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Liberty Utilities (CalPeco Electric) LLC

2025 General Rate Case

Before the California Public Utilities Commission

Chapter 5: Risk

Tahoe Vista, California

September 20, 2024

Liberty-05: Risk

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I.

RISK

This testimony describes the risk-based decision-making ("RBDM") process and framework at Liberty Utilities (CalPeco Electric) LLC ("Liberty"). The objective is to holistically address the Commission's guidance to the Small and Multi-jurisdictional Utilities ("SMJUs") found in Attachment 3 (the "Voluntary Agreement") to D.19-04-020. The development of Liberty's RBDM framework is an ongoing, multi-year, and collaborative effort involving internal and external stakeholders, other utilities, and the Office of Energy Infrastructure Safety ("OEIS"). The progression of this framework has been an iterative process consistent with the development of Liberty's Wildfire Mitigation Plan ("WMP") and integrates lessons learned, stakeholder feedback, and guidance from OEIS.

A. Description of Risk-Based Methodology

Risk management is a top priority for Liberty. Risk management is an integral component of Liberty's business that affects all levels of the company. It includes identifying, assessing, mitigating, and communicating risks. One of the objectives of Liberty's risk management process is to allow the company to make informed decisions for the business, its operations ,its customers and its stakeholders.

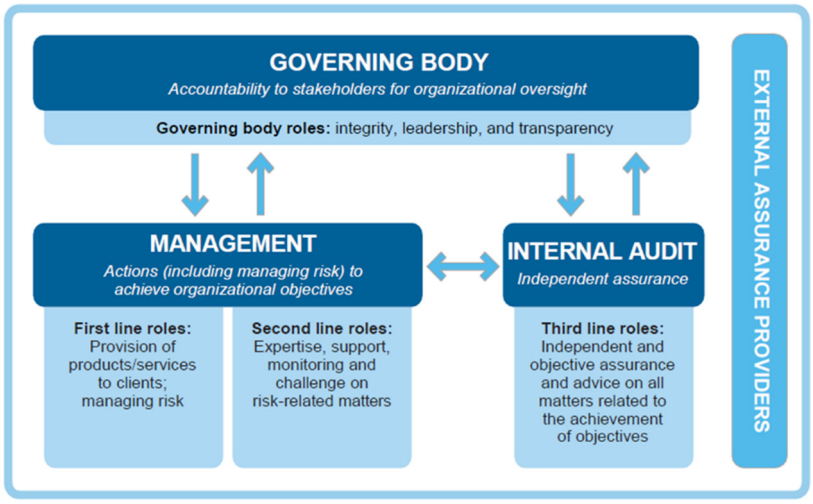
Liberty's Enterprise Risk Management ("ERM") framework is guided by the ISO 31000 codified by the International Organization for Standardization and the Enterprise Risk Management - Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). The ERM Program strives to include the following key elements:

- Establish and oversee a culture of risk by the Board Risk Committee and executive team;
- Develop and maintain appropriate risk policies, processes, and tools;
- Promote a risk-aware culture and accountability;
- Implement risk processes that are consistent and integrated throughout the organization;
- Identify and assess risks that may impact our organization's ability to achieve its objectives;
- Support effective risk mitigation strategies and controls;
- Communication, education, and training of risk processes to internal stakeholders; and
- Comply with applicable laws, regulations, and industry standards related to risk management.

1. Corporate Governance Structure and Leadership

The primary purpose of Algonquin Power and Utilities Corporation ("Algonquin") Board Risk Committee is to assist in Algonquin Board's oversight of its ERM practices and oversee the appropriateness and effectiveness of risk management that identifies and addresses risks faced by Liberty. The Algonquin Board Risk Committee supervises the implementation of Liberty's ERM program, whereby employees at all levels of the Company are responsible for managing the risks. As shown in Figure I-1 below, Algonquin employs a governance structure that utilizes the Institute of Internal Auditor's ("IIA") "Three Lines Model" to manage risks across the enterprise.

Figure I-1
Institute of Internal Auditor's "Three Lines Model"



Liberty's Board of Directors and senior management provide additional oversight of the ERM Program. The Board is integral in supporting the ERM framework, providing leadership in building, communicating, and supporting Liberty's ERM vision, risk culture, and initiatives. Senior management also promotes and utilizes the ERM framework and the associated risk management process applied to business activities.

The Enterprise Risk Management Council ("ERMC") is comprised of members of executive management, internal audit, and the ERM Team. The ERMC's primary purpose is to establish a consistent risk management approach, including but not limited to, providing risk leadership,

development of risk processes, and tools for assessing and mitigating risks. The ERM Team includes the Director of Risk Management, the Manager of Enterprise Risk Management, and Risk Analysts. The ERM team works closely with the first line of defense, business leaders, and employees who may act as Risk Owners. Risk Owner responsibilities include, but are not limited to, identifying, assessing, mitigating, and reporting on risks, providing subject matter expertise throughout the risk process, and providing continuous improvement opportunities to improve risk management. Liberty Utilities West Region has a Risk Advisor who oversees the risk assessment and mitigation process and supports communications to leaders of regulated utilities in California, Arizona, and Texas.

2. ERM Process

The ERM process, as shown in Figure I-2, consists of a cycle of identifying, assessing, mitigating, and communicating risks. Risks are identified using a top-down and a bottom-up approach to classify the greatest areas of concern. Formal risk assessments are conducted on an annual basis and the top risks are assigned Risk Management Action Plans (RMAPs) that are reassessed on a quarterly basis to track mitigation efforts with management sponsorship on a more frequent basis. The top risks are aggregated by region after input from Liberty's shared service organizations (such as regulatory, finance, and IT) that incorporate risk management priorities as part of ongoing business plans and reviews. All employees are encouraged to be the eyes of the company and to follow the guideline of "if you see something, say something."

Figure I-2
ERM Process

Identified risks are evaluated with a standardized risk scoring matrix to assess impact and likelihood. Factors that are considered when determining the impact of a potential risk include: financial, safety, security, reputational, reliability effects, and planned execution. As the ERM process continues, risk information and the methods for controlling those risks are refined and communicated to decision-makers. Although all risks associated with operating an electric utility cannot be eliminated, Liberty strives to manage the risks as much as possible. Liberty continues to develop and refine its risk-based modeling analytics and assessment methods to prioritize its long-term capital investments and operational programs that effectively mitigates safety and reliability risk in a prudent and rational way.

3. <u>Risk Registers</u>

With the guidance and support of the ERM team, risk registers are developed and maintained by Liberty. The standard risk register includes document control (name of the document, location of the business, date, and revision number), and risk information (description of the risk, causes/drivers, risk owner(s), description of impacts and likelihoods using impact and likelihood scales on an inherent and

residual basis, and controls). Risk registers are designed to develop an understanding of the types of risks that are facing Liberty. Risk information in each risk register may vary depending on the risk owner's experience, type, size, and location of the business. Risks may be identified and assessed using tools and techniques including, but not limited to workshops, interviews, existing assessments, and surveys based on qualitative and quantitative analysis. Currently, Liberty has regional level risk registers that highlight top risks across its operations and an effort is underway to develop a risk register that can be managed at an operational level.

4. Risk Mitigation

The risks identified in a risk register are evaluated to determine where mitigation or risk treatment may be required. Examples of appropriate risk treatment may include factors such as determining the benefits derived from reducing risk, costs, efforts, and resources. Mitigation plans are created where necessary and are documented. The goal of a risk mitigation plan is to establish target risk scores, design controls to reduce the impact and likelihood of identified risks to a reasonable level, and to document implementation of risk controls. These plans include pertinent stakeholders and are monitored and reviewed by them periodically.

