

# SMAP Workshop

**Janaize Markland**

Director, Enterprise Risk  
Management and Insurance  
PG&E

August 3, 2015

**Jamie Martin**

Director, Economic & Project Analysis  
PG&E





# PG&E Risk Framework + Integrated Planning

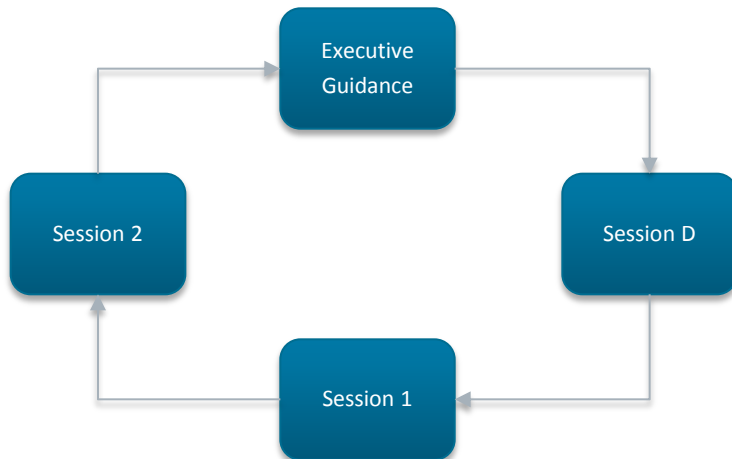
## Risk Management Culture



## Risk Management Framework



## Integrated Planning Process



Output	
Executive Guidance	PG&E's 5-Year Goals
Session D	<ul style="list-style-type: none"> <li>- Risk Register</li> <li>- Discussions on risk management plans and progress</li> <li>- Tools: RET, LOB-Specific models</li> </ul>
Session 1	<ul style="list-style-type: none"> <li>- LOB's 5-year Operating Plan: goals and strategies including risk management objectives</li> <li>- LOB preliminary prioritization of proposed work</li> <li>- Tools: RIBA, LOB-Specific models</li> </ul>
Session 2	<ul style="list-style-type: none"> <li>- LOB's 2-year Execution Plan: work plan, resource plan and detailed budget</li> <li>- LOB prioritization of proposed work</li> <li>- Metrics and targets</li> <li>- Sets the foundation for rate case forecasts</li> <li>- Tools: RIBA, LOB-Specific models</li> </ul>



# Risk Assessment: Risk Evaluation Tool & Risk Taxonomy

- Consistency
- Governance and Oversight
- Communication
- Embedded in Decision Making
- Continuous Improvement

- PG&E benchmarked industry, consulted with experts, and worked with academia (UC Berkeley, Stanford) to solicit input and validate approach.
- Each LOB with functional responsibility for a criteria column (i.e., safety, compliance, environmental, reliability, financial, reputational) provided specific language to articulate each impact level in a consistent way
- Market and Credit Risk Management performed a validation of the model's mathematics and structure.

## Risk Evaluation Tool (RET):

- The Company's 7x7 RET model features:
  - 6 impact categories:** Safety, Environmental, Compliance, Reliability, Trust, Financial
  - 7 impact levels:** Catastrophic, Severe, Extensive, Major, Moderate, Minor, Negligible
  - 7 frequency levels:** Common, Regular, Frequent, Occasional, Infrequent, Rare, Remote

Log-based scale where each bucket is roughly 10x worse than the bucket directly below (frequency and impact).

Four logs over seven frequency groups were used to increase separation between risks.

**Weightings:** Weightings for each of the 6 impact categories are based on the company's goals around Safety, Reliability and Affordability.

- Frequency scale
- Objectives of the company
- Impact scale

Frequency	> 10 times per year	1 - 10 times per year	Once every 1 - 3 years	Once every 3 - 10 years	Once every 10 - 30 years	Once every 30 - 100 years	Once every 100 + years
	F => 10 Common (7)	F = 1 - 10 Regular (6)	F = 1 - 0.30 Frequent (5)	F = 0.20 - 0.10 Occasional (4)	F = 0.10 - 0.03 Infrequent (3)	F = 0.03 - 0.01 Rare (2)	F = <0.01 Remote (1)
Objectives	Safety						
	Environmental						
	Compliance						
	Reliability						
	Reputational						
	Financial						
Impact	Catastrophic (7)	Severe (6)	Extensive (5)	Major (4)	Moderate (3)	Minor (2)	Negligible (1)



# Risk Evaluation Tool

- Consistency
- Governance and Oversight
- Communication
- Embedded in Decision Making
- Continuous Improvement

Pacific Gas and Electric Company  
Risk Evaluation Tool 2.1 (RET2)  
V2.1 D20141001

RET2 Record No	ECTS / Risk ID	Risk Name	Risk Description	Risk Scenario	LOB	Risk Owner	Risk Category	Risk Type	Safety Impact		Environmental Impact		Compliance Impact		Reliability Impact		Trust Impact		Financial Impact		
									Proposed	Safety Impact Justification	Proposed	Environmental Impact Justification	Proposed	Compliance Impact Justification	Proposed	Reliability Impact Justification	Proposed	Trust Impact Justification	Proposed	Financial Impact Justification	Overall Impact Justification
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					
16																					
17																					

Pacific Gas and Electric Company  
Risk Evaluation Tool 2.1 (RET2)  
V2.1 D20141001

RET2 Record No	ECTS / Risk ID	Risk Name	Risk Description	Risk Scenario	LOB	Risk Owner	Risk Category	Risk Type
1								
2								
3								
4								
5								
6								
7								
8								
9								

## The tool is comprised of the following features:

- Input fields that match the risk database (for easy upload/translation of data)
- Three scoring sections for:
  - Inherent residual score
  - Current residual score
  - Forecasted residual score
- Drop down selection boxes for each impact category to input impact level
- Frequency override option if data is available
- Justification boxes for each impact criteria + frequency



# Risk Evaluation Tool

- Consistency
- Governance and Oversight
- Communication
- Embedded in Decision Making
- Continuous Improvement

Pacific Gas and Electric Company  
Risk Evaluation Tool 2.1 (RET2)  
V2.1 D20141001

RET2 Record No	EGTS / Risk ID	Risk Name	Risk Description	Risk Scenario	LOB	Risk Owner	Risk Category	Risk Type	Safety Impact		Environmental Impact		Compliance Impact		Reliability Impact		Trust Impact		Financial Impact		Overall Impact Justification	
									Proposed	Safety Impact Justification	Proposed	Environmental Impact Justification	Proposed	Compliance Impact Justification	Proposed	Reliability Impact Justification	Proposed	Trust Impact Justification	Proposed	Financial Impact Justification		
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						
16																						
17																						
18																						

