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FIGURE

Figure 8.7-1 Fire Protection and Emergency Response Equipment

8.7 WORKER SAFETY AND HEALTH

This section describes the injury and illness prevention programs that will be established and implemented during construction, operation, and maintenance of the proposed CGS. The purpose of these programs is to protect human health and capital resources, and minimize the potential for workplace injuries and illnesses at the facility. The development and implementation of these programs will also ensure compliance with applicable laws, ordinances, regulations and standards (LORS), as established by the California Occupational Safety and Health Administration (Cal/OSHA), California Health and Safety Code, and the Uniform Fire Code (UFC).

The following sections provide a description of the workplace and the anticipated workplace hazards, define the crucial safety programs and related safety training programs, present the applicable LORS, and identify local safety agency contacts and permit requirements.

8.7.1 Workplace Description

The CGS includes the construction, operation, and maintenance of a combined cycle, natural gas-fired power generation facility and ancillary support structures on a 100-acre site located approximately 4 miles west of Interstate 5 in Colusa County, California. E&L Westcoast would construct and commission the power plant. E&L Westcoast would then transfer ownership and operation of the plant to PG&E after completion of commissioning. The CGS will consist of the following primary components:

- Two natural gas–fired combustion turbine generators (CTGs);
- One steam turbine generator;
- Two supplemental fired heat recovery steam generators (HRSGs);
- One air cooled condensor unit;
- Switchyard;
- Step-up transformers;
- Ancillary support facilities (including natural gas and water supply pipelines, an electric transmission line; and
- Replacement of two bridges.

The identified structures and buildings will occupy approximately 31 acres within the 100-acre site. The interconnection between CGS and the PG&E power grid will occur through a loop from PG&E's existing 230 kV transmission lines, which run in a north-south direction approximately 1,800 feet east of the project site. Water to the CGS will be supplied by the Tehama-Colusa Canal via a 2,700-foot pipeline. A 1,500-foot gas pipeline will be installed to connect the power plant to PG&E's existing natural gas lines east of the site. Figure 3.3-1 depicts the overall site arrangement. Figures 8.7-1 and 8.12-1 show the locations of fire protection systems and emergency equipment and the locations of hazardous and toxic materials used at the plant, respectively.

8.7.2 Occupational Safety and Health

Construction, operation, and maintenance activities associated with the CGS may expose workers to physical and chemical hazards. Potential worker exposure to these hazards will be minimized through adherence to appropriate engineering design criteria, implementation of appropriate administrative procedures, use of personal protective equipment, and compliance with applicable health and safety LORS.

Potential hazards that workers may be exposed to while working on CGS are presented in Table 8.7-1. Formal health and safety procedures and programs will be established and implemented for construction and operations to control the various hazards and provide for a safe workplace.

The site-specific injury and illness prevention programs and safety training programs, which are intended to protect worker health and safety during construction, operation, and maintenance of the proposed project, are described in the following sections.

8.7.3 Injury and Illness Prevention Programs

Prior to beginning construction activities, E&L Westcoast, will develop a site-specific construction injury and illness prevention program. At a minimum, this program will be consistent with the requirements established in PG&E's Power Generation-Operations Safety and Health Policy and Procedures Manual. Once the construction of the proposed project is complete, and project operation is under the control of PG&E, PG&E will implement a site-specific injury and illness prevention program for operations and maintenance activities, consistent with their existing Safety and Health Policies and Procedures and injury and illness prevention programs at their other power generation facilities.

8.7.3.1 Construction Injury and Illness Prevention Programs

Consistent with Cal/OSHA's policy on multi-employer work sites, each employer will be responsible for the health and safety of their own employees. Periodic health and safety audits will be conducted by CGS to verify contractor and subcontractor compliance with contractual health and safety obligations.

Construction Safety Program. The overall written construction safety program will include provisions to ensure compliance with Cal/OSHA's Injury and Illness Prevention Program (IIPP) requirements (California Code of Regulations [CCR] Title 8, Section 1509) and will include:

- A written Code of Safe Practices that relates to construction operations;
- Identification of the person or persons responsible for implementing the construction safety program;
- Posting of the Code of Safe Practices at a conspicuous location at the job site office, and providing it to each supervisor who shall have it readily available;
- A description of the system for identifying workplace hazards, including work place inspections, job hazard analysis, and written hazard assessments;
- Periodic meetings with employee representatives, supervisors, and management to discuss safety issues, including compliance assessments, accidents, injuries, and new or modified health and safety procedures;
- A system for ensuring employee and subcontractor compliance;
- Routine "tool box" or "tailgate" safety meetings conducted with employees and supervisors;
- A system for promoting employees' feedback and suggestions for improving workplace safety;
- Procedures for promptly correcting unsafe conditions; and
- Identification of safety training and experience requirements for specific work activities.

Construction Personal Protective Equipment Program. Contractor employees will use personal protective equipment (PPE) during construction as specified in the construction PPE program. Required

PPE shall be identified through hazard assessment and general industry standards. The specific PPE ensemble required for each job task will be specified in the job hazard analysis (JHA) for that task. The use of PPE for site activities includes, but is not limited to, the items described in Table 8.7-2. All PPE worn on site will comply with Cal/OSHA and American National Standards Institute (ANSI) requirements. Respiratory protection will be included in the PPE program. Employees will not be required to wear respiratory protection, or to work in areas requiring respiratory protection until they have received a medical evaluation, respirator fit-testing, and training on the proper use, limitations, and care of respirators.

Construction Exposure Monitoring Program. An exposure monitoring program will be developed to evaluate potential employee exposures to hazardous/toxic materials. Potential exposures will be identified during the task-specific JHAs. Air monitoring may be conducted if necessary to evaluate the potential for employee exposures to the contaminants of concern. Airborne exposures will be controlled through the implementation of engineering controls, administrative controls, or PPE. Air monitoring will also be required in support of other safety programs, including confined space entry, hot work permits, and emergency response. Sound-level monitoring will also be performed as necessary during the construction phase, and initially during new facility operation to evaluate potential employee noise exposures.

Construction Emergency Action Plan. An emergency action plan (EAP) will be developed specifically for the construction phase of the proposed project. The EAP will designate responsibilities and actions to be taken in the event of an emergency at the site. All employees working at the site will be trained on the contents of the program. The EAP will include:

- Emergency roles and responsibilities;
- Emergency notification procedures; and
- Egress routes and mustering points.