5. Risk Monitoring and Reporting

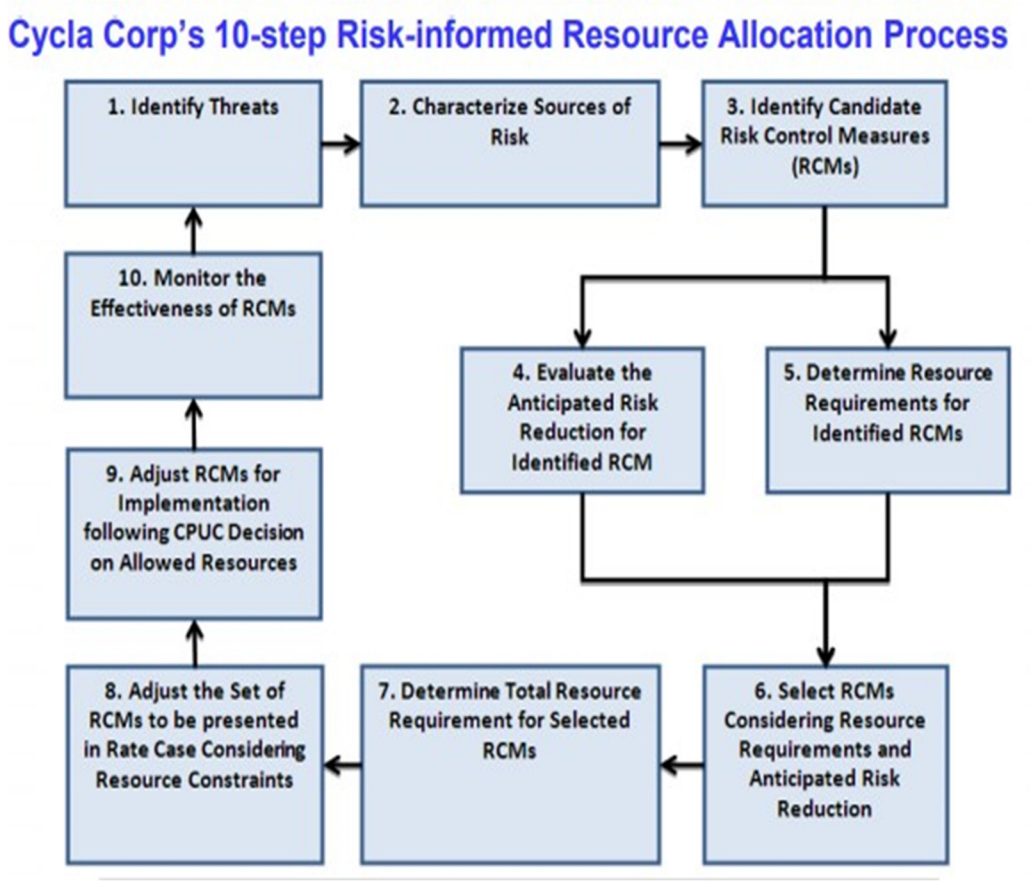
The purpose of monitoring and reporting is to ensure that there is risk mitigation progress, so that reasonable assurances can be given to the Company of its activities and associated risks. Monitoring of risks includes planning, gathering, analyzing information, recording results, and providing feedback. As such, risk registers and mitigation plans are recorded and reported to provide a foundation of risk knowledge to support the risk owner and associated operating units.

B. Comparison with Cycla Ten-Step Approach

Consistent with the Commission's guidance and illustrated in other California electric utility proceedings, Liberty follows the 10-step Risk-informed Resource Allocation Process developed by Cycla Corporation ("Cycla"). The Cycla approach was introduced in various proceedings and endorsed by the Commission in D.16-08-018. The Cycla approach is depicted in Figure I-3, below.[1]

[1] See D.16-08-018, p.17.

Figure I-3
Cycla Corp's 10-step Risk-informed Resource Allocation Process



The 10-step Cycla Risk-informed Resource Allocation Process (the "Cycla Process") includes the following:

1. Identify the threats having the potential to lead to safety risk;
2. Characterize the sources of risk;
3. Characterize the candidate measures for controlling risk;
4. Characterize the effectiveness of the candidate risk control measures (RCMs); in parallel with
5. Prepare initial estimates of the resources required to implement and maintain candidate RCMs;

6. Select RCMs the operator wishes to implement (based on anticipated effectiveness and costs associated with candidate RCMs);
7. Determine the total resource requirements for selected RCMs;
8. Adjust the set of selected RCMs based on real-world constraints, such as availability of qualified people to perform the necessary work;
9. Document and submit the General Rate Case, from which the CPUC decides permissible expenditures, and, based upon CPUC decision, adjust the operator's implementation plan; and
10. Monitor the effectiveness of the implemented RCMs and, based upon lessons learned, begin the process again.

As summarized in Table I-1 below, Liberty's risk management process is based upon the Cycla Process and involves the following steps:

- Risk identification: brainstorming sessions with operations managers and leaders, to develop risk register;
- Analysis: identify risk ownership within the organization, worst-case scenarios, likelihood, and impacts;
- Evaluation and Prioritization: scoring to prioritize risks that may have the most significant impact to safety and reliability;
- Risk Mapping and Modeling: using various software to illustrate and quantify risk reduction from mitigation portfolios;
- Risk-Informed Investment Decisions and Implementation: making and incorporating risk mitigation in capital and operating plans; and
- Risk Monitoring: establishing controls and mitigations to monitor and address risks.

Table I-1
Liberty's Risk Management Process

Liberty	Cycla
1. Risk Identification	Step 1
2. Risk Analysis	Step 2
3. Risk Evaluation and Prioritization	Step 2
4. Risk Mapping and Modeling	Steps 3, 4, and 5
5. Risk-informed Investment Decisions and Implementation	Steps 6, 7, 8, and 9
6. Risk Monitoring	Step 10

C. Identification and Scoring of Top Safety Risks

1. Risk Identification

Liberty has identified the following top risks: wildfire, cybersecurity, employee/contractor safety, public safety, destruction of critical facilities, and distribution asset failure. In its 2022 GRC, Liberty explained its process for determining its most significant risks.[2] This process included the following:

- In-person conferences and a high-level scoring survey. The survey consisted of listing the risks that a utility faces. These risks were previously identified by other California electric utilities as its initial starting point for its RBDM framework. The survey was then provided to subject matter experts and other experienced employees with specialized knowledge within a business unit.
- After identifying the most significant risks, Liberty then looked to identify the risk drivers and outcomes associated with each significant risk. This method of selecting the risk drivers and outcomes was modeled on the bow-tie analysis utilized by the large IOU in their respective Risk Assessment Mitigation Plans ("RAMP") and Safety Model Assessment Proceedings ("SMAP"). Liberty's approach uses the large IOUs' methodology as a starting point and then follows item number one in the Voluntary Agreement: "The utility should adopt the risk scoring mechanism that is best suited to

[2] Liberty 2022 General Rate Case, Chapter 3 – Risk (Rick Dalton), May 28, 2021, pp. 5-8.

their general resources and compliant with the other general principles outlined below. The risk-scoring methodologies adopted by the large utilities may prove instructive."[3]