**Safety Impact**

Proposed

Safety Impact Justification

Proposed

Envir

(01) Negligible  
(02) Minor  
(03) Moderate  
(04) Major  
(05) Extensive  
(06) Severe  
(07) Catastrophic

- As risks are evaluated, the drop down fields are used to record and track the impact levels
- Within each Impact category (Safety, Environmental, etc.) the user has the option to select from one of the 7 impact levels
- A justification field for each impact category is shown next to the drop down box. This field allows the users to input free form text and explain the reasoning behind the selected impact level
- After all 6 impact categories + a frequency have been decided and selected in the RET, a risk score will populate (see image below)
- The RET allows for users to input a "Frequency per Year Override" if the data exists to do so

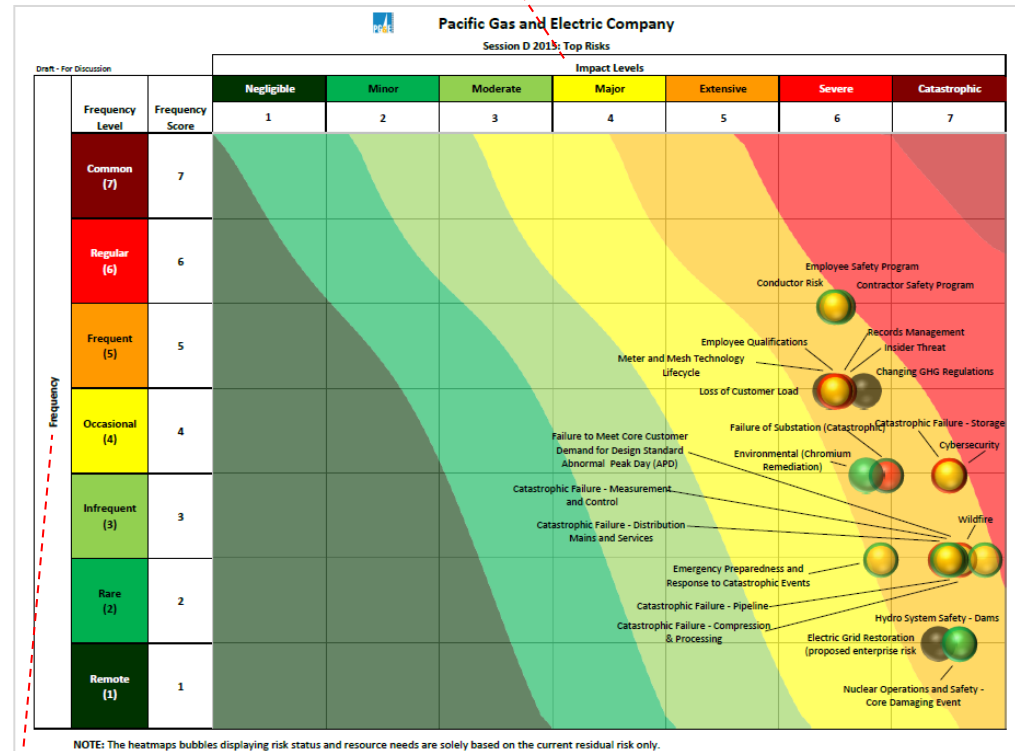
Overall Risk Score	Frequency	Frequency Per Year Override	Overall Frequency Justification	Risk Score
174	(06) 1 - 10 times per year			174

Frequency	Frequency Per Year Override	Overall Frequency Justification	Risk Score
(06) 1 - 10 times per year			174
(01) Once every 100+ Years			
(02) Once every 30 - 100 years			
(03) Once every 10 - 30 years			
(04) Once every 3 - 10 years			
(05) Once every 1 - 3 years			
(06) 1 - 10 times per year			
(07) > 10 times per year			

Impact Levels

### Output of the Risk Evaluation Tool (RET):

- Once all risks have been scored using the RET, a heat map is generated
  - The Y-Axis is Frequency
  - The X-Axis is Impact
  - The different colors on the heat map represent the 7 levels of risk
- Each bubble on the heat map shows a control status (inner bubble color) and a resource status (outer ring color)
- The heat map provides a visual aid for Leadership discussion
- The heat map (at right) was used at PG&E's 2015 Session D meeting and show the company's Top 24 risks.



Frequency



# Risk Assessment: Calibration

Consistency	Governance and Oversight	Communication	Embedded in Decision Making	Continuous Improvement
-------------	--------------------------	---------------	-----------------------------	------------------------

While preparing for Session D, many risk calibration scoring sessions are held to ensure the risk evaluation tool was applied consistently:

**- Horizontal Calibration:**

- Analyzes all overall risk scores across all six impact categories
- Compares and contrasts justifications, impact scores, and frequency scores
- Provides LOBs with context, insight into other company risks, and assurance the criteria has been applied consistently

**- Vertical Calibration:**

- With subject matter expertise for each impact category, a verification process is held to ensure scores in each impact were consistently applied

Personnel Impact	Impact Category	Risk Category	Risk Scoring					
			Safe	Environmental	Compliance	Reliability	Asset	Financial
Personnel Impact	Category 1	Risk Category 1	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...
Personnel Impact	Category 2	Risk Category 2	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...
Personnel Impact	Category 3	Risk Category 3	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...
Personnel Impact	Category 4	Risk Category 4	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...
Personnel Impact	Category 5	Risk Category 5	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...
Personnel Impact	Category 6	Risk Category 6	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...
Personnel Impact	Category 7	Risk Category 7	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...
Personnel Impact	Category 8	Risk Category 8	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...
Personnel Impact	Category 9	Risk Category 9	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...
Personnel Impact	Category 10	Risk Category 10	Safe: ...	Environmental: ...	Compliance: ...	Reliability: ...	Asset: ...	Financial: ...





