

# Transmission System Engineering

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This section discusses the transmission interconnection between the Redondo Beach Energy Project (RBEP) and the existing electrical grid, and the anticipated impacts that operation of the facility will have on the flow of electrical power in the Southern California region and specifically within the western Los Angeles Basin. This analysis contains the following discussions:

- A description of the proposed electrical interconnection between RBEP and the electrical grid
- The effects of RBEP on the existing transmission grid
- Potential nuisances (electrical effects, aviation safety, and fire hazards)
- Safety of the interconnection
- Description of applicable laws, ordinances, regulations, and standards (LORS)
- Agencies with jurisdiction over the proposed project
- Permit requirements

## 3.1 Transmission Lines Description, Design, and Operation

RBEP will be connected with the regional electrical grid using the existing, onsite, Southern California Edison (SCE) 230-kilovolt (kV) switchyard located on a parcel owned by SCE within the existing Redondo Beach Generating Station site. No new offsite transmission lines will be needed for the project. RBEP will connect into the existing SCE switchyard via a new onsite single-circuit interconnection. Figures 3.1-1a and 3.1-1b show the electrical system one-line diagram within the power block, and the interconnection configuration of RBEP with the onsite SCE switchyard. Figure 3.1-2 shows the typical transmission tower designs that could be used for each transmission line connecting the RBEP power block to the SCE switchyard.

### 3.1.1 Overhead Transmission Line Characteristics

No changes are planned for the SCE transmission line connecting the SCE switchyard to the California Independent System Operator (CAISO) transmission system. The new onsite 230-kV interconnection from the RBEP power block to the SCE switchyard will be designed as single-circuit, self-supporting steel structures, which may be installed on concrete pier foundations.

The insulators for the onsite 230-kV interconnection will be polymer or porcelain with overall lengths of approximately 10 to 15 feet for suspension insulators. The length of the insulator strings will be increased on structures other than tangent to ensure compliance with National Electrical Code (NEC) and National Electrical Safety Code (NESC) clearances.

### 3.1.2 230-kV Interconnection Switchyard Characteristics

The interconnection 230-kV switchyard will use 230-kV air- or gas-insulated circuit breakers in a breaker-and-a-half arrangement to obtain a high level of service reliability.

Station service power will be provided via the onsite SCE 230-kV switchyard. Auxiliary controls and protective relay systems for the SCE 230-kV switchyard will be located in a control building separate from the power plant.

### 3.1.3 Power Plant Interconnection Characteristics

The RBEP power block will interconnect to the CAISO transmission system through a breaker-and-a-half arrangement located at the onsite SCE switchyard. RBEP is rated lower than the existing Redondo Beach Generating Station Units 5–8; however, the existing 230-kV breakers may be replaced with newer circuit breakers if deemed necessary. The power plant will use 230-kV air- or gas-insulated circuit breaker positions for the three CTGs and an individual generator step-up (GSU) transformer for each generating unit. The RBEP electrical equipment will be designed to ensure compliance with all applicable NEC and NESC rules following the CAISO requirements. The main buses and the bays will also be designed following these requirements. Startup and

standby power will be supplied through the GSU transformer and auxiliary transformer. Auxiliary controls and protective relay systems for the power plant substation will be located in the power plant control building. All transmission line interconnections onsite will be aboveground.

## 3.2 Transmission Interconnection Studies

On May 15, 2008, the CAISO requested permission from the Federal Energy Regulatory Commission (FERC) to implement proposed reforms to generator interconnection process. The CAISO filed a revised version of the proposal on June 27, 2008 (CAISO, 2008). Some of the goals of the reform process are:

- Clearing the backlog of Interconnection Requests existing in the CAISO queue
  - Reduce the number of projects through increased Interconnection Cost financial commitments or project viability tests
  - Apply group study principles to the remaining projects
  - Develop procedures to ensure a more efficient interconnection of resources that more closely match system needs
- Provide interconnection applicants with reasonable cost and timing certainty
- Better integrate transmission planning with the generation interconnection process

