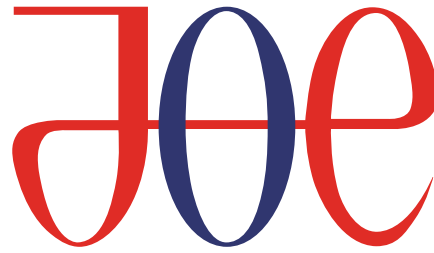


JAPAN OIL ENGINEERING CO., LTD.

Company Profile







**Japan's sole consulting & engineering company  
capable of providing total oil and gas development services**

Natural resources that sustain the wealth of our lives.....

Oil and natural gas, which have accumulated deep under the ground over a span exceeding several millions of years, will no doubt continue to play a key role as one of the most important sources of energy in both the industrial and civil sectors.

The scene of oil and gas exploration is in the midst of a shift to regions that are home to a harsh natural environment, such as remote areas, deepwater and arctic seas.

Also, along with growing concern over global environmental problems, there is ever-increasing demand by society for aggressive initiatives geared towards the well-balanced exploitation of natural resources with a minimum environmental footprint.

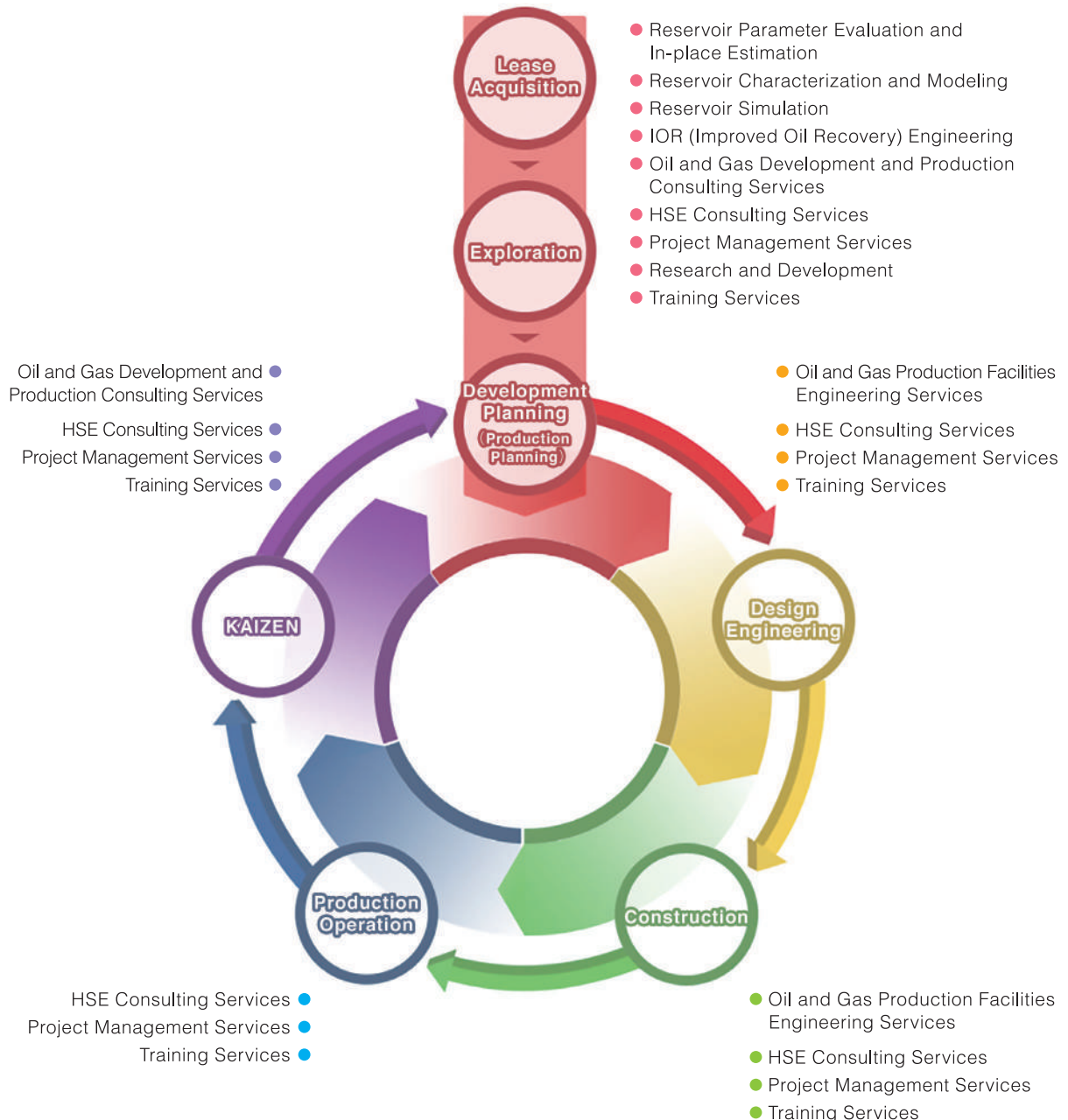
At Japan Oil Engineering Company (JOE), our vision is to do our part for the international society as a trusted adviser with a broad perspective in order to pass on the limited resources and invaluable nature of today to the next generation. With this vision in mind and the over-50 years of professional experience and state-of-the-art technology at our disposal, we seek to provide swift and precise solutions to the various issues that our customers face in their business.



# Providing services at every stage from Exploration to Production

Oil and gas field development activities are carried out from lease acquisition to exploration, development and production.

