

STATEMENT OF PROJECT OBJECTIVES (SOPO)

A. OBJECTIVES

PacifiCorp's Resiliency Enhancement Fire mitigation and Operational Risk Management (REFORM) project will implement a holistic technological ecosystem integrating a diverse set of innovative, scalable smart grid technologies with a unified objective of enhancing situational awareness to reduce or mitigate wildfire occurrences and improve grid reliability, flexibility, and resiliency. Project REFORM will use distribution fault anticipation (DFA) devices, advanced relays and communicating fault circuit indicators (CFCI) to analyze real-time system health using disturbance and fault data and to enhance situational awareness through advanced weather forecasting models and wildfire detection network (WDN) AI-enabled cameras. The project will demonstrate reliability metrics improvement, a reduction in public impacts from Public Safety Power Shutoff (PSPS) due to wildfire events, and improvement in overall wildfire risk management.

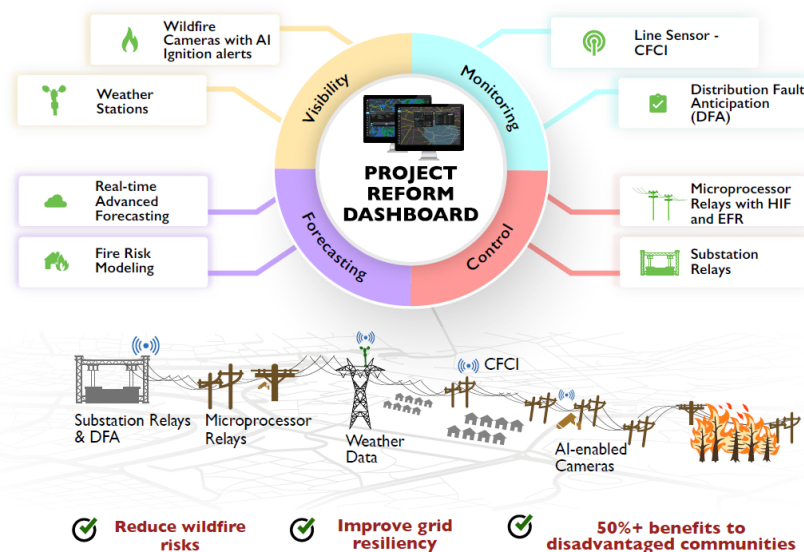


Figure 1: Project REFORM Technology Overview and Functional Areas

B. SCOPE OF WORK

Project REFORM will include installation of 2,000 CFCI devices; deployment of advanced relays with wildfire protection features — high-impedance fault detection (HIF) and elevated fire risk (EFR) settings — at 40+ sites in five states; implementation of high performance computing clusters (HPCC) for enhanced advanced forecasting (AF); deployment of eight wildfire cameras with AI-based ignition detection capabilities; testing and implementation of distribution resiliency controllers (DRC); and installation of an IP-based substation control advanced network (SCAN). All systems will be integrated to provide a holistic view to control center operators, engineers, field operation crews and emergency operation center.

While each technology is different in readiness level and scope, work across the five budget periods, corresponding to the years 2024-2028, breaks down in simple terms as follows. **Budget Period 1** is generally dedicated to overall planning and design in coordination with strategic partners. **Budget Period 2** is generally focused on material procurement, engineering design and

installation of equipment, and initial implementation of software and analytics systems. **Budget Period 3** is generally aimed at expanding equipment rollout and data collection and synthesis. **Budget Period 4** is generally focused on installation, testing, data validation, and obtaining stakeholder feedback. **Budget Period 5** is generally committed to system integration, reporting and extensive outreach and education across the region, and establishing processes to continue maintenance of the various systems.

C. TASKS TO BE PERFORMED

Task 1.0: Project Management and Planning

Subtask 1.1: Project Management Plan (PMP)

Within 30 days of award, the Recipient shall submit a Project Management Plan (PMP) to the designated Federal Project Officer (FPO). The Recipient shall not proceed beyond Task 1.0 until the PMP has been accepted by the FPO.

The PMP shall be revised and resubmitted as often as necessary, during the course of the project, to capture any major/significant changes to the planned approach, budget, key personnel, major resources, etc.

The Recipient shall manage and direct the project in accordance with the accepted PMP to meet all technical, schedule and budget objectives and requirements. The Recipient will coordinate activities to effectively accomplish the work. The Recipient will ensure that project plans, results, and decisions are appropriately documented, and that project reporting and briefing requirements are satisfied.

Subtask 1.2: National Environmental Policy Act (NEPA) Compliance

As required, the Recipient shall provide the documentation necessary for NEPA compliance.