# Risk Database: ECTS-Risk

- Consistency
- Governance and Oversight
- Communication
- Embedded in Decision Making
- Continuous Improvement

ECTS-Risk homepage provides insight into LOB or Company risk register

**Enterprise and Operational Risk Management**  
Manage risk; make our mission possible!

Current Data View: Corporate Affairs, Customer Care, Electric Operations

Administrative Tools | User's GUID

Risk ID	Risk Owner Name	Risk Name	Risk Description	Risk Type	Control Status	Risk Mitigation	Risk Status	Risk Category	Impact	Response To
201245	Joseph T Leader	AB 32 / Cap-and-Trade	Inefficient supply of allowances and offsets could lead to extremely high costs to customers.	Operational	97	Risk Monitoring and Review	GREEN	Electric Operations	YAGSIAN C (CMY3)	
202504	Sienna N Rogers	Above-Market Stranded Costs	Regulatory or political resistance to passing along costs to customers associated with previous investments and contractual obligations leads to financial stress on shareholders.	Operational	311	Identification and Evaluation	BLACK	Electric Operations	YAGSIAN C (CMY3)	
201273	Valerie J Ball	Asset Management	Inability to effectively monitor, account for, or demonstrate control of IT assets or reveal information may result in prolonged troubleshooting and issue resolution, inefficient use of assets, misapplied decisions, misallocation of cybersecurity risk, increased exposure to regulatory compliance violations	Operational	113	Risk Response	REDUCE	AMBER	Information Technology	COLLINS S (SRCH)
203061	Stephane Douglas	Asset Security	An individual or group commits acts which result in fatalities or inflicts damage making critical facilities inoperable. An employee working without meeting legal, regulatory or PG&E defined requirements designed to demonstrate a minimum level of competency for a specific job or specific work might result in: • Work procedure errors (safety, reliability) • Legal or regulatory non-compliance (financial, trust) • Cybersecurity breaches (safety, financial, trust) • Localized outages (reliability, trust) • Damage to property or assets belonging to PG&E, another corporation, a government organization, or a member of the public (safety, financial, reliability, trust) • Injury or death to the employee, other employees or a member of the public (safety, trust, financial)	Operational	229	Risk Response	REDUCE	RED	Electric Operations	SINGH J (J112)
202381	David M Hessel	Aviation Services Employee Qualifications	• Work procedure errors (safety, reliability) • Legal or regulatory non-compliance (financial, trust) • Cybersecurity breaches (safety, financial, trust) • Localized outages (reliability, trust) • Damage to property or assets belonging to PG&E, another corporation, a government organization, or a member of the public (safety, financial, reliability, trust) • Injury or death to the employee, other employees or a member of the public (safety, trust, financial)	Operational	102	Identification and Evaluation		AMBER	Safety and Shared Services	BYRD M (NOB7)
202530	Apama Narang	Bulk Power Operations	Slower levels of market, contractual, and regulatory complexity resulting in potential for the following up through 2020: (1) failure to support system reliability; (2) higher residential costs and (3) shareholder risk. Inability to deliver business-required outcomes as a result of inadequate change planning, ongoing lack of capacity to effectively deliver sustainable change, and the unanticipated impact on contract cost against realized business benefits.	Operational	128	Identification and Evaluation		BLACK	Electric Operations	YAGSIAN C (CMY3)
201280	Joe R. Risher	Business Adoption & Benefits Realization		Operational	77	Risk Response	REDUCE	AMBER	Information Technology	COLLINS S (SRCH)

The Enterprise Compliance Tracking System (ECTS) is currently PG&E's official system of record for all risk related data

- ECTS-Risk provides:

- A single repository for enterprise and operational risk data, across all LOBs (previously a manual and decentralized approach, including spreadsheets and word documents)
- Audit trail of risk data and decisions
- Management reports to facilitate oversight, monitoring and decision making
- A way to track and monitor progress on mitigations and response plans across the company
- A tasking function for Risk Managers within the LOBs to track progress to plan
- A scoring section that mirrors the risk evaluation tool

Return to Related Risk Record | Add/Modify Risk Drivers | Go to Latest Risk Response Plan | Add/Modify Metrics

**Risk Assessment**  
Related Risk Profile

Risk ID	Risk Name	Risk Description	Risk Category	Risk Type	Risk Score	Risk Status	Impact	Response To
202133	Wildfire	PG&E assets may initiate a wildland fire that is not easily contained and that endangers the public, private property, sensitive lands, and/or leads to long-duration service outages	Enterprise Asset	Inherent: 1496 Current: 626 Forecasted:			Eric W Back	Electric Operations SINGH J (J112)

**Risk Scoring**  
Inherent Risk Scoring | Previous Assessment Risk Scores

Impact	Inherent Score	Current Risk Score	Forecasted Risk Score
Safety	(7) Catastrophic	(7) Catastrophic	(6) Severe
Environment	(2) Catastrophic	(2) Catastrophic	(5) Severe
Compliance	(5) Severe	(5) Severe	(5) Severe
Reliability	(5) Severe	(5) Severe	(5) Severe
Reputational	(7) Catastrophic	(7) Catastrophic	(6) Severe
Financial	(7) Catastrophic	(7) Catastrophic	(6) Severe
Frequency	(4) Once every 3 - 10 years	(2) Once every 30 - 100 years	

