BONNEVILLE POWER ADMINISTRATION

Contractor Safety and Health Requirements
For Prime and Subcontractors

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CHAPTER 1 – GENERAL REQUIREMENTS – APPLICABLE TO ALL BPA PROJECTS

This document contains the safety requirements of clause 15-13, Contractor Safety and Health Requirements. Chapter 1, General Requirements, applies to ALL work, whereas, Chapters 2 through 5 are specific to the types of work required by the following documents:

• Statement of Work
• Technical Specification, and/or
• The Contractor’s Technical Work Plan

The Contractor shall ensure that all workers, subcontractors, and suppliers comply with the requirements of this safety document.

1. General

1.1. The Contractor shall furnish to each employee employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to employees; and shall comply with occupational safety and health standards promulgated under the Occupational Safety and Health Act of 1970. Each contractor employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to their own actions and conduct. In fulfilling these requirements, the Contractor shall comply with:

1.1.1. Department of Labor Safety and Health Standards for Construction under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701 et seq.).

1.1.2. All non-construction contractors shall comply with the general industry standards issued by the Secretary of Labor at 29 CFR Part 1910 Occupational Safety and Health Standards or equivalent OSHA State plan standards.

1.1.3. All construction contractors shall comply with 29 CFR Part 1926 Safety and Health Regulations for Construction or equivalent OSHA State plan standards.

1.1.4. All Federal and State safety and health rules and regulations applicable to the contract work, as supplemented by BPA Work Standards, Manufacturer Instructions, and safety and health requirements stated below or elsewhere in the contract. If there are conflicts between any of the requirements referenced in this contract, the more stringent requirement shall prevail.

1.2. Stopping Work for Health and Safety Concerns

1.2.1. Initial Notice: If the Contractor fails or refuses to immediately comply with any safety or health requirement, any BPA employee may notify the Contractor of any safety and health concerns. The notice may be in writing or oral. The notice may be delivered to any contractor employee or a subcontractor. The notice shall have the same effect on the contractor regardless of format or recipient. The Contractor shall take immediate action to mitigate the safety and health concerns identified in BPA’s notice. BPA employees have authority to immediately Stop a Work Activity without issuing an initial notice, refer to 1.2.2.
1.2.2. Stopping a Work Activity: BPA employees may direct the contractor to stop a work activity due to safety and health concerns. The BPA employee shall notify the Contractor orally with written confirmation, and request immediate initiation of corrective action. After receipt of the notice the Contractor shall immediately take corrective action to eliminate or mitigate the safety and health concern. When a BPA employee stops a work activity due to a safety and health concern the Contractor shall immediately notify the CO, provide a description of the event, and identify the BPA employee that halted the work activity. The Contractor shall not resume the stopped work activity until authorization to resume work is issued by a BPA Safety Official.

1.2.3. Stop Work Order: The Contracting Officer may direct the contractor to Stop Work due to safety and health concerns in addition to reasons described in Clause 14-14. The CO’s Stop Work Order may cover all work on the contract or only a portion of the work. After the CO issues a Stop Work Order for a safety and health concern the Contractor shall meet with representatives of BPA’s Contracting Office and the BPA Safety Office to present a written statement outlining specific changes the contractor will make to the work procedures to improve safety. A Stop Work Order issued for safety and health concerns will not be rescinded without approval by the CO and the BPA Safety Office. Refer to Clause 14-14 Stop Work Order.

1.2.4. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule when BPA stops a work activity due to safety and health concerns that occurred under the contractor’s control. Refer to clause 15-12 for Stopping A Work Activity and 14-14 for Stop Work Orders.

1.2.5. BPA’s conduct does not alter or waive the contractor’s safety and health obligations established in Clause 15-12.

1.3. The Contractor shall maintain an accurate record of, and shall immediately report to the COTR in the manner prescribed, all cases of death, injury, occupational diseases, and near misses arising from, or incident to, performance of work under this contract. The record and report shall include a description of the preventative measures to be taken to avoid recurrence, any restitution or settlement made, or the status thereof. The Contractor shall complete and file with the COTR, BPA form 6410.15e (Contractor’s Report of Personal Injury, Illness, or Property Damage Accident) within five (5) working days of such an occurrence. In the case of a Near Miss Incident that does not involve injury, illness, or property damage, the Contractor shall complete and file with the COTR, BPA Form 6410.18e (Contractor’s Report of Incident/Near Miss) within five (5) working days of such an occurrence. The Contractor shall submit with the reports applicable photographs and witness statements.

1.4. All cases of death, serious incidents, injuries or other incidents as determined by the CO in consultation with the BPA Chief Safety Officer shall be investigated by the Contractor to identify all causes and to recommend hazard control measures. A written report shall be submitted to BPA within 30 days of the occurrence.

1.4.1. In the event of a serious injury or fatality the immediate group shall stand down and stop work. The contractor shall secure the scene from change until released by the CO in consultation with the BPA Chief Safety Officer. The Contractor shall collect statements of the crew/witnesses as soon as practical.

1.4.2. BPA reserves the right to perform an incident investigation in parallel with the Contractor. The Contractor and their workers shall cooperate fully with BPA in
their investigation. Contractors are required to provide BPA a summary of the medical injuries, including if applicable the cause of death and any additional information on the workers’ physical capabilities/readiness level to perform the work.

1.5. Notification of Imminent Danger and Workers Right to Decline Work

1.5.1. All workers, including contractors, and BPA employees, are responsible for identifying and notifying other workers in the affected area of imminent danger at the site of work. Imminent danger is any condition or practice that poses a danger that could reasonably be expected to cause death or severe physical hardship before the imminence of such danger could be eliminated through normal procedures. Contract workers have the right to ask, without reprisal, their onsite management and other workers to review safe work procedures and consider other alternatives before proceeding with a work procedure.

1.5.2. Workers have the right to decline to perform tasks, without reprisal, that they believe will endanger their safety and health and the safety and health of other workers. Clause 15-12 Contractor Safety and Health requires Contractors to establish procedures that allow workers to cease or decline to partake in work that may threaten the safety and health of the worker. Reprisal means any action taken against an employee in response to, or in revenge for, the employee having raised, in good faith, reasonable concerns about a safety and health aspect of the work required by the contract.

2. Site Specific Safety Plan

2.1. The Contractor shall prepare, implement, and enforce a Site Specific Safety Plan (SSSP) or Job Hazard Analysis (JHA) for each contract or release. JHA’s are required for Access Road and Vegetation Management Work. SSSP’s are required for all other work.

2.2. Prior to the start of any on-site work for each contract or release, the Contractor shall:

2.2.1. Provide a Site Specific Safety Plan or a Job Hazard Analysis to identify and mitigate any recognized hazards or conditions. Site and adjacent conditions shall be considered. All significant hazards shall be identified. Unusual or unique hazards or conditions specific to the contract or release, known by BPA, will be identified in the technical specification. The contractor shall also provide a clear delegation of authority for the work site(s).

2.2.2. Submit to BPA a copy of the Site Specific Safety Plan or Job Hazard Analysis at least 10 days prior to start of on-site work. If the BPA Safety Office determines the Site Specific Safety Plan or Job Hazard Analysis to be insufficient, they may stop the Contractor’s right to start with any or all on site work.

2.2.3. The contractor shall make available to all workers at the work site the Site Specific Safety Plan or Job Hazard Analysis. All workers must be familiar with the content of the Site Specific Safety Plan or Job Hazard Analysis. The Site Specific Safety Plan or Job Hazard Analysis shall be available for review by BPA employees upon request.

2.3. The Contractor shall ensure that their subcontractors, suppliers, and support personnel follow all safety and health provisions and that all personnel working on the project are knowledgeable of the provisions of the plan.
3. Access Roads

3.1. The Contractor shall prepare, implement and enforce a Job Hazard Analysis for each contract or Master Agreement.

The Job Hazard Analysis describes the potential hazards encountered in access road work, along with the Contractor’s policies, controls, work practices, and personal protective equipment (PPE) selected to minimize those hazards. A Site Specific Safety Plan shall be required in cases where the work is outside the normal scope of Access Road work and in cases where blasting is necessary.

3.2. Equipment, machinery, and vehicle’s traveling on BPA’s right-of-way shall come no closer than 25 feet to any BPA transmission line structure or guy wires.

3.2.1. If work is required in close proximity to guy wires they shall be flagged before work commences.

3.2.2. Spotters shall be used to maintain safe work distances from structures.

3.3. Counterpoise

3.3.1. There may be buried counterpoise (a mini-ground mat) associated with the structures, and the contractor shall avoid cutting the counterpoise.

3.3.2. If the counterpoise is compromised in any way, the Contractor shall immediately notify the COTR.

4. Blasting

If blasting is required on the project, the Contractor shall submit a Site Specific blasting plan as directed in Construction Technical Specification division 01 31 19.

5. Communications

5.1. The Contractor shall ensure that field supervision maintains a reliable method of emergency communications from all right-of-way work areas in the event of accident or illness. The Contractor shall conduct communication checks/tests to ensure quality of communications with emergency personnel.

6. Confined Spaces

6.1. The Contractor shall identify any needed or required worker entry into a confined space as defined by Federal OSHA Standard 1910.146 (b) and/or any applicable State standard or regulation.

6.2. The Contractor shall identify any permit required for confined space entry and implement a confined space entry program as required by OSHA 1910.146 and/or any applicable State standard or regulation.

6.3. The Contractor shall monitor for hazardous atmosphere before and during any worker entry into an identified or suspected confined space.
7. Emergency Action Plan

7.1. The Contractor shall identify, locate and provide directions to the nearest emergency medical facilities. This shall include phone numbers for emergency services in the area.

7.2. Many BPA Facilities have an Occupant Emergency Plan (OEP). Each occupant must be aware of and familiar with the OEP. Contractors must familiarize themselves with these plans. Plans may be obtained from the CO or BPA District Manager.

8. Energized Facilities

8.1. Rules and requirements governing the issuance of Permits and the entry into, movement within and exit of BPA’s energized facilities are defined in BPA's Rules of Conduct Handbook (ROCH). Contractors shall comply with these requirements.

8.1.1. All Contractor workers entering BPA substations must obtain Non-Electrical Worker, Restricted Electrical Worker or Electrical Worker permits (as applicable), or be escorted by an appropriate number of permitted workers at all times. Permits are issued by the Substation Operations Group in compliance with the Rules of Conduct Handbook.

8.1.2. Entry into, exit out of, and movement within an energized facility by a non-permitted person requires an escort. Escorts must hold a permit which would allow them to perform the work being performed by the person being escorted.

8.2. Whenever a worker enters energized substation yards or communication equipment sites, or whenever work is otherwise in proximity to BPA’s normally-energized transmission facilities, the Contractor shall provide for the safety of the workers and shall at all times take necessary precautions to protect BPA’s facilities from accidental contact that could cause an outage, or damage the facility. At no time will any non-qualified Contractor worker or equipment come closer to energized lines or equipment than the Minimum Approach Distances (MAD) in Table 1.

8.3. The Contractor shall, as directed by the COTR after consultation with a BPA Qualified Electrical Employee, erect, maintain, and remove such safety fences as are required to prevent accidental contact between BPA's normally energized facilities and the Contractor's equipment or workers. BPA will normally furnish the safety fences required in its energized substation yards or communication equipment sites. The safety fences shall not be removed without consent of the COTR after consultation with a BPA Qualified Electrical Employee. Safety fences furnished by BPA remain the property of BPA.

8.4. Contractor workers shall not cross red and white or yellow and black ropes. These are used by BPA to designate electrical hazards.

8.5. Contractors using station service to power portable electric tools in energized yards must use grounding boxes (BPA “eartha-kits”) to minimize step and touch hazards. The cord’s grounding box must be clamped to a solidly grounded fixture before the extension cord is connected to a switchyard receptacle. If a solidly grounded fixture is not available within 10 feet of the worksite, the grounding box shall be attached to a ground rod. When using double insulated tools, work may be done within 25 feet of the grounding box. Station service may not be used for temporary power off the ground grid. As an alternative, when working off the ground grid, Contractors may use generators for portable power.
8.6. All work shall take place entirely on or entirely off the ground grid to avoid the hazards of transferred potential. If it is unavoidable for a work procedure to take place simultaneously on and off the grid (such as pulling cable and directional boring work), the COTR must be consulted for specific methods that would minimize the hazard.

Reference: Please see Substation Maintenance Standards and Guides SM-STD-13-1-5-Grounding, Precautions when Contacting the Substation Ground Grid.

8.7. Arc Flash Hazards

8.7.1. Arc flash personal protective equipment appropriate for the hazard/risk category shall be utilized.

8.8. Batteries and Chargers

8.8.1. All battery work shall be performed in accordance with BPA Work Standard BPA-WS-9-2, Manufacturer Instructions, and/or any applicable Federal, State standard or regulation.

8.9. Conductive Devices

8.9.1. Portable metal ladders are not permitted in energized substations.

8.9.2. Conductive objects such as metal tapes, surveyor chains, fish tapes, and center line may be used in energized yards only when specifically approved by the Qualified Electrical Worker that holds a BPA Electrical Worker Permit and restrained by adequate methods, to prevent electrical contact in the event of slippage or breakage at any point.

