Minutes of CALMAC Website Committee Status Call
March 9, 2022, 2 PM PST

Re: Bi-monthly in person status call of the CALAMC Website Committee.

Present: Reginald Wilkins, Southern California Edison

Kim Sides, Southern California Gas Company

Lauren Garcia, Pacific Gas and Electric

Tim Caulfield, Caulfield Consulting

Jeff Yip, Third Strand

Absent: Cynthia Rogers, California Energy Commission

Dan Hudgins, San Diego Gas and Electric

Kevin Valenzuela, San Diego Gas and Electric

Unassigned, California Public Utilities Commission

Summary: The Website Committee video call lasted approximately 20 minutes. The attached power point presentation was narrated by Tim Caulfield with assistance from Jeff Yip. No questions were asked at the conclusions of the presentation.

The presentation supplies the body of the minutes of the call

The next status report will be a written report, approximately April 15th. The next planned video meeting will be Wednesday May 11, 2021 at 2 PM Pacific Time.

CALMAC Maintenance and Weather File Creation Project

Status Report to CALMAC Website Committee

March 9, 2022

Presentation will cover:

- Accomplishments to date.
- Remaining Tasks.

- Detail available in Appendices for later review by committee members.

Accomplishments to Date:
Weather Code Automation

- Prepare CALMAC.org to accept code.
- Imported code from White Box Technologies (WBT) into CALMAC.org.
- Worked with WBT to understand code; including areas needing human judgment and expertise in WBT code process.
- Worked through automation of these steps.
- Verified with WBT that the automation steps produce accurate results.
- Finalized the automation code.
- Tested the code for robustness.
- Included functionality to initiate the production of weather files by date or on request.

Accomplishments to Date:

- Automation of the weather file process was the **main** goal of this project.
- Prior to starting this project, the ability to achieve this goal was unknown.
- **This goal has now been achieved**.

Tasks Remaining:
Issues with Automation needing resolution

- Need to make the process “year agnostic”.
- Need to address how “Compiled Code” can be kept viable long term.
- Need to decide how to handle when weather stations go off line, or new stations are created.
- Periodic review and adjustment of algorithms will be required (3 to 5 year cycle?)

Accomplishments during January and February 2022

- Made first yearly weather data transition from 2021 to 2022. 2022 weather files are being automatically updated on the site daily.
- Worked on development of API for bulk download of weather data. Anticipate supplying PG&E staff beta version for testing this week.
- Developed and listed the CA climate zone for each weather station along with longitude and latitude data.
- Began work on automating the mid-year change over from modeled solar radiation data to satellite derived solar radiation data.
- Conducted routine maintenance and operation tasks on the site.

Remaining Tasks:

- **Complete and document** Applications Programming Interface (**API**) **interface** for **downloading** the weather files. 75% Complete
- **Annotate** the weather file **code** so reviewers or future users can follow the coding. 20% Complete
- **Automate** annual **shift** from **modeled** radiation data to **satellite derived** estimates. 25%
- **Write users manual** for public weather files users (New task) 10% Complete
- Change Web Server to **HTTPS.** 0% Complete
- If budget allows: Add **Google Maps** view of weather locations. 0% Complete

Review:

- Accomplished automation of weather files.
- Accomplished creation of weather file web interface.
- Working on remaining tasks:
  - Finishing long term coding for Weather Files
  - Code Annotation
  - API for downloading
  - Incorporating satellite derived radiation estimates.
  - Creating user guide

Questions or Input?

Detail Appendix
CALMAC Maintenance and Weather File Creation Project

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Primary Project Structure

- Task 1 – Management and Maintenance of CALMAC Website
- Task 2 – Administration of the CALMAC Website Committee
- Task 3 – Creation, Automation and Posting of California Weather Files
- Task 4 – Host Updates of the California Weather Reference Files

Maintenance of CALMAC.org and Website Committee Support Tasks 1 and 2

- These tasks are a continuation of the project that has been going on since CALMAC.org was taken over by the CALMAC Website Committee in 2000.
- **Tasks completed from January 2022 through February 2022:**
  - **Posted reports and monitored website; hosted website.**
  - **Posted six new reports to the Searchable Database.**
  - **Facilitated CALMAC Website Committee call.**
  - **Supplied updated spending projections to PG&E.**
- **These tasks run for the duration of the contract.**

