Transmission Group

Safety & Environmental Orientation Program for Contractors

Applies To Eversource Connecticut, Western Massachusetts, and New Hampshire
Agenda

- Introduction
- ES Contractor Work Rules
- Transmission Work Rule Addendum
- Human Performance
- Main Safety Hazards (GEM’S)
  - Gravity
  - Electrical
  - Mechanical
All contractors and their employees are responsible for ensuring safety and environmental compliance including adherence to the following:

- State, federal, and local safety, health, and environmental requirements that are in effect during the work
- **Northeast Utilities Contractor Work Rules and Transmission Group Addendum**
- Guidance and work instructions
- Site-specific rules and/or addenda
Introduction (cont.)

- Contractors are required to ensure their employees, subcontractors, and agents are aware of:
  - The four tenets of the NU environmental Policy (maintaining Compliance, demonstrating Leadership, ensuring Accountability and practicing Stewardship)
  - The scope of their job and how it impacts the environment
  - Who to call in case of emergencies
Contractor Work Rules AND
Transmission Work Rule Addendum

http://www.transmission-nu.com/contractors/rules.asp
Northeast Utilities
Environmental Policy

_Northeast Utilities is committed to protecting the environment. In conducting our business we will:_

- Maintain _compliance_ with both the letter and spirit of environmental protection laws and our own procedures;
- Demonstrate _leadership_ by pursuing economically, socially and environmentally sustainable initiatives that protect the environment and are consistent with our corporate vision; and
- Ensure the _accountability_ of employees and their openness and responsiveness to co-workers, customers, shareholders and the public, by establishing specific objectives and measurable targets that promote continuous improvement and by reporting our environmental performance;
- Practice _stewardship_ by managing our operations with genuine care and working to reduce or eliminate significant environmental impacts and prevent pollution resulting from our activities.

We expect all employees to understand and comply with this policy, and will promote the tenets of this policy with our suppliers, vendors and contractors.

Our Management is responsible for implementing this policy. The Executive Environmental, Health and Safety Committee is responsible for oversight of this policy.

Northeast Utilities System

[Signature]

Charles W. Shively
Chairman, President and Chief Executive Officer

November 2004
Contractor Work Rules

- Key General Safety Rules
  - Emergency Response – Prior to the start of work, contractors must coordinate emergency response with ES Owners Representative.
  - Pre-job Safety and Environmental Briefings – Contractors must conduct and document pre-job safety and environmental briefings with all workers that will be involved in the job at the start of each shift, when the scope of work changes, and before new work assignments.
– Training Records – Contractors shall have training records, licenses, and other such documentation for their employees that are pertinent to the work being performed either on-site or available within twenty-four hours and subject to review by Eversource.
Contractor Work Rules (cont.)

- Use 100% fall protection whenever the fall hazard is four (4) feet or greater from structures that support overhead electrical lines
  - Scaffolding – The contractor must:
    - Designate a competent person
    - Use 100% fall protection or restraint at all times during erection, maintenance, use and dismantling of the scaffold
    - Use 100% fall protection whenever the fall hazard is six (6) feet or greater
      - Exception: Competent person possesses documentation clearly describing why 100% fall protection or restraint is not feasible or creates greater hazards.
Contractor Work Rules (cont.)

- Key Specific Safety and Health Rules
  - Trenching and Excavating – The contractor must:
    - Designate a competent person
    - Assume the soil is type C
    - Contact appropriate “Call Before You Dig or “Dig Safe”
    - Guard unattended trenches and excavations to prevent inadvertent falls
    - Spoils at least 2’ back from the edge
Fall protection

- The contractor must:
  - Use 100% fall protection whenever the fall hazard is four (4) feet or greater from structures that support overhead electrical lines.
  - Use 100% fall protection whenever the fall hazard is six (6) feet or greater in other construction activities.
  - Exception: Competent person possesses documentation clearly describing why 100% fall protection or restraint is not feasible or creates greater hazards.
Contractor Work Rules (cont.)

- Housekeeping – Contractors shall keep the site neat, clean, and free of debris, trash, and hazards.

- Lifting and Hoisting – The contractor must:
  - Certify that all operators of mobile equipment such as cranes, derricks, boom lifts, etc., have been trained and certified on the proper operation of the equipment
  - Riggers must be trained
  - Determine weight of load to be lifted
  - Use lifting devices and hardware rated and properly connected for the application
  - Use tag lines on all loads to prevent swinging
    - Exception: When there is a danger of equipment, load, or tag line making contact with energized parts
  - Barricade or otherwise keep workers clear of swing radius (loads and equipment) during movement of suspended loads
  - Keep workers clear of suspended loads
Contractor Work Rules (cont.)