8.10. Electrical Contact Protocol

8.10.1. Any worker experiencing an electrical shock of any type shall be transported to the nearest emergency medical facility as soon as possible.

8.10.2. In case of electrical shock, contacting one of the Electrical Burn Centers that specialize in electrical shock accidents is advised. Even in apparently minor electrical injuries, consulting with the closest Regional Burn Center regarding treatment is recommended. The Regional Burn Centers are:

Legacy Emanuel Medical Center (Portland, OR) – (888) 598-4232

Harborview Medical Center (Seattle, WA) – (888) 731-4791

Intermountain Burn Center – University of Utah (Salt Lake City, UT) – (801) 581-2700

8.11. Ground Grid

8.11.1. Installation of ground grids on the BPA system, and any connections to the ground grid are considered electrical work. Ground grid installation in substations and on transmission line rights-of-way shall be performed by qualified workers of a licensed electrical Contractor. The licensed electrical Contractor shall have experience working in substations and/or on transmission line projects. The qualified worker shall have experience working in substations and/or on transmission lines installing ground grids and shall be adequately trained and
familiar with the safety-related work practices involved with ground grid installations.

Exception: At BPA radio stations, the installation of ground grids and any connections to the ground grid are not considered electrical work. The contractor shall have experience installing lightning protection ground grids and shall be adequately trained and familiar with the safety-related work practices involved with such installations.

8.11.2. Workers shall not “come between” cut sections of substation ground grids. Separated sections of the grid shall only be connected after first being jumpered using hot methods by a Qualified Electrical Worker or a qualified worker of a licensed electrical Contractor under the supervision of the COTR.

Per OSHA Definition a qualified worker means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve, or resolve problems relating to the subject matter, the work, or the project.

8.11.3. Contractor shall not perform work on ground grid conductors with lightning in the area.

8.11.4. For worker protection, the local BPA Substation Operator shall be notified whenever any work is being performed on the ground grid.

8.12. Grounding Equipment

Aerial lifts, cranes, booms, and any other equipment working in proximity to energized lines or equipment where there is a possibility of accidental contact shall be connected to the substation ground mat within energized switchyards or to a ground rod in other locations with 2/0 copper ground. Multiple (parallel) ground leads may be required at some locations on the BPA power system when the anticipated fault current exceeds the capacity of a single 2/0 copper ground. These locations (if applicable) will be provided by BPA in the contract technical specifications.

8.13. Identification of Circuits

8.13.1. No work shall be performed on any circuit until positive identification of all electrical circuits in the work area has been established.
8.14. Minimum Approach Distance (MAD)

8.14.1. TABLE 1 – Minimum Approach Distances (MAD) For Non-Electrical Workers and Equipment

**TABLE 1**

<table>
<thead>
<tr>
<th>Nominal Voltage</th>
<th>MAD (in feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase to Phase</td>
<td>(phase to ground)</td>
</tr>
<tr>
<td>Up to 345 kV</td>
<td>15 ft.</td>
</tr>
<tr>
<td>500 kV*</td>
<td>20 ft.</td>
</tr>
<tr>
<td>400 kV DC + 500 kV DC +*</td>
<td>20 ft.</td>
</tr>
<tr>
<td>Fiber Optics (OPGW)</td>
<td>10 ft.</td>
</tr>
<tr>
<td>Insulated Overhead Ground Wires</td>
<td>10 ft.</td>
</tr>
</tbody>
</table>

*Note – Lines nominally designated as 500 kV lines may be operated up to 550 kV operating voltage, which is therefore used to calculate the MAD for 500 kV nominal voltage.

8.14.2.2. A Hold Order must be utilized:
8.14.2.2.1. While installing or removing any conductor which crosses over or under normally energized high voltage circuits. If the work cannot be accomplished under the protection of a Hold Order, a Clearance must be obtained.

8.14.2.2.2. While proximity work is in progress during line construction.

8.14.2.2.3. While mechanical equipment is working closer than 15 feet on circuits energized at 345 kV or less or 20 feet on circuits energized at 500 kV.

8.14.2.3. Equipment must be properly grounded.

8.14.2.4. A Safety Watcher must be employed.
### TABLE 2

<table>
<thead>
<tr>
<th>Nominal Voltage Phase to Phase</th>
<th>MAD WITHOUT Hold Order Inches</th>
<th>MAD WITH Hold Order Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>600 V - 15 kV</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>34.5 kV</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>69 kV</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>115 kV</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>138 kV</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>161 kV</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>230 kV (1)</td>
<td>72*</td>
<td>52</td>
</tr>
<tr>
<td>287 kV</td>
<td>62*</td>
<td>59</td>
</tr>
<tr>
<td>345 kV</td>
<td>67*</td>
<td>66</td>
</tr>
<tr>
<td>500 kV (2)</td>
<td>126*</td>
<td>88</td>
</tr>
<tr>
<td>400 kV DC (3)</td>
<td>93*</td>
<td>105</td>
</tr>
<tr>
<td>500 kV DC (3)</td>
<td>120*</td>
<td>138</td>
</tr>
<tr>
<td>Fiber Optics (OPGW)</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Insulated Overhead Ground Wires</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>

* The inadvertent movement factor (IMF) of 12 inches, included in MAD for worker motions, may be deducted at 230 kV and above, to specifically allow vehicles to safely pass under energized bus at those voltages. [Reference BPA Work Standard BPA-WS-5-1, *Minimum Approach Distance (MAD) Consideration*]

1. The MAD without a Hold Order for 230 kV exceeds the MAD for 287 and 345 kV because the maximum switching surge overvoltages on 230 kV lines exceed those on BPA's 287 and 345 kV lines. This is because all of BPA's 287 and 345 kV lines are terminated in transformers that remove trapped charge on the line prior to high-speed reclosing. No trapped charge, along with the transformer surge arresters, significantly reduce the maximum switching surge overvoltages.

2. On 500 kV lines equipped with zinc oxide arresters or station rod gaps and the reclosing relays cut out and a Hold Order in effect the Minimum Approach Distance is 88 inches.

3. The MAD with a Hold Order for DC voltages exceeds the MAD without a Hold Order due to the introduction of tools in the gap while performing live-line work. Lower switching surges present at reclosing on DC voltages are the same in both cases.

4. Phase spacing below 115 kV will not allow adequate MAD distances to be maintained.
TABLE 3 – Minimum Approach Distances (MAD) For Transporting Equipment Under Energized Transmission Lines

Table 3 may be used only when transporting or driving equipment under energized transmission lines under the following conditions:

8.14.2.5. Equipment is in transit (not being used to perform work) with the boom lowered and secured and no load on the load line, forks, bucket, etc.

8.14.2.6. A Safety Watcher is used to ensure MAD is maintained.

<table>
<thead>
<tr>
<th>Nominal Voltage Phase to Phase</th>
<th>MAD (in feet)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 kV or less</td>
<td>4 feet</td>
</tr>
<tr>
<td>50 kV to 345 kV</td>
<td>10 feet</td>
</tr>
<tr>
<td>500 kV</td>
<td>16 feet</td>
</tr>
</tbody>
</table>

*Note – The minimum approach distances listed in Table 3 are reduced from those required in Table 2 due to the subtraction of the inadvertent movement factor. They may be used only when complying with the required conditions listed for the use of Table 3.

8.15. Safety Watchers

8.15.1. The Contractor shall take adequate safety measures to protect its workers and others from induced voltages as well as direct contact. The Contractor shall utilize qualified Safety Watchers for the protection of workers and BPA facilities for the phases of the work where required by these specifications, law or regulations, or where it considers them to be necessary. A Safety Watcher’s primary responsibility is to limit the movement of personnel or equipment to prevent contact with energized overhead or underground electrical facilities.

8.15.2. A Safety Watcher must be a Qualified Electrical Worker. Contractors must hold a BPA issued Electrical Worker Permit to act as a Safety Watcher in BPA energized substations. Safety Watchers for work on BPA transmission lines external to an energized BPA substation may be performed by a contractor who holds a BPA issued Electrical Worker Permit or by a qualified line worker who holds a BPA Issued Term Clearance Certification. Safety Watchers must have satisfactory experience with energized high-voltage facilities of the type located in proximity to the workers they are assigned to watch. The requirements and process for obtaining an Electrical Worker Permit or a Term Clearance Certification are defined in the BPA Rules of Conduct Handbook. Contractors may obtain a list of individuals who hold an Electrical Worker Permit and/or a Term Clearance Certification from the CO.
8.15.3. A supervisor in charge of a job may not act as a Safety Watcher if there is any possibility of being distracted. Each worker is responsible for asking for a Safety Watcher whenever one is required. In the event of conflicting judgments, the more conservative interpretation shall prevail pending review and resolution by the COTR.

8.15.4. A Safety Watcher shall take a suitable location and give their undivided attention to ensure that no action on the part of the worker(s) being watched can result in violation of the Minimum Approach Distances applicable to workers being watched (Table 1, Table 2 or Table 3). There must be a definite understanding between the Safety Watcher and the person(s) being watched as to when the watching begins and ends. Safety Watchers, who must leave their assigned jobs, shall first make sure that all worker(s) are in the clear and remain in the clear until the Safety Watcher returns or is replaced. Safety Watchers have the authority to halt the work operation whenever any unsafe act or condition is imminent. A red or orange vest shall be worn by the assigned Safety Watcher for all work activities which require the continual presence and observation of a Safety Watcher. It may be worn at the discretion of either the person in charge or the COTR in other situations requiring a Safety Watcher.

8.15.5. A Safety Watcher is required for qualified electrical workers under the following circumstances:

8.15.5.1. When a worker is climbing into, out of, or changing location in a substation structure containing circuits normally energized at 600 volts or more. This does not apply to circuits barricaded or located 15 feet or more from the structure for circuits at 345 kV or less, and 20 feet or more for circuits operating at more than 345 kV. Multiple bays shall be considered one structure if workers can pass from one to the other without having to descend to the ground.

8.15.5.2. When inadvertent movement by a worker could result in violating the Minimum Approach Distance as specified in Table 2.

8.15.5.3. When operating or moving motor-driven equipment in the vicinity of high-voltage circuits and the possibility of violating the Minimum Approach Distance in Table 2 exists.

8.15.5.4. Whenever the COTR or Contractor requires a Safety Watcher.

8.15.6. Safety Watchers for non-electrical workers shall be required:

8.15.6.1. Whenever a Safety Watcher is required for qualified electrical workers.

8.15.6.2. Whenever a Clearance is necessary for the accomplishment of the work.

8.15.6.3. When operating or moving motor-driven equipment in an energized substation yard which are not guarded or barricaded to prevent violation of the minimum approach distance in Table 1.

8.15.6.4. Any time the COTR or Contractor requires a Safety Watcher.
9. Environmental Hazards

9.1. On contracts where BPA has identified that environmental hazards exist (i.e. asbestos, lead, mercury, silica, etc.) the Contractor shall have a COMPETENT PERSON on site that has the appropriate level of training to identify the hazards and select the appropriate control strategy in accordance with all Federal and State regulations.

9.2. The Contractor shall conduct occupational exposure assessments/measurements.

10. Fall Protection

10.1. Contractors performing work on structures over four feet above a lower level shall use fall protection that meets applicable consensus standards.

10.2. Contractors working in aerial lifts shall use fall protection.

10.3. Contractors performing work at a height of ten feet (10’) or greater shall have an approved, written, site specific fall protection work plan in place prior to the commencement of work.

10.4. The Contractor shall ensure that portable ladders are inspected and contain no defects, be adequately secured, extend at least three feet above any upper landing surface, and shall not be loaded past their manufacturer’s rated load capacity.

11. Fiber Optics

11.1. When working with fiber optics, the use of personal protective equipment is required to prevent injury. Eye protection shall be worn when splicing glass fiber. Care should be taken during the cleaving process to protect the eyes and the body from broken glass pieces.

CAUTION: Never look into the end of an optical fiber. The laser light that may be present is invisible and eye damage may occur.

12. Fire Hazards

12.1. Flammable liquids within 21.5 meters (70 feet) of conductors energized at voltages of 345 kV and higher shall not be transferred from one metal container to another unless the two have been electrically bonded together to eliminate arcing.

12.2. Metal safety cans are the preferred method for storing flammable and combustible liquids. Only plastic containers that are UL (Underwriters Laboratory) or FM (Factory Mutual) approved shall be used. These approved plastic safety cans are made from a high density polyethylene with steel fittings (usually stainless) that include leak proof closures, relief mechanisms and spark arrestors.

Safety can: An approved container of not more than 5 gallons capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

12.3. Fuel storage shall not take place under or adjacent to energized lines or equipment.

12.4. The Contractor shall be responsible for contacting the local jurisdiction having authority and being aware of and complying with any fire restrictions, shutdowns, “hoot owls” or special requirements.
12.5. The Contractor is responsible for carrying fire suppression tools and equipment as required by the authority having jurisdiction and training workers in their use.

