are "clear" of the conductor bus work and equipment.
5. Wherever transmission line workers "touch" wires, a personal ground shall be installed at the work area to establish an equipotential zone, unless workers are engaged in live-line barehand work (29 CFR 1926.964)

## 7.0 SUBSTATIONS

In addition to the other requirements referenced in this document, this section covers requirements that are specific to substations work.

For additional information, a National Grid representative can provide a copy of the National Grid Substation Maintenance Procedure SMP 499.01.2 *Protective Grounding Procedure* under the Substation Work Methods Infonet page for specifics regarding substation grounding practices.

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Grounding plans for substation, major distribution and transmission projects will be submitted to the National Grid construction supervisor a minimum of 1 week prior to construction for review. This plan will show the steps, work area limits and ground cable size and amount. Once reviewed with the National Grid ad prior to starting the job, the plan will be reviewed by the contractors with all employees and subcontractors on the project.

The use of an “Equipotential” step/platform or a conductive mat is required for access and egress from the following:

- a. Crane or any other equipment, including aerial lift equipment, that is connected to the substation ground grid and/or bonded to transmission line conductors when working outside of the station fence
- b. In the rights-of-way
- c. In areas inside the substation where there is no ground grid present.

When work is performed inside the substation and there is a ground grid available, the “Equipotential” step/platform or conductive mat is not necessary.

All vehicles shall be grounded and barricaded per OSHA standards and the National Grid Electric Operating Procedure G026 *Mechanized Equipment Grounding*.

Proper clearances shall be maintained from adjacent energized substation bus, energized portions of substation equipment and other transmission lines at all times.

Use of proper insulated tooling (shotguns and sticks) shall be utilized per NECA standard maintaining MAD.

## 7.1 PPE Requirements

1. All contractors shall comply with the applicable PPE and WZTC requirements referenced in Section 4.0.
2. Contractors who perform any ground breaking activities in a substation within a pre-marked area will require Dig Safe marks to be in place; otherwise, the job must be suspended and the National Grid construction supervisor or project representative shall be notified of the condition.
3. When using non-insulated man-lifts, and if provided by the manufacturer, a secure point of attachment for lifelines, or lanyards or deceleration devices



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shall be utilized, independent of the means to support or suspend the employee. Workers feet shall also always remain on the floor.

## 7.2 Notification of Control Authority When Entering a Substation

1. When a contractor enters and exits a National Grid substation, the contractor shall ensure that the System Control Center is notified. While work is being conducted, gates must be monitored at all times or the gates shall be locked. For more information, contact a National Grid representative regarding National Grid EOPG022 *Substation Security*.
2. Unescorted entry in substations can only be provided to contractors who provide assurance that their employees and subcontractors are electrically qualified as specified in 29 CFR 1910.269. Refer to Section 4.0 of this document
3. All National Grid specifically identified bulk power stations will require NERC-CIP training, certification and approval prior to entry to those sites.

## 7.3 Substation Work Area Identification (SWAI)

1. Contractors who will be working in substations shall follow the SWAI procedure. National Grid will provide a copy of this procedure if required by the project. For more information, contact a National Grid representative regarding National Grid SMP499.10.2 *Substation Work Area Identification Procedure*.
2. Qualified contractors as referenced in section 4.8 of this document shall install their own work area identification. National Grid shall arrange work area identification for non-qualified workers as required.
3. Designated storage areas for items not being used will be posted in the yard and should be the only place these items are kept.

## 8.0 GAS OPERATIONS WORK

In addition to the other requirements referenced in this document, this section covers requirements that are specific to Gas operations work. For more information, contact a National Grid representative regarding National Grid

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General Safety Requirements SHE1001 *Gas Policy* which can be found following this link:

[http://dc-gasweb1.na.ngrid.net/codesnstds/Codesnstds\\_2.0/GDxSplitViewTblOfContents.asp](http://dc-gasweb1.na.ngrid.net/codesnstds/Codesnstds_2.0/GDxSplitViewTblOfContents.asp).

## 8.1 PPE Requirements

1. All contractors shall comply with the applicable PPE and WZTC requirements referenced in Section 4.0.
2. The contractor shall wear all appropriate PPE and Class 2 rubber gloves for personal protection when digging or probing within 2 feet of known electrical conductors and when the location of energized conductors is unknown.