- In the 2022 GRC, Liberty used a consortium of datasets to complete the risk models for each of its six significant risks, including Responder Outage Management System (Responder), Gensuite reports (for modeling employee and public safety near misses and incidents), claims data, physical security worksheets, wildfire databases developed by the fire engineering consulting firm Reax Engineering (Reax), and financial data to estimate O&M and capital costs of equipment failures. These datasets were accessed to properly derive the risk-driver frequency of occurrences, and the outcome probabilities for the bow-tie structure to evaluate each risk. The time period from 2016-2020 was used to model each of the six significant risks. For future risk modeling that utilizes outage data, Responder has been replaced with Microsoft PowerBI, which is fed from Liberty's Advanced Distribution Management System. Liberty is also developing a more robust RBDM framework, which includes significant updates to its wildfire risk modeling. Please refer to section D.2 below for more information.
- Frequencies from the 2016-2020 risk-drivers were calculated for each risk, which composed the left-hand side of the risk model bow-tie structure. Determining the frequencies to generate probabilities of a risk-driver occurring is critical to the bow-tie structure and the evaluation of mitigations (or a portfolio of mitigations) for implementation since the risk reduction of the mitigations is calculated by the number of potential risk-event occurrences reduced.
- The outcomes for each of the bowties are modeled such that there are three consequential components: financial, safety, and reliability. Each consequence of each outcome will also follow the Commission's guidance from the large IOUs' RAMP and SMAP proceedings, where the parameters for safety must not be less than 50% weight. Here, Liberty will apply 30% weight for serious injuries and 30% weight to fatalities, totaling a 60% safety weight.
- In order to properly model the consequential components of the outcomes from a risk's bowtie structure, Liberty employed Monte Carlo simulations. Monte Carlo simulations

[3] D.19-04-020, April 25, 2019, Attachment III, p. 1.

are the preferred modeling approach when data points are limited, and very little information can be inferred from few observations. Monte Carlo simulations have an advantage over single-point estimators because they use data distributions and their corresponding parameters in order to best capture a range of outcomes. Other IOUs also used Monte Carlo simulations in their risk modeling process. Monte Carlo simulations were conducted with Crystal Ball software, which used 10,000 trials for the analysis.

Since the filing of the 2022 GRC, Liberty has not changed its top safety risks and they remain the same. Due to the level of risk, as well as guidance from OEIS, Liberty has focused extensively on wildfire risk and continued developing its RBDM tools, specifically its wildfire risk model.

2. Risk Based Decision Making Tools

Mitigation Decision Making

Liberty continues to develop and utilize tools that assess the effectiveness of its risk controls and assist in the planning and execution of mitigation work. Recognizing that potential wildfires continue to be Liberty's top risk, quantifying that risk and measuring the cost and effectiveness of related risk controls is critical to successfully maintaining an RBDM platform. Through guidance from OEIS, participation in the joint-utility Risk Modeling Working Group, and collaborations with Direxyon Technologies and Technosylva, Liberty is committed to continuously improving its risk modeling practices. Liberty has a risk model working group that meets regularly to discuss the company's risk model, including but not limited to the company's modeling techniques, data integration, and overall approach to modeling wildfire, asset failure, and PSPS risk in its service territory.

Beginning in June 2023, Liberty began developing an updated RBDM platform. The foundational work needed to create an overall modeling framework was completed in 2023. Liberty then prioritized the continued development and functionality of its wildfire risk and asset failure risk modules. Activities captured in these modules include, but are not limited to, grid hardening and vegetation management WMP initiatives described in Section 8 of Liberty's 2023-2025 WMP. In collaboration with Direxyon Technologies, Liberty has produced functioning models of both vegetation and assets. In doing so, Liberty also better aligned the company's technical and business processes related to risk assessment. Liberty's other objectives for the current WMP cycle include the continued development of the integrated model components and the further integration of asset and vegetation risk. Additionally, Liberty continues to develop a model for PSPS risk analysis.

Overview of RBDM Tools

Liberty's risk assessment framework, models, and processes measure several levels of wildfire, reliability of service, and PSPS risk. This long-term planning risk model has been developed to aid decisions and strategies for the future, with the objective of reducing the overall risk profile. The variables in Liberty's risk platform include topography, vegetation-based fuels, climatology, demographics, historic fire weather days, live and dead fuel moisture samples, and impact to the population. These variables are quantified so that Liberty will be able to identify and monitor areas where the data indicates that a wildfire event is most likely to occur.

Liberty's risk assessment objectives include the following:

- Quantify Liberty's risk spatially and temporally across its service territory using Liberty asset data and the framework data inputs described above.
- Utilize model outputs to conduct long-term planning for the wildfire mitigation strategies and objectives identified in Liberty's Updated 2023-2025 WMP.
- Establish an RBDM platform that provides data-driven insights for Liberty's decision makers to use as guidance for mitigation strategy.

Liberty is collaborating with Technosylva Inc. and Direxyon Technologies to provide a suite of risk assessment tools. Technosylva is an industry recognized provider of wildfire risk solutions with a software package known as Technosylva's Wildfire Analyst ("WFA"). Liberty is utilizing WFA's FireSight application to supplement its long-term mitigation planning and the FireRisk application to supplement tactical, short-term planning for operations, situational awareness, and PSPS decision-making. In addition, and in collaboration with Direxyon, Liberty is developing an asset level risk analysis utilizing data inputs from the WFA products, as well as Liberty's internal asset data and subject matter expert knowledge, to quantify risk at the circuit, segment, and individual asset level.

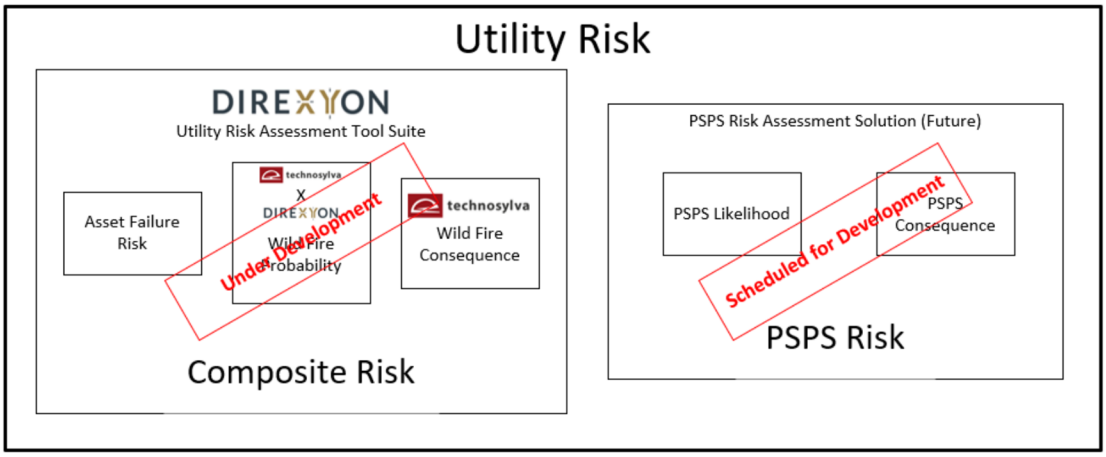
As Liberty's improved RBDM platform progresses, enhancements to wildfire, asset failure, and PSPS risk models will be continually evaluated by collaboration and review from internal and external sources. Through continued development and enhancements, Liberty's aims for its RBDM platform to:

- Quantify wildfire risk at specific locations by measuring the probability and consequence of a fire event occurring;
- Assess the vulnerability of an asset and the risk of a utility caused ignition based on the likelihood and consequence of that asset failing; and

- Analyze PSPS conditions to assess the likelihood and consequence of a PSPS event being initiated.

The RBDM framework is shown schematically in Figure I-4 below.