Subtask 1.3: Cybersecurity Plan (CSP)

The CSP shall be revised and resubmitted as often as necessary, during the course of the project, to capture any major/significant changes.

Subtask 1.4: Continuation Briefing(s)

The Recipient will brief DOE on roughly an annual basis to explain the plans, progress and results of the technical effort. The briefing shall also describe performance relative to project success criteria, milestones, and the Go/No-Go Decision point that are documented in the Project Management Plan (PMP).

BUDGET PERIOD 1

Task 2.0: Engineering Scoping

Subtask 2.1: Analyze locations for cameras – Leverage Technosylva RAVE data and existing wildfire detection network (WDN) to identify best camera placement.

Subtask 2.2: Scope relay installations – Identify site requirements and substation infrastructure to develop scope of work (SOW) at sites 1-6 in California and Oregon.

Subtask 2.3: Determine CFCI type and location – Create a field map that specifies CFCI sensor type and maps the location of each sensor.

Task 3.0: Permitting and Procurement

Subtask 3.1: Request permits for cameras in California – Use permitting consultants to identify required permits for the two California camera sites.

Subtask 3.2: Release Purchase Order for relay equipment – Order materials required for relay installations at sites 1-6 in California and Oregon.

Task 4.0: Engineering, Design, and Initial Build

Subtask 4.1: Develop plan for advanced forecasting (AF) architecture – Leverage sub-recipient PSSC Labs to develop system architecture for advanced forecasting.

Subtask 4.2: Develop plan for DRC architecture – University of Utah designs DRC architecture that align with PacifiCorp system requirements.

Subtask 4.3: Integrate Outage Data Initiative Nationwide (ODIN) with Outage Management System (OMS) – Ensure that PacifiCorp outage management systems report to ODIN system.

Subtask 4.4: Design review for relays – Complete engineering design reviews for relay installations sites 1-6 in Oregon and California.

Task 5.0: Installation and Testing

Subtask 5.1: Install two cameras in California – Work with sub-recipient Pano AI to install two wildfire detection network cameras in California and train end users.

Subtask 5.2: Implement software for cameras – Work with Pano AI to ensure end users have access to live feeds and camera notifications.

Subtask 5.3: Install relays at sites 1-6 – Install relays at sites 1-6 in California and Oregon.

BUDGET PERIOD 2

Task 6.0: Engineering Scoping

Subtask 6.1: Develop scope for SCAN system – Identify site requirements and substation infrastructure to develop SOW and begin estimates.

Subtask 6.2: Scope relay installations – Identify site requirements and substation infrastructure to develop SOW: sites 7-12 in California and Oregon; sites 31-40 in Utah, Idaho, Wyoming.

Task 7.0: Permitting and Procurement

Subtask 7.1: Request permits for cameras in Oregon – Use permitting consultants to identify required permits for the six Oregon camera sites.

Subtask 7.2: Release purchase order (PO) for relay and CFCI equipment – Order materials required for relay and CFCI equipment for sites 7-12 in Oregon and California.

Task 8.0: Engineering Design, and Initial Build

Subtask 8.1: Design review for SCAN sites – Complete engineering design reviews and detailed cost estimates for all SCAN sites.

Subtask 8.2: Design review for relays – Complete engineering design reviews for relay installations sites 7-12 in California and Oregon.

Task 9.0: Installation and Testing

Subtask 9.1: Install six cameras in Oregon – Work with Pano AI to install six wildfire detection network cameras in Oregon.

Subtask 9.2: Setup DRC testbed – Set up a lab scale testbed for DRC development at the University of Utah.

Subtask 9.3: Build IT infrastructure for AF – Leverage PSSC Labs hosting services and personnel to install PSSC Labs computers for the AF system.

Subtask 9.4: Install CFCIs – Complete installation of CFCIs at all locations.

Subtask 9.5: Install relays at sites 7-12 – Install relays at sites 7-12 in California and Oregon.

Task 10: System Integration and Reporting

Subtask 10.1: Integrate data from six cameras in Oregon – Integrate data from Pano AI wildfire cameras in Oregon for end-user access in software.

BUDGET PERIOD 3

Task 11.0: Engineering Scoping

Subtask 11.1: Scope relay installations – Identify site requirements and substation infrastructure to develop SOW for sites 13-30 in California and Oregon.

Task 12.0: Permitting and Procurement

Subtask 12.1: Release PO for relay equipment – Order relay equipment for sites 13-30 in California and Oregon, and sites 31-40 in Utah, Idaho, and Wyoming and obtain permits.