## 8.2 Gas Operations

1. Any contractor who performs covered tasks shall be operator qualified (OQ) as defined in the DOT Title 49 CFR, Subpart N and all applicable state requirements pursuant to the state the contractor is working in. Additionally, any qualifications of contractor employees shall be in full accordance with the Company's Operator Qualification written plan, (OQ Plan) Refer to the most current list of covered tasks in accordance with National Grids' Operator Qualification Program and the Northeast Gas Association, (NGA).
  - a. Contractor personnel involved with covered tasks may require certification by National Grid and an orientation of the involved tasks and National Grid Company standards. National Grid reserves the right to validate contractor qualifications prior to performing Live Gas work.
  - b. Atmospheres are to be tested with a properly calibrated Combustion Gas Indicator (CGI) or Gas Measurement Instrument (GMI) in accordance with National Grid excavation procedures as required.
  - c. Each employee in an excavation shall be protected from cave-ins by an adequate protective system, such as sloping, benching or an appropriate shoring system. For more information, contact a National Grid representative regarding National Grid Safety Procedure M-1301 *Standards for Working in Excavations*.

## 9.0 FORESTRY AND VEGETATION MANAGEMENT

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In addition to the other requirements referenced in this document, this section covers requirements that are specific to vegetation management work.

## 9.1 PPE Requirements

1. All contractors shall comply with the applicable PPE and WZTC requirements referenced in Section 4.0.
2. For work along roads and other areas of vehicular traffic, contractors shall wear high visibility clothing or vests.
3. Flame Resistant Clothing is not required per the applicable OSHA Forestry standard. Forestry contractors must instead wear natural fiber clothing when working within 10 feet of energized equipment.
4. Forestry contractors must wear a properly adjusted full-body fall protection harness connected to an appropriate lanyard when working from an aerial lift. The lanyard must connect to an attachment anchored to either the boom or bucket mounting hardware. Attachment points anchored through only the fiberglass portion of the bucket are not acceptable.
5. Forestry contractors will be required to wear chaps while operating a chainsaw or when assisting and/or working in close proximity to a chainsaw that is being operated.
6. Saws shall not be left unattended with the engine running.
7. When a contractor employee carries a saw, the engine shall be off and/or covered or the saw shall be carried with the blade to the rear and locked.
8. Tree crews will not be allowed to fly their buckets in between the primary and secondary cables if the MAD will be violated in process of doing so. In much of our construction, MAD cannot be maintained and ducking down is not an option in avoiding inadvertent contact.

## 9.2 Equipment and Work Methods

1. Forestry contractors shall utilize fiberglass sticks and stick saws for work around energized equipment. Additionally, integrity tests shall be performed and documented annually. Test results and expirations shall be available on each vehicle as needed.

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2. Forestry contractors shall perform and document dielectric testing of all aerial units annually. Test results and expirations shall be available on each vehicle as needed.
  
3. For lump sum or unit price mileage trimming projects, a single foreman may supervise up to four (4) bucket trucks on the same project. The minimum qualifications for the "lead" person on each of the other trucks shall be a Journeyman Tree Trimmer or equivalent (Qualified Line Clearance Tree Trimmer). At least one other employee on the truck shall be an OSHA defined, Qualified Line Clearance Tree Trimmer Trainee. For Upstate New York only, it is understood that a Qualified Line Clearance Tree Trimmer shall carry the title, wage and benefits as outlined in IBEW LU 1249's existing contract of a Journeyman Treeman and that a Qualified Line Clearance Tree Trimmer Trainee shall carry, at a minimum, the title, wage and benefits as outlined in IBEW LU 1249's existing contract of a Treeman Trainee, 2<sup>nd</sup> year.
  
4. By April 1<sup>st</sup> of each year, the contractor shall provide a list of employees that could reasonably be expected to work on National Grid property. This listing shall be provided to the National Grid project representative and include:
  - the current pay classification of each employee,
  - the date of their progression to their current pay level,
  - the dates each employee completed each level of the contractor line clearance tree trimmers training program,
  - the dates each employee completed their required OSHA safety and other training, or retraining, including any annual refreshers,
  - the date each employee last demonstrated their tree rescue and climbing proficiency where applicable
  - the date each employee completed CPR and first aid training,
  - Identify each certified pesticide applicator, their certification number and category certified.

### 9.3 Training

1. Forestry contractor management will be required to attend safety council meetings hosted by National Grid as required. The contractor shall ensure that all appropriate safety personnel for the National Grid territory are in attendance.