12.6. Welding, Cutting, Brazing and Grinding operations shall comply with OSHA 1910.252 and/or any applicable Federal, State standard or regulation.

13. Hazard Communication

13.1. The Contractor shall supply workers with effective information and training regarding any hazardous chemicals used at the work site and shall comply with OSHA 1910.1200, 1910 Subpart Z and/or any applicable Federal, State standard or regulation.

13.2. The Contractor shall maintain any required Safety Data Sheets (SDS) at the work location and have them available to workers.

14. Job Briefing

14.1. The contractor shall conduct and document job briefings each morning with safety as an integral part of the briefing, and shall provide copies of the daily job briefing and any other safety meeting notes to the COTR. The notes will at a minimum show the date, time, topics discussed, and attendees of each meeting, and will be retained for the duration of the warranty.

14.1.1. The person-in-charge of the job shall conduct job briefings with all workers assigned to the job. Job briefings shall be held at the work site with additional briefings conducted when work situations change that may pose different or additional hazards to workers. Workers working alone shall ensure that their day’s work is planned and performed as if a safety briefing covering the requirements was conducted. When more than one craft are working together, the person-in-charge of the job must be clearly established as part of the job briefing.

All job briefings must cover at least the following subjects:

- Hazards associated with the job
- Work procedures
- Special precautions
- Energy source controls
- Personal protective equipment
- Clearances, Work Permits, Hold Orders
- Emergency procedures/communications
- Special Permits (e.g., confined space; fall protection plans, etc.)
- Worker Training and Qualifications

15. Lockout/Tagout (LOTO)

15.1. The Contractor shall ensure that no workers are exposed to injury from the unexpected startup or release of stored energy systems.

15.2. Contractors performing work on machinery or equipment where such hazards may exist shall have a documented LOTO training and work program in place before performing such work. This program shall conform to all the requirements of Federal OSHA 1910.147 and any other applicable Federal or State standards and regulations.

15.3. The Contractor shall supply all required locks, tags, and devices required for locking out and tagging the machinery or equipment to be worked on.
16. Medical Services and First Aid

16.1. A person or persons shall be adequately trained to render First Aid/CPR/AED at the work site. Adequate first aid supplies shall be readily available. An automated external defibrillator (AED) shall be available at the work site.

17. Personal Protective Equipment (PPE)

17.1. The Contractor shall furnish all required safety and personal protective equipment, except that which has been specified to be furnished by BPA. All persons on all projects shall wear non-conductive hard hats meeting the requirements of OSHA/ANSI.

17.1.1. Yellow non-conductive hard hats with company logo are restricted to workers who hold a BPA Electrical Worker Permit.

17.1.2. Restricted Electrical Workers, Non-electrical Workers, and all others shall wear white non-conductive hard hats.

17.2. Appropriate footwear that provides adequate support and protection to the foot, toes and ankles for the work being performed shall be worn. Lace-up, over the ankle boots with rigid sole and heel meeting ASTM F 2413-11 with an EH rating or ASTM F 2413-05, Class 75 with EH rating shall be worn in all work areas where hard hats are required and other areas as determined by a supervisor. Supervisors have the responsibility for assuring that appropriate footwear is worn. Workers have the responsibility to wear appropriate footwear for the job.

17.3. While BPA's minimum qualifications for protective footwear are identified above, specialized footwear, in accordance with standard industry practice and appropriate for the work being performed, shall be worn at all times while executing the work tasks requiring specialized Personal Protective Equipment (PPE). Supervisors and workers have the responsibility of ensuring appropriate footwear is worn.

17.4. The Contractor shall assure that workers operating All-Terrain Vehicles (ATV's) on BPA right of ways shall be trained on the safe operation of the specific ATV being operated and that they wear a helmet. State ATV operator requirements in which the work is occurring must also be met.

17.5. Red or orange reflective vests shall only be worn by Safety Watchers.

18. Radio Frequency Exposure, for Personal Communication Systems

18.1. Radio Frequency (RF) emissions can be harmful to workers exposed at close proximity to high RF levels for an extended period of time. BPA has established a safe working distance of 5 feet in all directions around structure-mounted transmitting antennas. Workers may be closer than the safe working distance for a short period of time, such as while climbing past an energized transmitting antenna.

Workers may remain closer than the safe working distance for extended periods of time only if using a personal RF Exposure Monitor. If the RF Exposure Monitor signals an alarm, the antenna should be de-energized during the period of worker exposure, and in no case shall the exposure exceed 6 minutes in any 15-minute period while the RF Exposure Monitor signals an alarm.

18.2. BPA structures at communications sites such as radio stations and substations may have antennas that may be energized without notice. A RF Exposure Monitor shall be
worn at all times at these sites when working on the structure. Personnel should not assume that the area is without RF exposure. If the work required is longer than the allowed exposure time the land mobile radios(s) (LMR) and/or PCS/wireless equipment power should be de-energized and tagged consistent with the contractors’ lockout/tagout procedures so that it is not to be energized while work is in progress.

18.3. The 5-foot rule stated here is based on a system-wide average for most PCS/Cellular, HF, VHF, UHF, 700 MHz, and 800 MHz antennas on BPA communications structures (transmission towers, communications towers, buildings, poles). The safe working distance for these antennas may be greater than or less than 5 feet. Any antenna that requires a safe working distance greater than 5 feet will have a warning sign posted to indicate the safe working distance. In the absence of a sign, the safe working distance for that structure shall be checked in BPA’s Transmission Line Maintenance (TLM) database and the appropriate sign if applicable shall be installed as soon as possible. In such cases where there is no sign present, the safe working distance at that time may be unknown. A personal RF exposure monitor must be worn by workers as described above when working during this situation.

18.4. Broadcast antennas, radar antennas, and paging system adjacent to BPA communications structures can emit high levels of RF energy. When working on these BPA structures, an RF Exposure Monitor shall be worn by all workers on that structure. While exceeding worker exposure levels at ground levels at these sites is not likely, an RF Exposure Monitor shall be worn. If the RF Exposure Monitor indicates high exposure, the worker shall contact the adjacent site owner and ask for a reduction in power level while work is in progress.

18.5. Vehicle-mounted transmitting antennas have a safe working distance of 2 feet (24 inches) while transmitting. The exposed metal parts of a vehicle-mounted transmitting antenna should never be touched while transmitting as it will produce a painful burn on bare skin.


19. Traffic Control

19.1. The Contractor is responsible for ensuring that all traffic control measures required by Federal, State, local laws and regulations are followed and that they conform to the DOT Federal Highways Administration MUTCD (latest edition) as well as State and local law.

19.2. All flaggers shall have in their possession an appropriate State certification card attesting to having completed the required training.

20. Trenching and Excavation

20.1. Before any trenching or excavation work commences, the Contractor must submit to BPA for review, an excavation site safety plan for the specific excavation work proposed.

20.2. This plan must conform to all applicable State and Federal trenching, shoring and excavation safety standards.

20.3. If workers enter an excavation, the Contractor shall have a COMPETENT PERSON on site that is capable of identifying existing and predictable hazards and who has authority to take prompt corrective action.
20.4. Prior to entry into excavations 4 feet or more in depth an Excavation Entry Permit completed by the competent person and approved by the supervisor shall be posted on site. The Contractor shall use BPA form 5480.28 (Excavation/Trenching Permit) or an equivalent form approved by BPA.

20.5. Excavations 4 feet or more in depth shall not be entered unless sloped to the appropriate angle of repose, shored or shielded.

20.6. The Contractor shall be responsible for obtaining all necessary locates before any work commences. The Contractor shall follow appropriate digging recommendations which may include hand digging (potholing) a test hole to expose underground utilities, including the ground grid to determine location before digging with power equipment.

21. Welding

21.1. Welding ground lead must be placed on the equipment being welded to assure a solid return path to the welding machine. Do not use ground grid risers for welding ground return paths to avoid causing stray currents entering the ground grid.

21.2. Welders and helpers shall not “come between” welding current paths to avoid becoming part of the welding circuit.
CHAPTER 2 – SUBSTATION CONSTRUCTION

22. Minimum Qualifications for Qualified Electrical Workers

22.1. The Contractor shall ensure that all qualified electrical workers meet the following qualifications:

22.1.1. All qualified electrical workers must have completed a Department of Labor (DOL) approved apprenticeship program consisting of on-the-job training and related training. Related training is a course of study, usually covering the theoretical aspects of the trade which may be accomplished by correspondence or classroom instruction or a combination of correspondence and classroom instruction. On-the-job apprenticeship training shall show documented supervised work experience on normally energized high voltage lines or equipment.

22.1.2. Qualified electrical workers shall be qualified by experience or training to perform the specific type of work outlined in this contract.

22.1.3. Qualified electrical workers shall have completed in the past two (2) years a grounding/bonding training course that includes appropriate grounding techniques, step and touch, and the creation of an equipotential zone.

22.1.4. Qualified electrical workers shall have a current First Aid/CPR/AED card.

22.1.5. Qualified electrical workers shall be fluent in the English language as well as the language(s) of contractor workers under their supervision.

22.2. The Contractor shall make available, upon request by the Contracting Officer or authorized representative of the Contracting Officer, documentation verifying qualified electrical worker’s qualifications.

23. Coupling Capacitors and Bushing Potential Devices

23.1. Work in the base units of this equipment, other than tuning or voltage adjustments, shall be performed under the protection of a Clearance as outlined in BPA Work Standard BPA-WS-9-7, Bushing PDs, Coupling Caps & Line Tuning Units.

24. Current Transformer (CT) Secondary

24.1. The CT secondary circuit shall not be opened while the primary is energized, due to the possible development of a high secondary voltage.

24.2. When work is to be performed on CT circuits that are normally in service, the Test and Energization Engineer (T&E) or BPA System Protection and Control (SPC) employee shall lead the job briefing and approve any wiring work on CT circuits, including the shorting of CT’s.

24.3. All work shall be performed in accordance with BPA Work Standard BPA-WS-9-1, Servicing and Testing Current Transformers.
25. Grounding

25.1. The Contractor shall not perform any work on energized BPA high voltage conductors or equipment, and shall not come within the applicable Minimum Approach Distances listed in Table 1 or Table 2 as applicable.

25.2. New lines or equipment may be considered de-energized and worked as such where:

25.2.1. The lines or equipment are grounded, or

25.2.2. The lines or equipment are not connected to the power system (see 26.3.2) and the hazard of induced voltages is not present. Adequate clearances or other means must be implemented to prevent contact with any nearby energized lines or equipment and the new lines or equipment.

25.3. Dangerous voltages, which may require grounding a line or equipment, may be present from various sources, which include, but are not limited to the following:

25.3.1. Power lines or other energized high voltage equipment by accidental contact or by “feedback” through station service or potential transformers.

25.3.2. Induced voltages coupled from adjacent energized lines, from electrical charges carried by wind and dusts, etc. Contractors shall verify that the hazard of induced voltages is not present.

25.3.3. Remote lightning. Note: Portable protective grounds may not provide complete personal protection for close-in strikes. Aerial work shall be suspended and personnel shall stay in the clear during times that lightning is within sight or sound.

25.3.4. Trapped electrical charges, such as in capacitors or on transmission lines.

25.3.5. Accidental energization due to the inadvertent closing of an isolating device.

25.4. All normally energized conductors and equipment connected to the power system shall be treated as energized until cleared and tested or otherwise determined to be de-energized and then grounded with portable protective grounds. No workers or equipment shall come within the minimum approach distance (Table 1 or Table 2 as applicable) unless these provisions are met.

26. Special Requirements for work on normally energized lines and equipment that are separated by an isolating device under the provisions of a Work Clearance.

Note: Contractors are not allowed to hold a Clearance in a BPA Substation.

26.1. BPA electrical workers will clear and tag the equipment. A Clearance shall then be issued to the BPA Clearance Holder. The BPA Clearance Holder shall:

26.1.1. Know the limits of the Clearance, the facilities included, and the status of ground switches within the Clearance. The Clearance Holder shall also know the Clearance number, the time of issue and the name of the Dispatcher or Substation Operator who issued the Clearance.

26.1.2. Know the name(s) of other Clearance Holders and the type of work they are accomplishing when more than one Clearance is issued on the same transmission line.
26.1.3. Identify all parts of the protective grounding circuit prior to the installation of portable protective grounds to ensure that a thorough understanding of the specific grounding circuit exists by all crew members prior to the start of work.

26.1.4. Direct the installation of barriers or guards as necessary to prevent accidental contact with adjacent energized facilities before allowing work to begin in areas where such hazards exit.

26.1.5. Direct the utilization of Safety Watchers as required.

26.1.6. Convey this information to all persons working under that Clearance before work begins. In addition, any specific hazards associated with the work shall be pointed out.

26.1.7. Shall remain at the job site while work or testing is being performed on equipment under a Clearance. “At the job site” means at the location where the work is being performed. The holder of a Clearance may place or respond to telephone or radio calls, perform paperwork incidental to the job at hand, use available restroom facilities, or perform other minor tasks incidental to the work and still be considered “At the Job Site”.