JOE, providing services at every stage, offers total consulting services of oil and gas field development from exploration to production throughout the project.

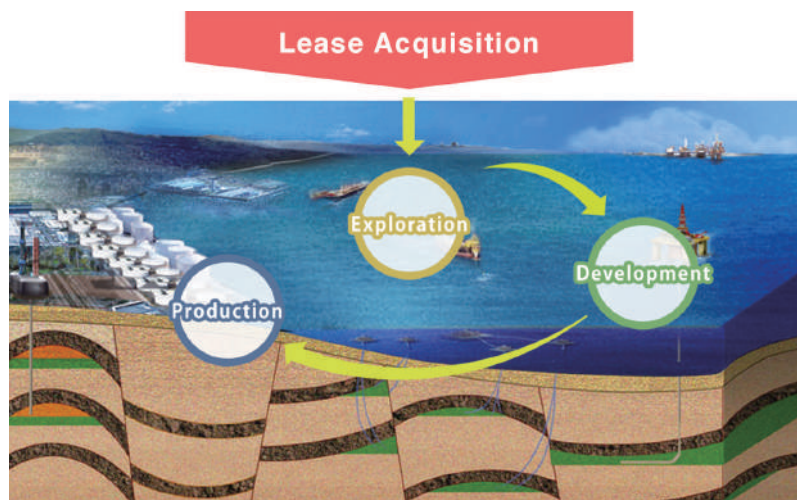


**JOE provides consultation services for oil and natural gas field development from lease acquisition to exploration, development and production, and proposes an optimal plan for the development of oil and gas.**



# Exploration to Abandonment

This page introduces oil and gas development flow from exploration to abandonment



## 1 Lease Acquisition

Japan, which hasn't abundant natural oil and gas resources, should acquire mining area from other countries or region those of which field are under development or production, and receive allocated produced oil. It is necessary to investigate the expected area in advance to judge whether oil and gas reserves exist or not, and we offer evaluation report for judgement.

## 2 Exploration

At the exploration stage, for the purpose of oil and gas field discovery and reserves evaluation, we define the expected area using acquired data by seismic exploration. Then drilling test is conducted and we analyze a plenty of data acquired using well logging technologies.

## 3 Development

When oil and gas is judged as commercially feasible based on oil and gas reserves evaluation, drilling of production wells is started to extract crude oil and natural gas from underground. Besides that, the operators design and construct onshore and offshore structures, crude oil and natural gas production processing facilities, storage facilities, and shipping facilities. Moreover, pipeline laying, drilling of the injectors and so forth required for actual operation are conducted.

## 4 Production

After the commissioning of the production facilities, oil and gas are produced based on production plan and, new wells are drilled to increase ultimate recovery amount and IOR/EOR (Improved Oil Recovery and Enhanced Oil Recovery) method is applied to improve the recovery rate. When commercial production is not expected and then abandonment is required, an appropriate approach is applied under regulations in individual countries for environmentally sound decommissioning.

**JOE provides consulting and engineering services  
for oil and gas development in wide range of areas.**

## Subsurface

### Reservoir Parameter Evaluation and In-place Estimation

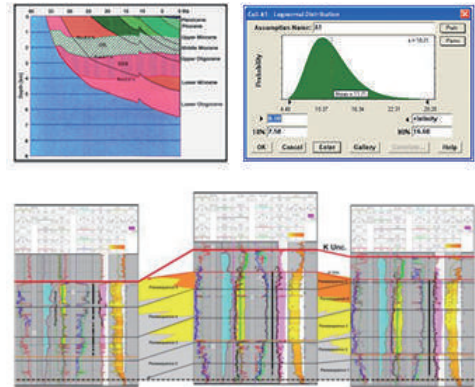
JOE evaluates the reservoir parameters and hydrocarbon in place by applying the latest technologies and software.

#### Overview of the evaluation of hydrocarbon-in-place and reservoir parameters

JOE collects the information of the target mining areas and their peripherals, and analyzes them from the engineering point of view. And then, comprehensive assessment on the prospectivity of the mining area is conducted through evaluation of the geological and geophysical data, basin analysis data and the validity of the development plan.

JOE evaluates various reservoir parameters and estimate petroleum-in-place deterministically or stochastically, which are based on a quick and reliable processing and analysis of various types of data. In doing so, JOE use the best state of art software available.

It is also possible to provide the economical evaluation and investment risk analysis service for the oil and gas exploration and development project. Our economical evaluation based on our wealth of experience, have received high praise from many customers in the accuracy and reliability.



#### Major items for evaluation

- Well log analysis
- Characteristics evaluation of reservoir rock
- Reservoir fluid analysis
- Hydrocarbon in-place estimation

**Rich experience in the field from projects in various countries and regions**

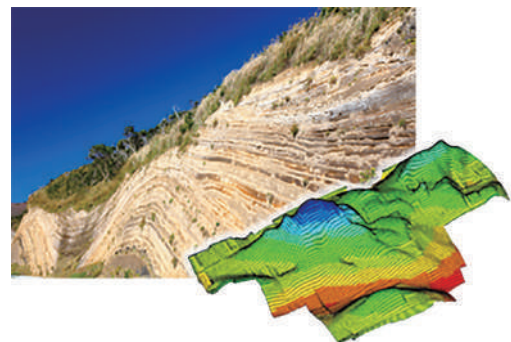
### Reservoir Characterization and Modeling

JOE constructs a precise and detailed 3D geological model through the analysis of geological, geophysical and reservoir engineering data, and builds an appropriate reservoir model for the highly-reliable reservoir simulation.

