



Contractor Safety Manual

Class 1 Contractors

Version 2020.1

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1. PURPOSE AND SCOPE

- 1.1. SDG&E is committed to the principle of “Safety First.” Nothing is more important than safety.
- 1.2. This Contractor Safety Manual (“Manual”) applies to Class 1 Contractors and Subcontractors, as defined in section 2 of this Manual.
- 1.3. The Contractor must comply with all applicable federal, state, regional, municipal, and local laws, ordinances, rules, codes, regulations, and executive orders, including all laws, ordinances, rules, codes, regulations, and executive orders applicable to health and safety (“Applicable H&S Laws”), this Manual, and all contract terms as set forth in the contract entered into with the Company, and must ensure that all employees and Subcontractors working on Contractor’s behalf meet or exceed these same requirements.
- 1.4. Contractors must provide a safe working environment for their employees and Subcontractors and ensure their operations do not adversely impact the safety of SDG&E employees or the public. The personal safety of a Contractor’s employees and Subcontractors is the Contractor’s responsibility.
- 1.5. If there is a conflict between this Manual, the contract entered into with the Company, or applicable H&S Laws, the more specific standard applies.
- 1.6. This Manual is not intended to be all inclusive, and Contractors, including their Subcontractors, are expected to be familiar with all Applicable H&S Laws to ensure compliance.
- 1.7. It is the Company’s policy to maintain an independent contractor relationship with all Contractors providing labor and other services to the Company. This Manual does not intend to create or imply an employer-employee relationship between the Company and the Contractor, its Subcontractors, or employees.
- 1.8. The Company reserves the right to take action, including, but not limited to, issue warnings, withhold payment, suspend work, require the removal of contractor personnel from the project, notify enforcement agencies, and terminate the contract if the Contractor does not comply with Applicable H&S Laws, all site and system-related safety requirements, this Manual, and all terms and conditions required by the contract entered into with the Company.
- 1.9. For all work performed by the Contractor for the Company, Contractor must utilize only employees and Subcontractors who are familiar with and have been trained on the general and specific hazards of the job and who are well prepared to deal with the hazards they may encounter while performing work for the Company.

2. DEFINITIONS

- 2.1. Agency Involvement: Contact by a federal, state, or local agency that regulates utility operations to evaluate compliance.
- 2.2. Applicable H&S Laws: All federal, state, regional, municipal, and local health and safety laws, ordinances, rules, codes, regulations, and executive orders, applicable to the Contractor, the Company, the work, the project, and the jobsite.
- 2.3. Competent Person: An individual who, by way of training, is knowledgeable of applicable standards, is capable of identifying workplace hazards relating to the specific operation, and has the authority to correct them. Some occupational safety and health standards add additional specific requirements that must be met by the Competent Person.
- 2.4. Confined Space: Has limited or restricted means for entry or exit and is not designed for continuous employee occupancy. Confined spaces include, but are not limited to, underground vaults, tanks, storage bins, manholes, pits, silos, process vessels, and pipelines. The term “Permit-Required Confined Space” (PRCS) is used to describe a Confined Space that has one or more of the following characteristics:
- contains or has the potential to contain a hazardous atmosphere
 - contains a material that has the potential to engulf an entrant
 - has walls that converge inward or floors that slope downward and taper into a smaller area that could trap or asphyxiate an entrant
 - contains any other recognized safety or health hazard, such as unguarded machinery, exposed live wires, or heat stress
- 2.5. Contractor: A third party company, firm, or person that is engaged by Company pursuant to a written contract, such as a master services agreement (MSA) or a construction contract, and is conducting its work (construction, excavation, equipment or facility installation, repair, or maintenance, etc.) at a facility, property, or worksite owned, operated, or managed by Company (including leased premises and right-of-ways).
- 2.5.1. A Class 1 Contractor is a contractor engaged to perform work that can reasonably be anticipated to expose the Contractor’s employees, Subcontractors, SDG&E employees, or the general public to one or more hazards that have the potential to result in Serious Safety Incident. Examples of a Class 1 Contractor include contractors performing work involving energized equipment or hazardous chemicals.
- 2.5.2. A Class 2 Contractor is a contractor engaged to perform any other work. Examples of Class 2 Contractors include contractors engaged to perform administrative tasks or IT work.
- 2.6. DOT Safety-Sensitive Covered Functions: Operations, maintenance, or emergency response functions regulated by 49 CFR Parts 192, 193, or 195 performed on a pipeline or an LNG

facility.

- 2.7. Electric Incident: An unintended interruption in electric distribution or transmission service.
- 2.8. Environmental Incident: An incident where potentially hazardous material may threaten life, health, or the environment. Any action that violates federal, state, or local environmental laws or requires reporting to any federal, state, or local agency is an Environmental Incident.
- 2.9. Field Environmental Representative: The person from Environmental Services who is responsible for providing environmental support where the Contractor may be working.
- 2.10. First Aid: Any one-time treatment, and any follow-up visit, for the purposes of observation of minor scratches, cuts, burns, splinters, or other minor industrial injury, that does not ordinarily require medical care and that does not involve loss of consciousness, restriction of work or motion, or transfer to another job. First-aid treatment includes any of the following:
- Using nonprescription medications at nonprescription strength
 - Administering tetanus immunizations
 - Cleaning, flushing, or soaking wounds on the skin's surface
 - Using wound coverings, such as bandages, band-aids, and gauze pads, or using steristrips or butterfly bandages
 - Using hot or cold therapy
 - Using any totally non-rigid means of support, such as elastic bandages, wraps, and non-rigid back belts
 - Using temporary immobilization devices while transporting an accident victim (splints, slings, neck collars, or back boards)
 - Drilling a fingernail or toenail to relieve pressure, or draining fluids from blisters;
 - Using eye patches
 - Removing foreign bodies from the eye using only irrigation or a cotton swab
 - Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs, or other simple means
 - Using finger guards
 - Using massages
 - Drinking fluids to relieve heat stress
- 2.11. Gas Incident: Any condition, whether natural or human caused, involving a gas system or liquefied natural gas (LNG) facility that results in the unintended escape of: gas or LNG outside a building; gas inside or near a building; or gas that presents a potential hazard to public safety.
- 2.12. Non-Serious Near Miss: A Work-Connected incident in which Property Damage less than \$50,000 or an injury or illness (other than a Serious Safety Incident) could have occurred, but did not.
- 2.13. Operator Qualification Program: A compliance program mandated by federal and state law

that evaluates and qualifies an individual's ability to perform covered tasks and to recognize and react to abnormal operating conditions that may occur while performing covered tasks, as defined in 49 CFR Part 192 and CPUC GO112-F.

2.14. Post-Accident Testing: Urine and breath alcohol testing conducted as a result of an accident that meets the following criteria:

2.14.1. Under 49 CFR Part 199 (Functions regulated by Pipeline & Hazardous Safety Administration), an incident reportable under 49 CFR Part 191.3 involving gas pipeline facilities, means an incident involving any of the following events:

- 1) An event that involves a release of gas from a pipeline, or of liquefied natural gas, liquefied petroleum gas, refrigerant gas, or gas from an LNG facility, and that results in one or more of the following consequences:
 - A death, or personal injury necessitating in-patient hospitalization;
 - Estimated property damage of \$50,000 or more, including loss to the operator and others, or both, but excluding cost of gas loss; or
 - Unintentional estimated gas loss of three million cubic feet or more.
- 2) An event that results in an emergency shutdown of an LNG facility. Activation of an emergency shutdown system for reasons other than an actual emergency does not constitute an incident.
- 3) An event that is significant in the judgment of the operator, even though it did not meet the criteria of paragraphs (1) or (2) of this definition.

2.14.2. Under 49 CFR Part 382, (functions regulated by Federal Motor Carrier Safety Administration), an accident involving a commercial motor vehicle where there is:

- A fatality; or
- Citation is issued to CMV driver by law enforcement; AND one of the following:
 - Medical treatment away from the scene of the accident; or
 - Towing of a vehicle.

2.15. Property Damage: A Work-Connected incident involving loss or damage to SDG&E-owned or non-SDG&E-owned property that occurs in the course of performing authorized contracted work or services on behalf of SDG&E.

2.16. Reportable Gas Incident: Any Gas Incident that meets the criteria for reporting to PHMSA or the CPUC. (Note: PHMSA is a DOT department, and these two terms may be used interchangeably).

2.16.1. Reportable Gas Incident to the CPUC and PHMSA

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2.16.1.1. An event that involves a release of gas from a pipeline or of liquefied natural gas (LNG) or gas from an LNG facility and results in:

- A death or personal injury necessitating in-patient hospitalization; OR
- Estimated property damage of Company facilities or other damage caused/effected by escaping gas, or both, of \$50,000 or more, excluding estimated cost of gas lost; OR
- Unintentional gas loss estimate of 3,000,000 cubic feet or more.

2.16.1.2. An event that results in an emergency shutdown of an LNG facility.

2.16.1.3. An event that is significant in the judgement of the operator, even though it did not meet the criteria above.

2.16.2. Reportable Gas Incident to the CPUC only

2.16.2.1. Incidents that have attracted public attention or have been given significant news media coverage, are subject to involve natural gas, or occur in the vicinity of Company facilities are involved.

(Note: Public Attention means any event that results in 10 or more calls or complaints to SDG&E regarding a common safety concern.)

2.16.2.2. Incidents where the failure of a pressure relieving and limiting stations, or any other unplanned event, results in pipeline system pressure exceeding its established Maximum Allowable Operating Pressure (MAOP) plus the allowable build up set forth in 49 CFR §192.201. See Table A for reference.

Table A

If system's MAOP is:	Then gas incident is reportable when system pressure is <u>greater</u> than:
60 psig or more	MOAP plus 10 percent, or a pressure that produces a hoop stress of 75 percent of SMYS, whichever is lower
12 psig or more, but less than 60 psig	MOAP plus 6 psig
Less than 12 psig	MOAP plus 50 percent

2.16.2.3. An event caused by the failure of any pressure controlling device, or any other unplanned event other than excavation related damage, that results in any part of the pipeline system being shut down and resulting in at least one customer outage.

- 2.17. Reportable Electric Incidents: Any Electric Incident that meets the criteria for reporting to the CPUC.
- 2.17.1. Reportable to the CPUC only
- 2.17.1.1. Fatality or personal injury rising to the level of in-patient hospitalization.
- 2.17.1.2. Are the subject of significant public attention or media coverage.
- (Note: Public Attention means any event that results in 10 or more calls or complaints to SDG&E regarding a common safety concern.)*
- 2.17.1.3. Damage to property of the utility or others estimated to exceed \$50,000 and are attributable or allegedly attributable to utility owned facilities.
- 2.18. SDG&E/Company Representative: The person responsible for administering the contract or coordinating the work performed by the Contractor.
- 2.19. SDG&E Safety Representative: The person responsible for providing safety support where the Contractor may be working.
- 2.20. Serious Near Miss: A Work-Connected incident in which Property Damage, a Spill/Release resulting in damages of \$50,000.00, or more or a Serious Safety Incident could have occurred, but did not.
- 2.21. Serious Safety Incident: A Work-Connected injury or illness occurring in a place of employment or in connection with any employment that requires inpatient hospitalization for other than medical observation or in which an employee suffers a loss of any member of the body or suffers any serious degree of permanent disfigurement.
- 2.22. SIF Potential Event: A Work-Connected event where a flaw or weakness (in an action or tool) that if left uncorrected, could result in a serious injury or fatality.
- 2.23. Site Manager(s)/Site Supervisor(s): The person responsible for the facility or Company property where the Contractor may be working.
- 2.24. Spill/Release: The discharge into the workplace or the environment of any material or substance that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or threatened hazard to human health and safety or to the environment. Hazardous materials include hazardous substances, hazardous wastes, and any material that a handler or the Business Unit has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment, if released into the workplace or the environment. Substances that are flammable, corrosive, reactive,

oxidizers, combustible, or toxic are considered hazardous. Examples are oil, fuels, paints, thinners, compressed gases (e.g., acetylene, carbon dioxide, oxygen, nitrogen), radioactive materials, and pesticides.

2.25. **Subcontractor:** A third party company, firm, or person that is engaged by a Contractor pursuant to a written contract, such as a master services agreement (MSA) or a construction contract, and is conducting its work (construction, excavation, equipment or facility installation, repair, or maintenance, etc.) at a facility, property, or worksite owned, operated, or managed by Company (including leased premises and right-of-ways).

2.25.1. A Class 1 Subcontractor is a contractor engaged to perform work by a Contractor that can reasonably be anticipated to expose the Subcontractor's employees, other Subcontractors, the Contractor's employees, SDG&E employees, or the general public to one or more hazards that have the potential to result in Serious Safety Incident. Examples of a Class 1 Subcontractor include Subcontractors performing work involving energized equipment or hazardous chemicals.

2.25.2. A Class 2 Subcontractor is a subcontractor engaged by a Contractor to perform any other work. Examples of Class 2 Subcontractors include Subcontractors engaged to perform administrative tasks or IT work.

2.26. **Work-Connected:** Occurring in the place of employment or in connection with any employment.

3. PRE-QUALIFICATION

- 3.1. SDG&E uses ISNetworkWorld (ISN) to pre-qualify Class 1 Contractors and Class 1 Subcontractors. Each Class 1 Contractor currently performing or intending to perform work for SDG&E must have an ISN account and must ensure that its Class 1 Subcontractors have an ISN account.
- 3.2. Before performing any work for SDG&E, Class 1 Contractors must upload the information specified in the Pre-Qualification Criteria (Appendix A) to ISN and must ensure its Class 1 Subcontractors upload the information specified in the Pre-Qualification Criteria (Appendix A).
- 3.3. ISN uses an "A," "B," "C," and "F" grading system to measure Contractors' safety performance against criteria established by SDG&E. Contractors who receive an "A" or "B" grade, and continue to maintain an "A" or "B" grade, are deemed qualified and are approved to work for SDG&E. Contractors who receive a "C" or "F" grade, and those whose grade changes from "A" or "B" to a "C" or "F," must be approved through SDG&E's Variance Request Process.

