Wildfire Risk Governance Committee

System Hardening Project Approvals

January 29, 2021

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Today's discussion will include mitigation recommendations, as well as additional remote grid projects to be scoped for 2021

The following 3 projects have recommended mitigations:

	Order No.	CPZ	Work Bucket	Total MAVF Core Risk Value	Mean MAVF Core Risk Rank	Recommendation	WGC Request
WGC Inform							
1	[redacted]	CLAYTON [redacted]	ECOP	32.63	377	Hybrid (OH/UG)	**Inform**
2		Bucks Creek 1101CB	CWSP - Top 50	9.55	11	Hybrid (OH/UG)	**Inform**
3		Volta [redacted]	CWSP - Top 250	13	39	OH	**Inform**

3 RG projects are requested for scoping:

	#	CPZ	Work Bucket	Total MAVF Core Risk Value	Mean MAVF Core Risk Rank	Recommendation	WGC Request
1	299 Ellis/Old Turri	Corning [redacted]	Hardening	21.6	413	RG	**Scoping Decision**
2	300 Main Turri	Corning	Hardening	21.6	413	RG	**Scoping Decision**
3	576 Stewart	Oakhurst [redacted]	Hardening	40.9	183	RG	**Scoping Decision**

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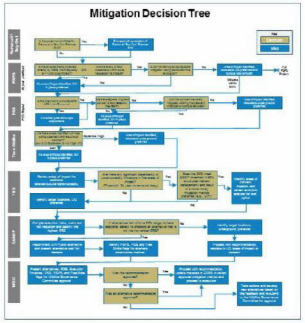
PGE-DIXIE-NDCAL-000013392

Decision: ECOP Top 20% - PM [redacted] – Clayton [redacted] H01

Mitigation Decision Tree



	Key Questions			Outcome
PSPS	Is this an area that is impacted directly by PSPS (>8 Frequency or >1,200 Cust Impact)?	Y	N	1 event, OH preferred
	Are there any critical customers within zone necessary to protect?	Y	N	
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y	N	N/A
PSS	Is the area being considered for HFRA Add/Remove?	Y	N	
	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y	N	Ingress / Egress concerns
Tree Strike	Moderate (6-14) or high (15+) strike tree potential areas in the segment	Y	N	
FSD	Are there any significant dependency or constructability limitations in the areas of impact? *(Threshold: 2+ year incremental delay)*	Y	N	
	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y	N	
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y	N	Hybrid and UG within 100%
				Hybrid Preferred

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PGE-DIXIE-NDCAL-000013393

Decision: ECOP Top 20% - PM [redacted] – Clayton [redacted] H01

Clayton 2212 (1.42 Miles)		No System Hardening	Overhead Hardening	Under-grounding	Hybrid
Project Scope Risk Reduced After Mitigation		-	1.48	2.36	1.99
Project Scope Residual Risk Value		**2.39**	**0.91**	**0.03**	**0.40**
Overall Miles Installed		1.42 Existing OH	1.42	3.15	2.82
OH System Hardening Cost	$1.8M/risk-mile	-	[redacted]		
UG System Hardening Cost	$8.2M/risk-mile	-			
Line Removal Cost		-			
Total Capital Cost					
Average O&M Cost (per year)					
NPV @ 6.8% discount rate					
Primary Filter	**$ NPV per unit of risk (RSE)**	-			
Primary Filter	**PSS Preference (Ingress/egress/fire history)**	Not Preferred	Satisfactory	Preferred	Preferred
Secondary Filter	**Strike Tree Potential**	Moderate Fall-in Risk	Low Fall-in Risk	N/A	Low Fall-in Risk
Secondary Filter	**Ingress/Egress – Preferred option**	Moderate	Not Preferred	Preferred	Preferred
Secondary Filter	**PSPS Mitigation (26 Customers)**	26 / 26 (0%)	26 / 26 (0%)	26 / 26 (0%)	26 / 26 (0%)
Secondary Filter	**Execution timeline (2021, 2022, 2022+)**	-	2021	2022+	2022+
					Recommended

