

LESSON 2

FIELD EXPLORATION

UNIT 1

READ AND UNDERSTAND THE TEXT.

STAGES OF FIELD DEVELOPMENT

Operations associated with field development and oil and gas production can be conventionally divided into three main stages, requiring implementation of significant planning and surveys, and also involvement of big investments:

- **field exploration;**
- **field development;**
- **field operation.**

Field exploration stage includes **geological surveys** and **seismic operations**, requiring to use complex equipment for **acquisition of data** and identification of oil-bearing formations.

Drilling of **wildcats** and then **exploratory wells** is also performed at this stage.

At the stage of field development **drilling companies** perform drilling of **production wells** for further **production of oil and gas** at the stage of field operation.

This stage also includes construction of **field infrastructure – pipeline system, production facilities, treatment facilities, metering stations** and **oil and gas transportation facilities**, electric power lines and communication lines, **crew camps**.

Field operation stage includes the very production, treatment, storage and transportation of oil and gas, implementation of **enhanced oil recovery** operations and activities for increase of **production rate**. Various production methods are applied and new technologies are introduced depending upon level of **well productivity**.

Certainly, division of field development into stages by time cannot exist, and such stages overlap, and operations are performed in parallel.

Successful drilling of a wildcat is followed by active **area drill-out** with **exploration wells** and then production wells, and also construction of infrastructure, and meanwhile field exploration continues.

Quest and exploration operations help to identify **original oil in place (OOIP)**, and also classify **reserves** by categories. Reserves can be classified by **recoverability** and **state**.

By recoverability reserves can be classified as **proved reserves, probable reserves** and **possible reserves**. Proved reserves are reserves which with high level of probability (at least 90%) can be **recovered** from subsurface. Probable reserves are reserves which have 50% probability of **recovery**. Possible reserves are reserves with probability of recovery not exceeding 10%.

By state proved reserves are divided into **proved developed reserves** and **proved undeveloped reserves**. Proved developed reserves in their turn can be classified as **producing reserves** and **non-producing reserves**.

LEARN THE NEW WORDS

1. **Area drill-out** – разбуривание площади
2. **Crew camp** – жилой поселок
3. **Data acquisition** - сбор данных
4. **Drilling company** – буровая компания
5. **Enhanced oil recovery (EOR)** – повышение нефтеотдачи пластов

6. **Exploration well** - разведочная скважина
7. **Exploratory well** – разведочная скважина
8. **Field development** – разработка месторождения
9. **Field exploration** – разведка месторождения
10. **Field infrastructure** – инфраструктура месторождения
11. **Field operation** – эксплуатация месторождения
12. **Geological surveys** – геологические исследования
13. **Metering station** – узел учета (нефти)
14. **Non-producing reserves** – неразрабатываемые запасы
15. **Oil and gas production** – добыча нефти и газа
16. **Oil and gas transportation facilities** - объекты транспортировки нефти и газа
17. **Original oil in place (OOIP)** – начальные геологические запасы нефти
18. **Pipeline system** – система (сеть) трубопроводов
19. **Possible reserves** – возможные запасы
20. **Probable reserves** – вероятные запасы
21. **Producing reserves** – разрабатываемые запасы
22. **Production facilities** - объекты добычи
23. **Production rate** - дебит
24. **Production well** - добывающая скважина
25. **Proved developed reserves** – доказанные разбуренные запасы
26. **Proved reserves** - доказанные запасы
27. **Proved undeveloped reserves** – доказанные неразбуренные запасы
28. **Quest and exploration operations** – поисково-разведочные работы
29. **Recover** – добывать, извлекать
30. **Recoverability** - извлекаемость
31. **Recovery** - извлечение, добыча
32. **Seismic operations** – сейсморазведочные работы
33. **State** - состояние
34. **Treatment facilities** – объекты подготовки
35. **Well productivity** – производительность скважины
36. **Wildcat** - поисковая скважина

EXERCISES

EXERCISE 1. FINISH THE SENTENCES IN WRITTEN FORM IN OWN WORDS.

1. Field exploration stage includes...
2. At the stage of field development drilling companies perform...
3. This stage also includes construction of field infrastructure...
4. Field operation stage includes...
5. Successful drilling of a wildcat is followed by...
6. Quest and exploration operations help to...
7. By recoverability reserves can be classified as...
8. By state proved reserves are divided into...
9. Probable reserves are reserves which...
10. Possible reserves are reserves with...

EXERCISE 2. TRANSLATE THE FOLLOWING SENTENCES INTO RUSSIAN IN WRITTEN FORM.

1. Operations associated with field development and oil and gas production can be divided into three main stages.
2. Drilling of wildcats and then exploratory wells is also performed at this stage.

3. This stage also includes construction of field infrastructure – pipeline system, production facilities, treatment facilities.
4. Various production methods are applied and new technologies are introduced depending upon level of well productivity.
5. Successful drilling of a wildcat is followed by active area drill-out with exploration wells and then production wells.
6. Quest and exploration operations help to identify original oil in place, and also classify reserves by categories.
7. By recoverability reserves can be classified as proved reserves, probable reserves and possible reserves.
8. By state proved reserves are divided into proved developed reserves and proved undeveloped reserves.
9. Probable reserves are reserves which have 50% probability of recovery.
10. Proved developed reserves in their turn can be classified as producing reserves and non-producing reserves.

EXERCISE 3. ANSWER THE QUESTIONS TO THE TEXT.