26.2. The Contractor shall:

26.2.1. Know the limits of the Clearance, the facilities included, and the status of ground switches within the Clearance. The Contractor shall verbally acknowledge to the Clearance Holder, the Clearance number, the time of issue, and the name of the Dispatcher or Substation Operator who issued the Clearance. In addition, they shall understand any specific hazards that may be associated with the work.

26.2.2. Know that all Low-Voltage isolating Device ACBs that are the limits of the Clearance have been tested open before touching or coming within the applicable Minimum Approach Distance of normally energized electrical parts.

26.2.3. Install portable protective grounds as directed by the Clearance Holder.

26.2.4. Install barriers and guards as directed by the Clearance Holder.

26.2.5. Utilize a Safety Watcher when one is required.

26.2.6. Cease work on equipment under a Clearance when the Clearance Holder is not at the job site.

26.3. When Clearances Are Not Required

26.3.1. New Construction: During the construction of new facilities, a Clearance is not required if power system equipment is not in place to provide a connection to the power system by the closing of an isolating device.

26.3.2. Return to Construction Status: Reconductoring of existing lines, removal and/or replacement of facilities, or for other similar type work. A Clearance is not required for this work providing that a letter requesting the work to be accomplished without a Clearance has been submitted to and approved in writing by the Manager of the Dispatching Office having jurisdiction over the equipment. Under the protection of a Clearance, the facilities will be separated from all possible sources of energization by the physical removal of the predefined circuit.
parts such as risers, wire spans, bus work, or other conductor, which completely separates the equipment from the power system. Reference BPA Work Standard 3-3, Work on Equipment Separated from the Power System.

27. Grounding Normally Energized Electrical Equipment

27.1. De-energized conductors and equipment which are to be grounded shall first be tested for voltage using approved methods.

27.2. When portable protective grounds are required, they shall be installed as close to the work being performed as practical and in such a manner as not to be disturbed during the course of the work, and shall require an adequate number of 2/0 copper ground leads or equivalent to effect a visible three-phase short and ground on the circuit. The minimum distances shown in Table 2 shall be maintained by qualified electrical workers from ungrounded conductors at the work location.

27.2.1. Any reference to portable protective grounds shall mean an adequate number of ground leads to effect a visible three-phase short and ground on the circuit. Visible grounding may be accomplished through conductive parts of equal current carrying capacity as the protective grounds require, but shall not be effected through a ground grid or other concealed conductors. All portable protective grounds shall be installed and removed with approved live-line tools.

27.2.2. In substations, when portable protective grounds have been installed at all possible sources of energization from the high voltage power system, separated circuit parts in the work area to be contacted during the course of the work shall be bonded and tied to ground by application of either discharge grounding cables or portable protective grounds.

27.2.3. All conductive parts in the work area that may be contacted during the course of the work shall be at the same potential and shall be tied to a common ground.

27.2.4. Before cutting or separating any part of the protective grounding circuit that could expose a worker to a possible difference of potential, the separated components shall be bonded together and tied to ground.

27.2.5. No disconnect switch, power circuit breaker, transformer*, wave trap, fuse, or current limiting reactor shall be part of the protective grounding circuit.

*Note: Does not apply to a visible single-turn primary such as in a “donut” CT circuit.

27.3. When attaching portable protective grounds, the ground end shall be attached first, and the conductor end shall be attached and removed using a live-line tool.

27.3.1. All ground leads from each ground set shall be connected at the ground end before any conductor end from that same ground set is connected to de-energized electrical parts.

27.3.2. Workers should avoid handling or contacting the ground lead while the conductor end is being installed or removed. During removal, all ground leads of each ground set shall be disconnected from the conductor end first. The conductor ends from that same set shall be moved to a point in the clear of the de-energized electrical parts before any ground lead from that same ground set is removed from the ground end.
27.4. When removing portable protective grounds, the conductor end shall first be removed from the line or equipment using a live-line tool.

27.5. Ground leads. Ground leads, as well as all other parts of a grounding system, shall be capable of conducting the anticipated fault current. All grounding parts shall have a minimum conductance of No. 2/0 AWG copper. Grounding for personal protection shall not be accomplished through vehicles or equipment. Multiple (parallel) grounds may be required at some locations on the BPA power system when the anticipated fault current exceeds the capacity of a 2/0 copper ground set. These locations (if applicable) will be provided by BPA in the contract technical specifications. When multiple grounds are required, the grounding cables for each phase shall be of the same length and have the same type of ground end and conductor end clamps.

27.6. Grounding Equipment

27.6.1. Aerial lifts, cranes, booms, and any other equipment working in proximity to energized lines or equipment shall be grounded with 2/0 AWG copper ground cables. Multiple (parallel) ground leads may be required at some locations on the BPA power system when the anticipated fault current exceeds the capacity of a single 2/0 copper ground. These locations (if applicable) will be provided by BPA in the contract technical specifications.

27.6.2. Equipment working within the MAD of normally energized grounded conductors or equipment shall be made at the same potential as the grounded conductor(s) or equipment being worked on. They shall be tied to a common ground to create an equipotential zone.

27.7. Minimum Crew Size (Grounding)

27.7.1. The minimum crew for installing portable protective grounds shall consist of two qualified electrical workers, or one qualified electrical worker and an electrical worker (electrical apprentice or journey-level worker in training) who has been approved by both the contractor's personnel responsible for directing the work task and the qualified electrical worker involved.

28. Ground Grid

28.1. Installation of ground grids on the BPA system, and any connections to the ground grid are considered electrical work. Ground grid installation in substations and on transmission line rights-of-way shall be performed by qualified workers of a licensed electrical Contractor. The licensed electrical Contractor shall have experience working in substations and/or on transmission line projects. The qualified worker shall have experience working in substations and/or on transmission lines installing ground grids and shall be adequately trained and familiar with the safety-related work practices involved with ground grid installations.

28.2. Workers shall not “come between” cut sections of substation ground grids. Separated sections of the grid shall only be connected after first being jumpered using hot methods by qualified electrical workers under the supervision of the COTR.

28.3. Do not perform work on ground grid conductors with lightning in the area.

28.4. All work shall take place entirely on or entirely off the ground grid to avoid the hazards of transferred potential. If it is unavoidable for a work procedure to take place
simultaneously on and off the grid (such as pulling cable and directional boring), the COTR must be consulted for specific methods that would minimize the hazard.

28.5. For worker protection, the local BPA Substation Operator shall be notified whenever any work is being performed on the ground grid.

29. Switches, Isolating Devices, Energized, Restrictions On

29.1. Work shall not be performed on one part of a high voltage switch or disconnect if the remainder of the switch or disconnect is energized unless approved barriers are installed. This does not prohibit connecting or disconnecting a bus or line to the de-energized end of a switch or disconnect if the Minimum Approach Distance (Table 2) is not violated. In both cases, precautions must be taken to assure that the switch cannot be operated until all work is completed.
CHAPTER 3 – LINE CONSTRUCTION

30. Minimum Qualifications for Contractor Workers – Line Workers

30.1. The Contractor shall ensure that all line workers meet the following qualifications.

30.1.1. All qualified line workers must have completed a Department of Labor (DOL) approved apprenticeship program consisting of not less than 7000 hours of on-the-job training and not less than 400 hours of related training. Related training is a course of study, usually covering the theoretical aspects of the trade which may be accomplished by correspondence or classroom instruction or a combination of correspondence and classroom instruction. On-the-job apprenticeship training shall show documented, supervised work experience on both wood pole and steel structures including energized lines of 12.5 kV and/or higher.

30.1.2. Line workers shall have demonstrated proficiency with recent experience installing, maintaining, erecting and/or repairing power line structures, lines and equipment operating at voltages of 12.5 kV and/or higher. Line workers shall be qualified by experience or training to perform the specific type of work outlined in this contract. Line workers working on BPA transmission lines rated at 115 kV or above shall have sufficient experience and training to understand and safely work in proximity to the hazards posed by high voltage transmission lines.

30.1.3. Line workers deemed qualified to perform work under a BPA Work Clearance shall have a demonstrated work history of successfully working under at least three Clearances on the BPA or an equivalent power system. At the discretion of the COTR, documented training may be substituted for this requirement.

30.1.4. Line workers shall have completed in the past two (2) years a grounding/bonding training course that includes appropriate grounding techniques, step and touch, and the creation of an equipotential zone.

30.1.5. Line workers shall have a current First Aid/ CPR/AED card.

30.1.6. Line workers and equipment operators shall be fluent in the English language as well as the language(s) of contractor workers under his/her supervision.

30.2. The Contractor shall make available, upon request by the CO or authorized representative of the CO, documentation verifying line workers’ qualifications.

31. Minimum Crew Size

31.1. When climbing structures, all work crews shall have a minimum of one qualified line worker and another electrical worker (electrical apprentice or journey-level worker in training) who has been approved by both the Contractor’s personnel responsible for directing the work task and the qualified line worker involved.

31.2. When sagging from a structure (by transit or other), all crews shall consist of one worker on the ground qualified in climbing rescue or one of the following:

31.2.1. A ground worker with radio contact with an onsite worker qualified in climbing rescue,

31.2.2. Continuous radio contact with an onsite worker qualified in climbing rescue, or
31.2.3. Visual contact with another worker qualified in climbing rescue.

31.3. The minimum crew for installing portable protective grounds shall consist of two qualified line workers, or one qualified line worker and an electrical worker (electrical apprentice or journey-level worker in training) who has been approved by both the contractor’s personnel responsible for directing the work task and the qualified line worker involved.

31.3.1. When applying portable protective grounds on transmission lines, the required qualified electrical workers shall be in the structure and/or an aerial lift device and be assisted by adequate help on the ground. These required electrical workers shall work closely together observing each other testing for voltage and applying portable protective grounds.

31.3.2. Additional portable protective ground sets may be installed on the same circuit and all sets may be removed by one qualified line worker and one other worker.

31.4. All other electrical work crews shall have a minimum of one qualified line worker per crew. Crews not performing electrical work or aerial work (e.g., road crews) need not comply with this requirement.

31.5. A crew is defined as a group of workers performing a task at the same work location. A work location is defined as a specific tower site or conductor span between towers.

31.6. There shall be sufficient journey-level workers on each crew to adequately supervise the work of apprentices working on that crew at each work location.

32. Special Requirements for work on lines physically separated from the BPA System including new construction and Return to Construction status.

32.1. When Clearances Are Not Required

32.1.1. New Construction: During the construction of new facilities, a Clearance is not required if power system equipment is not in place to provide a connection to the power system by the closing of an isolating device.

32.1.2. Return to Construction Status: Reconductoring of existing lines, removal and/or replacement of facilities, or for other similar type work. A Clearance is not required for this work providing that a letter requesting the work to be accomplished without a Clearance has been submitted to and approved in writing by the Manager of the Dispatching Office having jurisdiction over the equipment. Under the protection of a Clearance, the facilities will be separated from all possible sources of energization by the physical removal of the predefined circuit parts such as risers, wire spans, bus work, or other conductor, which completely separates the equipment from the power system. Reference BPA Work Standard 3-3, Work on Equipment Separated from the Power System.

32.2. The Contractor shall not perform any work on energized BPA high voltage conductors or equipment and shall not come within the Minimum Approach Distances of energized lines or equipment listed in Table 1 or Table 2 as applicable.

32.3. The Contractor shall protect workers from hazardous voltages which may be present from various sources. They may include, but are not limited to the following:
32.3.1. Power lines or other energized high voltage equipment by accidental contact as well as from “feedback” through station service or potential transformers.

32.3.2. Induced voltages coupled from adjacent energized lines, from electrical charges carried by wind and dusts, etc. Contractors shall closely monitor and control the hazard of induced voltages.

32.3.3. Trapped electrical charges, such as in capacitors on transmission lines.

32.3.4. Remote lightning. Note: Portable protective grounds may not provide complete personal protection for close-in strikes. Work shall be suspended and personnel shall stay in the clear during times that lightning is within sight or sound.

32.4. All conductors and equipment shall be treated as energized until cleared, tested and grounded with a portable protective ground. No worker or equipment shall come within the Minimum Approach Distance (Table 1 or Table 2 as applicable) unless these provisions are met.

32.5. De-energized conductors and equipment which are to be grounded shall first be tested for voltage using approved methods.

32.6. A determination shall be made by the Contractor to ensure that hazardous step and touch voltages are not present when grounding lines for worker protection.

32.7. New lines or equipment may be considered de-energized and worked as such where:

32.7.1. The lines or equipment are grounded, or

32.7.2. The hazard of induced voltages is not present, and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment.

32.8. Grounding

32.8.1. Portable protective grounds shall be placed at such locations and arranged in such a manner as to prevent each worker from being exposed to hazardous differences in electrical potential.

32.8.1.1. If work is to be performed at more than one location in a line section:

32.8.1.1.1. That line section must be grounded and short circuited with the appropriate number of 2/0 portable protective grounds.

32.8.1.1.2. If work is to take place at a location other than where the three phase short and grounds are, the conductor or equipment to be worked shall be grounded at the work site.

