Transmission
Addendum to Appendix H
Northeast Utilities Contractor Work Rules - 2/1/10
Rev. 7

I. General

1. This addendum applies to all contractors, sub-contractors and vendors working for Northeast Utilities (NU) Transmission.

2. The following shall be immediately available on the work site
   - Emergency contact numbers for each worker on the job site.
   - Written documentation of daily (or more frequent) job safety briefings. All copies shall be kept with the project documents for at least 60 days or for the duration of the project.
   - Documentation of worker Hazard Communications briefings for all materials requiring a Material Safety Data Sheet (MSDS). Copies of MSDS's shall be included with the documentation package.

3. The following shall be available within 24 hours at the work site
   - Copies of training records, certifications, or licenses for all workers on the job site including name(s) of competent person(s) for excavation, scaffolding, fall protection and asbestos related work activities.
   - Signed copy by all contractors and subcontractors of Appendix F – available for federal, state or local inspectors..

4. All Federal, State, and Local laws shall be complied with. This includes Occupational Safety & Health Administration (OSHA), Department of Transportation (DOT), Manual of Uniform Traffic Control Devices (MUTCD) & Federal Motor Carrier Safety Administration (FMCSA) regulations (Cargo Securement, Hours of Service, Hazardous Materials Security Plan, etc.) and all applicable state operator licenses for crane operations.

5. No smoking is allowed in and within 25 feet of the substation control house or other NU buildings.

6. All referenced procedures are on the Transmission Website (http://www.transmission-nu.com/contractors/default.asp) and are available from the NU Liaison.

II. Supplemental Training

The contractor shall provide and document the following training to their personnel and subcontractors as follows:

1. Safety & Environmental Orientation Training
    - Orientation training prior to each employee commencing work activities.

2. OSHA 10 Hour Training
    - All civil, line and electrical contractor supervisors with > 6 employees under their control shall have at a minimum a 10 hour OSHA training certificate (General Industry, Construction or T&D).

3. Substation Access Training
    - Substation access training prior to each employee commencing substation related work activities. All training must meet the guidelines as specified in the Substation Access Briefing Sheet and Validation Instructions.
    - The guidelines classify entrants by the type of work they will perform and the type of entrant. Under special circumstances (eg: deliveries, short term work, etc.), substation access training may be waived. The following criteria shall be met in order to utilize this exception:
        - work is short term (less than one day)
        - workers shall be under constant direct supervision by an electrically qualified person
        - workers shall attend a pre-job safety briefing which addresses all applicable hazards
        - the exception shall be approved by the NU Contractor Representative or by the NU Transmission Construction Test & Maintenance Manager and/or or the NU Supervisor - Transmission Contract Services.
        - the NU contractor representative will provide any additional site specific substation information on safety and environmental issues.
        - other exceptions shall be approved by a NU Transmission Construction Test & Maintenance Manager and/or a NU Supervisor - Transmission Contract Services.

4. Human Performance Training
    - All Contractor of Choice contract employees may be required to attend a Transmission provided human performance training session.

5. Environmental Best Management Practices (BMP) Training
    - BMP training prior to each employee commencing construction or maintenance activities on rights-of-way or construction sites that impact wetlands, endangered species or create soil disturbances requiring erosion & sediment control.

6. Equipotential Grounding & Bonding
    - Annual training on equipotential grounding and bonding theory and application for all contractor personnel and subcontractors exposed to differences in electrical potential. Prior to commencing work activities, electrical contractors (eg: line, electrical, electrical construction) shall also

submit a copy of their equipotential grounding program (procedures, training) to the NU Owners Representative for review.

All training modules and related information is on the Transmission Website (http://www.transmission-nu.com/contractors/default.asp) and are available from the NU Liaison

III. Safety Professional Oversight

The following safety professional oversight will be required for all civil, line and electrical construction projects as follows:

- Between 20 - 40 workers for an extended period of time will require a part-time safety professional
- > 40 workers for an extended period of time will require a full-time safety professional

The assigned contractor safety professional shall submit weekly status reports to the NU Representative.