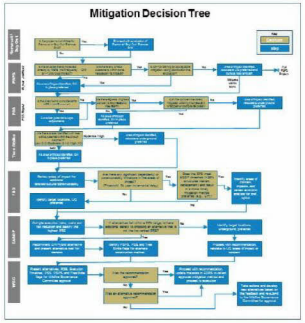
Supporting Detail for Recommended Alternative (EDRS Routing 2021-027PM) :

- **Public Safety Specialist:** Surrounded by grass oak. Population density is low. The area around this project has some fire history. Preference for action to be taken based on increased risk of ignition on tagged equipment.
- **Strike Tree Potential:** 616 total strike potential trees in the CPZ, LOW (0-5) tree strike potential in this segment does not suggest UG hardening is required.
- **Egress Considerations:** This road is not a main thoroughfare on a daily basis but is a route of egress for citizens from the Clayton Valley area when fire impacts the Clayton Valley area. The road is used for ingress for fire and emergency services from the south.
- **PSPS Mitigation:** No mitigation potential due to limited scope of this hardening project; no critical / essential customers in this segment. To achieve PSPS reductions, additional scope would have to be included.
- **Execution Timeline (Land/Bio/Cultural/Constructability):** OH hardening could be accomplished by 12/31/2021; 1.2 miles of CA red-legged frog habitat, CA tiger salamander, and Alameda Whipsnake; Pre-activity survey for cultural constraints (more significant impact for UG options); UG options include additional cost for easements, soil conditions, & expected bio risk.

PGE-DIXIE-NDCAL-000013394

Decision: CWSP Top 50 - PM [redacted] – Bucks Creek 1101 CB

Mitigation Decision Tree



	Key Questions	Outcome		
PSPS	Is this an area that is impacted directly by PSPS (>8 Frequency or >1,200 Cust Impact)?	Y	N	9 events, UG Preferred
PSPS	Are there any critical customers within zone necessary to protect?	Y	N	
PSPS	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y	N	N/A
PSS	Is the area being considered for HFRA Add/Remove?	Y	N	
PSS	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y	N	HWY 70, UG preferred
Tree Strike	Moderate (6-14) or high (15+) strike tree potential areas in the segment	Y	N	
FSD	Are there any significant dependency or constructability limitations in the areas of impact? *(Threshold: 2+ year incremental delay)*	Y	N	
FSD	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y	N	
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y	N	PSPS and Ingress/Egress
				Hybrid 1 Preferred

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Decision: CWSP TOP 50 – PM# [redacted] Bucks Creek 1101 CB

	Bucks Creek 1101 (4.73 miles)		No System Hardening	Overhead Hardening	Hybrid 1	Hybrid 2
	Project Scope Risk Reduced After Mitigation		-	4.73	9.14	8.95
	Project Scope Residual Risk Value		**9.55**	**3.63**	**0.41**	**0.61**
	Overall Miles Installed		4.73 Existing OH	4.73	5.42	4.73
	OH System Hardening Cost	$2.8M/risk-mile	-	[redacted]		
	UG System Hardening Cost	$4.4M/risk-mile	-			
	Line Removal Cost	$0.11M/risk-mile	-			
	Total Capital Cost (AACE Class 5)					
	Average O&M Cost (per year)					
	NPV @ 6.8% discount rate					
Primary Filter	**$ NPV per unit of risk (RSE)**		-			
	PSS Preference (Ingress/egress/fire history)		-	Non-satisfactory	Preferred	Non-satisfactory
Secondary Filter	**Strike Tree Potential**		Moderate Fall-In Risk	Low Fall-In Tree Risk	Low Fall-In Tree Risk	Low Fall-In Tree Risk
	Ingress / Egress		Moderate	Non-satisfactory	Preferred	Non-satisfactory
	PSPS Mitigation (5 customers)		45 / 45 (0%)	45 / 45 (0%)	45 / 45 (0%)	45 / 45 (0%)
	Execution timeline (2021, 2022, 2022+)		-	2021	2022+	2022+
	Other (Operational Considerations, etc.)		-	-	-	-
					Recommended	

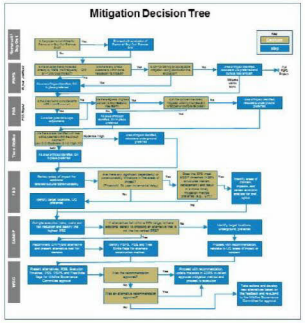
Supporting Detail for Recommended Alternative (FDRS Link 2021-0376):