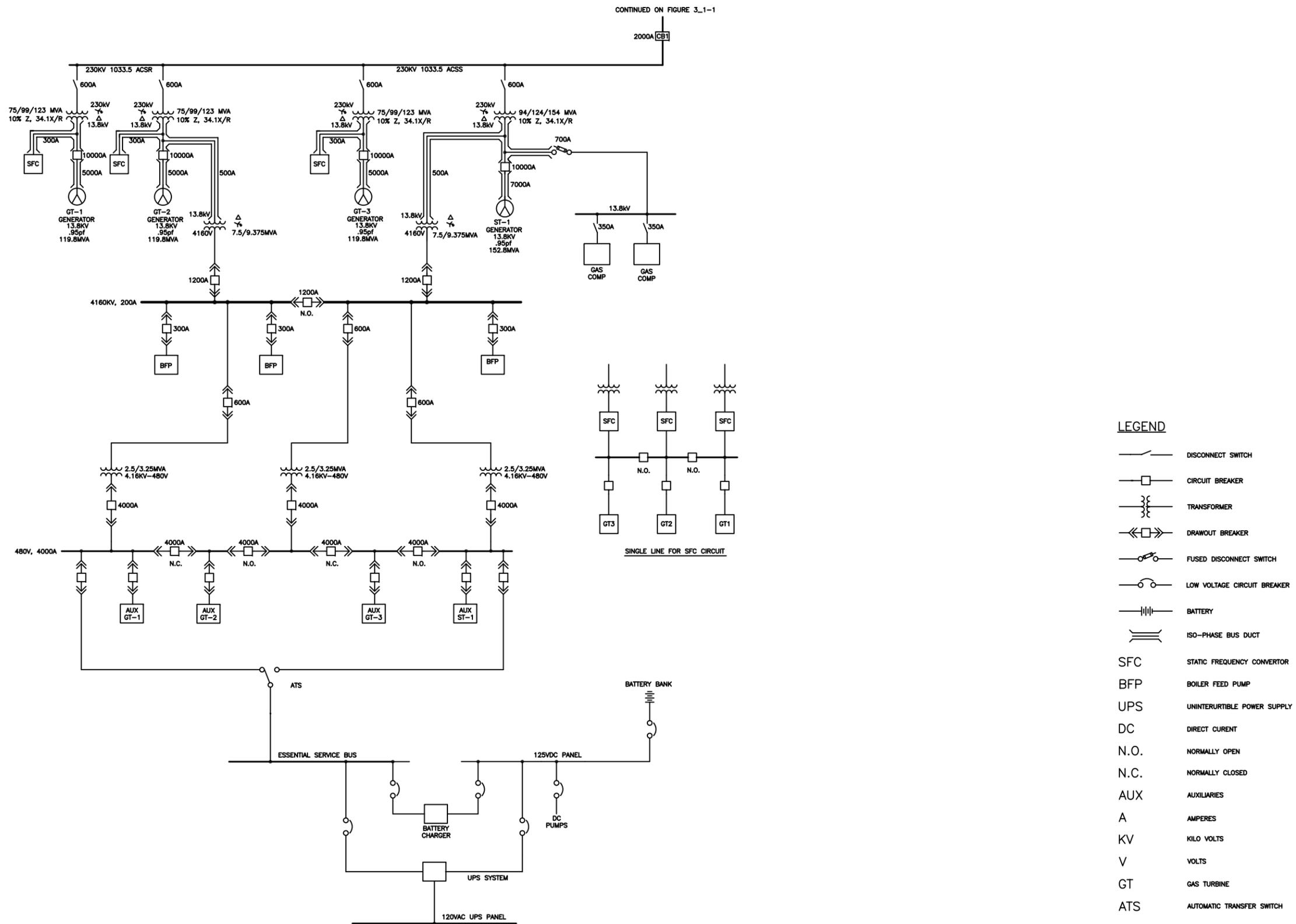
In many cases, system impact studies show that network upgrades are needed to connect new generation to deliver the full project output from the first point of interconnection with the transmission provider system to the grid. Network upgrades can include transmission lines, transformer banks, substation breakers, voltage support devices and other equipment needed to transfer the generation output to the customer load. The specific network upgrades and their costs, if needed, are determined from the Feasibility Study, System Impact Study, and Facility Study of the CAISO Generator Interconnection Procedure.

During 2007 and 2008, the CAISO, as directed by FERC, implemented Generator Interconnection Process Reform. A key element of the reform is that projects are now evaluated in groups called clusters, not in a serial, first in, first out manner. This reform has delayed the issuance of studies for projects that were to be included in the initial cluster (which CAISO labeled the “transition cluster”).

The RBEP interconnection request was filed on March 30, 2012. The interconnection fee has been paid and RBEP has a position (pending) in the CAISO queue. Appendix 3A provides a copy of the Generator Interconnection Study documents, proof of payment, and CAISO’s response. This is the equivalent of the “signed System Impact Study Agreement” required of data adequacy requirement B (b)(2)(E). Based on discussions with CAISO, the C5, Phase II is anticipated to start May 1, 2013 and be complete in 205 days or approximately November 22, 2013 (Feusi, 2012).

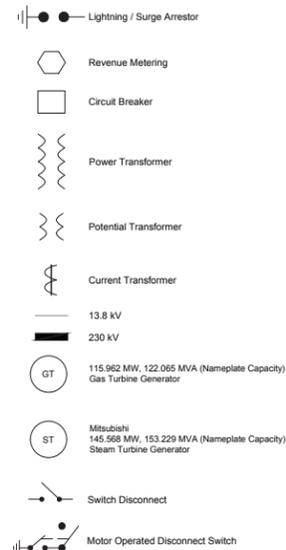
## 3.3 Transmission Line Safety and Nuisances

It is anticipated that no modifications are necessary to the 230-kV transmission lines connecting the SCE switchyard to the CAISO transmission system. The only new transmission line construction will be the onsite 230-kV generation tie line (gen-tie line) that will connect the RBEP power block to the SCE switchyard. Because RBEP is rated lower than the existing Redondo Beach Generating Station units, there will be in a net reduction in the power and current flowing on the transmission lines exiting the power plant site. The following sections discuss the safety and nuisance issues associated with electric transmission lines.