(Slide from PI Meeting Presentation)

Create, Automate and Host Weather Files Tasks 3 and 4

- This is the new portion of the CALMAC project.
- The objective is to "automate" the process of creating and posting of the weather files needed by California evaluators.
- There was considerable uncertainty about how successfully the team can automate the process of creating the weather files. This is meticulous work and often requires judgement and expertise that is difficult to automate.
- The Project Team will work on a best efforts basis to set up a file creation process that can be reproduced accurately and reliably, but complete success is far from guaranteed.

Project Steps – Task 3.1 and 3.2 Move code to web and validate

- Task 3.1 – Move the current White Box Technologies code for creation of weather files to the web
  - Create a Web-based platform - **Complete**
  - Transfer the White Box Technology to the platform – **Complete**
  - Study the current code and attempt to automate the processes – **95% Complete**
  - Adapt the computer code as necessary to work in the web environment – **Complete**
- Task 3.2 – Validate the Code
  - Create weather files using the web based code – **Complete, this process has been used to create the weather files since August 2021.**
  - Confirm that they web based code produces the same results as the files previously produced by White Box Technologies – **Complete – the weather files are created using the same software used previously, it is simply done on the web. Checks will continue.**

Project Steps – Task 3.3 and 3.4 Adapt code to web and Annotate

- Task 3.3 – Adapt Software to Automate Processes
  - Review results of Task 3.1 and 3.2 with CALMAC Project Manager and Website Committee. **Complete.**
  - Refine and adapt software to automate the process for creation of weather files. **98% Complete**.
  - Minimize the time and subject matter expertise needed to operate the software and clean its output. **95% Complete. Still need to review outstanding expert participation with project manager and Website Committee.**
  - "The level of "automation" that will be possible with the budget of this contract will be determined by the Statewide Project Manager and/or the CALMAC Website Committee." [quote from the contract language.] **Proof of concept complete.**
- Task 3.4 - Annotate the code developed and approved in Task 3.3 so that routines and subroutines can be reviewed you CPUC. Note: Confidentiality of proprietary software is an essential element of this review. **20% Complete.**

Project Steps – Task 3.5, 3.6, 3.7 and 4 Make the Weather Files Available

- Task 3.5 – Develop a web interface for the creation of the weather files. **95% Complete**
- Task 3.6 – Modify the code to use National Renewable Energy Laboratory (NREL) radiation data to create annual weather files based on actual radiance data, rather than modeled data. **50% Complete**
- Task 3.7 – To the extent possible, create an Applications Programming Interface (API) to facilitate the ease of downloading the weather files by users. **75% Complete**
- Task 4 – Host the weather files and download applications on CALMAC.org to make monthly and annual files available to the evaluation community. **90% Complete – The weather files are already hosted on the CALMAC website and are automatically updated daily. Note: The new weather files will not be in a monthly format, but will simply be year-to-date files to the last date the file was created.**

Project Budget/Expenditure Specifics

- Contract Duration – January 2021 through December 2022.
- Total funding – $195,000, Original budget split detailed below:
  - Task 1 – Management and Maintenance of Website - $70,000
  - Task 2 – Administration of Website Committee - $25,000

    Tasks 1 & 2 have been combined for billing purposed since distinguishing the effort spent on administering the Website Committee from managing the website is difficult. Total budget for Task 1/2 reset to $71,000. **This task is at 61% expenditure as of January 31, 2022. Task 1/2 is expected to come in on budget**.
  - Task 3 – Development and deployment of weather code - $80,000
  - Task 4 – Maintenance and hosting of weather files - $20,000

    Tasks 3 & 4 have been combined for billing purposed since distinguishing the effort spent on weather file code creation and automation from the creation and storage of files is difficult. The total budget for Task 3/4 is reset to $124,000. **This task is at 75% expenditure as of January 31, 2022. Expenditure is running ahead of prorated based expenditure but both subcontractors project completing the work within budget.**