2017 GRC SED RIBA Presentation

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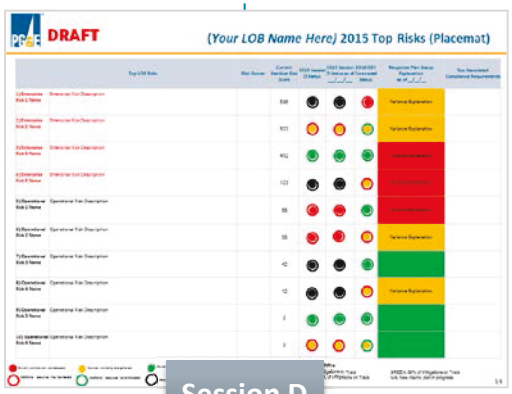
Integrated Planning & RIBA

Session D

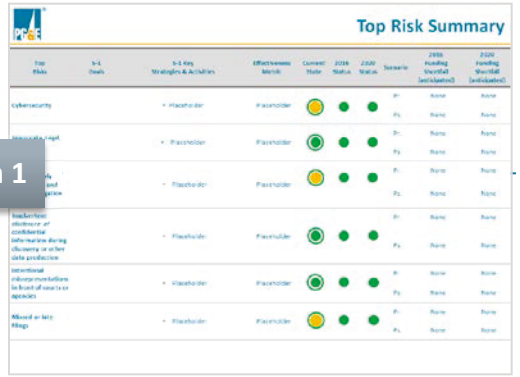
This session focuses on PG&E's top risks and compliance issues. The RET score is used to rank risks from an event, asset, or process level



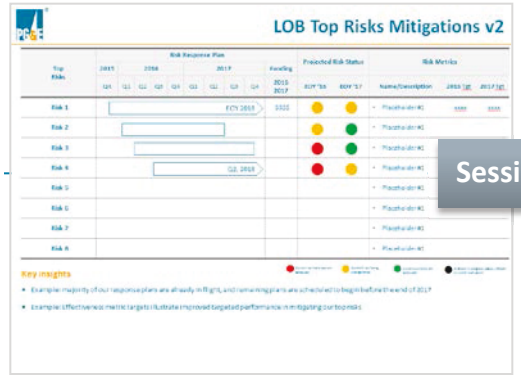
Session D

Session 1

This session discusses strategies for managing LOB priorities, including plans for top risks



Session 1



Session 2

RIBA

RIBA

RIBA ensures that risk informs prioritization discussions; RIBA scores identify the safety, environmental, and/or reliability risks that each project or program aims to prevent

Session 2

This Session prioritizes resources needed in order to execute strategy

RIBA – Scoring Overview

- RIBA is a process that provides a common framework for evaluating work
- Work is evaluated in three components: safety, reliability, and the environment
- Scores for each component are derived by determining the frequency and impact of the worst reasonable direct consequence of not performing the work
- In addition to the score, work is also categorized by drivers such as regulatory compliance, commitment, inter-relationship to other work, etc.

		Impact Levels						
		Negligible	Minor	Moderate	Major	Extensive	Severe	Catastrophic
	Frequency Level	1	2	3	4	5	6	7
Frequency	Common (7)	10	32	100	316	1,000	3,162	10,000
	Regular (6)	6	18	56	178	562	1,778	5,623
	Frequent (5)	2	7	23	74	234	740	2,340
	Often (4.5)	2	7	21	67	211	668	2,113
	Occasional (4)	2	6	18	56	178	562	1,778
	Infrequent (3)	1	4	14	43	135	427	1,351
	Rare (2)	1	3	10	32	100	316	1,000
	Remote (1)	1	2	6	18	56	178	562

***Note**: Each project can mitigate safety, environmental, and reliability risks. These scores are calculated independently and added together. The maximum possible score is 30,000 and the minimum score is 2 (due to rounding).*

What Does RIBA Provide?

