**Business Case Reauthorization – Non-Major Projects**

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| **Project Name:** SF RAS Descoping Project | **Line of Business:** Transmission Operations |
| **Executive Sponsor:** Janisse Quinones | **Business Owner:** Stephanie Carstairs |
| **Program Manager**: Rico Garcillano | **Project Manager:** Sutton Smiley |
| **Department:** RAS Operations | **Division/Area:** Multiple |
| **Start Date:** 07/01/2021 | **Completion/Closeout Date:** 6/9/2026 |
| **Release to Operations Date:** 11/25/2025 | **Primary Region:** Multiple |
| **Approval Gate:** 2 of 2 | **WBS or Order#:** T.0007421 |
| **Project Team Members:**  RAS Operations: Lyle Dixson, Kimberly Castro, Enes Muftic, Thu Duong. Sherrick Slattery, Dennis Dillon, Rico Garcillano  System Protection: Rafael Pineda  Substation Engineering: Nam Trinh  Telecom: Adam Fowler  Transmission Ops: Joanna Chong  Project Management: Sutton Smiley, Fatemeh Keneshlou  Construction: Ray Handyside, Eric Burke, Brian Stansbury  Test: Mike Ruiz, Gary Henry | |
| **Action Recommended:**  Business Applications - RAS Operationsrecommends that Vice President of Transmission Operations approve an additional expenditure of $1.4 million for a revised total project cost of $3.2 million, to continue to descope the SF RAS controller logic due to a reduction of outages the scheme will protect against.  This project was previously authorized by Sr. Director of Transmission System Operations for 2.0 million on 08/02/2022 and has incurred $1.8 million actual cost to date.  **Project Cost Summary (x1000)**   |  |  | | --- | --- | | **Costs** | **Project Re-Authorization** | | Base Estimate | $2,957 | | Risk Allowance | $240 | | Expected Case | $3,197 | | Risk Contingency | $60 | | Class Contingency | $146 | | Total Contingency | $206 | | High Case Estimate | $3,403 | | |

1. **Reauthorization**

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| |  |  |  | | --- | --- | --- | | **Previously Authorized Amount** | **Total Cost Increase from Driver(s)** | **Reauthorization Amount Requested** | | $2,009 | $1,395 | $3,403 |  |  |  |  | | --- | --- | --- | | **Actual Cost to Date** | **Open Committed Items** | **Actual Cost to Date Plus Open Committed Items** | | $1,800 | $6 | $1,806 |   The primary drivers for the additional funding are the non-deterministic testing of the RAS controller taking significantly more time and resources than planned and to allow of any re-work to modify the test cases after the two-year deferral. The specific reason(s) for requesting additional funding are as follows.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Specific Driver** | **Driver Category** | **Reason** | | **Cost Increase** | | Longer time than expected to complete non-deterministic testing of the controller | Schedule | Previous project authorization assumed the non-deterministic tests would be completed within 2 months of starting, however additional time was needed for the test, revisions of test forms by OE were required. Because of the re-work and additional work required for the non-deterministic tests, more labor has been forecasted to support the testing the Scenario Test Forms. | | $636,000 | | Risk Allowance | Cost | The project will be deferred for at least 24 months, during this period no cost is expected to be charged against the project, however the load flow in San Francisco is expected to change. As a result the test cases will need to be evaluated to determine how much re-work would be needed (if any). The project is planning for 6 months of re-work to prepare new test cases. | | $530,000 | | Test/IT Support for hardware. | Cost | There were a few circuits that were not functioning and required troubleshooting from IT/Test technicians to resolved. Additional there were a few requests from OE to make the hardware match the proposed test cases for various scenarios that required support from Test and GC construction. | | $228,000 | |  |  | | **Total** | $1,394,000 | |

1. **Request to Add Contingency**

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| |  |  | | --- | --- | | **Additional Requested Amount** | **Total Reauthorized Amount** | | $1.4M | $3.4M |  |  |  |  |  | | --- | --- | --- | --- | | **Approval Date** | **Document Routing Request #** | **Reason(s) for Contingency Release** | **Amount Released** | | 1/18/2023 | Unifier: CR-0001 | Funds needed for IT and RAS Ops Labor and additional scope at San Mateo and Martin substations | $0.4M | | 08/02/2022 | ICR: 35198 | Funds needed for IT and RAS Ops Labor | $0.3M | | 4/5/2022 | ICR: 33629 | Added scope of work at Martin substation | $0.4M | | 8/23/2021 | EDRS: 2021-48854 | Business Case – initial project funding | $0.9M | |

1. **Reauthorization Lessons Learned**

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| **Lesson(s) Learned** | **Actions Taken** |
| 1. Allocate more time to controller logic testing and test case creation in the project authorization and baseline schedules, while driving towards an aggressive date. | The project forecast has increased its labor to adjust based on actuals charged against the project, and incorporated team feedback on the remaining activities for the schedule to ensure adequate authorization. |

1. **Project Objective Statement**

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| De-scope the San Francisco Remedial Action Scheme System (SF RAS) by June 2023 for less than $3.17 million. |

1. **Strategic Objective**

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| Simplify SF RAS by limiting the monitored events to only extreme events identified in the Transmission Planning Reliability (TPL) standards and supported by California Independent System Operator (CAISO) planning coordinator. |