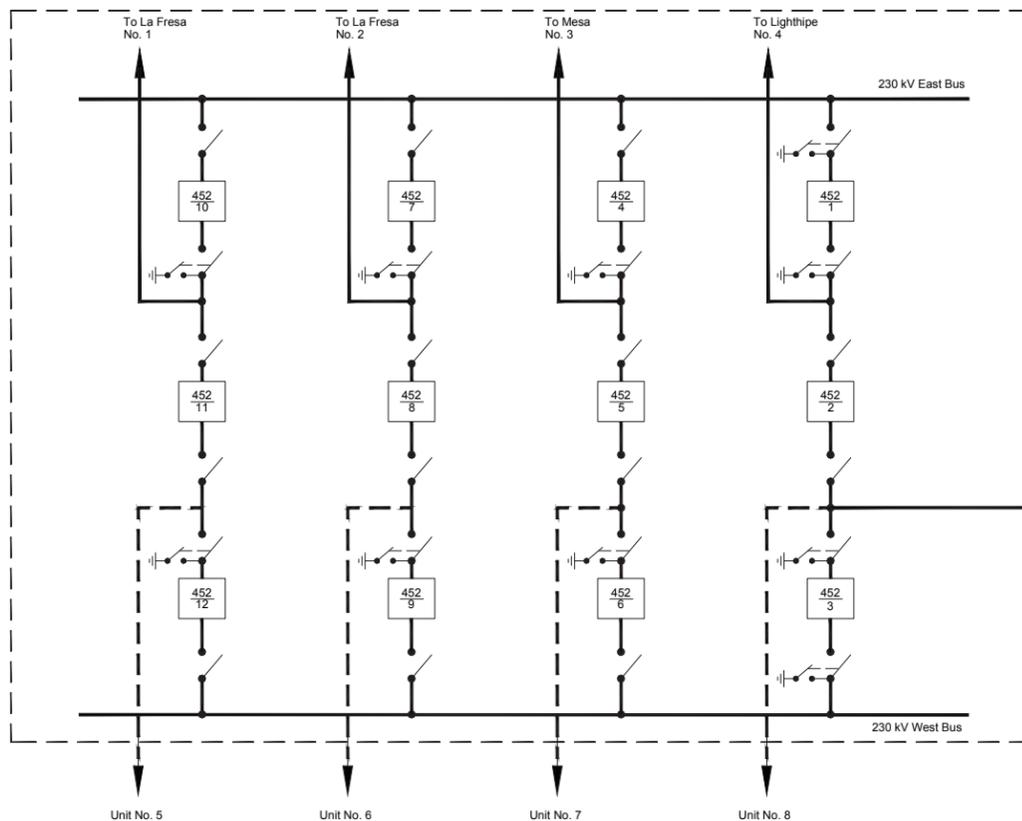


**FIGURE 3.1-1A**  
**One-Line Diagram, Power Island**  
 AES Redondo Beach Energy Project  
 Redondo Beach, California

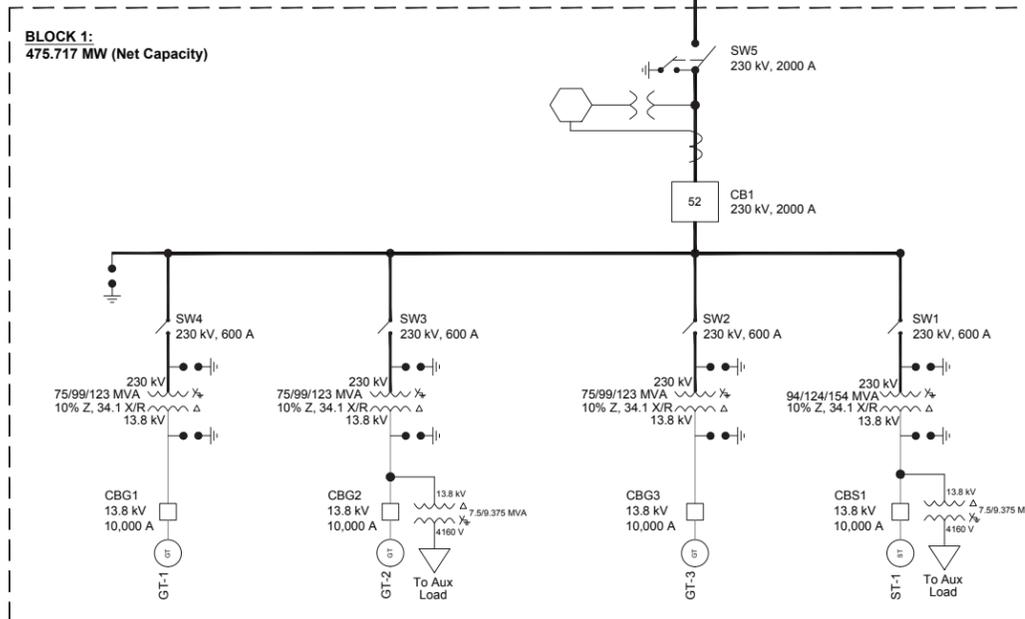
LEGEND



Southern California Edison (SCE)  
230 kV Redondo Beach Switching Station



Transmission Tie Line 937 feet,  
1033.5 ACSS  
 $Z_1 = 0.000030 + j 0.000248$  P.U.  