IV. Protective Switching & Tagging

1. Placement on Qualified Personnel List (QPL) – CL&P & WMECO

   - Refer to Attachment A - Placement of Contract Personnel on CONVEX Qualified Personnel List (QPL)

2. Requesting Clearances, Receiving Clearances - CL&P & WMECO

   - All individuals shall be OSHA Lockout/Tagout qualified and must satisfactorily complete Convex 6401 and 6501 training related to switching and tagging and demonstrate proficiency in the following transmission and CONVEX procedures and instructions:
     - Appendix H - Northeast Utilities Contractor Work Rules
     - CONVEX O.I. # 6401 – Protective Switching and Tagging Procedures
     - CONVEX O.I. # 6501 – Relay Switching and Tagging Procedures
     - M8-MT-2010 – Maintenance Instruction - Switching and Tagging Process
   - OI 6401 qualified contractors may only request clearances and receive clearances for their employees and subcontractors while on NU property (CL&P & WMECO only).
   - OI 6401 qualified contractors requesting clearances and receiving clearances may do so only with the oversight of a TG Sponsor. See the TG representative for specifics (CL&P & WMECO only).

3. Clearance Holder Crew Tracking Process

   - All contract personnel Crew Leads working under a Blue or Red Tag OI 6401 or ESCC Clearance shall be required to sign-on the clearance prior to starting work each day using the Transmission Group – Clearance Holder Crew

Tracking Document Form (only applies if > 2 crews are working under the same clearance). Crew Leads will be required to sign-off the clearance at the end of work each day and when their work has been completed using the Transmission Group – Clearance Holder Crew Tracking Document. Crews Leads at remote work locations can call the Clearance Holder to sign-on and sign-off the Clearance.

V. Grounding for the Protection of Employees

To work lines or equipment as deenergized, the lines or equipment shall be deenergized, tested for potential and grounded according to current OSHA regulations. See Section II 6 for additional requirements concerning grounding. The following requirements shall also be adhered to:

1. Substations
   - NU Procedure: TD 703 - Portable Grounds For Personnel Protection in Substations

2. Transmission Lines
   - Equipotential zone - Temporary protective grounds shall be placed at such locations and arranged in such a manner as to prevent each employee from being exposed to hazardous differences in electrical potential.
   - Protective grounding equipment shall be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault. This equipment shall have an ampacity greater than or equal to that of 4/0 copper, unless engineering study proves otherwise.
   - Protective grounds shall have an impedance low enough to cause immediate operation of protective devices in case of accidental energizing of the lines or equipment.
   - Before any ground is installed, lines and equipment shall be tested and found absent of nominal voltage, unless a previously installed ground is present.
   - When a ground is to be attached to a line or to equipment, the ground-end connection shall be attached first, and then the other end shall be attached by means of a live-line tool.
   - When a ground is to be removed, the grounding device shall be removed from the line or equipment using a live-line tool before the ground-end connection is removed.
   - When work is performed on a cable at a location remote from the cable terminal, the cable may not be grounded at the cable terminal if there is a possibility of hazardous transfer of potential should a fault occur.
   - Grounds may be removed temporarily during tests. During the test procedure, the employer shall ensure that each employee uses insulating equipment and is isolated from any hazards involved, and the employer shall institute any additional measures as may be necessary to protect each exposed employee in case the previously grounded lines and equipment become energized.

VI. Arc Flash Protection

All contract personnel working on or near energized transmission voltages 69kV or greater where there is a potential for an arc flash event shall comply with NESC 410 - 2007 and Transmission Arc Flash Protection Program Procedure M8-MT-2018, Rev. 2.

