QUARTERLY REPORT

PROJECT: **HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS, PHASE II – PROTOTYPING AND TESTING**

UAF CONTRACT: **UAF 10-0055**

CONTRACTOR: **POLARCONSULT ALASKA, INC.**

REPORTING PERIOD: **JANUARY 1, 2010 – MARCH 31, 2010**

PROJECT OVERVIEW

The project is on schedule and on budget. No problems have been encountered.

PROJECT SCHEDULE AND MILESTONES

No change from the schedule and milestones in the project contract.

SUMMARY OF PROJECT ACTIVITIES, STATUS, ACCOMPLISHMENTS

CURRENT PERIOD

- Coordinated development of scope of work and schedule with principal project subcontractor Princeton Power Systems, Inc. Coordinated disclosure of intellectual property between subcontractor and ACEP.
- Assisted ACEP in initiating contact with candidate members of Stakeholders' Advisory Group.
- Gave a presentation on the project to the Southeast Conference on March 2nd.
- Began coordination and planning for first Stakeholders' Advisory Group Meeting in Fairbanks, tentatively scheduled for April 29th.
- Gathered and began analysis of data to evaluate typical electrical loads in remote Alaska communities to guide sizing and development of HVDC system.
- Initiated contact with in-state communications utilities regarding potential of integrating future HVDC and fiber optic cable networks. Reviewed in-state fiber optic cable laying methods and costs for applicability to HVDC cables.

NEXT PERIOD

- Issue design document on converter and HVDC system sizing for remote Alaska interties.
- Hold meeting with Stakeholders' Advisory Group in Fairbanks. Tentatively scheduled for April 27th in conjunction with the Rural Energy Conference.
- Let subcontract to Princeton Power Systems, Inc. for converter development activities.
  - Draft converter standards and specifications.
  - Begin converter design and development.
- Locate a cold regions test site for field testing of transmission system components
- Work on conceptual designs of overhead transmission system (foundations, anchors, poles, and hardware)

QUARTERLY REPORT

PROJECT: **HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS, PHASE II – PROTOTYPING AND TESTING**

UAF CONTRACT: **UAF 10-0055**

CONTRACTOR: **POLARCONSULT ALASKA, INC.**

REPORTING PERIOD: **APRIL 1, 2010 – JUNE 30, 2010**

PROJECT OVERVIEW

The project is on schedule and on budget. No problems have been encountered.

Billed expenses to date are $55,018.02 (2.5% of the $2,175,500 project budget). All costs are from Denali Commission funds.

PROJECT SCHEDULE AND MILESTONES

No change from the schedule and milestones in the project contract.

SUMMARY OF PROJECT ACTIVITIES, STATUS, ACCOMPLISHMENTS

CURRENT PERIOD

- Held 1st Meeting of Stakeholders' Advisory Group (SAG) in Fairbanks on April 27th.
- Let subcontract to Princeton Power Systems, Inc. (PPS) for power converter development.
  - Held kick-off meeting at PPS in New Jersey in late May, attended by Jason Meyer (ACEP) and Dr. Richard Weis (UAF).
  - PPS is developing a converter specification document with input from PCA and project stakeholders.
- Identifying consultants for other specialty aspects of project.
- Working on system conceptual design and overhead system design, evaluating commercial availability of key system parts and components for transmission system
- Developing specifications for construction and maintenance logistics to guide design and construction efforts.

NEXT PERIOD

- Issue documents to ACEP for distribution to SAG on:
  - Site selection criteria and request for candidate sites for Phase III HVDC demonstration project.
  - Call for experience and design criteria on remote Alaska power transmission systems.
- Let subcontracts to specialists on aspects of system design/development (subject to ACEP review)
- Locate a cold regions test site for field testing of transmission system components
- Continue work on conceptual designs of overhead transmission system (foundations, anchors, poles, and hardware)

QUARTERLY REPORT

PROJECT: **HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS, PHASE II – PROTOTYPING AND TESTING**

UAF CONTRACT: **UAF 10-0055**

CONTRACTOR: **POLARCONSULT ALASKA, INC.**

REPORTING PERIOD: **JULY 1, 2010 – SEPTEMBER 30, 2010**

PROJECT OVERVIEW

- The project is progressing smoothly. No problems have been encountered.
- Billed expenses to date are $562,525.83 (26% of the $2,175,500 project budget). All costs are from Denali Commission funds.
- Polarconsult, with ACEP's approval, has let a subcontract to Manitoba Hydro International, LTD (Manitoba) of Winnipeg, Canada. Manitoba is an expert in cold regions design and HVDC systems design. It is expected that their involvement in the project can help increase the efficiency of the project effort and improve the final project deliverables. Manitoba's initial authorized budget of up to $25,000 will come from Task 3.4 funds (testing). Manitoba also has HVDC testing capabilities and facilities that may be used if appropriate.

PROJECT SCHEDULE AND MILESTONES

Polarconsult has worked with ACEP to revise the schedule for several project tasks. These revisions reflect project progress to date, and also provide additional time to consult with Manitoba on key task items. Major schedule changes are summarized below. A revised Gantt Chart for the project is attached to this report.

- Change Task 1.3 (electric code issues) completion from 11/19/10 to 3/31/11.
- Change Task 1.4 (phase III site selection) completion from 11/18/10 to 3/31/11.
- Change Task 2.1 (HVDC converter spec) completion from 9/4/10 to 10/15/10.
- Change Task 3.1 (cold region test site) completion from 6/28/10 to 5/1/11.
- Change Task 3.2 (overhead system conceptual design) completion from 10/5/10 to 12/1/10.
- Change Task 4.0 scope and budget proposal submittal date from 9/1/10 to 12/1/10.

SUMMARY OF PROJECT ACTIVITIES, STATUS, ACCOMPLISHMENTS

CURRENT PERIOD

Task 1 (Project Management, SAG, Code Issues, Phase III Site Selection)

- On-going informal communication has occurred with SAG members on various aspects of project. Correspondence has occurred with AVEC, AEA, and AP&T on converter specifications and interface with village grids; with IPEC and AEL&P about technical details on the Hoonah-Green's Creek Intertie (potential phase III

project site); with Ingemar Mathiasson (Northwest Arctic Borough) on HVDC ground return experiences and practice in Sweden; with the North Slope Borough and ACEP/UAF on buried utility experience with regard to polygonal cracking issues; with GVEA on foundation experience on their Healy-Fairbanks intertie structures; and with USDA-RUS on transmission design standards.

- A white paper to the SAG soliciting candidate locations for the phase III demonstration project has been drafted and sent to ACEP for review and comment. This paper is expected to be finalized and distributed to SAG members in October.
- The second SAG meeting has been scheduled for the week of January 10, 2011.

Task 2 (HVDC Converter Development)

- PPS has drafted a specification for the HVDC converter. Polarconsult is working with SAG members, ACEP/UAF, and Manitoba to prepare comments on the draft specification and is working with PPS to finalize the specification. Upon timely receipt of comments from Manitoba, the specification should be finalized in the next quarter.
- PPS has completed building the computer model of the HVDC converter. High frequency transformer design and power electronics topology have been finalized. Mechanical modeling and design is in progress. Thermal design is nearing completion. Purchase order for high frequency transformer manufacture has been issued, and AC fuse disconnects are on order. AC capacitors, AC contactors, high voltage IGBTs, high frequency transformer cores, and litz wire have been received and inspected.
- Development of HVDC converter test plan is in progress.
- No progress this quarter on converter testing and reporting.

Task 3 (Overhead Transmission System Design)

- The overhead system conceptual design effort is on track to be completed by the revised schedule date of December 2010.
- Polarconsult continues to talk to manufacturers and vendors of overhead transmission system components (poles, insulators, breakers, surge arrestors, etc) to assess their suitability for use in a remote overhead HVDC intertie. The results of this effort are being integrated into the conceptual design.
- Polarconsult has identified specialists in key technical areas pertinent to the overhead system. Manitoba is one of these experts with regard to HVDC-specific hardware and transmission design in cold regions. Duane Miller, PE of Golder Associates (formerly of Duane Miller Associates) is another expert that we expect to engage on geotechnical conditions and foundation design aspects of the overhead system.