 $Z_0 = 0.000166 + j 0.000680$  P.U.  
At 100 MVA base

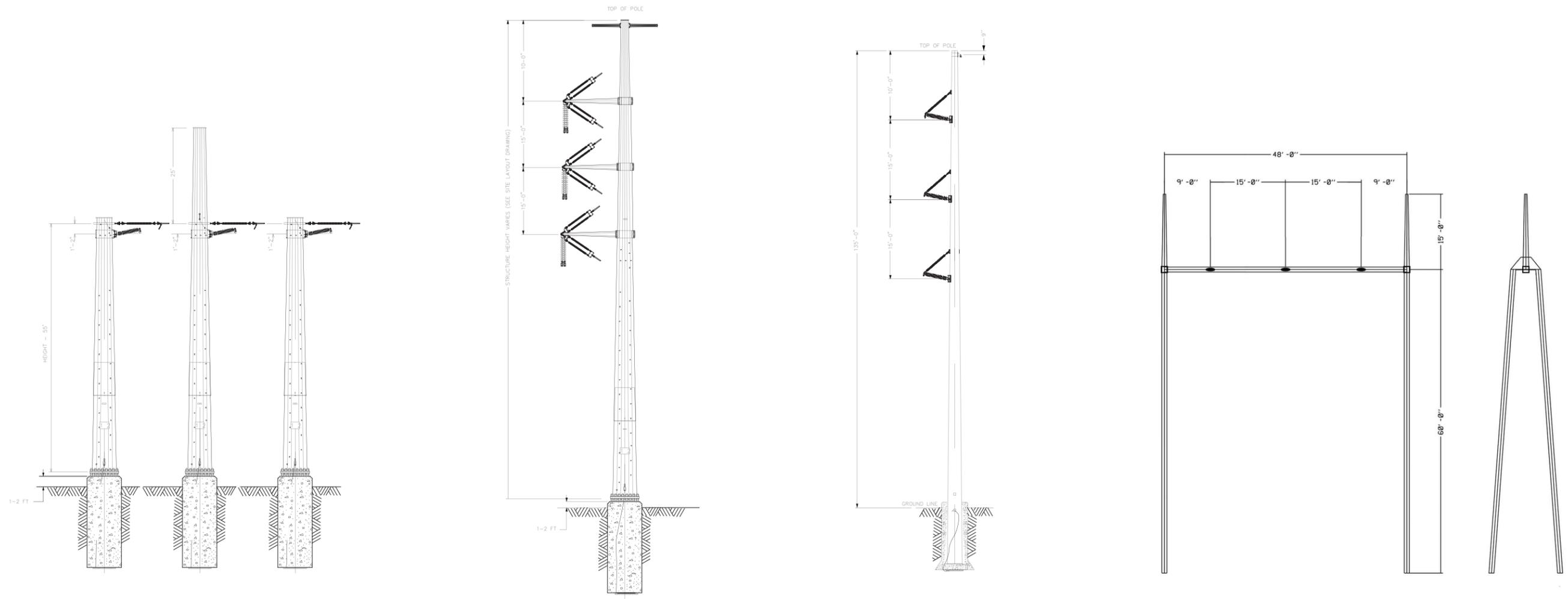


Notes:

1. All circuit breakers are Westinghouse SF-6, 2,000 Amp, 20,000 MVA per SCE drawing 597474, Sh.3.
2. Ground is optional.
3. Total project size is 475.717 MW @ 95% PF (Net Capacity)
4. Existing units 6 & 8 will be retired on June 1, 2018. Existing units 5 & 7 will be retired on October 2, 2018.