Construction Written Safety Programs. Additional written safety programs that will be established for the construction phase include, but are not limited to:

- Hazard communication program;
- Confined space program;
- Control of hazardous energy program (Lock Out/Tag Out);
- Hearing conservation program;
- Respiratory protection program;
- Blood-borne pathogens control program;
- Injury and accident reporting and investigation program;
- Ergonomics program;
- Emergency response program, including first aid and medical services;
- Smoking policy;
- General housekeeping, material handling, and storage procedures;
- Vehicle and traffic procedures;
- Elevated work procedures;
- Heavy equipment procedures;
- Hot work procedures;
- Crane and hoist procedures;
- Compressed gas and air handling procedures;
- Subcontractor safety programs;
- Equipment inspection programs;
- Supervisor safety and health orientations;

- Excavation and trenching program; and
- Hazard Identification Team and Safety Marshal program.

8.7.3.2 Operations and Maintenance Injury and Illness Prevention Programs

Upon startup of proposed project and implementation of routine operations, the construction injury and illness prevention programs will transition into an operations-oriented program. The program will reflect the potential hazards and resulting controls necessary to implement during routine operations and maintenance of CGS. PG&E will utilize existing injury and illness prevention programs that are established at similar power generation facilities that PG&E operates as templates for the CGS site-specific program. The CGS program will reflect any unique hazards specifically associated with maintenance and operation of this facility.

Program outlines for the operations safety programs that will be implemented are provided below. These include: Injury and Illness Prevention Plan, Fire Protection and Prevention Plan, Emergency Action Plan, Hazardous Material Management Program, and PPE Program.

Injury and Illness Prevention Plan. The primary mitigation measures for worker hazards during normal plant operation and maintenance are contained in the IIPP, as required by 8 CCR, Section 3203. The written IIPP designates an individual who is responsible for implementing the program. It also describes safety training and procedures for tracking safety training. JHAs identify safety hazards related to work tasks and establish procedures for avoiding, correcting, reporting, and notifying employees of these hazards.

The IIPP contains the following information and procedures:

- Identity of the person(s) with authority and responsibility for implementing the program;
- A system for ensuring that employees comply with safe and healthy work practices;
- A system for facilitating employer–employee communications regarding safety;
- Procedures for identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- An employee training program that includes:
  - introducing the program;
  - training of new, transferred, or promoted employees;
  - training on new processes and equipment;
  - supervisors training; and
  - evaluation of contractor training.
- Methods of documenting inspections and training, and for maintaining appropriate records.

Emergency Action Plan. In addition to the incorporation of various safety and environmental features and design measures to minimize emergencies and their effects on public and worker safety, the CGS will have a site-specific Emergency Action Plan. The outline for the CGS Emergency Action Plan is provided in Table 8.7-3. The Emergency Action Plan will address potential emergencies, including chemical releases, fires, bomb threats, pressure vessel ruptures, aqueous ammonia releases, and other catastrophic events. It describes evacuation routes, alarm systems, points of contact, assembly areas, responsibilities, and other actions to be taken in the event of an emergency. The plan includes a layout map, a fire extinguisher list, and a description of arrangements with local emergency response agencies for responding to emergencies.

Hazardous Materials Management Program. As described in Section 8.12, several chemicals will be stored and used during operation of the CGS. The storage and handling of chemicals will follow applicable LORS to minimize risk to workers and the surrounding community. Chemicals will be identified and stored in appropriate chemical storage facilities. Bulk chemicals will be stored in aboveground storage tanks; other chemicals will be stored in their delivery containers. Chemical storage and chemical feed areas will be surrounded by temporary or permanent containment or curbing to contain leaks and spills. The containment areas will be sized to hold an appropriate volume (considering the potential for the local hazard contingencies) as designated by a California registered Professional Engineer.

Safety showers and eyewash stations will be provided in or adjacent to chemical storage and use areas in accordance with 8 CCR requirements (within 50 feet, or 10 seconds of travel time). Standard PPE for use during chemical handling activities will be provided. Standard PPE will be readily available for use during minor chemical spill containment and cleanup activities by plant personnel. Adequate supplies of absorbent material will also be available on the site for minor spill cleanup. The Emergency Action Plan will include procedures for responding to a hazardous materials spill.

Personal Protective Equipment Program. PPE requirements for work at CGS will be identified during the job hazard analyses process. The PPE requirements will be developed and incorporated into the site-specific injury and illness prevention program. The PPE program will include the following:

- Hazard analysis and prescription of PPE;
- Personal protective devices;
- Head protection;
- Eye and face protection;
- Body protection;
- Hand protection;
- Foot protection;
- Hearing protection;
- Safety belts and life lines;
- Protection for electric shock; and
- Respiratory protective equipment.

Operations and Maintenance Written Safety Program. Additional written safety programs will be developed and implemented as necessary to address hazards that are identified as being associated with operation and maintenance of CGS. These programs will be made components of the overall operations and maintenance injury and illness prevention program for the CGS facility. These programs include, but are not limited to, the following:

- Blood-Borne Pathogens Control Program;
- Hazard Communication Program;
- Hearing Conservation Program
- Hazardous Energy Control Program;
- Confined Space Entry Program;
- Respiratory Protection Program;
- Ergonomics Program;
- General Facility Safety Procedures:
  - Compressed Gas Safety Procedures;
  - Heavy Equipment Safety Procedures;
  - Hand Tools and Equipment Guarding Procedures;
  - Hoist and Rigging Safety Procedures;

  - Heat Illness Prevention Procedures;
  - Slips, Trips, and Falls Prevention Procedures; and
  - Hot Work Safety Procedures;
- Fall Protection Program;
- Contractor Safety Program; and
- Risk Management Plan (RMP).

8.7.4 Safety Training Programs

To ensure that employees recognize and understand how to protect themselves from hazards that exist at the CGS, comprehensive training programs for construction and operations personnel will be implemented. The following sections provide an overview of the training programs that will be required for workers at CGS.

8.7.4.1 Construction Safety Training Program

Workers participating in the construction phase of the proposed project will participate in applicable training programs designed to protect themselves and others from injuries while working at the site. All construction personnel will be required to attend a basic site safety orientation training course. Additional training will be provided to each individual based specifically on their job responsibilities or craft for those requirements where previous satisfactory training cannot be documented. All training courses will be documented and attendance records will be maintained at a centralized location. Table 8.7-4 provides an overview of the training programs that will be available to construction personnel.

