TECHNICAL PROGRESS REPORT

REPORT TYPE: SEMI-ANNUAL

For

REPORTING PERIOD
BEGINNING OCT 1, 2006
ENDING MARCH 31, 2007

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Report Submitted April 30, 2007

For

DOE Award No. DE-PS26-02NT15444

PREFERRED UPSTREAM MANAGEMENT PROJECTS (PUMP) III
Distributed Generation Power Unites at Marginal Oil Well Sites

Report Submitted
By The
Interstate Oil and Gas Compact Commission
P.O. Box 53127
Oklahoma City, OK 53127-3127

DISCLAIMER

ABSTRACT

This project has been developed in response to a cooperative agreement offering by the U.S. Department of Energy and the National Energy Technology Laboratory (NETL) under the Preferred Upstream Management Projects (PUMP III) offering. The partners include the Interstate Oil and Gas Compact Commission (IOGCC) as lead agency working with the California Energy Commission (CEC) and the California Oil Producers Electric Cooperative (COPE).

The project envisioned and described in this technical report reflects the development of four sites with differing qualities of natural gas and qualities of potential oil production. The sites were selected for containing high Btu, medium Btu or low Btu gas as well as a "harsh," or high contaminant, gas. The purpose of using these criteria is to test a wide range of gas qualities for their performance in mircroturbines, which can in turn burn gas for the production of electricity used on location to lower production costs.

The projects help explore the possibilities of using gas that otherwise would be flared or vented because its impurities or abnormal Btu qualities render the gas unusable. With the ability to safely, efficiently and effectively use natural gas associated with oil production, oil production may continue or be prolonged.

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LISTS OF GRAPHICAL MATERIALS

None

INTRODUCTION

This is the tenth Semi-Annual Technical Report submitted in compliance with the United States Department of Energy (DOE) National Energy Technology Laboratory Preferred Up-Stream Management Practices (PUMP) III Assistance Grant Number DE-FC26-02NT15444 awarded to the Interstate Oil and Gas Compact Commission (IOGCC). This is a joint project between the IOGCC and the California Oil Producers Electric Cooperative (COPE) with funding provided by the DOE and the California Energy Commission (CEC). The entire project scope of work is anticipated to exceed $2 million Funding for the project is from an award from the DOE to the IOGCC for $1 million and the balance of the funding is being obtained by COPE through grant funding from the (CEC) for $1 million and additional in-kind donation of time and materials.

Project work entails generating electricity at 4 different sites to run oil well pumping units at marginally economic oil-well sites, or at other sites where there is a potential for oil wells to be plugged due to poor gas quality that prohibits the production of the oil.

The project utilizes state-of-the-art microturbines that are small enough to be utilized in distributed generation projects and flexible enough to handle a wide variety of natural gas produced in the field. Natural gas of various qualities and Btu content, which do not meet pipeline quality specifications and are produced in association with oil, will be the energy source used to generate electricity. One site will utilize high Btu gas, one site will utilize medium Btu gas, one site will utilize harsh (high H_2S content) gas and the last site will use very low Btu gas.

EXECUTIVE SUMMARY

Work Status and Progress: COPE received an executed copy of the California Energy Commission (CEC) grant on April 9, 2003 which allowed the PUMP III project to move forward. The CEC approved funding for $1,000,000.00 instead of the $1,500,000.00 COPE requested for the project. A kickoff meeting with the CEC was held on Monday, April 14, 2003, in their Sacramento, CA offices. Mark Carl, IOGCC project manager for the DOE grant, attended this meeting, along with Bob Fickes with COPE, Edan Prabhu, Mike Merlo and CEC officials.

The change in funding by the CEC required a modification in the scope of work and an amended form DOE F 4600.1. The modifications were completed and the IOGCC received approval to commence work on the project on May 9, 2003. On May 29, 2003, Virginia Weyland with DOE/NETL, Mark Carl with IOGCC, and Bob Fickes with COPE, Edan Prabhu and Mike Merlo, consultants with COPE, participated in a teleconference kick-off meeting.

COPE canvassed its membership for potential locations for the four test sites. We presently have contracts on the High Btu site, the Medium Btu site and the Harsh Gas site. The Low Btu site was anticipated to be at a well location operated by Chevron but extensive contract negotiations make this location uncertain and there is an increased effort to identify an alternate site.

The St. James project, located at 814 W. 23rd Street in Los Angeles, California, is the Medium Btu site and was selected as the first test site for the project. Testing at this site was completed in March 2006 after 24 months of very successful operation. The three microturbines at the site worked extremely well. COPE arranged with the University of Southern California – Irving to include the St. James site in its on-line monitoring Website so anyone can log on and evaluate the system at any time. The on-line monitoring well data is currently available at http://www.apep.uci.edu/DER/AQMD/ at project site #20. The monitoring site data have not been updated since December 15, 2004 pending Air Quality Management District renewal of the project with the University of California – Irving. The St. James site is denoted as site number 20 at this Website.