Consistency:

- Moves toward a more consistent risk-informed approach to the evaluation and prioritization of work within and across LOBs

Comparability:

- Increases comparability of work portfolios across LOBs during prioritization discussions

Transparency:

- Increases transparency into prioritization decisions to internal and external stakeholders

Key Components of the Process:

- **A common framework for evaluating work.** All capital and expense projects and programs are scored based on safety, reliability, and environmental impacts, and work drivers such as compliance requirements, commitments and financial benefits are flagged
- **Models and subject mater expertise are used to make prioritization decisions.** Model outputs are calibrated and challenged by subject matter experts to arrive at prioritization decisions

How RIBA informs the GRC forecast

- Projects are scored along three dimensions
  - Safety
  - Reliability
  - Environmental
- Projects are flagged based on the driver(s) of the work

- Scorers present their methodology to the broader group to ensure standard application of scoring and flagging taxonomy
- Projects are calibrated within and then across the LOB portfolios

- Prioritization discussions are based on risk scores and flags as well as other considerations (e.g., system and execution constraints)

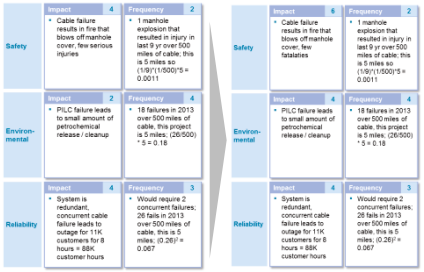
- Confidence using the RIBA process to make budget decisions in current and future years
- RIBA is a tool that helps to risk inform the GRC forecast

Score → Calibrate → Prioritization ↔ Risk-Informed Discussion

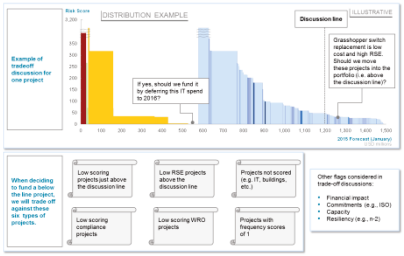
- Subject matter experts

		Impact Levels						
		Negligible	Minor	Moderate	Major	Extensive	Severe	Catastrophic
Frequency	Frequency Level	1	2	3	4	5	6	7
	7	10	32	100	316	1,000	3,162	10,000
	6	6	18	56	178	562	1,778	5,623
	5	2	7	23	74	234	740	2,340
	4.5	2	7	21	67	211	669	2,115
	4	2	6	18	56	178	562	1,778
	3	1	4	14	43	135	426	1,348
	2	1	3	10	32	100	316	1,000
	1	1	2	6	18	56	178	562

- RIBA expanded scoring team participates



- Leadership across the LOB participates

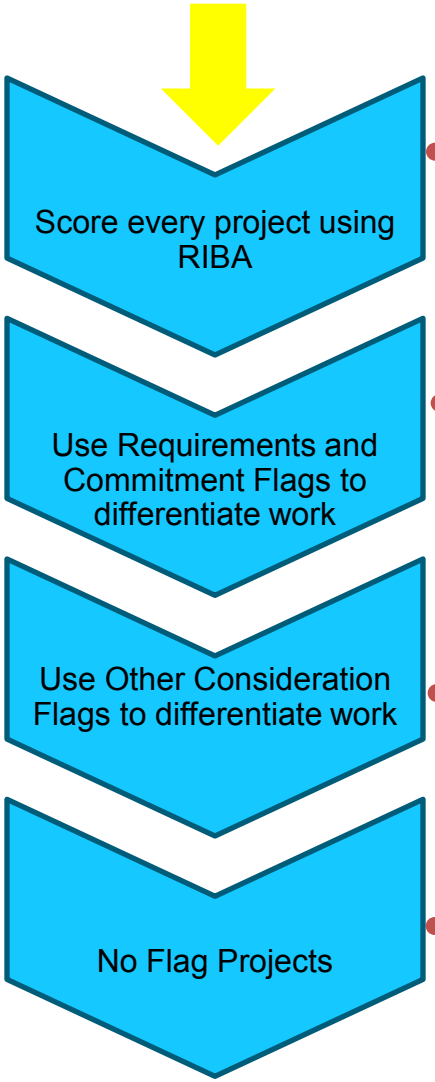


- Executive leadership

	Distribution Expense	Opportunity	Emergent Work / Forecast Increase	Watch
1	Emergency YTD under run $12.1, forecast	$ 6.0		
2	Cancelled orders, safety net payments under run	$ 1.2		
3	UG project tags SF placeholder	$ 1.0		
4	Insulators wash (assess in Sep)	TBD		
5	Idle Facilities investigation (extend program)	TBD		
6	Pole, Test & Treat credits (AT&T)	$ 1.0		
7		$ 9.2		
8	Maintenance unit cost increase		$ (2.5)	
9	Network maintenance unit cost increase		$ (0.9)	
10	Standard Cost Variance - YTD unfavorable		$ (3.4)	
11	Maintenance volume increase / FAS tags		$ (5.6)	
12	Solar applications volume increase		$ (1.6)	
13			$ (14.0)	
14	Major Emergency risk			TBD
15	Ops & Automation (operator HC / cap-exp split) at run-rate			$ (3.7)
16	SCV risk (YTD results extrapolated for remainder of year)			$ (4.0)
17	PCC Reduction 1.5% of DET (1/3 expense)			$ 7.5
18				$ (0.2)
19	Net	$ 9.2	$ (4.8)	$ (5.0)