Figure I-4
Composition of Overall Utility Risk



RBDM Framework Components

Within its RBDM framework, Liberty's composite risk score consists of modules for fire risk and asset failure risk. At a high level, the fire risk module is comprised of models for fire probability and fire consequence, while the asset failure risk module is comprised of models that inform on asset failure probability and consequence.

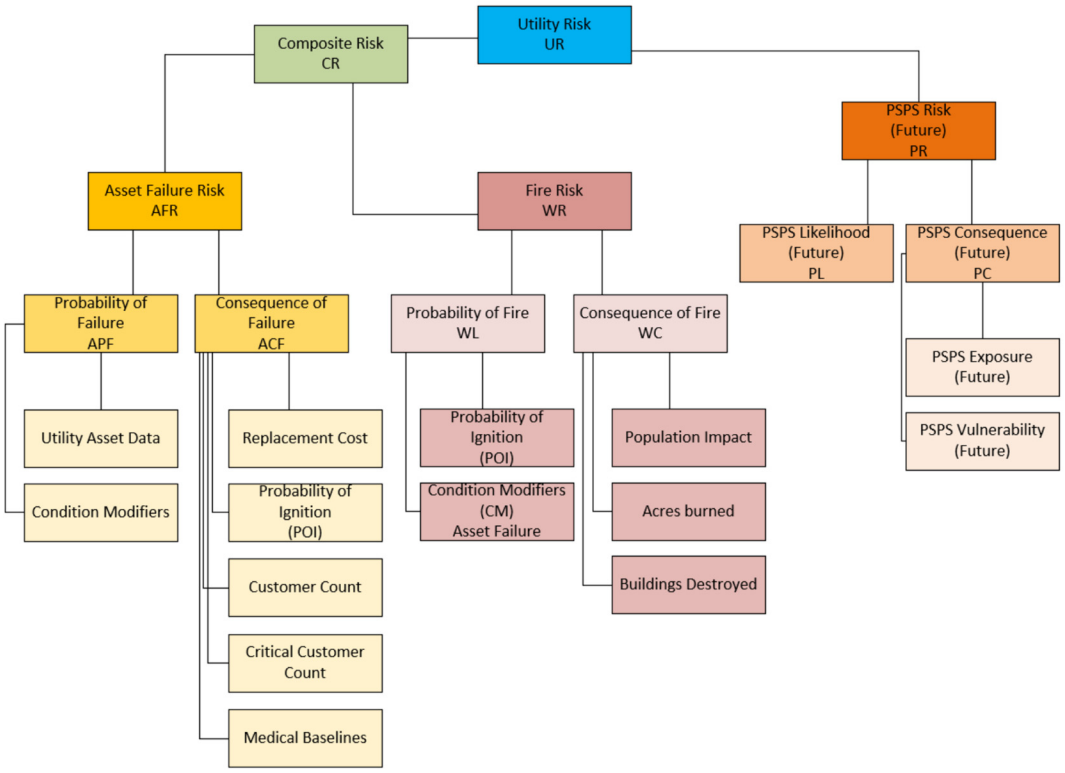
Topography, weather, and vegetation modeling are all factored into the fire risk module. The Asset Failure module includes internal asset data from Liberty's GIS database. It is being developed in collaboration with Direxyon to identify the programs and maintenance activities that would reduce risk at specific locations in the system, such as covered conductor installation, pole replacements, or additional inspections. The creation of a composite risk score using these models will aid Liberty in mitigating fire risk at locations in its service territory where the likelihood and potential consequence for a utility ignited fire is highest.

Currently, Liberty is utilizing the PSPS risk assessment methodology that was developed as part of its 2023-2025 WMP. In the future, Liberty will be implementing PSPS modeling into the Direxyon Risk Assessment Suite to align PSPS risk assessment with asset and fire risk assessments. Liberty's

PSPS risk model will consist of models that assess PSPS likelihood and PSPS consequence to the system, environment, and stakeholders if an event were to occur. Liberty plans to evaluate the development of an incumbent PSPS risk module after the fire risk and asset failure risk modules are implemented in 2024. Upon completion, the PSPS risk module will be combined with Liberty's Composite risk score to produce an overall Utility Risk score.

Liberty's RBDM model framework and components are shown in Figure I-5 below.

Figure I-5
RBDM Framework



The RBDM model framework consists of the following key components:

Utility Risk ("UR"): Throughout the development of the model framework, Liberty has prioritized implementation of its Composite risk score with the intention of shifting efforts to its PSPS risk module once the Composite score is implemented and tested for functionality. Until the PSPS risk module is completed, Liberty will utilize its Composite risk score to quantify overall UR.

Composite Risk ("CR"): CR is comprised of the Asset Failure risk and Fire Risk modules. Liberty utilized the modeling capabilities of Technosylva's WFA and the outputs of Technosylva's FireSight application, specifically the "conditional risk" and "expected risk" attributes, to build these models.

- Fire Risk ("WR"): Direxyon calculates WR at the individual asset level, and the cumulative risk at each level, contributing to the overall fire risk assessment of Liberty's network. WR is calculated based on two components: Probability of Fire – ("WL") and Consequence of Fire – ("WC").
    - Probability of Fire ("WL"): Probability of Fire is accounted for by using models for the Probability of Ignition and the Probability of Asset Failure.
        - Probability of Ignition ("POI") - Liberty utilizes the outputs of Technosylva's FireSight modeling tool to estimate the POI starting from an ignition source given fuel, fuel dryness, and wind conditions. POI determines the probability that a burning material will create a wildfire that requires suppression. POI ranges on a scale from 0 to 1, and is calculated at various ignition points along Liberty's distribution and transmission circuits. FireSight uses the National Fire Danger Rating System to determine the POI.
        - Probability of Asset Failure ("APF") - Liberty utilizes Direxyon's Asset Failure Risk model to identify the probability of failure given specific asset conditions. Adjustments to POF are based on characteristics of assets or mitigations within Liberty's WMP initiatives, such as conductor type and vegetation interventions. These characteristics act as condition modifiers that are calculated by Direxyon and reflect criteria not accounted for by Technosylva. Condition modifiers are necessary to account for the change of conditions over time due to repairs and mitigation work performed since the point in time when POF was calculated. As part of planned additions and enhancements, Liberty will include additional asset types to increase the coverage that APF has over its initiatives.
    - Consequence of Fire ("WC"): Technosylva's FireSight application conducts fire simulations with an 8-hour duration, based on a typical first burning period.

FireSight produces a set of consequence metrics that quantify various fire impacts. These metrics include potential acres burned, population impacted, number of buildings threatened, and estimated number of buildings destroyed. These metric outputs are monitored and used to visualize model results. Utilizing tools developed by Direxyon, Liberty derives fire consequence utilizing FireSight consequence metrics for Acres Burned, Population Impact, and Number of Buildings Destroyed.

- Asset Failure Risk ("AFR"): AFR is derived from the risk scores for APF and Consequence of Failure ("ACF"), which are quantified by Direxyon's modeling tools. AFR allows Liberty to identify those mitigations and programs that will reduce the risk of an asset failing and potentially causing an ignition, as measured by the WL model of the WR module. Liberty's proprietary asset data is utilized as an input to AFR modeling and is used to calculate current and forecasted risk scores for specific asset or mitigation types, as well as Risk Spend Efficiency ("RSE") metrics.
- Liberty's current PSPS risk assessment has two components:
    - PSPS Likelihood: The PSPS likelihood model estimates annualized proactive de-energization rates by circuit. This is accomplished by analyzing historical gridded weather data and climate conditions to determine the annualized likelihood that PSPS thresholds (in terms of ERC percentile, wind gust, and Fosberg Fire Weather Index) will be exceeded for each circuit.
    - PSPS Consequence: The purpose of the PSPS consequence model is to measure the anticipated adverse effects from a PSPS for the community at risk. The average PSPS duration is assumed to be a constant value for every circuit and weather condition such that the PSPS consequence is a function of the demographics of the circuit's customers. Therefore, for each circuit, given the average PSPS duration, the average customer minutes interrupted ("CMI") can be calculated based on the number of total customers expected to be impacted. A multi-attribute value function ("MAVF") that considers safety equivalent facilities ("EF"), financial impacts, and reliability is used to calculate an overall dimensionless score for each circuit. The calculation of safety employs a weighted count of impacted customers that includes extra weight for the number of medical

baseline and critical infrastructure customers expected to be impacted by the de-energized circuit.