4. BEFORE COMMENCING WORK

- 4.1. Before commencing work, the Contractor must:
 - 4.1.1. Review the project scope and determine Applicable H&S Laws.
 - 4.1.1. Have a written Injury and Illness Prevention Program (IIPP) meeting the requirements of Title 8, CCR Section 3203, when applicable. A copy of the IIPP must be provided to the Company upon request.
 - 4.1.2. Implement all other safety programs required by Applicable H&S laws and this Manual and document them in writing. A copy of any such programs must be provided to the Company upon request.
 - 4.1.3. Meet and maintain the insurance requirements as outlined in the contract entered into with the Company. A copy of any certificate of insurance must be provided to the Company upon request.
 - 4.1.4. When performing Department of Transportation (DOT) Safety-Sensitive Covered Functions, ensure that it and its Subcontractors:
 - 4.1.4.1. Have an approved Anti-Drug and Alcohol (“D&A”) Misuse Prevention Program Policy and Plan.
 - 4.1.4.1.1. All covered employees must be in a DOT random testing pool in accordance with 49 Code of Federal Regulations (CFR) Parts 40 and 199 regulated by the Pipeline & Hazardous Materials Safety Administration (PHMSA), and
 - 4.1.4.1.2. Employees who are involved with commercial motor vehicle driver functions must be in a random testing pool regulated under the DOT Federal Motor Carrier Safety Administration’s (FMCSA) 49 CFR Part 382.
 - 4.1.4.2. Have an approved Operator Qualification Program.
 - 4.1.4.2.1. Contractor must identify the scope of work and covered services the Contractor will provide before commencing DOT-covered tasks or functions and register with Veriforce, LLC, SDG&E’s Contractor Compliance Review Agent, to initiate a DOT compliance review.
 - 4.1.4.2.2. Contractor must pass the review, receive an “Approved” status from Veriforce before performing any covered work, and continually maintain an “Approved” status from Veriforce while performing any covered work.
 - 4.1.4.3. With regard to any DOT Drug and Alcohol and Operator Qualification

programs, the Contractor must be in compliance with federal law, including, but not limited to, 49 CFR Parts 40, 192, 193, 195, 199 and 382, and applicable California law.

- 4.1.5. Provide historical data on safety performance, such as Experience Modification Rates, Total Recordable Incident Rate (TRIR), Lost Time Incident Rate (LTI), Days Away, Restricted, or Job Transfer Rate (DART), fatalities and any other serious injuries reportable to regulatory agencies, OSHA violations, fines, and penalties, and OSHA 300A - Summary of Work Related Injuries and Illnesses and OSHA 300 log, if requested by the Company.
- 4.1.6. Provide the name, qualifications, and contact information of the Contractor's worksite safety representative to the SDG&E Representative.
- 4.1.7. Ensure that the Contractor's employees and all Subcontractors' employees have the proper tools, personal protective equipment, resources, work practices, licenses, certificates, qualifications, and appropriate training in compliance with statutes/regulations and Company-specific operating requirements. The Company may inspect the Contractor's tools, equipment, personal protective equipment, resources, work practices, licenses, certificates, and training records at any time to ensure compliance with statutes/regulations and Company-specific operating requirements. The Contractor shall, per its agreement or contract, provide such documentation to the Company upon request. The Contractor must supply all items necessary to complete a job. Contractor personnel are not permitted to use SDG&E machinery, equipment, or tools unless: (a) such use is specifically permitted by SDG&E and (b) the user/operator provides satisfactory proof of all appropriate training, required operating permits, and licenses to the SDG&E Representative.
- 4.1.8. Ensure that the Contractor's and Subcontractors' employees have appropriate medical clearance when required by governmental regulations. Copies of medical clearances (excluding specific medical records protected under the Health Insurance Portability and Accountability Act) for the Contractor's personnel shall be made available to the Company upon request.
- 4.2. Depending on the project, the Contractor may be required to provide additional documentation such as, but not limited to:
 - 4.2.1. Project-Specific Safety and Health Plan
 - 4.2.1.1. The plan must cover all aspects of onsite operations and activities associated with the contract entered into with the Company. This plan must comply with all applicable federal, state, and local regulations, Applicable H&S Laws, this Manual, and any project-specific requirements that the Company and Contractor have identified. The Contractor must provide a copy of this plan with its bid package, if applicable, and when requested by the Company at any time.

4.2.2. Fire Prevention and Protection Plan

4.2.2.1. The plan must include provisions for fire protection and suppression equipment set forth in applicable regulations and standards such as, but not limited to, the California Occupational Safety and Health Act (“Cal/OSHA”), the California Fire Code, the National Fire Protection Association Standards, the National Electrical Code, the National Electrical Safety Code, and SDG&E’s Electric Standard Practice – 113.1: [SDG&E Operations & Maintenance Wildland Fire Prevention Plan](#). (You need to be logged into ISN to access this link)

4.2.2.2. If company is working in an area with potential work restrictions per Electric Standard Practice 113.1 an appropriate number of company representatives shall receive the daily SDG&E weather briefing and be able to distribute to all effected personnel.

4.2.3. Employee and Operations Documentation

4.2.3.1. All required documentation for its employees and operations, including, but not limited to, training documentation, certifications, qualifications, medical certificates, and Safety Data Sheets (SDS).

4.2.4. Specialized Safety or Health Program(s)

4.2.4.1. If additional agency-mandated programs or procedures are not addressed in the Contractor’s written safety programs (e.g., confined spaces, hot work, respiratory protection, hearing conservation, heat illness prevention, fall protection, hazard communications, energy isolation, crane/hoist lifting, lock-out/tag-out, helicopter operations, mobile crane/hoist lifting, demolition/blasting, jobsite/traffic safety, excavation, scaffolding, energized electrical or pressure work, pollution control/monitoring equipment impairment, safety-fire-security equipment/system impairment, hazardous materials and waste storage, and naturally occurring radioactive materials NORM), separate written programs must be prepared and implemented by the Contractor in compliance with Applicable H&S Laws. Any such additional specialized safety and health programs must be provided to the Company upon request.

4.3. Before commencing work, the Contractor must sign and upload the Contractor Pre-Work Safety Meeting Notification and Acknowledgement form (Appendix B) to ISN. One notice may be used for multiple projects when the projects present similar hazards.

4.4. Substation Access

- 4.4.1. Only Qualified Employees for Substations (QEs) and Qualified Electrical Workers (QEWs), as defined below, with a work need who have attended SDG&E's Substation Entry Authorization Orientation can enter SDG&E substations unescorted.
1. Qualified Employee for Substations (QE): A person who, by reason of experience or instruction, is familiar with, trained, and qualified for the work to be performed and the hazards involved in the activity they are performing or overseeing. The QE must, at a minimum, complete SDG&E's Substation Entry Authorization Orientation, be listed on SDG&E's Substation Entry List maintained by SDG&E Transmission Grid Control Center, and be knowledgeable in all aspects of substation equipment and procedures.
 2. Qualified Electrical Worker (QEW): A person who has a minimum of two years of training and experience with high-voltage circuits and equipment, demonstrated familiarity with the work to be performed and the hazards involved, and obtained a journeyman status.
- 4.4.2. QEs and QEWs may only escort a non-qualified person into SDG&E substations provided the person has a work need. QEs and QEWs are responsible for all non-qualified people to whom they give substation access.
- 4.4.3. SDG&E provides substation keys to QEs and QEWs only after they successfully complete SDG&E's Substation Entry Authorization Orientation. Before any Contractor employee is admitted to the orientation, the Contractor must provide documentation to SDG&E Kearny Operations and Engineering Manager confirming the employee has been trained on the hazards of work activities to be performed inside substations.

4.5. Class 1 Subcontractor

- 4.5.1. Contractor must ensure that all of its Class 1 Subcontractors who it engages to perform work for SDG&E have reviewed this Manual. Contractor must further ensure that all of its Subcontractors are compliant with SDG&E's Contractor Safety Program.
- 4.5.2. Contractor must have a written contract with all Class 1 Subcontractors it engages to do work for SDG&E.

4.6. Safety Oversight By Contractor

- 4.6.1. Contractors shall provide and maintain an effective safety oversight of Contractor work crews working on SDG&E projects to ensure the safety of the employees and the public and compliance with applicable safety requirements,

including this Manual. With respect to subcontractor work crews, Contractors must provide and maintain similar effective safety oversight or, in the alternative, require each subcontractor to provide and maintain effective safety oversight of its work crews provided such safety oversight by the subcontractor is as effective as the safety oversight that would otherwise be provided by the Contractor.

4.6.2. Each Contractor shall appoint a designated safety person, who will support implementation of the required safety plans, programs and requirements listed in this document, as well as other safety requirements determined by the Contractor, to be necessary for the safe execution of the project.

4.6.3. Contractors employing 35 or more personnel on a project site, including their subcontractor employees, must provide, at a minimum, a full-time site Safety Professional (with no other collateral duties). One additional site Safety Professional (with no other collateral duties) is required for each additional 50 workers thereafter. Safety Professionals will have a minimum of an OSHA Outreach 30-Hour Course Card and relevant experience to identify hazards in the work scope being performed.

4.6.4. When the general contractor is employing less than 35 personnel on a project site, including subcontractors, the contractor shall have at least one supervisor with an OSHA Construction Outreach 30- Hour Course Card on site whenever work-related activities are being performed. Documentation of training must be available for review.

5. PRE-WORK MEETINGS WITH SDG&E

5.1. The Contractor must conduct pre-work meetings with the SDG&E Representative to discuss specific safety and health issues for the job or facility. The following information shall be discussed:

5.1.1. Hazard Information

5.1.1.1. Specific hazards at the jobsite as well as procedures that have the potential to impact the Contractor's employees and Subcontractors. This can be accomplished by developing a Job Safety/Hazard Analysis (JSA/JHA), Activity Hazard Analysis (AHA), or like document. These hazards may include, but are not limited to, asbestos, lead, Confined Spaces, equipment operation, high outdoor temperatures, energized electrical and gas systems, fall hazards, naturally occurring radioactive materials (NORM), specific hazardous substances, and Proposition 65 warnings.

5.1.1.2. The Contractor must share and communicate hazard information covered

in this meeting with all of its employees and Subcontractors before beginning any work in a language readily understandable to all of its employees and Subcontractors.

5.1.1.3. If Company discloses to the Contractor the presence of Proposition 65 listed chemicals at a Company work site, the Contractor shall be responsible for providing to its employees and Subcontractors the required warning regarding occupational exposure to Proposition 65 chemicals.

5.1.2. Specific Safety Rules and Requirements

5.1.2.1. Any specific safety rules/regulations pertaining to the project to ensure safe work practices in accordance with the Contractor's safety program or plan, Applicable H&S Laws, this Manual, and all contract terms as set forth in the contract entered into with the Company.

5.1.3. Stop The Job/Stop the Task Process

5.1.3.1. If an unsafe work condition or activity is identified, anyone working onsite has the authority to stop the job or the task. All work in the area of concern must immediately cease once a stop the job or task is declared until site supervision and the involved Contractor(s) have done a thorough investigation, remediated the unsafe situation, determined it is safe, and communicated this to affected employees. (See section 5.2.)

5.1.4. Emergency Response

5.1.4.1. Contractor must communicate its emergency response plan, such as evacuation alarms, evacuation routes, assembly areas, and interactions with emergency services to all affected personnel.

5.1.5. Company and Contactor contact information

5.1.5.1. Contractor must post the Contractor Pre-Work Safety Meeting Notification and Acknowledgement (Appendix B) onsite or otherwise communicate the contents of the notice to the employees performing the work in a manner that is at least effective as posting.

5.2. Before commencing any work for SDG&E, Contractor must communicate the contents of the Contractor Pre-Work Safety Meeting Notification and Acknowledgement and this Manual, and document the date and manner of such communication, with their employees and subcontractors performing the work.

6. CONTRACTOR SAFETY AND HEALTH REQUIREMENTS

6.1. General Responsibilities

6.1.1. The Contractor shall ensure that its employees and subcontractors know their safety responsibilities, including the following:

- Reporting to work in a technically, mentally, and physically fit condition;
- Performing all activities safely;
- Following all safety rules and practices outlined in this Manual and the Contractor's own safety and applicable Drug & Alcohol programs;
- Undertaking only those assignments they fully understand and are trained and qualified to perform;
- Refusing to perform any unsafe assignment or task regardless of supervision issuing such direction;
- Correctly wearing and using Personal Protective Equipment (PPE);
- Immediately notifying supervision of potential hazards and conditions;
- Reporting all injuries, illnesses, and work restrictions to their immediate supervisor; and
- Identifying, evaluating, and correcting hazards that may occur during the work, including testing or sampling for atmospheric hazards.

6.1.2. When work requires oversight by a Competent Person, the Contractor shall ensure properly qualified personnel are certified, when applicable, and onsite to serve in that capacity.

6.1.3. Contractor may not assign apprentice-level employees or other employees undergoing on-the-job training to perform any work for the Company, unless (a) the Company specifically authorizes the Contractor in writing to use such employees, and (b) such employee is under the supervision of a Competent Person. This requirement does not apply to linemen, electricians, wiremen, or relay technicians in an apprenticeship program working under the supervision of a Competent Person.