How RIBA informs the GRC forecast – Electric Operations

All Electric Operations Projects



We start the process by scoring every single project/ project category using RIBA methodology

- Mandatory
- Regulatory Compliance
- New Business/WRO
- Commitment/Rule20A

Work that we have to do regardless of the RIBA score

- In-flight
- Inter-relations
- Support

Other considerations used for prioritization

Projects are prioritized considering RIBA score and impacts to key metrics and initiatives

Scoring is designed around a structured interview with engineers most knowledgeable about the purpose of each project

ILLUSTRATIVE

Capacity project: reconductor Kern-Old River No. 2 70 kV Line (23 miles)

Safety Impact — 1
- No expected impact

Frequency — 1
- No expected occurrence

Env. Impact — 1
- No expected impact

Frequency — 1
- No expected occurrence

Reliability Impact — 4
- WRDI is 5MW of potential load shed next year based on load growth forecast. 5MW equates to approximately 1350 customers based on current MW/customer ratio (8861 customers are currently served by 33MW at Panama).

Frequency — 7
- We came very close to this overloaded condition this year and expect similar conditions next year. Loading is expected to be higher this summer due to the drought. Expected at least 10 days next year for such an overload condition.

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1. Provide **context and rationale** for EO RIBA effort, to support **change management**
2. Work with engineer to understand project and **rationale-** *why* are we doing this work? Is it to mitigate risk, or for another reason?
3. Determine the **Worst Reasonable Direct Impact (WRDI)** that the project is expected to mitigate
4. For each of safety, environmental and reliability, use the 1-7 scoring taxonomy to **determine the impact score for the WRDI**
5. Align with the engineer on the expected **frequency** of the WRDI in each risk area – how often could the adverse outcome occur?
6. Enter all of the data into spreadsheet-based scoring tool, which will capture necessary details (including key flags), and **calculate the overall project risk score**

Frequency (Probability of event)	Impact Levels (Consequence of event)						
	Negligible	Minor	Moderate	Major	Extensive	Severe	Catastrophic
Frequency Level	1	2	3	4	5	6	7
Common (7)	10	32	100	316	1,000	3,162	10,000
Regular (6)	6	18	56	178	562	1,778	5,623
Frequent (5)	2	7	23	74	234	740	2,340
Occasional (4)	2	6	18	56	178	562	1,778
Infrequent (3)	1	5	15	47	150	473	1,495
Rare (2)	1	3	10	32	100	316	1,000
Remote (1)	1	2	6	18	56	178	562