8.7.4.2 Operation and Maintenance Safety Training Programs

Operations and maintenance employees assigned to the proposed project will be given instructions regarding their responsibility for the safe conduct of their work. These instructions will be given at the time the employee is first hired and as an ongoing training program of hazard recognition and avoidance. Employees will also be instructed in the safety procedures pertinent to their employment tasks. Safe working conditions, work practices, and protective equipment requirements will be communicated in the following manner:

- A new or transferred employee will receive safety training orientation;
- Safety meetings will be held with employees;
- "Toolbox/tailboard" safety meetings will be conducted periodically for each crew. General safety topics and specific hazards that may be encountered will be discussed. Comments and suggestions from all employees will be encouraged;
- Hazard communication training, including California Proposition 65 warnings and discharge prohibitions, will be conducted as necessary when new hazardous materials are introduced to the workplace;
- Material safety data sheets will be available as required for all appropriate chemicals;
- A bulletin board with required postings and other information will be maintained at the plant site; and
- Warning signs (e.g., hazardous waste storage area, confined space area) will be posted in hazardous areas that comply with applicable regulations (i.e., bilingual, font size).

Safety training will be provided to each new employee as described below:

- A list of safe work rules for the CGS facility will be explained to each new employee;
- A copy of the applicable Safe Work Practices will be given to each new employee. The provisions will be incorporated into training for the qualifications programs so that employees may fully understand what the protective provisions mean;
- The Hazard Communication Program and requirements for personal protection for the types of hazards that may be encountered at the CGS facility site will be explained and documented;
- Unusual hazards that are found on site will be explained in detail to each new employee, including any specific requirements for personal protection; and
- Safety requirements for the new employee's specific job assignment will be explained by the supervisor upon initial assignment and upon any reassignment.

Table 8.7-5 provides an overview of the training programs that will be available to operations and maintenance personnel.

Contractors. An element of the Operations and Maintenance Safety Training Program includes addressing compliance with contractor safety while on site. Contractors will be provided with a list of potential job safety hazards for their assigned activity by a supervisor, including safety rules, chemical exposure hazards, physical hazards, and personal protection equipment. Contractors will also be invited to attend "tailgate" safety meetings.

8.7.5 Fire Protection

The fire suppression and protection procedures as they pertain to construction and operation of the proposed project are presented in Section 8.7.5.1. Section 8.7.5.2 presents a detailed description of fire protection systems that will be installed at CGS.

8.7.5.1 Construction Fire Suppression and Prevention

Onsite Construction Fire Suppression and Prevention. The CGS Project will rely on both onsite fire protection systems and local fire protection services. The contractor will develop a Fire Protection and Prevention Plan to be followed throughout all phases of construction and will provide the specified fire-fighting equipment. The Fire Protection and Prevention Plan will address each of the following requirements:

- General requirements;
- Responsibilities;
- Housekeeping;
- Employee alarm/communication system;
- Portable fire extinguishers;
- Fixed fire fighting equipment;
- Fire control;
- Perimeter fire buffer maintenance;
- Fire control procedures in remote locations;
- Flammable and combustible liquid storage;
- Use and handling of flammable and combustible liquids;

- Dispensing and disposal of flammable and combustible liquids;
- Servicing and refueling areas; and
- Training.

During construction, portions of the facility fire suppression system will be placed in service as soon as practicable to provide early fire protection. The fire protection systems for the facility are described in Section 3.4.10. Construction fire prevention procedures will be developed in accordance with applicable regulations (8 CCR, Section 1620 et seq.) and will be followed as necessary to prevent construction-related fires. Special emphasis will be given to operations involving open flames, such as welding, metal cutting, and brazing. Hot work permits will be required for specific activities that present the potential for fire and personnel involved in such operations will receive appropriate training by the contractor. In addition, a fire watch, utilizing the appropriate class of extinguishers or other equipment, will be maintained during hot work operations. Site personnel will not be expected to fight fires past the incipient stage.

Materials brought on site by contractors must conform to contract requirements, insofar as flame resistance or fireproof characteristics are concerned. Specific materials in this category include fuels, paints, solvents, plastic materials, lumber, paper, boxes, and crating materials. Specific attention will be given to compressed gases and storage of fuels, solvents, and paint.

Elements of the onsite fire suppression system during construction will consist of portable and fixed fire-fighting equipment. Portable fire fighting equipment will consist of fire extinguishers and small hose lines in conformance with Cal/OSHA and the National Fire Protection Association (NFPA). Periodic fire prevention inspections will be conducted by the contractor's safety representative.

Fire extinguishers will be inspected monthly and replaced immediately if defective or in need of recharge. All fire-fighting equipment will be located to allow for unobstructed access to the equipment and will be conspicuously marked. A temporary or permanent water supply, of sufficient volume, duration, and pressure to operate the required fire-fighting equipment, will be provided. Combustible materials will be controlled in covered roll-off dumpsters. Designated, approved flammable materials storage areas and flammable materials storage containers will be provided with adequate fire prevention systems.

A detailed inspection of the work area will be conducted prior to beginning work to determine whether potential fire hazards exist. The inspection will look for tall grasses (greater than 12 inches) in vehicle parking and work areas. Tall grasses will be mowed or flattened and sprayed with water to at least 35 feet away from work and parking areas prior to beginning work. Employees will be instructed on the potential for fire danger and emergency response procedures. Fire hazards will be included as a part of the daily safety meetings.

Offsite Construction Fire Suppression Support. The CGS onsite fire suppression system will be supported by the Maxwell Fire Protection District (MFPD). The MFPD will provide backup assistance and support to CGS in the event of a construction-related fire. The nearest fire station is located in Maxwell, approximately 7.5 miles from the facility. Response time is estimated to be approximately 15 to 20 minutes. The local fire response units will be provided information regarding the type and location of potential fire hazards at the site. This information will be included in emergency response planning.

8.7.5.2 Operations Fire Suppression and Prevention

Fire protection at the proposed project will include measures relating to safeguarding human life, preventing personnel injury, preserving property, and minimizing down time due to fire or explosion (National Safety Council, 1992). It will principally involve physical arrangements, such as sprinkler

systems, water supplies, and fire extinguishers. Fire protection measures will include measures to prevent the inception of fires. Of concern are adequate exits, fire-safe construction, reduction of ignition sources, and control of fuel sources.

The CGS facility is the fire protection responsibility of the MFPD. As such, fire suppression systems will be subject to review and approval by the MFPD, which will have final approval responsibility. In addition, facilities will be designed by a California Registered Fire Protection Engineer, and fire protection equipment will be installed and maintained in accordance with applicable NFPA standards and recommendations (National Fire Protection Association, 1994).

The MFPD representative will perform the final inspection of the proposed project when construction is complete. In addition, the MFPD will conduct periodic fire and life safety inspections thereafter, including reviewing and approving programs for regular equipment inspections and servicing and for the training of employees in fire protection procedures. In addition, the project's insurance carrier will provide periodic inspections by a fire protection specialist. Servicing of the fixed carbon dioxide (CO_2) and portable fire extinguishers will be conducted by a licensed contractor.