Scoring tool built in ECTS-Risk is modeled after the risk evaluation Tool





# Monthly Report Out: Dashboard

Consistency

Governance and Oversight

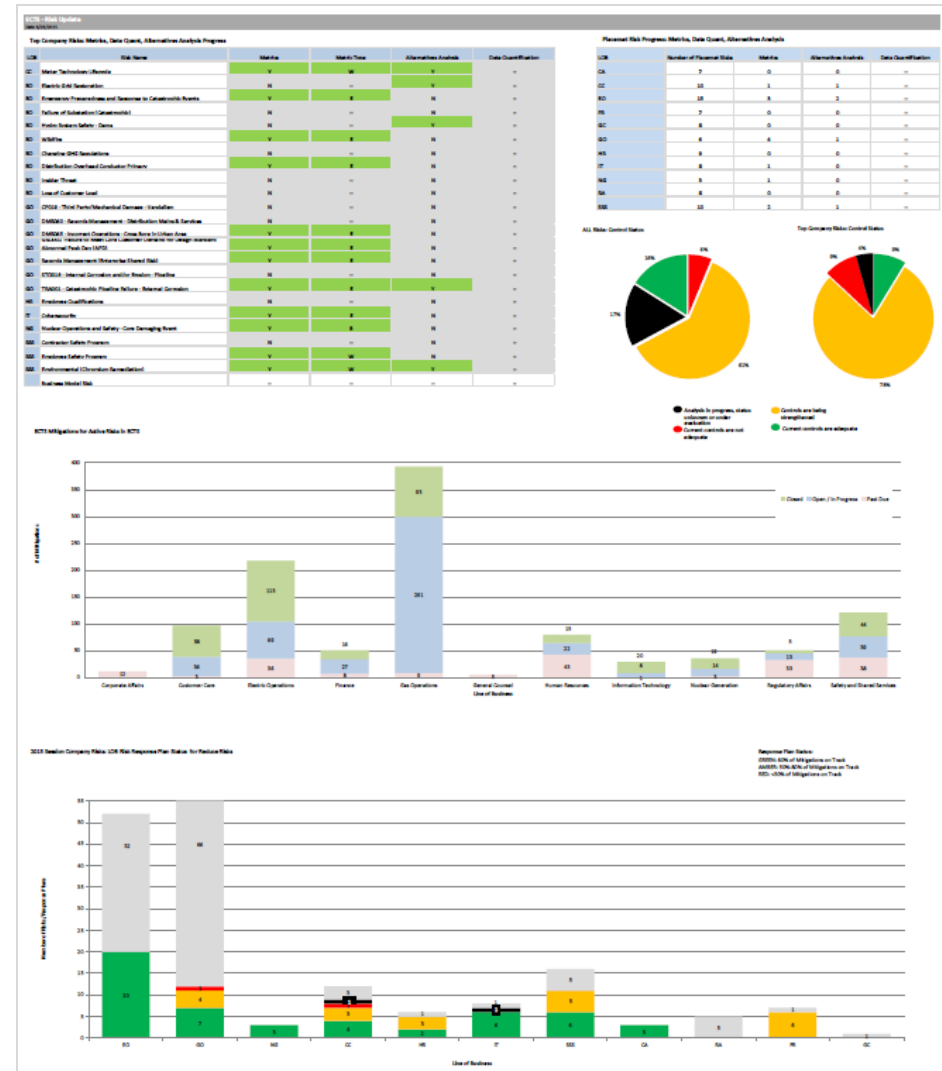
Communication

Embedded in Decision Making

Continuous Improvement

## Dashboard reporting:

- The dashboard to the right is one example of how PG&E utilizes ECTS to provide all LOBs visibility into their current data
- Provided monthly to Risk Managers in all LOBs and is available for officer-level Risk and Compliance Committee Meetings





# Business Plan Review (BPR)



EO Risk Mitigation Progress																			
<b>Variance Explanation</b>	<b>Top Risks</b>																		
N/A - All Projects and Initiatives are green	<ol style="list-style-type: none"> <li>Wildfire</li> <li>Failure of Substation (Catastrophic)</li> <li>Hydro System Safety – Dams</li> <li>Electric Grid Restoration</li> <li>Emergency Preparedness and Response to Catastrophic Events</li> <li>Changing GHG Regulations</li> <li>Distribution Overhead Conductor Primary</li> <li>Insider Threat</li> </ol>																		
<b>Green By Date</b>																			
<b>Recovery Plan</b>																			
<b>Description</b>	<b>Key Projects &amp; Initiatives</b>																		
The overall Risk Mitigation Progress metric is based on the status of the mitigations shown under Key Projects & Initiatives. Leading Indicators are NOT taken into account for the overall status of the risk mitigation progress metric.	<table border="1"> <tbody> <tr> <td>Wildfire: Continue build-out of SCADA infrastructure to support functionality. Identified 215 target locations requiring functionality. (12/31/2016)</td> <td>5/5/15 - 3/31/16</td> </tr> <tr> <td>Failure of Substation (Catastrophic): Implementation of physical security upgrades: Tier 1 by end of 2015—10 substations (12/31/2015) Tiers 2 and 3 by end of 2016 — 8 substations (12/31/2016)</td> <td>5/5/15 - 5/29/15</td> </tr> <tr> <td>Hydro System Safety – Dams: Install SCADA systems at high priority dams to complete gap 5 of ERM Hydro Operation Enterprise Risk Management dam safety improvement effort. (7/31/2015)</td> <td>5/6/15 - 5/6/15</td> </tr> <tr> <td>Electric Grid Restoration: TBD</td> <td>5/18/15 - 5/18/15</td> </tr> <tr> <td>Emergency Preparedness and Response: Continue multi-year work plan – Emergency Management Advancement Program (EMAP) – to improve planning, coordination, and implementation of integrated gas and electric restoration capabilities (12/31/2016)</td> <td>6/26/15 - 6/26/15</td> </tr> <tr> <td>Changing GHG Regulations: Analyze the impacts of potential GHG regulations on key compliance, cost and reliability issues. (9/30/2015)</td> <td>6/26/15 - 6/26/15</td> </tr> <tr> <td>Distribution Overhead Conductor Primary: TBD</td> <td>6/26/15 - 6/26/15</td> </tr> <tr> <td>Insider Threat: Create centralized view and company policy through working group, comprised of CSD, ETRM, IT Security Operations, HR, and Law (e.g. more extensive background checks for employees and contractor, monitoring technology, etc.). (3/31/2016)</td> <td>6/26/15 - 6/26/15</td> </tr> <tr> <td>Risk Reduction (TBD)</td> <td>6/26/15 - 6/26/15</td> </tr> </tbody> </table>	Wildfire: Continue build-out of SCADA infrastructure to support functionality. Identified 215 target locations requiring functionality. (12/31/2016)	5/5/15 - 3/31/16	Failure of Substation (Catastrophic): Implementation of physical security upgrades: Tier 1 by end of 2015—10 substations (12/31/2015) Tiers 2 and 3 by end of 2016 — 8 substations (12/31/2016)	5/5/15 - 5/29/15	Hydro System Safety – Dams: Install SCADA systems at high priority dams to complete gap 5 of ERM Hydro Operation Enterprise Risk Management dam safety improvement effort. (7/31/2015)	5/6/15 - 5/6/15	Electric Grid Restoration: TBD	5/18/15 - 5/18/15	Emergency Preparedness and Response: Continue multi-year work plan – Emergency Management Advancement Program (EMAP) – to improve planning, coordination, and implementation of integrated gas and electric restoration capabilities (12/31/2016)	6/26/15 - 6/26/15	Changing GHG Regulations: Analyze the impacts of potential GHG regulations on key compliance, cost and reliability issues. (9/30/2015)	6/26/15 - 6/26/15	Distribution Overhead Conductor Primary: TBD	6/26/15 - 6/26/15	Insider Threat: Create centralized view and company policy through working group, comprised of CSD, ETRM, IT Security Operations, HR, and Law (e.g. more extensive background checks for employees and contractor, monitoring technology, etc.). (3/31/2016)	6/26/15 - 6/26/15	Risk Reduction (TBD)	6/26/15 - 6/26/15
Wildfire: Continue build-out of SCADA infrastructure to support functionality. Identified 215 target locations requiring functionality. (12/31/2016)	5/5/15 - 3/31/16																		
Failure of Substation (Catastrophic): Implementation of physical security upgrades: Tier 1 by end of 2015—10 substations (12/31/2015) Tiers 2 and 3 by end of 2016 — 8 substations (12/31/2016)	5/5/15 - 5/29/15																		
Hydro System Safety – Dams: Install SCADA systems at high priority dams to complete gap 5 of ERM Hydro Operation Enterprise Risk Management dam safety improvement effort. (7/31/2015)	5/6/15 - 5/6/15																		
Electric Grid Restoration: TBD	5/18/15 - 5/18/15																		
Emergency Preparedness and Response: Continue multi-year work plan – Emergency Management Advancement Program (EMAP) – to improve planning, coordination, and implementation of integrated gas and electric restoration capabilities (12/31/2016)	6/26/15 - 6/26/15																		
Changing GHG Regulations: Analyze the impacts of potential GHG regulations on key compliance, cost and reliability issues. (9/30/2015)	6/26/15 - 6/26/15																		
Distribution Overhead Conductor Primary: TBD	6/26/15 - 6/26/15																		
Insider Threat: Create centralized view and company policy through working group, comprised of CSD, ETRM, IT Security Operations, HR, and Law (e.g. more extensive background checks for employees and contractor, monitoring technology, etc.). (3/31/2016)	6/26/15 - 6/26/15																		
Risk Reduction (TBD)	6/26/15 - 6/26/15																		
<p><b>Key Project and Initiatives - Status of Mitigations:</b></p> <p>RAG Status rules:</p> <ul style="list-style-type: none"> <li>Off track, not recoverable as of now</li> <li>Off track, recoverable</li> <li>On track</li> </ul> <p><b>Risk Mitigation Progress - Overall Metric:</b></p> <p>RAG Status rules:</p> <ul style="list-style-type: none"> <li>1 or more key projects or initiatives are red</li> <li>All key projects or initiatives are amber or green</li> <li>All key projects or initiatives are green</li> </ul> <p>The "Leading Indicators" section is inclusive of any risk metric associated to a given risk.</p>	<b>Leading Indicators</b>																		
	<ul style="list-style-type: none"> <li>Wildfire: TBD Overhead Wires Down</li> <li>Failure of Substation (Catastrophic): TBD</li> <li>Hydro System Safety – Dams: TBD</li> <li>Electric Grid Restoration: TBD</li> <li>Emergency Preparedness and Response: EP&amp;R Maturity Model</li> <li>Changing GHG Regulations: TBD</li> <li>Distribution Overhead Conductor Primary: D Overhead Wires Down</li> <li>Insider Threat: TBD</li> </ul>																		