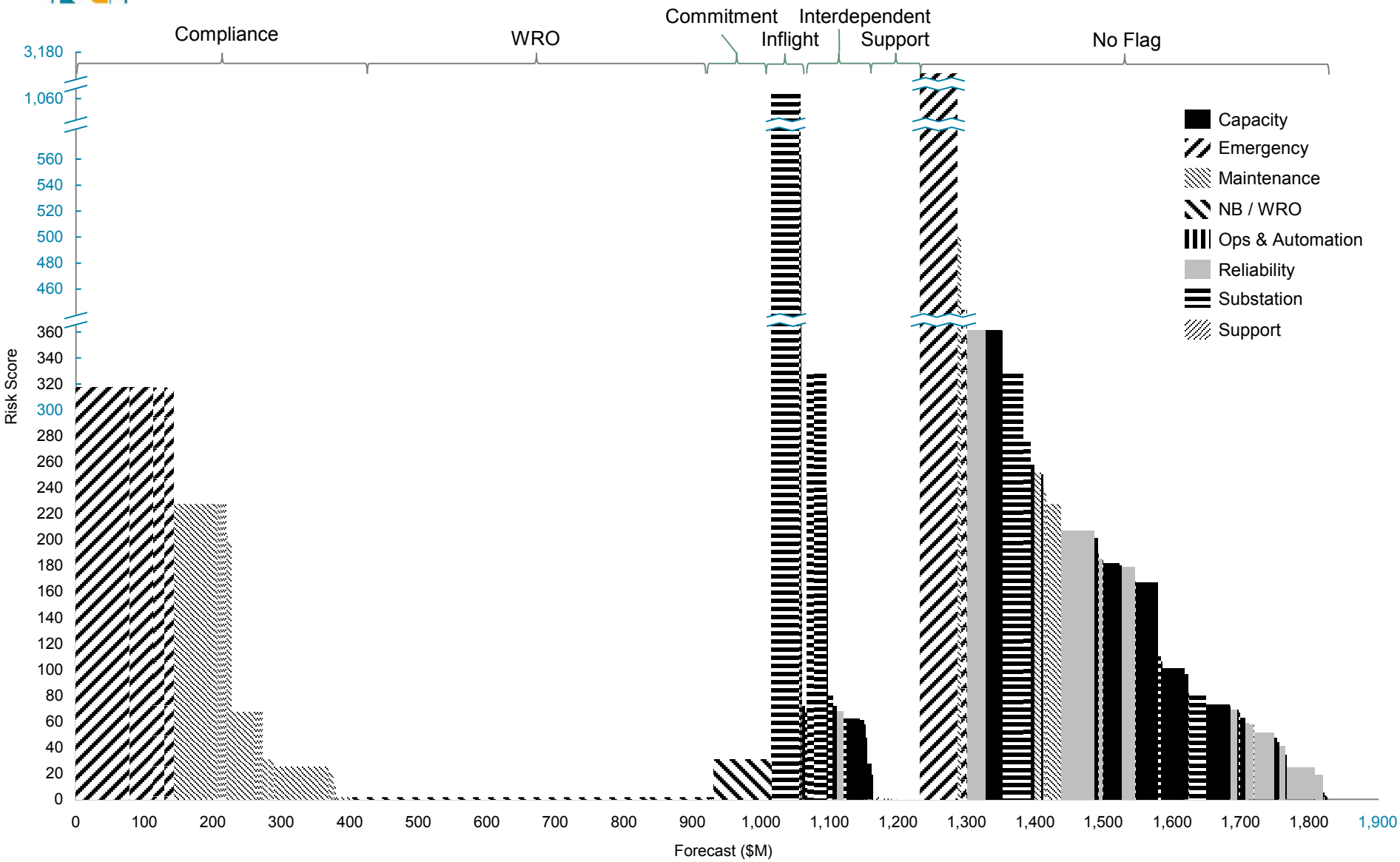
RIBA – 2017 Cross LOB Calibration (GRC Funded Activities)

				Safety			Environmental			Reliability			
LOB	Project Name	MWC	MAT	Impact Score	Frequency Score	Safety Score	Impact Score	Frequency Score	Env Score	Impact Score	Frequency Score	Reliability Score	Total Score
ED	Emergency Replacement , Overall Budget - MWC 59	59	59#	5	7	1000	4	7	316	6	7	3162	4,479
ED	Sub Emergency	59	59#	5	7	1000	4	7	316	6	7	3162	4,479
PG	Helms - Fire Protection Systems	2L		6	7	3162	2	3	4	3	3	13	3,180
ED	Distribution Major Emergency	95	95#	1	1	1	1	1	1	6	7	3162	3,163
PG	Halsey Forebay Dam 1 Leakage Mitigation	2N		7	4	1778	5	4	178	3	4	18	1,974
PG	Wishon Dam Repl Slabs/Joints	2N		6	3	426	5	3	135	7	3	1348	1,909
PG	COURTRIGHT DAM RPL SLAB/JOINTS	2N		6	3	426	5	3	135	7	3	1348	1,909
DCPP	U2: UPGRADE DEG 2-2 LOADING MARGIN	Major	021	4	5	74	3	5	23	6	6	1778	1,876
DCPP	PLO- COM: TORNADO MISSILE LAR (Tornado Missile & Depressurization Analysis)	SP_Reg	070	4	5	74	3	5	23	6	6	1778	1,876
DCPP	COM: LICENSE RENEWAL APPLICATION	SP_Reg	099	3	5	23	3	5	23	6	6	1778	1,825
DCPP	PLO:COM PROCURE CASK-LOAD CAMPAIGN #6	Program	42C	3	5	23	3	5	23	6	6	1778	1,825
DCPP	COM:ISFSI UPGRADE PAD	SP_Reg	42C	3	5	23	3	5	23	6	6	1778	1,825
DCPP	U1: UPGRADE DEG 1-1 LOADING MARGIN	Major	021	3	5	23	3	5	23	6	6	1778	1,825
DCPP	PLO:COM DRY CASK LOAD #5	Program	42C	3	5	23	3	5	23	6	6	1778	1,825
DCPP	COM:Fire Door Upgrade Project	Program	018	2	5	7	2	5	7	6	6	1778	1,792
DCPP	COM:PA SYS PH 2-INSTALL MAUS	SP_Reg	060	2	5	7	2	5	7	6	6	1778	1,792
DCPP	COM:PA SYS PH 2-INSTALL AMP UPS	SP_Reg	060	2	5	7	2	5	7	6	6	1778	1,792
PG	PIT 6 REPLACE SPILLWAY APRON	2L		6	2	316	6	5	740	5	5	234	1,290
DCPP	COM:SIMULATOR H/W AND S/W UPGRADE PH III	Major	099	2	7	32	1	7	10	5	7	1000	1,042
PG	COLEMAN DECOMMISSION ASBURY PIPE	2N		1	7	10	2	6	18	5	7	1000	1,028
ED	Distribution Sub Repl Emergency	59	59A	1	1	1	2	6	18	5	7	1000	1,018
ED	Major Emergency	95	95#	1	1	1	1	1	1	5	7	1000	1,001
PG	Battle Cr Salmon Restoration FERC Lic Am	3H		1	1	1	5	7	1000	1	1	1	1,001
PG	Spring Gap St LC-SandBar Dam Fish Scrns	11		1	1	1	5	7	1000	1	1	1	1,001
PG	HELMS-Repl Valves (8commen - 6 penstock)	2N		6	5	740	1	5	2	5	5	234	976
PG	Helms - U2 generator rotor replacement	2M		6	2	316	1	1	1	5	6	562	879
GD	Leaking Service Replacement	50	50G	6	5	740	1	7	10	1	7	10	760