- **Public Safety Specialist:** Fuel types are consistent with moderate to heavy brush and mixed conifer, however the general area has been heavily fire scarred and the fire scar areas are interrlaced with a significant amount of standing and down dead fuel.
- **Strike Tree Potential:** 105 total strike potential trees in the CPZ, Moderate (6-15) tree strike potential.
- **Egress Considerations:** This project crosses HWY 70 near the Bucks Creek Powerhouse and then parallels the highway for a roughly 2-mile stretch, and then runs along Storrie Rd. parelleling the Feather River on the canyon opposite side of Highway 70. HWY 70 is a main thoroughfare for ingress/egress for emergency responders and to the few residents who live in that direct area, it is also a major route for commerce both by vehicle and railroad. If Highway 70 was closed in this area it would make ingress and egress difficult if not impossible for responders and citizens and economically be a substantial hit to commerce. There are no alternative routes within the Feather River Canyon.
- **PSPS Mitigation:** No mitigation potential due to limited scope of this hardening project; no critical / essential customers in this segment. Cannot achieve PSPS reduction due to required overhead conductor over the water crossing near the substation.
- **Execution Timeline (Land/Bio/Cultural/Constructability):** Work required during the dry season (May 15 – Oct 15) and/or biomonitoring, and potential Heli restrictions (Feb 2 – July 15) due to owl activity centers. CALTRANS ROW, easement restrictions, and 1 culturally sensitive areas in Hybrid 1. Butte work further down HWY 70 is undergrounding line consistent with the Hybrid 1 alternative.

PGE-DIXIE-NDCAL-000013396

INFORM: CWSP TOP 250 – PM# [redacted] Volta 1101 LR 49742

Mitigation Decision Tree



	Key Questions	Outcome		
PSPS	Is this an area that is impacted directly by PSPS (>8 Frequency or >1,200 Cust Impact)?	Y	N	
	Are there any critical customers within zone necessary to protect?	Y	N	
	Is OH hardening an acceptable mitigation using distribution line exclusion?	Y	N	N/A
PSS	Is the area being considered for HFRA Add/Remove?	Y	N	
	Ingress/Egress concerns identified by PSS professionals cannot be mitigated by utilizing intumescent wrapped or composite poles.	Y	N	
Tree Strike	Moderate (6-14) or high (15+) strike tree potential areas in the segment	Y	N	
FSD	Are there any significant dependency or constructability limitations in the areas of impact? *(Threshold: 2+ year incremental delay)*	Y	N	
	Does the CPZ meet ECOP threshold (>25% structures warrant replacement) and result in a more timely mitigation method preferred (e.g., OH)?	Y	N	
EASOP	If alternatives fall within a 100% range, is there additional benefit to choosing an alternative that is not the top ranked RSE?	Y	N	
				OH Preferred

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PGE-DIXIE-NDCAL-000013397

INFORM: CWSP TOP 250 – PM# [redacted] Volta 1101 LR 49742

	Volta 1101 (3.55 miles)		No System Hardening	Overhead Hardening	Under-grounding	Hybrid
	Project Scope Risk Reduced After Mitigation		-	8.06	12.87	10.79
	Project Scope Residual Risk Value		**13**	**4.94**	**0.13**	**2.21**
	Overall Miles Installed		3.55 Existing OH	3.55	6.66	5.29
	OH System Hardening Cost	$1.9M/risk-mile	-	[redacted]		
	UG System Hardening Cost	$6.2M/risk-mile	-			
	Line Removal Cost	-	-			
	Total Capital Cost (AACE Class 5)					
	Average O&M Cost (per year)					
	NPV @ 6.8% discount rate					
Primary Filter	**$ NPV per unit of risk (RSE)**		-			
Primary Filter	**PSS Preference (ingress/egress/fire history)**		-			
Secondary Filter	**Strike Tree Potential**		**Low Fall-In Risk**	**Low Fall-In Risk**	**N/A**	**Low Fall-In Risk**
Secondary Filter	**Ingress / Egress**		**LOW**	**Satisfactory**	**Satisfactory**	**Satisfactory**
Secondary Filter	**PSPS Mitigation (19 customers)**		**38 / 38 (0%)**	**38 / 38 (0%)**	**38 / 38 (0%)**	**38 / 38 (0%)**
Secondary Filter	**Execution timeline (2021, 2022, 2022+)**		-	**2021**	**2022+**	**2022+**
Secondary Filter	**Other (Operational Considerations, etc.)**		-	-	-	-
				Recommended		