Situational Awareness

Liberty utilizes situational awareness support for daily monitoring and assessment of wildfire risk and for planning adjustments to work on days of elevated fire or PSPS risks. Since 2019, this support has been provided by Reax Engineering who analyzed, modeled, and assessed wildfire and PSPS risks and performed continuous weather analysis and forecasting for Liberty. Starting in 2024, Liberty will transition to CloudFire, Inc., a technology and fire protection company led by Dr. Chris Lautenberger, formerly principal engineer of REAX for this support.

In addition, Liberty is planning to add Technosylva's FireRisk application to enhance weather forecasting and fire potential modeling capabilities. FireRisk provides daily asset-based risk forecasting to support operational needs, including all situational awareness needs, such as monitoring conditions for a potential PSPS. The addition of FireRisk will provide near-to-live weather forecasting and help to identify locations and periods of concern in its service territory supports Liberty's ability to identify when PSPS may be warranted. For more information on the decision criteria Liberty utilizes when considering PSPS, refer to Section 9.2 of Liberty's Updated 2023-2025 WMP. Liberty seeks to continuously improve its situational awareness capabilities. The introduction of more frequent weather and fire potential observations to Liberty's operational decision-making process will enhance its ability to predict and prepare for high risk scenarios.

D. Discussion of Each Major Risk and Existing Controls in Place to Mitigate Risks

1. Wildfire Risk

As discussed in section D.1 above, Liberty has continued its focus on wildfire risk as the most significant risk of the top six safety risks identified in the 2022 GRC. Liberty maintains 993 total circuit miles of distribution and transmission lines, serving about 48,000 customers across 1,482 square miles of service territory in the Lake Tahoe basin and surrounding area. Liberty's service territory consists mostly of rural communities with a few urban centers. Most residential customers served reside in single-family homes, town homes, and duplexes. Ninety-five percent of Liberty's customers reside in Wildland-Urban Interfaces (WUIs). In the Lake Tahoe basin service territories, the terrain varies from flat land to steep slopes, ridges, and canyons with dense trees, brush, and timber throughout.

These factors present unique challenges to maintaining safe, efficient and reliable service and the environmental setting of Liberty's service territory presents enhanced fire risk around equipment in the

area. Approximately 93% of Liberty's electrical equipment and infrastructure lies within High Fire-Threat District (HFTD) Tiers 2 or 3 areas. While a more robust risk modeling framework will help identify the areas of greatest concern, nearly the entire service territory requires mitigation work to address significant fire risk. Given the established threat posed by wildfires, and guidance from the Commission and other key stakeholders, Liberty proposes a suite of mitigations in Section D of its 2025 GRC Capital testimony to mitigate ignition probability and the need for PSPS.

a) Existing Controls in Place to Mitigate Wildfire Risk

Details on existing controls and mitigations to address wildfire risk are provided in Liberty's updated 2023-2025 Wildfire Mitigation Plan.[4]

b) Proposed Mitigations to Address Wildfire Risk

Liberty's proposed mitigations to address wildfire risk are detailed in Section D of its 2025 GRC Capital testimony. Liberty's proposed mitigations under its vegetation management program are detailed in Section D.3 of its 2025 GRC Operating & Maintenance and Administrative & General Expenses testimony.

2. Public Safety Power Shutoff ("PSPS") Risk

Liberty has not executed a PSPS since its program was launched in 2019. Liberty is mindful that the decision to de-energize can have significant impact to stakeholders, and considers PSPS as a last-resort wildfire mitigation approach. As discussed in Section D.2 above, Liberty is utilizing its previous PSPS risk assessment methodology that was developed as part of its 2023-2025 WMP. In the future, Liberty will be implementing PSPS modeling into the Direxyon Risk Assessment Suite to align PSPS risk assessment with asset and fire risk assessments. While utilizing the same statistical criteria discussed in Liberty's 2023 WMP to assess the need for PSPS, FireRisk will provide enhanced observational capabilities to Liberty's PSPS team. During the development of Liberty's RBDM platform, assessment of PSPS risk will remain a priority.

As discussed below, previous assessments made by Liberty in collaboration with REAX Engineering for Liberty's 2023 WMP cover PSPS likelihood and consequence and inform Liberty's existing PSPS risk controls.

[4] Liberty 2023-2025 WMP, July 8, 2024.

As described in Section 9.2 of Liberty's Updated 2023-2025 WMP,[5] Liberty uses a combination of Energy Release Component ("ERC") percentile, wind gust, and Fosberg Fire Weather Index ("FFWI") to inform de-energization decisions. The current threshold for most PSPS zones is 40 mph wind gust and FFWI of 50, with slightly higher thresholds for circuits in windier areas.

PSPS Likelihood:

Recent PSPS risk analysis includes estimating the frequency, or likelihood of PSPS event given historic weather data gridded on Liberty's overhead lines. Gridded Real Time Mesoscale Analysis ("RTMA") data was analyzed to estimate the frequency with which Liberty's overhead network is exposed to wind gust and spell out values close to these thresholds. The result of this analysis is shown in Figure I-2 and Figure I-3 for July and November, and the full year detailed months are provided in Appendix B of Liberty's 2023 WMP.[6] The tables provide an estimate of the annualized number of line mile hours that exceed the wind gust and FFWI thresholds by month.

Table I-2
Annualized Line Mile Hours Exceeding Joint FFWI/Wind Gust Criteria by Month, July

		Wind gust (mph)					
		35	**40**	**45**	**50**	**55**	**60**
FFWI	**45**	52	11	2	0	0	0
	50	46	11	2	0	0	0
	55	30	10	2	0	0	0
	60	21	9	2	0	0	0
	65	13	7	2	0	0	0
	70	2	1	1	0	0	0

5 Liberty 2023-2025 WMP, July 8, 2024.

6 Liberty 2023-2025 WMP, October 6, 2023.

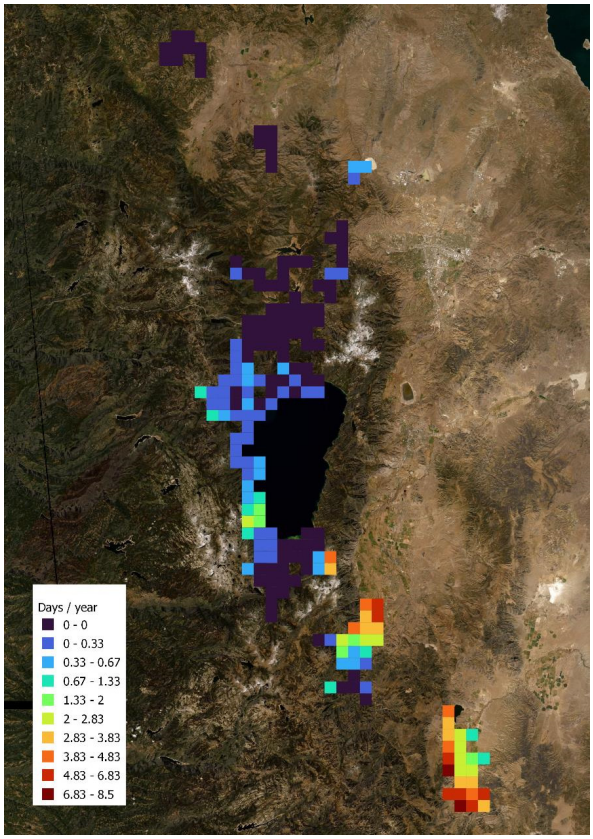
Table I-3
Annualized Line Mile Hours Exceeding Joint FFWI/Wind Gust Criteria by Month, November