Top Risks

The Business Plan Review (BPR) is a monthly report out by each LOB on their metric score card

- The BPR is directly aligned with Session D LOB commitments
- LOBs are able to provide insight and updates as performance to plan
- Top mitigations and risk metrics are tracked
- With Enterprise Risk oversight, each LOB self reports their status for the month

Key mitigations  
For top risks

Metrics in place  
For top risks

# Integrated Planning & RIBA

- Consistency
- Governance and Oversight
- Communication
- Embedded in Decision Making
- Continuous Improvement

## Session D

This session focuses on PG&E's top risks and compliance issues

**DRAFT** (Your LOB Name Here) 2015 Top Risks (Placemat)

Top Risk Name	Risk Owner	Current Risk Score	2015 Score	2016 Score	2017 Score	2018 Score	2019 Score	Response Plan Status	Top Resource
1. Operational Risk 1 Name	Operational Risk Description	500	●	●	●	●	●	Active	Resource
2. Operational Risk 2 Name	Operational Risk Description	523	●	●	●	●	●	Active	Resource
3. Operational Risk 3 Name	Operational Risk Description	452	●	●	●	●	●	Active	Resource
4. Operational Risk 4 Name	Operational Risk Description	123	●	●	●	●	●	Active	Resource
5. Operational Risk 5 Name	Operational Risk Description	98	●	●	●	●	●	Active	Resource
6. Operational Risk 6 Name	Operational Risk Description	56	●	●	●	●	●	Active	Resource
7. Operational Risk 7 Name	Operational Risk Description	42	●	●	●	●	●	Active	Resource
8. Operational Risk 8 Name	Operational Risk Description	12	●	●	●	●	●	Active	Resource
9. Operational Risk 9 Name	Operational Risk Description	3	●	●	●	●	●	Active	Resource
10. Operational Risk 10 Name	Operational Risk Description	3	●	●	●	●	●	Active	Resource

## Session 1

Session 1 discusses strategies for managing LOB priorities, including plans for top risks

**LOB Top Risks Mitigations v2**

Top Risk	2015				2016				2017				Funding 2016-2017	Projected Risk Status	Risk Metrics			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3				Q4		
Risk 1														● ● ● ●	EDW '16 EDW '17	Name/Description	2016 Tgt	2017 Tgt
Risk 2														● ● ● ●				
Risk 3														● ● ● ●				
Risk 4														● ● ● ●				
Risk 5														● ● ● ●				
Risk 6														● ● ● ●				
Risk 7														● ● ● ●				
Risk 8														● ● ● ●				

**Key Insights**

- Example: majority of our response plans are already in flight, and remaining plans are scheduled to begin before the end of 2017
- Example: Effectiveness metrics targets illustrate improved targeted performance in mitigating our top risks

## Session 2

## Session 2

This Session prioritizes resources needed in order to execute strategy

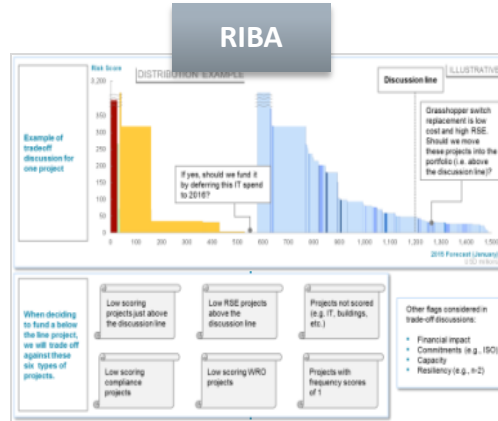
**Top Risk Summary**

Top Risk	S-1 Goals	S-1 Key Strategies & Actions	Effectiveness Metric	Current State	2016 Status	2017 Status	Scorecard	2016 Funding Allocated (Millions)	2017 Funding Allocated (Millions)
Cybersecurity		Placeholder	Placeholder	●	●	●	Pi	None	None
Information Security		Placeholder	Placeholder	●	●	●	Pi	None	None
Operational Risk		Placeholder	Placeholder	●	●	●	Pi	None	None
Customer Data Protection		Placeholder	Placeholder	●	●	●	Pi	None	None
Unauthorized disclosure of confidential information during discovery or other data production		Placeholder	Placeholder	●	●	●	Pi	None	None
Intentional misrepresentation in front of courts or agencies		Placeholder	Placeholder	●	●	●	Pi	None	None
Mixed or late filings		Placeholder	Placeholder	●	●	●	Pi	None	None