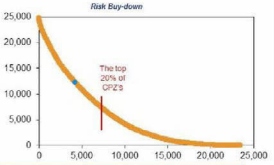
Supporting Detail for Recommended Alternative (EDRS Link 2021-03779):

- **Public Safety Specialist:** Fuel types are consistent with mainly grass/oak woodland, brush, and intermixed patches of conifers/Gray Pints. Area has a significant fire history but not directly in the project footprint but shows the ability of the area fuels to resist containment and become a major fire.
- **Strike Tree Potential:** 2 total strike potential trees in the CPZ, LOW (0-5) tree strike potential in this segment does not suggest UG hardening is required. Tx under-build for most of job.
- **Egress Considerations:** Evacuees have multiple ways out of the area, depending on the location of the fire. 1st responders will have 2 access roads.
- **PSPS Mitigation:** No mitigation potential due to limited scope of this hardening project; no critical / essential customers in this segment. To achieve PSPS reductions, additional scope would have to be included. 2 PSPS operations in 10-year lookback.
- **Execution Timeline (Land/Bio/Cultural/Constructability):** Work required during the dry season (May 15 – Oct 15) and/or biomonitoring. Mitigation expenses should be considered for ground disturbance. Potential permitting for multiple waterways. Tribal monitoring may be required. Cultural resources work and reporting may need be required, 1-2 days of SME time.

PGE-DIXIE-NDCAL-000013398

Proposed RG Project for Inclusion: #299 Ellis/Old Turri

Project Location and Overview	
Work Bucket	Hardening
Circuit	Corning 1102
CPZ	CORNING [redacted]
County	Tehama
Project Miles	2.01
Risk Statistics	
Mean Risk Score	0.175
Ignition Probability	4.46E-05
Conseq. Rank	4,517 (3%)
2021 Risk Rank	413 (11%)
2018 Risk Rank	1,844 (51%)
Operational Characteristics	
Estimated Full Project Cost (Expected Case)	[redacted]
Actual and Committed Costs	-
Project Status	Initiating
In Service Date	12/1/2021
HFTD	Tier 2
Customer Count	2



High Risk Flags	
PSPS Customer Impacts (Pre / Post) mitigation	2
Count of EC Tags	5
Tree Count	40
CPZ in Top 20% of Risk?	Yes
Fire Rebuild?	No

Mitigation Plan / Circuit Miles

PSS Concerns
- **Egress:** Main travel route ~2 mile dirtroad off main highway not maintained by county, bad weather will make it difficult to traverse without 4x4. Minimal impact to civilian egress, but significant for fire resources
- **Fire History:** Proximity to fires, but not on actual footprint

Mitigation Plan and Rationale
- 2.32 miles of line removed
- Eliminate line hardening requirement, reduce PSPS customer impacts, and savings of ~28% compared to Hardening
- Customer potentially will have ability to stay on during PSPS events

Issues / Factors Influencing Timeline
- Strong customer interest in project

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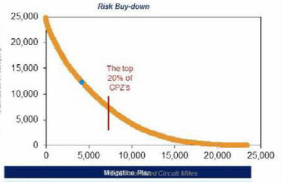
Proposed RG Project for Inclusion: #300 Main Turri

Project Location and Overview	
Work Bucket	Hardening
Circuit	Corning 1102
CPZ	CORNING-[redacted]
County	Tehama
Project Miles	1.04
Risk Statistics	
Mean Risk Score	0.175
Ignition Probability	4.46E-05
Conseq. Rank	4,517 (3%)
2021 Risk Rank	413 (11%)
2018 Risk Rank	1,844 (51%)
Operational Characteristics	
Estimated Full Project Cost (Expected Case)	[redacted]
Actual and Committed Costs	-
Project Status	Initiating
In Service Date	12/1/2021
HFTD	Tier 2
Customer Count	1



