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Palmdale Energy Project

Preliminary Fire Protection Plan

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PALMDALE ENERGY PRELIMINARY FIRE PROTECTION PLAN

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Attachments

1. Introduction

The Palmdale Energy Project ("PEP" or the "Project") consists of a natural gas-fired combined-cycle generating equipment to be developed on an approximately 50-acre site in the northern portions of the City of Palmdale. The combined-cycle equipment utilizes two Siemens SGT6-5000F natural gas-fired combustion turbine generators (CTG), two heat recovery steam generators (HRSG), and one steam turbine generator (STG).

The Project will have a nominal electrical output of 645 MW at average annual conditions. The Project will be fueled with natural gas delivered via a new natural gas pipeline. The Southern California Gas Company (SCG) will design and construct the approximately 8.7-mile pipeline in existing street rights-of-way (ROW) within the City of Palmdale.

The PEP plant is located on a 50 acre site south of East Avenue M in the northernmost areas of the City of Palmdale. The 50-acre plant site is adjacent to City of Palmdale owned property to the west, East Avenue M (Columbia Way) to the north, and U.S. Air Force Plant 42 on the south and east. Air Force Plant 42 is a Government Owned Contractor Operated (GOCO) facility for the production, engineering, final assembly and flight testing of high performance aircraft.

In the event of a major fire, fire support services, including trained firefighters and equipment for a sustained response, will be provided by the Los Angeles County Fire Department (LAFCD).

The following Preliminary Operations Fire Protection Plan (PFPP) has been prepared for the Palmdale Energy Center. A revision to the PFPP (the Operations Fire Protection Plan or Operations FPP) will be prepared prior to commercial operations of the PEP on a schedule acceptable to the CEC. The Operations FPP will be provided to the LACFD for review and comment and the CEC Compliance Project Manager for approval.

2. Emergency Notification Procedures

Any fire event at or near the site will trigger the emergency notification procedures identified in this section.

The operations Site Safety Officer ("SSO", or equivalent title as determined by the operations organization at commercial operation) shall be notified in the event of a fire.

Any workers in the immediate vicinity of the fire, as well as those in adjacent areas shall also be notified.

The control room shall immediately be notified of the fire.

The control room will sound the appropriate alarm, as necessary, or otherwise notify plant personnel of the fire.

The control room will alert the LACFD via 911 if the fire is not extinguished immediately with the use of only one fire extinguisher. The responsible functionary in the control room will direct an available employee to meet the Fire Department at the site gate and direct them to the fire scene.

Palmdale Energy will develop standard operating procedures (SOPs) for notifying LACFD and the CEC's Compliance Project Manager of all fire suppression alarm trips and any impairments of fire suppression systems either planned or unplanned. The SOPs will be prepared by the Project's operations organization when final design of the fire protection system is complete.

3. Evacuation

During significant emergency situations at or near the PEC, the site manager, in consultation with local authorities, may issue an evacuation notice. When an evacuation has been called, all site employees will gather at a designated assembly area and the site manager will account for all personnel. The site manager and supervisors will perform a sweep of the facility to locate personnel and reconvene at the assembly area. After personnel are accounted for, they will safely move from the site to safe zones, which may be areas off-site away from the threat.

Depending on the type and severity of the emergency, along with weather and or localized site conditions, roadways in the project area will be used for site evacuation. The site access road and Avenue M are the primary evacuation routes.

4. Palmdale Energy Center Roles and Responsibilities

Employees should know how to prevent and respond to fires and are responsible to adhering to company policy regarding fire emergencies. The following section provides general responsibilities by position.

1) Project Owner/Management

The project owners/management will implement necessary measures to reduce the risk and comply with federal, state, and local fire safety/protection policies. The owners/management will conduct the necessary training and make equipment available to provide a safe working environment for all employees and contractors.

2) Site Safety Officer

The SSO will manage the Operations FPP for the Project and shall maintain all records pertaining to the plan. Other responsibilities include:

- Understanding the Operations FPP and its requirements for training, fire prevention, fire suppression, and evacuation.
- Understanding the fire risk associated with the site and activities that will occur on site.
- Developing and administering the fire prevention and safety training program.
- Ensuring that fire control equipment and s systems are properly maintained and in good working condition.
- Monitoring combustibles on site and managing their storage.
- Posting fire rules on the Project's bulletin boards and contractor's field offices and areas visible to employees.
- Stopping Project work activities that pose a fire hazard or are not in compliance with the Operations FPP.
- Reporting all fires ignited on the site to the LACFD.