#### Overview of Reservoir Characterization

It is possible to construct a highly reliable reservoir model which reflects with great accuracy the information obtained from seismic data, well logging data, core data, well test data, production data and geological interpretation through a "geostatistical methods".

※ Geostatistical method:  
the construction technique of geological model to allow the spatial correlation and uncertainty quantification of reservoir properties.



#### Examples of reservoir modeling

- Rock typing
- Geostatistical modeling
- Upscaling

**Providing a reservoir modeling for the efficient and accurate reservoir simulation**

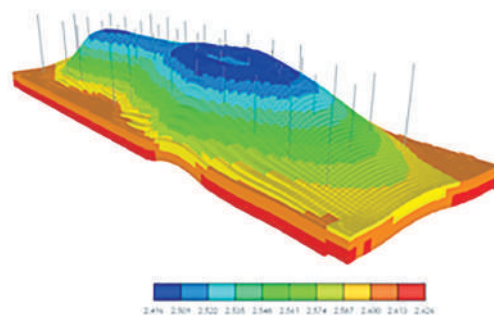


## Reservoir Simulation

JOE provides useful information to establish the development planning of clients through a variety of reservoir simulations.

### Accommodate various types of reservoir simulations

JOE has continued conducting its own research on numerical analysis method in the oil and gas reservoir engineering field for over-50 years. With such experience and track record, JOE can perform a variety of reservoir simulations related to petroleum reservoir engineering to make use of our experience and track record.



#### Examples of numerical simulations

- 3D 3-Phase black oil simulation
- 3D compositional simulation
- Naturally fractured reservoir simulation
- Various types of IOR (Improved Oil Recovery) simulations
- Geothermal reservoir simulation
- CCS (CO<sub>2</sub> capture & storage) simulation
- Methane hydrate production simulation
- Natural gas underground storage simulation
- Drill Cuttings re-injection simulation

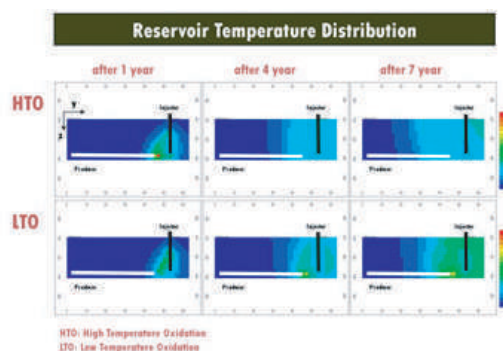
## IOR (Improved Oil Recovery) Engineering

JOE supports the resolution of the various problems encountered in applying IOR technologies.

### Support the challenges towards the IOR application

JOE has the latest technology, knowledge and know-how accumulated through various reservoir engineering research and simulator development related to IOR, such as miscible flooding, chemical flooding and thermal flooding.

We clarify and resolve the technical issues encountered in applying IOR technologies.



#### Evaluation, design and research necessary to apply IOR

- Screening of IOR applicability
- Reservoir evaluation of the IOR target reservoir
- Future reservoir performance prediction when applying IOR (Numerical simulation study)
- Design of an IOR pilot project
- Feasibility study and planning of IOR application project

## Subsurface

Petroleum Engineering & Consulting Dept.

### Research and Development

With respect to research and development on resources and the environment, JOE is the technical supporter with the reservoir engineering point of view.

#### Widespread application of the oil and natural gas development technology

JOE has been involved in research and development of advanced technologies by applying the oil and natural gas development related technology and has developed various types of reservoir simulators. Taking advantage of our experience, we support the development of "numerical tool" to evaluate the physical and chemical phenomenon which is not considered in commercial software. In addition, JOE also supports the development of "numerical simulator" for carrying out the production forecast of the new resources (methane hydrate, etc.) in accordance with the client's needs. Furthermore, JOE has abundant study experience for the "environment-friendly technology", such as CCS (Carbon Dioxide Capture and Storage). For a variety of research and development related to underground fluid behavior, JOE provides a technical assistance from the petroleum reservoir engineering point of view.



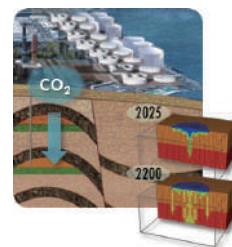
#### Methane hydrate development technology

Methane hydrate is ice-like substance in which methane molecule is trapped in a cage-like structure constructed by the water molecules under low temperature and high pressure. It has been attracting attention as the next generation of energy, since it can be expected sizable endowment under the seabed around Japan, and the emissions of carbon dioxide is less and clean at the time of combustion. JOE has played a role in the development of "numerical simulator" to predict the decomposition and production behavior of methane hydrate in the field scale. Also, JOE has been active in various scenes in methane hydrate

research and development including reservoir simulation and reservoir modeling for the world's first offshore methane hydrate production test off the coast of Japan.

