

## “C” Summary of Capabilities for Power Generation Endorsement

Conventional generation plants burn fossil fuel, such as coal or natural gas or use water for hydro electric generation which involves a wide breadth of overlapping work environments for maintenance and construction on infrastructure which supports the operation of the generating facility.

CUSP’s with a Generation endorsement will be familiar with hazards and controls for chemical releases, minimum approach distance, lock out/tag out, hot work, motorized equipment, fall protection, high angle rescue, walking and working surfaces and confined spaces as well as other related hazards. Operations may include exposure to transmission lines and cables, substations, railroad and barge terminals.

Generation facilities often have multiple contractors working within the facility. The frequent use of contractors requires a working knowledge of host employers’ responsibilities such as information transfer and multi-employer worksites.

All endorsement summaries represent safety related capabilities which a CUSP may be responsible for within the scope of the endorsement. They are intended to give a snapshot of knowledge, skills and attitudes a CUSP uses to identify and address safety and compliance related issues for protecting workers and avoiding unintended outcomes.

Capability Name	Relevance to the CUSP	Example of a Supporting Ability
<b>C1 - Excavating, Trenching and Shoring</b>	A general awareness of hazards and risk associated with basic types of subsurface disturbances to ensure workers are conducting excavations safely.	Familiar with the following work practices: <ul style="list-style-type: none"> <li>● 811 procedures &amp; identifications</li> <li>● Soil assessment and classification</li> <li>● Competent person, engineering requirements, designated observer vs Spotter</li> <li>● Sheeting, shielding &amp; shoring</li> <li>● Sloping &amp; benching</li> <li>● Crossings, Beams &amp; Cribbing</li> <li>● Fall protection for excavations</li> <li>● Excavations with confined spaces</li> <li>● Drilled shafts for monopoles &amp; footings</li> </ul>

<p><b>C2 - Work adjacent to energized electric power hazards</b></p>	<p>Understanding the various limits of approach to prevent workers encroaching on minimum approach distances.</p>	<p>Determine the following variables relating to work adjacent to power lines and energized equipment.</p> <ul style="list-style-type: none"> <li>● Exposed vs. dielectrically covered conductors or parts</li> <li>● Electrically Qualified vs. Non electrically Qualified worker</li> <li>● Confirming line's owner.</li> <li>● Minimum approach distance (MAD) <ul style="list-style-type: none"> <li>○ Mobile equipment, non-qualified and qualified worker</li> <li>○ Non-qualified and qualified worker without mobile equipment.</li> <li>○ Workers reach and extended reach</li> </ul> </li> <li>● Identify induction and static hazards.</li> <li>● Mobile equipment grounding and bonding</li> </ul>
<p><b>C3 - Work on or near de-energized electric power transmission and distribution lines and equipment.</b></p>	<p>Protect workers from hazardous differences of potential voltage by understanding the requirements for an electrically safe work condition.</p>	<p>Recognize and verify the following steps are observed for a clearance:</p> <ul style="list-style-type: none"> <li>● Identify &amp; request de-energized</li> <li>● Switched open &amp; verified</li> <li>● Open points are tagged</li> <li>● Tested for absence of nominal of voltage</li> <li>● Temporary protective grounds installed <ul style="list-style-type: none"> <li>○ Minimize fault current with bracket or trip grounds</li> <li>○ Protect from voltage caused by accidental energizing, induction or static with equipotential zone.</li> </ul> </li> <li>● Differences between bonding and grounding</li> <li>● Knowledge of receiving , holding, transferring, and Releasing a clearance.</li> <li>● Notify affected workers</li> </ul>