		Wind gust (mph)					
		35	**40**	**45**	**50**	**55**	**60**
FFWI	**45**	1,631	1,119	742	463	265	182
	50	1,190	894	587	407	249	178
	55	907	735	515	365	241	176
	60	701	615	452	326	227	165
	65	527	485	384	291	204	155
	70	390	366	302	242	176	139

The monthly results demonstrate that wind gust and FFWI thresholds are conducive to PSPS likelihood year-round and independent of fuel dryness. However, precipitation usually precludes fire spread in Liberty's service territory during the December to April timeframe and these months are not factored into PSPS as a mitigation of fire risk. PSPS is most likely to occur in May to June, during low snow fall years, and from September to November for most years. The results also show that peak PSPS frequency occurs during November, but only in years where season ending precipitation has not occurred. Although fuel moistures may trend toward seasonal lows in July and August, these tend to be the least windy months in Liberty's service territory because incoming weather troughs occur less frequently than later in the year, particularly during October and November.

Although the analysis captures the seasonality of elevated fire weather conditions in Liberty's service territory, it provides no information regarding spatial patterns of elevated fire weather conditions. Another analysis performed on this dataset shows the PSPS risk map of the number of hourly records where wind gust exceeds 40 mph and FFWI simultaneously exceeds 50 in RTMA pixels containing overhead lines. See Figure I-6 for the estimated number of days where wind gust and FFWI exceed thresholds (wind gust > 40 mph and FFWI > 50) by identifying days where 3 or more hourly records exceeded the same thresholds as the total annual hours in the same gridded plot. Since fuel dryness or presence of snow cover was not included in this analysis, Figure I-6 represents an upper limit of expected PSPS frequency, with actual PSPS frequency expected to be considerably lower.

Figure I-6
Number of Days Per Year Where 3 or More Hourly Records Jointly Exceed Wind Gust of 40 Mph and FFWI 50



Based on this analysis, Liberty identified the following circuits as having the greatest risk of PSPS:

- MULLER 1296
- TOPAZ 1261

PSPS Consequence:

The purpose of the PSPS consequence model is to measure the anticipated adverse effects from a PSPS for the community at risk. PSPS consequence modeling is decoupled from PSPS likelihood modeling and can therefore be done independently. The average PSPS duration is assumed to be a constant value for every circuit and weather condition such that the PSPS consequence is a function of the demographics of the circuit's customers. Therefore, for each circuit, given the average PSPS

duration, the average CMI can be calculated based on the number of total customers expected to be impacted. A MAVF that considers safety equivalent facilities ("EF"), financial impacts, and reliability is used to calculate an overall dimensionless score for each circuit. The calculation of safety employs a weighted count of impacted customers that includes extra weight for the number of medical customers and critical infrastructure customers expected to be impacted by the de-energized circuit. For each circuit, the following summary data is recorded:

1. Safety: Safety is quantified in terms of EF, which is estimated by multiplying the expected number of fatalities per CMI (1.5×10-9 EF/CMI30) by the weighted customers. The number of weighted customers is calculated based on the equation below:

$$\text{Weighted Customers} = \text{Safety Multiplier} \times \text{Total Customers} \quad (2)$$

The safety multiplier is calculated based on the equation below:

$$\text{Safety Multiplier} = \frac{30\text{x}(\text{Medical Customers}) + 30\text{x}(\text{Critical Infrastructure Customers}) + (\text{Other Customers})}{\text{Total Customers}}$$

2. Reliability: Reliability is measured by using CMI directly.
3. Financial impacts: Financial impacts are estimated from CMI using an estimated value of $250 per customer per 24-hour period of de-energization (or $0.17 per CMI).

Based on this analysis, the following circuits have the highest PSPS consequence risk:

- MEYERS 3400
- TAHOE 7300
- STATELINE 3101
- MEYERS 3300
- TOPAZ 1261

Evaluating Consequences of PSPS and Wildfire:

To measure the PSPS risk reduction, a baseline PSPS risk and a post-mitigation PSPS risk are calculated for comparison. Liberty calculates baseline PSPS risk utilizing quantitative estimates of PSPS likelihood and PSPS consequence. However, the post-mitigation PSPS risk associated with a wildfire mitigation would be equal to the baseline PSPS risk because the PSPS thresholds (e.g., wind speed, etc.) are not impacted by wildfire mitigation activities such as covered conductor installation. Thus, at present, the PSPS risk reduction associated with covered conductor would be zero.

It would be possible to demonstrate a reduction in post-mitigation PSPS risk if the PSPS thresholds were risk-informed, that is, if PSPS thresholds were based explicitly on the tradeoff between

expected wildfire risk and PSPS risk for a specific circuit. For example, a circuit that supplies power to many customers and has low wildfire risk should have a higher PSPS threshold (and therefore lower PSPS likelihood) than a circuit that supplies power to only a few customers and has high wildfire risk. If PSPS thresholds were risk-informed, then PSPS thresholds should increase for circuits with lower wildfire risk. Therefore, if a given circuit were to have its wildfire risk reduced due to mitigation activities, then its risk-informed PSPS threshold should be increased, thus lowering the likelihood of a PSPS event and its PSPS risk.

3. Cybersecurity Risk

Liberty's critical infrastructure includes its data, Operational Technology ("OT"), and Information Technology ("IT") required to support its utility operations and business functions. Data refers to the information vital for the efficient operation and management of an electrical utility that is generated, collected, processed, stored, and transmitted by the various systems and assets within these essential sectors. Liberty collects, generates, and analyzes various types of data with load data, equipment data, outage data, weather data, data regarding the physical configuration of Liberty's distribution network, and customer data representing types whose protection are most critical. OT includes Liberty's technology supporting physical infrastructure and distribution operations including distribution lines and switches, and other assets that Liberty owns and operates on behalf of its customers. IT is comprised of the systems that Liberty uses to store, process, analyze, and exchange data. Specific types of IT assets include computer hardware, software, and communication technologies.

Common cybersecurity threats or risks to the Company's data, IT, and OT assets include:

- Phishing attacks: These attacks involve sending fraudulent emails or messages that trick users into providing sensitive information such as passwords or confidential information or used to deliver malware.
- Malware attacks: Malware is a type of software designed to damage or disable computers and computer systems. It can infect computers through email attachments, software, or even through social engineering techniques.
- Ransomware attacks: Ransomware is a type of malware that encrypts a victim's files and then demands payment to restore access. It can be delivered through phishing emails, malicious downloads, or compromised websites.
- Denial of Service (DoS) attacks: These attacks overload a company's servers or network with traffic, rendering it inaccessible to legitimate users.