- Lock out/Tag out – Where work at Eversource facilities requires the use of a lock out/tag out system, the contractor:
  - Is required to coordinate lock out/tag out with the ES Owners Representative
  - May be required to comply with ES lock out/tag out requirements
Confined Space Entry (including Enclosed Space Entry) – The contractor:

- Will Consider **ALL** confined spaces as permit-required until:
  - Informed otherwise by ES or
  - The contractor conducts a written hazard assessment that documents otherwise

- Will Coordinate all entries into confined spaces with:
  - The ES Owners Representative
  - The local facilities/building supervisor and
  - Other work groups
ES Contractor Work Rules (cont.)

- Personal Protective Equipment (PPE) – Contractors shall:
  - Comply with local PPE requirements for the location or the type of work
  - Comply with The Transmission Group’s Minimum Personal Protective Equipment (PPE) Matrix
  - Determine any additional PPE requirements
Contractor Work Rules (cont.)

- Flame resistant Clothing (FR)– Wearing of fire retardant clothing is required for certain locations (i.e., substations) for performing certain electrical and gas activities. Minimum of 8 Calories is required
  - Refer to M8-MT-2018 Rev 4. for more detail
Contractor Work Rules (cont.)

- Electrical (Substation) Awareness – Electrical training appropriate to the work performed by contractors in substations is required by ES

- The intent of this training is to ensure persons understand the hazards of electricity and the actions they must take to prevent inadvertent contact

- This training is on-line at the Transmission Group external website
Contractor Work Rules (cont.)

- Reporting Injuries and Other Incidents (Near Misses) – Contractors are required to:
  - Report to the Owners Representative **ALL** injuries no matter how slight
  - Report to their personnel immediately; but not later than 24 hours of occurrence
  - Promptly investigate within 10 days all injuries to determine cause and corrective actions.
Key Specific Environmental Rules

- Unplanned Releases to the Environment - The contractor is responsible for:
  - Immediately reporting unplanned releases to the ES Owners Representative and/or the designated representative
  - Containment, reporting and remediation of any release from contractors equipment

- Permits, Licenses and certificates – The contractor shall comply with all permit, licenses, and certificate requirements and laws, regulations, ordinances, and conditions of local, state and federal agencies
Transmission Work Rule Addendum

- Additional work rule requirements for any and all contractors working for the ES Transmission Group.
Supplemental Training

- The contractor shall provide the following training to their personnel and subcontractors as follows:
  - Safety & Environmental Orientation Program (all employees)
  - OSHA 10 hour training (Civil, Line, Vegetation, General, Electrical)
  - Substation Access (employees accessing substations)
  - Human Performance (Contractor of Choice employees attend a ES provided human performance training session).
  - Environmental Best Management Practices (BMP) (employees working on R/Ws or construction sites that impact wetlands, endangered species or soil.)
Transmission Work Rule Addendum

- EH Rated Safety Footwear (ANSI Z41-1999) – Required for all electrical overhead and underground line work (maintenance, emergency, & construction) and substation work

- Requesting Clearances, Receiving Clearances & Switching – Individuals required to:
  - Satisfactorily complete TD 800
  - Satisfactory complete on the job verification process (see Transmission Work Rule Addendum for more detail)
Qualified Minimum Approach Distances (MAD)

Minimum Approach Distance

Line workers must maintain the minimum approach distance from exposed energized parts. This includes any conductive objects held in your hand.

Energized Part

Minimum Approach Distance

Reasonably Likely Movements of Employee
### New Minimum Approach Distance – Qualified Employees OSHA (eff. 4/1/15)

<table>
<thead>
<tr>
<th>Nominal Voltage Phase-to-Phase (V)</th>
<th>Phase to Ground Exposure Minimum Approach Distance in Ft/In</th>
<th>Phase-to-Phase Exposure Minimum Approach Distance in Ft/In</th>
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<tbody>
<tr>
<td>50 to 300</td>
<td>Avoid Contact</td>
<td>Avoid Contact</td>
</tr>
<tr>
<td>301 to 750</td>
<td>13.1”</td>
<td>13.1”</td>
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<tr>
<td>751 to 5,000</td>
<td>2’1”</td>
<td>2’1”</td>
</tr>
<tr>
<td>5,001 to 15,000</td>
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<td>15,001 to 36,000</td>
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<td>2’11”</td>
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<td>36,001 to 46,000</td>
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<td>3’3”</td>
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<tr>
<td>46,001 to 72,500</td>
<td>3’4”</td>
<td>4’</td>
</tr>
<tr>
<td>72,600 to 121,000</td>
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<td>145,100 to 169,000</td>
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<td>230,000</td>
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<tr>
<td>345,000</td>
<td>8’6”</td>
<td>12’6”</td>
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</tbody>
</table>
Transmission Work Rule Addendum (cont.)