Task 13.0: Engineering Design and Initial Buildout

Subtask 13.1: Design review for relays – Perform engineering design/cost estimation for relay installations: sites 13-30 in Oregon, California and sites 31-40 in Utah, Idaho, and Wyoming.

Task 14.0: Installation and Testing

Subtask 14.1: Develop beta version of AF models – Work with vendors to create beta version of the AF model by integrating data into WRF ensembles.

Subtask 14.2: Install microprocessor relays – Install relays with HIF and EFR capabilities at sites 13-30 in California and Oregon and sites 31-40 in Utah, Idaho, and Wyoming.

Subtask 14.3: Install SCAN system at substations – Coordinate across PacifiCorp teams to install SCAN systems with DFA capabilities at five sites.

Task 15.0: System Integration and Reporting

Subtask 15.1: Evaluate performance of CFCIs – Evaluate outage performance lessons learned/best practices for circuits with CFCIs.

Subtask 15.2: Evaluate performance of cameras – Solicit stakeholder feedback on wildfire cameras and evaluate the number of true positives from cameras.

BUDGET PERIOD 4

Task 16.0: Installation and Testing

Subtask 16.1: Test final WRF ensembles – Run WRF ensembles with real-time data to ensure AF models run in target time of less than or equal to 10 hours.

Subtask 16.2: SCAN testing – Ensure that SCAN remote communications are operational and DFA runs as expected.

Task 17.0: System Integration and Reporting

Subtask 17.1: Develop WDN implementation report and obtain feedback on AF system – Complete wildfire camera implementation report and solicit stakeholder feedback from smaller utilities on advanced forecasting interface.

Subtask 17.2: Develop tracking metrics for relay installation – Develop metrics that track HIF detection and EFR settings effectiveness.

BUDGET PERIOD 5

Task 18.0: System Integration and Reporting

Subtask 18.1: Obtain stakeholder feedback from AF – Document stakeholder feedback, best practices and lessons learned on use of AF system.

Subtask 18.2: Assess SCAN/DFA, CFCI and advanced relay impact – Document reliability metrics for tracking and reporting grid impacts from SCAN/DFA, CFCI and advanced relay installations

Subtask 18.3: Install DRC – Work with University of Utah to install DRC into the applicable site(s) pursuant to cybersecurity requirements.

Subtask 18.4: Report on REFORM – Develop a report that identifies lessons learned, best practices and overall project results.

Subtask 18.5: Training activities – Conduct necessary personnel training for system maintenance, software patching and firmware updates.

D. DELIVERABLES

Subtask 1.1 – Project Management Plan

Subtask 1.3 – Cybersecurity Plan

Subtask 1.4 – Pre-Continuation Briefing Document(s)

Subtask 2.1 – Report outlining of map of WDN camera locations and equipment install plans

Subtask 2.4 – Report outlining map of CFCI locations and equipment install plans

Subtask 4.3 – Report providing an overview of ODIN integration effort and lessons learned

Subtask 9.2 – Report outlining DRC architecture and testing results

Subtask 15.1 – Report on outage improvement metrics, CFCI program performance and overall lessons learned

Subtask 17.1 – Report on scalability and replication of the WDN camera network

Subtask 18.1 – Report highlighting stakeholder feedback, best practices and lessons learned on deployment and use of enhanced AF system

Subtask 18.2 – Report on overall grid impacts from installation on SCAN, DFA and relays

Subtask 18.4 – Final report on overall project that includes project results and best practices

In addition to the deliverables listed above, the Recipient shall submit all periodic, topical, final, and other reports in accordance with the Federal Assistance Reporting Checklist and accompanying instructions.

E. BRIEFINGS/TECHNICAL PRESENTATIONS

The Recipient shall prepare, and present periodic briefings, technical presentations and demonstrations as requested by the Federal Project Officer, which may be held at a DOE or the Recipient's facility, other mutually agreeable location, or via webinar. Such meetings may include all or a combination of the following:

Kickoff Briefing – *Not more than 30 days after submission of the Project Management Plan, the Recipient shall prepare and present a project summary briefing as part of a Project Kickoff Meeting.*

Pre-Continuation Briefing – *Not less than 90 days prior to the planned start of a budget period, the Recipient shall brief the DOE on the results to date, and their plans for the subsequent periods of work. The DOE will consider the information from this briefing, as well as the content of deliverables submitted to date, prior to authorizing continuing the project.*

Final Project Briefing – *Not less than 30 days before the end of the project, the Recipient shall prepare and present a Final Project Briefing on the results and accomplishments of the entire project.*

Other Briefings – *The Recipient shall prepare and present technical, financial, and/or administrative briefings as requested by the DOE. Additionally, the DOE may require Recipients to make technical presentations at national and/or industry conferences.*