#### CO<sub>2</sub> capture and storage

Now that global warming is becoming a serious problem, a variety of efforts to reduce air emission of carbon dioxide have been made in many parts of the world. As one of the promising solutions to the problem, CCS (CO<sub>2</sub> Capture and Storage) has received a lot of attention recently, in which carbon dioxide is injected into underground geological formations. JOE analyzes the behavior of CO<sub>2</sub> injected into geological formations by reservoir simulator to investigate the stability of stored CO<sub>2</sub> over a long period of time. For example, JOE simulates CO<sub>2</sub> migration in the reservoir, dissolution in the formation water, and the well placements to suppress the pressure rise which CO<sub>2</sub> injection causes. In addition, CO<sub>2</sub> is precipitated as carbonate minerals by reacting with some types of rock, which enable stable storage over tens of thousands years. However, flow simulation including this series of reactions takes a very long computation time, and also has many difficulties in the convergence of the calculation. Therefore, it can be considered as an advanced simulation. JOE has a lot of experience in such simulations, and is providing consultation services relating to such problems. The optimal well placements and well controls can achieve more stable and efficient CO<sub>2</sub> storage. To make highly reliable assessments for such optimal problems, JOE applies some optimization algorithms to the simulations.



### Training Services

JOE provides education and training services about oil and gas field development technologies for all technical engineers.

#### Our training services

JOE's training programs aim to share and transfer the knowledge and know-how we accumulated through domestic and international studies on reservoirs and Research and Development on the latest technologies. Please see the lower part of page 10 for more information about training services.



## Surface

Project Engineering Dept.

### Oil and Gas Development and Production Consulting Services

JOE provides practical solutions for the examination of various proposals for oil and gas development projects.



#### Oil and gas production consulting services overview

JOE provides a comprehensive solution for Oil and Gas projects covering; feasibility studies, verification studies for technical, economical and/or social soundness, operation and maintenance consultation through decades of experience and knowledge gained from participating and/or implementation of various projects in the Asia, Oceania, Middle East, Europe and FSU, North and South Americas, and Africa. JOE was initially established for providing such services as facilities maintenance and repair works for the Sodegaura Refinery Plant of Fuji Oil Company as the core business, but as years passed, the company has evolved and extended these services to cover maintenance and construction of petroleum refining equipment, petrochemical facilities, and upstream production facilities. JOE, as a total consulting company of energy on the oil and gas sector, offers high quality services by utilizing the latest software and our rich experience and knowledge from upstream to downstream.

#### Major services for oil and gas development and production consulting

- Project master plan establishment
- Validity evaluation of projects through technical, commercial and social aspects
- Evaluation of oil and gas development and production activities
- Planning of effective utilization of natural gas
- IT utilization and information infrastructure planning
- Facility modernization planning
- Facilities diagnosis and maintenance planning
- Technical survey on facilities construction technologies, operation evaluation, research and development (R&D)
- Implementation of various feasibility studies

### Oil and Gas Production Facilities Engineering Services

JOE provides safe and efficient design engineering for onshore/offshore oil and gas production, storage and shipping facilities.



#### Oil and gas production facilities engineering overview

JOE carries out engineering design services for production, storage and shipping facilities for both onshore and offshore oil and gas fields ensuring safe and efficient operation with our professional engineers having wide expertise and technical know-how in process, mechanical, piping, control, instrument, electrical, civil, construction, environment and safety as the backbone of our business. Furthermore, JOE also has extensive experiences in oil and gas pipeline projects.

#### Experience in oil and gas production facilities engineering

- < Onshore >
  - Basic Engineering and Detailed Engineering for oil production facilities
  - Basic Engineering and Detailed Engineering for booster gas compressor system
  - Basic Engineering for renovation and new installation of anti-corrosion facilities
  - Conceptual Engineering on surface facilities for CO<sub>2</sub>-EOR
- < Offshore >
  - Basic Engineering for offshore drilling, production, storage and shipping facilities
  - Conceptual Engineering and Basic Engineering for offshore waste water treatment system
  - Basic Engineering and Detailed Engineering of zero flaring for offshore oil production facilities
  - Conceptual Engineering and Pre-FEED on offshore surface facilities for CO<sub>2</sub>-EOR

※FEED : Front End Engineering Design

## Surface

### Health, Safety, Environment (HSE) Consulting Services

JOE provides sophisticated HSE services from development to abandonment.

#### HSE consulting service overview

HSE management is an integral approach in oil and gas development projects to ensure health and safety of all personnel affected by the projects and to achieve local and global environmental conservations, aiming at sustainable development with eco-friendly technology and partnership with communities concerned. JOE provides a variety of HSE related consulting services throughout the project lifecycle; from exploration, development, production to abandonment.



JOE has been seriously involved in tackling issues of the global warming and zero emissions through implementation of various consulting services such as greenhouse gas management and effective waste management by recovery and reuse of valuable materials in the wastes.

Geothermal energy development, one of our new challenges to renewable energy development, is inclined to delve into by utilizing our long-standing expertise in oil and gas field.

#### Major services for HSE consulting

- Environmental and Social Impact Assessments (ESIA/EIA) studies
- HSE due diligence services
- Environmental protection and restoration projects planning
- Oil Spill Response Planning (OSRPs)
- HSE management system services
- Risk management services: risk assessment, process safety management



## Project Management Services

Our professional staffs perform project management on behalf of our clients throughout the petroleum development project.



### Project management overview

JOE implements total project management in various aspect and phase of the project. JOE carries out Gas Transmission and Distribution Project (South Sumatra - West Java) in Indonesia and Crude Oil Export Facility Reconstruction Project in Iraq. For the services, JOE provides a team of experienced personnel, who can deliver effective management services to the client, including assistance/ support of tender package preparation, bid evaluation, cost and schedule control, material procurement, construction supervision and inspection, commissioning and start-up.