32.8.1.1.3. The Minimum Approach Distance shown in Table 2 shall be maintained from any ungrounded conductors or equipment.

32.8.2. When performing work at the structures, clipping crews and all others working on conductors, sub-conductors, or overhead ground conductors shall be protected by individual grounds (single phase) installed on the conductor being worked on at each work location. A clipping crew shall have a minimum of two structures.
clipped in between the crew and the conductor being sagged.

33. Special Requirements for work on normally energized lines and equipment that are separated by an isolating device under the provisions of a Work Clearance.

33.1. The Contractor shall not perform any work on any energized BPA high voltage conductors or equipment and shall not come within the Minimum Approach Distances of energized lines or equipment listed in Table 1 or Table 2 as applicable.

33.2. A Contractor will only perform work on normally energized BPA transmission lines under the protection of a Work Clearance. However, a Contractor may request, as an extra layer of protection, a Hold Order for work in proximity to energized lines and equipment when there is no intent or expectation that the MAD will be violated.

33.3. The Contractor shall protect workers from the hazards listed in section 32.3.1-32.3.4 of this document. In addition the Contractor shall protect workers from accidental energization due to the inadvertent closing of an isolating device.

33.4. BPA electrical workers will clear and tag the equipment. The Contractor shall then be issued a Clearance and, for the protection of its workers, properly install portable protective grounds at each work site.

33.4.1. The Clearance Holder shall identify all parts of the protective grounding circuit prior to the installation of portable protective grounds to ensure that a thorough understanding of the specific grounding circuit exists by all crew members prior to the start of work.

33.4.2. A visible, three phase short and ground shall be applied at each work site before any worker or equipment comes within the Minimum Approach Distance (MAD) of any de-energized line (as shown in Table 1 or Table 2 as applicable).

33.4.3. A work site is defined as each specific location where a task is being performed. Portable protective grounds shall be installed as close to the work being performed as practical, and in such a manner as not to be disturbed during the course of the work. Care shall be taken to ensure that portable protective grounds are not placed where they may be inadvertently knocked off or damaged by the work process.

33.4.4. Any reference to portable protective grounds shall mean an adequate number of 2/0 copper ground leads or equivalent to effect a visible three-phase short and ground on the circuit. Visible short-circuiting may be accomplished through conductive parts of equal current carrying capacity as the protective grounds require, but shall not be effected through a ground grid or other concealed conductors. All portable protective grounds shall be installed and removed with approved “live-line tools”.

33.5. Identification of Portable Protective Grounds - The Contractor shall employ an adequate portable protective ground identification and inventory system to ensure that the location and status of each identified applied portable protective ground is positively accounted for and shall inform and give positive and documented assurance to the Clearance Holder and to the BPA COTR or field inspector of the status and location of each inventoried portable protective ground before releasing any Clearance.
33.6. Portable protective grounds installed at multiple locations can cause circulating currents and hazardous voltages. These conditions can change due to line loading, weather, ground conditions and the installation and removal of additional grounds. The Contractor shall continuously monitor step and touch voltages and changing conditions as needed to ensure worker safety. When multiple crews are working on the same line section, direct radio connections shall be maintained between crews to monitor and measures taken to control such hazardous conditions.

33.7. When grounding overhead transmission lines grounding procedures and measuring of step-and-touch voltages shall be done in accordance with BPA TLM Standards and Guides I.A.2., Grounding, BPA Equipment and Structures; and I.A.3., Protection of Electrical Workers from Induced Currents and Voltages.

33.8. Ground Switches

33.8.1. The Clearance Holder shall be responsible for requesting the status of ground switches from the BPA Dispatcher and for ensuring that the ground switch position does not contribute to hazardous voltage conditions.

33.8.2. At no time shall a ground switch be considered a substitute for portable protective grounds.

33.9. Contractor Clearance Holder - All work carried out by a Contractor under a Work Clearance held by a Contract worker shall be governed by the provisions of the document “Contractor Clearance, Hold Order, and Work Permit Procedure”, and “Transmission Line Maintenance Standards and Guides III.A.14 “Clearances on Line Sections”, as well as this section of the contract Safety and Health Clause. The BPA Dispatcher shall have full authority to deny issuance of a Clearance or Hold Order to any Contract worker who, in the Dispatcher's opinion, has not adequately met or performed all the requirements contained in these documents. The Contractor shall accept full responsibility for the failure of its Clearance Holder to faithfully and accurately perform all the requirements stated therein or if the Clearance Holder is removed for cause under the provisions of this document. Multiple Clearance Holders may be required on the same project, depending on the situation. This will be determined by BPA on a case by case basis.

33.10. Workers shall be familiar with, know, and understand their responsibilities when working under a Clearance in accordance with the “Contractor Clearance, Hold Order, and Work Permit Procedure.”

33.11. The Clearance Holder shall hold a detailed daily job briefing and hazard analysis for each crew working under the provisions of his Work Clearance. Any time conditions change, a new job briefing must be held with all affected crew members.

33.12. All projects restricted solely to pole and arm replacement (no conductor is being moved or replaced) shall be subject to the grounding provisions contained in this section and shall require the installation of a three phase short and ground at each work location for worker protection.

34. Handlines and Rope Used in Energized Corridors

34.1. The Contractor shall make every effort to ensure that handlines and other rope used in energized corridors are maintained in as dry and clean a condition as possible in order to maintain a high resistance, dielectric condition. Handlines and ropes shall not be left in work positions overnight.
35. Additional Grounding Requirements - All Projects

35.1. When attaching portable protective grounds, the ground end shall be attached first, and the conductor end shall be attached and removed using a live-line tool.

35.2. When removing portable protective grounds, the conductor end shall first be removed from the line or equipment using a live-line tool.

35.3. Workers shall avoid handling or contacting the ground lead while the conductor end is being installed or removed. During removal, all ground leads of each ground set shall be disconnected from the conductor end first. The conductor ends from that same set shall be moved to a point in the clear of all the de-energized electrical parts before any lead from that same ground set is removed from the ground end.

**Exception:** On transmission towers where grounds are to be installed aloft, it is permissible to install or remove both ground and conductor ends on each phase prior to workers moving location. The conductor end shall be connected and disconnected with live-line tools.

35.4. Portable protective ground leads shall be attached to a tower ground, a grounding bar, or a driven ground, and shall be capable of conducting the anticipated fault current. All conductive parts in the work area that may be contacted during the course of the work shall be at the same potential and shall be tied to a common ground. Grounding parts shall have a minimum conductance of No. 2/0 AWG copper. Grounding for personal protection shall not be accomplished through vehicles, equipment, or rigging components.

Multiple (parallel) portable protective grounds may be required at some locations on the BPA power system when the anticipated fault current exceeds the capacity of a 2/0 copper ground set. When multiple portable protective grounds are required, the grounding cables for each phase shall be of the same length and have the same type of ground end and conductor end clamps. These locations (if applicable) will be provided by BPA in the contract technical specifications.

35.5. Before cutting or separating any part of the protective grounding circuit that could expose a worker to a possible difference of potential, the separated components shall be bonded together and tied to ground.

35.6. No disconnect switch, power circuit breaker, transformer*, wave trap, fuse, or current limiting reactor shall be part of the protective grounding circuit.

*Note: Does not apply to a visible single-turn primary such as in a "donut" CT circuit.

36. Grounds, Portable Protective, Static Wire

36.1. Before touching or coming within the Minimum Approach Distance of any overhead static (ground) wire, it must be grounded at that location by either a portable protective ground or a permanent ground connection. Except at 500 kV or above a portable protective ground must be installed. (Note - Some overhead ground wires on the BPA system are insulated and energized at primary voltage to supply airway lighting circuits. A Clearance must be obtained and grounds installed before workers can come within the MAD of these lines.)
37. Stringing or removing conductor

37.1. Prior to stringing operations a job briefing shall be held setting forth the plan of operation and specifying the type of equipment to be used and portable protective grounding procedures to be followed.

37.2. All pulling and tensioning equipment shall be isolated, insulated, or effectively grounded.

37.3. During stringing operations, each bare conductor, sub-conductor, and overhead ground conductor shall be grounded at the first tower adjacent to both the tensioning and pulling setups.

37.4. These grounds shall be left in place until conductor installation is completed.

37.5. Such grounds shall be removed as the last phase of aerial cleanup.

37.6. Grounds shall be placed and removed with a live-line tool.

37.7. Each conductor, sub-conductor, and overhead ground conductor shall be grounded at all dead-end or catch-off points. Work on dead-end towers shall require grounding on all de-energized lines.

37.8. A ground shall be located at each side and within 10 feet of working areas where conductors, sub-conductors, or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other.

37.9. All conductors, sub-conductors, and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.

37.10. Grounds may be removed as soon as the work is completed: Provided that the line is not left open circuited at the isolated tower at which work is being completed. (Grounds on an isolated line section shall not be removed until jumpers are closed.)

37.11. Contractors stringing over energized lines shall use tension stringing methods, guards, barriers, and/or other methods to positively prevent accidental contact with those lines. Contractors shall make arrangements to obtain either a Clearance or a Hold Order when crossing over or under any line energized in excess of 600 volts. Contract workers who are required to take Clearances or Hold Orders on foreign utility lines for such proximity work must be qualified electrical workers. Contractors who must obtain a foreign utility Clearance or Hold Order through the BPA Dispatcher (as a result of a foreign utility’s policy) must first obtain a BPA Term Contractor Certification. Qualified applicants must pass a test administered by BPA’s Substation Operations Group.

38. Grounding of Equipment

38.1. Aerial lifts, cranes, booms, and any other overhead lift equipment working in proximity to energized lines or equipment shall be grounded with 2/0 AWG copper ground cables. Multiple (parallel) grounds may be required at some locations on the BPA power system when the anticipated fault current exceeds the capacity of a 2/0 copper ground set. These locations (if applicable) will be provided by BPA in the contract technical specifications. When multiple portable protective grounds are required, the grounding cables shall be of the same length and have the same type of ground end and conductor end clamps.
38.2. Equipment working within the MAD of normally energized grounded conductors or equipment shall be made at the same potential as the grounded conductor(s) or equipment being worked on. They shall be tied to a common ground to create an equipotential zone.

39. Equipment and Rigging

39.1. Shop made tools or equipment must be engineered, stamped with the W.L.L. (working load limit), and proof tested to 125% of the W.L.L. before being used in the field.

39.2. The Contractor shall assure that catch-off anchors (including temporary snubs), rigging and hoists shall be of ample capacity to prevent failures.

39.3. The Contractor shall have a program in place to adequately inspect all synthetic slings as well as all other rigging components and tools.

39.4. Load lines shall not be detached from a tower section until the section is adequately secured. Unless otherwise designated by the COTR, “adequately secured” shall be defined as 50% or more of the attaching bolts in place. Loads shall not be released until all tower legs are secured. Line workers shall not belt off to unsecured tower sections, and shall not climb on to unsecured tower sections. These provisions shall apply to all methods of tower erection.

39.5. Use of aerial lifts, manufactured hook ladders, platforms, or similar devices shall be considered approved methods for clipping or dead ending conductor, and related work processes. Crawling over insulators (suspension or dead end) shall not be considered an approved practice unless all of the following conditions are met:

39.5.1. Alternate means were impractical or created a “greater hazard”.

39.5.2. 100% fall protection methods are used.

39.5.3. A written hazard analysis has been completed by the Contractor showing that crawling over insulators is the safest or only practical way of completing a specific work task. Burden of proof would be on the Contractor in each specific case.

39.5.4. Climbing over dead end assemblies is permissible only after they have been completed and pinned in their final position.

40. Clearances

40.1. Contractor Clearances taken on the BPA system or on foreign utility lines and equipment to facilitate the construction of BPA transmission lines will be accomplished in accordance with the documents titled “Contractor Clearance, Hold Order, and Work Permit Procedure”, and Transmission Line Maintenance Standards and Guides III.A.14 “Clearances on Line Sections.”.

40.2. The Contractor will submit the resumes, including work experience and training history, of a minimum of two qualified line workers proposed to be certified as Clearance holders to the CO or COTR. Qualified line workers must meet the minimum qualifications identified previously in this clause.

40.3. The CO or COTR will schedule the training and written exam and notify the Contractor of the time and date. Training and written examination will require approximately eight hours to complete and may be held at various locations in the BPA system.
40.4. The Contractor Clearance Certification will be valid for this contract or one year, whichever is shorter, unless the Contractor requests to have an individual's certification remain valid after completion of each job. In no case shall certification remain valid more than one year without re-certification.

40.5. Concurrent Clearances occur when two or more qualified electrical workers are issued clearances with the same clearance limits on a transmission line and/or its terminal equipment. This could include contract electrical crews working in conjunction with BPA electrical crews. The safety of BPA employees and Contractors must be of high priority during these times of integrated work and outages. When a contract requires Concurrent Clearances, the following BPA Work Standards will be included in Contract Documents and the procedures shall be followed:

BPA WS-10-14. Communications during Concurrent Work Clearances with Contractors

BPA WS-6-7. Multiple Clearance Hazards (Grounding & Bonding)
CHAPTER 4 – COMMERCIAL AVIATION SERVICES (NON-TRANSPORTATION)

41. Commercial Aviation Services (CAS) General -- Applicable to ALL CAS Operations

41.1. The contractor has sole responsibility for the airworthiness, operation and safety of the aircraft operations and the public during the conduct of operations.