The High Btu site experienced several delays due to well bore and microturbine problems during the first quarter of 2005 but has been operating consistently the past year. This project site is also performing extremely well using waste casinghead gas to microturbines for electricity for the pumping unites at the site.

COPE was working on a contract with Chevron to use one of their well sites for the Low Btu project, but negotiations fell through due to contract demands by Chevron that were in conflict with DOE's contract requirements with the IOGCC. IOGCC requested COPE to seek alternative sites for the Low Btu project site and a new operator has been identified and after securing appropriate permits, installation at this site is now complete.

The new operator for the low Btu site is DECOR, a California operator that specializes in purchasing production that is economically marginal and maximizing oil and gas production through streamlined operations and new technologies.

It has been found through this project that obtaining the pertinent permits for sites the has been one of the significant barriers to success. However, Mr. Bob Fickes, President of COPE, has been successful in obtaining approval from the California Energy Commission that utilizing waste/flare gas for the generation of electricity, as this project is doing, qualifies as an environmentally friendly renewable resource activity. This allows operators tax benefits and should allow for facilitating permitting.

At the harsh, or high hydrogen sulfide (H2S) gas site, installation has been completed and operations began on September 5, 2006. The site has been working continuously since start up except for a 2 day down period due to a Pacific Gas & Electric power outage. This site experienced many various delays related to permitting in California and especially due to delays and unnecessary requirements from Pacific Gas and Electric. This required an extension of time for the project. The extension was approved in September 2004 for 18- months on this project. However the delays related to the failed Chevron negotiations for the low Btu project site required an additional no-cost extension of this contract through September 2007. This extension is required in order to have adequate time for installation of equipment and enough time for operation to determine the success of the research using the Flex microturbine with very low Btu gas.

During the period covered by this report, three of the four sites were operating. The final remaining installation is the low-Btu site, which was long delayed by the difficulty in identifying and securing access to a suitable site.

At present, the low-Btu site is essentially completed and the microturbine is on location . Activities during this period include the development of the pad design, construction and full installation of the gas-fired turbine. Work began in May and major obstacles, including the finalization of a power purchase agreement with Pacific Gas & Electric and securing various permits, were overcome by year-end.

Due to widely varying gas quality, however, the turbine experienced immediate difficulties that resulted in overheating and failure of key components. Current activities include redesigning controls and the installation of failsafe procedures regarding overheating. Work on these design changes is currently underway, and full operational capacity is anticipated within the next reporting period.

EXPERIMENTAL

MICROTURBINE NOISE ABATEMENT

The St. James project site received citizen complaints regarding excessive noise once the microturbines were installed and we were requested to investigate and provide recommendations. Capstone and Cal Power were contacted for recommendations for possible noise abatement and mitigation techniques. We acquired a sound meter and performed spot readings to establish a baseline.

Several trial fixes were attempted during July, 2004 with limited success. The ambient noise level for the area exceeded existing city ordinance allowable levels with, or without, the microturbines operating at the site. The primary issue for the individual's complaints is the high pitch whine emanating from the microturbines. Trial fixes were completed in August with the installation of a prototype design installed on all three microturbines. The noise suppression equipment has reduced the whine significantly and is now considered to be at an acceptable level. A photograph of the various noise suppression designs may be seen in the August 2004 Status Report located in the Appendix of the previous Technical Progress Report submitted to DOE.

During May, 2005 the St. James project owner has advised COPE of continuation of the noise complaint arbitration and has requested assistance with reduction of the microturbine whine. Mitigation action previously taken by COPE and the owner had reduced the noise level for the site improved the condition but was not completely satisfactory. A consultant was retained to perform a more detailed noise survey and provide recommendations and submitted a report on May 7, 2005 with recommendation of utilizing noise blankets and lagging to reduce the tonal signature of the microturbines.

In July, 2005 a contract was awarded to Sound Waves to provide noise suppression covers for the microturbines. One cover was fabricated and installed. Results of the first installation will be reviewed with the owner in August before fabrication of the other two microturbine covers.

During August 2005 one acoustical cover was installed on MT #1 during July with positive results. The owner advised COPE on August 4th that the noise complaint had been resolved and requested that any additional work be discontinued on the remaining two covers at this time. Monitoring of the microturbine performance compared to the other two units has not shown any adverse effect from the cover.

Experimental activities were undertaken at the low-Btu site to control gas quality variations that resulted in operating failures. These activities will extend into the next reporting period.