ILLUSTRATIVE

- Top scoring capital projects discussed at 2017 Cross LOB calibration
- Middle and low scoring projects are also calibrated

2017 Electric Distribution Capital ($millions)



Appendix
RIBA Taxonomy

2017 EXPENDITURE FORECAST TO RISK REGISTER MAPPING
(THOUSANDS OF NOMINAL DOLLARS)

Ex. 4 Total
Exp: $ 722,643 Cap: $ 1,818,975

Expenditures that Align to Risk Register Items

Exp: $ 604,100 Cap: $ 1,155,988

Total – Enterprise Risks
Exp: $ 270,552 Cap: $ 61,626

Risk	Expense	Capital
Wildfire	$ 202,172	$ -
Failure of Substation (Catastrophic)	$ -	$ -
Emergency Preparedness and Response to Catastrophic Events	$ 55,734	$ 61,626
Records Management	$ 10,596	$ -
Cybersecurity	$ 500	$ -
Employee Safety	$ 1,550	$ -
Contractor Safety	$ -	$ -

Total -- Substation Risks
Exp: $ 43,736 Cap: $ 245,977

Substation Risks - General
Exp: $ 28,783 Cap: $ 115,490

Risk	Expense	Capital
Transformers & Voltage Regulators	$ 4,278	$ 39,955
Protective Relays, Instrument Transformers & Station Batteries	$ 4,855	$ 2,876
Voltage & Flow Control Equipment	$ 455	$ 6,209
Circuit Breakers & Switchgear	$ 4,983	$ 73,506
Grounding Systems	$ -	$ 577
Switches	$ 382	$ 665
Unit Substations	$ -	$ 142
Bus Structures	$ -	$ 6,028
Critical Equipment Procurement	$ -	$ -
Seismic Resiliency	$ -	$ 530

Total -- Distribution Overhead Risks
Exp: $ 192,569 Cap: $ 605,380

Distribution Overhead Risks - General
Exp: $ 136,171 Cap: $ 278,866

Risk	Expense	Capital
Conductor Primary	$ 8,988	$ 74,030
Support Structures	$ 26,498	$ 147,153
Line Equipment - Voltage Regulators, Boosters & Capacitors	$ 10,076	$ 27,872
Streetlight Structures	$ 5,028	$ 34,378
Conductor Secondary	$ -	$ 1,234
Transformers	$ 617	$ 13,498
Line Equipment - Protective	$ 5,191	$ 5,841
Encroachment on EO Assets	$ -	$ -
Distributed Generation	$ -	$ 22,509
Contact Voltage	$ -	