41.2. Aircraft vendors performing work under this contract must comply with the applicable Federal Aviation Regulations reference Title 14 CFR, Chapter 1, 49 CFR, Chapter XII, and 49 CFR Subchapter C, and/or DOT Special Permit(s) or exemptions and must comply with the “civil aircraft” regulations applicable to the type of operations conducted while in service to the Bonneville Power Administration. BPA has made a declaration to the FAA that aircraft operations for BPA are “civil aircraft” and not “public aircraft” at any time while in service to BPA under this contract.

41.3. All CAS vendors must be accepted by BPA's Aircraft Services or DOE prior to performance of any work on BPA's power system or property.

41.3.1. An initial assessment, and thereafter every two years if a continuing need exists, will be made by the Aircraft Service Manager, his designee or Department of Energy aviation consultant to ensure that the contractor meets the qualifications for this contract.

41.3.2. The assessment will be conducted on-site at the contractor's facility, where Bonneville Aircraft Services, his designee or the Department of Energy aviation consultant will need access to the Contractor's General Operations Manual, General Maintenance Manual (if applicable), Safety Management System document, aircraft maintenance and inspection records, pilot training records, and key management personnel.

41.3.3. In lieu of paragraphs 41.3.1 and 41.3.2, if the contractor produces documentation they are listed as approved for use under the Department of Defense (DOD) Commercial Air Transportation Quality and Safety Review Program or Aviation Resource Group/United States (ARG/US) or Wyvern, then the on-site assessment of paragraph 41.3.1 will be waived.

41.4. The Contractor must perform, and record, weight and balance calculations prior to flight to ensure that aircraft are within the manufacturers and FAA established weight and balance limitations for each operation, flight, or mission profile for which the aircraft are to be operated. Unless otherwise approved by the FAA, actual weights shall be used for the weight and balance calculations.

41.5. The contractor will only provide aircraft maintained, airworthy and safe for the intended operation in accordance with an FAA maintenance and inspection regulations 14 CFR Parts 21, 43, §91.409, 133 or the Contractor’s FAA Part 133 Operations Specifications and/or 135, if Part 135 is applicable.

41.6. The Contractor is required to submit quarterly reports of flight hours, costs, and other relevant information to the Bonneville Aircraft Service’s Manager or designee as required by Federal Management Regulation or successor regulation promulgated by GSA.

The report must include:
Agreement Start date:
Agreement End Date:
Aircraft Manufacturer:
Aircraft Model:
Vendor Name:
Vendor Location:
Registration #:
Costs:
Flight Hours:
Mission Description:

The report dates are: January 15, April 15, July 15, and October 15.

41.7. Contractors that operate under 14 CFR part 135 shall comply with the Pilot Records Improvement Act of 1996 (PRIA) and shall have a DOT/FAA approved drug and alcohol program in place covering all pilots and ground support personnel. If an operator is conducting aerial work under 14 CFR Part 91 or only certified to operate under 14 CFR Part 133, then the company should have a company drug and alcohol program in place covering all pilots, mission crew and ground support personnel.

41.8. To mitigate the potential for mid-air collision with other BPA aircraft, when the aircraft operation requires flight within or along a BPA right-of-way or to and from BPA facilities the CAS Vendor must:

Prior to Flight:

41.8.1.1. Contact Dittmer Dispatch at 360-418-2281 or 800-392-0816
41.8.1.2. Provide the company name and aircraft registration number
41.8.1.3. Purpose of flight (Transportation, aerial survey, power line patrol, etc.)
41.8.1.4. Departure location with estimated time of departure
41.8.1.5. Destination
41.8.1.6. Route of flight or name of power line (e.g. John Day – Grizzly #1 500 kV line)
41.8.1.7. Estimated time of arrival or completion of work
41.8.1.8. Provide Contractor contact’s name and phone number (must be available at all times during aircraft usage)

Upon completion of flight:
41.8.1.9. Contact Dittmer Dispatch at 360-418-2281 or 800-392-0816

41.8.1.10. Notify Dispatch that air operations are complete

This requirement in paragraph 41.7 does not relieve the Contractor from their responsibility to adhere to the vendor’s flight locating procedures.

41.9. The Contractor should have implemented an Integrated Safety Management System, which is subject to review by Bonneville Aircraft Services.

41.10. The Contractor shall notify immediately the Bonneville Aircraft Services’ Manager/Director of Operations, or Chief Pilot or designee if while in service to BPA an aircraft accident, incident, or FAA violation occurs.

42. Airplane Services (Non-Transportation)

42.1. Airplane(s) supporting BPA construction or maintenance activities may be used for any of the following: aerial surveys, LiDAR data acquisition and aerial photography. The personnel being transported during these airplane operations must be essential to or directly associated with the aircraft operation.

42.2. These airplane operations are considered aerial work and performed under the provisions applicable to civil aircraft in accordance with 14 CFR Parts 21, 39, 43, 45, 47, 61, 91 and 119.

42.3. Aircraft Maintenance programs.

42.3.1. The contractor must provide aircraft that have completed an annual inspection and been approved for return to service in accordance with 14 C.F.R. Part 43, and

42.3.2. The contract must comply the mandatory replacement times, inspection intervals, and related procedures specified in the manufacturer's maintenance manual or instructions for continued airworthiness applicable to the make and model of aircraft, OR

42.3.3. Comply with the section or alternative inspection intervals and related procedures set forth in the operator’s FAA approved maintenance program defined in 14 CFR Part 91.409 or if applicable the vendor’s FAA Operations Specifications or International Aviation Authority’s equivalent.

42.3.4. Must follow Instructions for Continued Airworthiness instructions for additional equipment and modifications to the aircraft.

42.3.5. Must comply with all applicable Airworthiness Directives to the make and model of aircraft and engines, and propellers.

42.4. A flight and duty hours schedule meeting the following minimum requirements:

42.4.1. Maximum flight time while performing aerial surveys shall be limited to eight (8) hours in each twenty-four (24) hour period; except that a maximum of eight (8) hours flight time may be allowed by permission of the BPA COTR or Aircraft Services to complete a specific mission or for an emergency flight.

42.4.2. Each pilot shall be provided one rest day in every seven (7) day period or two rest days shall be provided in every fourteen (14).
42.4.3. The pilot must have 10 hours of uninterrupted rest prior to initiating flight operations each workday while operating for BPA.

42.5. No vendor shall operate an airplane, except when necessary for takeoff or landing, below the following altitudes:

42.5.1. Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

42.5.2. Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

42.5.3. Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

42.6. All CAS vendor airplane pilots must meet the following minimum qualifications:

42.6.1. Possess a current FAA Airline Transport Pilot or Commercial Pilot Certificate with a Single-Engine Land class with instrument rating or if applicable multi-engine land class with instrument rating.

42.6.2. Possess a current FAA Class II Medical Certificate.

42.6.3. Assigned as pilot-in-command under the Contractor’s training program.

42.6.4. Qualified and current under the Contractor’s training program.

42.6.5. Meets the proficiency requirements of Part 61 and 91.

42.6.6. Must have 500 hours in the make and model of aircraft being flown on the contract.

42.6.7. Must be knowledgeable and familiar with guidance and hazards identified in the Helicopter Association International’s Utilities, Patrol and Construction Guide Chapters 1 – 7.

42.6.8. Must have completed the CAS vendors FAA or International aviation authority equivalent approved initial, recurrent or qualification training program in the previous 12 months.

43. Helicopter Services – (Non-Transportation) General Requirements

43.1. Aircraft vendors performing work under this contract must be certified under the applicable Federal Aviation Regulation reference 14 CFR Parts 119, 133 and/or 135 and comply with the vendor’s FAA issued part 133 and/or 135 Operation Specifications and FAA approved Rotorcraft Load Combination Flight Manuals and if applicable, the vendor’s FAA accepted General Operations Manual.

43.2. Currently, BPA prohibits Class A Human External Cargo (HEC) operations, either by use of platform or skid work while working for BPA.
43.3. Class B HEC operations may be authorized for rescue purposes of a worker in the wire environment when there is imminent loss of life or traditional rescue procedures can not remove the worker in a timely manner. The vendor must demonstrate through documentation the vendor's pilot(s) and workers are trained in these rescue techniques and the aircraft equipment includes the use of a personal safety device (belly band) during these operations.

43.4. All CAS vendor helicopter pilots must meet the following minimum qualifications:

43.4.1. Possess a current FAA Airline Transport Pilot or Commercial Pilot Certificate with a Rotorcraft/Helicopter Rating.

43.4.2. Possess a current FAA Class I or II Medical Certificate.

43.4.3. Assigned as pilot-in-command under the Contractor's Part 133 and/or 135 programs.

43.4.4. Qualified and current under the Contractor's FAA Part 133 and/or 135 programs.

43.4.5. Meets the proficiency requirements of Part 61, 133 and/or 135.

43.4.6. Must have 500 hours in the make and model of aircraft being flown on the contract.

43.4.7. Must be knowledgeable and familiar with guidance and hazards identified in the Helicopter Association International's Utilities, Patrol and Construction Guide Chapters 1 – 7.

43.4.8. Should have attended a formal pilot training program (i.e. factory school such as Sikorsky, Bell, Eurocopter, McDonnell Douglas, etc.) for the model of aircraft being contracted.

43.4.9. Must have completed the CAS vendors initial, recurrent or qualification training program in the previous 12 months.

43.4.10. Completed a “flying in the wire” environment training course.

43.5. Helicopter Maintenance programs.

43.5.1. The contract aircraft must comply the mandatory replacement times, inspection intervals, and related procedures specified in the manufacturer's maintenance manual or instructions for continued airworthiness applicable to the make and model of aircraft, OR

43.5.2. Comply with the section or alternative inspection intervals and related procedures set forth in the operator's FAA approved maintenance program defined in 14 CFR Part 91.409 or if applicable the vendor’s FAA Operations Specifications or International Aviation Authority’s equivalent.

43.5.3. Must follow Instructions for Continued Airworthiness instructions for additional equipment and modifications to the aircraft.

43.5.4. Must comply with all applicable Airworthiness Directives to the make and model of aircraft and engines, and propellers.
43.5.5. All maintenance must be recorded and been approved for return to service in accordance with 14 C.F.R. Part 43 or the contractor’s FAA Approved Aircraft Inspection Program.

43.6. No vendor shall operate a helicopter, except when necessary for takeoff or landing, below the following altitudes:

43.6.1. Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

43.6.2. External load operations over/within a congested area must have an FAA approved Congested Area Plan and a copy of that approved plan provided to BPA.

43.7. A minimum ceiling and visibility shall be established by the Contractor prior to initiating work that ensures safety during operations.

43.8. The vendor will ensure during all Class A and B external load operations that all workers can communicate either by radio or combination of hand and head signals during the external load operation. Loss of communication or lack of understanding between the pilot and workers as to the meaning of the hand and head signals will require the work to stop, until effective communications are re-established.

44. Helicopter Services – Aerial Survey Operations (Non-Electrical Contractors) (14 CFR Part 91)

44.1. Helicopter(s) supporting BPA construction or maintenance activities may be used for any of the following aerial survey operations: aerial photography, aerial surveys, or LiDAR data gathering. The personnel being transported during these rotorcraft operations must be essential to or directly associated with the aircraft operation.

44.2. The Contractor will only provide aircraft that are airworthy and safe for the intended operation and maintained under a FAA approved maintenance program defined in 14 CFR Part 91.409.

44.3. A flight and duty hours schedule meeting the following minimum requirements:

44.3.1. Maximum flight time while performing aerial surveys shall be limited to eight (8) hours in each twenty-four (24) hour period; except that a maximum of eight (8) hours flight time for single pilot operations may be allowed by permission of the BPA COTR or Aircraft Services to complete a specific mission or for an emergency flight.

44.3.2. Each pilot shall be provided one rest day in every seven (7) day period or two rest days shall be provided in every fourteen (14).

44.3.3. The pilot must have 10 hours of uninterrupted rest prior to initiating flight operations each workday while operating for BPA.

45. Helicopter Services – Construction/Repair External Load Work (14 CFR Part 133)

45.1. Helicopter(s) supporting BPA construction activities may be used for any of the following operations: rotorcraft load combinations including Class A, B or C loads. The personnel being transported during these rotorcraft load combinations must be essential to or directly associated with the aircraft and construction activities.
45.2. All rotorcraft external load operations must use a FAA approved load attachment means and the load carrying devices must meet industry standards.

45.3. All CAS vendor helicopter pilots must meet the following minimum qualifications in addition to those in 43.4:

45.3.1. Must have 500 hours or more of vertical reference long line experience.

45.3.2. Have received briefings or training on induced voltage hazards and other electrical hazards when working in a high voltage environment.