- Polarconsult is still working to identify a specialist on HVDC grounding grids. Manitoba has some expertise in this field, and we expect their industry contacts will lead us to other supplemental experts as needed to develop suitable conceptual designs and/or identify testing efforts that may be beneficial for the types of grounding grids proposed for this transmission system.

Task 4 (Secondary Development Activities)

Polarconsult is assessing the level of effort necessary to advance secondary project activities. Polarconsult will propose budget, scope, and schedule amendments to advance these secondary activities near the end of the 4th quarter 2010. Current status of the three major activities is summarized below:

- 4.1 – Construction and maintenance equipment. Requirements of the construction and maintenance equipment will be driven by the conceptual overhead intertie design, which is still under development. Polarconsult is contacting various equipment manufacturers to identify the capabilities of their equipment and potential suitability for constructing and maintaining HVDC interties. Logistics and environmental factors remain key considerations in this effort. Due to the extended schedule for Task 3.2, this task is not expected to be completed by December 2010. Polarconsult will provide a detailed status report to ACEP in December advising of the status and expected completion of this task.
- 4.2 – Submarine cables. Polarconsult has contacted submarine cable manufacturers and technical experts on submarine cable materials to identify key design elements of a cable suited to the technical and economic constraints of the proposed HVDC transmission system. This activity is on track to develop a conceptual cable specification and determine what testing, if any, is necessary for this submarine cable. Findings and recommendations will be issued to ACEP in December 2010.
- 4.3 – overland cables. Polarconsult is continuing to collect data to better characterize and quantify the polygonal cracking problem. We are also gathering data on other utility systems that have been successfully used in crack-susceptible soils. These data will allow a better definition of the problem and potential solutions. This activity is on track to issue findings and recommendations for testing, if any, to ACEP in December 2010.

Task 5 (Economic Analysis and Final Report)

Cost data on various components are being collected as appropriate. No economic analyses have been started at this time.

NEXT PERIOD

Task 1.1: On-going management.
Task 1.2: Finalize agenda and details of 2nd SAG meeting, distribute to SAG.
Task 1.3: Start formal dialog with Al Nagel at Dept of Labor on electric code issues. Coordinate with ACEP and Denali Commission.
Task 1.4: Finalize Phase III Site Selection White Paper, Issue to SAG for feedback.

Task 2.1: Finalize HVDC converter specification with PPS.
Task 2.2: Continue HVDC converter design and development (PPS).
Task 2.3: Finalize HVDC converter test plan (PPS with Dr. Weis).
Task 2.4: No activity planned for next quarter (scheduled to start Q1 2011).

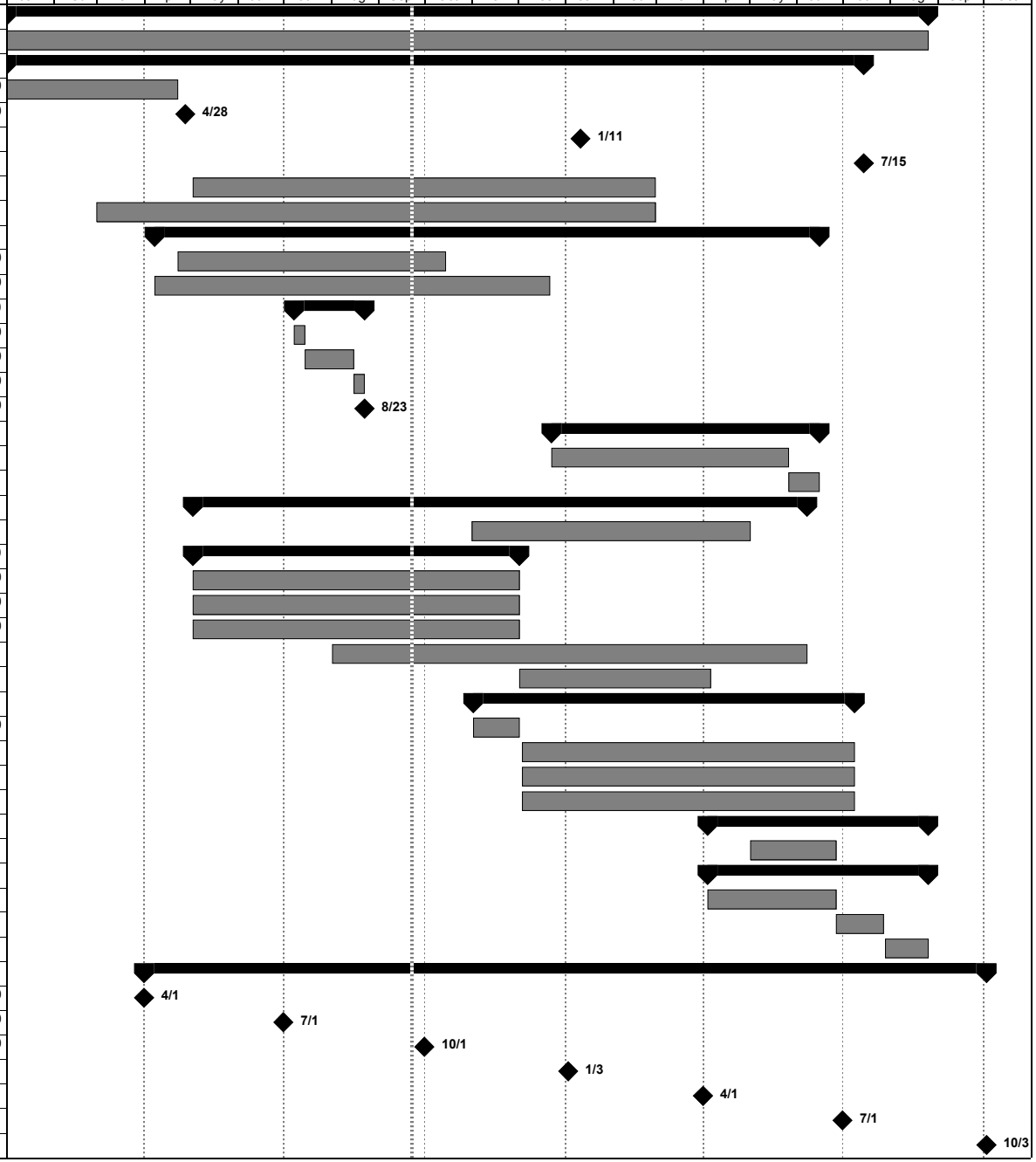
Task 3.1: Define test site requirements, identify test site as appropriate.
Task 3.2: Finish conceptual design of overhead system.
Task 3.3: Continue conceptual design of SWER grounding system.
Task 3.4: Start field tests, if required (after ACEP's approval of test plans).

Tasks 4.1-43: Issue reports describing work necessary on secondary design activities. Issue recommended scope, budget, and schedule amendments to allow for advancement of secondary design activities for ACEP's consideration.

Task 5.1: No activity planned for next quarter.
Task 5.2: No activity planned for next quarter.

HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS - PHASE II PROTOTYPING AND TESTING - SCHEDULE AMENDMENT #1 (9/22/10)

ID	Task Name	Start	Finish
1	**1.0 PROJECT MGMT, SCOPING AND STAKEHOLDER PROCESS**	**1/1/10**	**8/26/11**
2	1.1 Project Management	1/1/10	8/26/11
3	**1.2 Stakeholders Advisory Group (SAG)**	**1/1/10**	**7/15/11**
4	Assist ACEP to Organize Group	1/1/10	4/23/10
5	Meeting #1	4/28/10	4/28/10
6	Meeting #2	1/11/11	1/11/11
7	Meeting #3	7/15/11	7/15/11
8	1.3 Address Electric Code Issues	5/3/10	2/28/11
9	1.4 Phase III Project Selection	3/1/10	3/1/11
10	**2.0 CONVERTER DEVELOPMENT**	**4/8/10**	**6/16/11**
11	2.1 Develop Converter Standards and Specifications	4/23/10	10/15/10
12	2.2 Converter Design / Development	4/8/10	12/22/10
13	**2.3 Converter Test Plan**	**7/8/10**	**8/23/10**
14	Develop Draft Test Plan	7/8/10	7/15/10
15	ACEP Comments	7/15/10	8/16/10
16	Finalize Test Plan	8/16/10	8/23/10
17	Issue Test Plan	8/23/10	8/23/10
18	**2.4 Converter Testing and Test Results**	**12/23/10**	**6/16/11**
19	Testing	12/23/10	5/27/11
20	Issue Test Report	5/27/11	6/16/11
21	**3.0 TRANSMISSION DEVELOPMENT**	**5/3/10**	**6/8/11**
22	3.1 Procure Cold Regions Test Site	11/1/10	5/1/11
23	**3.2 Overhead System Conceptual Design**	**5/3/10**	**12/1/10**
24	3.2.1 Foundations and Anchors	5/3/10	12/1/10
25	3.2.2 Poles	5/3/10	12/1/10
26	3.2.3 Hardware	5/3/10	12/1/10
27	3.3 Earth Return Grounding System	8/2/10	6/8/11
28	3.4 Overhead System Testing	12/2/10	4/5/11
29	**4.0 OPT. TRANSMISSION DEVELOPMENT**	**11/1/10**	**7/8/11**
30	Develop/Approve Work Plan for Task 4 Activities	11/1/10	12/1/10
31	4.1 Construction and Maintenance Equipment and Methods	12/3/10	7/8/11
32	4.2 Submarine Cable Development	12/3/10	7/8/11
33	4.3 Overland Cable System Development	12/3/10	7/8/11
34	**5.0 SYSTEM ECONOMICS AND REPORTING**	**4/4/11**	**8/26/11**
35	5.1 Economic Evaluations	5/2/11	6/27/11
36	**5.2 Draft Final Report**	**4/4/11**	**8/26/11**
37	Prepare Draft Final Report	4/4/11	6/27/11
38	ACEP/SAG Review and Comment	6/27/11	7/28/11
39	Finalize and Issue Final Report	7/29/11	8/26/11
40	**PROJECT MANAGEMENT**	**4/1/10**	**10/3/11**
41	Quarterly Report #1	4/1/10	4/1/10
42	Quarterly Report #2	7/1/10	7/1/10
43	Quarterly Report #3	10/1/10	10/1/10
44	Quarterly Report #4	1/3/11	1/3/11
45	Quarterly Report #5	4/1/11	4/1/11
46	Quarterly Report #6	7/1/11	7/1/11
47	Quarterly Report #7 - FINAL PROGRESS REPORT	10/3/11	10/3/11



QUARTERLY REPORT

PROJECT: **HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS, PHASE II – PROTOTYPING AND TESTING**

UAF CONTRACT: **UAF 10-0055**

CONTRACTOR: **POLARCONSULT ALASKA, INC.**

REPORTING PERIOD: **OCTOBER 1, 2010 – DECEMBER 31, 2010**

PROJECT OVERVIEW

- The project is progressing smoothly. No problems have been encountered.
- Billed expenses to date are $782,142.38 (36% of the $2,175,500 project budget). All costs are from Denali Commission funds.

PROJECT SCHEDULE AND MILESTONES

Polarconsult has worked with ACEP to revise the schedule for several project tasks. These revisions reflect project progress to date, and also provide additional time to consult with Manitoba on key task items. Major schedule changes are summarized below. A revised Gantt Chart for the project is attached to this report.

- Change Task 2.1 (HVDC converter spec) completion from 10/15/10 to 3/31/11.
- Change Task 3.2 (OH system conceptual design) completion from 12/1/10 to 6/30/11.

SUMMARY OF PROJECT ACTIVITIES, STATUS, ACCOMPLISHMENTS

CURRENT QUARTER – Q4 2010

Task 1 (Project Management, SAG, Code Issues, Phase III Site Selection)

- On-going informal communication has occurred with SAG members on various aspects of project. Correspondence has occurred with AVEC on converter specifications and control requirements with village grids; with UAF/UAA faculty on polygonal cracking parameters; and with GVEA on foundation experience on their Healy-Fairbanks intertie structures.
- Polarconsult issued a white paper to the SAG requesting input on goals and sites for the phase III demonstration project. This will be a discussion topic at the upcoming SAG meeting on January 14, 2011.

Task 2 (HVDC Converter Development)

- Polarconsult received two sets of comments from Manitoba on PPS' draft converter specification. A variety of useful comments were provided – no critical technical issues were identified. Manitoba's comments were forwarded to PPS for review and draft response. PPS' response to Manitoba's comments, and the converter specification will both be finalized in the next quarter (Q1 2011).
- PPS has completed design of the power electronics and is selecting/designing components. Some power train components are on order and/or have been received.

The control architecture is finalized and hardware is under design / procurement. Thermal modeling and design for passive cooling is completed. The high-frequency power transformer and harmonic filter inductors are on order. Mechanical and tank components will be on order in Q1 2011. Converter assembly is scheduled to begin in Q2 2011.

- Development of the HVDC converter test plan is in progress, and will be issued by PPS for review by PCA and Dr. Weis in January 2011.
- No progress this quarter on converter testing and reporting.

Task 3 (Overhead Transmission System Design)

- The overhead system conceptual design effort is making progress, however a schedule extension is required to complete. Soliciting and receiving all data from manufacturers is taking longer than expected, and this task is now expected to be completed in Q2 2011.
- Polarconsult has asked several manufacturers (of poles, insulators, and foundation components) to submit preliminary supply proposals for the overhead HVDC system. As appropriate, responses may include existing product lines that will meet the application and/or customized products developed for this application. Customized products may include one-time tooling and development charges, but it is expected these costs will be recouped in construction savings stemming from the optimized component designs. This tradeoff will be analyzed once data are received from manufacturers.
- Polarconsult is still working to identify a specialist on HVDC grounding grids. We have identified candidates but none has committed to participating in the project yet.

Task 4 (Secondary Development Activities)

Polarconsult is currently preparing work plans for secondary project activities. These work plans will propose Phase II budget, scope, and schedule amendments to advance these secondary activities. The plans will be submitted to ACEP for review and approval in January 2011. Current status of the three major activities is summarized below:

- 4.1 – Construction and maintenance equipment. Polarconsult met with owner/ operators of prospective construction equipment in the 4th quarter to review equipment functionality and suitability for intertie construction. As the intertie conceptual design is finalized, this information will be used to make recommendations on suitable construction and maintenance equipment and methods. Logistics and environmental factors remain key considerations in this effort.
- 4.2 – Submarine cables. Polarconsult is preparing a submarine cable performance specification and expects to submit this to manufactures in Q1 2011 to obtain costs for tooling and manufacture of the cable, and manufacturer recommendations on

any special testing required before the cable is placed into commercial service. Polarconsult expects to receive information from manufactures back and determine if any additional Phase II work is warranted by the end of Q1 2011.

- 4.3 – Overland Cables. Polarconsult has compiled existing information to quantify the polygonal cracking problem, and is developing a test plan to evaluate proposed installation methods and cable designs to solve this problem. This test plan will be a part of the Work Plan that will be submitted to ACEP in January 2011.

Task 5 (Economic Analysis and Final Report)

Cost data on various components are being collected as appropriate. No economic analyses have been started at this time.

NEXT QUARTER – Q1 2011

Task 1.1: On-going management.
Task 1.2: Hold 2nd SAG meeting, manage SAG work groups.
Task 1.3: Work with Manitoba ADOL, and stakeholders to develop approval process, coordinate efforts with ACEP and Denali Commission.
Task 1.4: Collect input on candidate projects from SAG, analyze and make recommendations.

Task 2.1: Finalize HVDC converter specification with PPS.
Task 2.2: Continue HVDC converter design and development (PPS).
Task 2.3: Finalize HVDC converter test plan (PPS with Dr. Weis).
Task 2.4: No activity planned for next quarter (PPS has scheduled to start Q2 2011).

