

Subsea Field Development

Presented by

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Outline

Lecture 1: Subsea Field Development Overview

Lecture 2: Deepwater and shallow water development

Lecture 3: Wet Tree & Dry Tree System

Lecture 4: Subsea Tie - Back Development

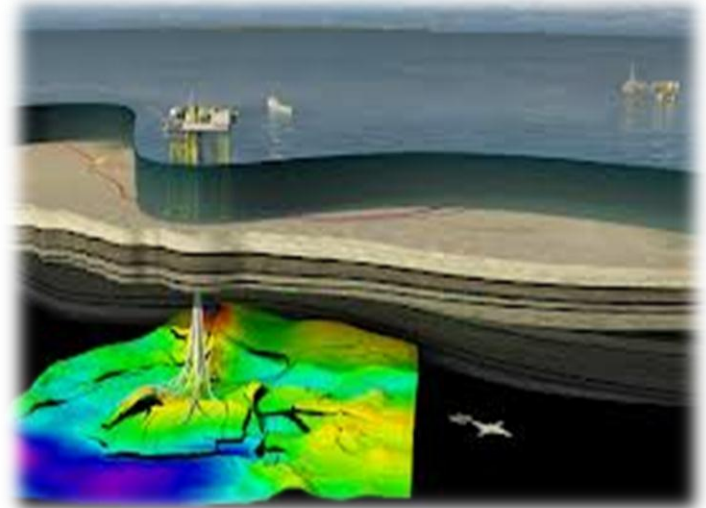
Lecture 5: Stand Alone Development

Lecture 6: Artificial Lift Methods and Constraints

Lecture 7: Subsea Processing

Lecture 8: Template, Clustered Well System and Daisy Chain

Lecture 9: Subsea Field Development Assessment



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Lecture 1: Subsea Field Development Overview



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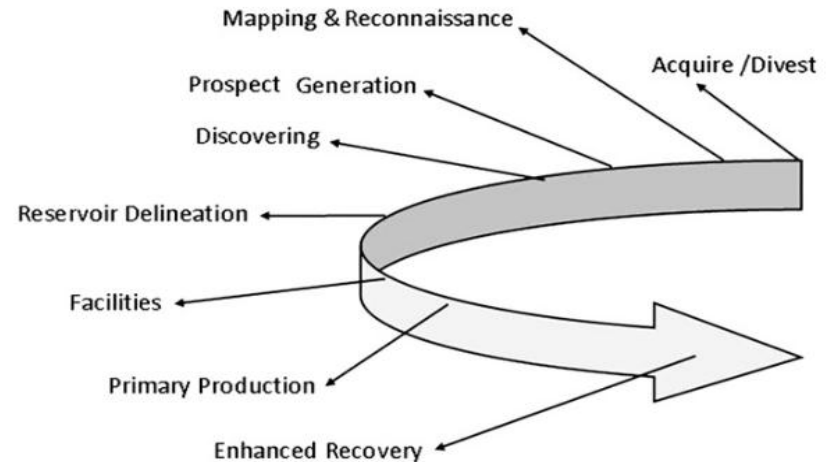


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Introduction

- ❑ Subsea field development is a long and complicated procedure.
- ❑ It begins with the primary survey and ends with the last reservoir recovery.

❖ Field Development Life Cycle Illustration

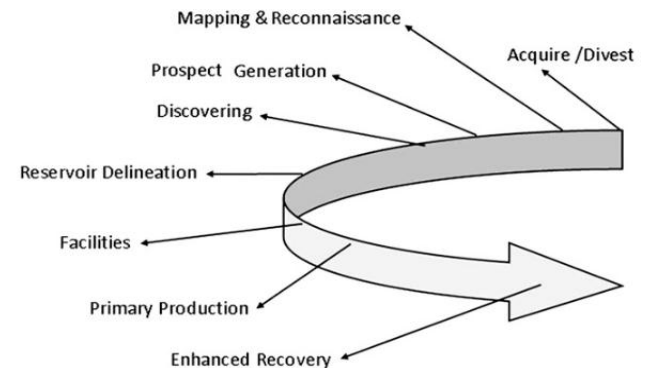


Field Development Life Cycle

- ✓ Initially, mapping and reconnaissance are conducted by exploration geologists and geophysicist

Note:

