
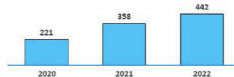
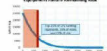




**Public Safety
Long Term Incentive Plan (LTIP)
Target Setting**

November 23, 2020

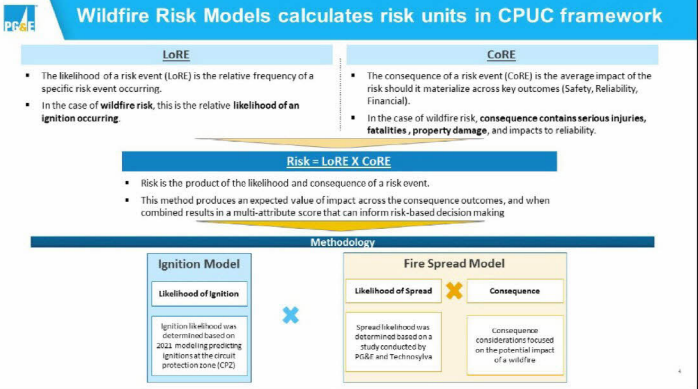


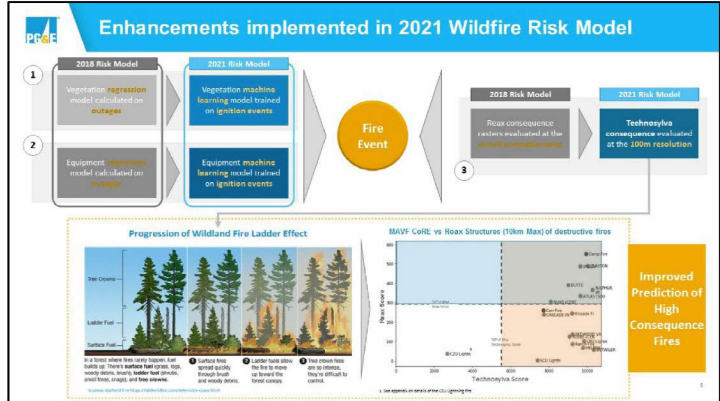
Evolution of the LTIP metric from units of work completed to amount of risk being reduced

	2020-2022 LTIP Plan	2021-2023 LTIP Plan
 System Hardening	<ul style="list-style-type: none"> Risk Exposure - Count of circuit miles system hardening in High Fire Threat Districts (HFTD) and High Fire Risk Areas (HFRA). Goal was "1,021 circuit miles over 3 years, 235 miles hardened YTD in 2020" 	<ul style="list-style-type: none"> Risk Exposure - Count of circuit miles system hardened in the HFTD and HFRA Risk Profile - 80% of system hardening miles have to be high risk miles; high risk miles include - 1) top 20 % of the risk buydown curve, 2) fire rebuild and, 3) PPS mitigation miles Risk Effectiveness - Prioritizes higher risk reduction mitigation options (Undergrounding and Line removals) 
 Substation Enablement	<ul style="list-style-type: none"> Number of substations out of possible 64 substations that are "energizable" during a Transmission-Level PPS event 62 high priority substations are now operationally ready within 48 hours (LTIP 3-yr 2.0 target = 50 substations) 	<ul style="list-style-type: none"> Replace the Substation Enablement metric for the 2021-2023 LTIP Period with EVM Risk Reduction Public Safety Metric. Rational: <ul style="list-style-type: none"> 3 Year target has been achieved Improved weather forecasting capabilities reduces the criticality of number of substations needed to reduce PPS impact
 Enhanced Vegetation Management (EVM)	<ul style="list-style-type: none"> No metric was established for EVM 	<ul style="list-style-type: none"> Risk Exposure - Count of EVM miles worked in the HFTD and HFRA Risk Profile - 80% of EVM miles worked in the top 20% of the HFTD's includes fire impacted areas Risk Effectiveness - Execute work consistent with defined EVM scope

Risk Model and Risk Quantification

J. Smith

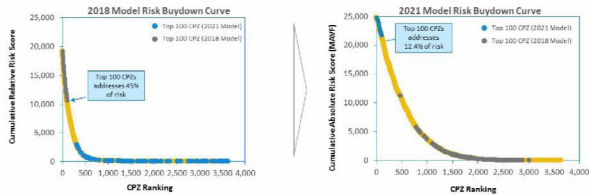






Risk models provide risk buydown curves to guide workplan

The risk buydown curve shows the amount of risk that can be addressed with every subsequent mile within a CPZ that is mitigated. This view shows the relative magnitude of potential projects and can compare impacts of programs with varied effectiveness. The visualization helps to highlight the consolidation of risk by CPZ as you move down the prioritization list.

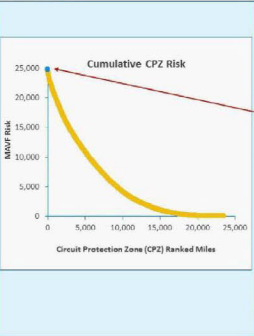


Equipment (Conductor) Risk Buydown curves highlight the significant shift of where the top 100 CPZ's are between the two models primarily as a result of the shift in the consequence model

Project Example

7/20/2014

The top 50 riskiest miles represent 4.9% of the system risk.