45.4. When helicopters are used to land tower sections or poles or cross arms, the following shall apply:

45.4.1. When landing a tower section load in an elevated position, a positive guide and positioning system shall be used. Fabricated temporary load carrying devices must be designed and stamped by a Professional Engineer and shall be of sufficient strength to safely support the specific load calculated for each load placement.

45.4.2. Qualified workers may work under a hovering helicopter only to guide and temporarily secure loads, and to attach or disengage load lines.

45.4.3. Loads shall not be released until all tower legs, pole or cross arms are secured. Line workers shall not belt off to unsecured tower sections or cross arms, and shall not climb on to unsecured tower sections, pole, or cross arms.

45.4.4. A maximum wind speed shall be established by the Contractor and before the start of each project or lift, based on the effect of wind on the load and helicopter load capacity using standard formulae. Wind speed shall be monitored and helicopter external load operations shall cease when this limit is reached.

45.5. When performing external load work, the Contractor shall submit for review by BPA’s Aircraft Services at least five (5) working days in advance of any proposed flight operations:

45.5.1. A job specific Job Hazard Analysis (JHA) that shall include hazard mitigations for the specific type of structures and work to be performed. When working in energized corridors or double circuit structures where a circuit remains energized, the JHA shall detail specific procedures to assure that the applicable MAD is maintained by the helicopter and all attachments including a procedure to account for wind and other conditions.

45.5.2. A flight duty hours schedule meeting the following minimum requirements:

45.5.2.1. Maximum flight time while performing external load work shall be limited to six (6) hours in each twenty-four (24) hour period for single pilot operations and eight (8) hours in each twenty-four (24) hour period for aircraft requiring two pilots; except that a maximum of eight (8) hours flight time for single pilot operations may be allowed by permission of the BPA COTR or field inspector to complete a specific mission or for an emergency flight.

45.5.2.2. Each pilot shall be provided one rest day in every seven (7) day period or two rest days shall be provided in every fourteen (14).
45.5.2.3. The pilot must have 10 hours of uninterrupted rest prior to initiating flight operations each workday while operating for BPA.

45.6. When performing any Class C external load operations, including sock line pulls, the CAS vendor shall ensure that:

45.6.1. All puller-tensioners used for pulling line with a helicopter shall be used in the free-wheel mode only and shall have a braking system adequate to achieve tension necessary to maintain needed control of the line.

45.6.2. If a breakaway device is used in conjunction with a helicopter line pull, the CAS vendor shall ensure that:

45.6.2.1. All personnel remain in the clear to protect them from any hazard in the event of an inadvertent breakaway.

45.6.2.2. The breakaway device is inspected before each pull. If damage is suspected the shear-pin must be replaced.

45.6.2.3. Vendor’s operating helicopters, such as the MD 500, 600 or 900 models, that are subject to fuel starvation due to a combination of bank and pitch angles experienced during Class C load operations will establish the following minimum fuel state for the pilot to stop the Class C operation. The limits are:

(a) 150 pounds indicated on the aircraft’s fuel gauge or

(b) no less than 250 pounds (approximately 36 gallons) in the fuel tanks of the aircraft.

45.7. When performing any Class B external load operations, the CAS vendor shall ensure that:

45.7.1. All long lines are non-conductive material and provide for adequate clearance (20 feet minimum from any infrastructure including towers, conductors, overhead ground wires or terrain features such as trees) for the operation being conducted.

45.7.2. When external load operations are conducted in the wire environment involving an interaction with workers, except for tower or pole placements, an electrically activated remote hook should not be used, due to the potential of induced voltage to the worker that may result in injury.

46. Helicopter Services – Heli-saw Operations

46.1. Helicopter(s) supporting BPA vegetation management activities may be used for rotorcraft load combinations including Class B loads heli-saw or heli-tree trimming. The personnel being transported during these rotorcraft load combinations must be essential to or directly associated with the aircraft operation. All rotorcraft external load operations must use a FAA approved load attachment means and the load carrying devices must meet industry standards

46.2. Comply with all applicable industry consensus safety standards relating to tree and brush cutting, pruning and trimming in proximity to energized high voltage lines.
46.3. All CAS vendor helicopter pilots conducting Heli-saw Operations must meet the following minimum qualifications in addition to those in 43.4:

46.3.1. Must have 250 hours or more of vertical reference long line experience.

46.3.2. Pilot-in-command must have 50 hours or more of aerial tree trimming experience with the make and model of aerial saw and helicopter within the previous 12 months.

46.4. Must have completed the CAS vendors Part 133 initial, recurrent or qualification training program in the previous 12 months.

46.5. A maximum wind speed shall be established by the Contractor and before the start of each project or lift, based on the effect of wind on the load and helicopter load capacity using standard formulae. Wind speed shall be monitored and helicopter lifting operations shall cease when this limit is reached.

46.6. When performing external load work, the Contractor shall submit for review by BPA’s Aircraft Services at least five (5) working days in advance of any proposed flight operations:

46.6.1. A job specific Job Hazard Analysis (JHA) that shall include hazard mitigations for the specific type of structures and work to be performed. When working in energized corridors or double circuit structures where a circuit remains energized, the JHA shall detail specific procedures to assure that the applicable MAD is maintained by the helicopter and all attachments including a procedure to account for wind and other conditions (See attachment 1).

46.6.2. A flight and duty hours schedule meeting the following minimum requirements:

(a) Maximum flight time while performing aerial tree trimming external load work shall be limited to four (4) hours in each twenty-four (24) hour period; except that a maximum of six (6) hours flight time may be allowed by permission of the pilot and BPA COTR or field inspector to complete a specific mission.

(b) Maximum flight time including aerial tree trimming and ferry time is 8 flight hours in any 24 hour period.

(c) Each pilot shall be provided one rest day in every seven (7) day period or two rest days shall be provided in every fourteen (14).

(d) The pilot must have 10 hours of uninterrupted rest prior to initiating flight operations each work day while operating for BPA.
46.7. Daily Job Briefings

46.7.1. The Contractor shall conduct a daily job briefing each morning with safety as an integral part of the briefing. The Contractor shall maintain written documentation of daily job briefings using BPA form 6410.32e or an equivalent form approved by BPA. These reports shall be made available to BPA upon request.

Each briefing shall include the following:

(a) Identify the line(s), the line voltage, and the appropriate minimum approach distance (MAD).

(b) Identify the specific work methods that will be used to prevent a violation of the MAD by contractor personnel on this project or release.

(c) Identify the qualified personnel needed to safely complete the work.

(d) Identify if a Clearance or Hold Order will be required to safely conduct the work on each specific release or project.

(e) Identify any other hazards recognized by the contractor after an inspection of the work area and how those hazards will be mitigated or controlled.

(f) All required PPE shall be reviewed.

46.8. Communications

46.8.1. The Contractor shall ensure that field supervision maintains a reliable method of emergency communications from all right-of-way work areas in the event of accident or illness.

46.8.2. The Contractor shall ensure that field supervision maintains reliable communications at all times with the BPA Clearance Holder when working under the protection of a Clearance or Hold Order.

46.9. Minimum Approach Distance (MAD)

46.9.1. The Contractor shall not perform any work on energized BPA high voltage conductors or equipment and shall not come within the Minimum Approach Distances of energized lines or equipment except under the provisions of a Work Clearance.

46.9.2. All conductors and equipment shall be treated as energized unless the contractor has been informed by a qualified BPA Clearance Holder at their work site that the line or equipment is de-energized and cleared for the contractor to perform their work.

46.10. Minimum Approach Distance (MAD) Charts

46.10.1. Refer and adhere to Charts and Tables in Chapter 5 Section 58, 58.1, and 58.2.
CHAPTER 5 – VEGETATION MANAGEMENT

47. Job Hazard Analysis

47.1. The Contractor shall prepare, implement and enforce a Job Hazard Analysis for each contract or Master Agreement.

47.2. Prior to the start of any on-site work for each contract or Master Agreement, the Contractor shall submit to BPA for review a Job Hazard Analysis to identify and mitigate any recognized hazards or conditions applicable to the type of work involved. Site and adjacent conditions shall be considered. The Contractor shall “walk down” the work areas to evaluate for location-specific hazards and the need for additional/different controls. (See Attachment 1, Job Hazard Analysis Submittal Instructions)

47.3. The Job Hazard Analysis shall be available to all workers at the work site. All workers must be familiar with the content of the Job Hazard Analysis. The Job Hazard Analysis shall be available for review by BPA employees upon request.

47.4. All safety issues shall be resolved prior to the start of work. The Contractor will not be allowed to begin work until the Contracting Officer issues a written notice-to-proceed.

47.5. The Contractor shall ensure that all safety and health provisions and requirements are followed by their subcontractors, suppliers, and support personnel and that all workers working on the project are knowledgeable of the provisions of the Job Hazard Analysis.

47.6. The Contractor shall comply with all applicable industry consensus safety standards relating to tree and brush cutting, pruning and trimming in proximity to energized high voltage lines.

48. Daily Job Briefings

48.1. The Contractor shall conduct a daily job briefing each morning with safety as an integral part of the briefing. Job briefings shall be held at the work site with additional briefings conducted when work situations change that may pose different or additional hazards to workers. The Contractor shall maintain written documentation of daily job briefings using BPA form 6410.32e or an equivalent form approved by BPA. These reports shall be made available to BPA upon request.

Each briefing shall include the following:

48.1.1. Identify the line(s), the line voltage, and the appropriate minimum approach distance (MAD).

48.1.2. Identify any trees or brush on each project or release that if felled, could violate the minimum approach distance (MAD). Identify specific methods or tools that will be used to determine the potential for trees to fall within the MAD.

48.1.3. Identify the specific work methods that will be used to prevent a violation of the MAD by contractor workers on this project or release.

48.1.4. Identify the qualified personnel needed to safely complete the work. All work conducted where “an electrical hazard exists” shall be performed by qualified line clearance tree trimmers. Trainees shall work under the direct supervision of a qualified line clearance tree trimmer.
48.1.5. Identify if a Clearance or Hold Order will be required to safely conduct the work on each specific release or project.

48.1.6. Identify any other hazards recognized by the contractor after an inspection of the work area and how those hazards will be mitigated or controlled. Note this inspection and hazard analysis must be done by a qualified line clearance tree trimmer “when an electrical hazard exists.”

48.2. All required PPE shall be reviewed.

49. Minimum Qualifications for Contractor Workers

49.1. The Contractor shall ensure and be able to document that all qualified line clearance tree trimmers working on this project or release meet the following minimum qualifications:

49.1.1. Be certified as having completed a program consisting of both coursework and supervised on-the-job training under a recognized line clearance tree trimmer training program. This program shall include at a minimum, the safety and training requirements outlined in OSHA 1910.269(r), ANSI Z133.1, and applicable State standards.

49.1.2. Have completed at least 35 hours of requisite coursework and two years of supervised on-the-job training. This shall include at least 6 months documented experience cutting trees in proximity to energized high voltage lines operated at 50 kV and above.

49.1.3. Have documented at least 1 year experience felling trees over 40 feet in height and greater than 8” diameter.

49.1.4. Have documented experience felling trees greater than 20” diameter.

49.1.5. Have a current First Aid/CPR/AED card.

49.1.6. Have fluency in the English language as well as the language(s) of contractor workers under their supervision.

49.2. The Contractor shall make available, upon request by the CO or authorized representative of the CO, documentation verifying worker qualifications.

49.3. The Contractor shall make available to the CO the names of the Qualified Line Clearance Tree Trimmers that will work on the project. Names must be updated and resubmitted to the CO if these names change.

50. Minimum Crew Size

50.1. When climbing any tree where any portion of the tree, work tools, or equipment can enter Zone B (see subsection 58 of this contract clause for Zone B definition), a second qualified climber/line clearance tree trimmer equipped with a second set of climbing tools shall be available on the job.

50.2. When a qualified climber is climbing a tree and working above 12 feet in height, a second qualified climber equipped with a second set of climbing tools shall be available on the job that is trained and knowledgeable in rescue methods.
50.3. All crews performing work where an electrical hazard or a violation of the MAD could occur shall have a minimum of one qualified line clearance tree trimmer per crew. Depending on site and job conditions, the contract may require a greater number.

50.4. There shall be sufficient qualified personnel on each crew to adequately supervise the work of trainees working on that crew at each work location.

51. Equipment and Rigging

51.1. All rigging or equipment used to control a tree’s fall shall be adequately anchored, sized and positioned to control the weight of the tree and positively control the direction of fall.

51.2. When using rigging to pull “leaners” over center, mechanical methods shall be employed and sized appropriate to the weight and position of the tree.

51.3. The Contractor shall have a program in place to adequately inspect all ropes, slings and all other rigging components and tools.

52. Tree Falling

52.1. The safety of the Contractor’s workers and the public, and the integrity of the BPA system shall be the Contractor’s primary considerations when felling trees on energized right-of-ways. If a conflict or question arises over proper procedure, the safest, most stringent or most conservative interpretation shall initially apply and the CO or COTR shall be contacted to resolve the issue.