They ultimately delineate the development area's geology based on the data gathered from old wells, seismic analysis, and any other information that is available



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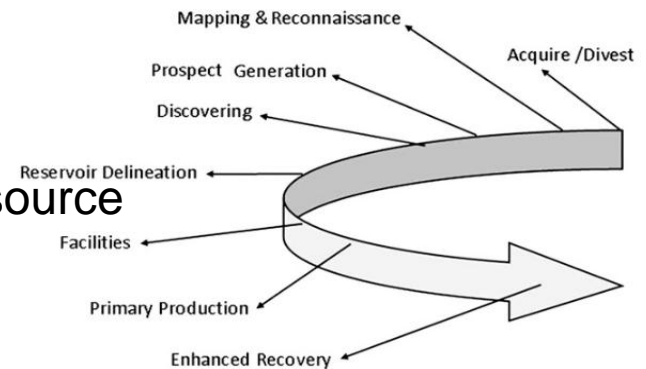


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Field Development Life Cycle

The initial issues at this stage concern the following aspects:

- ✓ Structure of the basin and the sub regional features (i.e., fault and/or fold traps for hydrocarbons);
- ✓ The stratigraphy (i.e., whether the reservoir rocks exhibit porosity and permeability);
- ✓ The burial history of the basin (i.e., whether the source rocks have been buried sufficiently for hydrocarbon generation).



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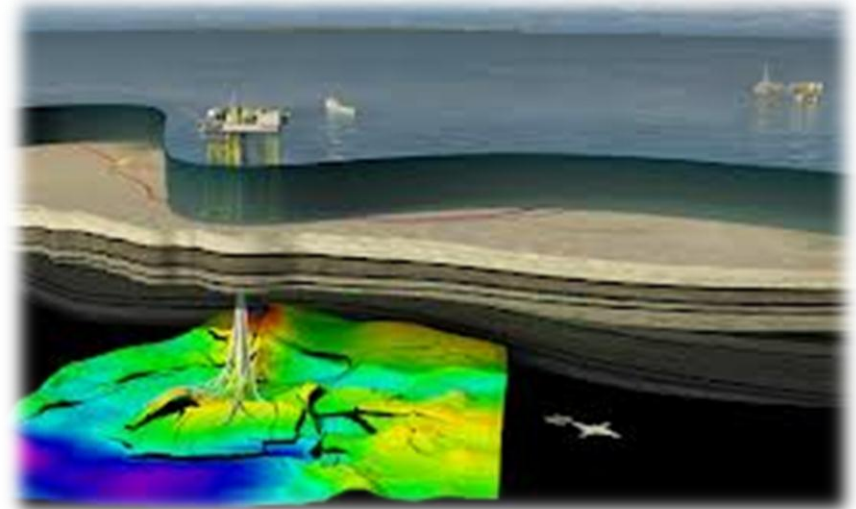


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Field Development Life Cycle

Note:

By addressing these concerns, investigators may identify and select parts of the larger area for further study and may ultimately generate a prospect evaluation.



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Field Development Life Cycle

- ❑ After the initial investigations, the reservoir description phase begins, which involves:
 - ✓ drilling delineation wells
 - ✓ conducting 3D seismic analyses

- ❑ This new information allows reservoir engineers and geologists to calculate the volume of oil and/ or gas that is present in the reservoir.



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Field Development Life Cycle

- ❑ Then it is time to ascertain the optimum subsea field layout and pipeline route; the production facilities will also be selected based on field layout and installation consideration.
- ❑ After all well and equipment testing, the field begins to produce oil and gas.
- ❑ However, as more and more oil and gas are transported to the host structure from the reservoir, the reservoir pressure will decrease, and need recovery to keep the production being transported from the reservoir.



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Field Development Life Cycle

- ❑ When defining a field architecture, the following issues should be considered:
 - ✓ Deepwater or shallow-water development;
 - ✓ Dry tree or wet tree;
 - ✓ Stand-alone or tie-back development;
 - ✓ Subsea processing;
 - ✓ Artificial lift methods;
 - ✓ Facility configurations (i.e., template, well cluster, satellite wells, manifolds).



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Field Development Life Cycle

- ❑ This course provides guidelines for the main disciplines associated with the development of a field architecture without topside facilities.
- ❑ This guideline includes system integration and interfacing, which are the most important parts of a field development project.



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