Total -- Distribution Underground Risks
Exp: $ 97,243 Cap: $ 243,005

Distribution Underground Risks - General
Exp: $ 80,131 Cap: $ 103,889

Risk	Expense	Capital
Network Components	$ 7,056	$ 13,209
Line Equipment	$ 1,045	$ 48,866
Cables	$ 5,979	$ 60,174
Subsurface & Pad-Mount Transformers	$ 3,032	$ 16,867

Other Work
Exp: $ 118,544 Cap: $ 662,986

	Exp	Cap
New Business, Work-at-the-Request of Others, Rule 20A	$ 32,488	$ 612,157
Distribution Operations	$ 74,820	$ 14,818
Electric Operations Technology	$ 3,580	$ 32,099
Distribution Support Activities	$ 7,655	$ 3,913

Notes:
(1) Substation, Distribution Overhead and Distribution Underground "General" risks represent expenditures that address multiple risks within those systems but a direct allocation is not possible.
(2) Numbers listed in each risk box represent total costs to mitigate the risk, not just the incremental portion.
(3) Gray highlighting denotes risks owned and managed by other lines-of-business. Some expenditures from the forecast for Exhibit 4 map to these items.

Safety Taxonomy

Impact Level	Safety
Catastrophic (7)	o **Fatalities:** Many fatalities and life-threatening injuries to the public or employees.
Severe (6)	o **Fatalities:** Few fatalities and life-threatening injuries to the public or employees.
Extensive (5)	o **Permanent/Serious Injuries or Illnesses:** Many serious injuries or illnesses to the public or employees.
Major (4)	o **Permanent/Serious Injuries or Illnesses:** Few serious injuries or illnesses to the public or employees.
Moderate (3)	o **Minor Injuries or illnesses:** Minor injuries or illnesses to many public members or employees.
Minor (2)	o **Minor Injuries or illnesses:** Minor injuries or illnesses to few public members or employees.
Negligible (1)	o No injury or illness or up to an unreported negligible injury.

Environmental Taxonomy

Impact Level	Environmental
Catastrophic (7)	o **Duration:** Permanent or long-term damage greater than 100 years; or o **Hazard Level/Toxicity:** Release of toxic material with immediate, acute, and irreversible impacts to surrounding environment; or o **Location:** Event causes destruction of a place of international cultural significance; or o **Size:** Event results in extinction of a species.
Severe (6)	o **Duration:** Long-term damage between 11 years and 100 years; or o **Hazard Level/Toxicity:** Release of toxic material with acute and long-term impacts to surrounding environment; or o **Location:** Event causes destruction of a place of national cultural significance; or o **Size:** Event results in elimination of a significant population of a protected species.
Extensive (5)	o **Duration:** Medium-term damage between 2 and 10 years; or o **Hazard Level/Toxicity:** Release of toxic material with a significant threat to the environment and/or release with medium-term reversible impact; or o **Location:** Event causes destruction of a place of regional cultural significance; or o **Size:** Event results in harm to multiple individuals of a protected species.
Major (4)	o **Duration:** Short-term damage of up to 2 years; or o **Hazard Level/Toxicity:** Release of material with a significant threat to the environment and/or release with short-term reversible impact; or o **Location:** Event causes destruction of an individual cultural site; or o **Size:** Event results in harm to a single individual of a protected species.
Moderate (3)	o **Duration:** Short-term damage of a few months; or o **Hazard Level/Toxicity:** Release of material with a moderate threat to the environment and/or release with short-term reversible impact; or o **Location:** Event causes damage to an individual cultural site; or o **Size:** Event results in damage to the known habitat of a protected species.
Minor (2)	o **Duration:** Immediately correctable; or contained within a small area.
Negligible (1)	o Negligible to no damage to the environment.

