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Risk Assessment and Mitigation Phase

(Chapter SCG/SDG&E-Risk-6-QWP)

**Cybersecurity
Workpapers**

May 17, 2021

Overall Workpaper Description	This workpaper file explains the risk scoring and Risk Spend Efficiency (RSE) quantification. It contains necessary information and sources for calculating the risk score and RSE for respective mitigations and controls filed in the 2021 RAMP.
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"Master Inputs" Tab	This sheet contains the major MAVF inputs for risk scoring
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"RSE Summary" Tab	This sheet presents a summarized view of RSE scoring
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RSE Equation	$\text{Risk Reduction} = (\text{Pre} - \text{Mitigated LoRE} * \text{Pre} - \text{Mitigated CoRE}) - (\text{Post} - \text{Mitigated LoRE} * \text{Post} - \text{Mitigated CoRE})$
Discounted Time	$1 - \left(\frac{1}{\frac{(1 + \text{Benefit Discount Rate})^{\text{Benefits Lifetime}}}{\text{Benefit Discount Rate}}} \right)$
RSE per \$M	$\frac{\text{Risk Reduction} * \text{Discounted Time}}{\text{Total Cost} (\$M)}$

Master Inputs

Discount Factors

Benefit Discount Factor	3.00%
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MAVF Framework

	Range	Weight
Safety Index	20	60%
Reliability Index	1	23%
Financial Cost	500	15%
Stakeholder Satisfaction Index	100	2%

2021 RAMP
 SCG/SDG&E-RISK-6-QWP
 SCG/SDG&E Cybersecurity RSE Summary

ID	Mitigation Name	Lifetime Benefit	Total Cost (\$k)	% Change in LoRE
SCG-SDG&E-RISK-6-P1	A1: Internal Defenses	5.0	\$29,430	24%
SCG-SDG&E-RISK-6-P1	A1: Obsolete Information Technology (IT) Infrastructure and Application Replacement	5.0	\$19,036	18%
SCG-SDG&E-RISK-6-P1	A1: Perimeter Defenses	5.0	\$19,862	30%
SCG-SDG&E-RISK-6-P1	A1: Sensitive Data Protection	5.0	\$22,207	12%
SCG-SDG&E-RISK-6-P2	A2: Internal Defenses	5.0	\$44,092	37%
SCG-SDG&E-RISK-6-P2	A2: Obsolete Information Technology (IT) Infrastructure and Application Replacement	5.0	\$27,600	26%
SCG-SDG&E-RISK-6-P2	A2: Perimeter Defenses	5.0	\$31,300	46%
SCG-SDG&E-RISK-6-P2	A2: Sensitive Data Protection	5.0	\$31,499	17%
SCG-SDG&E-RISK-6-C02	Planned: Internal Defenses	5.0	\$36,166	33%
SCG-SDG&E-RISK-6-C05	Planned: Obsolete Information Technology (IT) Infrastructure and Application Replacement	5.0	\$25,182	24%
SCG-SDG&E-RISK-6-C01	Planned: Perimeter Defenses	5.0	\$26,737	41%
SCG-SDG&E-RISK-6-C03	Planned: Sensitive Data Protection	5.0	\$27,635	16%

2021 RAMP
 SCG/SDG&E-RISK-6-QWP
 SCG/SDG&E Cybersecurity RSE Summary

ID	Mitigation Name	Pre-Mitigated LoRE	CoRE Safety	CoRE Financial	CoRE Reliability
SCG-SDG&E-RISK-6-P1	A1: Internal Defenses	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-P1	A1: Obsolete Information Technology (IT) Infrastructure and Application Replacement	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-P1	A1: Perimeter Defenses	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-P1	A1: Sensitive Data Protection	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-P2	A2: Internal Defenses	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-P2	A2: Obsolete Information Technology (IT) Infrastructure and Application Replacement	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-P2	A2: Perimeter Defenses	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-P2	A2: Sensitive Data Protection	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-C02	Planned: Internal Defenses	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-C05	Planned: Obsolete Information Technology (IT) Infrastructure and Application Replacement	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-C01	Planned: Perimeter Defenses	0.17	1,693.80	2,449.29	8,662.18
SCG-SDG&E-RISK-6-C03	Planned: Sensitive Data Protection	0.17	1,693.80	2,449.29	8,662.18

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 SCG/SDG&E-RISK-6-QWP
 SCG/SDG&E Cybersecurity RSE Summary