FIGURE 3.1-1b  
One-line Diagram, Power Block Connection to Switchyard  
AES Redondo Beach Energy Project  
Redondo Beach, California

NOT TO SCALE



Single Circuit Horizontal Dead End

Single Circuit Dead End Structures: R1-1

Single Circuit Braced Post Structures: R1-2

230 kV 60' A-Frame-Dead End

### 3.3.1 Electrical Clearances

Typical high-voltage overhead transmission lines are composed of bare conductors connected to supporting structures by means of porcelain, glass, or plastic insulators. The air surrounding the energized conductor acts as the insulating medium. Maintaining sufficient clearances, or air space, around the conductors to protect the public and utility workers is paramount to the safe operation of the transmission line. The required safety clearance required for the conductors is determined by considering various factors such as: the normal operating voltages, conductor temperatures, short-term abnormal voltages, wind-blown swinging conductors, contamination of the insulators, clearances for workers, and clearances for public safety. Minimum clearances are specified in the NESC (IEEE C2) and California Public Utilities Commission (CPUC) General Order (GO) 95. Electric utilities, state regulators, and local ordinances may specify additional (more restrictive) clearances. Typically, clearances are specified for the following:

- Distance between the energized conductors themselves
- Distance between the energized conductors and the supporting structure
- Distance between the energized conductors and other power or communication wires on the same supporting structure, or between other power or communication wires above or below the conductors
- Distance from the energized conductors to the ground and features such as roadways, railroads, driveways, parking lots, navigable waterways, and airports
- Distance from the energized conductors to buildings and signs
- Distance from the energized conductors to other parallel power lines

The RBEP 230-kV interconnection to the SCE switchyard will be designed to meet appropriate national, state, and local clearance requirements.

### 3.3.2 Electrical Effects

The electrical effects of high-voltage transmission lines, both within the plant site and outside of the plant site, fall into two broad categories: corona effects and field effects. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware because of high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. Field effects are the voltages and currents that may be induced in nearby conducting objects. A transmission line's inherent electric and magnetic fields cause these effects.

#### 3.3.2.1 Electric and Magnetic Fields

Operating power lines, like the energized components of electrical motors, home wiring, lighting, and other electrical appliances, produce electric and magnetic fields, commonly referred to as electromagnetic field (EMF). The EMF produced by the alternating current electrical power system in the United States has a frequency of 60 hertz, meaning that the intensity and orientation of the field changes 60 times per second.

Electric fields around transmission lines are produced by electrical charges on the energized conductor. Electric field strength is directly proportional to the line's voltage; that is, increased voltage produces a stronger electric field. At a given distance from the transmission line conductor, the electric field is inversely proportional to the distance from the conductors, so the electric field strength declines as the distance from the conductor increases. The strength of the electric field is measured in units of kilovolts per meter. The electric field around a transmission line remains steady and is not affected by the common daily and seasonal fluctuations in usage of electricity by customers.

Magnetic fields around transmission lines are produced by the level of current flow, measured in terms of amperes, through the conductors. The magnetic field strength is also directly proportional to the current; that is, increased amperes produce a stronger magnetic field. The magnetic field is inversely proportional to the distance from the conductors. Thus, like the electric field, the magnetic field strength declines as the distance from the

conductor increases. Magnetic fields are expressed in units of milligauss (mG). The amperes and, therefore the magnetic field around a transmission line, fluctuate daily and seasonally as the usage of electricity varies.

Considerable research has been conducted over the last 30 years on the possible biological effects and human health effects from EMF. This research has produced many studies that offer no uniform conclusions about whether long-term exposure to EMF is harmful. In the absence of conclusive or evocative evidence, some states, California in particular, have chosen not to specify maximum acceptable levels of EMF. Instead, these states, including California, mandate a program of prudent avoidance whereby EMF exposure to the public would be minimized by encouraging electric utilities to use cost-effective techniques to reduce the levels of EMF.

Although California does not have regulatory levels for electric and magnetic fields, the estimated electric field of the existing 230-kV SCE transmission lines at the center of the right-of-way (ROW) from Redondo Beach to La Fresa/Mesa/Lighthipe substations is 0.9 kV/meter, and 0.7 kV/meter at the edge of the ROW. The estimated magnetic field under those lines and at the center of the ROW is 46 mG (0.046 G), and 35 mG (0.035 G) at the edge of the ROW, which are well below regulatory levels established by states that do have limits. Other states have established regulations for magnetic field strengths that have limits ranging from 150 mG to 250 mG at the edge of the ROW, depending on the voltage of the transmission line.

The estimated electric field of the new RBEP interconnection to the onsite SCE switchyard is approximately 0.79 kV/meter under the 230-kV gen-tie line, and 0.25 kV/meter at the project boundary. The estimated magnetic field directly under the gen-tie line is approximately 74.2 mG (0.0742 G), and 17.1 mG (0.0171 G) at the project boundary, which are well below regulatory levels established by states that have limits as stated above.

### 3.3.2.2 Audible Noise and Radio and Television Interference

Corona from a transmission line may result in the production of audible noise or radio and television interference. Corona is a function of the voltage of the line, the diameter of the conductor, and the condition of the conductor and suspension hardware. The electric field gradient is the rate at which the electric field changes and is directly related to the line voltage.