The overall fire prevention and protection program for the facility will be designed and implemented to protect both personnel and property. The program will specifically address:

- Names and/or job titles responsible for maintaining equipment and accumulation of flammable or combustible material control;
- Procedures in the event of fire;
- Fire alarm and protection equipment;
- System and equipment maintenance;
- Perimeter fire buffer maintenance;
- Monthly inspections;
- Annual inspections;
- Fire-fighting demonstrations and training; and
- Housekeeping practices.

Fire Suppression. The following fire suppression systems are proposed:

- **Carbon Dioxide Fire Protection System.** This system protects the combustion turbine generator and appropriate accessory equipment compartments from fire. The system will have fire detection sensors in all appropriate compartments that warrant such protection.

- **Fire Hydrants/Hose Stations.** Fire suppression water will be supplied from a dedicated 300,000-gallon portion of the 400,000-gallon raw water/firewater storage tank located on the power block site. Two pumps 100 percent dedicated to fire protection will deliver water to the fire protection water piping network. Hydrants/hose stations will be located approximately every 300 feet around the perimeter of the plant.

- **Sprinkler System.** This system will provide protection to portions of the common services buildings.

- **Smoke Detectors, Combustible Gas Detectors, and Fire Extinguishers.** These will be provided at all locations having potential fire hazards due to the presence of combustible liquids, solids, or other highly flammable materials, and where major property damage could result. Extinguishers will be located at Uniform Fire Code–approved intervals throughout the facility as directed by the local fire inspector, and will be selected for the appropriate class of service.

Water will be used as the primary extinguishing agent. Chemical and gas extinguishing agents (permanently installed or in portable extinguishers) will be provided in special hazard areas where water would be ineffective or harmful to the equipment being protected.

8.7.6 Laws, Ordinances, Regulations, and Standards

The LORS applicable to worker safety and health are summarized in Table 8.7-6. California operates its own Occupational Safety and Health Administration. As such, Cal/OSHA regulations will take precedence over the federal OSHA regulations at this site. The proposed project will operate in accordance with all laws, ordinances, regulations, and standards applicable to worker health and safety. Construction, operation and maintenance of the CGS will be performed in conformance with the LORS as presented in Table 8.7-6. Effective development and implementation of the safety plans and programs described in this section, and implementation of an ongoing, comprehensive safety assessment program will ensure compliance with the established health and safety regulations.

8.7.7 Involved Agencies and Agency Contacts

Agency contacts regarding worker health and safety at the CGS facility are as follows:

Issue	Agency/Address	Contact/Title	Telephone
Fire protection	Maxwell Fire Protection District 231 Oak Street Maxwell, CA 95955	Dave Wells, Chief	(530) 458-0200 (non-emergency)
Building permits	Colusa County Department of Planning and Building 2220 12th Street Colusa, CA 95932	Mr. Albert Bumgarner, Building Inspector	(530) 458-0480
Worker health and safety	Cal/OSHA (District Office) 2424 Arden Way, Suite 410 Sacramento, CA 95825	Mr. Richard DaRosa Area Manager Consultation	(916) 263-0704
	Cal/OSHA (Redding Office) 381 Hemsted Dr. Redding, CA 96002	Dennis Barker Area Manager Compliance/permits	(530) 224-4743
Pressure vessel permit	Oakland Pressure Vessel Unit District Office Division of OSHA 1515 Clay Street, Suite 1302 Oakland, CA 94612	Don Cook, Principal Safety Engineer	(510) 622-3052

8.7.8 Permits Required and Permit Schedule

Responsible Agency	Permit/ Approval	Schedule
Any Cal/OSHA district or field office	Construction Activity Permit Required for the following: • Construction of trenches or excavations that are 5 feet or deeper and into which a person is required to descend • Construction of any building, structure, scaffolding, or falsework more than three stories high or an equivalent height (36 feet) • Demolition of any building or structure, or dismantling of scaffolding or falsework more than three stories high or an equivalent height (36 feet) • Erection or dismantling of vertical shoring systems more than three stories high, or an equivalent height (36 feet) Copy of the permit applicant's Code of Safe Practices	Submit completed permit application to any Cal/OSHA district or field office at least two weeks prior to beginning of construction.
Any Cal/OSHA district or field office	Trenching and Excavation Permit Required for the following: • Trenches and excavations that are more than 5 feet deep into which personnel are required to enter or adjacent to structures • Construction of buildings, structures, scaffolding, or falsework more than three stories high • Demolition of any building, structure, or the dismantling of scaffolding or falsework more than three stories high	Submit completed permit application to any Cal/OSHA district or field office prior to commencing construction; submit at least 24 hours prior to "trigger event."
Any Cal/OSHA Administration district or field office	Permit for the erection of a fixed tower crane Required for the following: • Erection, • Climbing, and • Dismantling of fixed tower cranes Notifications to Cal/OSHA must be made at least 24 hours prior to the initiation of the following activities: • Completion of erection and commencement of operation	Submit completed permit application to any Cal/OSHA district or field office; submit at least 24 hours prior to "trigger event."

Responsible Agency	Permit/ Approval	Schedule
	• Climbing of the tower crane • Dismantling of the tower crane	
Oakland Pressure Vessel Unit District Office, Division of OSHA	Pressure Vessel Permit	30 days prior to operation
Cal/OSHA = California Occupational Safety and Health Administration		

8.7.8.1 Permitting Agencies

The table above provides a list of applicable permits related to the protection of worker health and safety applicable to the proposed project. Provided for each permit are the activities covered and application requirements to obtain the permit.

8.7.8.2 Permitting Contacts

All permits noted in the table above may be obtained from the Cal/OSHA district office, which for work places in Colusa County, is located in Redding, California ((530) 224-4743).

8.7.8.3 Permitting Schedule

Permits listed above are supplied on an as-needed basis by any Cal/OSHA district or field office. Notification requirements are listed as "within 24 hours of a permit triggering event"; therefore, a specific permitting schedule is not provided, as the permits may be required at variable times during the construction of the plant or during operations.

8.7.9 References

California Code of Regulations. No date. Title 8. General Industry Safety Orders, (Chapter 4, Subchapter 7) and Construction Safety Orders (Chapter 4, Subchapter 4).

Code of Federal Regulations. No date. Title 29 Part 26. Health and Safety for Construction and Title 29 Part 1910 Occupation Safety and Health Standards.

National Fire Protection Association. 1994. A Compilation of NFPA Codes, Standards, Recommended Practices and Guides. Quincy, Massachusetts.

National Safety Council. 1992. Accident Prevention Manual. Vol. 2, Chap. 6, Fire Protection, pp. 1324-1386.