RESULTS AND DISCUSSION

MEDIUM Btu LOCATION:

The Medium Btu project site is at the St. James project lease site located at 814 W. 23rd Street in Los Angeles, California. Operations began in the first quarter of federal fiscal year 2004 (late December, 2003). The long delay in getting this site ready for start-up was due to its location. The site is located in downtown Los Angeles which made permitting extremely difficult due to the many various regulatory agencies. Air quality permit requirements proved to be the greatest hurdle. Mr. Bob Fickes, President of COPE, was successful in obtaining approval from the California Energy Commission that utilizing waste/flare gas for the generation of electricity, as this project is doing, qualifies as an environmentally friendly renewable resource activity. This allows operators utilizing the methods we are doing research on for this project extra tax benefits and should allow for facilitating permitting.

The project also breaks new ground on how operators will be able to deal with excess "waste gas" or electricity generated when utilizing distributed energy equipment.

Continuous production from the site has been on-going since May, 2004. This project site in no longer being monitored as the contract expired at the end of February 2006 and we were successful in returning this idle site back to economic production that provided approximately 50 barrels of oil per day over the past 2 years. The site is still producing utilizing the microturbines used during the project evaluation time period.

Monthly status reports for the months of October 2006 through March 2007 are included in the Appendix.

HIGH Btu LOCATION:

The High Btu well site has been experiencing problems related to design changes to the on-site compressor, gas production fluctuation problems where they routinely run out of gas in the evenings (possibly due to decreased ambient temperatures keeping the gas in liquid form) and repairs to the well bore itself. The repairs to the well bore took longer than expected due to the shortage of available workover rigs. During July, 2005 the work on the well was completed and placed back on line and the microturbine was re-started for electrical generation. Shortly afterward the microturbine was required to be shut down due to a problem with the fuel-air ratio control valve. This valve was repaired in late August-early September and shortly afterward the control board experienced problems and required repair work which again forced shut down of the microturbine.

HARSH GAS LOCATION:

During this reporting period the Harsh gas site located in Kern County, California, (called the Maricopa Site) has been installing piping and foundation work for the generator and ancillary equipment. Work continued on air permitting for the project. A Capstone microturbine was originally selected for this site because the site is not only a harsh gas site (with H_2S of approximately 6,000 ppm) but the Btu content of the gas is also

considered medium to low. The California Air Pollution Control District for this region where this project occurs said that a request for variance would be permitted for this site to test the Capstone microturbine high sulfur unit. Due to hidden cost and liability concerns contained in the contract submitted to COPE for the project it was decided that an Ingersoll Rand (IR) turbine would be utilized at this site in place of the Capstone equipment.

A contract was negotiated with IR and the generator has been installed and the site is ready to begin operations as soon as the interconnect agreement with Pacific Gas & Electric (PG&E) is finalized. PG&E receive the agreement in December, 2004 and final negotiations were to be completed in early April, 2006, however PG&E placed a new last minute $25,000 requirement at a meeting that was arranged for them to sign the agreement. After numerous calls and extra work effort by the project team we were finally successful in obtaining all the permits and were able to start operations on September 5, 2006. The site has been working continuously since start up except for a 2 day down period due to a Pacific Gas & Electric power outage.

LOW Btu LOCATION:

COPE was working on a contract with Chevron to use one of their well sites for the Low Btu project but negotiations fell through due to contract demands by Chevron that were in conflict with DOE's contract requirements with the IOGCC. IOGCC requested COPE to seek alternative sites for the Low Btu project site and a new operator has been identified and work is proceeding on permits and installation. The new operator for the Low Btu site is DCOR, a California operator that specializes in purchasing production that is economically marginal and maximizing oil and gas production through streamlined operations and new technologies. Modifications to the Flex-microturbine have been completed and it has been delivered to the site. Start up of operations will commence as soon as final design modifications have been complete.

CONCLUSIONS

The medium Btu site (St. James project site), has been operating almost continually since the beginning of May, 2005 allowing the renewed production of oil and gas from this site. Research work at this project site has been successfully completed and the microturbines proved to be very effective in providing a continuous electrical supply for the pumping operations.

The high Btu site has now been in operation for approximately 18 months and after some initial difficulty in dealing with fluctuations in the quality/Btu content of the well head gas the site has been operating smoothly for the past 12 months.

Installation at the harsh gas site is complete at this time. One unexpected difficulty encountered in this effort was obtaining an agreement with Pacific Gas & Electric (PG&E). The company proved to be very reluctant to allow the site to interconnect with its grid. As a result, unnecessary requirements were added to the project. The reluctance to accept “free” electricity was difficult to understand and impossible to predict.

The low-Btu site is nearing start up and is expected to begin operations within the next few months. An issue uncovered in this component of the project was the wide variability in Btu quality at a single site. Learning how to deal with this variability would represent a significant learning lesson for producers seeking to employ the distributed generation technology.