The electric field gradient is greatest at the surface of the conductor. Large-diameter conductors have lower electric field gradients at the conductor surface and, hence, lower corona than smaller conductors, everything else being equal. Also, irregularities (such as nicks and scrapes on the conductor surface) or sharp edges on suspension hardware concentrate the electric field at these locations and, thus, increase corona at these spots. Similarly, contamination on the conductor surface, such as dust or insects, can cause irregularities that are a source for corona. Raindrops, snow, fog, and condensation are also sources of irregularities.

### 3.3.2.3 EMF, Audible Noise, and Radio and Television Interference Assumptions

EMF, audible noise, and radio and television interference near power lines vary with regard to the line design, line loading, distance from the line, and other factors.

Electric fields, corona, audible noise, and radio and television interference depend on line voltage and not the level of power flow. Because line voltage remains nearly constant for the new 230-kV line to the SCE switchyard during normal operation, the audible noise associated with the transmission lines in the area will be of the same magnitude before and after the RBEP.

Corona typically becomes a design concern for transmission lines having voltages of 345 kV and above. Because RBEP's gen-tie line is rated at less than 345 kV and will be constructed on the RBEP property, no corona-related design issues are expected.

The magnetic field is proportional to line loading (amperes), which varies as demand for electrical power varies and as generation from the generating facility is changed by the system operators to meet changes in demand.

The RBEP interconnection to the SCE switchyard will be within the project boundary and will be designed and constructed to avoid audible noise and radio and television interference impacts on the public. The new RBEP interconnection will be the same voltage as the existing Redondo Beach Generating Station's interconnection to the SCE switchyard; therefore, the corona and electric field gradient effects from RBEP are expected to be the

same as the existing condition at the site. The interconnection of the RBEP with SCE's existing switchyard and transmission system, are not expected to result in significant changes in EMF levels, corona, audible noise, or radio and television interference over the existing baseline condition. No changes are proposed for the transmission lines connecting the existing SCE switchyard to the CAISO transmission system.

### 3.3.2.4 Induced Current and Voltages

A conducting object, such as a vehicle or person, in an electric field will experience induced voltages and currents. The strength of the induced current will depend on the electric field strength, the size and shape of the conducting object, and the object-to-ground resistance. When a conducting object is isolated from the ground and a grounded person touches the object, a perceptible current or shock may occur as the current flows to ground. The mitigation for this potential hazardous and nuisance shocks is to ensure that metallic objects on or near the ROW are grounded and that sufficient clearances are provided at roadways and parking lots to keep electric fields at these locations low enough to prevent vehicle short-circuit currents from exceeding 5 milliamperes.

Magnetic fields also can induce voltages and currents in conducting objects. Typically, this requires a long metallic object, such as a wire fence or aboveground pipeline that is grounded at only one location. A person who closes an electrical loop by grounding the object at a different location will experience a shock similar to that described above for an ungrounded object. Mitigation for this potential hazard is to ensure multiple grounds on fences or pipelines, especially those orientated parallel to the transmission line.

The RBEP 230-kV interconnection will be constructed in conformance with CPUC GO-95 and Title 8 California Code of Regulations (CCR) 2700 requirements. Therefore, hazardous shocks are unlikely to occur as a result of construction, operation, or maintenance.

### 3.3.3 Aviation Safety

Federal Aviation Administration (FAA) Regulations, 14 Code of Federal Regulations (CFR) Part 77, establish standards for determining obstructions in navigable airspace and set forth requirements for notification of proposed construction. These regulations require FAA notification for construction over 200 feet above ground level. Notification also is required if the obstruction is lower than specified heights and falls within restricted airspace in the approaches to public or military airports and heliports. For airports with runways longer than 3,200 feet, the restricted space extends 20,000 feet (3.3 nautical miles) from the runway. For airports with runways measuring 3,200 feet or less, the restricted space extends 10,000 feet (1.7 nautical miles). For public or military heliports, the restricted space extends 5,000 feet (0.8 nautical mile).

The nearest public airport to the RBEP is the Zamperini Field Airport in Torrance, California, which is approximately 4 miles to the southeast. The Los Angeles International Airport is approximately 5.8 miles north of the project site. The nearest military airport is the Los Alamitos Army Airfield, which is approximately 20 miles southeast from the RBEP.