Protection Zone Name	Miles	Cumulative Miles	Mean MAWP Score	Total CPZ MAWP	% total risk reduced (52%)
OREGON TRAIL 1109JUN991	0.02	0.02	3.16	3.16	0.01%
CALPINE 1144276-G	0.01	0.03	1.88	1.88	0.01%
MARIPOSA 210190130	0.08	0.12	1.69	1.69	0.02%
SHEPHERD 2111688294	0.01	0.13	1.44	1.44	0.02%
MIDDLE TOWN 1109CB	0.06	0.19	1.30	3.20	0.03%
SISSON LAKE 1101CB	1.00	1.17	1.26	5.77	0.04%
KESEWICK 11011586	6.66	7.83	1.25	48.84	0.17%
MIDDLETOWN 110230K510	4.71	12.04	0.92	48.56	0.23%
KONOCTI 1102965078	5.61	17.65	0.88	51.70	0.42%
MARIPOSA 2102241564	0.64	18.29	0.77	10.81	0.44%
BUCKS CREEK 1101CB	4.20	22.58	0.72	7.55	0.47%
SILVER LAKE 2102798466	0.09	22.67	0.74	4.38	0.47%
MIDDLETOWN 1102CB	0.42	23.08	0.72	8.70	0.48%
MIDDLETOWN 1103830	24.80	47.88	0.72	151.83	0.87%

Key Takeaways

- Mitigating 25 of the 50 riskiest miles within PG&E's service territory would reduce ~0.5% of PG&E's total wildfire risk.
- Reason it is only 0.5% is because this is across all circuits in HFTD's (~25,000 miles).
- On each project a more granular risk spend efficiency calculation can and will be performed on an NPV basis once the project is fully scoped similar to what is shown on the Keswick circuit protection zone.

Project Example: Keswick [REDACTED] Circuit Protection Zone

Keswick [REDACTED] Circuit Protection Zone

- 6.6 Miles in total, the 100m X 100m squares are the absolute risk values for each section of that protection zone
- The total protection zone absolute risk score is 48.84 risk units (sum of all the 100m squares along the circuit)

the CPZ mean risk score of 1.25

m / sq	Overhead Hardening	Under-grounding	50%-50% OH / UG
	30.28	48.35	29.32
	18.56	0.49	9.52
	0.6	0.6	0.6

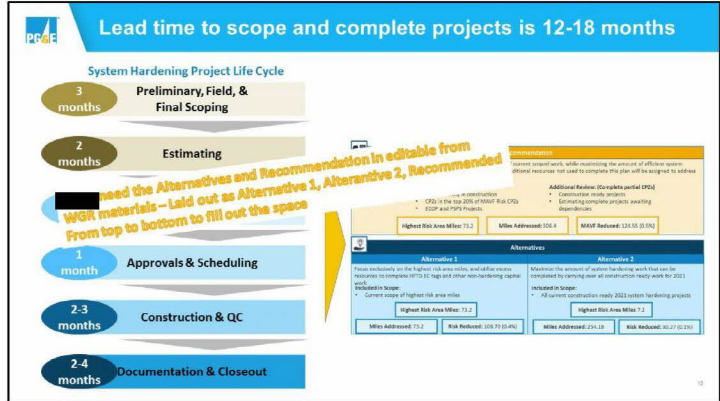
Need to get the items in the tables filled out.

need to check with EPC major projects On the 7% and 3% numbers and with capital accounting On 30 year – depreciation for OH and 60 year – depreciation for UG

UG System Hardening [REDACTED] (miles)	\$ -
Total Capital Cost	\$ -
Per Year O&M Spend	###
NPV @ 7% discount rate	
\$ NPV per unit of risk (RSE)	

Assumptions:

- Discount Rate: 7%, Cost Escalation / Inflation: 3% (inline with major project business cases)
- Benefits Duration: 30 years for OH and 60 for UG (inline with capital accounting)
- Routine Veg Tree Count / Mile: 50.76
- RSE Cost of Reassigning [REDACTED] / mile
- Patrols and Inspections: [REDACTED] / mile for OH and [REDACTED] / mile for UG



Target Setting

© 2008

System Hardening

Conditions

Condition 1: 80% of system hardening miles have to be high-risk miles over the three-year period or LTIP is 0

Risk Profile (High Risk Miles defined as)

1. Top 20% of risk buydown curve
2. Fire rebuild miles
3. PPS mitigation miles

Condition 2: Set minimum percentage of miles mitigated with either Line Removal or Undergrounding over the three-year period or LTIP is 0

Risk Effectiveness

- 10% of Undergrounding or Line Removal work in the System Hardening project portfolio?