52.2. At no time shall it be considered acceptable to fall trees on BPA lines, equipment or structures whether they are energized or de-energized. All Zone A or B trees shall be directionally felled away from transmission lines and towers using methods appropriate to ensure the direction of fall.

52.3. Additional methods of mechanical control shall be used to safely and positively control the direction of fall whenever:

52.3.1. Lodged trees are encountered. (Domino falling shall not be considered an adequate method of positive control.)

52.3.2. Wind or other conditions make directional falling dangerous or uncertain. (or work shall be temporarily suspended until conditions improve)

52.3.3. Decay, rot or other weak spots are present or suspected.

52.3.4. A clear falling path cannot be ensured.

52.4. A clear falling path shall be assured or:

52.4.1. The tree shall be felled under the protection of a Clearance or:

52.4.2. Positive control shall be maintained by mechanical equipment or:

52.4.3. The tree shall be climbed and pieced out.

52.5. A safe work zone and escape path shall first be created before a tree is fell.
52.6. Sufficient hinge wood shall be left to hold the tree to the stump during its fall and to guide the intended direction of fall.

53. Flammable Liquids

53.1. Cutters shall not carry portable containers containing flammable liquids on their person.

54. Fall Protection

54.1. Contractors performing work over four feet above ground shall use fall protection that meets applicable consensus standards. Belay lines and other climbing lines and equipment used for climber fall protection shall be inspected before each use, properly stored and maintained exclusively for climbing purposes, and not used for rigging.

54.2. The Contractor shall ensure that only qualified climbers trained and experienced in fall protection, rescue and other safe aerial work practices and procedures shall be permitted to climb or perform aerial work under this contract. The contractor shall make periodic assessments and observations to ensure climber skills are adequate. Documentation of these assessments shall be made available to BPA upon request.

55. Lockout/Tagout (LOTO)

55.1. The Contractor shall ensure that no workers are exposed to injury from the unexpected or accidental startup or release of stored energy of equipment or machinery that is shut down for repair, maintenance or adjustment.

55.2. All adjustments, cleaning and repairs that could pose a hazard shall not be performed on a running engine. “Hot refueling” is strictly prohibited.

56. Communications

56.1. The Contractor shall ensure that field supervision maintains reliable communications at all times with the BPA Clearance Holder when working under the protection of a Clearance or Hold Order.

57. Minimum Approach Distance (MAD)

57.1. The Contractor shall not perform any work on energized BPA high voltage conductors or equipment and shall not come within the Minimum Approach Distances of energized lines or equipment except under the provisions of a Work Clearance.

57.2. All conductors and equipment shall be treated as energized unless the contractor has been informed by a qualified BPA Clearance Holder at their work site that the line or equipment is de-energized and cleared for the contractor to perform their work.

57.3. When applying herbicide, all overspray shall be considered as conductive. Wind and other conditions shall be taken into account to ensure that the MAD is not violated by overspray or equipment.
58. Minimum Approach Distance (MAD) Charts and Tables

D1 (distance 1) – Minimum Approach Distance for Qualified Line-Clearance Tree Trimmer (see Table 4)

D2 (distance 2) – Minimum Approach Distance for all other tree workers (see Table 5)

**Zone A** – Inside the Minimum Approach Distance (MAD). Any trees or work completed in this zone requires an outage (Clearance), and the workers shall be qualified line clearance tree trimmers or under the direct supervision of qualified line clearance tree trimmers.

**Zone B** – If the tree or trees are in this zone, or if there is any potential of the tree, its branches, or tools entering this zone, the workers shall be qualified line clearance tree trimmers. A Hold Order may be required for work in this zone.

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1 A Hold Order is required when falling or removing danger trees if an electrical hazard (or a violation of the MAD) could result. The contractor has the responsibility of determining hazard trees and the need for a Hold Order.
58.1. TABLE 4 – Minimum Approach Distance (MAD) from Energized Conductors for Qualified Line Clearance Tree Trimmers

TABLE 4

<table>
<thead>
<tr>
<th>Nominal Line Operating Voltage (Phase-to-Phase)</th>
<th>Minimum Approach Distance in feet-inches²</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.051 – 0.3</td>
<td>Avoid Contact</td>
</tr>
<tr>
<td>0.301 – 0.75 kV</td>
<td>1-03</td>
</tr>
<tr>
<td>0.751 – 15.0 kV</td>
<td>2-07</td>
</tr>
<tr>
<td>15.1 – 36.0 kV</td>
<td>3-05</td>
</tr>
<tr>
<td>36.1 – 45.0 kV</td>
<td>3-09</td>
</tr>
<tr>
<td>46.1 – 72.5 kV</td>
<td>4-09</td>
</tr>
<tr>
<td>72.6 – 121.0 kV</td>
<td>5-01</td>
</tr>
<tr>
<td>136.0 – 145.0 kV</td>
<td>5-11</td>
</tr>
<tr>
<td>161.0 – 169.0 kV</td>
<td>6-11</td>
</tr>
<tr>
<td>230.0-242.0 kV</td>
<td>8-11</td>
</tr>
<tr>
<td>345.0 – 362.0 kV</td>
<td>15-00</td>
</tr>
<tr>
<td>500.0 – 550.0 kV</td>
<td>21-08</td>
</tr>
</tbody>
</table>

*Based on ANSI Z-133.1-2006 Table 1 including an altitude correction factor appropriate to the BPA system.*
58.2. TABLE 5 – Minimum Approach Distance (MAD) from Energized Conductors for All Other Tree Workers

**TABLE 5**

<table>
<thead>
<tr>
<th>Nominal Line Operating Voltage (Phase-to-Phase)</th>
<th>Minimum Approach Distance in feet-inches&lt;sup&gt;3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber Optic and Overhead Ground Wires</td>
<td>10-00</td>
</tr>
<tr>
<td>0.0-169.0 kV</td>
<td>15-00</td>
</tr>
<tr>
<td>230.0-242.0</td>
<td>16.05</td>
</tr>
<tr>
<td>345.0-362.0</td>
<td>20-05</td>
</tr>
<tr>
<td>500.0-550.0</td>
<td>26-08</td>
</tr>
</tbody>
</table>

<sup>3</sup> Based on ANSI Z-133.1-2006 Table 2 and additions appropriate to the BPA system

59. Attachment 1 -- Vegetation Management Job Hazard Analysis Submittal Instructions

**Attachment 1**

**Vegetation Management Job Hazard Analysis Submittal Instructions**

**Contractors Name:** ____________

**Master Agreement Number:** ____________

All contractors shall consider the Job Hazards on any projects that they compete for. Once a Contractor has been selected for award, the Contractor’s Job Hazard Analysis (JHA) must be submitted for BPA’s review, before the Contract or Master Agreement is issued. The list below is not “all inclusive”, and contractors are solely responsible for the safety practices of its workers. Please address ALL of the following items in your Job Hazard Analysis that apply to the type of projects and the work you will perform.

1. **Compliance with all Federal and State rules and regulations**

   Assurance that company will comply with all Federal and State laws and regulations governing the type of work performed on the project
2. Project Safety Meetings/Daily Safety Briefings

   a. Job safety briefings at start of project - written documentation required

   b. Daily safety briefings (written documentation required) - including proper name and voltage of transmission lines, appropriate Minimum Approach Distances, and the need for Clearances or Hold Orders. When work commences on a different transmission line, another safety briefing will be conducted that covers all safety related issues including the SPECIFIC transmission line involved in the work, the proper voltage of the transmission line, and the Minimum Approach Distance involved

   c. The Contractor shall maintain written documentation of daily job briefings using BPA form 6410.32e or an equivalent format approved by BPA. These reports shall be made available to BPA upon request

3. Accident/Injury/Near-Miss Reporting

   a. The Contractor shall maintain an accurate record of, and shall immediately report to the COTR in the manner prescribed by the latter, all cases of death, injury, occupational diseases, and near misses arising from, or incident to, performance of work under this contract.

   b. For incidents that involve Personal Injury, Illness, or Property Damage - The Contractor shall complete and file with the COTR BPA Form 6410.15e (Contractor's Report of Personal Injury, Illness, or Property Damage Accident) within 5 working days of such an occurrence.

   c. For incidents that DO NOT involve Personal Injury, Illness, or Property Damage - The Contractor shall complete and file with the COTR BPA Form 6410.18e (Contractor's Report of Incident/Near-Miss) within 5 working days of such an occurrence

4. Use of Personal Protective Equipment

   a. List types of personal protective equipment appropriate for work being performed

   b. Qualified Line Clearance Tree Trimmers (QLCTT) shall wear red hard hats. All other workers shall wear white hard hats

5. Use of proper Fall Protection

   List Fall Protection measures appropriate for work being performed

6. Environmental Issues

   Snake bites, bees, poison oak, heat stress, cold weather
7. Chainsaw Safety

List all appropriate safety measures involved with chainsaw work

8. Minimum Approach Distances

a. How will Contractor ensure Minimum Approach Distances are not violated?

b. Presence of overhead/nearby transmission lines

c. Presence of nearby distribution lines

d. Include Minimum Approach Distance tables - Table 1 for Qualified Line Clearance Tree Trimmers (QLCTT), Table 2 for persons other than QLCTT

e. Use of Safety Watchers for bucket truck work, if necessary

f. Are Clearances or Hold Orders required?

g. Use of laser rangefinders capable of determining heights and distances to determine height of trees

h. Use of controlled felling methods – safety lines, winches, climbing and piecing out

i. Describe methods used to ensure the safety of workers in the felling zone

j. Only Qualified Line Clearance Tree Trimmers (QLCTT) can work on trees that have potential to get into Zones A and B

9. Communication

a. State how reliable methods of communication will be maintained between contract workers, Natural Resource Specialists (COTR’s), Inspectors, and BPA Transmission Line Maintenance workers. Communicating with COTR’s or on-site Inspectors is important.

b. Qualified Line Clearance Tree Trimmers must have fluency in the English language as well as the languages of contractor workers under their supervision

c. Acknowledge that the Inspector has authority to stop work that presents a safety hazard and the contractor is obligated to comply with that direction

10. Qualification of Workers Used for Falling Danger Trees

a. Assurance that properly qualified workers will be utilized when felling danger trees (Qualified Line Clearance Tree Trimmers - QLCTT)

b. List the name of the QLCTT’s that will be felling trees for your company. Names must be updated and resubmitted to the Contracting Officer if these names change
11. Hazardous Road Conditions
   a. Steep narrow roads for vehicle and brush machine and navigation
   b. Condition of roads due to weather

12. Equipment Used on Site
   a. List types of equipment to be used on site
   b. Include use of extender saws or long pole saws

13. Machinery safety
   The Contractor shall ensure that no workers are exposed to injury from the unexpected or accidental startup or release of stored energy of equipment or machinery that is shut down for repair, maintenance or adjustment

14. Herbicide Application
   a. Maneuvering on access roads, avoiding poles and guy wires
   b. Requirement to have Safety Data Sheets (SDS’s) on site
   c. Assurance that Herbicide Applicators have the proper State permits/licenses to perform work with herbicides
   d. Use of respirators if required
   e. Spray shall be directed downward, never up towards transmission line conductors

15. Mowers
   a. Use of spotter/helpers
   b. Protection of guy wires/wood poles/tower legs
   c. Protection of workers from flying rocks/wood
   d. Protection of nearby vehicles or workers

16. Proper Fueling Procedures
   a. No fueling under power lines
   b. No fuel carried on body
17. Fire safety
   a. Knowledge of fire precaution levels and appropriate rules and regulations when fire precaution levels are raised
   b. Precautions used to prevent fires on rights-of-way
   c. The Contractor is responsible for carrying fire suppression tools

18. Public safety
   a. Explain measures that will be taken to protect the public (property owners, hikers, boaters, etc.)
   b. Traffic control measures that will be taken to protect the public on roadways

19. Handling Downed Conductor
   Contractors shall never handle ungrounded downed conductors. The handling of downed conductor is to be accomplished ONLY by qualified electrical workers using proper techniques. Until the conductor is properly grounded at the location where the work is to be performed and verified by a Qualified Electrical Worker, the Contractor shall not handle the downed conductors.

20. Electrical Contact Protocol
   Any worker experiencing an electrical shock of any type shall be transported to the nearest emergency medical facility as soon as possible.

   In case of electrical shock, the worker is advised to contact one of the Electrical Burn Centers that specialize in electrical shock accidents.

   There are three Electrical Burn Centers serving BPA’s service territory.

   Emanuel (Portland) covers all of Oregon and north to the Kelso/Longview, Washington area. Harborview (Seattle) covers the rest of Washington and into northern Idaho and western Montana. Intermountain (Salt Lake City) covers southern Idaho. The operative standard is to have a maximum of three hours (air travel) time to the nearest burn unit. All three work cooperatively.

   Legacy Emanuel Medical Center (Portland, Oregon) 1-888-598-4232
   Harborview Medical Center (Seattle, Washington) 1-888-731-4791
   Intermountain Burn Center - University of UT (Salt Lake City, Utah) 1-801-581-2700