

Gas Storage Technology Consortium

Technical Quarterly Progress Report for
April 1, 2006 – June 30, 2006

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July 6, 2006

Work Performed Under DOE Cooperative Agreement DE-FC26-03NT41779

Submitting Organization:

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ABSTRACT

Gas storage is a critical element in the natural gas industry. Producers, transmission & distribution companies, marketers, and end users all benefit directly from the load balancing function of storage. The unbundling process has fundamentally changed the way storage is used and valued. As an unbundled service, the value of storage is being recovered at rates that reflect its value. Moreover, the marketplace has differentiated between various types of storage services, and has increasingly rewarded flexibility, safety, and reliability. The size of the natural gas market has increased and is projected to continue to increase towards 30 trillion cubic feet (TCF) over the next 10 to 15 years. Much of this increase is projected to come from electric generation, particularly peaking units. Gas storage, particularly the flexible services that are most suited to electric loads, is critical in meeting the needs of these new markets.

In order to address the gas storage needs of the natural gas industry, an industry-driven consortium was created – the Gas Storage Technology Consortium (GSTC). The objective of the GSTC is to provide a means to accomplish industry-driven research and development designed to enhance operational flexibility and deliverability of the Nation's gas storage system, and provide a cost effective, safe, and reliable supply of natural gas to meet domestic demand.

This report addresses the activities for the quarterly period of April 1 to June 30, 2006. Key activities during this time period include:

- Develop and process subcontract agreements for the eight projects selected for co-funding at the February 2006 GSTC Meeting;
- Compiling and distributing the three 2004 project final reports to the GSTC Full members;
- Develop template, compile listserv, and draft first GSTC Insider online newsletter;
- Continue membership recruitment;
- Identify projects and finalize agenda for the fall GSTC/ AGA Underground Storage Committee Technology Transfer Workshop in San Francisco, CA.; and
- Identify projects and prepare draft agenda for the fall GSTC Technology Transfer Workshop in Pittsburgh, PA.

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INTRODUCTION

Gas storage is a critical element in the natural gas industry. Producers, transmission and distribution companies, marketers, and end users all benefit directly from the load balancing function of storage. The unbundling process has fundamentally changed the way storage is used and valued. As an unbundled service, the value of storage is being recovered at rates that reflect its value. Moreover, the marketplace has differentiated between various types of storage services, and has increasingly rewarded flexibility, safety, and reliability. The size of the natural gas market has increased and is projected to continue to increase towards 30 trillion cubic feet (TCF) over the next 10 to 15 years. Much of this increase is projected to come from electric generation, particularly peaking units. Gas storage, particularly the flexible services that are most suited to electric loads, is critical in meeting the needs of these new markets.

In order to address the gas storage needs of the natural gas industry, an industry-driven consortium was created – the Gas Storage Technology Consortium (GSTC). The objective of the GSTC is to provide a means to accomplish industry-driven research and development designed to enhance operational flexibility and deliverability of the Nation's gas storage system, and provide a cost effective, safe, and reliable supply of natural gas to meet domestic demand. Consortium technology development is conducted in the general areas of well-bore and reservoir, operations, mechanical, and salt caverns. Consortium members elect an Executive Council that is charged with reviewing projects for consortium co-funding. Proposals must address improving the production performance of gas storage and must provide significant cost share. The process of having industry develop, review, and select projects for funding ensures that the consortium conducts research that is relevant and timely to industry. Co-funding of projects using external sources of funding is sought to ensure that consortium funds are highly leveraged.

EXPERIMENTAL

A description of experimental methods is required by the DOE for all quarterly technical progress reports. In this program, Penn State is responsible for establishing and managing an industry-driven gas storage consortium. Technology development

research awards are made on a competitive basis. Technical reports from the individual researchers are required to contain an experimental discussion section and are submitted to consortium members and DOE for their review. Therefore, this section is not applicable to the Penn State contracted activities.

RESULTS & DISCUSSION

This report addresses the activities for the reporting period from April 1, 2006 through June 30, 2006. Key activities during this time period include:

- Develop and process subcontract agreements for the eight projects selected for co-funding at the February 2006 GSTC Meeting;
- Compiling and distributing the three 2004 project final reports to the GSTC Full members;
- Develop template, compile listserv, and draft first GSTC Insider online newsletter;
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- Identify projects and finalize agenda for the fall GSTC/ AGA Underground Storage Committee Technology Transfer Workshop in San Francisco, CA.; and
- Identify projects and prepare draft agenda for the fall GSTC Technology Transfer Workshop in Pittsburgh, PA.