## Session 1

## RIBA

RIBA ensures that risk informs prioritization discussions





# Risk Informed Budget Allocation (RIBA)

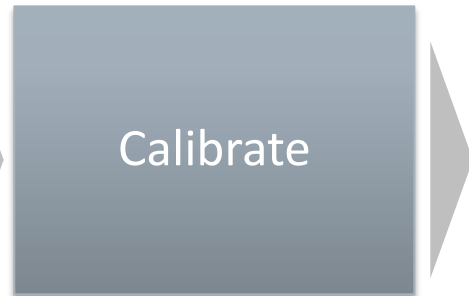
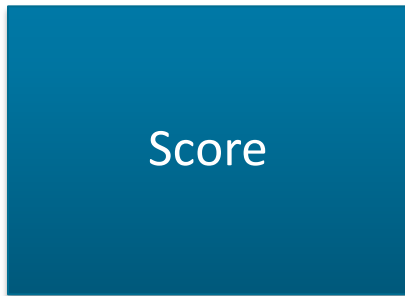
- Consistency
- Governance and Oversight
- Communication
- Embedded in Decision Making
- Continuous Improvement

- Each project is risk-scored with a Subject Matter Expert
- Projects are scored along three dimensions
  - Safety
  - Reliability
  - Environmental

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



- Projects are flagged based on the driver(s) of the work

- RIBA expanded scoring team participates

- Leadership across the LOB participates

- Executive leadership

		Impact Levels						
		Negligible	Minor	Moderate	Major	Extensive	Severe	Catastrophic
Frequency Level	1	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	425	1,348
2	1	3	10	32	100	316	1,000	
1	1	2	6	18	56	178	562	

Category	Impact	Frequency	Example
Safety	4	2	Cable failure results in the first blow of methane cover, few fatalities
	2	4	1 methane explosion that resulted in injury in last 9 yr over 500 miles of cable, this is 5 miles in (159/11,000)*5 = 0.0011
Environmental	4	4	PLC failure leads to small amount of petrochemical release / cleanup
	4	4	18 failures in 2015 over 500 miles of cable, this project is 5 miles, (20/500)*5 = 0.18
Reliability	4	3	System is redundant, concurrent cable failure leads to outage for 1% customers for 9 hours = 80k customer hours
	4	3	Would require 2 concurrent failures, 20 fails in 2013, 20 fails in 2013, over 500 miles of cable, this is 5 miles, (0.26)*5 = 0.007



Distribution Expense	Opportunity	Emergent Work / Forecast Increase	Watch
1 Emergency YTD under run \$12.1, forecast	\$ 0.0		
2 Cancelled orders, safety net payments under run	\$ 1.2		
3 UG project tags SF placeholder	\$ 1.0		
4 Insulators wash (asses in Sep)	TBD		
5 Site Facilities investigation (extended program)	TBD		
6 Pole, Test & Treat credits (AT&T)	\$ 1.0		
7			
8 Maintenance unit cost increase	\$ 9.2	\$ (2.0)	
9 Network maintenance unit cost increase		\$ (0.9)	
10 Standard Cost Variance - YTD unfavorable		\$ (3.4)	
11 Maintenance volume increase / FAS tags		\$ (5.0)	
12 Solar applications volume increase		\$ (1.0)	
13		\$ (14.0)	
14 Major Emergency risk			TBD
15 Ops & Automation (operator HC / cap-exp sp8) 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	\$ (8.0)



# Risk Informed Budget Allocation (RIBA)

Consistency	Governance and Oversight	Communication	Embedded in Decision Making	Continuous Improvement
-------------	--------------------------	---------------	-----------------------------	------------------------

## Step 1 – General and Scoring Information

GENERAL INFORMATION										
LOB Project Identifier 1	LOB Project Identifier 2	Project Name	Project Description	MWC	MWC Group	MAT	MAT Description	Project Manager	Asset Engineer	Asset Supervisor
19.4	31047788	Madera 1104 – Reconductor <i>[Location]</i>	NA	08	E Dist Relia	08J	Annealed Con	<i>[Name]</i>	<i>[Name]</i>	<i>[Name]</i>

SCORING INFORMATION				
Project Scorer	Interviewee (e.g. name of asset engineer)	Scoring Date	Bundle # or Tier # if part of a program	Project Notes
<i>[Name]</i>	<i>[Name]</i>	5/20/14	NO	Reconductor 1440' of #6 Cu. Due to number of splices



# Risk Informed Budget Allocation (RIBA)

- Consistency
- Governance and Oversight
- Communication
- Embedded in Decision Making
- Continuous Improvement

## Step 3 – Risk Scores

### SAFETY RISK SCORE

Impact Score	Impact Notes	Time-to-impact / Frequency Score	Frequency Override (1/T)	Frequency Notes	Total Safety Risk Score
6	Possibility for Live wire down causing fatality. Right across the street from <i>[School]</i>	1		Per Calculation: 11 fatalities / 14 year = 0.79. 0.79 / 2700 WD outages = 0.0003 for a frequency of 1.	178

### ENVIRONMENTAL RISK SCORE

Impact Score	Impact Notes	Time-to-impact / Frequency Score	Frequency Override (1/T)	Frequency Notes	Total Environmental Risk Score
1	Urban neighborhood. Right across the street from <i>[School]</i>	1			1

### RELIABILITY RISK SCORE

Impact Score	Impact Notes	Time-to-impact / Frequency Score	Frequency Override (1/T)	Frequency Notes	Total Reliability Risk Score
4	Broken Wires. CESO = 3161. Duration 6+ hours. Impacts <i>[School]</i> .	6		4 WD outages in 3 years	178



**Total Risk Score**  
356



# Risk Informed Budget Allocation (RIBA)

- Consistency
- Governance and Oversight
- Communication
- Embedded in Decision Making
- Continuous Improvement

## Step 4 – Flags

COMMITMENTS AND OTHER CONSIDERATIONS									
Commitment	If a "4 – Public/Regulatory commitment," then state who the commitment is to	Due date for compliance (MM/DD/YYYY)	Inflight YES OR NO	Inter-relationships with other projects YES OR NO	Capacity YES OR NO	Financial Benefits (Select: hard, soft, none)	Benefit Amount (\$000)	Support YES OR NO	Notes for other commitments and requirements
			NO	NO	NO				