- Grounding for Protection of Employees
  - Transmission Lines
    - Comply with OSHA equipotential grounding requirements and your own safety rules and procedures
  - Substations
    - Comply with NU procedure TD 703 – Temporary Protective Grounds for Personnel Protection in Substations
    - Check with NU owners representative for local requirements
      - i.e., Substations requiring two grounding cables per phase
Transmission Work Rule Addendum (cont.)

- **Handling & Use of Sulfur Hexafluoride Gas (SF6)** – Contractors shall comply with ES procedure TD 710- Handling and use of Sulfur Hexafluoride (SF6) Gas

- **Request for Safety Plan** – When requested by ES, Contractors may be required to:
  - Submit a site specific job hazard analysis documenting
    - Major job steps
    - Major hazards associated with job steps
    - Barriers and controls to manage major hazards identified
Soil Management & Environmental Assessment

- Excavations In Potentially Contaminated Soils — Where identified as contaminated or polluted by ES soil sampling:
  - Applicable workers shall have required OSHA training (i.e., 24 hour)
  - The Contractor shall coordinate all soil disturbing and handling activities with the ES Owners Representative
Soil and Erosion Control – Where contractors are performing civil construction work and/or work on transmission right-of-ways contractors:

- Shall follow the Transmission Group’s state specific Construction and Maintenance Environmental Requirements - Best Management Practices (BMP’s)
- Shall provide training for their employees on the BMP’s
– Environmental Assessments – When requested by ES, Contractors may be required to:

- Complete Environmental Assessments for:
  - Working in Wetlands
  - Disposing of obsolete equipment
  - Other applicable capital construction projects
Incident Investigation & Corrective Action – Contractors are required to:

- Immediately inform the ES Owners Representative
- Submit a detailed written report to the ES Owners Representative within 10 working days for all injuries/illnesses and other significant incidents
- Upon request, present a review to management for all serious incidents (OSHA injuries and significant near misses) within 30 days
- Complete and submit a Human Performance & Error Reduction Summary Sheet for safety near misses and system disturbance human errors
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

Includes all contracts awarded after 5/1/08. The assigned contractor safety professional shall submit weekly status reports to the ES Representative
Human Performance Expectations

- Safety First and Always
- Follow ALL OSHA Requirements
- Follow ES Contractor Work Rules AND Transmission Work Rule Addendum
- Use Fundamental Error Elimination Tools AT ALL TIMES
- Pre-Job Briefs before EVERY JOB
- Flagging
Main Safety Hazards (Gem's)

- **Gravity**
  - Falling from height
  - Falling objects (tools, materials, structures)
  - Aerial device operation
  - Dangerous trees
- **Electrical**
  - Electrical contact
  - Induced voltage (electromagnetic & electrostatic)
  - Backfeed
  - Flash potential
  - Step & Touch potential
- **Mechanical**
  - Equipment failure
  - Conductor tension
  - Loaded springs
  - Moving parts
  - Loads – hoisting/rigging
  - Crane/derrick set-up
  - Vehicle operation
  - Work area protection
Barriers

- Eliminate the Hazard
  - i.e., De-energize & ground electrical circuit
    (Lock out/Tag out)
- Reduce Energy to Safe Level
  - i.e., Wear personal protective equipment
- Use Physical Barriers
  - i.e., Install guardrail around excavation
Use Error Elimination Tools Handbook
Error Traps & Error Elimination Tools

- **Traps Present**
  - Time pressure
  - Distraction/Interruptions
  - Multiple tasks
  - Overconfidence
  - Vague guidance
  - First shift/last shift
  - Peer pressure
  - Change/off normal
  - Physical environment
  - Mental stress

- **Tools to Use (ALL THE TIME)**
  - Questioning attitude
  - Effective communication
  - Task preview
  - Job site review
  - Procedure use
  - Self-Checking
  - STOP when unsure
  - Pre-job safety briefing
  - Flagging
Pre-Job Briefs

Potential Hazard

Potential Hazard

Potential Hazard

Barriers / Defenses

Barriers / Defenses

Barriers / Defenses
Pre-job brief held.....Transponder repair work.....Leader ignored suggestion to secure base of weather satellite to mounting ring prior to tilting support cart (up ender)