TECHNICAL TASKS FROM STATEMENT OF WORK – CEC 500-10-050

Task 2 Baseline Technology Assessment for Pipeline Integrity and Monitoring Technology in the State of California

The goal of this task is to perform a comprehensive review of the current state of technology being used in California to manage pipeline integrity and safety.

The Contractor shall:
Assess the state of technology (hardware, software, and processes) being used in California to assess and monitor the condition and health of the natural gas pipeline network.
Specific topics of this task will include (but are not limited to):

1. Internal and external assessment and inspection methods,
2. Long-term condition monitoring techniques,
3. Risk-modeling and incident prediction tools,
4. ROW encroachment and excavation damage prevention,
5. Detection of pipeline leaks and ruptures,
6. Remote stress/strain analysis of pipelines,
7. Tools, techniques, and data analysis methods utilized in integrity management programs,
8. Nondestructive examination and analysis methods,
9. Automated, semi-automated, and manual methods for system shutdown,
10. System modeling of incident responses and shutdown, and
11. Data collection and communication technologies.

Deliverables:

- Task Report

Task 3 Assessment of Currently Available Pipeline Integrity Assessment and Monitoring Technology

The goal of this task is to assess all the available technology that could be used in California, but is not currently being used because it is either: (a) ready for use but not widely used on a commercial basis, (b) unknown, or (c) unproven.

The Contractor shall:

- Identify immediate opportunities to improve the assessment, monitoring, and integrity management program of the California pipeline network.
- Rank these opportunities based on impact, value, timeline, and feasibility.
- Catalogue all currently available pipeline integrity related technologies.
- Clearly define which pipeline assessment and monitoring needs could be immediately filled with commercially available technologies.
- Develop a gap analysis between the currently practiced or available pipeline integrity technologies and what is recommended to further enhance pipeline safety

Deliverables:

- Catalogue of Available Technologies
- Gap Analysis

Task 4 Evaluate Emerging Pipeline Integrity Assessment and Monitoring Technology

The goal of this task is to identify emerging technologies to enhance pipeline integrity that could be developed and implemented within two to four years based on technical merit, applicability, reliability, cost effectiveness, and degree of enhanced safety.

The Contractor shall:

- Recommend specific hardware, software, and practices that could be considered. A broad array of technologies will be considered, including (but not limited to):
    1. Hardware, sensors, software, and/or process solutions,
    2. Land, air, and space (satellite) based platforms,
    3. Robotics and internal inspection technologies,
    4. Communication pathways through the smart energy grid such as wireless and SCADA networks, and
    5. System automation, response, and simulation modeling techniques.
- Provide a report that prioritizes (by impact, feasibility, and timeliness) emerging technologies that could be developed to enhance pipeline safety, assessment, monitoring, and overall system integrity that could be implemented within four years.
- Place special emphasis on the development of a strategy to integrate the use of the AMI communications backbone, currently being installed or enhanced in California. This will optimize the value of the AMI system and the performance of the pipeline monitoring and safety technologies identified or developed for implementation.

Deliverables:

- Task Report

Task 5 Implementation Plan to Introduce New Pipeline Integrity Assessment and Monitoring Technologies to the California Pipeline Network

The goal of this task is to recommend specific technologies and the actions necessary to implement them in a timely and cost effective manner. This could include laboratory and field testing of new technologies as well as further development of emerging technologies.

The Contractor shall:

- Provide a testing, deployment, and implementation plan for currently available technologies.
- Provide recommendations for the development of select emerging technologies.
- Provide recommendation for the development of new technologies to meet outstanding gaps.

Deliverables:

- Implementation Plan

Task n-1 Technology Transfer Activities *(If applicable)*
The goal of this task is to develop a plan to make the knowledge gained, experimental results and lessons learned available to key decision-makers.

The Contractor shall:
- Prepare a Technology Transfer Plan. The plan shall explain how the knowledge gained in this project will be made available to the public. The level of detail expected is least for research-related projects and highest for demonstration projects. Key elements from this report shall be included in the Final Report for this project.

- Conduct technology transfer activities in accordance with the Technology Transfer Plan. These activities shall be reported in the Monthly Progress Reports.

Deliverables:
- Draft Technology Transfer Plan
- Final Technology Transfer Plan

Task n Production Readiness Plan *(If applicable)*
The goal of the plan is to determine the steps that will lead to the manufacturing of the technologies developed in this project or to the commercialization of the project's results.

The Contractor shall:
- Prepare a Production Readiness Plan. The degree of detail in the Production Readiness Plan discussion should be proportional to the complexity of producing or commercializing the proposed product and its state of development. The plan shall include, as appropriate, but not be limited to:
  - Identification of critical production processes, equipment, facilities, personnel resources, and support systems that will be needed to produce a commercially viable product;
  - Internal manufacturing facilities, as well as supplier technologies, capacity constraints imposed by the design under consideration, identification of design critical elements and the use of hazardous or non-recyclable materials. The product manufacturing effort may include "proof of production processes;"
  - A projected "should cost" for the product when in production;
  - The expected investment threshold to launch the commercial product;
  - An implementation plan to ramp up to full production.

Deliverables:
- Draft Production Readiness Plan
- Final Production Readiness Plan