- Insider threats: Insider threats are posed by internal accounts which have access to sensitive data and can intentionally or unintentionally leak, steal, or misuse it.
- Advanced Persistent Threats (APTs): APTs are sophisticated, long-term cyber-attacks that are designed to infiltrate a company's network and extract sensitive data without being detected.
- Zero-day exploits: Zero-day exploits are vulnerabilities in software that are unknown to the vendor and can be exploited by hackers to gain access to a company's systems.

a) Existing Controls in Place to Mitigate Cybersecurity Risks

Liberty's cybersecurity mitigation program focuses on capabilities, including people, processes, and technology, to defend, detect and respond to cybersecurity threats. As stated in Presidential Policy Directive 21, the Energy Sector is uniquely critical by providing an "enabling function" across all critical infrastructure sectors. Algonquin is an owner and operator of critical infrastructure such as electric, gas, water, and wastewater utilities, dams, and communications critical infrastructure. Specific to California, Liberty owns and operates energy critical infrastructure, including electric infrastructure and distribution networking.

Government agencies and other governance bodies provide oversight and guidance to the electric industry on matters of cybersecurity and explain that increasingly onerous compliance and reporting requirements that those entities impose are increasing utilities' costs of meeting their requirements. There are multiple regulatory regimes, Authorities Having Jurisdiction ("AHJs"), and operational frameworks holding oversight mandates. A system of regulations and the means to enforce them, are usually established by a governmental authority to regulate a specific activity and/or assets.

The electric transmission system is regulated by federal and regional AHJs that include the Federal Energy Regulatory Commission ("FERC"), the U.S. Department of Energy ("DOE"), and the North American Electric Reliability Corporation ("NERC"). Various state, city, and county AHJs impose additional requirements. As a result, rules and regulations can be complex and considerable care must be taken to ensure compliance with the various federal, state, and local requirements on an ongoing basis. In addition to the requirements imposed by these entities, there are overarching frameworks, common controls, rules, or organizations that guide Liberty and Algonquin's overall cybersecurity strategies. Included among them are the NERC Reliability Standards, Sarbanes-Oxley Act ("SOX"), International Organization Standardization ("ISO"), National Institute of Standards and Technology ("NIST"), and Liberty's Physical and Cyber Security Plans, Procedures and Reporting requirements

which incorporate five functions encapsulated by NIST's Cybersecurity Framework: identify, protect, detect, respond, and recover (i.e., Figure I-7, below). These are the core elements around which actions are related to our cybersecurity obligations and investments in people, processes, and technologies.

Figure I-7
NIST's Cybersecurity Framework

Each function can be briefly described as follows:

- Identify: Assess and manage risks by identifying assets, systems, and threats to prioritize cybersecurity needs.
- Protect: Implement safeguards to limit the impact of potential cybersecurity incidents on critical infrastructure and services.
- Detect: Continuously monitor systems for signs of breaches or vulnerabilities to swiftly identify and analyze potential threats, both internally and externally.
- Respond: Develop and execute response strategies to contain, mitigate, and eliminate the impact of detected incidents.
- Recover: Implement plans to restore normal operations after an incident, ensuring the organization's resilience and adaptation to evolving threats.

Each of these functions is required for the Company to timely and adequately keep up with ever-evolving threats.

b) <u>Proposed Mitigations to Address Cybersecurity Risks</u>

Liberty proposed mitigations to address cybersecurity risks fall under the "Information Technology" project detailed in Section F of its 2025 GRC Capital testimony.

4. Employee/Contractor Safety Risk

Providing safe and reliable service includes mitigating safety risks to Liberty's employees and contractors.

a) Existing Controls in Place to Mitigate Employee/Contractor Safety Risk

Liberty has multiple controls in place to mitigate safety risks to its employees:

- Monthly safety compliance refresher training;
- Defensive driving training with weekly score and coaching;
- Digital tailboard with real time hazard identification for AQI, weather advisory, and wildfire index;
- Weekly safety summary of incidents and near misses throughout the organization, including lessons learned;
- Monthly Safety Culture Scorecard covering leading and lagging indicators for inspections, leadership engagement, good catches, near misses, safety observation targets, and severity-based incident rate; and
- Safety observations with targets set for leadership team

Liberty has the following controls in place to mitigate safety risk to its contractors:

- Safety observations with targets set for leadership team;
- Digital work permit system with contractors - data from this system is used to enhance hazard identification and workplace safety;
- A safety culture perception survey that provides a comprehensive view of employee and contractor perceptions towards Liberty's overall safety culture and enables proactive planning;
- Site tracker that requires contractors to submit monthly safety performance;
- As part of safety due diligence, Liberty partners with ISN to review and verify contracts, written EHS programs, and track OSHA/EPA citations.

b) Proposed Mitigations to Address Employee/Contractor Safety Risk

To further mitigate safety risks for its employees and contractors, Liberty plans to supplement its existing controls with the following during this GRC cycle:

- Quarterly employee/contractor safety stand downs on shared training topics, including a review of lessons learned from industry incidents;

- Upgrade ISN to use multiple tools that would track individual training qualifications and help to configure training requirements based on project scope;
- Add incident management to ISN requirements, allowing contractors to immediately report onsite incidents from mobile phones or tablets, including incident details, root cause analysis, and corrective actions;
- Include an add-on for subcontractor management to view relationships between a prime contractor and their subcontractors.

OEIS Safety Culture Assessment: The Office of Energy Infrastructure Safety ("Energy Safety") conducted its third annual Safety Culture Assessment ("SCA") of electrical corporations in 2023. Energy Safety directed the process pursuant to the requirements of Public Utilities Code, Section 8389(d)(4). The process was carried out by Energy Safety's SCA contractor. In 2023, Energy Safety's SCA contractor again was the National Safety Council. Energy Safety's SCA is distinct and complimentary to other safety culture assessments required elsewhere in the Public Utilities Code. Energy Safety's SCA specifically focuses on the safety culture present in the wildfire mitigation work setting: the setting most pertinent to risks faced by the wildfire mitigation workforce in terms of personal risk and risks faced by the public in terms of wildfire risk. Energy Safety's goal is to develop a longitudinal view of safety culture across electrical corporations to identify best practices and relative gaps. The 2023 SCA process included a management self-assessment with a summary plan for 2024, 12-month and 3-year safety culture objectives, lessons learned, progress on the 2022 SCA recommendations, a workforce survey, and follow-up interviews.[7]

5. Public Safety Risk

Public safety risk are events involving a member of the public, whether it is with a company employee or contractor or with company infrastructure. Liberty evaluated its public safety risk by reviewing its Gensuite records to note any event for which a member of the public was involved in a near-miss or safety incident. Many of the near-misses or safety events were motor vehicle incidents. Approximately one million miles are driven annually by Liberty employees in the Tahoe area. Such significant travel creates potential public safety risks. The public's contact with overhead lines or digging into underground lines were also identified as a public safety risk for Liberty.

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7 The Office of Energy Infrastructure Safety's 2023 Safety Culture Assessment, Liberty Utilities, Prepared by National Safety Council, March 2024.

a) Existing Controls in Place to Mitigate Public Safety Risk

Liberty currently has the following controls designed to reduce the public safety risks.

Liberty conducts a Smith System's Driver's Training every two years for its employees. In 2023, Liberty also conducted an Off-Road Driver's Training to reduce motor vehicle incident public safety risk.

Liberty strongly warns the public against approaching downed lines or working near overhead lines through demonstrations in schools, community outreach, and symposiums.

Liberty provides hazard awareness training to vendors and contractors and locates underground residential distribution services at no charge.

Liberty also has a no-charge service for de-energizing customer services to enable them to make repairs around or near lines safely.