Table 8.7-1
CGS Construction, Operation, and Maintenance Hazard Analysis
(Page 1 of 3)

Activity	Exposure Potential	Potential Hazard	Control Strategies
Heavy Equipment Operation	C, O, M	Employee injury and property damage from collisions with workers and/or facility equipment.	Implement heavy equipment safety program, ensure that equipment is routinely inspected and operators are properly trained.
Trenching and Excavation	C,M	Employee injury and property damage from collapse of trenches and excavations or contact with underground utilities.	Implement an excavation and trenching safety program, ensure operators are properly trained. Require digging permits prior to initiating excavation or trenching.
Vehicle Operation	C, O, M	Employee injury from vehicle accident or pedestrian/vehicle accident.	Implement vehicle safety program that incorporates driver safety training.
Work at Elevation	C, O, M	Employee injury due to falls from the same level and elevated work areas.	Implement a fall protection program that requires fall protection systems whenever unprotected work is performed at greater than 6 feet.
General Project Work	C, O, M	Employee injury resulting from a slip, trip, or fall.	Maintain good housekeeping, adequate lighting, compliant stairways, and railings.
Crane and Derrick Operation	C, M	Employee injuries and property damage due to falling loads.	Implement hoisting and rigging safety program, inspect equipment routinely and ensure that operators are properly trained.
Hot Work	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program, require Hot Work permits, ensure that welders, pipe fitters, etc., are properly trained.
Working with Combustible Liquids	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program that includes proper procedures for the proper storage and use of flammable or combustible liquids.
Concrete/Forms Work	C	Employee injuries due to work at height, slips, trips, and falls.	Wear fall protection when working at height, protect exposed rebar, and maintain good housekeeping.

Table 8.7-1
CGS Construction, Operation, and Maintenance Hazard Analysis
(Page 2 of 3)

Activity	Exposure Potential	Potential Hazard	Control Strategies
Electrical Work	C, O, M	Employee injuries due to contact with energized parts or due to arc flash energy.	Implement energy control program, including LO/TO of energized sources, and reduced fault energy, added disconnects and enhanced overcurrent protection designs.
Materials Handling	C, O, M	Employee injuries due to improper lifting.	Implement an ergonomics program, and train employees in proper lifting techniques.
Confined Space Entries	C, M	Employee injuries due to suffocation, exposure to toxic materials, engulfment, etc.	Implement a confined space program, including permit procedures and air monitoring requirements.
Compressed Gas Storage	C, O, M	Employee injuries and equipment damage due to explosive release of pressure.	Implement a compressed gas safety program, including procedures for proper use and storage.
Power Tool Use	C, O, M	Employee injuries due to improper use, or use of damaged power tools.	Implement procedures for inspecting power tools before operation and train employees on the proper use and care of power tools.
Working with or near hazardous or toxic materials	C, O, M	Employee injuries due to exposure to hazardous and/or toxic materials.	Implement hazard communication program and exposure control procedures including: engineering controls, administrative controls, and PPE for activities that may expose employees to hazardous/toxic materials.
Working with or near noisy equipment	C, O, M	Employee overexposure to noise.	Implement a hearing conservation program to include: identifying high noise activities and sources, sound level monitoring, and PPE.
Working with or near exposed machinery	C, O, M	Employee injuries from entanglement in rotating or moving equipment.	Develop and implement machine guarding equipment LO/TO procedures.

Table 8.7-1
CGS Construction, Operation, and Maintenance Hazard Analysis
(Page 3 of 3)

Activity	Exposure Potential	Potential Hazard	Control Strategies
Work outdoors	C,O, M	Employee injury or illness from biological hazards such as ticks, snakes, spiders and wildlife.	Develop and implement procedures for outdoor work that warn employees of the potential for exposure and provide guidelines for avoidance of contact with biological hazards.
Work in weather extremes	C, O, M	Employee injury or illness due to heat or cold stress.	Develop and implement procedures for work in hot and cold environments that provide for employee monitoring, appropriate clothing and other guidance.

C = Construction Phase
O = Facility Operations
M = Facilities Maintenance
LO/TO = Lockout/tagout

Table 8.7-2
Protective Equipment Guide
(Page 1 of 2)

Body Area	Hazards	Recommended Protection
Eyes/Face	Low-velocity flying particles	Safety glasses with side shields
	High-velocity chips and sparks	Impact goggles or safety glasses with full face shield
	Corrosive liquid splash during transfer	Splash proof goggles and face shield
	Welding – injurious light rays	Welding hood with appropriate eye filter lenses
Head/Ears	General overhead hazards, overhead rigging, material handling, maintenance, and general construction operations	Nonconductive hard hat
	Noise exposure	Ear plugs or muff
Respiratory System	Low-hazard inert dust	Nuisance dust mask
	Welding fumes	Dust, fume, mist respirator
	Low concentration solvent vapors	Cartridge-type air purifying respirator with organic vapor cartridges
	Acid or base mists	Cartridge-type air purifying respirator with appropriate acid/base cartridges
	High-concentration dusts or toxic vapors, gases	Air line respirator
	Oxygen deficient atmospheres, immediately dangerous to life and health concentrations of vapors, gases	Self-contained breathing apparatus
Hands and Arms	Handling rough or sharp objects	Leather gloves
	Handling hot objects	Insulated gloves
	Using solvents	Chemical-resistant synthetic gloves
Feet and Legs	General wear for light handling	Safety shoes
	Handling heavy objects	Steel-toed safety shoes
	Using brush hooks or scythes	Shin guards
	Working with corrosive liquids	Chemical resistant safety boots
	Underground work	Synthetic safety toe boots

Table 8.7-2
Protective Equipment Guide
(Page 2 of 2)

Body Area	Hazards	Recommended Protection
Trunk and Full Body	Normal work attire	Cotton pants and shirt
	Hot or corrosive liquids	Chemical resistant apron or full body suit
	Punctures, impact, or cuts	Canvas or leather kickback apron or metal mesh apron
	Electrical arc flash energy	Full body protections per NFPA 70E
Fall Protection/Rescue	Working from elevated structure or platform without standard railings	Full body safety harness and lanyard
	Vessel (confined space) entry	Full body safety harness and lifeline or wristlets and lifeline
	Suspended scaffolds	Full body safety harness/lanyard

IDLH: Immediately dangerous to life and health.