ID	Mitigation Name	CoRE Stakeholder Satisfaction	CoRE	Post-Mitigated LoRE	Risk Reduction
SCG-SDG&E-RISK-6-P1	A1: Internal Defenses	676.47	13481.73	0.13	545.45
SCG-SDG&E-RISK-6-P1	A1: Obsolete Information Technology (IT) Infrastructure and Application Replacement	676.47	13481.73	0.14	409.09
SCG-SDG&E-RISK-6-P1	A1: Perimeter Defenses	676.47	13481.73	0.12	681.81
SCG-SDG&E-RISK-6-P1	A1: Sensitive Data Protection	676.47	13481.73	0.15	272.72
SCG-SDG&E-RISK-6-P2	A2: Internal Defenses	676.47	13481.73	0.11	842.94
SCG-SDG&E-RISK-6-P2	A2: Obsolete Information Technology (IT) Infrastructure and Application Replacement	676.47	13481.73	0.13	588.75
SCG-SDG&E-RISK-6-P2	A2: Perimeter Defenses	676.47	13481.73	0.09	1053.67
SCG-SDG&E-RISK-6-P2	A2: Sensitive Data Protection	676.47	13481.73	0.14	392.50
SCG-SDG&E-RISK-6-C02	Planned: Internal Defenses	676.47	13481.73	0.11	748.36
SCG-SDG&E-RISK-6-C05	Planned: Obsolete Information Technology (IT) Infrastructure and Application Replacement	676.47	13481.73	0.13	561.27
SCG-SDG&E-RISK-6-C01	Planned: Perimeter Defenses	676.47	13481.73	0.10	935.46
SCG-SDG&E-RISK-6-C03	Planned: Sensitive Data Protection	676.47	13481.73	0.14	374.18

2021 RAMP
 SCG/SDG&E-RISK-6-QWP
 SCG/SDG&E Cybersecurity RSE Summary

ID	Mitigation Name	Discounted Time	RSE per \$Million	Data Sources
SCG-SDG&E-RISK-6-P1	A1: Internal Defenses	4.58	84.88	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-P1	A1: Obsolete Information Technology (IT) Infrastructure and Application Replacement	4.58	98.42	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-P1	A1: Perimeter Defenses	4.58	157.21	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-P1	A1: Sensitive Data Protection	4.58	56.24	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-P2	A2: Internal Defenses	4.58	87.55	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-P2	A2: Obsolete Information Technology (IT) Infrastructure and Application Replacement	4.58	97.69	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-P2	A2: Perimeter Defenses	4.58	154.17	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-P2	A2: Sensitive Data Protection	4.58	57.07	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-C02	Planned: Internal Defenses	4.58	94.77	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-C05	Planned: Obsolete Information Technology (IT) Infrastructure and Application Replacement	4.58	102.08	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-C01	Planned: Perimeter Defenses	4.58	160.23	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-C03	Planned: Sensitive Data Protection	4.58	62.01	> "Cost of Cyber Crime" studies (2017, 2019) > SME input

2021 RAMP
SCG/SDG&E-RISK-6-QWP
SDG&E Cybersecurity RSE Summary

ID	Mitigation Name	Lifetime Benefit	Total Cost (\$k)	% Change in LoRE
SCG-SDG&E-RISK-6-P1	A1: Operational Technology (OT) Cybersecurity	5.0	\$19,514	36%
SCG-SDG&E-RISK-6-P2	A2: Operational Technology (OT) Cybersecurity	5.0	\$21,262	49%
SDG&E-RISK-6-C04	Planned: Operational Technology (OT) Cybersecurity	5.0	\$20,843	49%

2021 RAMP
SCG/SDG&E-RISK-6-QWP
SDG&E Cybersecurity RSE Summary

ID	Mitigation Name	Pre-Mitigated LoRE	CoRE Safety	CoRE Financial
SCG-SDG&E-RISK-6-P1	A1: Operational Technology (OT) Cybersecurity	0.08	679.68	3,088.20
SCG-SDG&E-RISK-6-P2	A2: Operational Technology (OT) Cybersecurity	0.08	679.68	3,088.20
SDG&E-RISK-6-C04	Planned: Operational Technology (OT) Cybersecurity	0.08	679.68	3,088.20

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 SCG/SDG&E-RISK-6-QWP
 SDG&E Cybersecurity RSE Summary

ID	Mitigation Name	CoRE Reliability	CoRE Stakeholder Satisfaction	CoRE	Post-Mitigated LoRE
SCG-SDG&E-RISK-6-P1	A1: Operational Technology (OT) Cybersecurity	11,957.90	740.00	16465.78	0.05
SCG-SDG&E-RISK-6-P2	A2: Operational Technology (OT) Cybersecurity	11,957.90	740.00	16465.78	0.04
SDG&E-RISK-6-C04	Planned: Operational Technology (OT) Cybersecurity	11,957.90	740.00	16465.78	0.04

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 SCG/SDG&E-RISK-6-QWP
 SDG&E Cybersecurity RSE Summary

ID	Mitigation Name	Risk Reduction	Discounted Time	RSE per \$Million	Data Sources
SCG-SDG&E-RISK-6-P1	A1: Operational Technology (OT) Cybersecurity	470.24	4.58	110.36	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SCG-SDG&E-RISK-6-P2	A2: Operational Technology (OT) Cybersecurity	645.18	4.58	138.97	> "Cost of Cyber Crime" studies (2017, 2019) > SME input
SDG&E-RISK-6-C04	Planned: Operational Technology (OT) Cybersecurity	645.18	4.58	141.76	> "Cost of Cyber Crime" studies (2017, 2019) > SME input