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CHAPTER 2 – PROJECT PURPOSE AND NEED

This chapter defines the objectives, purpose, and need for the proposed Sierra Pacific Power Company (SPPCo) 625 and 650 Line Upgrade Project (project), as required by the California Public Utilities Commission (CPUC) Proponent's Environmental Assessment (PEA) Guidelines (CPUC Information and Criteria List, Appendix B, Section V), Working Draft PEA Checklist for Transmission Line and Substation Projects (November 24, 2008), and the California Environmental Quality Act (CEQA) Guidelines (Section 15126.6(a)).

2.0 OVERVIEW

SPPCo has been serving customers in Nevada and northeastern California for over 150 years. Their service territory covers 54,500 square miles, providing electricity to 2.4 million electric customers throughout Nevada and in northeastern California, as well as a state tourist population exceeding 40 million annually. Among the many communities served are Reno-Sparks, Carson City, Elko, Incline Village, and north and south Lake Tahoe. SPPCo also provides natural gas to more than 145,000 customers in the Reno-Sparks area.

SPPCo is proposing this project to maintain a safe and reliable transmission system for the north Lake Tahoe area, while accommodating current and projected growth in the area. Presently, the north Lake Tahoe transmission system does not have adequate single-contingency reliability; therefore, if one of several critical lines is lost as a result of an intense storm event, fire, or downed trees, a severe power outage could occur. Currently, the 625 Line experiences the most outages in the north Lake Tahoe transmission system due to snow loading and downed trees. Additionally, because the line is currently constructed with wood poles, fire danger is an ever-present concern. Single-contingency reliability can be achieved by upgrading the 625 Line and the 650 Line to 120-kV conductors and insulators. Utilizing steel poles will further enhance the reliability of the lines and reduce dependence on the Kings Beach Diesel Generation Station.

2.1 PROJECT OBJECTIVES

The project is being proposed to meet objectives identified by SPPCo and the CPUC. Specifically, the project has the following five primary objectives:

1. To provide reliable capacity during single-contingency outages
2. To provide additional normal capacity for projected future loads in the north Lake Tahoe area
3. To reduce dependence on the Kings Beach Diesel Generation Station
4. To reduce fire hazards and outage durations associated with old wooden poles and encroaching vegetation
5. To provide reliable access to the 625 Line for operation and maintenance activities

To meet the aforementioned objectives, SPPCo is proposing to modify six components of the north Lake Tahoe transmission system. The project components and their locations, and the

existing and proposed system configuration, are presented in Chapter 3 – Project Description. Each of the project objectives is more thoroughly described in this chapter.

2.1.0 Provide Reliable Capacity During Single-Contingency Outages

The existing north Lake Tahoe transmission system is a loop comprised of a series of 60-kV and 120-kV transmission lines running from Truckee to Squaw Valley to Tahoe City to Kings Beach and then back to Truckee. The following lines comprise this loop:

- One 60-kV transmission line (609 Line) and one 120-kV transmission line (132 Line) from Truckee to Squaw Valley
- One 60-kV transmission line from Tahoe City to Squaw Valley (629 Line)
- One 60-kV transmission line from Kings Beach to Tahoe City (625 Line)
- One 60-kV transmission line from Truckee to Kings Beach (650 Line)

All of these transmission lines combined can supply a maximum of 88 megavolt-amperes (MVA) of electricity to the north Lake Tahoe area.

At 60 kV, the system is unable to maintain the necessary capacity to power Kings Beach if the 650 Line is damaged. Likewise, capacity is unable to be maintained to Tahoe City if the 629 Line or 132 Line is damaged, as line losses associated with transmitting electricity around the remaining two legs in the circuit—the 609 and 625 lines—result in significant voltage drops producing brownouts and blackouts. Loss of the 132 Line represents the worst possible outage scenario during winter peak-loading conditions. The capacity of the system during a 132 Line outage is reduced from 88 MVA to 61 MVA (99 to 70 MVA with the Kings Beach Diesel Generation Station providing backup).[1] This is a serious shortfall of needed capacity and would likely result in load curtailment at the areas' ski resorts.

The first leg of the loop, the 132 Line, was constructed at 120 kV, and is backed-up by the much older 609 Line, both of which originate in Truckee and terminate at the Squaw Valley Substation. The upgrade of the 629 Line—which is the second leg of the system—to 120 kV was completed in 2008; however, the line will continue to operate at 60kV until the upgrades to the remaining legs of the system are completed. Once the 625 and 650 lines and associated substations are upgraded to 120 kV, the entire transmission loop will operate at 120 kV and allow for a total capacity of 114 MVA. The benefit of this increase in reliable capacity will be the ability to maintain the current maximum system loads while experiencing an outage on any one of the four legs of the system (single-contingency reliability).

