

# NATURAL GAS AND OIL TECHNOLOGY PARTNERSHIP SUPPORT

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## INTRODUCTION

The Natural Gas and Oil Technology Partnership expedites development and transfer of advanced technologies through technical interactions and collaborations between nine national laboratories and the petroleum industry (majors, independents, service companies), and universities.

The Partnership combines the expertise, equipment, facilities, and technologies of the U.S. Department of Energy's national laboratories with those of the US petroleum industry. The laboratories utilize unique capabilities developed through energy and defense research and development, including electronics, instrumentation, materials, computer hardware and software, engineering, systems analysis, physics, and expert systems. Industry contributes specialized knowledge and resources and prioritizes Partnership activities.

The areas of technology are as follows:

- **Diagnostics and Imaging Technology** addresses cutting-edge geophysical methods for improved reservoir characterization with a focus on improved borehole hardware and computational efforts for seismic processing and other exploration issues. The Partnership catalyzed formation of a 25-company collaboration which has become the industry focal point for this technology.
- **Oil and Gas Recovery Technology** addresses a broad range of technologies aimed at improving production from existing fields and with specific emphasis on assisting independent producers. The industry interface is an Industry Review Panel consisting of more than 20 individuals representing independents, majors, and the service companies.
- **Drilling, Completion, and Stimulation Technology** aims at better access to the reservoir through improved drilling and completion technologies. Currently, the laboratories participate in several joint industry projects fostered by two industry organizations: the Drilling Engineering Association (DEA) and the Completion Engineering Association (CEA). In 2002 this technology area has been expanded to cover research and development in gas exploration, production and storage.

- **Upstream Environmental Technology** addresses new technologies that are needed to produce more oil and gas from mature domestic sources while safeguarding the environment. Key issues to be addressed include:
  - produced water
  - stationary source emissions
  - risk assessment
  - tank bottoms and sludge
  - naturally occurring radioactive material (NORM)
  - soil remediation
  - vapor recovery
  - offshore structure decontamination and dismantlement (D&D)
  - drilling wastes.
- **Downstream Environmental Technology** is an area of technology that was developed to address the needs of the U. S. refining industry. This technology area emphasizes advanced processing technologies, such as bioprocessing and particulate emissions.

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COORDINATION OF BIOPROCESSING PROJECTS**

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The Natural Gas and Oil Technology Partnership Bioprocessing program involves projects at four national laboratories: Oak Ridge National Laboratory, Argonne National Laboratory, Idaho National Engineering and Environmental Laboratory, and Lawrence Livermore National Laboratory. To ensure coordination between the different projects, two meetings involving the four laboratories and their collaborating industry partners are held each year.

## **DISCUSSIONS OF CURRENT ACTIVITIES**

### **T. W. Schmidt and S. M. Robinson**

During 2002, T. W. Schmidt participated in the development of the recommendations for funding of the Partnership Programs on behalf of Oak Ridge National Laboratory. In addition to existing projects in Diagnostics and Imaging Technology and Downstream Environmental Technology, T. W. Schmidt and S. M. Robinson assisted in the continued research of the In-Well Oil and Water Separation Project, completion of the Physical Property Measurement of Produced Water Project, the studies of the project to develop an ecological framework to evaluate the impacts of the releases at petroleum exploration and production sites, and measurements using inorganic membranes for hydrogen separations in refineries. Other activities include program planning with the Partnership, selection of a Partnership Steering Committee, coordination of the Partnership projects in Bioprocessing of Crude Oils, and coordinating all of the national laboratory participation in the Downstream Technology Area. In 2002 one new research project was funded: Modeling of Water-Soluble Organic in Produced Water. More recently ORNL has submitted two proposals to a new research area that focuses on gas exploration, production and storage.