Processing Subcontract Agreements for 2006 GSTC Projects

The GSTC provided \$887,027 to co-fund 8 projects in the last reporting period. In this quarter, efforts were directed to getting the subcontracts in place. Six subcontracts are in place and two are still outstanding as of June 30. The Colorado Engineering Experiment Station (CEES) agreement is still under review at CEES. The GSTC Executive Council agreed to fund the Protocol Evaluation for Scale Prevention and Remediation in Gas Storage Reservoirs and Formulations project from the Colorado School of Mines (CSM), subject to a revised budget. The revised budget from the CSM has been re-submitted to the GSTC. Based on the revised budget, a subaward has been drafted and sent to CSM for review and signature.

Distribution of 2004 GSTC Project Final Reports

A paper copy and an electronic version on a compact disc (CD) of the 2004 final projects reports were distributed to all 2004 GSTC Full members. The reports are for projects that were selected at the February 2004 meeting. Four projects were initially identified for funding, however, one project was not completed nor were any funds expended. The reports distributed are:

- Gas Storage Field Deliverability Enhancement and Maintenance: An Intelligent Portfolio Management Approach;
- Real Time Well Bore Integrity Monitoring; and
- Renovation of Produced Waters from Underground Natural Gas Storage Facilities: A Feasibility Study Using Hybrid Constructed Wetland Technology.

A copy of the software for the Gas Storage Field Deliverability Enhancement and Maintenance: An Intelligent Portfolio Management Approach was included as part of the package. An overview of this project will be provided at both of the upcoming GSTC fall technology transfer meetings. In-depth training on the software will be scheduled at a later date.

Online GSTC Insider Newsletter

The first online GSTC newsletter was sent to the GSTC listserv and posted to the GSTC website on June 28. The Insider contained the following discussion topics:

- GSTC Spring Meeting
- Final Project Reports for 2004 Distributed
- Dan Driscoll Assumes New Position
- GSTC Welcomes New Members
- Joint GSTC/ AGA Technology Transfer Meeting
- Joint PRCI/ GSTC/ SWC Technology Transfer Meeting

Membership Recruitment

The GSTC membership continues to grow and broaden in its diversity. During this quarter the California Energy Commission was added. Recruiting additional members throughout 2006 will continue.

Upcoming Technology Transfer Meetings

The GSTC is planning the upcoming technology transfer meetings.

- **San Francisco, CA.** The first meeting will be held at the Serrano Hotel in San Francisco, CA in conjunction with the American Gas Association (AGA) Underground Storage Committee Fall Meeting on October 4, 2006. Six projects have been identified to be showcased, along with a special presentation from the California Energy Commission.
- **Pittsburgh, PA.** The second event will be held in the northeastern US in Pittsburgh, PA at the Embassy Suites Pittsburgh International Airport hotel. The meeting will be in conjunction with the Pipeline Research Council International (PRCI) Underground Storage Technical Planning Committee meeting and the Stripper Well Consortium (SWC) technology transfer meetings. The PRCI meeting will be on November 7, 2006. The GSTC meeting will be held on November 8, 2006, immediately following the PRCI meeting. The SWC technology transfer session will follow on November 9, 2006. The scheduling of back-to-back meetings will fit with the plans to strengthen the interactions between SWC, GSTC, and PRCI. This will expand the cross-fertilization of the two consortiums and allow delegates to conveniently attend all meetings. The meeting is still in the planning stage and will be organized to showcase selected GSTC research projects.

Planned Activities for the Next Reporting Period

During the next quarter the GSTC will:

- Continue to finalize the 2006 calendar;
- Finalize the agenda for the fall technology transfer workshop in Pittsburgh, PA;
- Continue member recruitment,
- Draft and release another online GSTC Insider newsletter, and
- Continue to update and improve the GSTC web site.

CONCLUSIONS

During this reporting period, the GSTC negotiated the subawards for six co-funded projects and are working towards finalizing the contracts for the remaining two. The GSTC is preparing for two regional technology transfer meetings, one in the southwest (California region) and one in the northeast (Pennsylvania region) in the October/November time frame. The GSTC has laid a solid foundation for continued membership growth and industrial-relevant technology transfer.

REFERENCES

A listing of referenced materials is required by the DOE for each quarterly technical progress report. This technical progress report for the GSTC did not utilize any reference material during this reporting period.