<p><b>C4 - Generation Plant Hazardous Energy Control (LOTO)</b></p>	<p>Protection of workers from unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities.</p>	<p>Able to apply a performance based program for controlling different types of hazardous energy which may include electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy for the purpose of electric power generation, including related equipment for communication or metering. CUSP's must be familiar with energy control program requirements such as:</p> <ul style="list-style-type: none"> <li>● Isolate the energy supply and attach appropriate lockout or tag out devices on the energy-isolating devices to prevent unexpected re-energization.</li> <li>● Train workers on the energy-control program.</li> <li>● Audit these procedures periodically to ensure that they are being followed and that they remain effective.</li> </ul>
<p><b>C5 - Operation of Cranes, Derricks and related Rigging</b></p>	<p>Know the requirements for power-operated lifting equipment to prevent unsafe operation.</p>	<p>Aware of the requirements and standards for:</p> <ul style="list-style-type: none"> <li>● Ground conditions requiring ground protection mats, blocking or cribbing</li> <li>● Operator qualification and certification.</li> <li>● Signal person qualifications</li> <li>● Rigger Qualification</li> <li>● Understanding load charts</li> <li>● Lift Plans &amp; load estimations</li> <li>● Critical Lifts which exceed 75% of the rated capacity of the crane or derrick or requires the use of more than one crane or derrick</li> <li>● Selection &amp; inspection of wire rope, chains, hooks, slings &amp; shackles</li> <li>● Equipment inspection requirements</li> <li>● Work area control</li> <li>● Different types of lift equipment including: <ul style="list-style-type: none"> <li>○ Gantry cranes</li> <li>○ Telescopic handlers (forklift with extending boom)</li> <li>○ Telescopic Booms</li> <li>○ Lattice crane</li> </ul> </li> </ul>

<p><b>C6 - General Construction</b></p>	<p>Become familiar with host employer's responsibilities for supporting contractor's hazard identification and controls of various areas of general construction.</p>	<p>Able to research, select &amp; apply relevant standards &amp; requirements to ensure worker safety &amp; correct operational procedures on:</p> <ul style="list-style-type: none"> <li>● Directional boring</li> <li>● Erecting steel structures</li> <li>● Concrete and Masonry Construction</li> <li>● Grading &amp; access road construction</li> <li>● Stormwater and erosion controls.</li> <li>● Demolition</li> </ul>
<p><b>C7 - Information Transfer</b></p>	<p>Verify a work permit process which transfers information to contractors and non-generation plant workers before work begins.</p>	<p>Coordinate the exchange of the following information related to the safety of the individuals performing work:</p> <ul style="list-style-type: none"> <li>● Characteristics of installations</li> <li>● Conditions and hazards known to exist or anticipated to arise during work</li> <li>● Information about the design and operation of installations</li> <li>● Contract employer responsibilities to advise host of conditions on unique or unanticipated hazards</li> <li>● Emergency procedures and evacuations</li> <li>● Work Permits may include <ul style="list-style-type: none"> <li>○ Hot work</li> <li>○ Confined Space</li> <li>○ Line Brake</li> <li>○ Fall Protection</li> <li>○ Line Clearance</li> </ul> </li> </ul>

<p><b>C8 - Job Briefings</b></p>	<p>Ensure the person in charge conducts a job briefing before the start of each job.</p>	<p>CUSPs ensures the lead workers is provided with the following information:</p> <ul style="list-style-type: none"> <li>● Nominal Voltage</li> <li>● Transient overvoltage</li> <li>● Induces voltages</li> <li>● Location of grounds</li> <li>● Condition of protective grounds</li> <li>● Locations of circuits and equipment</li> <li>● Condition of poles</li> <li>● Environmental conditions relation to safety</li> </ul> <p>Require job briefings to cover no less than the following:</p> <ul style="list-style-type: none"> <li>● Hazards associated with the job</li> <li>● Work procedures involved</li> <li>● Special precautions</li> <li>● Energy-source controls</li> <li>● Personal protective equipment</li> <li>● Scope and complexity of the work shall govern the number and extent of briefing.</li> <li>● Emergency Action Plan</li> </ul>
<p><b>C9 - Environmental and Health hazards in General Construction</b></p>	<p>Prevent exposures to substances, material or conditions which could cause illness or harm.</p>	<p>Identification &amp; awareness of construction related health hazards and industrial hygiene controls:</p> <ul style="list-style-type: none"> <li>● Respirable Crystalline Silica</li> <li>● Asbestos</li> <li>● Hexavalent chromium</li> <li>● Aqueous Ammonia</li> <li>● Lead</li> <li>● PCBs</li> <li>● SF6</li> <li>● Welding, cutting, or grinding of metals of toxic significance</li> <li>● Hazwhopper and incident response</li> <li>● Ventilation</li> </ul>