Table 8.7-3
CGS Operations Emergency Action Outline

1.0 Introduction	4.7 Emergency Plant Shutdown
1.1 Purpose	4.8 Site Security
1.2 Scope	4.9 Emergency Medical Treatment and First Aid
2.0 Responsibilities	
Emergency Response Coordinator	4.10 Decontamination
Alternate Emergency Evacuation Coordinator	4.11 Documentation and Recordkeeping
Safety Coordinator	4.12 News Media
Position Description Assignments	4.13 Emergency Notification List
Construction/Facility Manager	4.14 Emergency Telephone Numbers List
Construction/Facility Supervisor	5.0 Reference Procedures
Operators	5.1 Evacuation Plan
Health and Safety Manager	5.2 Emergency Equipment Locations
Security	5.3 Fire Extinguisher Locations
3.0 Response and Notification Plan (Points of Contact)	5.4 Security
3.1 Supervisor/Emergency Coordinator	5.5 Accident Reporting and Investigation
3.2 Health and Safety Manager	5.6 Lockout/Tagout
4.0 Response Procedures	5.7 Hazard Communication
4.1 Evacuation Routes and Procedures	5.8 Spill Containment and Reporting
4.2 Accidents Involving Serious Injury and/or Death	5.9 First Aid and Medical Response
4.3 Fire	5.10 Respiratory Protection
4.4 Hazardous Waste or Chemical Spills	5.11 Personal Protective Equipment
4.5 Earthquake	5.12 Sanitation
4.6 Bomb Threat	5.13 Work Site Inspection

Table 8.7-4
Construction Training Program

Training Course	Target Employees
Site Safety Orientation	All
Injury and Illness Prevention Plan	All
Emergency Action Plan	All
PPE Program	All
Heavy Equipment Safety Program Forklift Operator Training	Employees working on, near, or with heavy equipment
Trenching and Excavation Safety Program	Employees working on or near trenches or excavations.
Fall Protection Program	Employees required to work at elevation (> 6 feet).
Scaffolding Safety Program	Employees required to erect or use scaffolding
Hoisting and Rigging Safety Program	Employees responsible for performing and/or supervising hoisting and rigging.
Crane Safety Program	Employees supervising or performing crane operations
Flammable and Combustible Liquid Storage and Handling	Employees responsible for the handling and storage of flammable or combustible liquids or gases
Hot Work Permits	Employees performing hot work
Hazardous Energy Control (Lockout/Tagout)	Employees performing lockout/tagout
Electrical Safety	Employees required to work on electrical systems and equipment
Permit Required Confined Space Entry	Employees required to supervise or perform confined space entry
Hand and Portable Power Tool Safety	All
Housekeeping Policy and Program	All
Hearing Conservation	All
Safe Lifting Program	All
Safe Driving Program	Employees supervising or driving motor vehicles
Hazard Communication	All
Pressure Safety	Employees supervising or working on pressurized systems or equipment
Line Breaking Safety	Employees performing general maintenance or working on pressurized systems or equipment
Respiratory Protection Program	All employees required to wear respiratory protection
Fire Prevention Program	All
Emergency Action Plan	All
HAZWOPER/First Responder	Employees working around hazardous materials or waste
Arc Fault Program	Employees working around energized electrical systems

Table 8.7-5
Operations and Maintenance Training Program
(Page 1 of 2)

Training Course	Target Employees
Site Safety Orientation	All
Injury and Illness Prevention Plan	All
Emergency Action Plan	All
PPE Program	All
Trenching and Excavation Safety Program	Employees performing or supervising trenching or excavation work
100% Fall Protection Program	Employees required to use fall protection
Hoisting and Rigging Safety Program	Employees responsible for the oversight or conduct of hoisting and rigging
Forklift Operator Training	Employees working on, near, or with forklifts
Crane Safety Program	Employees supervising or performing crane operations
Flammable and Combustible Liquid Storage and Handling	Employees responsible for the handling and storage of flammable or combustible liquids or gases
Hot Work Permits	Employees performing hot work
Hazardous Energy Control (Lockout/Tagout)	Employees performing lockout/tagout and working in the vicinity of locked out equipment
Electrical Safety	Employees required to work on electrical systems and equipment
Permit Required Confined Space Entry	Employees required to supervise or perform confined space entry
Hand and Portable Power Tool Safety	Employees who will be operating hand or portable power tools
Housekeeping Policy and Program	All
Hearing Conservation	All
Safe Lifting Program	All
Safe Driving Program	Employees supervising or driving motor vehicles
Hazard Communication	Employees handling or working around hazardous materials
Pressure Safety	Employees supervising or working on pressurized systems or equipment
Line Breaking Safety	Employees performing general maintenance or working on pressurized systems or equipment

Table 8.7-5
Operations and Maintenance Training Program
(Page 2 of 2)

Training Course	Target Employees
Relief Valve Maintenance and Testing	Employees performing maintenance or testing of relief valves
Respiratory Protection Program	All employees required to wear respiratory protection
Fire Prevention Program	All
Fire Protection Program	All
Arc Fault Program	Employees working around energized electrical systems

Table 8.7-6
Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards
(Page 1 of 6)

Administering Agency	Applicable LORS	Requirement/Compliance	AFC Section
California Occupational Safety and Health Act 1973	Title 8, CCR	The Act establishes Cal/OSHA and establishes minimum safety and health standards for work operations occurring in the state.	8.7
	8 CCR, Section 339	Requires listing of hazardous chemicals relating to the Hazardous Substance Information and Training Act.	8.7.3.1, 8.7.3.2, 8.7.4.1, 8.7.4.2
	8 CCR, Section 450 et seq. – 560 et seq.	Establishes safety orders for pressurized vessels including: air tanks, anhydrous ammonia, and general safe work practices.	8.7.3.2
	8 CCR, Section 750 et seq.	Establishes safety orders for work with high-pressure steam.	8.7.3.2
	8 CCR, Construction Safety Orders (Sections 1500 et seq. – 1938 et seq.)	Establishes safety orders for construction work.	8.7.3.1
	8 CCR, Sections 1508 et. seq. – 1527 et seq.	Requirements for IIPP, PPE, and general site safety.	8.7.3.1
	8 CCR, Sections 1528 et seq. – 1537 et seq.	Requirements for controlling exposures to hazardous air contaminants.	8.7.3.1
	8 CCR, Sections 1539 et seq. – 1547 et seq.	Requirements for excavations and trenching.	8.7.3.1
	8 CCR, Sections 1590 et seq. – 1596 et seq.	Requirements for earth moving and haulage.	8.7.3.1
	8 CCR, Sections 1597 et seq. – 1599 et seq.	Requirements for vehicles, traffic control, flaggers, barricades, and warning signs.	8.7.3.1
	8 CCR, Sections 1604 et seq. – 1605 et seq.	Requirements for construction hoists.	8.7.3.1
	8 CCR, Sections 1620 et seq. – 1635 et seq.	Requirements for railings, ramps, stairs, access and egress, openings in floors, roofs and walls, and temporary floors.	8.7.3.1