REFERENCES

None

BIBLIOGRAPHY

None

LISTS OF ACRONYMS AND ABBREVIATIONS

AQMD	Air Quality Management District
BTU	British Thermal Units
CEC	California Electric Cooperative
COPE	California Oil Producers Electric Cooperative
DOE	Department of Energy
IOGCC	Interstate Oil and Gas Compact Commission
IR	Ingersoll Rand
NETL	National Energy Technology Laboratory
PAC	Project Advisory Committee
PG&E	Pacific Gas & Electric
PUMP	Preferred Upstream Management Practices
SCAQMD	Southern California Air Quality Management District

APPENDICES

STATUS REPORT
For
OFFGASES, Contract Number DE-FC26-02NT15444
Sumitted on April 30, 2007

For the period October 2006

Project Manager: Gerry Baker, IOGCC

What we planned to accomplish this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation.

- **High BTU installation completed.**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

Task 6: Low BTU Installation.

- **Continue with redesign for safety system and start Electrical work not directly affected.**

Task 7: Harsh Gas Installation.

- **Harsh Gas Installation completed.**

Task 9: High Btu Test and monitor.

- **Maintain OFFGASES project equipment**

Task 10: Medium Btu test and monitor.

Medium BTU Test and Monitoring is completed.

Task 12 Harsh Btu Test and Monitoring

- **Maintain OFFGASES project equipment**
- **Debug startup problems**

What we accomplished this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment
- **All equipment selected for projects.**

Task 4: High BTU Installation
- **High BTU installation completed**

Task 5: Medium BTU Installation.
- **Medium BTU installation completed.**

- **Task 6: Low BTU Installation.**
    - **DÉCOR and Contractor continue to work on higher priority work to maintain plant operation. The Electrical power portion of the installation has been installed including connection to the transformer. "Turbine side" work is on hold pending final design and material acquisition for the SC.**
    - **Design of safety system and redesign of electrical backboard to accommodate additional programmable controller (SC) is continuing. DÉCOR technician and Flex Energy personnel worked on interaction between SC and EC controllers.**
    - **Flex Energy continued work on programming the system programmable controller (EC) and establishing remote interface through the Project onsite computer.**
    - **Mechanical design and some piping work is in process to accommodate the safety system components and controller SC. DCOR has taken the lead on this task due to need to tie into existing systems. Long lead material has been identified and ordered. Some material has been received on site.**
    - **SCE has indicated readiness for commissioning test.**

Task 7: Harsh Gas Installation.
- **Harsh Gas Installation completed.**

Task 9: High test and monitor.
- **Monitor turbine performance**

Task 10: Med test and monitor.
- **Medium BTU Test and Monitoring is completed**

Task 12: Harsh Gas Test and Monitoring
- **Monitor turbine performance**

What we expect to accomplish during the next period

Task 6: Low Btu Installation

- **Work on mechanical and controller systems.**
- **Work on electrical system**
- **Work with SCE to finalize draft addendum for microturbine to existing contract**

Task 12: Harsh Gas Test and Monitoring

- **Work through Master Service issues with I R**

How we are doing compared to our plan

Issues encountered:

Harsh Project

- **Heat exchanger developed leaks and we are loosing cooling fluids**

Low Btu Project

- **Design of SC needs to be completed and material ordered . Owner, DCOR, has experienced delays due to workload demand on their limited resources needed to do this task. They are experiencing problems with cabling to their existing power generator.**
- **SCE needs to finalize draft addendum for microturbine to existing contract and get DCOR approval.**

Actions:

Harsh Project

- **Replacement parts are backordered. This will be a warrantee repair.**

Low Btu Project

- **Design for safety system is in process by DÉCOR. Weekly interface with owner by team to encourage completion.**
- **Follow-up with SCE to expedite draft addendum for DCOR review and approval.**

Status of Milestones and Deliverables

Task Number	Task/Description	Start Date Planned /	Start Date Actual	Due Date Planned/	Due Date Actual	Status (%)
1.1	Attend Kick-off Meeting	4/14/2003	4/14/2003	4/26/2003	4/14/2003	100
1.2	CPR Meetings	1/17/2004		2/17/2004		
1.3	Final Meeting	3/7/2005		3/31/2005		