1. What are the main stages of field development?
2. What operations are performed at field exploration stage?
3. What operations are performed at field development stage?
4. What operations are performed at field operation stage?
5. How can reserves be classified by recoverability?
6. How can reserves be classified by state?
7. How are proved developed reserves classified?
8. What are proved reserves?
9. What are possible reserves?
10. What are probable reserves?

EXERCISE 4. CORRECT THE STATEMENTS TO THE TEXT AS REQUIRED.

1. Drilling of wildcats and then exploratory wells is performed at field development stage.
2. At the stage of field development drilling companies perform production of oil and gas.
3. Various production methods are applied and new technologies are introduced depending upon level of well productivity.
4. Field exploration stage includes geological surveys and seismic operations.
5. Field operation stage includes drilling of production wells for further production of oil and gas.
6. Probable reserves are reserves which have 50% probability of recovery.
7. Possible reserves are reserves with probability of recovery not exceeding 80%.
8. Proved reserves are reserves which with high level of probability (at least 90%) can be recovered from subsurface.
9. Quest and exploration operations help to identify original oil in place.
10. Proved developed reserves in their turn can be classified as probable reserves and possible reserves.

EXERCISE 5. MAKE UP 5 SENTENCES USING NEW WORDS. LET YOUR PARTNER TO TRANSLATE.

EXERCISE 6. MAKE UP 5 QUESTIONS USING NEW WORDS. LET YOUR PARTNER TO ANSWER.

EXERCISE 7. MAKE UP A DIALOGUE USING NEW WORDS.

EXERCISE 8. DESCRIBE HOW YOU UNDERSTAND THE FOLLOWING.

1. Enhanced oil recovery methods are...
2. Production rate is...
3. Producing reserves are...
4. Non-producing reserves are...
5. Recoverability is...
6. Proved developed reserves are...
7. Proved undeveloped reserves are...
8. Data acquisition is...
9. Original oil in place is...
10. Probable reserves are...

EXERCISE 9. READ AND TRANSLATE THE TEXT INTO RUSSIAN.**EXERCISE 10. TRANSLATE THE FOLLOWING SENTENCES INTO ENGLISH IN WRITTEN FORM.**

1. Начальные геологические запасы нефти включают доказанные, вероятные и возможные запасы.
2. Поисково-разведочные работы необходимы для определения наличия запасов нефти и газа.
3. Методы повышения нефтеотдачи пластов применяются на этапе эксплуатации месторождения.
4. Сейсморазведочные работы определяют будущий масштаб разработки месторождения.
5. Извлекаемость нефти и газа из недр зависит от многих факторов поисково-разведочных работ.
6. Поисковые и разведочные скважины пробуривают на начальном этапе разработки месторождения.
7. Инфраструктура месторождения включает объекты добычи и транспортировки нефти и газа.
8. Сейсморазведочные работы проводятся для сбора данных о возможном нахождении залежей нефти и газа.
9. Незарабатываемые запасы – это доказанные запасы, добыча которых еще не началась.
10. Данные геологических исследований обеспечивают основу для бурения разведочных скважин.

EXERCISE 11. COMPLETE THE TEST.

#	QUESTION	ANSWERS	CORRECT ANSWER
1	Drilling of wildcats and then exploratory wells is performed at the stage of...	1. Field exploration. 2. Field development. 3. Field operation. 4. Field design.	
2	Field operation stage includes...	1. Oil and gas production. 2. Oil and gas storage and transportation. 3. Implementation of enhanced oil recovery methods. 4. All of the above.	

3	Wildcat means...	<ol style="list-style-type: none"> 1. Single production well. 2. Single drilling rig. 3. Single exploration well. 4. Single driller. 	
4	Exploration well is drilled in order to...	<ol style="list-style-type: none"> 1. Produce oil and gas. 2. Inject water. 3. Find new oil and gas. 4. None of the above. 	
5	Original oil in place means...	<ol style="list-style-type: none"> 1. Initial geological reserves of crude oil. 2. Initial oil tank stock before field development. 3. Stock of original oil opposite to stock of artificial oil. 4. All of the above. 	
6	By recoverability reserves can be classified as	<ol style="list-style-type: none"> 1. Producing reserves and non-producing reserves. 2. Proved reserves, probable reserves and possible reserves. 3. Proved developed reserves and proved undeveloped reserves. 4. Producing reserves and probable reserves. 	
7	Reserves with 90% probability of recovery are called..	<ol style="list-style-type: none"> 1. Proved reserves. 2. Probable reserves. 3. Possible reserves. 4. Developed reserves. 	
8	Reserves with 50% probability of recovery are called..	<ol style="list-style-type: none"> 1. Proved reserves. 2. Probable reserves. 3. Possible reserves. 4. Developed reserves. 	
9	Reserves with 10% probability of recovery are called..	<ol style="list-style-type: none"> 1. Proved reserves. 2. Probable reserves. 3. Possible reserves. 4. Developed reserves. 	
10	By state proved reserves are divided into...	<ol style="list-style-type: none"> 1. Producing reserves and non-producing reserves. 2. Proved reserves, probable reserves and possible reserves. 3. Proved developed reserves and proved undeveloped reserves. 4. Producing reserves and probable reserves. 	

AUDIO EXERCISES

EXERCISE 1. LISTEN TO THE AUDIO RECORD OF THE TEXT.

EXERCISE 2. ANSWER AUDIO QUESTIONS TO THE TEXT.

EXERCISE 3. TRANSLATE THE SENTENCES INTO RUSSIAN.

EXERCISE 4. TRANSLATE THE SENTENCES INTO ENGLISH.

EXERCISE 5. RETELL THE TEXT.