6.2. Daily Tailgate

6.2.1. Contractor must have a daily documented tailgate meeting that covers the following topics:

- Scope of work
- Hazards associated with the job tasks
- Mitigations for hazards
- Employee names
- Visitor names
- Emergency contact information
- Job task change

6.3. Stop the Job / Stop the Task

- 6.3.1. If the Contractor has any questions concerning SDG&E's safety requirements, Contractor must address these questions to the SDG&E Representative.
- 6.3.2. If a Company Representative informs the Contractor that the Contractor's practices create an imminent danger, the Contractor must immediately suspend the work and not resume the work until the Contractor establishes to the satisfaction of the Company Representative that the work can be performed safely.
- 6.3.3. If the Company points out hazards or unsafe actions to the Contractor and the hazard or unsafe action cannot immediately be corrected, the Contractor must complete the Corrective Action Requirement form (Appendix C) and submit it to the SDG&E Representative within the time specified by the SDG&E Representative detailing the corrective action taken.
- 6.3.4. If the Contractor becomes aware of a safety issue that the Contractor cannot resolve, or does not know how to resolve, the Contractor must stop the work in question and immediately report the safety issue to the SDG&E Representative.

6.4. Unattended Work

- 6.4.1. The Contractor may not leave the job site unattended while potentially hazardous equipment or conditions are present (e.g., an exposed live electrical source or raised loads or open trenches). Warning signs and barricades are not sufficient. Equipment and materials must be properly stored, locked, covered, or chocked, as appropriate.

6.5. First Aid

- 6.5.1. The Contractor must provide and routinely inspect Cal/OSHA-compliant First-Aid kits throughout its assigned work area. SDG&E's First-Aid kits are located throughout SDG&E facilities and may be used by Contractor on an emergency basis only. Contractor will immediately notify the SDG&E Representative of usage and will restock any materials used.
- 6.5.2. The Contractor must provide a sufficient number of First Aid and CPR-certified personnel to respond immediately to first-aid needs of the Contractor's employees.
- 6.5.3. Contractor must identify local hospitals or clinics to provide emergency medical services to Contractor employees. Contractor must make the location, address, phone number, and directions available to all personnel working on the project.

6.6. DOT Drug and Alcohol Testing

- 6.6.1. If covered under DOT's drug and alcohol testing regulations, the Contractor must:

- 6.6.1.1. Enforce and ensure compliance with drug and alcohol prevention policies and reporting requirements. Conduct post-accident drug and alcohol testing of covered employees when required in accordance with the DOT post-accident criteria.
- 6.6.1.2. Immediately remove employees from performing covered work while waiting for a post-accident test result and when any positive drug or alcohol test result is reported. Notify the SDG&E Representative of any and all incidents requiring Post-Accident Testing, and report compliance.
- 6.6.1.3. In accordance with DOT testing regulations, conduct “Reasonable Cause” testing when signs and symptoms are present and reasonable cause has been established by two trained Contractor management personnel. In the absence of immediate action by the Contractor’s foreman, or if the Contractor is delayed in taking immediate action, SDG&E reserves the right to remove the Contractor’s employees and require such employees to submit to reasonable cause testing when present on Company premises or jobsites.
- 6.6.1.4. Ensure that its employees adhere to the DOT return-to-duty regulations and procedures before returning employees to their DOT position if previously removed due to positive drug or alcohol testing.
- 6.6.1.5. Require its employees to adhere to its own D&A policy and applicable DOT requirements.
- 6.6.1.6. The DOT and SDG&E prohibit the use of illegal drugs and alcohol. Furthermore, use of prescribed marijuana (for medical or recreational use) is also prohibited. Off-the-job involvement with drugs or alcohol that affects job performance, including operation of a motor vehicle to perform job duties, is prohibited as well. In addition, the Contractor should verify through a prescribing doctor’s statement that its employees with legal prescriptions for impairing effect medications are able to safely perform their safety-sensitive and driving functions while on the prescribed medication.
- 6.6.1.7. Submit to unannounced Company jobsite inspections of Contractor crew members on jobsites and D&A program audits performed by Veriforce at Contractor’s headquarters offices. All Contractors shall grant Veriforce access to their property and records in accordance with 49 CFR Parts 199 and 382.
- 6.6.1.8. Provide statistical data on all DOT drug testing conducted as per the schedule set by Veriforce or the Company’s D&A Testing Administrator.
- 6.6.1.9. Notify the Company’s D&A Testing Administrator if the Contractor’s or subcontractors’ scope of work changes (i.e., the Contractor will begin

performing covered functions or the Contractor will begin performing additional covered tasks not previously identified or qualified to perform).

6.7. Responsibility for Tools and Equipment

- 6.7.1. The Contractor must supply all items necessary to complete a job. Contractor personnel are not permitted to use SDG&E machinery, equipment, or tools unless (a) such use is specifically permitted by SDG&E, and (b) the user/operator provides satisfactory proof of all appropriate training, required operating permits, and licenses to the SDG&E Representative.
- 6.7.2. The Contractor is responsible for the safe condition and security of its own tools. SDG&E assumes no responsibility for safeguarding the Contractor's material, equipment, or supplies.

6.8. Work Permits

- 6.8.1. Because of the potential hazards associated with some work at SDG&E, certain permits are required to prevent injuries to people, damage to the environment, loss of production, and damage to SDG&E property. The Contractor is responsible for completing all necessary Contractor-issued permits, including, but not limited to, Hot Work Permit and Confined Space Entry Permit, and obtaining all necessary Cal/OSHA-issued permits, including, but not limited to, construction, scaffolding, falsework/vertical shoring, demolition, and trenching/excavations, before beginning permit-required work. Activity Notification Forms, if required, must be submitted to Cal/OSHA before beginning permit-required work.
- 6.8.2. The Contractor must post copies of approved permits in the immediate work area for the duration of the permitted work.
- 6.8.3. When the work is finished, the Contractor must complete and sign the post-work checklist on the bottom of the permit.

6.9. Personal Protective Equipment and Safety Equipment

- 6.9.1. The Contractor shall provide all required Personal Protective Equipment (PPE), safety equipment, and supplies, and shall ensure their employees are trained and properly use PPE. PPE and safety equipment shall be inspected on a daily basis for signs of wear damage that might reduce the degree of safety integrity originally provided. Worn or damaged equipment shall be replaced as necessary. PPE and safety equipment shall not be modified or altered in any way that may reduce the integrity or effectiveness of the equipment.

6.9.2. General Work Clothing

- 6.9.2.1. Contractor site personnel must, at all times, wear clothing suitable for the

work being performed, including flame resistant (FR)/arc-rated clothing for any energized electrical work and when required for natural gas-related work.

6.9.2.2. Every person who enters an energized SDG&E substation must wear flame resistant (FR)/arc-rated garments and other personal protective equipment (PPE) unless: (a) the entry area is posted with other instructions or (b) the person remains in a vehicle not used for operating, maintaining, repairing, or washing substation equipment that can be or has been energized (e.g., deliveries). Acceptable FR garments include long-sleeve shirt, pants, coveralls, and special suits that cover the torso, arms, and legs and have a minimum arc rating of 8.0 calories per square centimeter (8.0 cal/cm²) by ASTM F1506. Shirts must be tucked into pants, buttons must be fastened (except top button), and sleeves must be rolled down and buttoned. Garments containing manmade fibers (e.g., acetate, nylon, polyester, rayon) are prohibited in substations unless arc rated. When performing tasks having potential arc energy above 8.0 cal/cm², protection providing at least an equal arc rating as the exposure must be worn. When in the control shelter and not working on or near exposed energized conductors or equipment (e.g., service panels, back side of control or relay panels, inverters, converters, or batteries), hardhat and safety glasses may be removed.

6.9.2.3. Work clothing for gas handling tasks includes but is not limited to 100% cotton coveralls, FR coveralls, or FR long-sleeve shirt and pants when:

- Blowing or leaking gas is present or may be present
- Performing leak repair
- Performing pipeline fire control/fire watch
- Performing pressure control work (tapping, stopping, service valve changing, etc.) or any other procedure such as purging or completing a fitting
- Welding, soldering, or brazing.
- Supervision or operational oversight of any of the above tasks

Garments must be made without hook-and-loop (e.g. Velcro) closures, other features or fabrics that may increase the risk of electrostatic discharge (compared to 100% cotton) during tasks listed above. FR garments must be labeled as being tested and meeting requirements of National Fire Protection Association (NFPA) standard 2112. Shirts must be tucked into pants, buttons must be fastened (except top button), and sleeves must be rolled down and buttoned.

6.9.3. Foot Protection

6.9.3.1. The Contractor's employees must wear appropriate protective footwear or

foot protectors when there may be exposure to the following:

- impact injuries
- spills and splashes
- compression injuries
- electrical shocks and burns
- extreme cold, heat, and moisture
- slips, trips, and falls
- punctures

6.9.3.2. Additional foot protection must be used for work activities when necessary.

6.9.4. Eye Protection

6.9.4.1. Contractor must provide safety glasses with side shields (ANSI Z87.1) are to be used in any area where safety glasses are required. Additional eye and face protection shall be provided and utilized for work activities where protection from dust, particulates, liquids, vapors, or radiant energy is necessary.

6.9.5. Head Protection

6.9.5.1. Where hardhats are required, they must meet ANSI Z89.1 requirements for a Class E hardhat.

- Hardhats shall be worn with the bill facing forward except for work tasks that allow certain limited work tasks (e.g., welders, surveyors) to be performed with the brim turned backward. “Cowboy” style hard hats are prohibited. “Full brim” and “front brim” hard hats are permissible.
- No ball caps, knit caps, or other headdress shall be worn under the hard hat that could interfere with the fit or stability of the hard hat.
- Chin straps will be worn when wearers are subject to high wind conditions or working on elevated structures.

6.9.6. Hearing Protection

6.9.6.1. All personnel engaging in or around any activities that generate noise above the Cal/OSHA action levels shall wear hearing protection at all times and be part of a hearing conservation program.

6.9.7. Hand Protection

6.9.7.1. The Contractor shall provide gloves as needed and as appropriate. The Contractor must provide hand protection for its employees when needed to

prevent exposure to:

- Absorption of harmful substances
- Severe cuts, lacerations, abrasions, or punctures
- Chemical, heat or electrical burns
- Extreme heat and cold
- Bloodborne pathogens

6.9.8. Respiratory Protection

6.9.8.1. The Contractor must implement its own respiratory protection program, to include equipment and training as needed, to meet regulatory requirements.

6.9.9. High Visibility Vests/Clothing

6.9.9.1. The Contractor shall provide to and require all employees whose work exposes them to vehicular traffic, including off-highway, private roads, or job sites, to wear approved vests or clothing marked with or made of reflective or high visibility material. Employees must be visible to at a minimum distance of 1,000 feet and their apparel must be compliant with the American National Standard for High-Visibility Apparel. The retroreflective safety material shall be designed to clearly identify the wearer as a person. Barricading, coning, or delineation of the immediate work area will not eliminate the need for the high visibility vest/clothing.

6.9.9.2. Employees whose work exposes them to vehicular traffic and who work on or in proximity to energized electrical equipment must wear: (a) approved arc-rated FR vests meeting ANSI 107 Class 2 high visibility standards or (b) approved arc-rated FR shirts, jackets, or sweatshirts meeting ANSI 107 Class 3 high visibility standards.

6.9.9.2.1. For purposes of this rule, exposure to vehicular traffic occurs during any activity on a normally traveled portion of a roadway or other area open to traffic. Barricading, coning, or delineating the immediate work area does not eliminate the exposure or need for the vest. Even if exposure is intermittent, the vest must be worn on arrival at the job site and not removed until departure.

6.10. Forklifts and Other Powered Industrial Vehicles

6.10.1. Only those drivers authorized by the Contractor and trained and certified in the safe operation of forklifts may operate such Contractor-provided vehicles. Operators must have completed their “operator evaluation” within the last three years.

6.10.2. Before using the vehicle, a forklift driver must inspect and ensure that all operational

controls, lights, and warning systems are working. The inspection must be documented and made available to the Company upon request.

- 6.10.3. Every forklift must be equipped with a warning device (horn, gong, or other audible device) and a back-up alarm that can be heard clearly above the normal industrial noise in the work place.

6.11. Confined Spaces

- 6.11.1. The Contractor shall ensure that site personnel entering Confined Spaces are thoroughly and properly trained on the hazards presented by Confined Spaces, preparing the space for work activities, means of protection, communications, requirements, and emergency response actions.

- Any torch or hose must be removed from Confined Spaces whenever work is suspended.
- Compressed gas cylinders are not permitted inside a Confined Space.
- When temporary wiring is used in Confined Spaces, an approved and designated switch shall be provided at or near the entrance of the space(s) for cutting off the current in the event of an emergency.

- 6.11.2. Before entry into a Permit-Required Confined Space, the Contractor shall discuss with the Company Representative information about past entries, hazards, and safety measures associated with the space including use of a rescue team, as well as isolation of the space (from hazardous energy/substances) completed by the Company. After the entry, the Contractor shall conduct a debriefing with the Company representative.

- 6.11.3. The Contractor's shift supervisor or his designee shall control entries into a Permit-Required Confined Space via a Confined Space Entry Permit. Before this Permit is issued, the Confined space must be tested for oxygen concentration, flammable gases/vapors/dusts, and any toxic air contaminants that may be present (e.g., carbon monoxide during welding/cutting or hydrogen sulfide in sump areas), and assessed for other serious hazards (e.g., mechanical, electrical, and thermal hazards). A pre-entry briefing must be held with all entrants and attendants before work. The results of the pre-entry tests must be reviewed with the Contractor's site supervisor. If hot work is to be performed in a Confined space, the provisions of the hot work section of this agreement shall also apply. The Contractor shall be responsible for providing necessary ventilation or other safety measures to eliminate or control any hazards that exist or they create due to their work activities. The Contractor must perform continuous or periodic monitoring, if required.

- 6.11.4. Entry into other Confined spaces (e.g., electric utility, gas transmission/distribution, and telecommunication vaults) when these spaces are not Permit –Required Confined

Spaces shall also be properly assessed for hazards, and testing for hazardous atmospheres shall be documented. Proper communication and safety measures shall also be implemented.