1.4	Monthly Progress Reports	4/26/2003	4/26/2003	3/6/2005		80
1.5	Test Plans, Technical Reports and Interim Deliverables	10/20/2003	2/2004	2/16/2004		30
1.6	Final Report	2/15/2005		3/6/2005		
1.7	Identify and Obtain Matching Funds	4/14/2003		4/26/2003		100
1.8	Identify and Obtain Required Permits	4/14/2003	4/14/2003	10/6/2003		100
1.9	Electronic File Format	4/14/2003	4/14/2003	4/14/2003	4/14/2003	100
1.10	Establish the PAC	5/5/2003	5/5/2003	7/14/2003	5/21/2003	100
1.11	Conduct PAC Meetings	7/21/2003	10/09/03	1/15/2005		
2.0	Site Selection	6/2/2003	5/12/2003	10/16/2003	10/21/2003	100
3.0	Specify Equipment	6/23/2003	5/12/2003	10/20/2003		100
4.0	High BTU Installation & Testing	10/20/2003	10/03/03	2/16/2004		100
5.0	Medium BTU Installation & Testing	10/20/2003	5/20/2003	2/16/2004		100
6.0	Low BTU Installation & Testing	10/20/2003	9/15/2003	2/16/2004		55
7.0	Harsh Gas Installation & Testing	10/20/2003	9/15/2003	2/16/2004		100
9.0	High BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		90
10.0	Medium BTU Gas System Maintenance & Monitoring	2/24/2004	7/13/04	2/4/2006	2/4/2006	100
11.0	Low BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		
12.0	Harsh Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		10
13.0	Technology Transfer Activities	2/15/2005		3/6/2005		10

STATUS REPORT
For
OFFGASES, Contract Number DE-FC26-02NT15444
For the Period November 2006

Project Manager: Gerry Baker, IOGCC

What we planned to accomplish this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation.

- **High BTU installation completed.**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

Task 6: Low BTU Installation.

- **Work on mechanical and controller systems.**
- **Work on electrical system**

Task 7: Harsh Gas Installation.

- **Harsh Gas Installation completed.**

Task 9: High Btu Test and monitor.

- **Maintain OFFGASES project equipment**

Task 10: Medium Btu test and monitor.

Medium BTU Test and Monitoring is completed.

Task 12 Harsh Btu Test and Monitoring

- **Maintain OFFGASES project equipment**
- **Work through Master Service issues with I R**

What we accomplished this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation

- **High BTU installation completed**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

Task 6: Low BTU installation.

- **Considerable progress was made in the mechanical area. Electrical work progressed well considering that the resources have been focused on restoring the main gas generator due to equipment failure. Some components for the safety system didn't arrive until the end of the month. Work continues on software and system portions. The team is trying to complete work by mid December. If it slips into the second part of the month, SCE has notified us that they will not be able to support Commissioning at that time due to other commitments and resource limits during the Holidays. COPE reviewed and commented on the SCE/DCOR Power Purchase Agreement Amendment for the microturbine. SCE will submit final version for DCOR review and approval in December.**

Task 7: Harsh Gas Installation.

- **Harsh Gas Installation completed.**

Task 9: High test and monitor.

- **Monitor turbine performance**

Task 10: Med test and monitor.

- **Medium BTU Test and Monitoring is completed**

Task 12: Harsh Gas Test and Monitoring

- **Monitor turbine performance**
- **Found leak in heat exchanger.**
- **Turbine manufacturer had issues with water content in fuel.**

What we expect to accomplish during the next period

Task 6: Low Btu Installation

- **Complete work on mechanical**
- **Work on controller and software systems.**
- **Complete work on electrical system**
- **Work with SCE to finalize draft addendum for microturbine to existing contract**

Task 12: Harsh Gas Test and Monitoring

- **Work through Master Service issues with I R**

How we are doing compared to our plan

Issues encountered:

Harsh Project

- **Turbine manufacturer had issues with water content in fuel.**

Low BTU Project

- **Owner has experienced failure of their main gas turbine generator and is evaluating the cost benefit to repair or discontinue their power purchase agreement with Southern California Edison.**

Actions:

Harsh Project

- **Heat trace fuel supply line to keep gas supply above dew point.**

Low Btu Project

- **Monitor owners evaluation and assist in establishing a new distributive generation agreement if the power purchase agreement is cancelled.**

Status of Milestones and Deliverables

Task Number	Task/Description	Start Date Planned /	Start Date Actual	Due Date Planned/	Due Date Actual	Status (%)
1.1	Attend Kick-off Meeting	4/14/2003	4/14/2003	4/26/2003	4/14/2003	100
1.2	CPR Meetings	1/17/2004		2/17/2004		
1.3	Final Meeting	3/7/2005		3/31/2005		
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1.9	Electronic File Format	4/14/2003	4/14/2003	4/14/2003	4/14/2003	100
1.10	Establish the PAC	5/5/2003	5/5/2003	7/14/2003	5/21/2003	100
1.11	Conduct PAC Meetings	7/21/2003	10/09/03	1/15/2005		
2.0	Site Selection	6/2/2003	5/12/2003	10/16/2003	10/21/2003	100
3.0	Specify Equipment	6/23/2003	5/12/2003	10/20/2003		100
4.0	High BTU Installation & Testing	10/20/2003	10/03/03	2/16/2004		100
5.0	Medium BTU Installation & Testing	10/20/2003	5/20/2003	2/16/2004		100
6.0	Low BTU Installation & Testing	10/20/2003	9/15/2003	2/16/2004		75

7.0	Harsh Gas Installation & Testing	10/20/2003	9/15/2003	2/16/2004		100
9.0	High BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		90
10.0	Medium BTU Gas System Maintenance & Monitoring	2/24/2004	7/13/04	2/4/2006	2/4/2006	100
11.0	Low BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		
12.0	Harsh Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		20
13.0	Technology Transfer Activities	2/15/2005		3/6/2005		10

STATUS REPORT
For
OFFGASES, Contract Number DE-FC26-02NT15444
For the Period December 2006

Project Manager: Gerry Baker, IOGCC

What we planned to accomplish this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation.