#### Major services for project management

- Tender package preparation, tender evaluation
- Project schedule and cost management
- Procurement management
- Fabrication and construction management and supervision
- Inspection and test attendance
- Start-up support
- Project documents management

## Training Services

JOE provides education and training services about oil and gas field development technologies for all technical engineers.

Petroleum Engineering & Consulting Dept.

Project Engineering Dept.

### Training Services

Our training program provides the participants with an all-around skill of reservoir engineering, reservoir simulation, geostatistical analysis, etc. In addition to that, JOE provides in-depth training programs related to process theories applied in the oil and gas processing facilities, process simulation, pipeline design, offloading system and HSE management, based on the knowledges and know-hows accumulated for many years through production and engineering consulting services, engineering services, and HSE consulting services.



#### Featured Experiences

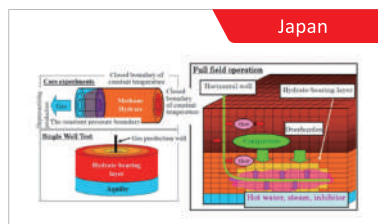
- Training on engineers from oil-producing countries (Reservoir engineering)
- Petroleum skill development seminar on Saudi Arabian and Kuwaiti
- Reservoir analysis and simulation and EOR training for Iraqi
- Training for Thai young engineers (Reservoir engineering)
- Training for Kuwait students (Reservoir engineering)
- Training for Japanese reservoir engineers
- Technical solutions training (Zero Emission, HSE management)
- Training of technological development on crude oil pipeline and export facilities for Ugandan
- Training of designing water injection facilities
- Training on risk management and environmental assessment for offshore oil and gas field development
- Domestic training for environment basics on oil and gas development activities
- Domestic training for operational technologies on production facilities in oil and gas field

# Field Experiences

JOE has been involved in resource development projects in various areas around the world and our services have been appreciated by our clients. We provide our services on resources analysis and evaluation during development, and subsequent activities such as master plan establishment, design, construction, operation, improvement and optimization plan establishment in relation to environmental and safety services by using our knowledge and experiences at every phase of the project cycle. Our business contributes to the international community by passing on the finite resources and invaluable nature to the next generation and providing one-stop solution from mining exploration development to decommissioning through production.

## Representative example

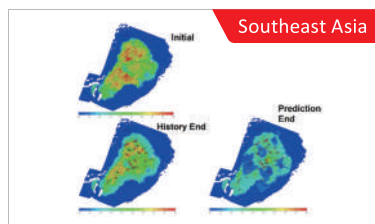
### Methane hydrate development-related projects



Methane hydrate (MH), which is stable as solid under the high pressure and low temperature condition shown in such as geological formations below the seafloor deeper than 500 m, is thought to be one of new gas resources. Today, based on petroleum reservoir engineering, several methods to produce MH from geological formations are proposed, such as "depressurization method" and "hot water injection method". Research Consortium for Methane Hydrate Resources in Japan (MH21) has developed the numerical reservoir simulator "MH21-HYDRES" designed for simulations of production in a MH reservoir. JOE has been contributing to the development of the simulator with our experiences in developing various types of numerical reservoir simulators for conventional oil and gas productions.

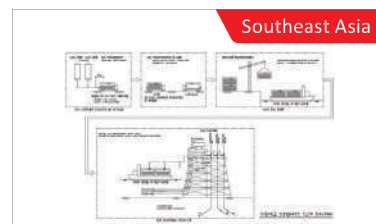
※For details, please refer to the following link.  
【 <https://www.mh21japan.gr.jp> 】

### CO<sub>2</sub>-EOR/ CCS-related Projects



This project is the study of CO<sub>2</sub> EOR to the oil reservoir which has been already developed for a long time. In this project, the numerical simulation of "CO<sub>2</sub>-WAG" was conducted, which is one of CO<sub>2</sub> EOR. CO<sub>2</sub> gas and water are alternatively injected into a formation in CO<sub>2</sub>-WAG process. In simple water-flood, some of the oil is trapped in a formation due to capillary effects and the like. In contrast, CO<sub>2</sub> injection decrease trapped oil by inducing a kind of miscible state. As a result of this study, it was implied that CO<sub>2</sub>-WAG extends the life of oil production period than traditional water-flood. The implementation of this simulation and the interpretation of the results need deep knowledge about physical-chemical phenomenon and numerical analysis as well as reservoir engineering skills. Our high technological skills which are enable the development of reservoir simulators and advanced simulation studies led to make this project successful.

### Vietnam CO<sub>2</sub> Impact Study and Planning of CO<sub>2</sub>-EOR Pilot Test



When CO<sub>2</sub> is injected into a reservoir as an enhanced oil recovery (EOR) method, there are some concerns about the negative effects on the existing processing facilities induced from CO<sub>2</sub> breakthrough and CO<sub>2</sub> rich fluid. Therefore, to sort out such concerns, JOE in cooperation with a corrosion expert company conducted the study of CO<sub>2</sub> impact which is very important in validating the CO<sub>2</sub>-EOR operation. Along with this impact study, planning of CO<sub>2</sub>-EOR pilot test was also conducted where JOE carried out a one-through outline of CO<sub>2</sub>-EOR pilot test including the procurement of available CO<sub>2</sub>, onshore/offshore transportation methods and feasible injection operation method.

### Project Management Consultancy Services for South Sumatra -West Java Gas Pipeline Project



For this project, JOE provided a comprehensive project management services for planning, procurement and implementation of the Project as a whole which covers the design, procurement, installation, testing and commissioning.