Liberty provides high voltage demonstration training at public events to educate about potential hazards. Liberty has created a flyer that field personnel are directed to distribute to any contractor or homeowner working near Liberty's power lines. This flyer has information about potential hazards and correct processes needed to mitigate them.

b) Proposed Mitigations to Address Public Safety Risk

The vast majority of investments detailed in Liberty's 2025 GRC Capital testimony are allocated to wildfire mitigation, distribution, and substation projects that address public safety risk by sustaining a safe and reliable distribution system.

6. Destruction of Critical Facilities Risk

Liberty has categorized its risk of impact to critical facilities into two sections: covered substations and office facilities risk. Liberty has 12 covered substations throughout its service territory and two office facilities, one in North Lake Tahoe and one in South Lake Tahoe. Examples of risk-drivers of a critical facilities risk include seismic events, avalanche/landslide, extreme wind conditions, physical attack on substation(s), and building electrical system failure.

a) Existing Controls in Place to Mitigate Destruction of Critical Facilities Risk

Liberty uses data presented in the Commission's Physical Security OIR R.15-06-009 for its covered substation risk analysis. For its office facility risk, Liberty consulted its building safety manager to detail its current controls and prospective mitigations. Both the North and South Lake Tahoe offices were being remodeled in 2022. As part of the remodels, building materials and facilities were upgraded and will offer more protection from above-referenced events that could lead to critical damage.

Increased protections include using fire resistant materials on the exterior wall coverings and seismic retrofits. Additional planned mitigations include removing pine needles from roofs, removing tall trees near the office, and installing security camera upgrades.

In its functional and tabletop PSPS exercises, which are conducted annually, Liberty includes scenarios and prepares for potential impact to external critical facilities. As stakeholders in a potential PSPS, representatives from critical facilities are included as exercise participants and asked to provide feedback on emergency preparedness and communications procedures. Feedback is captured in exercise After Action Reports ("AAR") and incorporated into future exercise planning and is considered when making adjustments to Liberty's PSPS Playbook.

b) Proposed Mitigations to Mitigate Destruction of Critical Facilities Risk

The vast majority of investments detailed in Liberty's 2025 GRC Capital testimony are allocated to wildfire mitigation, distribution, and substation projects that address destruction of critical facilities risk by sustaining a safe and reliable distribution system.

7. Distribution Asset Failure

Another significant risk is the failure of distribution assets. Assets are categorized into substation, overhead, or underground components. Substation assets are the most critical as they affect the most customers. Distribution overhead and underground failures normally have less customer impact, but are closer to customers with less protection. Risks include prolonged outages, nuisance momentary outages, environmental impacts (e.g., transformer spills), and reduced flexibility of the system. The safety risk of Liberty's employees and contractors or the public making physical contact with energized assets are covered in previously discussed safety risk categories. The safety risk from a prolonged outage in harsh winter conditions or in the event of a PSPS are addressed in Liberty's PSPS risk modeling.

Present controls include periodic inspection of the facilities, as well as system protective equipment to quickly clear faults caused by a failed asset (e.g., breaker failure, transformer failure). Overhead and underground facilities are inspected regularly per G.O. 95, G.O. 165, and G.O. 128 requirements. This includes substation breakers, line reclosers, dropout reclosers, overhead fuses, fused padmount switches, and vacuum interrupting padmount switches. Several substation upgrade projects have been underway for several years to upgrade or replace older substation equipment and protective controls.

Proposed mitigations for overhead and underground distribution include Distribution Fault Anticipation ("DFA") technology, underground rebuild projects, overhead rebuild projects, improving sectionalizing of circuits with reclosers and switches, and microgrid solutions

a) Existing Controls in Place to Mitigate Distribution Asset Failure

Present controls include periodic inspection of the facilities, as well as system protective equipment, utilized to quickly clear faults caused by a failed asset (e.g., breaker failure, transformer failure). For overhead and underground assets, the facilities are inspected regularly per G.O. 95, G.O. 165, and G.O. 128 requirements. This includes substation breakers, line reclosers, dropout reclosers, overhead fuses, fused padmount switches, and vacuum interrupting padmount switches. Several substation upgrade projects have been underway for several years to upgrade or replace older substation equipment and protective controls.

b) Proposed Mitigations to Mitigate Distribution Asset Failure

Proposed mitigations for overhead and underground distribution include Distribution Fault Anticipation (DFA) technology, underground rebuild projects, overhead rebuild projects, improving sectionalizing of circuits with reclosers and switches, and microgrid solutions.

E. Risk-Spend Efficiency ("RSE") Calculations

The RSE presented in Liberty's 2022 GRC filing and workpapers are preliminary RSE calculations that have been used qualitatively in decision making activities such as capital planning. More sophisticated RSE calculations for Liberty's current mitigations are planned as part of the scope of work for its development of an RBDM framework, with the help of Technosylva and Direxyon Technologies, as discussed in section D.2 above. Refer to Liberty's 2022 GRC filing and workpapers for more information on its preliminary RSE calculations.[8]

F. Alternative Mitigations

Wildfire mitigations are industry standard; using RSE/RBDM framework to determine level of mitigations; interim mitigations – SRP coverage; monitoring markets/developments for new mitigations;

G. Request for Funding of Mitigations

Liberty's request for funding of the mitigations described above are detailed in its 2025 GRC Capital testimony and Operating & Maintenance and Administrative & General Expenses testimony.

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[8] Liberty 2022 General Rate Case, Chapter 3 – Risk (Rick Dalton), May 28, 2021.

H. Proposed Accountability Reporting and Monitoring of Risk Reduction

As discussed earlier, Liberty complies with the voluntary agreement for SMJU and D.19-040-020 requirements for GRC testimony, risk evaluation, and mitigation support for spending over the GRC cycle. In addition, in July 2020, through R.20-07-013 – Order Instituting Rulemaking to Further Develop a Risk-Based Decision-Making Framework for Electric and Gas Utilities – the Commission refined requirements for integrating risk modeling into the GRC process. SMJU issues related to this proceeding were placed under track 4 and addressed in D.22-10-002 – Addressing Phase 1 Tracks 3 and 4 Issues. As part of this Decision, SMJUs were ordered to implement a series of changes to their Risk Spending Accountability Reports ("RSAR"), including changes to refine cost reporting, cost variance reporting, and identification of WMP programs in GRC applications.[9]

[9] Refer to Liberty's 2022 RSAR.

Appendix A
Witness Qualifications

LIBERTY UTILITIES (CALPECO ELECTRIC) LLC

QUALIFICATIONS AND PREPARED TESTIMONY

OF PETER STOLTMAN

Q. Please state your name and business address for the record.

A. My name is Peter Stoltman and my business address is 701 National Ave, Tahoe Vista, CA 96148.

Q. Briefly describe your present responsibilities at Liberty Utilities (CalPeco Electric) LLC.

A. I am currently the Senior Manager of Wildfire Prevention of Liberty CalPeco.

Q. Briefly describe your educational and professional background.

A. I have been the Senior Manager of Vegetation Management for Liberty Utilities (CalPeco Electric) LLC since June 2023 and was the Manager of Vegetation Management since March 2020. Prior to that, I was a Technical Specialist and Vegetation Management Program Manager for Oncor Electric Delivery Company LLC responsible for the regulatory compliance and maintenance strategy of the transmission and distribution vegetation management programs. I have worked as a consulting arborist in residential, commercial, municipal, and utility industries, and held various related positions in the public and private sector. I am an International Society of Arboriculture (ISA) Board Certified Master Arborist, the highest level of certification offered by ISA. I received a Bachelor of Science Degree in 2005 from the University of Idaho College of Natural Resources where I studied natural resource conservation.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor Chapter 5: Risk.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgement, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.