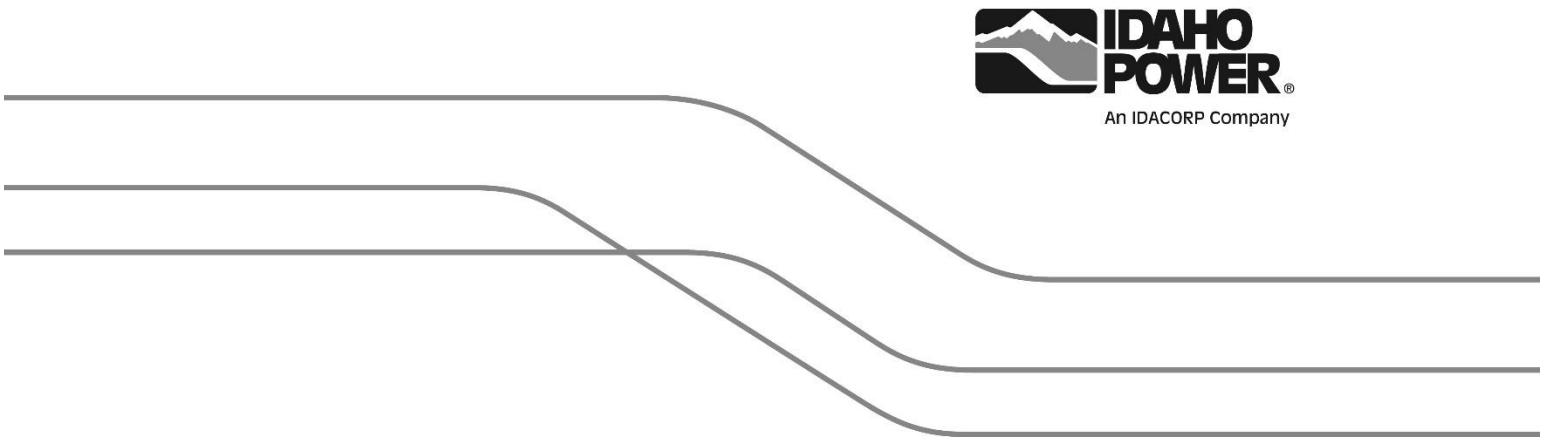

Electrical Plan Update Process

March 2019

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BACKGROUND

Idaho Power Company (Idaho Power), in collaboration with community advisory committees (CAC) has created six electrical buildout plans throughout Idaho and Oregon. The members of the CACs were selected representatives from environmental agencies, various government divisions and jurisdictions, small and large businesses, and community leaders and members. The purpose of each plan was to create a clear and well-documented electrical supply plan to serve customers. The local knowledge and understanding of the CAC members align the electrical plans with community goals and values. The preferred options for future substation locations and transmission line routes identified in the electrical plans will be the first solutions investigated for implementation when required by growth. Individual projects resulting from the electrical plans may require jurisdictional approval, which often includes an open, public siting process. Facilities identified in this plan will be preferred, but are subject to change due to land availability, community and customer preference, and needs discovered during the development phase. Typically, permitting and siting takes approximately 12 to 18 months. Depending on the project scale, construction takes approximately 6 to 12 months. The process may include the following steps:

- Pre-application meeting with jurisdiction to identify the project need and location(s)
- Public Meetings - outreach and open houses with customers, landowners, and stakeholders
    - If several options exist, they can be vetted here to establish a site preference
- Permit Application - development and submission by Idaho Power for consideration and review by jurisdictional planning staff
- Public Hearing - permit consideration and decision by the jurisdictional hearing body
    - Idaho Power presents application including need, location, and site improvements
    - Public opportunity to provide information towards the decision (testimony)
    - Hearing body decision to approve, approve with conditions, or deny application

Idaho Power believes that public engagement during the siting and permitting of facilities is an important part of the planning process. We appreciate a community's willingness to participate in development of the best possible solution to continue to serve customers. We encourage the inclusion of details from this Plan in future iterations of city and county comprehensive plans. This will help communities be aware of future utility facilities during their planning process.

The electrical plans are available on Idaho Power's website at idahopower.com/energy/planning/regional-electric-plans.

PURPOSE OF THE ELECTRICAL PLAN UPDATE

Idaho Power recommends that the electrical plans be updated every 10 years or as needed to keep the information current and relevant. The update process provides an opportunity to incorporate changes to zoning and future land-use maps, as well as current community goals and values. The three goals of the electrical plan update process are the following:

- Review and update the community goals and siting criteria
- Review and update the preferred locations for future substations and transmission lines
- Collaborate planning with local jurisdictions

To promote collaboration between utility and jurisdictional planning processes, jurisdictions are encouraged to include information from the electrical plan in the electrical section of their comprehensive plans.