6.12. Signs, Signals, and Barricades

6.12.1. Vehicle traffic, moving machinery, falls, electrical, struck-by, and caught between hazards may require the protection by barricades and other warning signs and signals. The Contractor must determine when such protection is needed and how it is to be implemented, meeting at least the following minimum requirements.

- Barricades can include barricade tape, machine guards, guardrails, jersey barriers, fencing, or traffic barricades, as appropriate and necessary.
- Barricades must be in place before the creation of the hazard (i.e. removing a manhole cover).
- Tape and rope are used to identify the boundary of an area where a hazard exists and are for short term use only, less than 24 hours. Tape and rope cannot be used as a physical barricade.
- All barricades shall have signs denoting the hazard(s) the barricade is designed to protect against. A tag shall not be used in the place of a sign.
- Barricades used to protect excavations from vehicles and pedestrians shall be at least 6 feet from the edge of the excavation.
- The Contractor is responsible for the removal of signs, barricades, and tape when the hazard no longer exists.

6.12.2. Color Coding Physical Hazards

6.12.2.1. Only yellow or red will be used to denote hazard boundaries.

6.12.2.2. Yellow shall be used to designate CAUTION and physical hazards such as Struck By, Slip/Trip, Fall, and Caught Between hazards.

6.12.2.3. Yellow CAUTION tape should be used to highlight conditions that could be or become hazardous.

6.12.2.4. Yellow CAUTION tape may be crossed by personnel once the hazard has been communicated and the proper precautions can be taken.

6.12.2.5. Red shall be used to designate FIRE, DANGER, and STOP hazards

6.12.2.6. Red Danger tape/signs should be used when there is an imminent danger. Examples of when to use red danger tape/signs include:

- fall hazards
- exposed electrical components

- overhead work

6.12.2.7. Red DANGER tape may only be crossed by individuals that are working within that area.

6.12.2.8. Emergency STOP switches/controls on hazardous machines shall be red.

6.13. Materials Handling, Storage, Use, and Disposal

6.13.1. All materials shall be stacked, racked, or otherwise secured to prevent sliding, falling, or collapse.

6.13.2. Rigging equipment for material handling shall be inspected before each use and as necessary during its use to ensure that it is safe.

6.14. Hand and Power Tools

6.14.1. Hand and power tools shall be used and maintained in accordance with manufacturer's instructions and shall be used only for the purpose for which designed.

6.14.2. Tools shall be inspected, tested, and determined to be in safe operating condition before use. Periodic inspections shall be made as frequently as necessary or required to ensure safe operating condition and proper maintenance.

6.14.3. Hand and power tools shall be in good repair and with all required safety devices installed and properly adjusted.

6.14.4. Tools having defects that will impair their strength or render them unsafe shall be removed from service.

6.14.5. When using pneumatic tools, one approved safety check valve must be installed at the manifold outlet of each supply line. All pneumatic hose connections must be securely fastened.

6.14.6. Power tools which under Applicable H&S Laws must have guards shall be equipped with such guards. All guards must be functional.

6.14.7. Reciprocating, rotating, moving, or grinding equipment shall be guarded as required by Applicable H&S Laws.

6.15. Welding and Cutting

6.15.1. Welding and cutting operations shall be adequately ventilated at all times. The Contractor shall provide mechanical ventilation unless otherwise specified in the

contract.

- 6.15.2. Welders will wear approved eye glasses, with suitable filter lenses, and head protection. Persons assisting the welder will also wear protective glasses/lenses.
- 6.15.3. Screens, shields, or other safeguards will be provided for the protection of personnel, equipment, and materials exposed to sparks, slag, molten metal, falling objects, or ultraviolet (UV)/infrared (IR) radiation.
- 6.15.4. If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity shall be taken to a safe place.
- 6.15.5. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.
- 6.15.6. Arc welding and cutting operations shall be shielded by noncombustible or flameproof screens that will protect employees and other persons working in the vicinity from the direct rays of the arc, sparks, molten metal, spatter, and slag.
- 6.15.7. Preservative coatings shall be removed at least 4 inches from the area to be heated to ensure any temperature increase of the unstripped metal will not be appreciable. Artificial cooling of the metal surrounding the heating area may be used to limit the area to be stripped.
- 6.15.8. Flashback arrestors with an internal check valve are required in-line between the torch and the regulator to prevent flame from passing into the fuel gas system. All compressed gas cylinders, regardless of size, in use or in designated storage areas shall be secured with durable suitable restraints, such as chain, heavy gauge wire (minimum No. 9), wire cable, metal bars, or cylinder cages. The use of materials that will not withstand environmental conditions or work condition or events, such as UV light, heat, chemicals, and burns from cutting/welding slag or weathering shall not be used. Examples of unacceptable materials include: rope, bungee cords, or nylon material.
- 6.15.9. Gas cylinders can only be stored in safe locations in compliance with applicable regulations. Fuel gases must be stored separately from oxygen and other oxidizers by at least 20 feet apart or by a five-foot wall with a fire-resistance rating of at least one half hour unless in use or stored in a mobile rack for use. Cutting rigs not in use for the next shift shall have their regulators removed and caps placed on the cylinders.
- 6.15.10. Cable, hoses, and other equipment shall be elevated or hidden so as to be kept clear of passageways, ladders, and stairways.

6.16. Hot Work

- 6.16.1. Any person performing work including flame cutting, welding, brazing, grinding, torch soldering, portable space heaters with an open flame, heated tar pots, or any procedure involving an open flame or sparks must have a written hot work program, approved in advance of the work by the SDG&E Representative. All hot work programs must meet, at a minimum, the requirements set forth in 8 CCR 4848 and 8 CCR 6777 and Chapter 35 of the California Fire Code. Hot work performed in the Fire Threat Zone (FTZ) may have additional requirements added by SDG&E.
- 6.16.2. Any Contractor performing any hot work or spark-generating activity within 35 feet of any combustible material or raw or processed refuse or where sparks, hot slag, embers, ash, or flame could travel to ignite such materials must inspect all potentially affected areas before performing any hot work, maintain a fire watch, and keep firefighting equipment in the immediate area of the hot work. The Contractor is not to use SDG&E fire extinguishers to meet this requirement.
- 6.16.3. While a person is performing hot work as described in 4.15.2, they cannot also act as a fire watch. An additional person is required.
- 6.16.4. The Contractor shall remove combustible material or use noncombustible barriers, blankets, or other means (e.g., wetting refuse that cannot be removed) to prevent sparks or heat from impacting combustible materials in work areas and below, above, or adjacent to the hot work, including the other side of walls or surfaces.
- 6.16.5. Where hot work to be conducted involves tie-ins to existing facility plant or equipment, the hot work permit shall be submitted to the SDG&E Representative for review and approval before the hot work permit is issued.
- 6.16.6. When hot work involves working on flammable or combustible chemical lines or vessels, they must be depressurized, drained, purged of residual chemical, and inserted to ensure a safe atmosphere.
- 6.16.7. Flammable and combustible chemical lines adjacent to the one(s) being worked on will also have to be depressurized and effectively protected by blanketing or shielding to protect them from damage.
- 6.16.8. Hot work on chemical systems must be coordinated with SDG&E.
- 6.16.9. If a fire watch is required for hot work, at least one 20-pound ABC type fire extinguisher and fire watch individual shall remain at the work location during hot work for at least 30 minutes after the hot work has ended.
- 6.16.10. The Contractor must inspect the area and remain in the area until (a) it is determined that no smoldering or previously unnoticed fires exist or (b) an additional 30 minutes has elapsed, whichever is longer.
- 6.16.11. When a hot work permit is required, the details of the fire watch, including start and

stop time and observations made shall be documented, dated, signed by the fire watch individual, and submitted to their direct supervisor to be kept on file.

6.17. Electrical Equipment and Tools

- 6.17.1. Electrical equipment must not be installed, maintained, or modified by anyone other than a qualified electrician or qualified electrical worker.
- 6.17.2. Damaged or defective electrical tools must not be used. All portable electric tools, drop cords, extension cords, and similar items must be visually inspected before use. Any items showing signs of possible damage must not be used.
- 6.17.3. When working with energized line or equipment, appropriate rubber gloves, blankets, mats, and other protective equipment must be used.
- 6.17.4. All temporary electrical equipment used must be listed by an approved testing laboratory (Underwriters Laboratories, Inc. U.L., or Factory Mutual Laboratories) for the specific application. All temporary electrical installations must conform to the National Electric code and meet local regulation. Work on electrical circuits and equipment must be performed only by qualified personnel familiar with code requirements.
- 6.17.5. Temporary electric cords must be covered or elevated and kept clear of walkways and other locations where they may be exposed to damage, water, or where they create tripping hazards. Do not use welding rods to suspend electrical cords.
- 6.17.6. Energized wiring in junction boxes, circuit breaker panels, and terminals must be covered at all times, unless the junction boxes, circuit breaker panels, or terminals are designed to be open. If they are designed to be open, access must be limited to personnel qualified and trained on the job site hazards.
- 6.17.7. Hazardous areas must be barricaded and appropriate warning signs posted.
- 6.17.8. Tools and equipment must be grounded or double insulated through the use of ground fault circuit interrupters or other equipment grounding conductor program. All 120 volt, single phase, 15, 20, and 30-ampere receptacle outlets must have GFCI protection. All GFCI receptacles, including portable units, must be inspected daily before use and tested monthly by the Contractor. This test shall consist of pushing the test button on the GFCI and obtaining an open circuit upon pushing the test button.
- 6.17.9. Work on or near electrical equipment has the potential for exposure to electric arc or flame. Surveys have been performed on certain SDG&E electrical equipment to estimate the arc incident energy that a worker may be exposed to based on equipment voltage, fault current, fault duration, arc length, and minimum approach distance to energized equipment allowed by Cal/OSHA. Appendix E contains electric arc incident energies and arc flash boundaries for

SDG&E Utility Systems/Equipment and Buildings. Contractors shall use protective procedures, equipment, and flame-resistant/arc-rated clothing, as required, to protect workers from the potential arc/flame exposure to which they may be exposed.

6.17.10. The Contractor shall require compliance with applicable aspects of Cal/OSHA low and high voltage electrical safety orders.

6.18. Control of Hazardous Energy

6.18.1. Hazardous energy can include electrical, mechanical, hydraulic, pneumatic, chemical, thermal, and other energy sources.

6.18.2. All work activities involving existing utilities or components must be reviewed with the SDG&E Representative and approved before work is performed.

6.19. Lockout/Tagout

6.19.1. The Contractor must contact SDG&E to identify any SDG&E equipment-specific lockout/tagout procedures that apply for the project work.

6.19.2. SDG&E's general rule concerning LOTO by a Contractor for any SDG&E equipment or other equipment with which SDG&E employees may be exposed to hazardous energy, is that an SDG&E Authorized Employee (for LOTO) will place their lock on first (or tag, if lock is not possible) and remove it last upon completion of the task by the Contractor. Any exception needs to be approved in advance by SDG&E.

6.19.3. If a Contractor employee is working on equipment or a system that is to be locked out, he/she must attach his/her lock and tag to the lockout device. That employee must retain the lock key, and only this person is authorized to unlock the lock and remove the tag upon completion of the job. If more than one person is working on the system, then each must place his/her own lock on the switch and retain his/her own key. Master keys are prohibited. (Note: Group Lockout/Tagout may be utilized, following the Cal/OSHA regulatory procedure on Group LOTO.)

6.20. Portable Ladders

6.20.1. In situations that require the use of portable ladders, the Contractor must provide ladders that have been inspected, are in good condition, and are appropriate to the tasks involved.

6.20.2. Any portable ladder that is not a free-standing step ladder must be tied, blocked, or otherwise secured to prevent its being displaced.

6.21. Asbestos, Mold, and Lead-Related Work

- 6.21.1. Only Company-approved abatement Contractors may remove or abate asbestos, lead, other metals listed as Proposition 65 chemicals, or mold. The company may allow contractors to perform work that incidentally disturbs lead or other metals in paint within certain guidelines.
 - 6.21.2. Such work requires authorization by an SDG&E Representative before work begins. Lead-containing materials may not be applied or installed without the prior approval of the Company.
 - 6.21.3. No materials containing asbestos may be used for construction or left at SDG&E sites without prior written consent from SDG&E.
 - 6.21.4. The Contractor shall not expose persons at or adjacent to SDG&E-controlled sites to asbestos or any other Proposition 65 listed chemicals without providing prior and adequate written warning of such environmental or occupational exposure.
 - 6.21.5. The Contractor shall ensure proper handling, storage, and documentation of all hazardous materials that it brings onsite, including, but not limited to, primary and secondary chemical labeling, product compatibilities, compliant SDSs, and proper storage. Hazardous materials, wastes, or emissions discovered by the Contractor shall be reported to the SDG&E Representative immediately.
- 6.22. Energized Electrical or Pressure Work
- 6.22.1. When the nature of the task requires that it be done while power/pressure is on, an Energized Electrical Work Permit must be completed and signed before work may begin. The permit must be available at the jobsite.
- 6.23. Excavation Work and Structure Penetrations
- 6.23.1. The Contractor must follow all Applicable H&S Laws, obtain all applicable permits, submit activity notification form to Cal/OSHA if needed, and obtain approval from the SDG&E Representative before performing any of the following activities:
 - Excavation Work
 - Ground Breaking
 - Roof, Ceiling, Floor, or Wall Penetrations
 - Soil Movement
 - Trenching
 - Tunneling
 - Using a Concrete Saw
 - 6.23.2. No excavation work shall be done until the existence and location of unseen or underground pipes, electrical conductors, contaminated soils, etc., have been

determined, DigAlert has been notified, and all laws, rules, and regulations pertaining to DigAlert and California Government Code section 4216 *et seq.* have been followed.