# Continuous Improvement

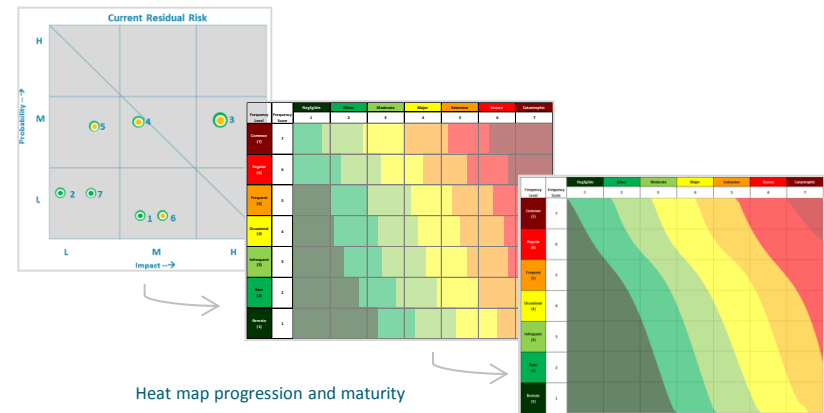
- Continue to enhance **Session D** to focus on progress from the past year as well as goals for the upcoming year
- Continue to refine the EORM process in accordance with PG&E's EORM Vision 2020, beginning with:
  - Increase use of data in risk assessments , including using PRA and other methods for risk quantification
  - Increase use of alternatives analysis
  - Increase use of risk metrics to determine effectiveness of risk mitigations
  - Strengthening connections within Integrated Planning
- Continue to strengthen RIBA process and alignment with EORM
  - Ensure that improvements made in the EORM program are incorporated into the RIBA process, as appropriate
- Continue to benchmark to inform and refine future direction:
  - Asset intensive, industry leading companies in utilities and beyond
  - 3<sup>rd</sup> party peer reviewers



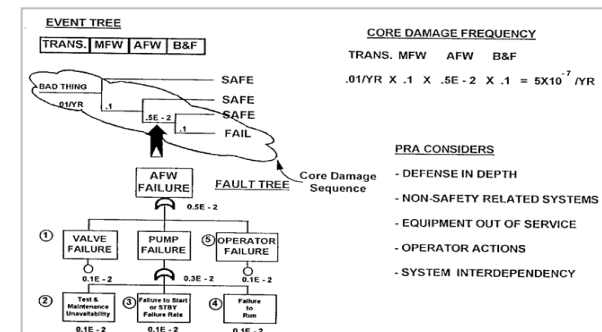
2015 Company Risk Portfolio



Example of ability to calibrate the entire portfolio of risk based on RET enhancements



Heat map progression and maturity



Example of Nuclear PRA Overview





# Enterprise and Operational Risk Management

- Data-driven, risk-based decision making to support safe, reliable, and affordable electric and gas service that is integrated into our planning process and becomes the foundation for our regulatory rate cases.
- PG&E leads the utility industry in the evolution of enterprise and operational risk management (EORM) by integrating EORM into the culture, strategic decision, regulatory processes, and operational business execution that is supported through a balance of quantitative and qualitative analysis.
- EORM will continue to improve its transparency and accountability of its business through the full integration of its risk management, asset management and investment management processes with the objective of safe, reliable, and affordable electric and gas service.

Consistency	Governance and Oversight	Communication	Embedded in Decision Making	Continuous Improvement
-------------	--------------------------	---------------	-----------------------------	------------------------

	2016	2017	2018	2019	2020
Consistency	<ul style="list-style-type: none"> <li>• Risks across the organization are of an equivalent level to assist in a consistent management approach across all lines of business</li> <li>• Risk tolerance is further explored during risk assessments and response plan approval and alternatives analysis review</li> </ul>	<ul style="list-style-type: none"> <li>• Asset investment strategies are evaluated in a probabilistic environment</li> <li>• PG&amp;E is able to develop a RAMP proceeding that is consistent with commission expectations</li> <li>• Process is developed to establish risk tolerance within each LOB RCC</li> </ul>	<ul style="list-style-type: none"> <li>• The investment management process has evolved to include uncertainty analysis and demonstrate ALARP</li> <li>• Plan is implemented to consistently drive risk tolerance discussions within LOB</li> </ul>	<ul style="list-style-type: none"> <li>• The process for establishing risk tolerance within the regulatory process is in established and serves as a guide for additional risk mitigation activities</li> </ul>	<ul style="list-style-type: none"> <li>• PG&amp;E can demonstrably show actual risk reduction benefits</li> <li>• Risk tolerance is enabling PG&amp;E to better manage its portfolio of risks</li> </ul>
Quantification	<ul style="list-style-type: none"> <li>• Practical and effective methods for quantifying risks have been identified and tested through pilots in gas operations and electric operations.</li> <li>• Outcomes of risks are discussed in terms of uncertainty, including worst, best and most likely values</li> </ul>	<ul style="list-style-type: none"> <li>• The ability to utilize data models and methods for risk quantification continues to build upon successes and lessons learned during 2016 pilots</li> <li>• LOBs are actively identifying data gaps and have plans to acquire data for enhanced risk quantification and assessment for top risks, as a matter of process</li> </ul>	<ul style="list-style-type: none"> <li>• Top risks and corresponding mitigations are supported by data that can be used to demonstrate baseline performance</li> </ul>	<ul style="list-style-type: none"> <li>• All top risks are quantified, performance targets have been established, and progress towards them is being made</li> <li>• Key risk indicators are in place and are able to provide insights on risk reduction across the company's risk portfolio</li> </ul>	<ul style="list-style-type: none"> <li>• Risks are quantified to the level appropriate for making trusted risk-informed, financially prudent decisions</li> <li>• Risk reduction can be measured and is effectively communicated to stakeholders</li> </ul>
Culture	<ul style="list-style-type: none"> <li>• The company discusses projects and initiatives in terms of risk reduction value.</li> </ul>	<ul style="list-style-type: none"> <li>• Risk reduction value is explicitly considered within investment planning Decisions.</li> </ul>	<ul style="list-style-type: none"> <li>• Risk reduction value is discussed during integrated planning sessions.</li> </ul>	<ul style="list-style-type: none"> <li>• Risk reduction value is clearly understood and is a determining factor in investment decisions.</li> </ul>	<ul style="list-style-type: none"> <li>• Management has independent assurance of risk management practices and outputs.</li> </ul>