Risk Exposure

- Count of circuit miles system hardened in the HFTD

System Hardening Targets (Risk Miles)

	LTIP 0.5	LTIP 1.0	LTIP 2.0
2021	305	320	350
2022	350	368	403
2023	396	416	455
2021-2023	1,051	1,103	1,209

see changes in Condition language to span three years and get out of the hurdle for 2021

1. Basis of the 80% is to allow for operational execution considerations including permitting, weather related access, and mob/demob efficiencies
2. Basis of the top 20% correlates to ~70% of the risk on the risk buydown curve
3. Risk reduction effectiveness for Overhead hardening is estimated at 62% and Undergrounding or Line Removal is estimated at 99%

Enhanced Vegetation Management (EVM)

Conditions

Condition 1: 80%¹ of EVM miles have to be high-risk miles over the three-year period or LTIP 1.0

Risk Profile (High Risk Miles defined as)

- Top 20%² of risk model buydown curve
- Fire impacted miles

Risk Effectiveness

- Execute work consistent with defined EVM scope
 - Achieve 12' recommended radial clearance
 - Access viable potential trees including high-risk species
 - Remove overhangs above and within 4 feet of power lines
 - Mitigate vegetative fuels under and adjacent to powerlines on targeted basis

Risk Exposure

- Count of EVM miles worked in the HFTD and HFRA

EVM Targets (Risk Miles)

	LTIP 0.5	LTIP 1.0	LTIP 2.0
2021	1,800	1,890	2,070
2022	1,800	1,890	2,070
2023	1,800	1,890	2,070
2021-2023	5,400	5,670	6,210

Note: Targets are based on 13-year historical data. (1) - 2013; (2) - 2011 - 2010.

- see changes in Condition language to span three years and get out of the hurdle for 2021.

1. Basis of the 80% is to allow for operational execution considerations including permitting, weather-related access and, customer approvals
 2. Basis of the top 20% correlates to "85% of the risk on the risk buydown curve"



The LTIP targets for system hardening are set based on 2021 risk miles and program funding assumptions

Program Funding

- Forecast of [redacted] Wildfire Mitigation capital spend in 2021 consistent with the Settlement for the 2020-2022 GRC. 2022 forecast escalates 2021 by 15% and 2023 forecast escalates 2021 by 30%.

Unit Costs

- Assume [redacted] per circuit miles of Overhead SH work and [redacted] for Underground work

Program Duration

- Execution of the 13-year plan focusing on top 20% circuit protection zones by 2032

System Hardening LTIP Targets

	LTIP 0.5	LTIP 1.0	LTIP 2.0
2021	305	320	350
2022	350	368	403
2023	396	416	455
2021-2023	1,051	1,103	1,209

Targets are miles of system hardening work for specific risk-prioritized work

- The total mileage of the proposed 2021 Project Portfolio was set as the threshold goal (LTIP 0.5) for 2021
- LTIP 0.5 goals in 2022 and 2023 reflect escalation of program funding level
- The target and stretch goals (LTIP 1.0, 2.0) were set as 5% and 15% higher, respectively

¹⁴ [redacted] includes scoping and engineering costs for future system hardening projects beyond 2021 and additional minor capital spend for other Wildfire Mitigation Programs



The LTIP targets for EVM are set based on work to be completed over the remaining twelve years of the program

- Program Duration**
 - Assumes execution of the 12-year Enhanced Vegetation Management Plan (2021-2032)
 - Evaluating viability of 10-year pace (2021-2030)
- Program Funding**
 - Forecast of [redacted] spend on EVM program in 2021, 2022 and 2023 respectively (in alignment with PCIR)
 - 10-year pace will result in incremental forecast of [redacted] per year
- Unit Costs**
 - Assume [redacted] per miles of EVM work

Enhanced Vegetation Management LTIP Targets

	LTIP 0.5	LTIP 1.0	LTIP 2.0
2021	1,800	1,890	2,070
2022	1,800	1,890	2,070
2023	1,800	1,890	2,070
2021-2023	5,400	5,670	6,210

- Targets are miles of EVM work for specific risk-prioritized work.
- The total mileage of the proposed 2021 Project Portfolio was set as the threshold goal (LTIP 0.5) for 2021
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Appendix

11/20/2014



Review of Work Plans

CZU Lightning Complex Fire Map



Source: CALFIRE

Damage Overview



Fire Description and Observations

- The wildfire started at 8:41 AM on August 16, 2000 and were the result of a thunderstorm that produced close to **11,000 bolts of lightning** and started **hundreds of fires** throughout California
- The lightning strikes initially **started fires separately** known as the Warnella Fire near Davenport and the Woodell Fire, near Woodell Creek, as well as three fires on what would become the northern edge of the CZU Complex fire.
- Two days after the fires began, a **change in wind conditions** caused these three northern fires to **rapidly expand and merge**, growing quickly to over 40,000 acres
- The modeling complexity of this wildfire is such that it would **require taking into account the hundreds of fires** that were started rather than treating this as a single wildfire



Work Plan Sign Off

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