VII. Request for Safety Plan

Contractors may be required to submit a detailed job hazard analysis to the NU liaison for each specific job or project prior to commencing work activities. The plan will complement existing contractor safety programs by providing a site-specific and documented job planning safety review of each project. The plan, at a minimum, must include the following:

1. Documentation of the Job Sequence
   - Break the project into job segments and list the major steps, responsible parties and sequence of events for the project. This should be scaled to the complexity of the job**.**
2. Documentation of Major Hazards
   - List the major high risk hazards, such as electrical (contact, flash), gravity (fall, falling objects), kinetic (vehicle & equipment operation) and mechanical (rigging, tools and equipment) associated with the project.
3. Documentation of Barriers
   - List the specific barriers and controls that will be utilized to manage the major hazards identified:

   Examples of Control and Safety Barriers

Eliminate the hazard	*Minimize energy to safe levels*
Install physical barriers	*Wear protective equipment*
Install warning devices	*Minimize error potential*
Use written procedures	*Provide training*
Provide supervision	*Identity hazards only*

4. Communication and Monitoring of the Job Plan
   - Provide the elements of the daily job plan/job safety briefing.
   - Explain how safety performance will be monitored and by whom.
5. Environmental Concerns
   - Identify any environmental concerns that may be encountered.
   - Explain how environmental concerns are communicated to your direct employees, and your subcontractors.

VIII. Additional Personal Protective Equipment (PPE) Requirements

1. EH Rated Safety Footwear
   - ASTM F2413-05 (M I/75/C75/Mt75) EH Rated Safety (steel toe or composite) footwear will be required for all electrical overhead and underground line work (maintenance, emergency & construction) and substation work.

2. High Visibility Clothing
    - Fluorescent orange clothing is required while operating ATVs, performing foot patrol inspections, and/or sampling activities on rights-of-ways or other off-road locations between September 1 and the last day of February. This can be accomplished by wearing an orange cap or hat, traffic vest, sweat-shirt, jacket, etc. Contract line crews shall address visibility precautions during the hazard assessment and safety briefing process.
    - Fluorescent traffic vests are required for all active construction locations and when exposed to motor vehicle traffic.

IX. Skinning Tools

Where a proper skinning tool exists, skinning knives are not to be used. When a knife must be used, it shall be used in such a manner that the cut is made away from the body. At a minimum, leather work gloves shall be worn.

X. Vehicle Operation

Vehicles shall be parked to avoid backing whenever practical. If backing is necessary, it shall be done upon arrival. Before moving a parked vehicle, operators shall conduct a circle safety check to identify persons and objects. If more than one employee is in/on/near a vehicle, one employee shall be positioned outside the vehicle to aid the driver when backing is necessary.

XI. Sulfur Hexafluoride Gas (SF6)

Contractors shall comply with the following concerning the handling and use of SF6:

- NU Procedure TD-710: Handling & Use of Hexafluoride Gas

XII. Soil Management & Environmental Assessment

1. Excavations in Potentially Contaminated Soils
    - If the contractor will be disturbing soils which have been deemed contaminated or polluted (as identified by NU soil sampling) all applicable workers shall have required OSHA HAZWOPER training (e.g. 24 hour for workers and 40 hour for supervisors) and shall coordinate all soil disturbing activities with the NU Representative. No soil can be transported off-site unless coordinated with an NU Representative.

2. Soil and Erosion Control
    - All contractors shall comply with all federal, state and industry specific requirements for soil and erosion control.
    - All contractors performing civil construction work and all work on transmission right-of-ways shall follow the Owners state specific Best Management Practices (BMP's) and provide training to their employees on the BMP's (eg: hay bales, silt fences, swamp mats, etc.) to control storm water

run-off and soil erosion and protect sensitive areas (wetlands, waterways, endangered species, etc.).

3. Environmental Assessment
   - Contractors may be required to complete Environmental Assessments for working in wetlands, disposing of obsolete equipment and for other applicable capital construction projects.