The electrical plan update process covers transmission lines and substations from 46 kilovolts (kV) to 230 kV. High-voltage transmission lines (345 kV and 500 kV) are outside the update's scope and follow different planning processes. Distribution lines (12.5 kV and 34.5 kV) are also outside the scope of the electrical plan update process.

ELECTRICAL PLAN UPDATE PROCESS

The electrical plan update process follows the general steps outlined below:

- Idaho Power gathers the most recent future land-use maps. Where future land-use maps are not available, zoning maps will be substituted.
- Idaho Power conducts a spatial load forecast (See Appendix B) to determine anticipated buildout load.
    - The anticipated buildout load is reduced by the amount of energy efficiency expected at buildout. The amount of energy efficiency at buildout will be reviewed and updated with each update process. For more information on energy efficiency, visit the Idaho Power website at idahopower.com/save.
    - New technologies and alternative generation can also affect the amount of expected load at buildout. New technologies are considered during each electrical plan update process. Future generation additions are identified through our biennial integrated resource planning process. Information on this process is available on the Idaho Power website at idahopower.com/energy/planning/integrated-resource-plan.
- Idaho Power conducts a series of four to six CAC meetings (See Appendix C) to review and update the electrical plan.
    - Each meeting will last 4 to 6 hours, depending on geographical constraints for the committee traveling to the meetings and the complexity of the electrical plan.
    - The CAC reviews and updates the existing community goals and siting criteria.
    - The CAC reviews the existing electrical plan.
    - The CAC breaks into small groups. Each group develops recommendations for each future substation and transmission line.
    - Idaho Power conducts a technical analysis of the proposed preferred options for each group to ensure they meet the N-1 reliability criteria (See Appendix D).
    - The CAC recommends a single preferred option and potential secondary alternatives for each new substation and transmission line.
    - Idaho Power will update the electrical plan report and submit it to the CAC for review.
- Idaho Power makes the final updated electrical plan available to the public and helps city and county jurisdictions incorporate the updated plan in the electrical sections of their comprehensive plans.

APPENDIX A. GLOSSARY

Buildout—The point in time when all available land is developed according to the land-use ordinances.

CAC —Community Advisory Committee (referred to herein as the Committee).

Demand—The amount of energy used at one time. Measured in megawatts (MW). One MW = 1,000,000 Watts.

Distribution circuits (12.5 to 34.5 kV)—Electrical circuits used to distribute power from distribution substations to homes and businesses throughout the community.

Distribution substation—Substations that serve local loads in urban and rural neighborhoods.

Energy—Amount of power used over time. Measured in kilowatt-hours (kWh).

Energy efficiency—Methods or appliances that assist in saving energy.

High-voltage transmission (230 to 500 kV)—Electrical circuits used to transfer large amounts of power long distances.

Kilovolt (kV)—Unit of measurement of voltage. 1 kV = 1,000 volts.

Load—Cumulative electrical demand from customers in an area.

Megawatt (MW)—Unit of measurement of power. 1 MW = 1,000,000 Watts.

N-1 criteria—A reliability criteria. 'N' stands for 'normal' and represents the power transmission system operating normally with all transmission lines and transformers in operation. 'N-1' indicates the system operating normally, but with the removal of a single transmission line or transformer. If a line or transformer fails (as may happen in the event of a storm or a fire), the system should still be able to perform to reliability standards.

Peak demand—The amount of power used during a peak day in summer or winter. Measured in megawatts (MW).

Power—The rate at which work is performed. Measured in megawatts (MW). One MW = 1,000,000 Watts.

Regional Electrical Plan—Together with local jurisdictions and customers, Idaho Power created Regional Electrical Plans to determine where to construct new facilities to meet customers' energy needs.

Reliability—The degree to which customers can depend on electrical service. Key components of reliability include how often power outages occur, how long the outages last, and how many customers are impacted.

Source substation—Converts high-voltage transmission lines (230 kV and above) to lower voltages (46 to 138 kV). Acts as a power source for distribution substations.

Spatial load forecast—Methodology used to determine buildout load. Demand density is assigned to each future land use designated by local jurisdictions. The buildout load forecast assumes all available land is developed per the land-use ordinances.

Substation—A substation is used to transform one voltage to another and protect and control power lines. Substations include transformers, circuit breakers, switches, support structures, and large metallic pipe, called bus, to connect the components.

Transmission (46 to 138 kV)—Electrical circuits used to transfer power from source substations to distribution substations and between distribution substations.

Voltage—The pressure that moves a current of electricity. Measured in kilovolts (kV) for power lines. One kV = 1,000 volts.