2.1.1 Provide Additional Normal Capacity for Projected Future Loads

The north Lake Tahoe electrical system must be able to supply the maximum load at adequate voltage levels and without overloading the system components. This is referred to as normal capacity. Even though the system will not incur maximum load levels at all times, it must be capable of supplying peak loads whenever they occur. The non-coincident peak levels are the maximum loads incurred for this particular area. Industry accepted planning criteria also requires

[1] SPPCo uses General Electric's Positive Sequence Load Flow software to plan the expansion of future power systems and to manage the operation of their existing system.

the system to supply peak loads with any one component out of service. This is referred to as reliable capacity and is why non-coincident peak levels are used to determine capacity needs. Operating capacity must not be exceeded to the point where system voltage is reduced to 90 percent or an overload occurs.

The north Lake Tahoe transmission system loop has a normal capacity of 88 MVA and experiences peak loads during the winter months. The January 2006 non-coincident peak was 80.1 MVA, the January 2007 non-coincident peak was 67.5 MVA, and the January 2008 non-coincident peak was 92.5 MVA.[2] Overall, population growth in the Lake Tahoe Basin is low and does not drive the load growth. Restrictions on new residential and commercial development keep the growth rate at about 1 percent. Tourism and its accompanying services are the major factors effecting the load growth in the north Lake Tahoe area. In addition, persistent drought in the region has led ski resorts to install snow-making equipment. This technology has been validated over the past several years and more resorts are using snow-making to increase tourism and extend the ski season. In all likelihood, this trend will continue into the future.

In order to arrive at a reasonable load growth rate, 1 to 2 percent was added to the base of 1 percent population growth to allow for the large sporadic growth increases caused by ski resort additions. As a result, the load growth projections for the north Lake Tahoe area are in the 2 to 3 percent range and are the basis for the projected need for increased capacity in the north Lake Tahoe electrical system. Upon completion of the upgrade to 120 kV, the system will be capable of 114 MVA, which will accommodate peak loads and should provide adequate normal capacity to accommodate current and projected growth in the area. At a growth rate of 1, 2, and 3 percent, this capacity would meet the needs of the area for approximately 20, 11, and 8.75 years, respectively.

2.1.2 Reduce Dependence on the Kings Beach Diesel Generation Station

The Kings Beach Diesel Generation Station is capable of providing 11 MVA additional (or back-up) capacity to the north Lake Tahoe transmission system during outages and is currently the only source of the system's single-contingency reliability. Due to limited operating hours imposed by the facility's air quality permit (currently set at 721 hours per year), the preferred use of the facility is to reserve the operating hours for multiple-contingency events (outages on multiple legs of the system). Upon completion of the upgrade to 120 kV, the north Lake Tahoe transmission system will have adequate single-contingency reliability without having to rely upon the generation station. The Kings Beach Diesel Generation Station would remain available for multi-contingency events.

2.1.3 Reduce Fire Hazards and Outage Durations

Four principle mechanisms are responsible for outages associated with the transmission lines, excluding substation issues, in the north Lake Tahoe transmission system:

1. High winds blowing over old poles

[2] Electrical load across the north Lake Tahoe transmission system is greatly affected by the ski resorts in the project area. The January 2007 non-coincident peak may be lower than that from 2006 and 2008 due to these ski resorts using less electricity to operate (e.g., make snow).

2. Trees falling onto the lines
3. Snow loading
4. Forest fires

Rebuilding the transmission lines with new, more robust steel poles and polymer insulators will dramatically reduce the number of outages experienced over the next decade as a result of the aforementioned four factors. As a result of the proposed modifications, outages on the system and fire hazards will be greatly reduced and greater efficiency will be achieved in operating and maintaining the existing facilities.

2.1.4 Provide Reliable Access to the 625 Line

The 625 Line was originally designed and constructed to blend with the existing vegetation and terrain. The path that the alignment travels is not straight and there are significant elevation changes spanned. In addition, there are no established roads to significant portions of the alignment. As a result, it is a challenge to maintain safe and reasonable access to the 625 Line, especially in the winter when heavy snow can further complicate repair and maintenance activities and access.

SPPCo is planning to reroute the 625 Line so that its alignment more closely follows the existing roadways in the project area. More specifically, approximately 10 miles of the new 625 Line will be built generally parallel to Mount Watson Road in order to increase access during construction and maintenance activities. By aligning the 625 Line generally parallel to the Mount Watson Road, maintenance activities will be easier to perform, thus reducing fire risk, outages from downed trees on the lines, and environmental impacts in the event of structure or line failure.

2.2 REFERENCES

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