3) Supervisors

Supervisors are responsible for:

- Ensuring that employees receive appropriate fire safety training
- Notifying the SSO when changes in operation or maintenance increase the risk of fire
- Enforcing fire prevention and protection policies
- Accounting for employees/contractors in the case of an evacuation
- Performing fire sweeps to account for staff
- Facilitating fire agency access to the site
- Cooperating with the LACFD during and following fires
- Identifying unsafe work practices that may lead to fire ignitions

4) Employees/Contractors

- Employees and contractors are responsible for:
- Conduct operations safely to limit the risk of fire
- Report potential fire hazards to their supervisors
- Follow fire emergency procedures
- Understand the emergency evacuation procedures

5) Personnel Training

The project will require all on-site employees and contractors to receive training on the facility's fire prevention plan, including the fire hazards on site and their individual responsibilities in the event of a fire. Employees and contractors will receive training prior to working on site and periodic training will also be provided.

6) Coordination with Fire Support Services

The Project will provide site tours to the LACFD to familiarize them with the Project's fire protection features, equipment layout, and fire hazards. The Project will invite the LACFD to tour the site prior to first fire of the combustion turbines for an introduction to the facility as it nears completion and a second tour prior to commercial operation when all fire prevention features as well as plant systems, equipment, and components have been commissioned and verified to be operational.

5. Fire Protection Design Criteria

The purpose of the plant fire protection system is to minimize the likelihood, spread and duration of a fire. Its design is intended to minimize damage to equipment and facilities, and ultimately reduce the risk of injury to personnel. The firefighting system consists of all fire protection subsystems and equipment provided for the protection of the power generating and balance of plant facilities.

Classification of hazard areas and installation of electrical equipment shall be in accordance with NFPA 70 (National Electrical Code).

All fire protection systems shall be designed in accordance with the requirements of applicable local Fire Prevention and Building Codes, the Authority Having Jurisdiction (AHJ) and applicable NFPA codes and standards. System design submittals shall be reviewed by the Chief Building Official (CBO).

1) Referenced Publications

Fire protection equipment, systems and devices shall be designed, installed and tested in accordance with the Codes and Standards in effect when engineering and construction of the facility take place. The Codes and Standards identified below are representative of those that will be used for facility design and operation.

i. National Fire Protection Association (NFPA)

NFPA 10	Portable Extinguishers
NFPA 11	Low, Medium and High Expansion Foam
NFPA 13	Installation of Sprinkler Systems
NFPA 14	Installation of Standpipe and Hose Systems
NFPA 15	Water Spray Fixed Systems
NFPA 20	Installation of Stationary Pumps
NFPA 22	Standard for Water Tanks for Private Fire Protection
NFPA 24	Installation of Private Fire Service Mains and Their Appurtenances
NFPA 30	Flammable and Combustible Liquids Code
NFPA 54	National Fuel Gas Code
NFPA 70	National Electrical Code
NFPA 72	National Fire Alarm Code
NFPA 496	Purged and Pressurized Enclosures for Electrical Equipment
NFPA 850	Recommended Practice for Fire Protection for Electric Generating Plants

2) Fire Protection Materials and Equipment

Fire protection materials and equipment shall be UL listed and/or FM approved for the intended service. Materials and equipment shall be installed in accordance with the following codes and standards, as applicable:

National Fire Protection Association (NFPA)
National Electric Code (NEC)
American Society of Testing and Materials (ASTM)

ASTM D 2774-08	Standard Practice for Underground Installation of Thermoplastic Pressure Piping
ASTM D 3261	Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
ASTM E 814	Fire Tests of Through Penetration Fire Stops
ASTM F 714-05	Standard Specification for Polyethylene (PE) Pipe
ASTM F 1055	Standard Specification for Electrofusion Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
ASTM F 2620	Standard Practice for Heat Fusion of Polyethylene Pipe and Fittings

American Water Works Association (AWWA)

AWWA C104	Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
AWWA C111	American National Standard for Rubber Gasket Joints for Cast- Iron and Ductile Iron Pressure Pipe and Fittings
AWWA C115	Standard for Flanged Ductile Iron Pressure Pipe with Threaded Fittings
AWWA C150	Thickness Design of Ductile Iron Pipe
AWWA C605	Standard for Underground Installation of PVC Pressure Piping and Fittings for Water
AWWA C900	Standard for Polyvinyl Chloride (PVC) Pressure Pipe
AWWA C906	Polyethylene Pipe and Fittings, 4 in Through 63 In for Water Distribution

6. Fire Protection Design Criteria

1) Fire Water Supply System

The firewater system will be supplied from a dedicated volume of 200,000 gallons within the facility's 1,000,000 gallon raw water storage tank. It will serve the power block, balance of plant areas, and operations and maintenance building.