In order to achieve the objectives of the National Energy Policy and to enable effective utilization of the main non-exportable reserves at low operational costs, an infrastructure of gas transmission is required to link the main gas reserve basin and sources of supply in South Sumatra to the main demand centers in West Java. Such gas transmission infrastructures development also required corresponding infrastructures for gas distribution in West Java.

### Iraq Crude Oil Export Facility Reconstruction Project



Iraq's oil sector has suffered tremendously from various war and conflicts and debilitating economic sanctions since 1980 until 2003 invasion of Iraq by coalition forces. In order to carry out the reconstruction of the financially exhausted country of Iraq, the government has received fund support and technical assistance from various international sources, including Japanese government. The Project was initiated in 2005 through the request from the Iraq government and a Feasibility Study was carried out as a first step of the Project immediately thereafter. The Loan Agreement between Japan and Iraq was signed in 2007 and JOE was nominated as a professional and international consulting firm for the implementation of Project Management Consulting (PMC) Services through the international bidding process.

### Consultancy service for preparation of HSE documents on geothermal resource development



In this project, JOE supported the client in developing (1) HSE documents for management of Health, Safety and Environment (HSE) in the drilling site where our client operates, and (2) HSE Check Sheet which our client submitted for the HSE audit to receive an investment.

In order to reflect the intention of our client in mind, JOE has developed simple and practical documents based on actual site survey, the result of a meeting on environmental impact and HSE considerations other than HSE related documents and information provided by our client as well as associated stockholders.

Geothermal power generation has excellent potential thanks to its stable natural availability in Japan, and its further development is expected in the future. JOE is supporting geothermal related business which utilizes renewable energy from various aspects actively.

### The Project for Strengthening Environmental Management in Petroleum Industry in Persian Gulf and its Coastal Area



Middle East

The reserves currently being developed are only confined to the southwest inland and offshore Persian Gulf of Iran, and further development of such reserves are planned by the government in this decade.

In this project, JOE carried out the followings for the Clients, Ministry of Petroleum and its subsidiary organizations, in order to improve the environmental management in petroleum industry in the Persian Gulf and its coastal area; 1) Preparation of draft Master Plans for improvement of marine and coastal environmental management system and oil spill emergency response system. 2) Training to improve personal capacity on environmental management and oil spill emergency response. 3) Survey few sites in petroleum industrial area;

### Technical Training around Crude Oil Pipeline and Loading Facilities to Engineers



Africa

JOE supported this training program conducted by our customer for the oil development country's engineers in order to transfer the engineering technique and know-how of designing pipeline and loading facilities in oil and gas production area.

This particular program was based on the result of that feasibility study which suggested to conduct the practical training. In addition, this project also provided the Ugandan engineer's the opportunity to site visits of oil refineries and tank yards in Japan.

JOE provided our special experience and wide ranging knowledge so as to meet the expectations from our customers who traveled halfway the globe for this purpose and it is our source of pride that this training project was completed successfully.

### Technical and Environmental Review of FPSO Projects

JOE was designated as the independent technical consultant for financial due diligence of the Lenders to various FPSO projects. As the independent technical consultants to the projects, our scope of services was to assess and evaluate the various phases of each project development and prepare the reports. The reports were prepared to provide the independent technical review of the projects related documents and to confirm to the lenders that the FPSO meets its technical and environmental requirements.

South America

### Reservoir Simulation Study in Middle East

In this area, the client promotes the conservation of hydrocarbon resources, protection of the environment and improvement of oil recovery. Water injection and sour gas injection has been conducted for that purpose. The aim of this simulation study is to contribute an improved oil recovery plan in near future. Using the reservoir simulation model of the client, JOE calculated the future production performances of multiple case settings. Finally JOE proposed the most optimal production scheme.

Middle East

【Please visit our company website for more details and other projects】 <https://www.joe.co.jp/en/experience/>

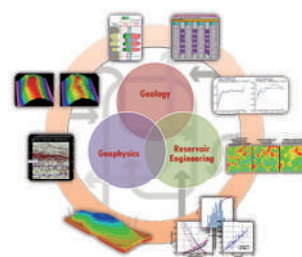
**JOE will dedicate itself to meet expectations of customers and contribute to their success in the areas of CO<sub>2</sub>-EOR/CCS, methane hydrate, geothermal resources, simulation software development and HSE, too, by applying the technology, experience and capabilities it has gained through development of oil and natural gas.**

## Software

### Subsurface

In geology-related services, JOE analyzes geological and geophysical data, evaluates various reservoir parameters and calculates an original oil/gas in place using commercial software such as Schlumberger's Petrel. We also construct and/or evaluate geological models and reservoir models applying geostatistical methods.

In reservoir simulation-related services, there is a wide variety of reservoir simulation models such as black-oil, compositional, natural fracture, thermal and chemical model. The appropriate model should be selected depending on the reservoir characteristics, fluid properties and production techniques. By using the best model for target field, JOE can perform history matching of the production history (observation data of oil and gas) and forecast the future production profile.



### Surface

JOE fully utilizes Aspen HYSYS® process simulator capabilities to develop simulation models of new and existing processing facilities and estimate solutions for facility bottlenecks. Along with process simulation model establishment, we estimate costs by using Aspen Process Economic Analyzer and Aspen Capital Cost Estimator in the stages of conceptual and basic design phase.

