

ANNEX III TO THE AGREEMENT BETWEEN
THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA
AND THE
NORWEGIAN MINISTRY OF PETROLEUM AND ENERGY
IN FOSSIL ENERGY RESEARCH AND DEVELOPMENT IN THE AREA OF
DEVELOPMENT OF A GEOLOGIC RESERVOIR DATABASE
FOR STOCHASTIC MODELING

WHEREAS, in the furtherance of their mutual interest the United States Department of Energy (DOE) and the Norwegian Ministry of Petroleum and Energy (MOPE) entered into the agreement in the field of Fossil Energy Research and Development signed April 22, 1987 (hereinafter referred to as the Energy R&D Agreement) which is set forth in the Appendix;

WHEREAS, MOPE has designated the Institute for Energy Technology (IFE) to act on its behalf for purposes of this Annex III;

WHEREAS, DOE and IFE (hereinafter referred to as the Parties) desire to cooperate in the field of fossil energy research and development;

WHEREAS, the Parties have a mutual interest in technology exchange on the development of geologic reservoir databases and their use in stochastic reservoir modeling;

WHEREAS, the Parties have a mutual interest in developing predictive models of sand body heterogeneity to promote more effective development of complex petroleum reservoirs;

WHEREAS, Norway's Continental Shelf is known to be a prolific petroleum producing area, and therefore a prime candidate for evaluation, selection and petroleum recovery studies of stochastic models of geologic reservoir heterogeneity;

IT IS AGREED AS FOLLOWS:

Article I - Scope of Work

The Parties shall cooperate in tasks in the area of development of a geologic reservoir database for stochastic reservoir modeling as set forth in Article II and in accordance with the terms and conditions of the Energy R&D Agreement.

Article II - Responsibilities of the Parties

The Parties shall carry out a series of tasks over the period of this Annex III as described below:

A. Technical Information Exchange

The Parties shall provide annual summaries of geologic database and reservoir modeling activities in their respective countries.

B. Experimental Tasks Performed by DOE

Approximately 4 staff-years of DOE personnel effort in total shall be devoted to:

- Task 1. Collection of information about depositional environment, facies, lateral and vertical heterogeneity, trapping mechanism, and reservoir drive mechanism for petroleum reservoirs in Texas.
- Task 2. Incorporation of the collected geologic reservoir information into a database formatted for use in predictive models or simulators.
- Task 3. Development of a preliminary model of the distribution and potential recovery of bypassed mobile versus immobile oil, using the reservoir data.
- Task 4. Collection and incorporation into the data base of information from other reservoirs, including from outcrop/subsurface studies of Shannon formation barrier bar reservoirs; and verifying against the predictive models.

C. Experimental Tasks Performed by IFE

Approximately 4 staff-years of IFE personnel effort in total shall be devoted to:

- Task 1. Collection of data on the dimensions, form, and petrophysical parameters of several clastic depositional environments from outcrops, cores, and the literature. The delta front depositional environment will be studied first.
- Task 2. Development of a prototype database using information on the delta front depositional environment and a format suitable for use in reservoir modeling.
- Task 3. Verification of the prototype database and reservoir simulation using the GEOPROBE program.
- Task 4. Collection of information about other depositional environments, incorporation into the database, and testing against the stochastic/reservoir models.

Article III - Management

The National Institute for Petroleum and Energy Research and ICF-Lewin shall carry out DOE's technical responsibilities under Paragraph B of this Annex III.

Each Party shall designate a Project Manager for this Annex III. These Project Managers shall provide technical management and coordination of the tasks described in this Annex III.

The status of activities performed under this Annex III shall be reported to the Joint DOE/MOPE Coordinating Committee as described in Article IV of the Energy R&D Agreement.

Article IV - Funding

All costs resulting from cooperation under this Annex III shall be borne by the Party that incurs them, except as otherwise agreed in writing. It is understood and agreed that the ability of each Party to carry out its obligations under this Annex III is subject to the availability of appropriated funds.

Article V - Intellectual Property Rights

Article IX of the Energy R&D Agreement is hereby incorporated by reference (see Appendix).

Article VI - Invention or Discovery

Article X of the Energy R&D Agreement is hereby incorporated by reference (See Appendix).

Article VII - General Provisions

Collaboration under this Annex III shall be in accordance with the laws and regulations of the respective Parties. All questions related to the Annex arising during its term shall be settled by the Parties by mutual agreement.

Article VIII- Duration

This Annex III shall enter into force upon the later date of signature and shall remain in force for a period of 18 months. This Annex may be amended or extended only by mutual written agreement of the Parties.

This Annex III may be terminated at any time at the discretion of either Party, upon six months advance notification in writing by the Party seeking to terminate. Such termination shall be without prejudice to the rights which may have accrued under this Annex III to either Party up to the date of such termination.

FOR THE DEPARTMENT OF ENERGY
OF THE UNITED STATES OF AMERICA



Robert H. Gentile
Assistant Secretary
Fossil Energy

INSTITUTE FOR ENERGY TECHNOLOGY
ON BEHALF OF THE NORWEGIAN MINISTRY
OF PETROLEUM AND ENERGY



Nils-Godtfred Aamodt
Managing Director

6.14.90
Date

Aug. 2, 1990
Date