Reliability Taxonomy

Catastrophic (7)	**Location:** Impacts an entire metropolitan area, including critical customers, or is system-wide; and **Duration:** Disruption of service of more than a year due to a permanent loss to a nuclear facility, hydro facility, critical gas or electric asset; or **Customer Impact:** Unplanned outage (net of replacement) impacts more than 1 millions customers; or EO: 50 million total customer hours, or more than 1 million mwh total load; GO: 10 million total customer hours, or reduction of capacity greater than or equal to 2.1 Bcf/d for 7 months DCPP: 4,000% miss of equivalent forced outage factor and/or availability target PG: 40% or more of utility-owned generating fleet unavailable for 1 year
Severe (6)	**Location**: Impacts multiple critical locations and critical customers; or **Duration**: Substantial disruption of service greater than 100 days; or **Customer Impact**: Unplanned outage (net of replacement) impacts more than 100k customers; or EO: 5 million total customer hours, or more than 100k mwh total load; GO: 1 million total customer hours, or reduction of capacity greater than or equal to 1.2 Bcf/d for 7 months; DCPP: 2,000% miss of equivalent forced outage factor and/or availability target PG: 10% or more of utility-owned generating fleet unavailable for 1 year
Extensive (5)	**Location:** Impacts multiple critical locations or customers; or **Duration:** Disruption of service greater than 10 days; or **Customer Impact:** Unplanned outage (net of replacement) impacts more than 10k customers; or EO: 500k total customer hours, or more than 10k mwh total load; GO: 100k total customer hours, or reduction of capacity greater than or equal to 0.6 Bcf/d for 7 months; DCPP: 500% miss of equivalent forced outage factor and/or availability target PG: 2.75% or more of utility-owned generating fleet unavailable for 1 year
Major (4)	**Location:** Impacts a single critical location; or **Duration:** Disruption of service greater than 1 day; or **Customer Impact:** Unplanned outage (net of replacement) impacts more than 1k customers; or EO: 50k total customer hours, or more than 1k mwh total load; GO: 10k total customer hours, or reduction of capacity greater than or equal to 0.3 Bcf/d for 7 months; DCPP: 100% miss of equivalent forced outage factor and/or availability target PG: 0.75% or more of utility-owned generating fleet unavailable for 1 year
Moderate (3)	**Location:** Impacts a small area with no disruption of service to critical locations; or **Duration:** Disruption of service of up to 1 full day; or **Customer Impact:** Unplanned outage (net of replacement) impacts more than 100 customers; or EO: 5k total customer hours, or more than 100 mwh total load; GO: 1k total customer hours, or reduction of capacity greater than or equal to 0.1 Bcf/d for 7 months; DCPP: 50% miss of ES equivalent forced outage factor and/or availability target PG: 0.20% or more of utility-owned generating fleet unavailable for 1 year
Minor (2)	**Location:** Impacts a small localized area with no disruption of service to critical locations; or **Duration:** Disruption of up to 3 hours; or **Customer Impact:** Unplanned outage (net of replacement) impacts less than 100 customers; or EO: Less than 5k total customer hours, or less than 100 mwh total load; GO: Less than 1k total customer hours, or reduction of capacity greater than or equal to 0.01 Bcf/d for 7 months; DCPP: 5% miss of ES equivalent forced outage factor and/or availability target PG: 0.05% or more of utility-owned generating fleet unavailable for 1 year
Negligible (1)	No reliability to negligible impacts.