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2. Forestry contractors shall implement and provide the required training and certification programs necessary to provide OSHA defined Qualified Line Clearance Tree Trimmers or Qualified Line Clearance Tree Trimmer Trainees. Qualifications shall be provided in the ISN system. Forestry contractors shall provide an update HASP by April 1<sup>st</sup> of each year for all work being conducted at National Grid.
3. All contractors using ATV's, UTV's and RTV's for transmission or Forestry work are required to follow all local OHRV requirements for PPE and Driving safety

## **10.0 LNG PRODUCTION, TRANSPORT AND HANDLING**

In addition to the other requirements referenced in this document, this section covers requirements that are specific to LNG Production facilities.

All contractors working at LNG plants will sign in and out of plants daily in the contractors log book. All other gas supply facilities and subcontractors require authorization under the contractor management official. If required by the project, trained National Grid plant personnel shall initially, and as needed, review and re-issue as needed, a work permit process which shall describe the work being performed, valves with their locations and Lock-out/Tag-out numbers.

### **10.1 PPE Requirements**

1. All contractors shall comply with the applicable PPE and WZTC requirements referenced in Section 4.0 and shall include FR outer clothing.
2. Cryogenic protective gloves/gauntlets and face shields are required when making connections to load / unload LNG. National Grid retains the right to enhance PPE requirements as conditions warrant. The use of additional PPE shall be based on the task performed and the PPE matrix for work in production plants.

### **10.2 Training**

1. Contractors who transport LNG/propane at National Grid facilities are required to be certified in first aid/CPR and are required to complete frost-bite awareness training. Documentation of training records shall be maintained in the ISN system.

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2. National Grid expects contractors working at LNG plants to meet the requirements of 49 CFR 193 Subpart H for health, training or experience and/or any applicable National Grid procedures that supersede the above requirements. Contractors shall provide documentation on their qualified workers, as referenced in section 3.1 of this document.
3. All Contractor personnel performing work in LNG plants must meet the requirements of the National Fire Protection Association (NFPA), part 59.

## 11.0 ELECTRIC GENERATION

In addition to the other requirements referenced in this document, this section covers requirements that are specific to Electric Generation.

### 11.1 PPE Requirements

1. All contractors shall comply with the applicable PPE and WZTC requirements referenced in Section 4.0
2. Hearing protection is required when working anywhere inside a generation plant and/or outside the plant where noise may be excessive. Acoustic barriers shall be maintained by the contractor as needed.
3. Safety shoes with a minimum height of six-inches are required in Generation plants.
4. Contractors working in generation plants are required to wear 8-Cal clothing protection. For additional guidance, a National Grid representative can provide reference to Electricity Distribution Operations Infonet webpage under Electric Generation's Policies and Procedures EGO-028 *Personal Protective Clothing* & EGO-029 *Personal Protective Equipment*.

### 11.2 Training

1. Required training may include; PCB's, asbestos, mercury, confined space awareness and excavation competent person requirements. HAZCOM is required by contractors working in generation plants as applicable.
2. Contractors who work at a National Grid Generation Station shall attend an orientation regarding plant safety and as required, US Coast Guard Maritime Security (MARSEC) policies.

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3. Equipment training is required per federal, state and local regulations and National Grid procedures. Operators of any powered industrial vehicle must be qualified and documentation shall be documented in the ISN system.

### 11.3 Equipment & Excavations

1. All excavations shall be performed in accordance with EGO-0005 *Procedure for Excavation in National Grid Generation Facilities* and National Grid Safety Procedure M-1301 *Standards for Working in Excavations*. For additional information, contact a National Grid representative for copies.
2. Gasoline and diesel powered fork trucks shall NOT be used inside the plant or other enclosed facility. Only propane/electric fork trucks are permitted except where additional hazards may exist.
3. All wood products necessary for the work must be made of flame retardant material.

### 11.4 Equipment Isolation

For isolation of hazardous energy sources while working in Generation plants, please contact a National Grid representative regarding EGO-0010, *Control of Hazardous Energy Sources-Work Permit System*.

## 12.0 CIVIL CONSTRUCTION

In addition to the other requirements referenced in this document, this section covers requirements that are specific to civil construction work.

### 12.1 PPE Requirements

1. All contractors shall comply with the applicable PPE and WZTC requirements referenced in Section 4.0.
2. Rubber gloves shall be worn while carrying out work in and around energized or identified direct buried lines, live duct banks, transformer enclosures, manholes, switch gear and other electrical apparatus when performing civil investigations, installations or repairs.