- 6.23.3. If at any time there is evidence of possible cave-in or slides, all work in the excavation shall immediately cease until the necessary safeguards have been taken.
- 6.23.4. All excavations shall be backfilled as soon as practical after work is completed and all associated equipment removed.
- 6.23.5. Excavation within or immediately adjacent to operating facilities shall be approved by the SDG&E Representative before commencing work.
- 6.23.6. When any excavation also constitutes a Confined space or Permit-Required Confined Space, the Contractor must also comply with the applicable provisions of Section 6.11. All excavations over 20 feet must be designed by a registered professional engineer.
- 6.23.7. Access and Egress
 - 6.23.7.1. The Contractor shall ensure that there are safe means of entering and exiting any excavation over 4 feet in depth.
 - 6.23.7.2. All excavations shall have safe access, be properly barricaded, and shall have a flashing light barricade at night.
 - 6.23.7.3. Means of egress, such as a ladder, ramp or stairway, shall be located within 25 feet of workers.
 - 6.23.7.4. Ladders used in excavation shall be secured and shall extend 3 feet above the top of the excavation.
 - 6.23.7.5. Structural ramps used by employees shall be designed by a Competent Person.
 - 6.23.7.6. Structural ramps used for equipment shall be designed by a registered professional engineer.
 - 6.23.7.7. If workers must cross over an open excavation, a safe means of getting across the trench must be provided. Walkways and bridges equipped with standard guardrails and toe boards are required over excavations 4 feet or more in depth and wider than 30 inches.
- 6.23.8. Clearance
 - 6.23.8.1. All equipment shall maintain a minimum distance of 10 feet from

energized overhead power lines rated 50 kV or less, with an additional 0.4 inches of clearance added for every kV over 50.

- 6.23.8.2. All soils shall be stockpiled at least 2 feet back from the edge of the excavation and must be at least 3 feet high when used as a barricade.
- 6.23.8.3. No person shall be permitted in an excavation when any equipment or materials, excluding soil, are located within 6 feet of the edge.

6.23.9. Protective Systems

- 6.23.9.1. All excavations must have a protective system, such as a trench shield, shoring, sloping, or benching, in compliance with applicable regulations unless the excavation is (1) made entirely of stable rock (fissured rock is not stable rock); or (2) less than 5 feet in depth and examination of the ground by a Competent Person provide no indication of a potential cave-in.
- 6.23.9.2. All protective systems must be installed and maintained under the guidance of a Competent Person
- 6.23.9.3. Protective systems shall be installed and removed in a manner that protects workers from cave-ins, structural collapses, or from being struck by members of the support system.
- 6.23.9.4. Protective systems shall be installed in a manner to restrict lateral or other hazardous movement of the support system.
- 6.23.9.5. Protective systems and their components shall not be subjected to loads which they are not designed to withstand.
- 6.23.9.6. The bottom of the protective system shall not be positioned higher than 2 feet above the bottom of the excavation.
- 6.23.9.7. Any excavation left unattended shall be barricaded, fenced, covered with steel plates, or otherwise protected against accidental entry or falls by pedestrians or personnel.

6.23.10. Inspection of Excavations

- 6.23.10.1. The Contractor shall designate a Competent Person to assess the excavation and determine that it is safe for project personnel to enter and work. The excavation shall be inspected as least daily before personnel are permitted to enter an excavation, after any rain event, and after the development of a known or potential hazard condition. If the inspection identifies evidence of a situation that may result in a cave-in, protective

system failure, hazardous atmosphere, or other hazardous condition, exposed workers shall be removed from the hazardous area until the necessary precautions have been taken to ensure safety.

- 6.23.10.2. Testing and appropriate controls shall be used before workers enter an excavation that may have a hazardous atmosphere (e.g., near landfills or underground storage tanks).

6.24. Helicopter and Unmanned Aircraft Systems (UAS) Operations

- 6.24.1. All planned, anticipated, or actual operations involving a helicopter, UAS, or any type of aircraft, must be in compliance with all relevant and applicable federal, state, and local laws and regulations as well as FAA and Cal/OSHA regulations and policies. In addition, any such flight operations must be in compliance with SDG&E's Aviation Operations Manual (AOM). It is the contractual responsibility of the contractor to be familiar and in compliance with all relevant procedures and to ensure compliance with the most current version of the AOM. The most current version may be obtained by contacting the SDG&E Aviation Services Department at aviationservices@semprautilities.com or (619) 752-1264.

- 6.24.2. All helicopter and UAS operations must be coordinated through SDG&E's Aviation Services Department at least two weeks before the planned date of operation (AOM, Section 4.1).

6.25. Mobile Tower Crane Lifts

- 6.25.1. Work that will involve mobile crane lifts must be in compliance with all applicable Cal/OSHA requirements and any other applicable local, state, or federal requirements.

- 6.25.2. Operation of mobile cranes, including portable crane derricks, power shovels, and other heavy lifting equipment must meet all applicable clearances with respect to high voltage overhead lines, including, but not limited to, 8 CCR 2946 and 8 CCR 1908.

6.26. Portable Space Heaters with an Open Flame

- 6.26.1. A Hot Work Permit must be obtained before a space heater may be used. (Note: a fire watch is not required after the heater has been turned off). Heaters shall not be left unattended while in use.

- 6.26.2. Heaters must be Factory Mutual or Underwriters Laboratory (UL) approved, have an auto shut-off mechanism when tipped over, and shall not be used inside buildings, except in high-bay manufacturing/warehouse areas or large construction areas with good ventilation that have access restricted to contractors.

- 6.26.3. Heaters shall be positioned away from all combustible material to reduce the possibility of uncontrolled fire and away from vehicle and pedestrian traffic to prevent them from being overturned and personnel trip and fall incidents.
- 6.27. Powder or Pneumatically Actuated Tools
- 6.27.1. The use of pneumatically driven nailers/staplers (operating at more than 100 psi pressure at the tool), and (gun) powder-actuated tools on SDG&E property must be conducted by trained and qualified personnel.
- 6.27.2. Such tools may only be operated by individuals who have been properly trained and certified on the specific tool being used.
- 6.27.3. These tools shall have a safety device on the muzzle to prevent the tool from operating unless the muzzle is in contact with the surface as the trigger is pulled. Taping up the trigger of these devices to speed up the work will result in an immediate shut-down of the work and removal of the Contractor.
- 6.27.4. When the tool is being used, the Contractor must prevent non-authorized SDG&E employees or other persons from entering the immediate area.
- 6.27.5. When not in use or unattended, all pneumatically driven nailers and staplers shall be disconnected from the air supply at the tool.
- 6.27.6. Powder-actuated tools shall be locked in their required storage containers. Violation of these rules will result in an immediate shut-down of the work and ejection of the contractor.
- 6.28. Pollution Control/Monitoring Equipment Impairment
- 6.28.1. Work that may affect the proper functioning of pollution control devices, equipment, or systems including, but not limited to, the following requires a Pollution Control Systems Impairment Permit:
- Recycling Equipment
 - Waste Storage Systems
 - Waste Handling / Processing Systems
 - Storage Equipment/Systems
 - Wastewater Treatment Equipment/Systems
 - Air Pollution Control/Monitoring Devices (scrubbers, etc.)
- 6.29. Safety-Fire-Security Equipment/System Impairment
- 6.29.1. Work that impairs the function of emergency equipment including, but not limited to, the following requires a Safety-Fire-Security Systems Impairment Permit:

- Deluge Showers,
- Eyewash Fountains,
- Fire Doors,
- Fire Detection and Extinguishing Equipment,
- Self-Contained Breathing Apparatus, and
- Other types of emergency equipment such as toxic gas sensors, oxygen sensors, etc.

6.29.2. Such equipment is not to be moved, relocated, or blocked even temporarily without the required permit.

6.30. Scaffolding

6.30.1. Before commencing scaffold work, the Contractor shall identify their Competent Person in charge of erecting and dismantling all scaffolds. All Contractor employees and subcontractors working on a scaffold shall be appropriately trained. Guardrails, mid-rails, and toe boards must be installed on all open sides of scaffolds more than 6 feet in height.

6.30.2. All scaffold platforms shall have a safe means of access. Access may be provided by ladders specifically made for scaffold access, portable ladders, stair towers, stairway-type ladders, ramps, walkways, integral prefabricated rungs in the frame, or direct access from another structure. Should workers be required to climb over the top rail to access a scaffold, the Contractor shall provide an approved means for the person to remain 100% tied off while climbing.

6.30.3. Scaffold and scaffolds parts shall be inspected by a Competent Person daily, before each work shift, and after any event that may have caused damage. Before using a scaffold, the Contractor Safety Representative shall verify that the scaffold was inspected for that shift. The Contractor shall employ a scaffold tagging system to show any restrictions on the scaffold and the shift inspection information

6.31. Fall Protection

6.31.1. The Contractor is required to provide fall protection, including any personal fall restraint and arrest system, as required by applicable regulations. Fall protection must also be provided when working over dangerous equipment and machinery, regardless of the fall distance.

6.31.2. The Contractor shall ensure that all fall protection systems and applicable fall protection work plans are developed and implemented in accordance with applicable regulations. Where fall protection is required, the Contractor shall ensure:

- 100% tie off

- Selected fall protection systems have been inspected and are appropriate for the work activities to be performed.
- Fall protection systems are properly constructed and installed.
- The Contractor's employees are supervised to ensure work is conducted in accordance with requirements and safe work procedures are observed.
- The Contractor's employees are trained on the proper selection, use, and maintenance of fall protection systems.

6.32. Rigging and Operations

- 6.32.1. All rigging must be conducted in accordance with applicable regulations.
- 6.32.2. The Contractor shall ensure only properly trained and qualified personnel perform rigging operations. Riggers and signal persons must meet qualification requirements.
- 6.32.3. The controlling entity is responsible for ensuring that necessary ground preparations are provided for the crane.
- 6.32.4. Multi-crane lifts must be planned by a qualified engineer.
- 6.32.5. Spotters are required to monitor separation between power lines and equipment.
- 6.32.6. Rigging equipment shall be inspected before use and as necessary throughout the course of the shift. Equipment and materials found to be worn or damaged shall be removed from service immediately.
- 6.32.7. Rigging equipment should be used in accordance with the manufacturer's instructions and should never be used beyond its rated capacity.
- 6.32.8. Loads shall be tag-lined unless the use of the tagline would pose a greater hazard. Only chain type come-a-longs shall be permitted.

6.33. Vehicle and Heavy Equipment

- 6.33.1. All vehicles used in support of Contractor work activities shall be operated safely in accordance with all requirements. This includes heavy equipment, trucks, pick-up trucks, passenger motor vehicles.
- 6.33.2. Every operator must possess a valid license to operate such a vehicle.
- 6.33.3. Seatbelts, or designed operator constraint devices, must be used at all times. The vehicle operator will ensure that all passengers are equipped with an individual and functional seat belt before moving the vehicle.
- 6.33.4. Vehicles should be shut off, placed in park or reverse gear, and the parking brake set

when unattended.

- 6.33.5. All operators shall observe the specific site traffic control rules within the boundaries of the site.
- 6.33.6. All heavy equipment vehicles shall have an audible back-up alarm.
- 6.33.7. All heavy equipment vehicles shall be equipped with a fire extinguisher.
- 6.33.8. Vehicle operators may only operate cellphones and other electronic devices while driving when allowed by California law by using an integrated hands-free system provided it is safe, prudent, and necessary to do so and the cellphone or device is secured in compliance with applicable law.

6.34. Demolition/Blasting

- 6.34.1. No demolition or blasting may take place without prior authorization from SDG&E and the required permits have been obtained.
- 6.34.2. In addition to general hazards posed by construction activities, demolition work, and blasting activities can result in additional hazards due to unknown factors such as modifications to the structure's original design, materials hidden within structural members, and unknown strengths or weaknesses of construction materials. The Contractor shall ensure all personnel involved in demolition/blasting activities are thoroughly trained to identify these hazards and to implement the appropriate safety precautions to take to control the hazards, including protection from falling materials and debris, and shall conduct work in accordance with applicable regulations, before commencing work.
- 6.34.3. Blasting operations shall be conducted during daylight hours.
- 6.34.4. Personnel authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution, including but not limited to warning signals, flags, barricades, or woven wire mats, to ensure the safety of site personnel and the general public.
- 6.34.5. While explosives are being handled or used, smoking shall not be permitted and no one near the explosives shall possess matches, open light, or other fire or flame. No person shall be allowed to handle explosives while under the influence of intoxicating liquors, narcotics, or other dangerous drugs.

6.35. Sanitation

- 6.35.1. The Contractor shall establish and maintain proper sanitation and hygiene standards for all Contractor employees on SDG&E sites.

6.36. Hazard Communication

- 6.36.1. The Contractor shall maintain a written hazard communication program.
- 6.36.2. The Contractor shall ensure that information regarding hazardous materials used during Contractor's work activities is communicated to the Company and the Contractor's employees and subcontractors.
- 6.36.3. For all hazardous materials the Contractor will use onsite, the Contractor must keep safety data sheets (SDSs) onsite or available on demand from electronic databases and make the SDSs available to the Company for review upon request. The Contractor must also provide its employees and subcontractors access to the SDSs.
- 6.36.4. The Contractor must ensure that all containers, including secondary containers, are properly labeled in accordance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).
- 6.36.5. The Contractor is responsible for identifying, labeling, and communicating all chemical hazards at the project site to all affected personnel.
- 6.36.6. The Contractor must ensure that all of its employees are trained and competent to handle the chemicals they use and to protect themselves from any chemical exposure on SDG&E premises. This training must include:
 - Preventing the exposure of hazardous chemicals to anyone in the work area;
 - Preventing the accidental or unauthorized release of any chemicals to the environment; and
 - Enabling trained employees to appropriately respond to any chemical incidents that may arise as a result of their activities on SDG&E's premises.