We also utilize PIPESIM licensed by Schlumberger to perform the calculation of gas lift operation performance, production history matching of producer/injector wells, and pipeline flow simulation.

JOE, as the sole user in Japan, utilize OGM (Oil & Gas Manager) licensed by SIEMENS for cost estimation of oil and gas field development in onshore/offshore in every region. In addition, we have recently introduced an engineering software OLI, which is a corrosion and scaling simulation program, to prevent and minimize corrosion/scaling that occur during oil and gas production.

Besides these, we have a wide array of software such as computational drawing software AutoCAD and AutoCAD PLANT 3D, pipe stress analysis software Auto PIPE as software of plant design and construction, electrical transient analysis program ETAP an electrical power simulator software, safety measures visualization software BowTieXP Standard, among others.

【Please visit our company website for more about softwares】 <https://www.joe.co.jp/en/software/>



# History

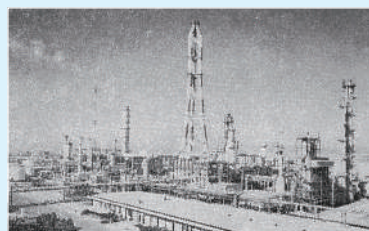
## Brief history of 50 years since the foundation of JOE, focusing on technologies

1968 }	● Establishment (June 1968)	The Company was established in June 1968 named as Fuji Engineering Co. Ltd. for the purpose of providing engineering and maintenance works to Sodegaura refinery of Fuji Oil Co., Ltd. (FOC). In 1969, the Company renamed "Japan Oil Engineering Company Ltd." and started engineering and consultation services from drilling to shipment for Khafji Field Office of Arabian Oil Co., Ltd.
	● Pioneer of reservoir estimation/ simulation study in Japan (70's)	JOE started various evaluation of petroleum reserves, seismic data analysis and sedimentary basin evaluation for simulation studies in areas such as the Middle East and Southeast Asia. At that time, it was not possible to install a large and expensive computer in the office, but JOE had been devising appropriate solutions to conduct a useful simulation as possible.
	● Support for overseas state-owned oil companies during the creation period (1975-1978)	JOE provided a master plan development/ implementation and human resource education (geology, reservoir, facilities) as technical cooperation projects with JICA to Petronas, then newly established Malaysian national oil company.
	● Evaluation study of oil and gas production facilities in KSA (1977-1979)	JOE received a contract from the Ministry of Petroleum Resources and Minerals of Saudi Arabia for performance evaluation study of major oil and gas production facilities (oil/gas separators) in the country.
1978 }	● Introduced simulation technology for geothermal development for the first time in Japan (late 70's to 80's)	JOE introduced simulation technology to geothermal development for the first time in Japan, applying knowledge about geology and reservoir engineering cultivated in oil development project. JOE have worked further on research of evaluation method of geothermal development project, geothermal reservoir analysis/assessment, reservoir simulation study.
	● Oil development project in Bohai Bay, China (1980-1985)	JOE carried out a comprehensive study and engineering services for development of Beihai oil field in Bohai Bay, China, consisting of field development, construction and operation of production, storage and loading facilities. The services included project feasibility study, engineering and design, operation and maintenance procedures, material control and capacity development for operational personnel.
	● Offshore Oil and Gas Fields Development in Japan (80's)	For Aga-oki-kita and Iwafune-oki field projects in the Sea of Japan, JOE provided various technical supports throughout the development phases from basic engineering to commissioning. Furthermore, for Iwaki-oki gas field development project in the Pacific coast, JOE provided a set of technical support for construction of offshore production and onshore base facilities.
	● Development of CO <sub>2</sub> -EOR simulator started in the early 1980's	In 1983, JOE began collaborative research and development of a reservoir simulator used to predict production behavior when CO <sub>2</sub> -EOR was applied to oil fields for the first time in Japan.
1988 }	● The first overseas EOR demonstration project by Japanese companies (90's)	JOE jointly implemented the first overseas EOR demonstration project (assessment of applicability of steam injection, CO <sub>2</sub> injection method) as a Japanese company for Turkey's Ikiztepe oil field. After this, JOE implemented numerous CO <sub>2</sub> -EOR simulation studies for oil fields in the Middle East, Southeast Asia and North America.
	● Platform Conversion Project in South China Sea (1991-1993)	JOE was awarded consultation and basic design for oil field development project in the South China sea. It was a very difficult project because converting facilities consisted of a self contained drilling and production platform then has a quit few examples. Nevertheless, JOE completed the project successfully and the platform was commissioned without large modification and have been in stable operation since then.
	● Construction of modernized Desalting Plant (1993-1995)	JOE provided EPC services for Hout crude oil Desalting Plant to Khafji Field Office, Arabian Oil Co., Ltd. In this project, JOE introduced a process automation technology (sequential operation system) as an advanced approach at that time, making stable and safety operation possible regardless of the skill of the operator.
	● PMC for Offshore Oil Field Development in Vietnam (1996-1998)	JOE, as a project management consultant (PMC), was involved in oil fields development project in the South China Sea, Vietnam. This project consisted of installation of WHP (Wellhead Platform), FPSO (Floating Production Storage Vessel) and pipelines. The FPSO introduced in the project was the first case under a Japanese flag oil field development.
1998 }	● First Zero Flaring Project in the Middle-east (1998-2000)	Zero flaring was achieved firstly in Abu-Dhabi, UAE through the method of full recovery of flare gas that had been burnt out in the atmosphere and re-injection into oil reservoir for pressure maintenance. JOE conducted the conceptual study and basic design of the project.
	● Methane hydrate simulator development (2000)	Methane hydrate exists in large quantities in the waters around Japan, and commercial production is expected in the future. Since 2000, JOE have been participating in the improvement of production simulator designed for methane hydrate (MH21-HYDRES; developed by the University of Tokyo) as a core member.
	● Enhancement of Oil Spill Response Capability in Bangladesh (2001-2002)	JOE established plan for enhancement of preventive measures and effective responses for potential oil spill incident in the coastal ports in Bangladesh. The project assisted the responsible authority to develop the National Oil Spill Contingency Plan and protection of the World Heritage of extensive mangrove forests in the region.
	● Gas Pipeline Project in Indonesia (2004-2013)	JOE, as a project management consultant (PMC), contributed a great effort in the completion of the gas pipeline project from South Sumatra to East Java which is aimed for securing stable energy supply in Indonesia.
2008 }	● Reconstruction of Crude Export Facility in Iraq(2009-)	JICA launched a reconstruction project of the existing aged crude export facility of Iraq in 2009 as ODA project to enhance the export capacity of crude oil and strengthen the country's economic foundation. JOE has been participating in the project as a project management consultant (PMC) since the beginning. The project is ongoing and moving forward to its completion.
	● Establishment of Oil Spill Contingency Plans (2010-2013)	JOE supported the Iraqi authorities to develop Oil Spill Response Plan for the crude export facility and related marine operations in Iraq. Following the project, JOE also worked on the establishment of a comprehensive oil spill response scheme to any oil spill incidents in Iraq nationwide, upon request from the Iraqi government.
	● Prediction of methane hydrate production behavior (2010's)	In 2013, methane hydrate production test was conducted in Japan waters. MH21-HYDRES was used to predict gas/water production behavior.
	● Geothermal Power Development in Japan (2014-2015)	Geothermal power generation is recently attracting interest again in Japan as renewable energy resources. In addition to evaluation of geology and geothermal reservoir, JOE assists operators in a series of HSE measures to be considered for development required for review by governmental financial institutes.