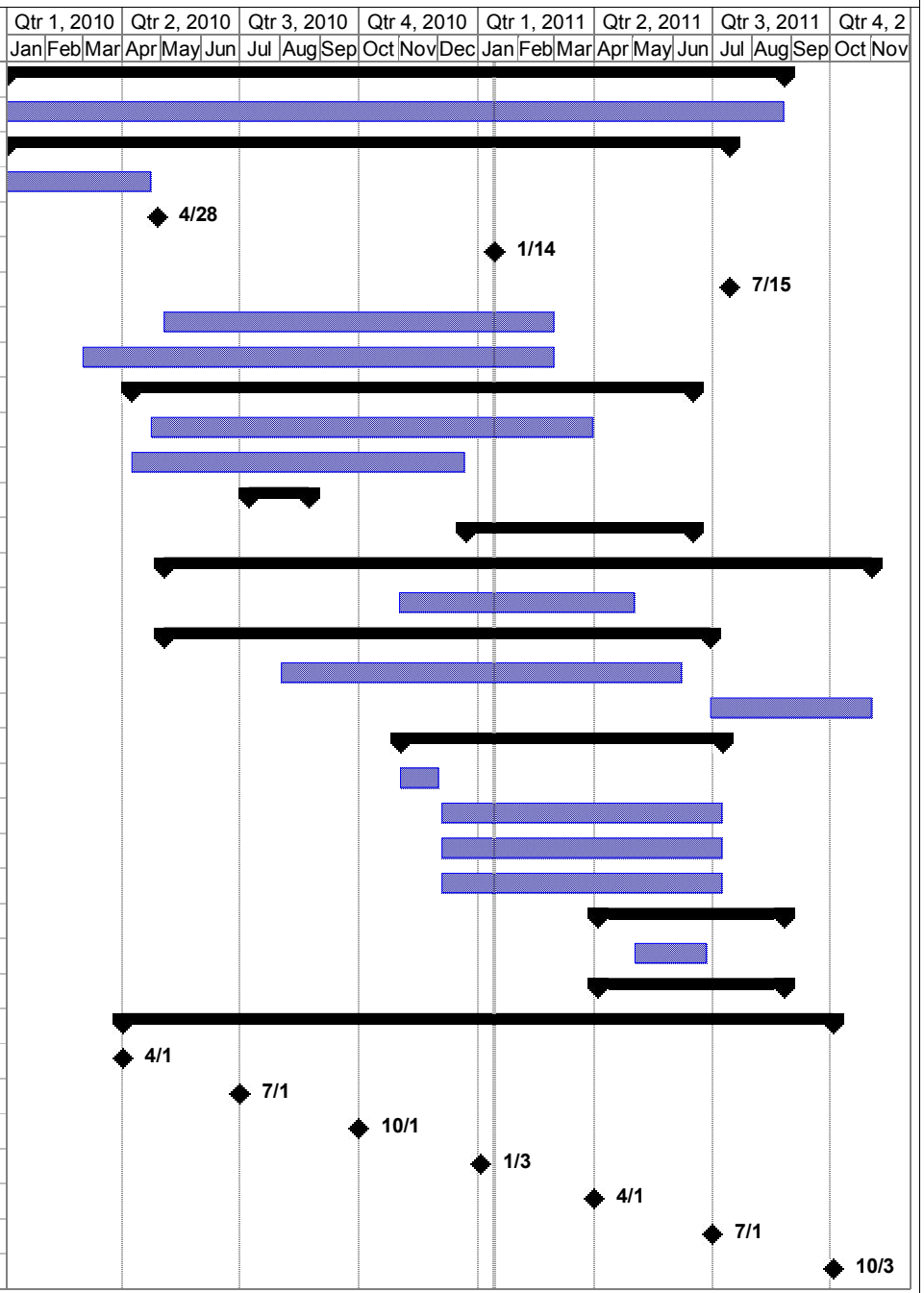
Task 3.1: Define test site requirements, identify test site as appropriate.
Task 3.2: Finish conceptual design of overhead system.
Task 3.3: Retain consultant for SWER grounding system concept design, define any test needs.
Task 3.4: Start field tests for overland cable (after ACEP's approval of test plans).

Tasks 4.1-4.3: Issue reports describing work necessary on secondary design activities. Issue recommended scope, budget, and schedule amendments to allow for advancement of secondary design activities for ACEP's consideration.

Task 5.1: No activity planned for next quarter.
Task 5.2: No activity planned for next quarter.

HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS - PHASE II PROTOTYPING AND TESTING - SCHEDULE AMENDMENT #2 (1/15/11)

ID	Task Name	Start	Finish
1	**1.0 PROJECT MGMT, SCOPING AND STAKEHOLDER PROCE**	**1/1/10**	**8/26/11**
2	1.1 Project Management	1/1/10	8/26/11
3	**1.2 Stakeholders Advisory Group (SAG)**	**1/1/10**	**7/15/11**
4	Assist ACEP to Organize Group	1/1/10	4/23/10
5	Meeting #1	4/28/10	4/28/10
6	Meeting #2	1/14/11	1/14/11
7	Meeting #3	7/15/11	7/15/11
8	1.3 Address Electric Code Issues	5/3/10	2/28/11
9	1.4 Phase III Project Selection	3/1/10	3/1/11
10	**2.0 CONVERTER DEVELOPMENT**	**4/8/10**	**6/16/11**
11	2.1 Develop Converter Standards and Specifications	4/23/10	3/31/11
12	2.2 Converter Design / Development	4/8/10	12/22/10
13	**2.3 Converter Test Plan**	**7/8/10**	**8/23/10**
18	**2.4 Converter Testing and Test Results**	**12/23/10**	**6/16/11**
21	**3.0 TRANSMISSION DEVELOPMENT**	**5/3/10**	**11/1/11**
22	3.1 Procure Cold Regions Test Site	11/1/10	5/1/11
23	**3.2 Overhead System Conceptual Design**	**5/3/10**	**6/29/11**
27	3.3 Earth Return Grounding System	8/2/10	6/8/11
28	3.4 Overhead System Testing	6/30/11	11/1/11
29	**4.0 OPT. TRANSMISSION DEVELOPMENT**	**11/1/10**	**7/8/11**
30	Develop/Approve Work Plan for Task 4 Activities	11/1/10	12/1/10
31	4.1 Construction and Maintenance Equipment and Methods	12/3/10	7/8/11
32	4.2 Submarine Cable Development	12/3/10	7/8/11
33	4.3 Overland Cable System Development	12/3/10	7/8/11
34	**5.0 SYSTEM ECONOMICS AND REPORTING**	**4/4/11**	**8/26/11**
35	5.1 Economic Evaluations	5/2/11	6/27/11
36	**5.2 Draft Final Report**	**4/4/11**	**8/26/11**
40	**PROJECT MANAGEMENT**	**4/1/10**	**10/3/11**
41	Quarterly Report #1	4/1/10	4/1/10
42	Quarterly Report #2	7/1/10	7/1/10
43	Quarterly Report #3	10/1/10	10/1/10
44	Quarterly Report #4	1/3/11	1/3/11
45	Quarterly Report #5	4/1/11	4/1/11
46	Quarterly Report #6	7/1/11	7/1/11
47	Quarterly Report #7 - FINAL PROGRESS REPORT	10/3/11	10/3/11



QUARTERLY REPORT

PROJECT: **HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS, PHASE II – PROTOTYPING AND TESTING**

UAF CONTRACT: **UAF 10-0055**

CONTRACTOR: **POLARCONSULT ALASKA, INC.**

REPORTING PERIOD: **JANUARY 1, 2011 – MARCH 31, 2011**

PROJECT OVERVIEW

- The project is progressing in a normal manner, consistent with and in accordance to general project management expectations. No problems have been identified that would prevent overall project success.
- As of March 31, 2011, grant funds totaling $886,308.70 (41% of the $2,175,500 project budget) have been received by Polarconsult. All grant payments are from Denali Commission funds.

PROJECT SCHEDULE AND MILESTONES

Polarconsult has worked with ACEP to revise the scope, schedule and budget for several project tasks as called for under the project statement of services. These revisions will be formalized once the work plan for the overhead system field testing is completed and approved by ACEP in May 2011.