### 12.2 Enclosed Space Assessment and Ventilation

Contact a National Grid representative regarding the National Grid EOP-UG006 *Underground Inspection and Maintenance* and National Grid Safety Procedure I-902 *Enclosed Space Procedure* for more information regarding enclosed space requirements.

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1. Contractors are required to follow all procedures in this document in regards to enclosed spaces (manholes, sidewalk vaults, etc.), including assessment, ventilation, entry and rescue.
2. Each enclosed space shall be tested prior to removing manhole lids and entry. Atmospheric testing shall be continuous for the duration of the entry using a calibrated, industry approved atmospheric tester.
3. When performing hot work or when indicated by atmospheric monitoring, engineering controls such as forced mechanical ventilation shall be used when working in National Grid manholes at all times.
7. All contractors who are qualified electrical workers will treat these spaces as “enclosed spaces” and follow non-entry rescue provisions.
8. In some situations a boom is allowed for retraction from an enclosed space. Refer to Safety Procedure I-902 for more information.
9. Steel cable or wire rope for non-entry rescue is prohibited.

### **12.3 Equipment Safety Inspection**

All contractors shall comply with the applicable equipment safety inspection procedures referenced in Section 5.3

### **12.4 Excavation requirements**

All excavation work shall be performed under the control of a competent person. All soils in National Grid territories are to be considered class “C”, considered unstable and shall require all excavations be performed in accordance with OSHA 1926.651, EGO-0005 *Procedure for Excavation in National Grid Generation Facilities* and National Grid Safety Procedure M-1301, *Standards for Working in Excavations*. For more information, contact a National Grid representative for a copy.

Crews that are performing Excavations shall include an excavation log with their job brief that states the soil type, expected depth and length as well as final depth and length. All required steps need to prevent collapse will be documented on this form as well prior to entry.



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Protective systems shall be used for all manhole installations. Where trench boxes are required, the contractor shall submit a PE stamped plan and the location shall be designated on the excavation drawings.

All lifts (not limited to materials and equipment) shall be planned and rigged by a competent person. A lift plan shall be provided for all “critical lifts” and must be submitted by a qualified professional to the National Grid representative prior to the lift taking place.

## **12.5 Cable fault finding and replacements**

For excavation work needed to support faulted cables and emergency cable locates, the use of Cable Avoidance Tooling (CAT) shall be used in addition to Dig Safe requirements as an added safeguard to further pin point unidentified buried cables.

For excavations within the tolerance zone, all hand digging in and around direct buried cables shall require basic PPE, non-metallic handled shovels, rubber gloves, FR clothing and EH rated work boots with over shoes.

All excavation equipment shall be grounded in accordance with NG EOP G026. For additional information, contact a National Grid representative.

The use of GPR (Ground Penetrating Radar) shall also be required to verify the Dig Safe/811 locates after award of the project and prior to excavation. This shall include electric URD, UCD and Substation projects.

## **12.6 Technical Review**

Where and when applicable, all trench and excavation work shall be reviewed and stamped by a civil PE in the state of record and will be executed under the supervision of a trenching and excavation competent person. All leading edges of trenches and excavations shall be appropriately demarcated, clearly posted and controlled to prevent unauthorized persons from entering and inadvertently falling into the excavation. All trenches and excavations shall be closed as soon as practical/possible. All excavations shall be fully controlled for the duration of the exposure by adequately substantial means to withstand the environment and conditions expected to be present.

All pot holing/test holing and exploratory excavations shall utilize vacuum excavation whenever near known underground utilities or hazards, and

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when the potential for unknown hazards such as live electrical or gas conveyances exist. When using vacuum extraction in combination with air blowing/air knife tools, all persons in the immediate area shall be wearing safety glasses in addition to a full face shields.

### **13.0 AVIATION**

1. Helicopter Crews of two or more shall perform a preflight documented job brief.
2. Helicopter work shall require the use of aviation helmets for both the pilot and passengers.
3. Helicopter pilots and passengers shall participate in the "Flying in the Wire and Obstruction Environment" training prior to flight.
4. Helicopter pilots shall meet the following minimum flight time experience:
  - a. 2000 hours as Pilot in Command or Second in command of a rotor craft
  - b. 1000 hours in a turbine rotorcraft / helicopter
  - c. 100 hours in a helicopter of the make and model to be utilized at National Grid
  - d. 300 hours flight time in Wire Environments

For more information, contact a National Grid representative for a copy of EOP T012 *Helicopter Utilization & Notifications*.