



ENVIRONMENTALLY FRIENDLY DRILLING SYSTEMS PROGRAM **COASTAL IMPACTS TECHNOLOGY PROGRAM (CITP)**

Reducing Environmental Tradeoffs along the Texas Coastal Areas

The **Environmentally Friendly Drilling (EFD)** program, managed by the Houston Advanced Research Center (HARC), integrates advanced technologies into systems that significantly reduce the footprint of petroleum drilling and production in environmentally sensitive areas. The objective is to identify, develop and transfer critical, cost effective, new technologies that can provide policy makers and industry with the ability to develop reserves in a safe and environmentally friendly manner.

The program continues to add participants from environmental organizations, academia, state and federal agencies, government laboratories, and industry. Currently over 100 organizations support this effort including financial assistance. The partnership identifies new technologies and transfers them to areas that must incorporate new practices to address environmental concerns. Regional partners optimize technologies to fit the needs of their locale. Partners routinely come together to discuss progress with the sponsors/advisors. The program was honored with the Environmental Partnership Chairman's Stewardship Award from the Interstate Oil and Gas Compact Commission at their 2009 annual meeting.



Coastal Impacts Technology Program (EFD-CITP)

The EFD Coastal Impacts Technology Program (CITP) is a research and demonstration program that may lead to commercial application of technologies that will reduce the environmental impacts of unconventional natural gas and other petroleum exploration and production activities along the Texas Gulf Coast. The project area includes all the coastal counties in Texas, as the research demonstration, testing, commercial applications and workshops will be held in various coastal counties. The CITP is a comprehensive program that identifies environmentally friendly technologies, implements the technologies along the Gulf Coast, measures the effectiveness of the technologies to conserve, protect or restore the natural coastal environment, and educates the workforce.

The goal is to provide a program of research and demonstration that may lead to commercial application of technologies that will reduce the environmental impacts of unconventional natural gas and other petroleum exploration and production activities along the Texas Gulf Coast.



Through applied scientific research, this project will specifically focus on environmental issues related to coastal areas of Texas. Environmental mitigation of the impacts of gas and oil exploration and production of onshore production on fragile coastal areas is the focus of the program. According to the Texas Independent Oil and Gas Association, “*New technology developed by industry, universities and the Department of Energy is needed to help industry meet our members’ goal of producing oil and gas in a safe and environmentally acceptable manner; especially when operating in environmentally sensitive areas.*” In Texas, the National Park Service has several areas with oil and gas operations where activities are highly restricted. Two areas—the Big Thicket National Preserve and Padre Island National Seashore—currently have more than 200 active claims or pending claims for exploration activities. Technologies developed and demonstrated in this project will assist the National Park Service in meeting its multiple-use objectives while assuring the Public that the environment is being protected.

Milestones

Technology Road Mapping - identify technologies that will reduce the environmental impact of oil and gas activities along the Texas Gulf Coast.

- ◆ Conduct workshops at university locations, eg, University of Houston in Houston, Texas A&M University-Kingsville, Texas A&M University in Corpus Christi, and Texas A&M University-Galveston. Participants will include universities, industry, environmental organizations and regulators.
- ◆ Conduct technical workshops with RPSEA members currently engaged in testing and adapting gas and oil technologies. These may be coordinated with the above workshops.
- ◆ Document technologies that can protect the natural coastal environment and reduce the environmental impact of oil and gas activities.

Environmental Impact Mitigation - evaluate and test technologies that may mitigate the environmental impacts of oil and gas exploration and production on coastal areas.

- ◆ Develop a methodology to include various indicators related to air, water, land, human health and biodiversity. The goal is to develop specific methodologies for the diverse ecosystems along the Texas Gulf Coast, including: barrier islands along the coast, salt grass marshes, surrounding bays and estuaries, cypress swamps, tallgrass prairies and tall woodlands of oak and pine.
- ◆ Discuss the draft methodology at a workshop that will, at a minimum, include representation from industry, academia and environmental organizations.
- ◆ After revising the draft based on workshop outcome, test the draft methodology on technologies identified to reduce the impact of oil and gas activities on the natural coastal environment.
- ◆ Use the methodology to develop a voluntary, consensus-based, market driven scoring process to be used in subsequent years as key technologies are deployed.

Inter-state collaboration - coordinate efforts with other producing states to identify, formalize and co-fund collaborations regarding applicable technologies.

- ◆ Host at least one workshop in Texas to enable the various states to discuss their programs and to identify areas of mutual collaborations that exist to identify and develop technologies that protect or restore the natural coastal environment.
- ◆ Develop a post-workshop consensus report that documents the technologies identified that protect or restore the natural coastal environment.

Workforce Program - create and implement an educational workforce program to develop workforce skilled in environmental mitigation of exploration and production impacts in coastal regions

- ◆ Develop material(s) that can be used to educate workforce. This will include materials focused on Environmental Stewardship that can be used on websites and downloads.
- ◆ Host at least one workshop with industry to discuss how to develop and implement fellowship and internship programs for Texas universities with capabilities and interests in the relevant program areas.
- ◆ Host at least one workshop with state producer associations help to meet industry workforce needs in environmental mitigation disciplines.
- ◆ RPSEA will develop and implement fellowship and internship programs for Texas universities with capabilities and interests in the relevant program areas, including working with historically black colleges and universities and health science institutes. (Funding for the fellowship/internship programs are not included in the CIP.)

Environmentally Friendly Drilling Program

For 20 years, we have worked to reduce our environmental footprint. Remarkable progress has been made.

The program has shown we can **reduce the footprint more than 90%** with a further reduction in the impact on the environment if low impact technologies are combined in a system.

From the past...
(multiple well sites)



...to the present drill site pad
6 times smaller and able
to access multiple wells
from **ONE** location



System includes:

- Modular small footprint rigs with reduced emissions.
- Pad drilling of multiple wells from one site.
- New downhole logging and steering tools.
- Closed loop drilling fluid systems.

Managed by the Houston Advanced Research Center (HARC), Texas A & M University, Sam Houston State University and TerraPlatforms LLC
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SPONSORS



MANAGEMENT TEAM



ENVIRONMENTAL ORGANIZATIONS



COLLABORATORS



ALLIANCE MEMBERS



For further information about the EFD Program contact:

Rich Haut
Houston Advanced Research Center
rhaut@harc.edu
(281) 364-6093

Tom Williams
twilliams@afsolutionsinc.com
(713) 201-3866

Dave Burnett
Texas A&M University
burnett@pe.tamu.edu
(979) 845-2274

Gene Theodori
Sam Houston State University
glt002@shsu.edu
(936) 294-4143

www.efdsystems.com