Princeton Power Systems, Inc. (PPS) sustained a fire at their main facility in February 2011. The fire did not damage materials and equipment for the converters, but it did damage the part of their facility where the converters were to be tested. As a result of the fire, PPS has requested an extension of time to complete the converter development and testing that will move project completion back to December 30, 2011.

SUMMARY OF PROJECT ACTIVITIES, STATUS, AND ACCOMPLISHMENTS

CURRENT QUARTER – Q1 2011

Task 1 (Project Management, SAG, Code Issues, Phase III Site Selection)

- On-going informal communication has occurred with SAG members on various aspects of project. Correspondence has occurred with AVEC on converter specifications and control requirements with village grids; with UAF/UAA faculty on polygonal cracking parameters; and with GVEA on foundation experience on their Healy-Fairbanks intertie structures.
- Polarconsult participated in the 2nd SAG meeting on January 14, 2011. Participation included presentations on overall project status and review of criteria and candidates for a Phase III demonstration project.
- Polarconsult participated in a series of teleconferences with SAG members to evaluate candidate locations for a Phase III demonstration project.

Task 2 (HVDC Converter Development)

- Polarconsult received the finalized converter specification (revision 1.0, April 20, 2011) from PPS for final review and approval. The specification incorporated Manitoba and Polarconsult comments provided during the past quarter. The comments were the result of teleconference meetings, individual discussions, and email messages between the project managers and project technical specialists. The associated discussions addressed numerous issues including items such as acoustic level and surge arrestor selection among others. During these discussions, no technical impediments were identified that would prevent project success. Manitoba's comments were forwarded to PPS for review and response. The converter specification will receive its final review by Manitoba and Polarconsult during the next quarter (Q2 2011).
- PPS completed the following items this quarter: finalization of converter specification; modification of power electronics and circuit topology; component procurement specification; converter modeling and simulation analysis; control architecture; circuit board schematics; thermal management simulation and passive cooling design; converter mechanical design; Failure Rate and MTBF analysis and power electronics design; and preparation of the draft preliminary test plan.
- Layout and ordering of the Master Control Board and completion of the mechanical and tank component selection is to be completed during Q2 2011. Further, assembly of one, 1 MW HVDC converter unit, is scheduled to start on June 1, 2011.
- PPS is continuing with Design Failure Mode Effects Analysis (DFMEA). MHRC and PPS are coordinating directly on technical review and assessment of converter function.

Task 3 (Overhead Transmission System Design)

- Polarconsult continues to receive information from manufacturers and vendors on the poles, insulators, and related hardware for the overhead system. We continue to integrate this information into our design as it is provided.
- Polarconsult has held a series of teleconferences with the managers of Manitoba Hydro's transmission and distribution operating divisions to learn how they build and maintain AC and DC transmission lines and AC distribution lines in arctic climates, what challenges they have encountered, and what solutions they have engineered. Points of contact to other Canadian provincial electricity providers have been requested.
- Polarconsult is working with Dr. Zarling of UAF and Arctic Foundations, Inc. to finalize designs for the pole and guy foundations.
- Manitoba has provided a grounding analysis for code review by the Alaska Department of Labor.

Task 4 (Secondary Development Activities)

Current status of the three major activities is summarized below:

- 4.1 – Construction and maintenance equipment. Polarconsult has identified several promising existing equipment and tools that can be adapted to facilitate construction and maintenance of the overhead system. We are discussing arrangements with vendors of this equipment to identify the best manner to proceed with adaptations.
- 4.2 – Submarine cables. Polarconsult is developing a performance specification for submarine cable suitable for the HVDC technology.
- 4.3 – Overland Cables. Polarconsult is preparing a plan for testing cable assemblies that can survive polygonal cracking.

Task 5 (Economic Analysis and Final Report)

Cost data on various components are being collected as appropriate. No economic analyses have been started at this time.

NEXT QUARTER – Q2 2011

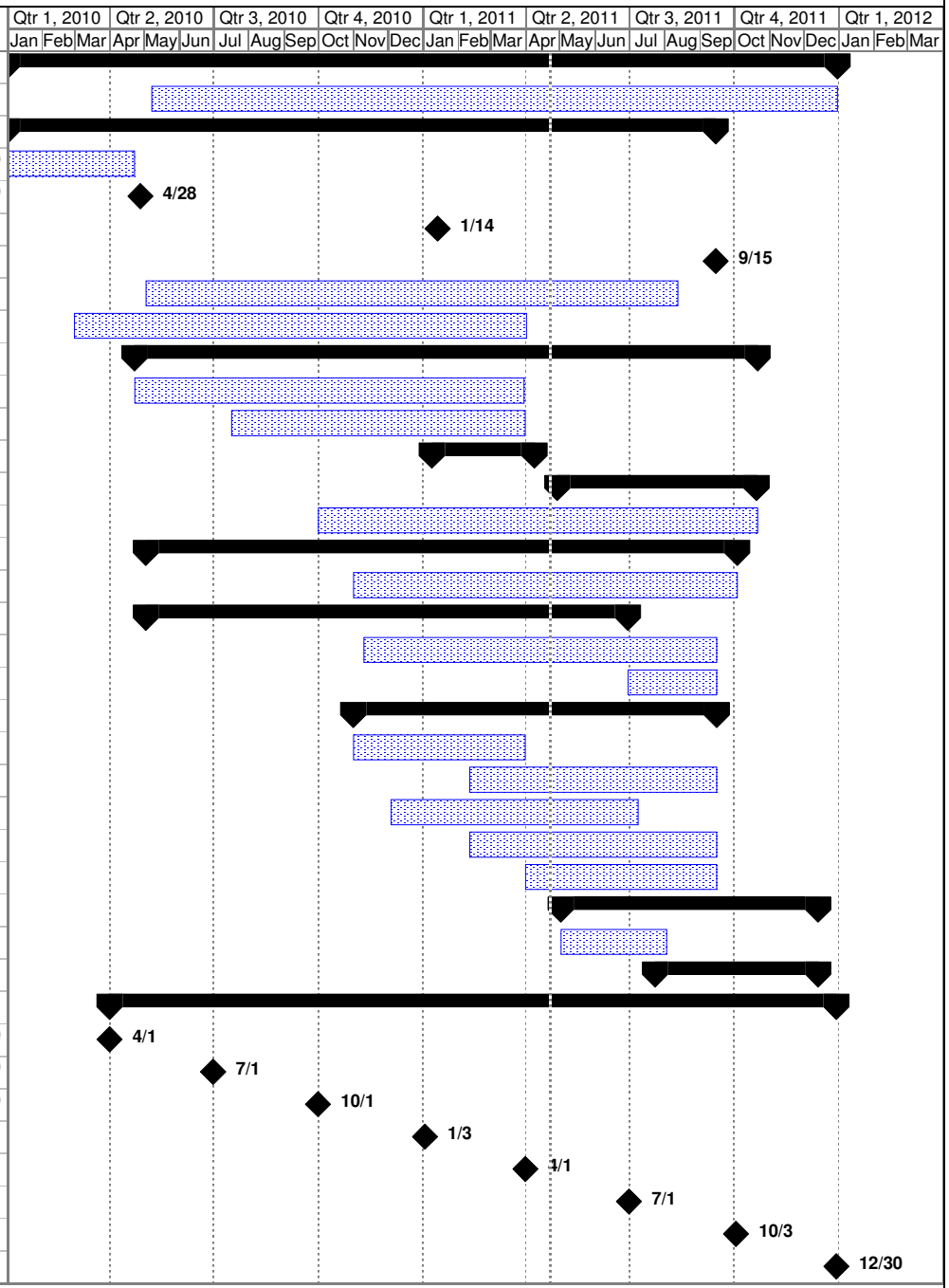
Task 1.1: On-going management.
Task 1.2: Work with ACEP to start SAG work group on code issues, continuing informal correspondence with SAG members.
Task 1.3: Continue working with Manitoba ADOL, and stakeholders to develop approval process, coordinate efforts with ACEP and Denali Commission.
Task 1.4: Completed.
Task 2.1: Review and approve final HVDC converter specification with PPS.
Task 2.2: Continue HVDC converter design and development (PPS).
Task 2.3: Finalize HVDC converter test plan (PPS with Dr. Weis).
Task 2.4: Develop and review test procedures (PPS).
Task 3.1: Define test site requirements, identify test site as appropriate.
Task 3.2: Finish conceptual design of overhead system.
Task 3.3: Retain consultant for SWER grounding system concept design, define any test needs.
Task 3.4: Start field tests for overland cable (after ACEP's approval of test plans).