Firewater Source

The facility's raw water storage tank will be provided and sized to serve both firewater and process requirements in accordance with NFPA 22 and 850. The source of makeup water for the raw water storage tank will be reclaimed water from the Sanitation Districts of Los Angeles County Lancaster Water Reclamation Plant.

Pumping Source

The pumping system will consist of one primary pump (electric motor driven) and one back-up pump (diesel engine driven). The fire pumps will be automatic self-starting on loss of normal system pressure. An electric motor driven jockey pump will be provided to maintain normal system pressure.

The firewater pumping system will maintain either the minimum operating pressure required for support of the design basis fire (to be determined during the facility's design phase) or as required to permit an effective monitor nozzle range of 100 ft. (in the event monitors are part of the fire protection system equipment), whichever is greater.

2) Firewater Distribution System

A firewater distribution system will be provided for the protection of the power block areas, balance of plant areas, and control/administration building. It will be sized to accommodate the flow and pressure requirements defined by the design basis fire.

Fire hydrants will be provided as specified in the final design documents.

The firewater distribution system will be equipped with sectional valves, hydrants, monitors, and hose reels to support manual firefighting operations.

The distribution system will be designed to provide water supply to any point from at least two directions, consisting of loops or grids, with sufficient sectional valves provided to allow isolation of any section.

Permanent connections to the firewater distribution system for other than fire protection service shall not be permitted.

7. Hazards

A preliminary matrix of fire hazards for the facility is provided as Attachment 1 to this PFPP. The matrix identifies fire hazards for facility equipment and buildings. The preliminary matrix will be updated as final design of the Project is performed.

Palmdale Energy Project
Preliminary Fire Protection Plan
Attachment 1

Preliminary Matrix of Fire Hazards

PALMDALE ENERGY PRELIMINARY FIRE PROTECTION PLAN MATRIX OF FIRE HAZARDS

	Machines / Components / Buildings / Enclosures	Hazards							
	Description	Ammonia	Natural Gas	Lubricating Oil	Hydraulic Oil	Insulating Oil	Electrical Gear	Wood	Other
2 X 5000F	Gas Turbine Burner Area (protected by GT enclosure fire system)								
	Gas piping run to GT (protected by GT enclosure fire system)								
	Generator Bearing Housing (GT side)			X					
	Generator Exciter Housing								
	Pressurized lube oil lines between lube oil tank and GT connections			X					
	GT high pressure hydraulic skid				X		X		
	GT Exhaust bearing (protected by GT enclosure fire system)			X			X		
	GT Inlet Bearing (Compressor End, protected by GT enclosure fire system)			X					
	Mechanical Package (Lube Oil)			X			X		
	GT Enclosure			X	X		X		
	Generator Enclosure			X			X		
	SFC/SEE Package						X		
	Gas Turbine Electrical Package (with electrical equipment false floor)						X		
Steam Turbine Generator	HP/IP Bearings			X					
	IP/LP Bearings			X					
	Steam Turbine Enclosure						X		
	Pressurized lube oil lines between lube oil tank and ST connections			X					
	Steam Turbine HP Hydraulic Skid (fire resistant fluid)				X				
	ST Lube Oil Tank and Filter Area (outdoor)			X			X		
	ST Stop Valves								
	Generator Bearing (Turbine Side)			X					
	Generator Bearing (Exciter Side)			X					
	Generator Enclosure			X			X		
	Combined ST/GT Lube Oil Package (Outdoor; for indoor see buildings/enclosures section)			X			X		
Power Control Centers (PCCs)	Steam Turbine PCC (with electrical equipment incl. false floor)						X		
	Steam Turbine PCC (cable distribution - underneath the PCC)						X		
	BOP PCC (with electrical equipment incl. false floor)						X		
	BOP PCC (cable distribution - underneath the PCC)						X		
	Water treatment area MCC (with electrical equipment incl. false floor)						X		
	Water treatment area MCC (cable distribution - underneath the MCC)						X		
	Closed Cooling Water MCC (with electric equipment incl. false floor)						X		
	Closed Cooling Water MCC (cable distribution - underneath the PCC)						X		
	Air Cooled Condenser PCC (with electric equipment incl. false floor)						X		
	Air Cooled Condenser PCC (Cable distribution - underneath the PCC)						X		
	Medium voltage Switchgear Enclosure (with electrical equipment incl. false floor)						X		