- **High BTU installation completed.**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

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Task 6: Low Btu Installation

- **Complete work on mechanical**
- **Work on controller and software systems.**
- **Complete work on electrical system**
- **Work with SCE to finalize draft addendum for microturbine to existing contract**

Task 12: Harsh Gas Test and Monitoring

- **Work through Master Service issues with I R**

What we accomplished this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation

- **High BTU installation completed**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

Task 6: Low BTU installation.

- **Continued electrical work, we are still having trouble keeping contractors on the project.**
- **Working on controls and programming**
- **High BTU wiring is completed**
- **SCE interconnection work completed**
-

Task 7: Harsh Gas Installation.

- **Harsh Gas Installation completed.**

Task 9: High test and monitor.

- **Monitor turbine performance**

Task 10: Med test and monitor.

- **Medium BTU Test and Monitoring is completed**

Task 12: Harsh Gas Test and Monitoring

- **Monitor turbine performance**
- **Found leak in heat exchanger.**
- **Turbine manufacturer had issues with water content in fuel.**
- **Tested for water content of gas**
- **Decided to heat trace lines to keep temperature above due point eliminating the problem. Heat tracing will only be needed in the winter time when the ambient temperature gets below**

What we expect to accomplish during the next period

Task 6: Low Btu Installation

- **Finalize all construction and proceed to startup mode**

Task 12: Harsh Gas Test and Monitoring

Monitor turbine performance

How we are doing compared to our plan

Issues encountered:

Harsh Project

- **Turbine manufacturer had issues with water content in fuel.**

Low BTU Project

- **Owner has experienced failure of their main gas turbine generator and is evaluating the cost benefit to repair or discontinue their power purchase agreement with Southern California Edison.**

Actions:

Harsh Project

- **Heat trace fuel supply line to keep gas supply above dew point.**

Low Btu Project

- **Monitor owners evaluation and assist in establishing a new distributive generation agreement if the power purchase agreement is cancelled.**

Status of Milestones and Deliverables

Task Number	Task/Description	Start Date Planned /	Start Date Actual	Due Date Planned/	Due Date Actual	Status (%)
1.1	Attend Kick-off Meeting	4/14/2003	4/14/2003	4/26/2003	4/14/2003	100
1.2	CPR Meetings	1/17/2004		2/17/2004		
1.3	Final Meeting	3/7/2005		3/31/2005		
1.4	Monthly Progress Reports	4/26/2003	4/26/2003	3/6/2005		80
1.5	Test Plans, Technical Reports and Interim Deliverables	10/20/2003	2/2004	2/16/2004		30
1.6	Final Report	2/15/2005		3/6/2005		
1.7	Identify and Obtain Matching Funds	4/14/2003		4/26/2003		100

1.8	Identify and Obtain Required Permits	4/14/2003	4/14/2003	10/6/2003		100
1.9	Electronic File Format	4/14/2003	4/14/2003	4/14/2003	4/14/2003	100
1.10	Establish the PAC	5/5/2003	5/5/2003	7/14/2003	5/21/2003	100
1.11	Conduct PAC Meetings	7/21/2003	10/09/03	1/15/2005		
2.0	Site Selection	6/2/2003	5/12/2003	10/16/2003	10/21/2003	100
3.0	Specify Equipment	6/23/2003	5/12/2003	10/20/2003		100
4.0	High BTU Installation & Testing	10/20/2003	10/03/03	2/16/2004		100
5.0	Medium BTU Installation & Testing	10/20/2003	5/20/2003	2/16/2004		100
6.0	Low BTU Installation & Testing	10/20/2003	9/15/2003	2/16/2004		75
7.0	Harsh Gas Installation & Testing	10/20/2003	9/15/2003	2/16/2004		100
9.0	High BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		90
10.0	Medium BTU Gas System Maintenance & Monitoring	2/24/2004	7/13/04	2/4/2006	2/4/2006	100
11.0	Low BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		
12.0	Harsh Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		20
13.0	Technology Transfer Activities	2/15/2005		3/6/2005		10

STATUS REPORT
For
OFFGASES, Contract Number DE-FC26-02NT15444
For the Period January 2007

Project Manager: Gerry Baker, IOGCC

What we planned to accomplish this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation.

- **High BTU installation completed.**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

.