Tasks 4.1-4.3: Issue reports describing work necessary on secondary design activities. Issue recommended scope, budget, and schedule amendments to allow for advancement of secondary design activities for ACEP's consideration.

Task 5.1: No activity planned for next quarter.
Task 5.2: No activity planned for next quarter.

HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS - PHASE II PROTOTYPING AND TESTING - SCHEDULE AMENDMENT #3 (3/11/11)

ID	Task Name	Start	Finish
1	**1.0 PROJECT MANAGEMENT AND ADMINISTRATION**	**Fri 1/1/10**	**Fri 12/30/11**
2	1.1 Project Scoping and Management	Fri 5/7/10	Fri 12/30/11
3	**1.2 Stakeholder Involvement**	**Fri 1/1/10**	**Thu 9/15/11**
4	Assist ACEP to Organize Group	Fri 1/1/10	Fri 4/23/10
5	Meeting #1	Wed 4/28/10	Wed 4/28/10
6	Meeting #2	Fri 1/14/11	Fri 1/14/11
7	Meeting #3 (preliminary date)	Thu 9/15/11	Thu 9/15/11
8	1.3 Electric Code Issues	Mon 5/3/10	Fri 8/12/11
9	1.4 HVDC Phase III: Demonstration Project Site Evaluation	Mon 3/1/10	Fri 4/1/11
10	**2.0 CONVERTER DEVELOPMENT**	**Fri 4/23/10**	**Fri 10/21/11**
11	2.1 Develop Converter Standards and Specifications	Fri 4/23/10	Thu 3/31/11
12	2.2 Converter Design / Development	Fri 7/16/10	Thu 3/31/11
13	**2.3 Converter Test Plan**	**Sat 1/8/11**	**Fri 4/8/11**
18	**2.4 Converter Test Results**	**Fri 4/29/11**	**Fri 10/21/11**
21	2.5 HVDC Systems Integration	Fri 10/1/10	Fri 10/21/11
22	**3.0 TRANSMISSION DEVELOPMENT - PRIMARY**	**Mon 5/3/10**	**Mon 10/3/11**
23	3.1 Test Site Procurement	Mon 11/1/10	Mon 10/3/11
24	**3.2 Overhead System Conceptual Design**	**Mon 5/3/10**	**Wed 6/29/11**
28	3.3 Earth Return Grounding System	Tue 11/9/10	Thu 9/15/11
29	3.4 Overhead System Construction	Thu 6/30/11	Thu 9/15/11
30	**4.0 TRANSMISSION DEVELOPMENT - SECONDARY**	**Mon 11/1/10**	**Thu 9/15/11**
31	Develop/Approve Work Plan for Task 4 Activities	Mon 11/1/10	Thu 3/31/11
32	4.1 Construction and Maintenance Equipment and Methods	Thu 2/10/11	Thu 9/15/11
33	4.2 Submarine Cable Development	Fri 12/3/10	Fri 7/8/11
34	4.3 Overland Cable Development	Thu 2/10/11	Thu 9/15/11
35	4.4 Telecommunications Feasibility Evaluation	Fri 4/1/11	Thu 9/15/11
36	**5.0 REPORTING**	**Mon 5/2/11**	**Tue 12/13/11**
37	5.1 Economic Evaluation	Mon 5/2/11	Wed 8/3/11
38	**5.2 Final Report**	**Sat 7/23/11**	**Tue 12/13/11**
42	**PROJECT MANAGEMENT**	**Thu 4/1/10**	**Fri 12/30/11**
43	Quarterly Report #1	Thu 4/1/10	Thu 4/1/10
44	Quarterly Report #2	Thu 7/1/10	Thu 7/1/10
45	Quarterly Report #3	Fri 10/1/10	Fri 10/1/10
46	Quarterly Report #4	Mon 1/3/11	Mon 1/3/11
47	Quarterly Report #5	Fri 4/1/11	Fri 4/1/11
48	Quarterly Report #6	Fri 7/1/11	Fri 7/1/11
49	Quarterly Report #7	Mon 10/3/11	Mon 10/3/11
50	Quarterly Report #8 - FINAL PROGRESS REPORT	Fri 12/30/11	Fri 12/30/11



polarconsult alaska, inc.
ENGINEERS • PLANNERS • ENVIRONMENTAL CONSULTANTS

QUARTERLY REPORT

PROJECT:	**HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS, PHASE II – PROTOTYPING AND TESTING**
UAF CONTRACT:	**UAF 10-0055, MODIFICATION #1**
CONTRACTOR:	**POLARCONSULT ALASKA, INC.**
REPORTING PERIOD:	**APRIL 1, 2011 – JUNE 30, 2011**

PROJECT OVERVIEW

- The project is progressing in a normal manner, consistent with and in accordance to general project management expectations. No problems have been identified that would prevent overall project success.
- As of June 30, 2011, grant funds totaling $1,508,956.23 (69% of the $2,175,500 project budget) have been received by Polarconsult. All grant payments are from Denali Commission funds.

PROJECT SCHEDULE AND MILESTONES

Polarconsult has worked with ACEP to revise the scope, schedule and budget for several project tasks as called for under the project statement of services. These revisions were formalized as Modification No. 1 to the Contract Documents on June 21, 2011.

SUMMARY OF PROJECT ACTIVITIES, STATUS, AND ACCOMPLISHMENTS

CURRENT QUARTER – Q2 2011

Task 1 (Project Management, SAG, Code Issues, Phase III Site Selection)

- Informal communication between SAG members and Polarconsult has occurred on various aspects of project. Correspondence has occurred with UAF faculty and Golden Valley Electric Association (GVEA) on foundation design issues; and with Copper Valley Electric Association (CVEA) on potential sites for Phase II foundation testing in the Glennallen area.
- Polarconsult and ACEP have established that the 3rd SAG meeting will take place in Juneau during the Rural Energy Conference being held September 27 – 29, 2011. The date, time and venue will be selected in July 2011. Polarconsult has requested that representatives of Princeton Power Systems, Inc. (PPS) and Manitoba High-Voltage Research Centre (MHRC) attend the conference and SAG Meeting.
- Per Polarconsult's directive, MHRC prepared and issued a report discussing code and safety issues relating to single-wire earth return (SWER) circuits in April 2011. The report was in direct response to questions asked by the Department of Labor regarding the safety of HVDC SWER circuits.

Task 2 (HVDC Converter Development)

- Polarconsult received the finalized converter specification (revision 1.0, April 20, 2011) from PPS for final review and approval. The specification incorporated Manitoba and Polarconsult comments. Polarconsult has reviewed the final specification and identified minor issues that will be resolved with PPS in Q3 2011.
- PPS completed the following items this quarter: completed parts procurement for the two 500 kW units; received and tested at full voltage the 1st of 16 high voltage stage printed circuit boards (PCBs), received and tested the fiber optic base and expander PCBs.
- PPS has released the remaining 15 high voltage stage PCBs for production, and is assembling the tank status PCBs and other peripheral PCBs. The trigger PCBs that will drive the high voltage stack boards are being manufactured.
- PPS is continuing with Design Failure Mode Effects Analysis (DFMEA). MHRC and PPS are coordinating directly on technical review and assessment of converter function.
- Per Polarconsult's directive, MHRC issued a report on integration and implementation considerations for multi-terminal HVDC networks using the PPS converters.