<p><b>C10 - Confined / Enclosed Spaces</b></p> <p>Permit Required Confined Space, 29 CFR, 1910.146 29 CFR, 1926.1204</p> <p>OSHA Publication, 3138, Permit Required Confined Space</p> <p>Enclosed Space 29 CFR, 1910.269(e)</p>	<p>A knowledge of requirements for safeguarding workers whose worksites have exposure to confined spaces</p>	<p>A working understanding of the following requirements:</p> <ul style="list-style-type: none"> <li>● Definition of confined spaces</li> <li>● Identification of confined spaces.</li> <li>● Permit vs. non permit space.</li> <li>● Signage and warnings</li> <li>● Written program</li> <li>● Pre entry testing &amp; procedures</li> <li>● Monitoring and inspection</li> <li>● Air ventilation</li> <li>● Responsibilities for: <ul style="list-style-type: none"> <li>○ Host employer</li> <li>○ Controlling contractor</li> <li>○ Authorized Entrants</li> <li>○ Attendants</li> <li>○ Entry supervisor</li> </ul> </li> <li>● Rescue &amp; emergency services</li> </ul>
<p><b>C11- Fire Protection</b></p>	<p>A general awareness of types of fire protection systems that may be encountered in a plant environment.</p>	<p>Should be familiar with the following fire protection systems and practices:</p> <ul style="list-style-type: none"> <li>● Deluge/ aqueous System</li> <li>● Foam System</li> <li>● Carbon Dioxide system</li> <li>● Halon system</li> <li>● Fire hose and pump</li> <li>● Rated extinguisher</li> <li>● Recommended testing and certification</li> <li>● Annual Training Requirements</li> </ul>
<p><b>C12 - Ladders, Elevated Platforms and Scaffolds</b></p> <p>1926 Subpart L</p>	<p>Become familiar with use, hazards &amp; work practices associated with the erection and use of scaffolds.</p>	<p>Be aware of the requirements and inspection needs for the following:</p> <ul style="list-style-type: none"> <li>● Scaffolding <ul style="list-style-type: none"> <li>○ Inspection</li> <li>○ Personal Fall Protection</li> <li>○ Guard and Toe Rails</li> <li>○ Distance from Energized Facilities</li> <li>○ Training Requirements</li> <li>○ Material Handling</li> </ul> </li> </ul>

<p><b>C13 - Training and Qualifications</b></p> <p>1910.269 (a)(2)</p>	<p>Confirm workers have been trained and are qualified to perform their job assignments.</p>	<p>Determine that all workers are familiar with safety-related work practices, procedures and requirements for the risk of the hazards involved.</p> <p>Ensure that are proficient in:</p> <ul style="list-style-type: none"> <li>● Distinguishing live parts from other parts</li> <li>● Use of precautionary techniques</li> <li>● Recognizing electrical hazards</li> <li>● Recognizing of sources of energy</li> <li>● Control or avoid hazards</li> <li>● Emergency procedures</li> </ul>
<p><b>C14 - Personal Protective Equipment</b></p> <p>29 CFR, 1910.269(g) 29 CFR, 1910 Subpart I</p>	<p>Able to determine the appropriate personal protective equipment.</p>	<p>Familiar with the use and inspection of the following personal protection equipment:</p> <ul style="list-style-type: none"> <li>● Fall Protection <ul style="list-style-type: none"> <li>○ Positioning lanyard and strap</li> <li>○ Body belts</li> <li>○ Harnesses</li> </ul> </li> <li>● Hand, face and footwear protection</li> <li>● Chemical exposure protection</li> <li>● Training requirements for selected devices</li> <li>● Selecting protective clothing and other protective equipment</li> </ul>
<p><b>C15 - Welding, Cutting and Brazing</b></p> <p>29 CFR, 1910 SubPart Q</p>	<p>Become familiar with use, hazards &amp; work practices associated with welding, cutting and brazing.</p>	<ul style="list-style-type: none"> <li>● Fire prevention and protection <ul style="list-style-type: none"> <li>○ Fire hazards</li> <li>○ Guards</li> <li>○ Fire watch</li> <li>○ Fire Extinguishers</li> </ul> </li> <li>● PPE <ul style="list-style-type: none"> <li>○ Eye protection</li> <li>○ Protective clothing</li> </ul> </li> <li>● Work in confined spaces <ul style="list-style-type: none"> <li>○ Ventilation</li> <li>○ Securing and Machinery</li> <li>○ Attendant with a pre-planned rescue procedure</li> <li>○ 'Warning signs</li> </ul> </li> </ul>

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