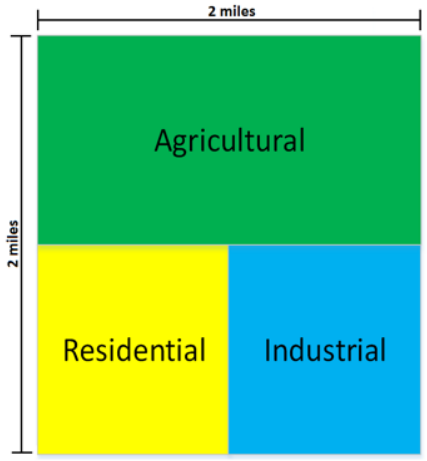
APPENDIX B. SPATIAL LOAD FORECAST

Spatial load forecasting is a method of forecasting the future loads for a defined area by using future land use and zoning designations. For the electrical plan process, spatial load forecasting is used to determine buildout loads for the study area.

The electrical plan spatial load forecasts require the following steps:

- Obtain the most current future land use and zoning designations from the cities and counties.
- Extend future land use and zoning designations to cover all private land within the study area.
    - It is assumed all public land will remain public and require very little power at buildout.
- Assign a load density in megawatts-per-square mile (MW/mi^2) to each future land use or zoning designation.
    - The agricultural, commercial and industrial zoning load densities are estimated based on existing built-out or filled-in areas. For residential zones, 4 kilowatts (kW) per house is used to calculate residential load density.
- Calculate the anticipated buildout load for each zone area by multiplying the area by the assigned load density.
- Calculate the total buildout load by summing the load from all the zones.

Below is an example of a spatial load forecast:



Zoning Description	Load Density (MW/mi^2)	Zone Area (mi^2)	Load (MW)
Agricultural	0.4	2	0.8
Residential	5	1	5
Industrial	45	1	45
Total		**4**	**50.8**

Figure 1: Spatial Load Forecast Example

APPENDIX C. MEETING CONTENT

The agenda for a four-meeting schedule is listed below. Note that more meetings may be required to cover the mapping and recommendation development processes.

Meeting 1

- Introductions.
- Review schedule and objectives.
- Review electrical facilities and utility information.
- Review and update previous community goals and siting criteria.
- Review the previous electrical plan and subsequent changes.
- Review the results of the technical study and any required transmission/substation upgrades.

Meeting 2

- Review reliability criteria and mapping instructions.
- Review and finalize updates to community goals and siting criteria.
- Conduct small-group mapping.
- Invite CAC members to review proposed changes with constituents.

Meeting 3

- Small-group mapping report out.
- Discuss technical review of each group's alternatives.
- Develop a single preferred option with potential secondary alternatives.

Meeting 4

- Review draft electrical plan.
- Discuss public communication and comprehensive plan implementation.

APPENDIX D. (N-1) RELIABILITY ANALYSIS

Idaho Power conducts an (N-1) reliability analysis as part of the electrical planning process. 'N' stands for 'normal' and represents the power transmission system operating normally with all transmission lines and transformers in operation. 'N-1' indicates the system operating normally, but with the removal of a single transmission line or transformer. If a transmission line or transformer fails (as may happen in the event of a storm or a fire), the system should still be able to perform to reliability standards.

