

IMPLEMENTING AGREEMENT  
BETWEEN  
THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA  
AND THE  
DEPARTMENT OF ENERGY OF THE UNITED KINGDOM OF GREAT BRITAIN  
AND NORTHERN IRELAND  
IN THE FIELD OF  
DISCREPANCY ANALYSIS OF ENHANCED OIL RECOVERY PROJECTS

WHEREAS, the Department of Energy of the United States of America (USDOE) and the Department of Energy of the United Kingdom of Great Britain and Northern Ireland (UKDOE), hereinafter referred to as the "Parties" signed a Memorandum of Understanding on Collaboration in Energy Research and Development on October 18, 1984;

WHEREAS, the USDOE and UKDOE are both engaged in research to define those reservoir parameters which cause reservoir production predictions to be in error;

WHEREAS, USDOE uses predictive simulation to define critical uncertainties in enhanced oil recovery technologies and applications, and the UKDOE has developed comprehensive, detailed simulators applicable to enhanced recovery but have limited access to sufficiently detailed data with which to test their simulators; and

WHEREAS, joint research in this area, known as discrepancy analysis, would provide UKDOE the necessary data to evaluate their simulation capabilities and would provide the USDOE with data to analyze the discrepancies observed between actual and predicted recoveries in specific cost-shared field projects;

IT IS AGREED AS FOLLOWS:

Article I

Scope of Work

The USDOE, through its Bartlesville Project Office, and the UKDOE, through their Atomic Energy Establishment at Winfrith, and UKDOE's agents, shall jointly undertake research into the broad area of discrepancy analysis which shall include the following tasks:

#### Task 1 - Inventory of Models

Within three months after signing this Agreement, each Party shall provide the other Party with an inventory listing all its reservoir models from EOR projects, including brief descriptions of the major features of each reservoir model.

#### Task 2 - Selection of Enhanced Oil Recovery Projects

USDOE shall examine and screen its 27 EOR projects and all information available to USDOE about these EOR projects. USDOE shall identify the project or projects (number shall probably be more than three [3]) best suited to be examined under the subsequent Tasks. USDOE shall then submit these selected projects to the Project Coordinating Committee for selection of a project or projects (no more than three [3]), for detailed analysis as set forth in the Tasks below.

#### Task 3 - Availability of Information

USDOE shall provide to UKDOE all available information on the projects selected in Task 2. Both Parties shall undertake a detailed analysis of such projects. USDOE shall use its best efforts to obtain additional information concerning the selected projects which either USDOE or UKDOE judges necessary for the Tasks set forth below.

#### Task 4 - Analysis of Information

UKDOE shall analyze all information provided to it by USDOE in Task 3. UKDOE shall provide USDOE with a detailed process description of the reservoirs of the selected projects. If there are deficiencies in the information, the Parties may agree to additional experimental work which shall be set forth in an Amendment to this Agreement to be signed by the Parties. Based on the results of the UKDOE analysis of the provided information, the Project Coordinating Committee shall develop a schedule for the completion of the three following Tasks which shall not exceed two (2) years.

#### Task 5 - Formulation of Geological and Petrophysical Models

Each Party shall interpret the information provided in Task 3 and the analysis provided in Task 4. Each Party shall construct geological and petrophysical model of the reservoirs, including the initial conditions and later conditions which are indicated from information provided in Task 3. The Parties shall agree on such a model for each reservoir for use in Task 6.

#### Task 6 - Reservoir Simulation

UKDOE shall take the models agreed upon in Task 5 and undertake reservoir simulation calculations. UKDOE shall provide USDOE with such calculations. The Parties shall discuss and jointly evaluate the computer prediction against actual performance information obtained from the selected projects.

#### Task 7 - Meetings

The Project Coordinating Committee shall hold an annual meeting to be hosted alternately in each country of the Parties. At the meeting, a review shall be made of the progress of each Task, and the Project Coordinating Committee may recommend modifications to the information exchange and analysis within the scope of this Agreement. If the Project Coordinating Committee decides to explore new areas of cooperation, these activities shall be set forth as an Amendment to this Agreement to be signed by the Parties. At their option, the Project Managers may hold meetings as frequently as they deem necessary and appropriate.

#### Article II

##### Management and Planning

A Project Coordinating Committee shall be established and shall consist of four persons, two from each Party. Each Party shall appoint a Program Manager responsible for the programmatic aspects of this Agreement and a Project Manager responsible for the technical aspects of this Agreement.

#### Article III

##### Expenses

Each Party shall bear the travel and living expenses as well as salaries of its personnel and all costs incurred in their respective operations.

#### Article IV

##### General Provisions

1. All activities conducted under this Agreement shall be in accordance with the laws and regulations of the countries of the Parties.
2. Implementation of this Agreement is subject to the availability of appropriated funds.
3. Compensation for damages incurred during the implementation of this Agreement shall be in accordance with the laws of the countries of the Parties.

#### Article V

##### Information

1. Each Party shall provide to the other Party quarterly reports containing all information as set forth in Article I. In addition, the Parties shall prepare jointly an annual report describing the current status, progress and results achieved from the activities listed in Article I.
2. The Parties support the wide dissemination of information provided, exchanged or arising under this Agreement. Such information may be made available to the public by either Party through customary channels and in

accordance with normal procedures of the Parties. Each Party shall have all right to use, disclose, publish or disseminate such information for any and all purposes whatsoever.

3. Information transmitted from one Party to the other Party under this Agreement shall be accurate to the best knowledge and belief of the Transmitting Party, but the Transmitting Party does not warrant the suitability of the information transmitted for any particular use or application by the Receiving Party or by any third Party. Information developed jointly by the Parties shall be accurate to the best knowledge and belief of both Parties. Neither Party warrants the accuracy of the jointly developed information or its suitability for any particular use or application by either Party or by any third Party.

#### Article VI

##### Duration and Termination

1. This Agreement shall enter into force upon signature and shall remain in force for a period of five (5) years. It may be amended or extended by mutual written consent of the Parties.
2. This Agreement may be terminated at any time at the discretion of either Party upon six (6) months advance notification in writing to the other Party by the Party seeking to terminate the Agreement. Such termination shall be without prejudice to the rights which may have accrued under this Agreement to either Party up to the date of such termination.

Signed in duplicate.

FOR THE DEPARTMENT OF ENERGY  
OF THE UNITED STATES OF AMERICA

Keith N. Frye  
(Signature)

Keith N. Frye  
(Printed Name)

Deputy Assistant Secretary for  
Advanced Fuels, Technology,  
Extraction and Environmental Controls  
(Title)

September 19, 1986  
(Date)

FOR THE DEPARTMENT OF ENERGY  
OF THE UNITED KINGDOM OF GREAT  
BRITAIN AND NORTHERN IRELAND

P. J. WALMSLEY  
(Signature)

P. J. WALMSLEY  
(Printed Name)

Director, Petroleum Engineering Division  
(Title)

27<sup>th</sup> August 1986  
(Date)