Task 6: Low Btu Installation

- **Finalize all construction and proceed to startup mode**

Task 12: Harsh Gas Test and Monitoring

- **Monitor turbine performance**

What we accomplished this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation

- **High BTU installation completed**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

Task 6: Low BTU installation.

- **Ran unit on high BTU gas**
- **Had barring failure. This is a known infant mortality problem with Capstone turbines.**
- **Replace main barring**
- **Turbine overheated during restart after barring repair**
- **Need to address overheating issues with design change.**

Task 7: Harsh Gas Installation.

- **Harsh Gas Installation completed.**

Task 9: High test and monitor.

- **Monitor turbine performance**

Task 10: Med test and monitor.

- **Medium BTU Test and Monitoring is completed**

Task 12: Harsh Gas Test and Monitoring

- **Monitor turbine performance**
- **Ran emission test with results as follows:**

NOx: 2 ppmv @ 15% O2
CO: ranged from 0 to 11 ppmv @ 15% O2
O2: 18.4%

What we expect to accomplish during the next period

Task 6: Low Btu Installation

- **Finalize all construction and proceed to startup mode**

Task 12: Harsh Gas Test and Monitoring

Monitor turbine performance

How we are doing compared to our plan

Issues encountered:

Low BTU Project

-
- **Overheating of turbine has caused control problems**

Actions:

Low Btu Project

- **Redesign controls and install failsafe procedure for overheating**

Status of Milestones and Deliverables

Task Number	Task/Description	Start Date Planned /	Start Date Actual	Due Date Planned/	Due Date Actual	Status (%)
1.1	Attend Kick-off Meeting	4/14/2003	4/14/2003	4/26/2003	4/14/2003	100
1.2	CPR Meetings	1/17/2004		2/17/2004		
1.3	Final Meeting	3/7/2005		3/31/2005		
1.4	Monthly Progress Reports	4/26/2003	4/26/2003	3/6/2005		80
1.5	Test Plans, Technical Reports and Interim Deliverables	10/20/2003	2/2004	2/16/2004		30
1.6	Final Report	2/15/2005		3/6/2005		
1.7	Identify and Obtain Matching Funds	4/14/2003		4/26/2003		100
1.8	Identify and Obtain Required Permits	4/14/2003	4/14/2003	10/6/2003		100
1.9	Electronic File Format	4/14/2003	4/14/2003	4/14/2003	4/14/2003	100
1.10	Establish the PAC	5/5/2003	5/5/2003	7/14/2003	5/21/2003	100
1.11	Conduct PAC Meetings	7/21/2003	10/09/03	1/15/2005		
2.0	Site Selection	6/2/2003	5/12/2003	10/16/2003	10/21/2003	100
3.0	Specify Equipment	6/23/2003	5/12/2003	10/20/2003		100
4.0	High BTU Installation & Testing	10/20/2003	10/03/03	2/16/2004		100
5.0	Medium BTU Installation & Testing	10/20/2003	5/20/2003	2/16/2004		100
6.0	Low BTU Installation & Testing	10/20/2003	9/15/2003	2/16/2004		75
7.0	Harsh Gas Installation & Testing	10/20/2003	9/15/2003	2/16/2004		100
9.0	High BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		90
10.0	Medium BTU Gas System Maintenance & Monitoring	2/24/2004	7/13/04	2/4/2006	2/4/2006	100
11.0	Low BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		
12.0	Harsh Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		20
13.0	Technology Transfer Activities	2/15/2005		3/6/2005		10

STATUS REPORT
For
OFFGASES, Contract Number DE-FC26-02NT15444
For the Period February 2006

Project Manager: Gerry Baker, IOGCC

What we planned to accomplish this period

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Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation.

- **High BTU installation completed.**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

.

Task 6: Low Btu Installation

- **Finalize all construction and proceed to startup mode**

Task 12: Harsh Gas Test and Monitoring

- **Monitor turbine performance**

What we accomplished this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation

- **High BTU installation completed**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

Task 6: Low BTU installation.

- **Repair unit from failure**
- **Implement design changes**

Task 7: Harsh Gas Installation.

- **Harsh Gas Installation completed.**

Task 9: High test and monitor.

- **Monitor turbine performance**

Task 10: Med test and monitor.