Example of a system in normal operation

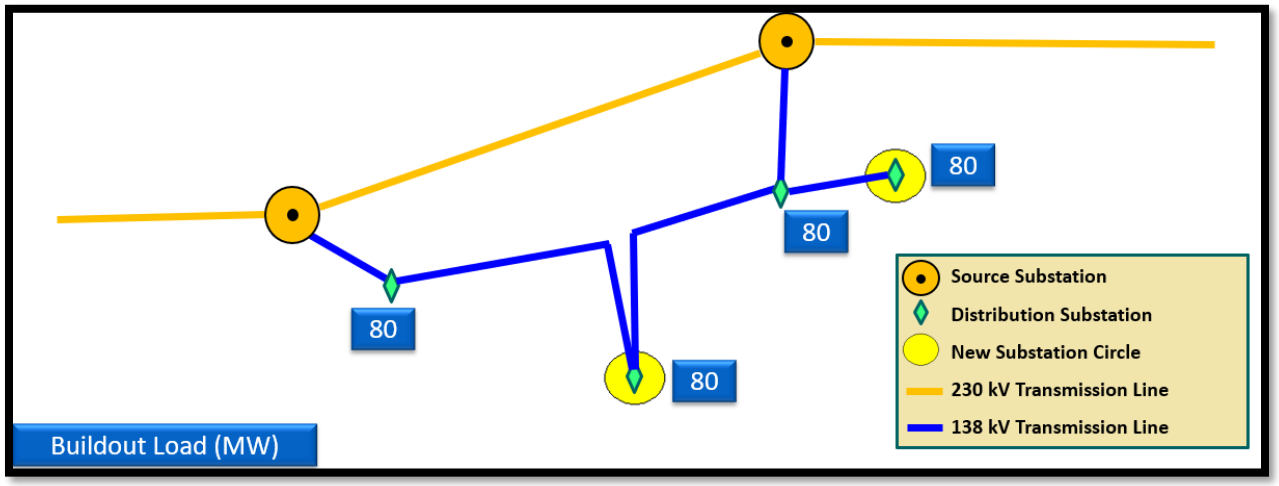


Figure 2: System in Normal Operation

Example of a system in violation of the (N-1) criteria

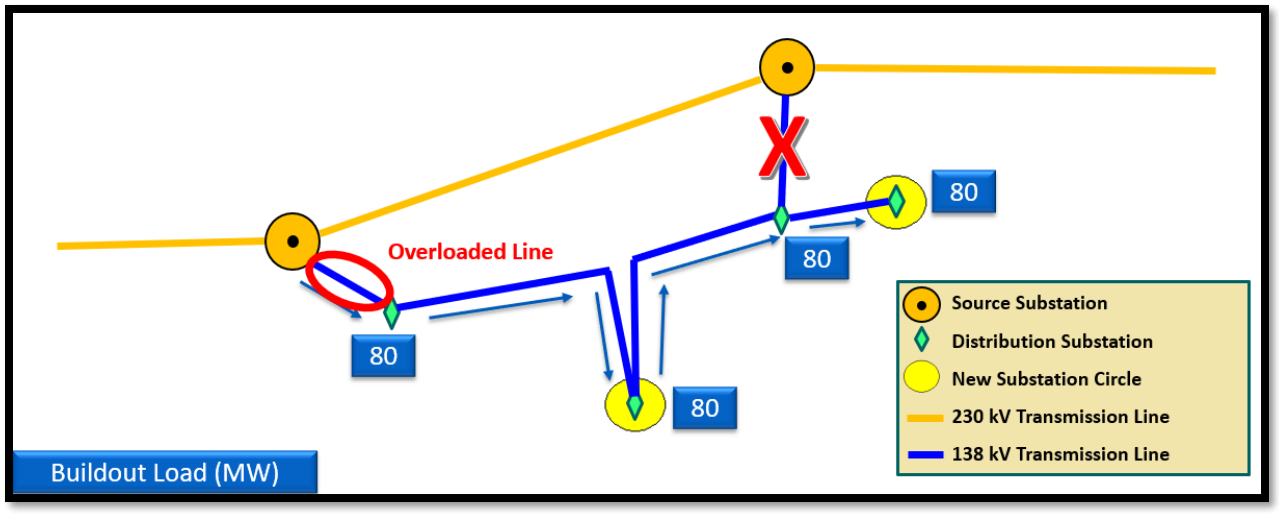


Figure 3: System in Violation of (N-1) Criteria

Example of a system that meets the (N-1) criteria

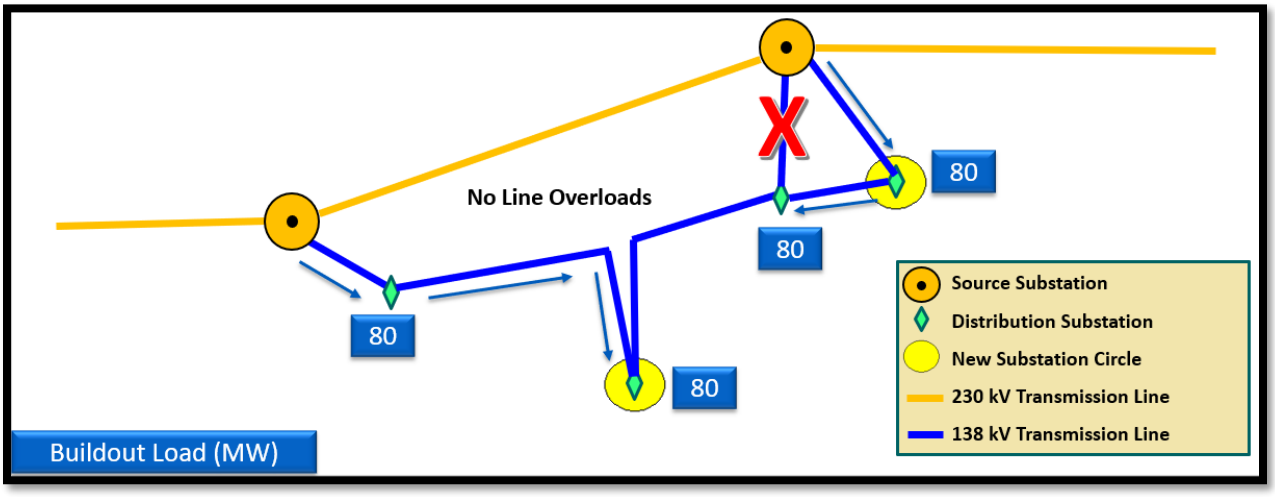


Figure 4: System that Meets (N-1) Criteria