Table 8.7-6
Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards
(Page 2 of 6)

Administering Agency	Applicable LORS	Requirement/Compliance	AFC Section
California Occupational Safety and Health Act 1973 (continued)	8 CCR, Sections 1635 et seq. – 1667 et seq.	Requirements for scaffolding.	8.7.3.1 and 8.7.3.2
	8 CCR, Sections 1669 et seq. – 1678 et seq.	Requirements for safety belts, nets, and ladders.	8.7.3.1 and 8.7.3.2
	8 CCR, Sections 1680 et seq. – 1708 et seq.	Requirements for saws, powder-actuated tools, miscellaneous tools and equipment.	8.7.3.1 and 8.7.3.2
	8 CCR, Sections 1709 et seq. – 1722 et seq.	Requirements for steel reinforcing, concrete pouring, and structural steel erection operations.	8.7.3.1
	8 CCR, Sections 1760 et seq.	Electrical requirements for construction work.	8.7.3.1
	8 CCR, Sections 1920 et seq. – 1938 et seq.	Requirements for construction-related fire protection and prevention.	8.7.5.1
	8 CCR, Electrical Safety Orders (Sections 2299 et seq. – 2974 et seq.)	Establishes safety orders for installation of low and high voltage electrical systems.	8.7.3.1
	8 CCR, General Industry Safety Orders (Sections 3200 et seq. – 6184 et seq.)	Establishes safety orders for general industry work, including operations and maintenance.	8.7.3.2
	8 CCR, Sections 3200 et seq. – 3583 et seq.	Requirements for IIPP, PPE, and general site safety.	8.7.3.2
	8 CCR, Sections 3620 et seq. – 3920 et seq.	Requirements for mobile equipment operation.	8.7.3.2
	8 CCR, Sections 3940 et seq. – 4647 et seq.	Requirements for power transmission equipment, rotating equipment, moving parts points of operation, etc.	8.7.3.2
	8 CCR, Sections 4794 et seq. – 4884 et seq.	Requirements for compressed gases and gas systems for cutting and welding.	8.7.3.2

Table 8.7-6
Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards
(Page 3 of 6)

Administering Agency	Applicable LORS	Requirement/Compliance	AFC Section
California Occupational Safety and Health Act 1973 (continued)	8 CCR, Sections 4850 et seq. – 4853 et seq.	Requirements for electric welding.	8.7.3.2
	8 CCR, Sections 4884 et seq. – 5049 et seq.	Requirements for cranes and other hoisting equipment.	8.7.3.2
	8 CCR, Sections 5094 et seq. – 5100 et seq.	Requirements for control of excessive noise exposure and ergonomic hazards.	8.7.3.2
	8 CCR, Sections 5139 et seq. – 5223 et seq.	Requirements for the control of hazardous substances, including Hazard Communication program requirements.	8.7.3.2
	8 CCR, Sections 5615 et seq. – 5629 et seq.	Requirements for the control of hazards from flammable liquids, gases, and vapors.	8.7.3.2
	8 CCR, Sections 6150 et seq. – 6184 et seq.	Requirements for fire protection and prevention.	8.7.5.2
	8 CCR, Part 6	Provides health and safety requirements for working with tanks and boilers.	8.7.3.2
Federal Occupational Safety and Health Administration[a]	29 CFR 1926	Contains federal health and safety regulations pertaining to construction activities.	8.7.3.1
	29 CFR 1910	Contains federal health and safety regulations pertaining to general industry.	8.7.3.2
California Health and Safety Code	Section 25500 et seq. (LaFollette Bill)	Requires that every new or modified facility that handles, treats, stores, or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan.	8.12, 8.7.3.1, and 8.7.3.2
	Sections 25500 et seq. – 25541 et seq.	Requires the preparation of a Hazardous Material Business Plan that details emergency response plans for a hazard-ous materials emergency at the facility.	8.12

Table 8.7-6
Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards
(Page 4 of 6)

Administering Agency	Applicable LORS	Requirement/Compliance	AFC Section
Colusa Fire Department Chief	UFC, Article 80	Requires the prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use, and handling of hazardous materials and information needed by emergency response personnel.	8.12
	NFPA 10: Portable Fire Extinguishers	Requirements for the selection, placement, inspection, maintenance, and employee training for portable fire extinguishers.	8.7.4 and 8.7.5
	NFPA 12: Carbon Dioxide Fire Extinguishing Systems	Requirements for the installation and use of carbon dioxide extinguishing systems.	3.4.10 and 8.7.5
	NFPA 13 and 13A: Sprinkler Systems	Guidelines for selection, installation, maintenance, and testing of fire sprinkler systems.	3.4.10 and 8.7.5
	NFPA 14: Standpipe and Hose Systems	Guidelines for the selection and installation of standpipe and hose fire protection systems.	3.4.10 and 8.7.5
	NFPA 15: Water Spray Fixed Systems	Guidelines for selection and installation of fixed water spray systems.	3.4.10 and 8.7.5
	NFPA 22: Water Tanks and Private Fire Protection	Requirements for water tanks that are used for private fire protection.	3.4.10 and 8.7.5
	NFPA 24: Installation of Private Fire Service Mains and their Appurtenances	Requirements for installation of private fire service mains and appurtenances.	3.4.10 and 8.7.5
	NFPA 26: Supervision of Valves Controlling Water Supplies	Provides guidance for installation and supervision of valves used to control water supplies.	3.4.10 and 8.7.5
	NFPA 30: Flammable and Combustible Liquids	Requirements for storage, transfer, and use of flammable and combustible liquids.	8.7.3.1 and 8.7.3.2
	NFPA 37: Stationary Combustion Engines and Gas Turbines	Provides fire protection requirements for the installation and use of combustion engines and gas turbines.	3.4.10 and 8.7.5

Table 8.7-6
Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards
(Page 5 of 6)