Task 3 (Overhead Transmission System Design)

- Polarconsult has fiberglass poles and foundation materials under procurement for installation at the test site. Both are expected to arrive in Alaska in August. Polarconsult has requested cost estimates for manufacturing production-scale quantities of these materials. Our assessment of design alternatives for overhead structures continues.
- Polarconsult has investigated sites for testing cold regions power pole foundation designs in the Glennallen and Fairbanks areas. The 'Farmer's Loop Road Test Site' owned by the U.S. Army Corps of Engineers' Cold Regions Research and Engineering Laboratory (CRREL) in Fairbanks has been identified as the preferred location for testing. This site is preferred because Fairbanks has better logistics and support capabilities than Glennallen, and is also nearby ACEP and UAF, which will simplify long-term monitoring of the foundations. The CRREL site also has well-characterized thermal and soil profiles reducing uncertainty in the site's suitability for this project. Polarconsult is currently working with CRREL to secure agreements for access to the site. Installation of foundation materials is expected to occur in August or September 2011.

Task 4 (Secondary Development Activities)

Current status of the three major activities is summarized below:

- 4.1 – Construction and maintenance equipment. Polarconsult has identified existing equipment and tools that can be adapted to facilitate construction and maintenance of the overhead system.
- 4.2 – Submarine cables. Polarconsult is currently developing a performance specification for submarine cable suitable for the HVDC technology.
- 4.3 – Overland Cables. Polarconsult continues to develop plans for cable test assemblies. Quotes have been obtained for manufacture of testing apparatus.

Task 5 (Economic Analysis and Final Report)

Cost related information on relevant components are being collected. No economic analyses have been started at this time.

NEXT QUARTER – Q3 2011

Task 1.1: On-going management.

Task 1.2: The 3rd SAG meeting will be held in Juneau in late September during the Alaska Rural Energy Conference (September 27 – 29th). Time, date and venue will be determined and announced in July. Continuing informal correspondence with SAG members.

Task 1.3: Continued coordination with MHRC to address any further questions from the Alaska Department of Labor on ground return and safety issues.

Task 1.4: Completed.

Task 2.1: Incorporate final PCA comments on the final converter specification.

Task 2.2: Complete sub-assembly testing and assembly of converters. Perform low voltage (open air) testing of converter, then perform full voltage (in oil) testing of converter.

Task 2.3: Complete testing of subassemblies. Finalize HVDC converter test plan (PPS with Dr. Weis). Commission high voltage test lab for full voltage testing of converters.

Task 2.4: Testing is scheduled to begin in mid-August and be completed by October.

Task 3.1: Finalize agreement with CRREL for the use of their permafrost test site on Farmers' Loop Road in Fairbanks. Site access is expected in August.

Task 3.2: Finish conceptual design of overhead system.

Task 3.3: Document findings, incorporate to final report.

Task 3.4: Installation of the relevant transmission components at the CRREL test site.

Tasks 4.1-4.3: Issue final test plan for buried cable testing for ACEP approval in early August, followed by the test program activities.

Task 5.1: Begin economic analysis of intertie configurations by developing cost estimates.

Task 5.2: Issue draft outline of study to ACEP for review in late August or early September.

polarconsult alaska, inc.
ENGINEERS • PLANNERS • ENVIRONMENTAL CONSULTANTS

QUARTERLY REPORT

PROJECT:	**HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS, PHASE II – PROTOTYPING AND TESTING**
UAF CONTRACT:	**UAF 10-0055, MODIFICATION #1**
CONTRACTOR:	**POLARCONSULT ALASKA, INC.**
REPORTING PERIOD:	**JULY 1, 2011 – SEPTEMBER 30, 2011**

PROJECT OVERVIEW

- The project is progressing in a normal manner, consistent with and in accordance to general project management expectations. No problems have been identified that would prevent overall project success.
- As of September 30, 2011, grant funds totaling $1,608,566.48 (74% of the $2,175,500 project budget) have been received by Polarconsult. All grant payments are from Denali Commission funds.

PROJECT SCHEDULE AND MILESTONES

No changes to the project scope or schedule were made during the quarter.

SUMMARY OF PROJECT ACTIVITIES, STATUS, AND ACCOMPLISHMENTS

CURRENT QUARTER – Q3 2011

Task 1 (Project Management, SAG, Code Issues, Phase III Site Selection)

- Informal communication between Stakeholder Advisory Group (SAG) members and Polarconsult has occurred on various aspects of project. Correspondence has occurred with UAF faculty and Golden Valley Electric Association (GVEA) on foundation design issues; with Nels Anderson Jr. on implementation and policy issues associated with this project, and with GVEA and Copper Valley Electric Association (CVEA) on potential sites for Phase II foundation testing in the Glennallen area.
- At the request of ACEP, Polarconsult gave a 'brown bag' presentation on the project to approximately a dozen stakeholders on August 29th at ACEP's Anchorage offices.
- Polarconsult and ACEP revised the time and location of the third SAG meeting from Juneau during the Rural Energy Conference to Anchorage on October 25th to avoid conflicts with the Rural Energy Conference. Darren Hammell of Princeton Power Systems, Inc. (PPS) plans to attend the SAG meeting to report on converter status.

1503 WEST 33RD AVENUE • SUITE 310 • ANCHORAGE, ALASKA 99503
PHONE (907) 258-2420 • FAX (907) 258-2419 • HOMEPAGE www.polarconsult.net

Task 2 (HVDC Converter Development)

- Dr. Richard Wies of UAF visited PPS from August 10-12, 2011 to review PPS status on assembly and testing of the HVDC converter. PPS was performing open-air dielectric testing of the converter during this visit.
- ACEP Manager Jason Meyer and Polarconsult visited PPS from August 16-18, 2011 to review PPS' new facilities and status of the HVDC converter. The low voltage cabinets and high voltage apparatus were reviewed at PPS facilities, and the high voltage tank was reviewed at PPS subcontractor's facility. The full power testing apparatus and PPS facility where the full power testing will take place were also reviewed. PPS was performing initial function tests of the complete converter system during this visit.
- Development of converter specifications is complete.
- The converter design is complete. PPS has completed fabrication of the first of two 500 kW converters, and is currently bringing the first of the two converters up to full voltage and functionality for testing. The second converter is ready for final assembly pending successful operation of the first converter.
- PPS has completed basic function-testing of the converter, and is currently bringing the converter up to full voltage to continue their testing program. They will be moving the converters from their engineering labs to their testing and manufacturing facility in October, and beginning full power tests for the first converter in late October. Testing with both 500 kW converters will occur in early November.

Task 3 (Overhead Transmission System Design)

- Polarconsult has contracted with Golder Associates, Inc. to assist in developing a set of conceptual geotechnical conditions that present the greatest common challenges for overhead power lines.
- Polarconsult ultimately determined that the approval process to gain access to the U.S. Army Corps of Engineers' Cold Regions Research and Engineering Laboratory (CRREL) in Fairbanks was not compatible with the schedule for this project. Polarconsult has found a test site in Fairbanks with soils that are representative of the geotechnical conditions outlined by Golder Associates, Inc. The test site is at 970 Browsing Avenue, south of Farmer's Loop Road and north of Creamers' Field.
- Polarconsult has obtained all long-lead materials for the overhead pole installations. We are finalizing our test plan for the foundation tests, and will proceed with field installations in late October. Testing will take place during installation to evaluate installation productivity of different equipment, and during November to evaluate initial performance of the foundation systems. Long term monitoring responsibilities will be transferred to ACEP.

Task 4 (Secondary Development Activities)

Current status of the three major activities is summarized below:

- 4.1 – Construction and maintenance equipment. Polarconsult has identified existing equipment and tools that can be adapted to facilitate construction and maintenance of the overhead system. These will be used for foundation installation at the Fairbanks test site in late October.
- 4.2 & 4.4 – Submarine Cables & Integration with Telecommunications. Polarconsult has contracted with Cabletricity, Inc. of British Columbia to assist in finalization of the submarine cables and telecommunications integration components of the project.
- 4.3 – Overland Cables. Polarconsult completed the cable test plan and is proceeding with fabrication of cable test apparatus.

Task 5 (Economic Analysis and Final Report)

Cost related information on relevant components are being collected. No economic analyses have been started at this time.

NEXT QUARTER – Q4 2011

Task 1.1: On-going management and project closeout.

Task 1.2: The 3rd SAG meeting will be held at the Denali Commission's offices in Anchorage on October 25th. Continuing informal correspondence with SAG members.
PPS is organizing an open house at PPS' facilities in Princeton, NJ for November 14th. All project stakeholders are invited to see the converters and PPS facilities.