6.37. Emergency Eyewash and Shower Equipment

- 6.37.1. The Contractor must ensure that emergency eyewash stations, and deluge showers when required, ("EASE") are available as required by 8 CCR 5162 and 5185. "Available" for purposes of this requirement means either that the project site has plumbed EASE that meets the requirements of 8 CCR 5162 or the Contractor must provide EASE that meets the requirements of 8 CCR 5162. At a minimum, the Contractor must ensure that its employees have unobstructed access to the EASE within 10 seconds and that the EASE provides at least 15 minutes of continuous drenching time. The Contractor must ensure that its employees are aware of the location of such equipment and have been properly trained to use this equipment.

6.38. Chemical Storage by Contractors on SDG&E Premises

- 6.38.1. Before storing any chemicals on SDG&E premises, the Contractor must obtain prior

approval from the SDG&E representative.

- 6.38.2. Contractors may only bring on to SDG&E premises the amounts of hazardous chemicals required to complete a specific authorized work task and must not exceed limits for the area as allowed by applicable fire code restrictions or other regulations.
- 6.38.3. The name, location, and amount of chemicals stored must be provided to SDG&E in advance of storage at a SDG&E facility.
- 6.38.4. By the end of each workday, Contractor must properly seal, store, and secure all chemicals at each job location or remove them from the site.
- 6.38.5. Contractor must store its daily-use chemicals and compressed-gas cylinders as follows:
 - Compressed-gas cylinders must be in compliance with DOT hydrostatic testing requirements
 - Incompatible materials must be separated and kept in securely closed containers that will not spill or leak
 - All flammable substances must be stored in FM- or UL- approved flammable storage containers or cabinets with flash arresters
 - Flammable substances must not be placed near potential sources of ignition (sparks, flames, etc.)
 - Bonding and grounding straps must be used whenever flammable liquids are dispensed
 - Chemicals must be located within an appropriate storage area based on the characteristics of the chemical and manufacturers storage recommendations
 - When required by the applicable codes or regulations, Contractors must provide secondary containment for chemicals
 - Compressed-gas cylinders must be secured in an upright position using two non-combustible straps or chains located at 1/3 and 2/3 of the height of the cylinder
 - Valve-protection caps must be in place when compressed-gas cylinders are not in use
 - Cylinder valves must be closed when cylinders are empty or are moved
 - Only gas-specific regulators approved by the supplier for use that are in proper working order may be used
 - Oxygen cylinders shall not be stored near highly combustible material, especially oil and grease

6.39. Hazardous Wastes Generated by Contractor on SDG&E Premises

- 6.39.1. Contractor must comply with all applicable Federal, State, and local laws and regulations regarding the handling, packaging, identification, labeling, and storage of chemical wastes it generates.

- 6.39.2. Only waste-handling vendors approved by SDG&E are allowed to transport and dispose of hazardous chemical wastes generated on SDG&E's premises.
- 6.39.3. When the generation of hazardous waste is anticipated, Contractor must inform SDG&E in advance. Contractor must:
- Provide at least two weeks' prior notice of waste-disposal needs to SDG&E; and
 - Provide appropriate waste characterization information to SDG&E.
- 6.39.4. Hazardous wastes must be: (a) kept within a fence or other secured area and (b) located or staged in such a way that allows for safe and easy access for removal.
- 6.39.5. Disposal of chemical wastes on SDG&E property is strictly prohibited. Drains, sewers, sinks, restrooms, trenches, trash containers, and the ground must never be used for the disposal of hazardous chemicals or hazardous wastes.
- 6.40. Odors and Dust
- 6.40.1. The Contractor must use appropriate controls to minimize dust, odors, fumes, and vapors produced by its activities so as not to create a health hazard, interfere with, or be noticeable by SDG&E personnel or members of the public.
- 6.40.2. No less than five (5) days before use, the Contractor must inform the SDG&E Representative of planned uses of any odor-producing substance (e.g., petroleum or chemical-based building materials, solvents, cleaners, paints, resins, or sealants) and dust or smoke-producing activities that may cause employee or public concerns or discomfort. An action plan must be coordinated with the SDG&E Representatives to prevent employee or public exposure and avoid unplanned interruption of work.
- 6.41. Silica
- 6.41.1. Contractors shall not expose Company employees and others to silica dust emissions and are required to follow all local, state and federal regulations.
- 6.41.2. Silica dusts are commonly present at varying concentrations in concrete and other building materials. Therefore, you are expected to comply with all applicable regulations for protection of workers and the environment before and during the disturbance or removal of silica containing materials.
- 6.42. Controlling Contamination
- 6.42.1. Demolition
- 6.42.1.1. The Contractor must identify and obtain any regulatory permits required for demolition.

6.42.1.2. Before the demolition of all or a portion of a building, the Contractor must ensure that appropriate permits and approvals have been obtained and granted by local authorities, and identify and remove any hazardous materials in the demolition area. Among other things, SDG&E buildings may have asbestos-containing materials, lead-based paints or fluorescent bulbs.

6.42.1.3. Contractor must coordinate demolition activities to minimize disruption to occupants and operations in any locations that could be impacted by the work. Demolition work must be conducted in a manner so as to minimize potential negative impacts.

6.42.2. Discovery of Water-Damaged Materials and Mold during Contractor's Activities

6.42.2.1. The Contractor must immediately suspend work and notify the SDG&E Representative upon discovery of any water-damaged materials and mold contamination.

6.43. Spill Response

6.43.1. The Contractor must provide its employees with PPE, spill response materials, and other equipment and supplies that may be needed to handle hazardous materials and respond to a spill, leak, or exposure onsite. Contractor personnel responding to a spill, leak, or exposure onsite must be properly trained.

6.44. Heat Illness Prevention

6.44.1. A heat illness prevention plan is required when workers are engaged in outdoor operations where the environmental risk factors for heat illness may exist during the work period. The Contractor's Heat Illness Prevention Plan must ensure that all Contractor and subcontractor employees are covered by the plan and the plan includes the following elements:

6.44.1.1. Water must be as close as practicable to the work location.

6.44.1.2. Shade must be available when the temperature reaches 80°F. Enough shade shall be available for all crew members without causing them to make physical contact. Employees shall be able to take a preventive cool-down rest in the shade when they feel the need to do so.

6.44.1.3. The Cal/OSHA "Heat Wave" procedures go into effect on days with a predicted high temperature at or above 80 degrees.

6.44.1.4. The Contractor shall brief workers about heat illness precautions.

- 6.44.1.5. The Contractor shall remind and encourage workers to drink plenty of water, take cool-down breaks and use shade as necessary.
 - 6.44.1.6. The Contractor shall closely watch new-assigned employees for heat illness for the first 14 days.
 - 6.44.1.7. The Contractor supervisor or designee shall closely observe all workers during a heat wave.
 - 6.44.1.8. The Cal/OSHA “High Heat” procedures go into effect at or above 95°F.
 - 6.44.1.9. The Contractor shall conduct pre-shift meetings to review high heat procedures, encourage workers to drink plenty of water, and remind workers of their right to take a cooldown rest in shade and with water when necessary.
 - 6.44.1.10. The Contractor shall ensure effective communication by voice, observation, or electronic means.
 - 6.44.1.11. The Contractor shall observe workers for alertness and signs or symptoms of heat illness using one or more of the following: (1) Supervisor or designee observation of 20 or fewer employees; (2) A ‘buddy system’; (3) Regular communication with sole employee such as by radio or cellular phone; (4) or other effective means of observation.
 - 6.44.1.12. If any signs or symptoms of heat illness are observed, the Contractor shall take immediate action commensurate with the severity of the illness. If signs or symptoms are indicators of severe heat illness, the Contractor must call 911.
- 6.45. Housekeeping
- 6.45.1. The Contractor is responsible for cleanup and removal of its debris, excess material, empty product containers, tools, etc.
 - 6.45.2. All work areas must be kept clean at all times. Waste materials and rubbish must be cleared up as work progresses. Work activities, equipment, tools, and debris must not obstruct emergency exit routes, firefighting equipment, emergency alarm call points, or other emergency facilities.
 - 6.45.3. Combustible scrap and debris must be removed at regular intervals during the course of work activities. The Contractor must provide containers for the collection and separation of waste, trash, oily and used rags, and other refuse. Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, and harmful dusts, must be equipped with covers and labeled. Garbage and other waste must be disposed of at frequent and regular intervals.

6.45.4. Following the completion of work activities, or upon request from SDG&E, the Contractor shall clean the work area(s) to the satisfaction of SDG&E. Should the Contractor fail to do so, SDG&E reserves the right to remove all offending materials and debris and to deduct the cost of this operation from any required payment to the Contractor. SDG&E accepts no responsibility for any materials and tools that may be removed.

6.46. Smoking, Eating, and Drinking

6.46.1. Smoking, eating, and drinking are only permitted in areas designated by the Contractor and approved by the SDG&E Representative. In areas designated for smoking, eating, and drinking, the Contractor shall provide waste receptacles, and the Contractor must keep the designated areas clean and sanitary.

7. INCIDENT REPORTING

7.1. Contractor must immediately report to the SDGEContractorIncidents@sdge.com and **SDG&E Contractor Representative** any project-related incidents, including the following:

- Non-Serious Near Misses
- Serious Near Misses
- **SIF Potential Event**
- Property Damage
- Injuries and illnesses
- Fires
- Hazardous situations
- Spill/Release
- Environmental Incident
- Significant adverse chemical reactions or injuries
- Electric Incident
- Gas Incident
- Stop-the-Job/Stop-the-Task situations
- Agency Involvement

7.2. Contractor is responsible for promptly investigating such incidents involving its employees and Subcontractors and completing the investigation within 10 calendar days. For the type of incidents identified below or when required by notification through an SDG&E Representative, the investigation report must be provided to SDG&E in ISNetworld as part of the Contractor Incident Form (Appendix D) and include photographs from the incident as well as information regarding corrective and preventive measures taken by the Contractor to prevent recurrences. In cases where more time is needed to complete the investigation, a preliminary written investigation report must be submitted within 10 calendar days to the SDG&E Representative followed by a final report within a reasonable time thereafter.

- Serious Near Misses
- **SIF Potential Event**
- Property Damage over \$500.00
- Injuries requiring treatment beyond First Aid
- Fires
- Hazardous situations
- Spill/Release
- Environmental Incident
- Significant adverse chemical reactions or injuries
- Electric Incident
- Gas Incident
- Stop-the-Job/Stop-the-Task situations
- Agency Involvement

- 7.3. Within 10 calendar days of an incident identified in section 7.2, Contractor must complete the Contractor Incident Form (Appendix D) and upload the completed form, along with a copy of its written investigation, if applicable, to ISN.
- 7.4. Contractor must provide incident-related information to SDG&E upon request.
- 7.4.1. Contractor must submit SDG&E-related incident information in the ISN Site Tracker tool monthly, if requested.
- 7.5. SDG&E has the right to initiate its own investigation into any contractor incident on SDG&E property, involving SDG&E facilities, or related to SDG&E projects.

8. PROHIBITED CONDUCT

- 8.1. Discrimination and Harassment
- 8.1.1. Discrimination and harassment of any kind on the basis of race, color, creed, religion, gender, national origin or ancestry, age, marital status, sexual orientation, physical or mental disability, pregnancy, childbirth, medical condition, military status, citizenship, or other basis protected by federal, state, or local laws is strictly forbidden and will not be tolerated by SDG&E. The Contractor's and Subcontractors' employees must not engage in any conduct that may be discriminatory or harassment, including the following:
- Verbal conduct that may be considered offensive or intimidating based on one's gender, race, age, religion, or other protected characteristic. This includes epithets, derogatory jokes or comments, unwanted advances, invitations, or comments.
 - Any non-verbal conduct that may be considered offensive based on one's gender,

race, age, religion, or any other protected characteristic. This includes derogatory and sexually-oriented posters, photography, cartoons, drawings, or gestures.

- Physical conduct that may be considered offensive based on one's gender, race, age, religion, or any other protected characteristic. This includes bullying, assault, unwanted touching, blocking normal movement, or interfering with work activities.
- Unwelcomed sexual advances, requests for sexual favors, other verbal or physical conduct of a sexual or otherwise offensive nature.
- Displaying or distributing suggestive or offensive objects, pictures, comments, jokes, innuendo, or other statements.

8.2. Music Systems

8.2.1. Personal music systems such as iPods, MP3, and CD players, radios, headsets, earphones, and related equipment may impede employees' situational awareness. The use of such equipment by Contractor's employees is prohibited while on the job at SDG&E facilities. "Open air" music systems (radios, stereos, etc.) are not permitted where they may disturb other workers.

8.3. Prohibited Materials

8.3.1. The sale, possession, or use of illegal drugs, firearms, explosives, drug-related paraphernalia for illegal drugs, alcohol, or other controlled substances while on SDG&E property (including company parking lots) or while working for SDG&E is prohibited.

8.3.2. SDG&E reserves the right, without prior notice, to inspect all property brought onto SDG&E property to determine whether prohibited materials are present.

8.4. Photography/Camera Devices

8.4.1. No cameras, photographic equipment, or audio or video recording devices are permitted without SDG&E's prior approval.

ACKNOWLEDGEMENT FORM

By signing below, I acknowledge that I have read and understand this Manual and that my company and its employees and subcontractors will abide by the requirements stated in this document.

Contractor Company Name:	Contractor Representative's Name:
Contractor Representative's Title:	
Signature of Contractor's Representative:	Date Signed:

Contractor must upload a signed copy to ISN before commencing any work and annually thereafter until the contract expires.