Administering Agency	Applicable LORS	Requirement/Compliance	AFC Section
Colusa Fire Department District Chief (continued)	NFPA 50A: Gaseous Hydrogen Systems	Provides fire protection requirements for hydrogen systems.	8.7.5
	NFPA 54: National Fuel Gas Code	Provides fire protection requirements for the use of fuel gas.	3.4.10 and 8.7.5
	NFPA 70, 70B and 70E: National Electric Code	Guidance on the safe selection and work practices associated with the design, installation, construction, and maintenance of electrical systems.	8.7.3.1 and 8.7.3.2
	NFPA 71: Installation, Maintenance and use of Central Station Signaling Systems	Provides requirements for the installation, maintenance, and use of central station signaling systems.	3.4.10 and 8.7.5
	NFPA 72A, 72E and 72F: Local Protective Signaling System, Automatic Fire Detection System, Emergency Voice/Alarm Communication System	Provides requirements for the design, installation, use and maintenance of local protective signaling systems, automatic fire detection systems and emergency communication systems.	3.4.10 and 8.7.5
	NFPA 78: Lightning Protection Code	Provides requirements for lightning protection.	8.7.3.1
	NFPA 80: Fire Doors and Windows	Provides requirements for fire doors and windows.	8.7.3.1
	NFPA 90A: Installation of Air Conditioning and Ventilation Systems	Provides guidance for the installation of air conditioning and ventilation systems.	8.7.3.1
	NFPA 101: Life Safety, Fire in Buildings and Structures	Requirements for the design and construction of means of egress from structures.	8.7.3.1
	NFPA 291: Fire Flow Testing and Marking of Hydrants	Requirements for flow testing and marking of fire hydrants.	8.7.3.2
	NFPA 1962: Care, Maintenance and Use of Fire Hoses	Requirements for the care, use and maintenance of fire hoses, connections, and nozzles.	8.7.3.2

Table 8.7-6
Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards
(Page 6 of 6)

Administering Agency	Applicable LORS	Requirement/Compliance	AFC Section
City of Colusa Building Inspector	ANSI/ASME Boiler and Pressure Vessel Code	Provides specifications and requirements for boilers and pressure vessels.	8.7.3
	ANSI, B31.2, Fuel Gas Piping	Provides specifications and requirements for fuel gas piping.	8.7.3.1

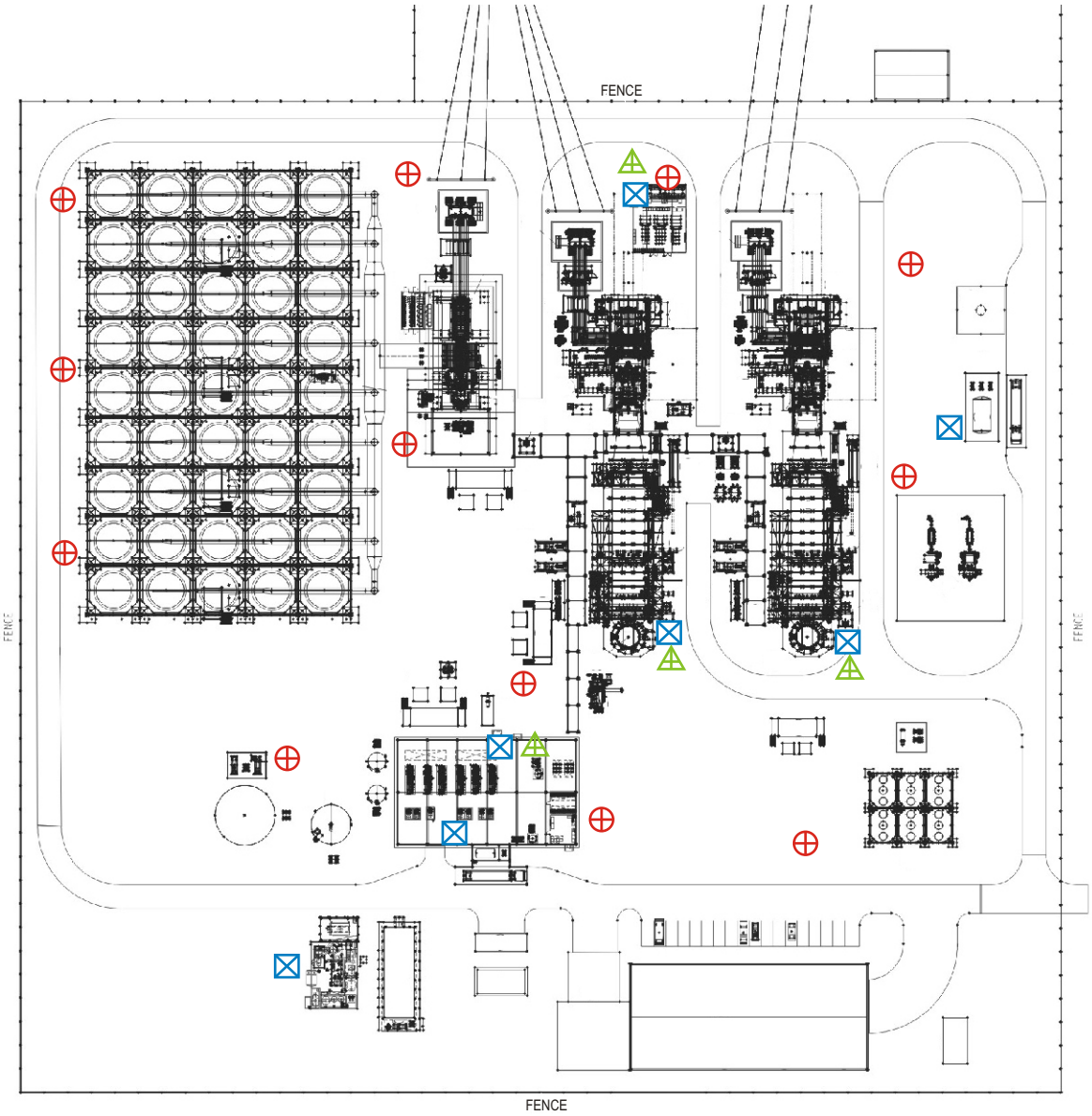
Note:

[a] Cal/OSHA has primary jurisdiction for worker health and safety in California. These regulations are provided for reference purposes and apply as referenced in Cal/OSHA regulations.

ANSI/ASME = American National Standards Institute/American Society for Mechanical Engineers
Cal/OSHA = California Occupational Safety and Health Commission
CCR = California Code of Regulations
CFR = Code of Federal Regulations
IIPP = Injury, illness, prevention program
NFPA = National Fire Protection Association
PPE = personal protective equipment
UFC = Uniform Fire Code

LEGEND

- Fire Hydrants
- Safety Showers/ Eyewash Station
- Spill Response Kit



0 50 100 150
Scale in Feet

N

FIRE PROTECTION AND EMERGENCY RESPONSE EQUIPMENT

Colusa Generating Station
E&L Westcoast, LLC
Colusa County, California

28067004
November 2006

URS

FIGURE 8.7-1

Source:
Bechtel Corporation; Colusa Power Plant, Dwg. No. P1-0100-00001
General Arrangement With Air Cooled Condenser (COL_GA05 RevOc) October 4, 2006