High Risk Flags	
PSPS Customer Impacts (Pre / Post) mitigation	1
Count of EC Tags	7
Tree Count	13
CPZ in Top 20% of Risk?	Yes
Fire Rebuild?	No

Mitigation Plan and Circuit Miles

PSS Concerns
- **Egress:** Main travel route is long, one lane dirt road off main highway. Bad weather will make it difficult to traverse without 4x4. Minimal impact to civilian egress, but significant for fire resources

Mitigation Plan and Rationale
- 0.75 miles of line removed
- Eliminate line hardening requirement, reduce PSPS customer impacts
- Customer potentially will have ability to stay on during PSPS events and savings of ~12% compared to Hardening
- Strong customer interest in project

Issues / Factors Influencing Timeline
- Customer desires assistance with obtaining a second meter for barn
- Barn is located across county road, potential additional permitting issues
- Same owner as one of the customers in #299 Ellis/Old Turri. Likely need to do this project, despite minimal cost savings in comparison to Hardening, to keep larger #299 project active.

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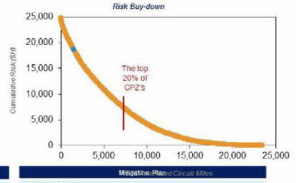
Proposed RG Project for Inclusion: #576 Stewart

Project Location and Overview	
Work Bucket	Hardening
Circuit	Oakhurst 1101
CPZ	OAKHURST [redacted]
County	Madera
Project Miles	0.75
Risk Statistics	
Mean Risk Score	0.267
Ignition Probability	5.04E-05
Conseq. Rank	45 (1%)
2021 Risk Rank	183 (5%)
2018 Risk Rank	317/1 (87%)
Operational Characteristics	
Estimated Full Project Cost (Expected Case)	[redacted]
Actual and Committed Costs	-
Project Status	Initiating
In Service Date	12/1/2021
HFTD	Tier 2
Customer Count	1

[redacted]



High Risk Flags	
PSPS Customer Impacts (Pre / Post) mitigation	1
Count of EC Tags	9
Tree Count	7
CPZ in Top 20% of Risk?	Yes
Fire Rebuild?	No

Mitigation Plan and Circuit Miles

PSS Concerns
- **Egress:** Main travel route is long, one lane dirt road off main highway. Bad weather will make it difficult to traverse without 4x4. Minimal impact to civilian egress, but significant for fire resources

Mitigation Plan and Rationale
- 0.75 miles of line removed
- Eliminate line hardening requirement, reduce PSPS customer impacts, and savings of ~16% compared to Hardening
- Customer potentially will have ability to stay on during PSPS events

Issues / Factors Influencing Timeline
- House/property is on sale by owner

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PGE-DIXIE-NDCAL-000013401

Key Decision – Approval to Scope Remote Grid Projects

Approval Status	PENDING

Decision Detail

Request to move forward with scoping three (3) remote grid projects totaling ~3.8 miles.

- #259 Ellis/Old Turri
- #300 Main Turri
- #5/6 Stewart

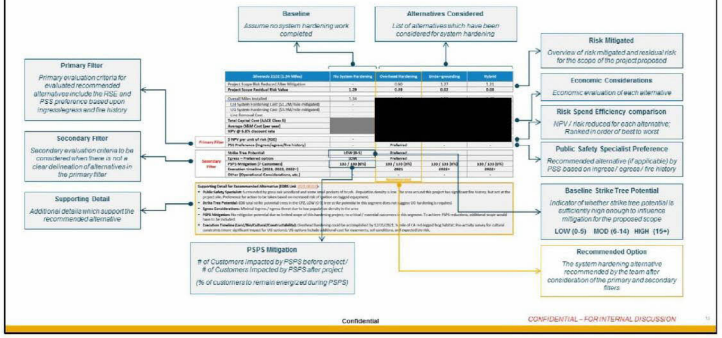
Concerns and Mitigations

Approvals

[redacted]	

Action Items and Validations

System Hardening Decision Framework Overview



PGE-DIXIE-NDCAL-000013403