Written in red above applied for Subsurface area (Petroleum Engineering & Consulting Dept.) and blue for Surface area (Project Engineering Dept.)

[Please visit our company website for more details of our achievements and history] <https://www.joe.co.jp/en/experience/> and <https://www.joe.co.jp/en/history/>

## Corporate Data



Sodegaura Refinery, FOC (1969)



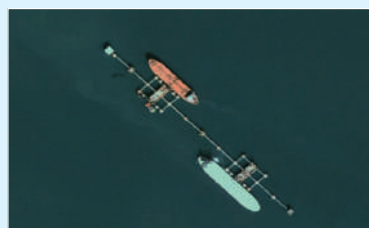
The Iwafune-oki platform



Desalting Plant for Hout Crude Oil



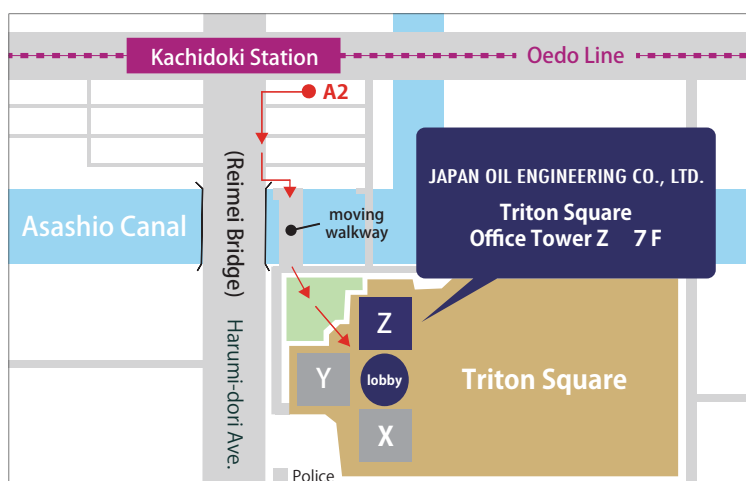
Compressor Station  
for Indonesia gas pipeline project



Basra Oil Terminal, Iraq offshore

Company Name	Japan Oil Engineering Company Ltd.
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URL	<a href="https://www.joe.co.jp/en/">https://www.joe.co.jp/en/</a>
Establishment	June 20, 1968
Paid-up Capital	100 Million Yen
Shareholder	Fuji Oil Co.,Ltd.
Member of the Board	
President - Representative Director	Hidehisa SUZUKI
Directors	Yukihiro MATSUMOTO Toshio YOSHIDA Junichi MORI
Non-executive Directors	Masanori KURIHARA (Ph. D) Atsuo WATANABE
Audit & Supervisory Board Member	Yoshifumi YAMASAKI
Number of Employees	48 (As of March 31, 2023)
Our Business	Consulting and engineering service for development and production of oil and gas along with geothermal power generation, and CO2-EOR and CCS/CCUS technologies

### ACCESS



Five minutes walk from A2 Exit of Kachidoki station, Toei Oedo Subway Line.  
Turn left and walk along Harumi-dori Ave., through moving walkway on the left after 200m, and proceed to the grand lobby (2F) by escalator.  
Please come to the 7th floor from the office tower Z elevator hall on the left.

Passing on finite resources  
and invaluable nature  
to the next generation



**JAPAN OIL ENGINEERING CO., LTD.**

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