PALMDALE ENERGY PRELIMINARY FIRE PROTECTION PLAN MATRIX OF FIRE HAZARDS

	Machines / Components / Buildings / Enclosures	Hazards							
	Description	Ammonia	Natural Gas	Lubricating Oil	Hydraulic Oil	Insulating Oil	Electrical Gear	Wood	Other
Auxiliary Equipment	Main Condensate Pumps			X			X		
	Air compressor unit			X			X		
	Steamside Vacuum Pump Set			X			X		
	Feedwater Pump			X			X		
	Low Voltage Aux Transformer for ST PCC (Oil type, ≤ 500 gal of oil capacity)					X	X		
	Low Voltage Aux Transformer for Air Cooled Condenser PCC (Oil type ≤ 500 gal of oil capacity)					X	X		
	Low Voltage Aux Transformer for BOP PCC (Oil Type ≤ 500 gal of oil capacity)					X	X		
	Low Voltage Aux Transformer for Water Treatment MCC (Oil ≤ 500 gal of oil capacity)					X	X		
	Low Voltage Aux Transformer for Water Treatment MCC (Oil ≤ 500 gal of oil capacity)					X	X		
	Low Voltage Aux Transformer for Control Room (Oil Type ≤ 500 gal of oil capacity)					X	X		
	Main Step Up Transformers					X	X		
	Auxiliary Transformers					X	X		
	Fin Fan Cooler (Service Water)					X	X		
	Heat Recovery Steam Generator						X		X
	Sampling Station								
	Ammonia Storage Tank / Unloading Area	x							X
	SCR Skid	x							
	Structure for Fuel Gas Filtering and Pressure Reducing Station		X						
	Fuel Gas Preheater, Metering, and Final Filter		X						
	Fuel Gas Conditioning Skid		X						
	Duct Burner Skid		X						
	Air Cooled Condenser Structure						X		
	Emergency y Diesel Generator						X		X
Bldgs and Enclosures	Any Indoor Lube Oil Package			X			X		X
	Admin Section of Control, Admin, Warehouse Building						X		X
	Control Room Section of Combined Control Room, Warehouse Building						X	X	X
	Laboratory Container						X		X
	Continuous Emissions Monitoring system Enclosure						X		X
	Fire Pump Enclosure (incl. electric, diesel, and jockey pump)						X		X
	Auxiliary Boiler (with enclosure)			X			X		X

Palmdale Energy Project
Preliminary Fire Protection Plan
Attachment 2

Preliminary Outline for Standard Operating Procedure
for
Fire Protection and Suppression System Failures

PALMDALE ENERGY PRELIMINARY FIRE PROTECTION PLAN OUTLINE FOR STANDARD OPERATING PROCUDURE FOR FIRE PROTECTION AND DETECTION SYSTEMS

1. Introduction

A narrative for the rational for the fire suppression system Standard Operating Procedure and the roles of the organizations and personnel responsible for its implementation will be provided in the operations period SOP developed following fire protection system design.

2. Fire Detection and Suppression Systems Matrix

A fire protection system matrix including locations and types of detection and suppression systems prepared during design of the Palmdale Energy Center will be provided.

Suppression systems may include:

- Wet Pipe Sprinklers
- Water Mist or Hybrid Gas Water Systems
- Deluge Systems
- Dry Chemical / Foam Systems
- Fire Resistant Fluids
- Building Internal Fire House Connections
- CO2 or FM200
- Hydrants
- Portable Extinguishers
- Fire Water Pump Enclosure
- Fire water mains

Fire and gas detectors may include:

- Fuel gas, point detectors
- Thermal detectors, rate compensated
- Smoke, photo-electric, ionization, or combination detectors
- Manual pull stations
- Optical, flame sensing, detectors

3. Fire Suppression and Detection System Inspection and Testing Requirements

The codes and or standards to be followed for detection and suppression system inspection and testing will be identified and a brief description of the nature and

frequency of the tests will be provided in the operations period SOP developed following fire protection system design.

4. Procedures to Follow When a Fire Suppression or Detection System Malfunctions

A narrative and decision-tree matrix of procedures to follow upon discovery of a fire suppression or detection system malfunction will be provided in the operations period SOP developed following fire protection system design.

5. Procedures to Notify the Los Angeles County Fire Department and the CEC Compliance Project Manager

A narrative and decision-tree matrix for procedures to follow for notification of the Los Angeles County Fire Department and CEC Compliance Project Manager upon discovery of problems or failures of the facility's fire suppression and detection systems will be provided in the operations period SOP developed following fire protection system design