In addition to airports mentioned earlier, there are also three private heliports within 5 miles of the RBEP. For public or private heliports, the restricted space extends 5,000 feet (0.8 nautical mile) from the heliport. The three heliports are as follows:

- |                                 |                   |
|---------------------------------|-------------------|
| 1. Cosmodyne Heliport           | 4.1 miles (east)  |
| 2. TRW Manhattan Beach Heliport | 3.4 miles (north) |
| 3. Toyota Helistop Heliport     | 4.6 miles (east)  |

As part of the analysis for RBEP, a FAA Notice Criteria Tool has been used to determine whether RBEP meets Federal Aviation Regulation 77.13 (FAR §77.13) requirements regarding the need to notify FAA of RBEP construction. The notice criteria tool results are provided in Appendix 3B. Although all structures are under 200 feet in height, the FAA criteria tool indicates that the RBEP stacks are located in proximity to a navigation facility and may impact the assurance of navigation signal reception. Based on the results of this evaluation, an FAA Form 7460-1, Notice of Proposed Construction or Alteration has been filed with the FAA and notice of receipt is provided in Appendix 3C. If the RBEP stacks will require marking or lighting, it will be consistent with

requirements found the FAA Advisory Circular No. 70/7450-1G, “Obstruction Marking and Lighting.” See Section 5.6, Land Use, and Section 5.12, Traffic and Transportation, for additional information regarding aviation.

### 3.3.4 Fire Hazards

The existing 230-kV SCE transmission line has been designed, constructed, and maintained in accordance with applicable standards including GO-95, which establishes clearances from other manmade and natural structures as well as tree-trimming requirements to mitigate fire hazards. SCE is expected to maintain the transmission line corridor and immediate area in accordance with existing regulations and accepted industry practices that will include identification and abatement of fire hazards.

The new RBEP 230-kV interconnection will be designed in accordance with applicable standards, including GO-95.

## 3.4 Applicable Laws, Ordinances, Regulations, and Standards

This section provides a list of applicable LORS that apply to electric transmission systems.

### 3.4.1 Design and Construction

Table 3.4-1 lists the LORS for the design and construction of the RBEP onsite 230-kV interconnection.

TABLE 3.4-1  
Design and Construction LORS

LORS	Applicability	Conformance (AFC Section)
Title 8 CCR, Section 2700 et seq. “High Voltage Electrical Safety Orders”	Establishes essential requirements and minimum standards for installation, operation, and maintenance of electrical installation and equipment to provide practical safety and freedom from danger.	Section 3.3
GO-52, CPUC, “Construction and operation of power and communication lines for the prevention or mitigation of inductive interference”	Applies to the design of facilities to provide or mitigate inductive interference.	Section 3.3.2.4
GO-95, CPUC, “Overhead electric line construction”	CPUC rule covers all aspects of design, construction, operation, and maintenance of electrical transmission line and fire safety (hazards).	Section 3.3.1
ANSI/IEEE 593, “IEEE Recommended Practices for Seismic Design of Substations”	Recommends design and construction practices.	Section 3.3.1

ANSI = American National Standards Institute

### 3.4.2 Electric and Magnetic Fields

The LORS pertaining to EMF are listed in Table 3.4-2.

TABLE 3.4-2  
Electric and Magnetic Field LORS

LORS	Applicability	Conformance (AFC Section)
Decision 93-11-013, CPUC	Presents the CPUC position on EMF reduction.	Section 3.3.2.1
GO-131-D, CPUC, “Rules for Planning and Construction of Electric Generation, Line, and Substation Facilities in California”	Establishes the CPUC construction application requirements, including requirements related to EMF reduction.	Section 3.3.2.1
ANSI/IEEE 544-1994, “Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines”	Presents the standard procedure for measuring EMF from an electric line that is in service.	Section 3.3.2.1

### 3.4.3 Hazardous Shock

Table 3.4-3 lists the LORS regarding hazardous shock protection that apply to the transmission interconnection and the overall project. LORS for the overall project are discussed in the appropriate sections of this Application for Certification (AFC). The existing SCE switchyard is within the secured area of the RBEP project site. The SCE switchyard fence is located to protect any person within the RBEP site from entering the switchyard where they could be exposed to associated hazardous shocks resulting from electrical faults from the new RBEP equipment or the SCE high-voltage transmission system.

The new 230-kV interconnection will be designed in accordance with applicable LORS.

TABLE 3.4-3  
Hazardous Shock LORS

LORS	Applicability	Conformance (AFC Section)
8 CCR 2700 et seq. "High Voltage Electrical Safety Orders"	Establishes essential requirements and minimum standards for installation, operation, and maintenance of electrical equipment to provide practical safety and freedom from danger.	Section 3.3.2.4
ANSI/IEEE 80, "IEEE Guide for Safety in Alternating Current Substation Grounding"	Presents guidelines for assuring safety through proper grounding of alternating current outdoor substations.	Section 3.3.2.4
NESC, ANSI C2, Section 9, Article 92, Paragraph E; Article 93, Paragraph C	Covers grounding methods for electrical supply and communications facilities.	Section 3.3.2.4

### 3.4.4 Communication Interference

The LORS pertaining to communication interference are listed in Table 3.4-4.