- **Medium BTU Test and Monitoring is completed**

Task 12: Harsh Gas Test and Monitoring

- **Monitor turbine performance**

What we expect to accomplish during the next period

Task 6: Low Btu Installation

- **Finalize all construction and proceed to startup mode**

Task 12: Harsh Gas Test and Monitoring

Monitor turbine performance

How we are doing compared to our plan

Issues encountered:

Low BTU Project

- **Overheating of turbine has caused control problems**

Actions:

Low Btu Project

- **Redesign controls and install failsafe procedure for overheating**

Status of Milestones and Deliverables

		Start Date		Due Date		Status
Task Number	**Task/Description**	**Planned /**	**Actual**	**Planned/**	**Actual**	**(%)**

1.1	Attend Kick-off Meeting	4/14/2003	4/14/2003	4/26/2003	4/14/2003	100
1.2	CPR Meetings	1/17/2004		2/17/2004		
1.3	Final Meeting	3/7/2005		3/31/2005		
1.4	Monthly Progress Reports	4/26/2003	4/26/2003	3/6/2005		80
1.5	Test Plans, Technical Reports and Interim Deliverables	10/20/2003	2/2004	2/16/2004		30
1.6	Final Report	2/15/2005		3/6/2005		
1.7	Identify and Obtain Matching Funds	4/14/2003		4/26/2003		100
1.8	Identify and Obtain Required Permits	4/14/2003	4/14/2003	10/6/2003		100
1.9	Electronic File Format	4/14/2003	4/14/2003	4/14/2003	4/14/2003	100
1.10	Establish the PAC	5/5/2003	5/5/2003	7/14/2003	5/21/2003	100
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3.0	Specify Equipment	6/23/2003	5/12/2003	10/20/2003		100
4.0	High BTU Installation & Testing	10/20/2003	10/03/03	2/16/2004		100
5.0	Medium BTU Installation & Testing	10/20/2003	5/20/2003	2/16/2004		100
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10.0	Medium BTU Gas System Maintenance & Monitoring	2/24/2004	7/13/04	2/4/2006	2/4/2006	100
11.0	Low BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		
12.0	Harsh Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		20
13.0	Technology Transfer Activities	2/15/2005		3/6/2005		10

STATUS REPORT
For
OFFGASES, Contract Number DE-FC26-02NT15444
For the Period March 2007

Project Manager: Gerry Baker, IOGCC

What we planned to accomplish this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation.

- **High BTU installation completed.**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

.

Task 6: Low Btu Installation

- **Finalize all construction and proceed to startup mode**

Task 12: Harsh Gas Test and Monitoring

- **Monitor turbine performance**

What we accomplished this period

Task 1.8: Identify and Obtain Required Permits:

- **Ongoing process. Will track under each classification activity unless generic activity.**

Task 3: Specify Equipment

- **All equipment selected for projects.**

Task 4: High BTU Installation

- **High BTU installation completed**

Task 5: Medium BTU Installation.

- **Medium BTU installation completed.**

Task 6: Low BTU installation.

- **The low Btu unit was shut down during March to incorporate design changes intended to mitigate temperature excursions. The changes include better temperature sensing and response. Prior to shutdown the unit was started and stopped several times. It was discovered that the fuel energy content was significantly different from previous samples, and measures to compensate are also being implemented.**

Task 7: Harsh Gas Installation.

- **Harsh Gas Installation completed.**

Task 9: High test and monitor.

- **Monitor turbine performance**

Task 10: Med test and monitor.

- **Medium BTU Test and Monitoring is completed**

Task 12: Harsh Gas Test and Monitoring

- **Preformed 4000 hour maintenance on turbine**
- **Found compressor shaft slightly bent causing vibration**
- **Found problem in fuel control system**
- **Found metal shavings in barring oil.**
- **All covered under maintenance agreement**

What we expect to accomplish during the next period

Task 6: Low Btu Installation

- **Finalize all construction and proceed to startup mode**

Task 12: Harsh Gas Test and Monitoring

Monitor turbine performance

How we are doing compared to our plan

Issues encountered:

Low BTU Project

- **Overheating of turbine has caused control problems**

Actions:

Low Btu Project

- **Redesign controls and install failsafe procedure for overheating**

Status of Milestones and Deliverables

Task Number	Task/Description	Start Date Planned /	Start Date Actual	Due Date Planned/	Due Date Actual	Status (%)
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1.7	Identify and Obtain Matching Funds	4/14/2003		4/26/2003		100
1.8	Identify and Obtain Required Permits	4/14/2003	4/14/2003	10/6/2003		100
1.9	Electronic File Format	4/14/2003	4/14/2003	4/14/2003	4/14/2003	100
1.10	Establish the PAC	5/5/2003	5/5/2003	7/14/2003	5/21/2003	100
1.11	Conduct PAC Meetings	7/21/2003	10/09/03	1/15/2005		
2.0	Site Selection	6/2/2003	5/12/2003	10/16/2003	10/21/2003	100
3.0	Specify Equipment	6/23/2003	5/12/2003	10/20/2003		100
4.0	High BTU Installation & Testing	10/20/2003	10/03/03	2/16/2004		100
5.0	Medium BTU Installation & Testing	10/20/2003	5/20/2003	2/16/2004		100
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11.0	Low BTU Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		
12.0	Harsh Gas System Maintenance & Monitoring	2/24/2004		2/24/2005		20
13.0	Technology Transfer Activities	2/15/2005		3/6/2005		10