Task 1.3: Completed.

Task 1.4: Completed.

Task 2.1: Completed.

Task 2.2: Assembly is completed. Testing is underway, and will be completed in the next quarter.

Task 2.3: Completed.

Task 2.4: Test results will be reported to Polarconsult upon completion of testing in November 2011.

Task 3.1: Completed.

Task 3.2: 95% complete. Polarconsult will receive remaining final deliverables from subcontractors in October so the conceptual designs can be completed.

Task 3.3: Completed.

Task 3.4: Polarconsult will install foundations and structures for the overhead system at the Fairbanks test site in October.

Tasks 4.1-4.3: Issue final test plan for buried cable testing for ACEP approval in early August, followed by the test program activities.

Task 5.1: Polarconsult has most of the cost data needed to perform economic analysis of the HVDC system. Upon receipt of outstanding data, Polarconsult will complete economic analyses of the HVDC system.

Task 5.2: PPS final reports will be received in early November. All other key subcontractor reports and data are due to Polarconsult by the end of October. Other minor reports and deliverables will be received by Polarconsult in early November. Polarconsult will issue the review draft of the final report to ACEP for review and comment on November 21st.

polarconsult alaska, inc.
ENGINEERS • PLANNERS • ENVIRONMENTAL CONSULTANTS

QUARTERLY REPORT

PROJECT: **HVDC TRANSMISSION SYSTEM FOR RURAL ALASKAN APPLICATIONS, PHASE II – PROTOTYPING AND TESTING**

UAF CONTRACT: **UAF 10-0055, MODIFICATION #1**

CONTRACTOR: **POLARCONSULT ALASKA, INC.**

REPORTING PERIOD: **OCTOBER 1, 2011 – DECEMBER 31, 2011**

PROJECT OVERVIEW

- Several of Polarconsult's subcontractors are behind schedule in providing their final reports to Polarconsult. These delays are impacting preparation of the final report for the project. As discussed with ACEP, Polarconsult expects to have the draft final report to ACEP for review and comment by January 27, 2012.
- PPS encountered a problem with some of the components in the high voltage portion of the prototype converter. PPS states that the prototype converters have successfully proven the technology, but the problem prevents full-power operation of the prototypes due to overheating of these components.
- With the exception of the above items, the project is progressing in a normal manner, consistent with and in accordance to general project management expectations. No problems have been identified that would prevent overall project success.
- As of December 31, 2011, grant funds totaling $2,021,533.75 (93% of the $2,175,500 project budget) have been received by Polarconsult. All grant payments are from Denali Commission funds.

PROJECT SCHEDULE AND MILESTONES

No changes to the project scope or schedule were made during the quarter.

SUMMARY OF PROJECT ACTIVITIES, STATUS, AND ACCOMPLISHMENTS

CURRENT QUARTER – Q4 2011

Task 1 (Project Management, SAG, Code Issues, Phase III Site Selection)

- Informal communication between Stakeholder Advisory Group (SAG) members and Polarconsult has occurred on various aspects of project. Correspondence has occurred with Alaska Village Electric Cooperative, Inc. (AVEC) on project economics.
- The 3rd SAG meeting was held on October 25th at the Denali Commission's offices in Anchorage, Alaska. Darren Hammell, Executive Vice President and co-founder of PPS, attended in person to provide an update on the converter development effort.
- At the request of ACEP, Polarconsult and Princeton Power Systems, Inc. (PPS) held a site visit and converter demonstration in Princeton, NJ on November 14th. The site

visit was attended by representatives from the Denali Commission, ACEP, UAF, Manitoba HVDC Research Centre, PPS, and Polarconsult.

- Representatives from the National Rural Electric Cooperative Association (NRECA)'s Cooperative Research Network (CRN) visited PPS on December 14th to learn more about the HVDC project and converter system. NRECA and CRN may have an important role in the next phase of system development as a technical expert representing utility interests.

Task 2 (HVDC Converter Development)

- Development of converter specifications is complete.
- Design and construction of the two 500 kW prototype power converters is complete.
- PPS has completed basic function-testing of the converter, and has determined that the insulated gate bipolar transistors (IGBTs) that perform the core switching function in the high voltage tank are not performing per manufacturer's specifications. PPS states that the IGBTs are generating excessive heat, which is forcing PPS to limit converter power levels to approximately 25 to 50 kW, or 5 to 10% of rated power, to avoid overheating and thermal damage to the converter components. As a result of this problem, PPS is unable to complete full power testing and all of the tests specified in the Phase II test plan. In spite of this problem, PPS states that the prototype converters have successfully demonstrated the converter design and technology. At the end of the 4th quarter, PPS was evaluating potential remedies to this problem. Polarconsult expects to receive a plan from PPS to correct this problem in February 2012.

Task 3 (Overhead Transmission System Design)

- Polarconsult has completed the overhead transmission conceptual design, and is awaiting final deliverables from Golder Associates and Line Design Engineering before the report narrative describing the overhead conceptual designs can be completed.
- Polarconsult installed a demonstration guyed fiberglass power pole at the 970 Browsing Avenue test site in Fairbanks, Alaska. The pole foundations and guy anchors are a combination of micro thermopiles and conventional screw anchors. The pole assembly is fitted with load cells and soil probes to monitor thermal and structural performance of the thermopiles and screw anchors over time.

Task 4 (Secondary Development Activities)

- 4.1 – Construction and maintenance equipment. This activity is complete. Findings will be presented in the final report.
- 4.2 & 4.4 – Submarine Cables & Integration with Telecommunications. Polarconsult is awaiting final deliverables from Cabletricity on technical recommendations and economics of submarine cable installations using this technology. Cabletricity has

solicited cable quotes for a hypothetical 25-mile intertie from several cable suppliers and at the close of the 4th quarter was still awaiting responses from a few suppliers.

- 4.3 – Overland Cables. Polarconsult completed the cable testing. Test results will be presented in the final report.

Task 5 (Economic Analysis and Final Report)

Compilation of cost data for the overhead system and buried overland system was completed in the 4th quarter. Cost data for submarine cable systems has been solicited from several cable manufacturers and installers, and responses are still pending from several manufacturers.

The framework for economic analysis of the HVDC system has been completed, and available cost data has been entered. As final cost data is collected, the economic analysis will be completed.

Final deliverables from many of our subcontractors were running behind schedule at the end of the 4th quarter. These delays are impacting final analysis and integration of findings into the final report narrative. As discussed with ACEP, Polarconsult is currently planning to submit the draft final report to ACEP for review and comment on January 27th, 2012.

NEXT QUARTER – Q1 2012

While the performance period of Polarconsult's contract with ACEP concludes effective December 30, 2011, Polarconsult will continue to work with ACEP and with Polarconsult's subcontractors to finalize the project deliverables. As appropriate, Polarconsult will also work with ACEP on ACEP's independent assessment and reporting on this project.

Task 1.1: Project closeout.
Task 1.2: Completed.
Task 1.3: Completed.
Task 1.4: Completed.
Task 2.1: Completed.
Task 2.2: Completed.
Task 2.3: Completed.
Task 2.4: Test results are due to Polarconsult in January 2012.
Task 3.1: Completed.
Task 3.2: Awaiting receipt of final deliverables from Golder Associates and Line Design Engineering. Otherwise completed.
Task 3.3: Completed.
Task 3.4: Completed.
Task 4.1: Completed.
Task 4.2: Awaiting receipt of final deliverable from Cabletricity.
Task 4.3: Completed.

Task 4.4: Awaiting receipt of final deliverable from Cabletricity.

Task 5.1: Polarconsult has most of the cost data needed to perform economic analysis of the HVDC system. Outstanding cost data will be provided by Polarconsult's subcontractors. Upon receipt of outstanding data, Polarconsult will complete economic analyses of the HVDC system.

Task 5.2: Polarconsult has completed the report outline and, to the extent possible, the report narrative and appendices. Outstanding portions of the report narrative and appendices are awaiting receipt of final deliverables from Polarconsult's subcontractors, expected in mid-January, 2012.