TABLE 3.4-4  
Communication Interference LORS

LORS	Applicability	Conformance (AFC Section)
47 CFR 15.25, "Operating Requirements, Incidental Radiation"	Prohibits operations of any device emitting incidental radiation that causes interference to communications; the regulation also requires mitigation for any device that causes interference.	Section 3.3.2
GO-52, CPUC	Covers all aspects of the construction, operation, and maintenance of power and communication lines and specifically applies to the prevention or mitigation of inductive interference.	Section 3.3.2.4
CEC staff, Radio Interference and Television Interference (RI-TVI) Criteria (Kern River Cogeneration) Project 82-AFC-2, Final Decision, Compliance Plan 13-7	Prescribes the CEC's RI-TVI mitigation requirements, developed and adopted by the CEC in past citing cases.	Section 3.3.2.2

### 3.4.5 Aviation Safety

Table 3.4-5 lists the aviation safety LORS that may apply to the proposed transmission interconnection and the overall project. LORS for the overall project are discussed in the appropriate sections of this AFC.

TABLE 3.4-5  
Aviation Safety LORS

LORS	Applicability	Conformance (AFC Section)
Title 14 CFR, Part 77, "Objects Affecting Navigable Airspace"	Describes the criteria used to determine whether a "Notice of Proposed Construction or Alteration" (FAA Form 7450-1) is required for potential obstruction hazards.	Section 3.3.3
FAA Advisory Circular No. 70/7450-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting of obstructions as identified by FAA Regulations Part 77.	Section 3.3.3
CPUC, Sections 21555-21550	Discusses the permit requirements for construction of possible obstructions in the vicinity of aircraft landing areas, in navigable airspace, and near the boundaries of airports.	Section 3.3.3

### 3.4.6 Fire Hazards

Table 3.4-6 lists the LORS governing fire hazard protection for the proposed transmission interconnection and the overall project. LORS for the overall project are discussed in the appropriate sections of this AFC.

TABLE 3.4-6  
Fire Hazard LORS

LORS	Applicability	Conformance (AFC Section)
14 CCR Sections 1250-1258, "Fire Prevention Standards for Electric Utilities"	Provides specific exemptions from electric pole and tower firebreak and electric conductor clearance standards, and specifies when and where standards apply.	Section 3.3.4
ANSI/IEEE 80, "IEEE Guide for Safety in AC Substation Grounding"	Presents guidelines for assuring safety through proper grounding of AC outdoor substations.	Section 3.3.4
GO-95, CPUC, "Rules for Overhead Electric Line Construction," Section 35	CPUC rule covers all aspects of design, construction, operation, and maintenance of electrical transmission line and fire safety (hazards).	Section 3.3.4

### 3.4.7 Jurisdiction

Table 3.4-7 identifies national, state, and local agencies with jurisdiction to issue permits or approvals, conduct inspections, or enforce the above-referenced LORS. Table 3.4-7 also identifies the responsibilities of these agencies as they relate to RBEP construction, operation, and maintenance.

TABLE 3.5-7  
National, State, and Local Agencies with Jurisdiction over Applicable LORS

Agency or Jurisdiction	Responsibility
FAA	Establishes regulations for marking and lighting of obstructions in navigable airspace (AC No. 70/7450-1G).
Caltrans Department of Aeronautics	Grants permits to private heliports in California. May advise local jurisdictions regarding obstructions to helicopter navigation.
CEC	Jurisdiction over new transmission lines associated with thermal power plants that are 50 MW or more (Public Resources Code [PRC] 25500).

TABLE 3.5-7  
National, State, and Local Agencies with Jurisdiction over Applicable LORS

Agency or Jurisdiction	Responsibility
CEC	Jurisdiction of lines out of a thermal power plant to the interconnection point to the utility grid (PRC 25107).
CEC	Jurisdiction over modifications of existing thermal power plants that increase peak operating voltage or peak kilowatt capacity 25 percent (PRC 25123).
CPUC	Regulates construction and operation of overhead transmission lines. (GO-95)
CPUC	Regulates construction and operation of power and communications lines for the prevention of inductive interference. (General Order No. 52)
Local Electrical Inspector	Jurisdiction over safety inspection of electrical installations that connect to the supply of electricity (National Fire Protection Association 70).
City of Redondo Beach	Establishes and enforces zoning regulations for specific land uses. Issues variances in accordance with zoning ordinances. However, local review processes are subsumed by CEC review of the project. The CEC construction review process will ensure project conformity with all applicable policies.

## 3.5 Permits and Permit Schedule

No permits are required to comply with the transmission impacts of the project.

## 3.6 References

California Independent System Operator (CAISO). 2008. Generator Interconnection Process Reform, Revised Draft Proposal, June 27, 2008. California Independent System Operator. Available at: <http://www.caiso.com/1f42/1f42c00d28c30.html>.

Feusi, Leslie / CAISO Interconnection Resources, Lead Interconnection Specialist. 2012. Personal communication with Julie Gill/AES SLD. July 24.