XIII. Incident Investigation & Corrective Action

Contractors shall immediately inform the NU Contractor Representative of all occupational injuries, illnesses, and other significant safety-related or environmental incidents (e.g.: near-misses, inadvertent trips, fires, spills). All incidents shall be investigated to identify their causes and actions taken to prevent recurrence as follows:

- Submit a detailed electronic report describing what happened, causes and corrective action to the Contractor Representative within working 10 days for all injuries/illnesses and other significant incidents.
- If requested, present a review to management for all serious incidents (OSHA injuries and significant near misses) within 30 days.
- Contractors shall complete and submit a Human Performance & Error Reduction Summary Sheet in order to collect information on human errors (e.g.: inadvertent trips, etc.) and near misses, to determine causes and establish corrective action.

Attachment A

Placement of Contract Personnel on Convex Qualified Personnel List (QPL) - CL&P & WMECO

The following requirements (1a -1d) must be met prior to Transmission Group Contractors being placed on the Convex Qualified Personnel List (QPL).

1. Prerequisites
    - A person shall be trained and knowledgeable of all physical and safety requirements necessary to perform protective switching and tagging related to transmission.
2. Classroom
    - Satisfactorily complete a Convex OI 6401/6501 Initial Switching & Tagging Program.
    - Attend a one-half day Protective Switching and Tagging Refresher Course every three (3) years to remain on the Qualified Personnel List.

3. On the Job Training & Verification
    - Requestors
        - Perform two (2) observations of a qualified person performing clearance requestor duties (eg: review of nomenclature drawings, walk-through, request process, etc.) during which a clear understanding of the evolution is demonstrated
        - Perform two (2) actual clearance requestor evolutions under the observation of a qualified person (eg: review of nomenclature drawings, walk-through, request process, etc.) during which a clear understanding of the evolution is demonstrated.
        - TG Sponsor review. Contractor management review & sign-off
    - Clearance Holder
        - Perform two (2) observations of a qualified person performing clearance holder duties (eg: review of nomenclature drawings, walk-through, pre-job briefing, communication with Convex, etc.) during which a clear understanding of the evolution is demonstrated
        - Perform two (2) actual clearance holder evolutions under the observation of a qualified person (eg: review of nomenclature drawings, walk-through, pre-job briefing, communication with Convex, etc) during which a clear understanding of the evolution is demonstrated.
        - TG Sponsor review. Contractor management review & sign-off

4. Contractor Request for Placement on QPL
    - After completing the above training and OJT, the contractor shall provide to the TG Sponsor in writing that a potential QPL candidate has met all the requirements stated above for placement on the QPL.

- A person shall be placed on the CONVEX Qualified Personnel List after the Manager of Convex Operations receives a formal written request from the TG Sponsor indicating the person, company and their requested level of qualification (I – Issue, R – Request).

5. Removal From QPL List
   - Personnel can be removed from the QPL for the following reasons:
     - Failing to satisfactory complete the initial or annual refresher training
     - Work performance not in accordance with existing procedures, policies and/or safety practices
     - Involved in a switching & tagging accident or near miss
   - The TG Sponsor will request in writing that the Manager of Convex Operations remove the individual from the QPL as a Requestor and/or, Switcher and/or Clearance Holder. If a person on the QPL does not perform a task for which he or she is qualified over the period of one calendar year, a recommendation will be forwarded to CONVEX to change their status to "Inactive" until they attend annual refresher training. While their status is "Inactive" employees may not perform the tasks for which they had been previously qualified.

6. Reinstatement
   - To be reinstated to the QPL, individuals must satisfactory complete Section 4.7.1.1 above.

7. TG Sponsor Requirements
   - Definition
     - Knowledgeable TG employee who is OI 6401/OI 6501 Qualified, listed on the QPL and who will act as the contractor protective switching and tagging sponsor.
     - Will provide operational and safety guidance to the contractor for the type of work performed. Typically, the TG Sponsor will be the Project Construction Representative or a Transmission Field Supervisor.
   - Requirements
     - TG Sponsor must be on the CONVEX QPL to request and be issued clearances (Note: TG Sponsors do not have to be on the Convex QPL for switching).
     - TG Sponsor contact information must be submitted to Convex with the request and be listed on the clearance.
     - TG Sponsor or their Supervisor may change or cancel a clearance during an emergency per OI 6401.