APPENDIX A Pre-Qualification Criteria

Criteria	Target	Below Target
3-Year TRIR	Equal to or less than BLS industry average for applicable NAICS code	Greater than BLS industry average for applicable NAICS code
3-Year DART	Equal to or less than BLS industry average for applicable NAICS code	Greater than BLS industry average for applicable NAICS code
EMR	Equal to or less than 1.1	Greater than 1.1
5 -Year Fatality Data	Zero (0) fatalities within the last five (5) years	One (1) or more fatalities within the last five (5) years
5-Year Non-Fatal, Serious Safety Incident Data (e.g., life altering/life threatening, including incidents affecting the public)	Zero (0) non-fatal, serious safety incidents within the last five (5) years	One (1) or more non-fatal, serious safety incidents within the last five (5) years
3-Year OSHA Serious, Willful, or Repeat Citations	Zero (0) serious, willful, or repeat OSHA citations within the last three (3) years	One (1) or more serious, willful, or repeat citations within the last three (3) years
3-Year OSHA Non-Serious Citations	Zero (0) non-serious OSHA citations within the last three (3) years	One (1) or more non-serious citations within the last three (3) years
Written Safety Programs	Company has comprehensive written safety programs that are in compliance with environmental, health, and safety laws and regulations and are specific to the hazards associated with the work to be performed	Company does not have comprehensive written safety programs that are in compliance with environmental, health, and safety laws and regulations and are specific to the hazards associated with the work to be performed
Drug and Alcohol Plan	Company has a comprehensive written drug and alcohol plan that is in compliance with applicable laws and regulations	Company does not have a comprehensive written drug and alcohol plan that is in compliance with applicable laws and regulations
Subcontractor Management Plan	Company has a written plan to monitor subcontractors and hold them accountable for the same requirements as themselves	Company does not have a written plan to monitor subcontractors and hold them accountable for the same requirements as themselves
Employee Disciplinary Action Plan	Company has a written employee disciplinary action plan	Company does not have a written employee disciplinary action plan
Safety Culture Evaluation	Company has a positive safety culture that it is working to advance	Company does not have a positive safety culture that it is working to advance

APPENDIX B

Contractor Pre-Work Safety Meeting Notification and Acknowledgement

Document # _____



Contractor Pre-Work Safety Meeting Notification and Acknowledgement

Section 1 (To be filled out by SDG&E Representative and sent to Contractor in RFP or pre-work)

1.1 SDG&E General Information

Facility / Project Name: _____
 Facility / Project Location: _____
 Length of project _____ (Estimated Days)
 SDG&E Representative: _____
 SDG&E Representative Emergency Contact Info: _____
 SDG&E Field Environmental Representative: _____
 SDG&E Security Representative: _____
 SDG&E Site Manager/Supervisor: _____
 SDG&E Safety Representative: _____
 Other: _____

1.2 Known Existing Site Hazards (Not addressed in the Contractor Safety Manual)

Contractor required to submit a Site Specific Safety Plan prior to work starting

Hazardous Materials - Safety Data Sheets are available for hazardous substances used at the Company's facilities. Contact the SDG&E Representative for assistance and copies of SDS if necessary.

- Proposition 65 chemicals may be present when working on SDG&E facilities.
- Naturally Occurring Radioactive Materials (NORM) may be present in the gas and associated sludge and liquids in the pipelines. The Contractor understands the requirements and guidelines of working with NORM and will comply with all applicable laws and regulations dealing with safety and radiation.
- The Contractor must have prior approval from the Company's Environmental and Safety departments before bringing on site any hazardous substances that might create an exposure to SDG&E employees or an impact to the environment.
- Before the start of a job or project, the Contractor will disclose any and all hazardous materials use to the SDG&E Representative.
- No less than five (5) days before use, the Contractor must inform the SDG&E Representative of planned uses of any odor-producing substances (e.g., petroleum or chemical-based building materials, solvents, or cleaners) and dust or smoke-producing activities that may cause SDG&E employees or members of the public concerns or discomfort. The Contractor must provide a written plan to ensure employee or public exposure and unplanned interruption of work is avoided.
- No less than five (5) days before use, where there is the potential for SDG&E employees to be exposed to hazardous materials used by the Contractor, the Contractor must inform the SDG&E Representative.
- In case the Contractor will be storing hazardous materials at the Company facilities or project locations, the company may inspect that area for proper storage.



APPENDIX B Contractor Pre-Work Safety Meeting Notification and Acknowledgement

Document # _____

Materials Containing Asbestos - No materials containing asbestos shall be used by Contractors for construction, operations, or maintenance or left at SDG&E sites. Contractors are required to obtain authorization from a Company representative before disturbing material that is known, presumed, or suspected to contain asbestos.

If materials at the site are known, presumed, or suspected to contain asbestos, they are listed below (or documentation is attached):

Materials Containing Lead or Other Metals - Any potential lead (Pb) exposure hazards including lead and other metals in surface coating exposure hazards must be identified by the Contractor. All painted surfaces shall be assumed to contain lead and other metals unless shown otherwise by sampling and analysis. If lead or other metals are encountered, the Contractor must inform a Company Representative.

If material at the site are known, presumed, or suspected to contain lead, they are listed below (or documentation is attached):

Lead, as well as other metals including, but not limited to, arsenic, cadmium hexavalent chromium, and mercury, are commonly present in paint at varying concentrations in painted surfaces. Therefore, the Contractor is expected to comply with all applicable regulations for protection of the workers and the environment, including, but not limited to, Cal/OSHA, before and during disturbance or removal of lead or other metal containing paint. Lead, arsenic, cadmium, chromium VI, and mercury are substances known to the State of California to cause cancer /or birth defects and other reproductive harm.

Proposition 65 Chemicals - The Contractor shall not create at the work site an environmental or occupational exposure to Proposition 65 listed chemicals unless the Contractor provides the required Proposition 65 warning to SDG&E and other persons who may be exposed.



APPENDIX B Contractor Pre-Work Safety Meeting Notification and Acknowledgement

Document # _____

Section 2 (To be filled out by the SDG&E Representative and Contractor in a pre-work meeting)

2.1. Contractor General Information

Field Supervisor Name: _____

Field Supervisor Emergency Contact Info: _____

Jobsite Foreman Name: _____

Jobsite Foreman Emergency Contact Info: _____

Safety Representative Name: _____

Safety Representative Emergency Contact Info: _____

Project Work Hours/Days: _____ / _____

2.2. Topics Discussed During Pre-Work Meeting

Job Hazard Analysis (JHA) Stop the Job Authority Project Permit Requirements Project Security Requirements

Site Specific Safety Plan Project Training Requirements/Qualifications Operator Qualification Tasks

SDG&E Safety Orientation Video Reviewed SDG&E Class 1 Manual reviewed by contractor

List not intended to be all inclusive, please include all other topics discussed below.

Site or Business Unit specific procedures

Other

2.3 Emergency Information (Attach Maps if Needed)

Nearest Hospital Name: _____

Nearest Hospital Address: _____

Nearest Hospital Phone Number: _____

For medical emergencies, please call 911. The Contractor understands the proper reporting of fires, hazardous situations, hazardous substance releases, incidents, Cal/OSHA recordable occupational injuries and illnesses, and Near Misses. The Contractor also understands the proper review, reporting, and enforcement of drug and alcohol testing of incidents meeting the post-accident criteria of CFR Title 49, Part 40, Part 199, and Part 382.



APPENDIX B Contractor Pre-Work Safety Meeting Notification and Acknowledgement

Document # _____

2.4 Acknowledgment

By signing below, I acknowledge that the contractor has completed the SDG&E Pre-Work Safety Meeting Notification in its entirety. Additionally, any and all site-specific orientation requirements will be passed on to all contractor employees before allowing to work on-site. (if applicable);

SDG&E Representative Name: _____

SDG&E Representative Signature: _____

Date SDG&E Signed Form: _____

Contractor's Representative Name: _____

Contractor's Representative Signature: _____

Date Contractor signed Form: _____

Distribution: 1) SDG&E Representative fills out section 1 and sends the form to the Contractor in RFP or pre-job. 2) SDG&E Representative and the Contractor complete section 2 in a pre-work meeting. 3) SDG&E Representative sends the completed form to the Contractor before work starts. 4) Contractor uploads the completed form to ISN.



APPENDIX C Corrective Action Requirement

Name of Contractor: _____

All safety concerns must be addressed as soon as feasible. If a serious imminent hazard cannot be immediately corrected, either the work in question must be suspended or personnel must be restricted from entering the hazard zone until the hazard can be eliminated or properly controlled.

Description & Location of Safety Concern	Date Identified	Required Resolution Date	Solution Implemented	Completion Date

Contractor Representative Signature

Date

Contractor Representative Printed Name

Contractor Representative Title

******Contractor must complete this form, return it to the SDG&E Representative within the time specified by the SDG&E Representative, and upload it to ISN.***

APPENDIX D Contractor Incident Form



Contractor Incident Form SDG&E Contractor Safety Program

1. TYPE OF INCIDENT (Check ALL that apply):

- | | | |
|--|--|---|
| <input type="checkbox"/> Injury / Illness | <input type="checkbox"/> Security/Theft | <input type="checkbox"/> Fire |
| <input type="checkbox"/> First Aid * | <input type="checkbox"/> Property Damage | <input type="checkbox"/> Agency Involvement |
| <input type="checkbox"/> Non-Serious Near Miss * | <input type="checkbox"/> Electric Incident | <input type="checkbox"/> Spill/Release |
| <input type="checkbox"/> Serious Near Miss | <input type="checkbox"/> Gas Incident | <input type="checkbox"/> SIF Potential Event |
| <input type="checkbox"/> Vehicle | <input type="checkbox"/> Notice of Violation | <input type="checkbox"/> Other <input type="text"/> |

* Only complete Section 1 & 2

2. GENERAL INFORMATION

SDG&E Project/Asset Name:

Contractor Responsible:

Incident Date: Report Submittal Date:

Incident Time: am pm Date Reported to SDG&E:

Contractor Involvement: Caused By Contributed Involved Witnessed Subcontractor
 Other

Incident Summary:

Incident Location (City, County, State): Closest Cross Street:

Is the incident location the same location as the work location? Yes No

SDG&E Project/Hiring Manager:

APPENDIX D Contractor Incident Form

Contractor Safety Representative (Name and Email):

Which SDG&E Business Unit were you performing working for at the time of the incident? (Choose only one)

- | | |
|---|--|
| <input type="checkbox"/> Construction Management | <input type="checkbox"/> Gas Transmission |
| <input type="checkbox"/> Facilities and Support Services | <input type="checkbox"/> Customer Programs |
| <input type="checkbox"/> Transmission & Substation Operations | <input type="checkbox"/> Electric Generation |
| <input type="checkbox"/> Electric (district work) | <input type="checkbox"/> Gas (district work) |
| <input type="checkbox"/> Emergency Management & Aviation | <input type="checkbox"/> Vegetation Management |
| <input type="checkbox"/> Environmental Services | <input type="checkbox"/> Other: <input type="text"/> |

3. INCIDENT DESCRIPTION:

N/A

How did the incident occur?

Was work stopped as a result of this incident? Yes No

Witnesses (if applicable): Yes No

Name of Witness:

Witness phone number:

Name of Witness:

Witness phone number:

Name of Witness:

Witness phone number:

4. INJURY/ILLNESS INFORMATION: (Beyond on-site first aid)

N/A

How was the employee injured?

Nature of injury: Yes No

Body part(s) injured:

Was medical treatment provided? Yes No

Treatment in emergency room? Yes No

Was party hospitalized overnight? Yes No

Date of first medical care:

Is this an OSHA recordable injury? Yes No

Is this a days away/restricted duty injury: Yes No

If yes to the above, check below **ALL** that apply:

- | | | | |
|---|--|--|---|
| <input type="checkbox"/> Light duty | <input type="checkbox"/> Sprain/Strain | <input type="checkbox"/> Loss of consciousness | <input type="checkbox"/> Received medication |
| <input type="checkbox"/> Surgery | <input type="checkbox"/> Physical therapy | <input type="checkbox"/> Laceration | <input type="checkbox"/> Fracture |
| <input type="checkbox"/> Contusion | <input type="checkbox"/> Inflammation/
Irritation | <input type="checkbox"/> Embedded object
removed from eye | <input type="checkbox"/> Time away from work
after the day of injury |
| <input type="checkbox"/> Repetitive Motion | <input type="checkbox"/> Fatality | <input type="checkbox"/> Other: <input type="text"/> | |
| <input type="checkbox"/> Serious Safety
Incident | | | |

APPENDIX D Contractor Incident Form

This Contractor Incident Form is intended to track incident information and is not intended to take the place of your incident investigation report. Please attach your incident investigation report, along with any related photos and documentation, to this form. Definitions are located in the Class 1 Contractor Safety Manual.

9. SDG&E REVIEW: (To be completed by the SDG&E Representative, Field Construction Advisor, or Project Manager)

Was there an internal investigation initiated? Yes No

If yes, please summarize SDG&E's findings: _____

Is additional corrective action necessary? Yes No

If yes, please explain: _____

When will the additional corrective action(s) be completed? _____

Did the Contractor violate an SDG&E or Contractor policy, procedure, or practice? Yes No

Was the incident preventable? Yes No

SDG&E Representative Name: _____ Title: _____ Date submitted: _____

10. ISN UPLOAD: (It is the SDG&E Project/Hiring Manager's responsibility to ensure the incident form is entered into ISN)

Date entered into ISN: _____ Entered by: _____

ISN Incident number: _____



APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

Arc incident energies that workers may be exposed to during faults have been estimated for SDG&E systems and equipment. In addition, the associated “arc flash boundary” defined as the distance where incident energy would be two calories per square centimeter (2 cal/cm²) also has been estimated. The estimates were determined by engineering analysis using methods identified in the California Code of Regulations Title 8 Subchapter 35 Electrical Safety Orders. Arc energies are provided as shown below:

Generation & Battery Storage Sites	Refer to each site’s arc energy analysis report
Transmission	Table 1.
Substation – Station Service, Buses & Switchgear	Table 2. A.
Substation – Exception Switchgear	Table 2. B.
Substation – Station Batteries	Table 2. C.
Distribution	Table 3.
Metering - Residential, CT Rated & Self-Contained Type 16S Meter Sockets	Table 4. A.
Metering - 480 Volt Equipment Fed from Overhead Transformers	Table 4. B.
Metering - 480 Volt Equipment Fed from Underground Transformers	Table 4. C.
Metering - 480 Volt Equipment Fed from Subsurface/Other Transformers	Table 4. D.
Building/Plant Electric Service after Meter	Table 5.

APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

Table 1. Transmission

Nominal Voltage AC	Equipment Type	Incident Energy Maximum (cal/cm ²)	Arc Flash Boundary (feet)
69 kV	Overhead - Open air	7 (at 3'4")	5
138 kV	Overhead - Open air	7 (at 3'7")	5
230 kV	Overhead - Open air	8 (at 5'3")	9
500 kV	Overhead - Open air	3 (at 11'3")	13

**Table 2.A. Substation
Station Service, Buses & Switchgear**

Nominal Voltage	Equipment Type	Incident Energy Maximum (cal/cm ²)	Arc Flash Boundary (feet)
Up to 240V	Station Service equipment	4 (at 1'6")	3
277/480V	Enclosed Station Service without labels after first circuit breaker or fuse	5 (at 1'6")	4
277/480V	Enclosed Station Service without labels before first circuit breaker or fuse	108 (at 1'6")	20
Up to 15 kV	Overhead - Open Air	3 (at 2'2")	2
Up to 15 kV	All switchgear except buses listed in Table 2.B.	25 (at 4')	50

APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

**Table 2.B. Substation
Exception Switchgear**

Nominal Voltage	Substation	Position	Incident Energy Maximum (cal/cm ²)	Incident Energy Maximum (cal/cm ²)	Arc Flash Boundary (feet)
Up to 15 kV	Felicita	Bus 12 kV N	30 (at 4')	25 (at 5'5")	19
Up to 15 kV	Laguna Niguel	Bus 12 kV W	32 (at 4')	25 (at 5'6")	20
Up to 15 kV	Sampson	Bus 12 kV SEC 30, 31, 32, 33	46 (at 4')	25 (at 6'9")	24
Up to 15 kV	Station B	Bus 12 kV NE, NW, SE, SW	31 (at 4')	25 (at 5'5")	20

APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

**Table 2.C. Substation
Station Batteries**

Cell Type	Nominal Capacity (amp-hours)	Resistance (milliohms)	Instant. Fault Current (amps)	Open Air		Enclosed	
				Incident Energy at 18" (cal/cm ²)	Arc Flash Boundary (feet)	Incident Energy at 18" (cal/cm ²)	Arc Flash Boundary (feet)
EC-5M	215	0.875	2290	1.3	2	3.9	3
EC-7M	290	0.593	3370	1.9	2	5.8	3
EC-9M	365	0.453	4420	2.5	2	7.6	3
EC-11M	470	0.356	5620	3.2	2	9.7	4
EC-13M	525	0.310	6450	3.7	3	11.1	4
EC-15M	620	0.266	7530	4.3	3	13.0	4
EC-17M	670	0.226	8840	5.1	3	15.2	5
EC-19M	795	0.219	9140	5.2	3	15.7	5
EC-21M	850	0.205	9760	5.6	3	16.8	5

APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

Table 3. Distribution

Nominal Voltage AC	Equipment Type	Incident Energy Maximum (cal/cm ²)	Arc-Flash Boundary (feet)
OVERHEAD			
50 V to 600 V	Open Air	4 (at 1'3")	3
>600 V to 15 kV	Open air <u>All circuits (except 48, 258)</u> Rubber glove method	8 (at 1'3")	2.5'
	Open air <u>Exception circuits 48, 258</u> Using live line tool method	8 (at 2'2")	4'
	----- Using Rubber glove method	----- 12.2 (at 1'3")	
UNDERGROUND			
50 V to 600 V	Transformer secondary compartment, termination	4 (at 1'6")	3
>600 V to 15 kV	Live-front protected by fuses	4 (at 4')	6'
	Dead-front protected by fuses	2 (at 3')	3'
	600 A system enclosed <u>Not protected by fuses</u> Live-front	25 (at 4')	16'
	600 A system enclosed <u>Not protected by fuses</u> Dead-front and Dead-break	8 (at 4')	8'

APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

Table 4.A. Metering
Residential, CT Rated & Self-Contained Meter Sockets

Nominal Voltage AC	Equipment Type	Incident Energy maximum (cal/cm ²)	Arc Flash Boundary (feet)
50V – 250V	Residential Meter Sockets	4	3
480	Current Transformer (CT) Rated Meter Sockets	4	5
480	Self-contained Meter Sockets Form 2S, 12S & 16S	20	8
480	Other Enclosed Equipment: e.g. Bypass Meter Sockets, CT Cabinets, Customer Switchgear	See charts in Appendices 4.B., C. and D.	

APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

Table 4.B. Metering
480 Volt Equipment Fed from Overhead Transformers

Nominal Voltage	Transformer Rating	Fuse Size	Fuse Catalog #	Incident Energy Maximum (cal/cm ²)			Arc Flash Boundary
				at 18"	at 24"	at 36"	
12 kV	25 KVA	5 A	Kerney 124080	2.9	1.8	0.9	2.5'
12 kV	50 KVA	8 A	Kerney 124080	5.1	3.2	1.6	3'
12 kV	75 KVA	12 A	Kerney 124080	8.2	5.1	2.7	3.5'
12 kV	100 KVA	15 A	Kerney 124080	10.4	6.5	3.3	4.3'
12 kV	167 KVA	25 A	Kerney 124080	29.7	18.5	9.6	8'
12.47 kV	25 KVA	5 A	Kerney 124080	2.9	1.8	0.9	2.5'
12.47 kV	50 KVA	8 A	Kerney 124080	5.1	3.2	1.6	3'

APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

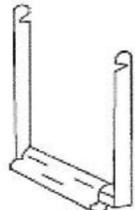
Table 4.C. Metering

480 Volt Secondary Fed from Underground Transformers

LIVE FRONT TRANSFORMER FUSING TABLE TYPE "NX" FUSE UNITS				Incident Energy (cal/cm ²)			Arc Flash Boundary
TRANSFORMER RATING KVA	FUSE SIZE—AMPS			at 18"	at 24"	at 36"	
	SINGLE	PHASE	THREE PHASE				
	6.9KV	12KV	12KV				
15	8	8	—	NA not 480V secondary			
25	8		—	NA not 480V secondary			
30	—		8	4.3 2.7 1.4			2.5'
37.5	10		—	NA not 480V secondary			
45	—	8	4.3 2.7 1.4			2.5'	
50	12	—	NA not 480V secondary				
75	18	10	8	9.0	5.6	2.9	4'
100	25	12	—	NA not 480V secondary			
112.5	—	—	12	9.0	5.6	2.9	4'
150	—	—	12	14.2	8.9	4.6	5.5'
167	30	20	—	NA not 480V secondary			
225	—	—	18	29.2	18.2	9.4	8'
250	—	30	—	NA not 480V secondary			
300	—	—	25	42.9	26.8	13.8	10'
333	—	30	—	NA not 480V secondary			
500	—	—	40	81.0	50.5	26.1	15'
750	—	—	2-25	90.7	56.6	29.2	16'
1000	—	—	2-30	118.3	73.9	38.1	20'

LIVE FRONT TRANSFORMER FUSING TABLE THREE-PHASE, 12KV TYPE SM-4 RATED 14.4KV		Incident Energy cal/cm ²			Arc Flash Boundary
TRANSFORMER RATING—KVA	FUSE SIZE AMPS	at 18"	at 24"	at 36"	
1500	125	95.6	59.7	30.8	16'
2000	150	140.6	87.8	45.3	20'
2500, 3000	200	191.9	119.8	61.8	25'

D & W (G.E.) CUTOUT FUSES FOR 4KV-WS, WSV, WUS TRANSFORMER		Incident Energy cal/cm ²			Arc Flash Boundary
TRANSFORMER RATING KVA	FUSE SIZE (AMPS)	at 18"	at 24"	at 36"	
5	6	3.2	2.0	1.0	2.5'
7.5	6	3.2	2.0	1.0	2.5'
10	10	4.7	3.0	1.5	3'
15	10	4.7	3.0	1.5	3'
25	15	6.7	4.2	2.2	3.5'
30	20	10.0	6.2	3.2	4.5'
37.5	25	14.9	9.3	4.8	5.5'
50	30	20.3	12.7	6.5	6.5'
75	50	36.0	22.5	11.6	9'
100	75	72.5	45.2	23.3	15'
167	100	78.5	49.0	25.3	15'



FUSE

APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

Table 4.D. Metering

480 Volt Secondary Fed from Subsurface/Other Transformers

REPLACEMENT FUSE FOR SUBSURFACE TRANSFORMER (HSS) (HTS) (CURRENT LIMITING)				Incident Energy cal/cm ²			Arc Flash Boundary
TRANSFORMER RATING KVA	AMPS	FUSE RATING KVA	STOCK NO. OR CONSTR. STD.	at 18"	at 24"	at 36"	
25	6	15.5	S365682	NA not 480V secondary			
50	10		S365686	NA not 480V secondary			
75	12		S365690	NA not 480V secondary			
100	15		S365712	NA not 480V secondary			

REPLACEMENT FUSE FOR BAY-O-NET							Incident Energy cal/cm ²			Arc Flash Boundary
TRANSFORMER KV	KVA	KEARNY	AMPS	CPS	AMPS	STOCK NUMBER	at 18"	at 24"	at 36"	
2.4 1ph	25	124080-15	15	4038108C07	15	S363534	NA not 480V secondary			
	50	124080-30	30	-	-	S363538	NA not 480V secondary			
	75	-	-	4038108C12	50	S366150	NA not 480V secondary			
4.16 3ph	75	124080-15	15	4038108C07	15	S363534	3.3	2.1	1.1	2.5'
	150	124080-30	30	-	-	S363538	10.6	6.6	3.4	4.5'
	225	-	-	4000353C12	40	S363540	11.4	7.1	3.7	4.5'
	500	-	-	4000353C16	100	S363546	21.2	13.2	6.8	6.5'
6.9 1ph (A)	25	124080-6	6	4038108C04	6	S363530	NA not 480V secondary			
	50	124080-12	12	4038108C06	12	S363532	NA not 480V secondary			
	75	124080-15	15	4038108C07	15	S363534	NA not 480V secondary			
	100	124080-25	25	4038108C09	25	S363536	NA not 480V secondary			
12.0	25	124080-5	5	4038108C03	5	S363528	2.9	1.8	0.9	2.5'
	45 3ph	124080-5	5	4038108C03	5	S363528	4.5	2.8	1.4	2.5'
	50	124080-8	8	4038108C05	8	S366138	4.5	2.8	1.4	2.5'
	75 1 ph	124080-12	12	4038108C06	12	S363532	NA not 480V secondary			
	75 3 ph	124080-6	6	4038108C04	6	S363530	5.1	3.2	1.6	3'
	100 1ph	124080-15	15	4038108C07	15	S363534	NA not 480V secondary			
	167 1ph	124080-12	12	4038108C09	25	S363536	NA not 480V secondary			
	225	124080-15	15	4038108C07	15	S363534	20.3	12.7	6.5	6.5'
	250 1ph	-	-	4000353C12	40	S363540	NA not 480V secondary			
	300	124080-25	25	4038108C09	25	S363536	40.6	25.3	13.1	10'
	500	124080-30	30	4000353C12	40	S363540	48.7	30.4	15.7	10.5'
	750	-	-	4000353C14	65	S363542	66.5	41.5	21.4	13'
	1000	-	-	4000353C14	65	S363542	66.5	41.5	21.4	13'
	1500	-	-	4038361C04CB	100	S366140	121.7	76.0	39.2	20'
2000	-	-	4038361C05CB	125	S366142	166.1	103.7	53.5	25'	
2500	-	-	4038361C05CB	125	S366142	166.1	103.7	53.5	25'	
ALL	SLUG	-	-	-	-	-	-	-	-	

CLT FUSES FOR WESTINGHOUSE (YP) TRANSFORMERS (FOR REFUSING ONLY)				Incident Energy cal/cm ²			Arc Flash Boundary
TRANSFORMER RATING-KVA	FUSE SIZE AMPS	CATALOG NO.	STOCK NO. OR CONSTR. STD.	at 18"	at 24"	at 36"	
15	5	678C248G03	S366848	4.5	2.8	1.5	2.5'
25	5	678C248G03	S366848	4.5	2.8	1.5	2.5'
37.5	8	678C248G06	S366912	7.1	4.4	2.3	3.5'
50	12	591C273G03	S366624	20.3	12.7	6.5	6.5'
75	18	678C276G03	S366688	31.4	19.6	10.1	8'
100	25	678C276G06	S366752	42.9	26.8	13.8	10'
167	30	680C386G01	S366800	42.9	26.8	13.8	10'

APPENDIX E

Electric Arc Incident Energies and Arc Flash Boundaries for SDG&E Utility Systems/Equipment and Buildings

Table 5. Building/Plant Electric Service after Meter

Nominal Voltage AC	Equipment Type	Incident Energy maximum (cal/cm ²)	Arc Flash Boundary max. (feet)
Up to 240 V ¹	All equipment	4	5
277/480V	Enclosed equipment without arc hazard labels after first circuit breaker or fuse	5	4
277/480V	Enclosed equipment without arc hazard labels before first circuit breaker or fuse	108	20

Note 1: No Arc Flash Boundary is specified for 120 V, single-phase office equipment (e.g. light switches, wall outlets, light fixtures, associated circuit breakers).

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