# Appendix



# Electric Operations 2015 Top Risks (Placemat)



	Top LOB Risks	Risk Owner	Current Residual Risk Score	2014 Session D Status	2015 Session D Status as of 4/1/15	2016 EOY Forecasted Status	Response Plan Status Explanation as of 4/1/15	Top Associated Compliance Requirements
1) Wildfire	PG&E assets may initiate a wildland fire that is not easily contained and that endangers the public, private property, sensitive lands, and/or leads to long-duration service outages.	[Name]	626					PRC 4292-4296, CPUC GO 95, CPUC GO 165, NERC FAC-003-3, CPUC D.14-02-015
2) Failure of Substation (Catastrophic)	Complete loss of a substation may result in significant wide-scale/prolonged outages, public or employee safety issues, significant environmental damage, or significant property damage.	[Name]	401					NERC CIP-014 CPUC GO 174
3) Hydro System Safety	A failure of a PG&E dam, conveyance, or penstock may result in significant damage to third parties, the environment, and PG&E.	[Name]	349					FERC 18 CFR Part 12, CA Water Code Division 3, US EPA Clean Water Act
4) Electric Grid Restoration	In the event of a system-wide disturbance requiring the deployment of black-start resources, PG&E's restoration plan may not meet current customer or community expectations resulting in trust issues.	[Name]	283	N/A		TBD	N/A	NERC COM-001-1.1 NERC EOP-001-2.1B NERC EOP-003-2 NERC EOP-005-2 NERC EOP-008-1 NERC NUC-001-2
5) Emergency Preparedness and Response to Catastrophic Events	The risk of inadequate plans and poor response execution to a catastrophic emergency may result in safety concerns, extended outages, regulatory action, and reputational damage. This risk includes business continuity for the enterprise outside of the event.	[Name]	280					CPUC GO 166
6) Changing GHG Regulation	Incompatible and/or stringent state and federal GHG regulations may result in increase in costs to customers.	[Name]	417	N/A		TBD	N/A	AB 32; US EPA Clean Air Act Section 111(b) and 111(d)
7) Distribution Overhead Conductor Primary	Failure of or contact with, energized electric distribution primary conductor may result in public or employee safety issues, significant environmental damage (fire), prolonged outages, or significant property damage.	[Name]	408					CPUC GO 95, CPUC GO 165, PRC 4293, NERC FAC-003-3

NOTE: Text in red denotes an enterprise risk. Electric Grid Restoration is currently a proposed Enterprise risk.

All black risks presented in Session D are scheduled for a formal "black-to-color" risk assessment in 2015.

\* Risk status is preliminary and has not been approved by Risk and Compliance Committee

Current controls are not adequate   
 Controls are being strengthened   
 Current controls are adequate   
 Analysis in progress, status unknown or under evaluation  
 Additional resources may be needed   
 Additional resources not anticipated   
 Resource needs unknown

**Response Plan Status:**

RED: <50% of Mitigations on Track

AMBER: 50%-80% of Mitigations on Track

GREEN: 80% of Mitigations on Track

N/A: New risk/no plan in progress



# Session D: LOB Deep Dive

Consistency	Governance and Oversight	Communication	Embedded in Decision Making	Continuous Improvement
-------------	--------------------------	---------------	-----------------------------	------------------------

<b>Risk Name:</b> Wildfire <b>Risk Description:</b> PG&E assets may initiate a wildland fire that is not easily contained and that endangers the public, private property, sensitive lands, and/or leads to long-duration service outages.	<b>P(95) Scenario:</b> A utility-related fire near a national park resulting in fire of greater than 10,000 acres, property damage, multiple loss of life and significant fines, claims, and law suits as well as extended regulations.	2014 SD Status	
		Current Risk Status as of 4/1/15	

<b>Risk Response Plan Status</b>		<b>Risk Response Plan Owner</b>	Eric Back	<b>Alternatives Analysis Evidenced</b>	Yes	<b>Metrics in Place</b>	Yes
----------------------------------	--	---------------------------------	-----------	--	-----	-------------------------	-----

**Comments:** The last three years have made up the driest three-year period in recorded California history back to 1850 resulting in a higher risk posture for Wildfire. Electric operations is pursuing and executing on mitigations to reduce the short-term and long-term risk profile including infrastructure replacement, increased inspections, and increased non-exempt pole clearing.

**Strategy to Manage Challenges:**

- Develop coalition of stakeholders to determine most effective wildfire reduction strategies
- Utilize coalition of government agencies to effectively deploy wildfire mitigation strategies
- Continue to align proactive mitigations with drought conditions and identified wildfire risk areas

Risk Response Plan Mitigations				Metrics		
Mitigation	Completion Date (From Risk Assessment)	% Complete as of 4/1/15	Next Steps	Metric Description	Metric Legend	Metric Status
Implement remote capability to disable reclose in wildfire areas	12/31/16	25%	Continue build-out of SCADA infrastructure to support functionality. Identified 215 target locations requiring functionality.	<b>T&amp;D Overhead Wires Down</b>	RED: Over 2615 AMBER:2615 or less GREEN: 2540 or less	
Continued asset management programs focused on wildfire risk zones	12/31/18	On-going	Review exempt surge arrestors for use in distribution system and develop implementation strategy. Implement infrared strategy and develop bridging strategy for transmission lines with focus on wildfire areas.	<b>911 response time</b>	GREEN:93.5% of Target AMBER:92.6-93.4% RED: Less than 92.6%	92.6% through Feb
Continued enhanced Vegetation Management in repeat outage locations	12/31/15	On-going	Public Safety & Reliability tree program directly considers repeat vegetation-related outages in planning criteria. Execute on five year plan for targeted historic locations. Also mitigates the Overhead Conductor risk.	<b>Vegetation Miles Worked</b>	GREEN:97% of Target AMBER:95-96.9% RED: Less than 95%	
Formalize corporate tracking of annual fire season safety awareness training completion	6/30/15	75%	Complete implementation by identifying and assigning training to field personnel.	<b>Distribution Wildfire Detailed Inspections</b>	TRACKING	EOY target of 178
Develop algorithms to provide identification of poor performing conductor	6/30/14	100%	Algorithm was implemented in STAR prototype. Also mitigates the Overhead Conductor risk.	<b>Electric Asset Related Fires</b>	UNDER DEVELOPMENT	N/A
				<b>T&amp;D Infrared Inspection Miles</b>	UNDER DEVELOPMENT	N/A

Current controls are not adequate    
 Controls are being strengthened    
 Current controls are adequate    
 Analysis in progress, status unknown or under evaluation  
 Additional resources may be needed    
 Additional resources not anticipated.    
 Resource needs unknown

**Response Plan Status:**  
 RED: <50% of Mitigations on Track     GREEN: 80% of Mitigations on Track  
 AMBER: 50%-80% of Mitigations on Track     N/A: New risk/no plan in progress

# Thank You

**Janaize Markland**  
J5MP@pge.com

**Jamie Martin**  
J2DZ@pge.com