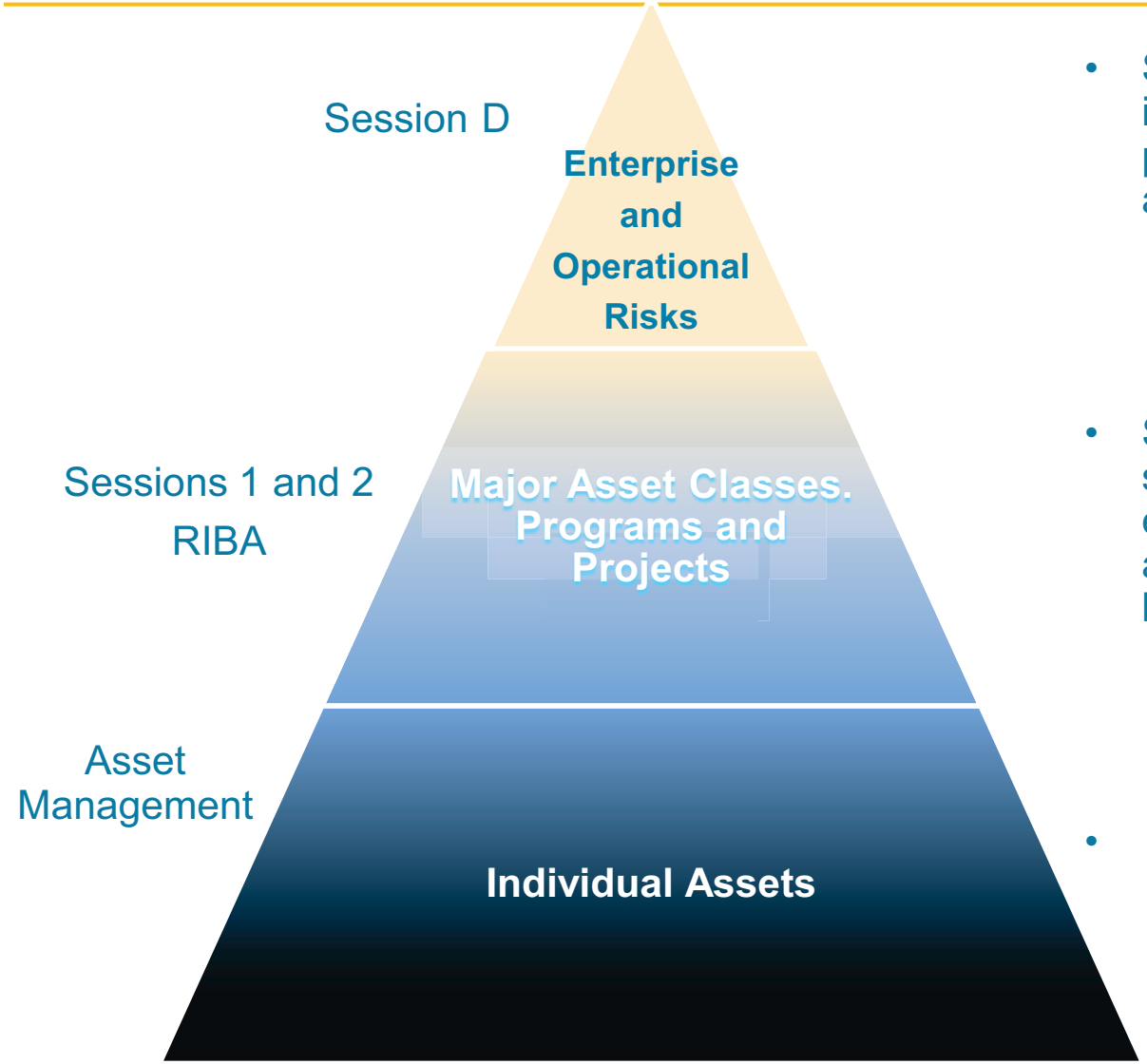
Frequency Taxonomy

Level	Description	Frequency Description	Frequency per year
7	Imminent or Already failed	> 10 times per year	F = 10 - 100
6	Within 1 year	1 - 10 times per year	F = 1 - 10
5	Within 3 years	Once every 1-3 years	F = 0.3 -1.0
4.5	Within 5 years	Once every 3 - 5 years	F= 0.2 -0.3
4	Within 10 years	Once every 5-10 years	F = 0.1 -0.2
3	Within 30 years	Once every 10 - 30 years	F = 0.033 - 0.1
2	Within 100 years	Once every 30 - 100 years	F = 0.01 - 0.033
1	100+ years	Once every 100 + years	F = 0.001 - 0.01

Non-risk Flag Taxonomy

Flag	Definition
Mandatory	Must be conducted in the budget or forecast year to comply with a regulation
Compliance	Work that is required by written regulation, but that does not meet the definition of 'Mandatory'
Commitment	The company has made a specific commitment to completing the proposed work in a public forum or to regulators. Includes Rule 20A work
WRO	Work requested by others spans agricultural-related requests, and new business (customer connections)
Inflight	Under construction or 50% of total expected cost committed as of the beginning of the budget year (e.g. if in 2014 planning for 2015, then as of 1/1/2015). Applies to project work that has a defined scope. For a complete definition of a project refer to the Project approval Procedure, Utility Procedure: PM-1001P-01.
Inter-relationships	Used to indicate that the proposed work either must, or should, be done in conjunction with other work (e.g. opportunity created by a planned outage or having a trench open).
Capacity	Work meant to meet changes in system demand or load growth in the future
Financial Benefits	Hard financial benefits - Any sustainable net cost reduction Soft financial benefits - Any productivity or business improvement
Support	IT Apps & Infrastructure; Tools & Equipment; Fleet; Buildings, Roads and Physical Infrastructure; Training

RIBA Alignment With Overall Risk Management



- Session D (Risk and Compliance) identifies risks and mitigation plans; both are reviewed on an annual basis
- Sessions 1 and 2 (five-year strategic playbook and one-year execution plan) identify strategies and tactical plans that are informed by both Session D and RIBA
- Asset management activities within the LOBs are foundational to risk management

Thank You

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