1. **Background**

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| Electric load in San Francisco and northern San Mateo County is served from the south by numerous 230kV, 115kV, and 60kV transmission lines supplied from San Mateo Substation and the Jefferson-Martin 230kV underground line.  Extreme contingencies such as the 1989 Loma Prieta earthquake and the December 8, 1998 San Francisco outage originating from San Mateo could cause a partial or complete loss of generation and transmission. These scenarios could lead to a complete blackout of the area if no special protection systems are deployed to limit the extent of the outage. The SF RAS system was installed to provide additional protection to the electric grid and to customers during these extreme outages.  Since the December 8, 1998 Event, PG&E has made and continues to make significant system upgrades to the transmission system along the SF Peninsula. These projects include, but are not limited to capacity increase jobs such as the Jefferson-Martin cable, the AP-1, the HP-4, and most recently the ZA-1 as well as bus reliability jobs such as the BAAH conversions at Martin Sub., Mission Sub., San Mateo Sub. and Embarcadero Sub. Given these system upgrades coupled with the fact that SF RAS is not required to meet any NERC reliability requirements, an effort to either retire or descope SF RAS was presented to the CAISO. While a full retirement of the scheme was not supported by the CAISO, a descoping effort to minimize the outage scenarios that the scheme will protect against down to 8 extreme events that be tied back to the NERC TPL standard (note: TPL extreme events must be studied, but are optional to mitigate). |

1. **Scope**

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| * Review and revise key events/significant scenarios based off of CAISO recommendations. Re-program controller based on events. * Updating scheme due to the following completed projects:   + Embarcadero – Potrero   + East Grand   + Hunters Point distribution changes * Upgrade IT communication equipment as needed to support project. * This project excludes the de-commissioning of SF RAS A. This scope will be covered under the RAS relocation project (74035421). |

1. **Success Criteria**

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| * Zero injuries, zero reliability issues (inadvertent trip signals) and zero environmental notice of violation during construction * Project released to operations by November 25, 2025 and closed out by June 9, 2026 * Scheme released to operations successfully * Updated Description of Operations (DOO) approved prior to release for service * Completion of the project within authorized financial cost   Complete recovery of project cost through FERC |

1. **Project Implementation Plan**

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| **Description of the Phases and Key Milestones/Deliverables** | **Actual/Forecast Completion Date** |
| Project Kickoff | 8/1/2021 (A) |
| Project Walkdown | 5/2/2022 (A) |
| Construction Start | 9/1/2021(A) |
| Engineering Start | 1/11/2022 (A) |
| Scope Approved | 3/6/2023 |
| JE Approved | 3/6/2023 |
| Engineering End | 3/7/2023 |
| Construction End | 10/28/25 |
| Forecast In-Service Date (FISD) | 11/25/2025 |
| Project Closed | 6/9/2026 |

1. **Regulatory Cost Recovery and Treatment**

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| The project costs are expected to be included in the PG&E’s base utility revenue requirement when it becomes operational in 2025. The Company expects to recover these costs through its Federal Energy Regulatory Commission Transmission Owner’s (TO) Rate Case, and to earn the authorized return on equity established in that proceeding. |

1. **Funding Status**

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| This project is funded by Major Work Category 63, Electric Transmission System Operations. The year 2023 does not have sufficient funding and the project will be deferred until 2025. |

1. **Project Forecast ($000s)**

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| **Project Costs ($000s)** | **Prior Year Costs** | **2023** | **2024** | **2025** | **Total** |
| Base Estimate | $ 1,799 | $ 488 | $ 0 | $ 461 | $ $2,748 |
| Contingency | $ - | $ 0 | $ 0 | $ 240 | $ 240 |
| Total Authorized Expected Case | $ 1,799 | $ 488 | $ 0 | $ 701 | $ 2,988 |
| **Total High Case *(for information only)*** | $ 3,173 |  |  |  |  |

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| ***Cost Assumptions:***   * AFUDC, material burden, A&G overhead and costs escalation factors are based on current PG&E Capital Accounting Guidelines. * Project team has manually removed $300k from the forecast to account for the project deferral of 24 months, in which time no AFUDCs will be accrued. * Project released to operations by November 2025 |

1. **Issues and Risks**

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| **Risk Description** | **Probability of Occurrence (H, M, L)** | **Impact on Scope and Schedule** | **Impact on Cost** | **Mitigation Strategy / Contingency Plan** |
| Unknown Risk Allowance to Avoid Contingency Release | H | L | $300k | **Mitigation**: Execute project towards the best case scenario to avoid requiring additional risk allowance.  **Contingency*:*** To use the funds to address unknown risks to avoid stoppage in work to release contingency. |

1. **Flexibility Matrix**

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|  | **Least Flexible** | **Moderately Flexible** | **Most Flexible** | **Comments** |
| **Schedule** |  |  | X | Project schedule is the most flexible and will adapt to resource availability. |
| **Scope** | X |  |  | Key events for SF RAS are still being finalized with CAISO, once approved there will be little room for variance to the Scheme. |
| **Resources** |  | X |  | Reassignment of most resources will cause a schedule delay, but will not generally jeopardize project success. RAS Ops engineers have significant other capital project workload during the descoping. |

1. **Impacted Metrics**

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| The completion of this project allows for a smaller and simpler scheme to maintain and update, leading to more cost effective maintenance over the long run. |

1. **Environmental Impact**

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| No significant environmental impact is anticipated. The new equipment will be located within existing control center computer rooms and at substation control rooms. |

1. **Additional Information**

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| * Embarcadero – Potrero project has been supporting the SF RAS changes from 2013 until the present date. SF RAS has evolved due to other projects affecting the San Francisco & Peninsula load flow, the project team has determined that Embarcadero – Potrero is no longer the appropriate funding source for the RAS changes. As a result, this project has been created to fund the remaining changes and the de-scope efforts. All costs from 1/1/21 onwards will be transferred from Embarcadero – Potrero to the de-scope project. * The de-scope project assumes that SF RAS A will be decommissioned as part of a separate project (74035421) and the de-scope project (T.0007421) will be re-purposing material from SFCC for VGCC. |

1. **Line of Business Specific**

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| N/A |