Before   **While**   **After**   + $$
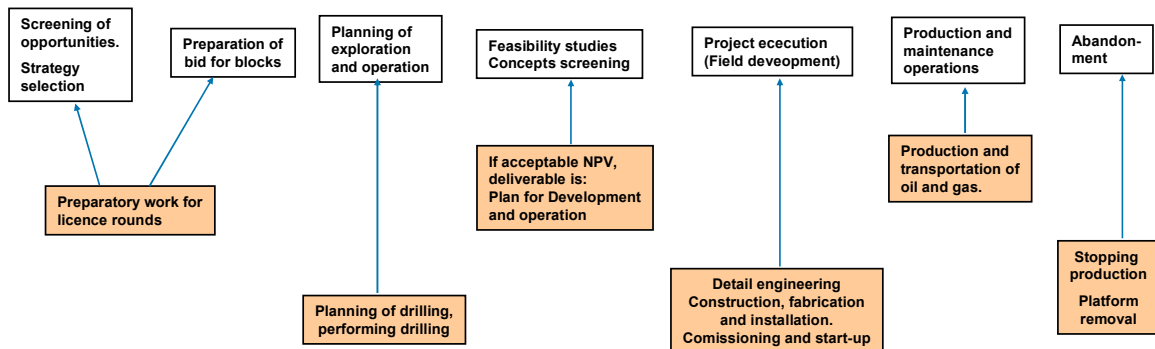
Design of offshore structures in a field development perspective

"From nothing to nothing with solid profit"
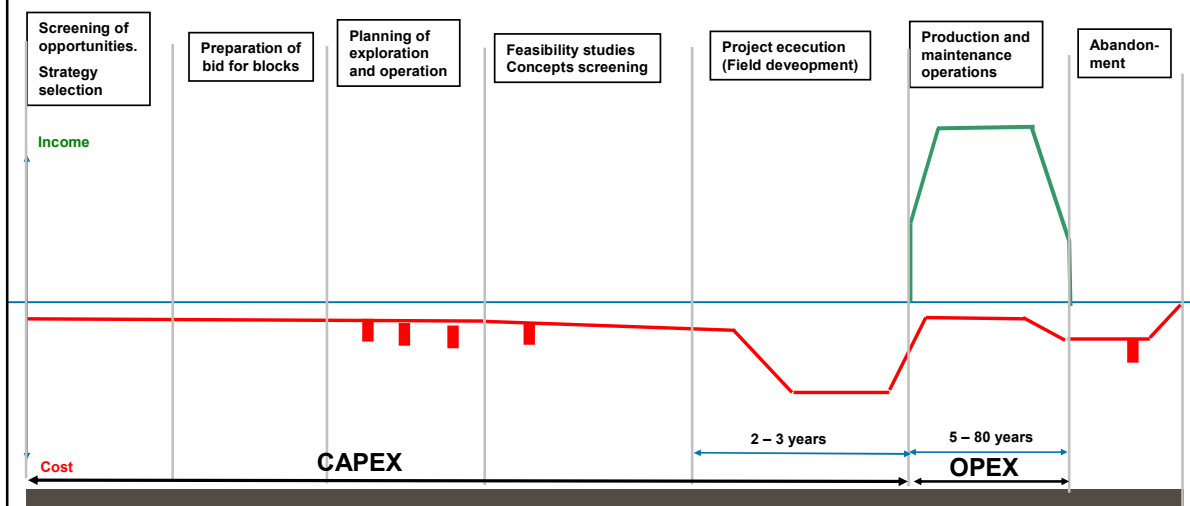
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Activity chain in a field development and operation

| Screening of opportunities. Strategy selection | Preparation of bid for blocks | Planning of exploration and operation | Feasibility studies Concepts screening | Project ececution (Field deveopment) | Production and maintenance operations | Abandon-ment |

Preparatory work for licence rounds

Planning of drilling, performing drilling

If acceptable NPV, deliverable is: Plan for Development and operation

Detail engineering Construction, fabrication and installation. Comissioning and start-up

Production and transportation of oil and gas.

Stopping production Platform removal

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Activity chain in a field development and operation
Cost and income versus time

| Screening of opportunities. Strategy selection | Preparation of bid for blocks | Planning of exploration and operation | Feasibility studies Concepts screening | Project ececution (Field deveopment) | Production and maintenance operations | Abandon-ment |

Income

2 – 3 years 5 – 80 years

Cost   CAPEX   OPEX

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NET PRESENT VALUE (NPV)

Both cost and income are calculated representing present value:

* Cost: Area under red curve, C_{PV} (present value for total cost)
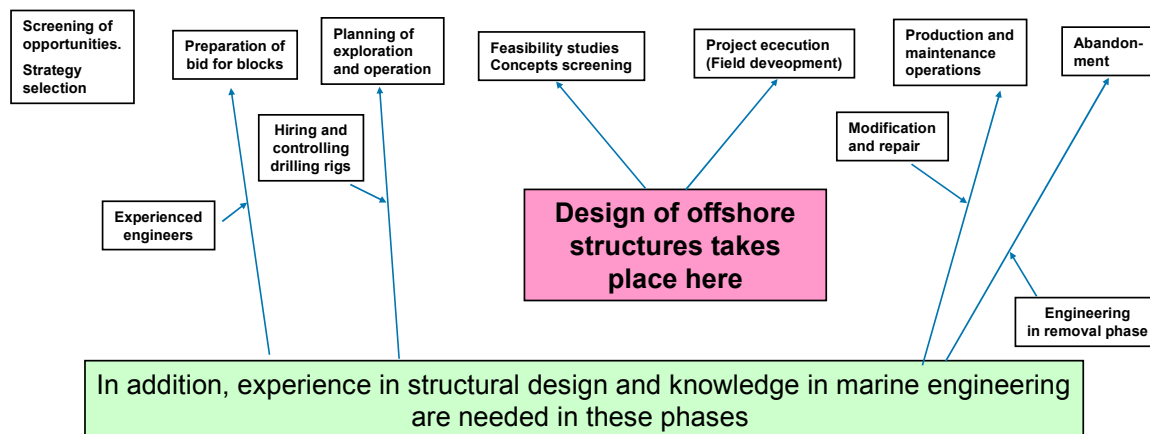* Income: Area under green curve, I_{PV} (present value for total income)

Net Present Value (NPV):

NPV = I_{PV} – C_{PV}

Requirement: NPV > 0 for an acceptable discount rate

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Where will our major contributions be?

| Screening of opportunities. Strategy selection | Preparation of bid for blocks | Planning of exploration and operation | Feasibility studies Concepts screening | Project ececution (Field deveopment) | Production and maintenance operations | Abandon-ment |

Hiring and controlling drilling rigs

Experienced engineers

Modification and repair

Design of offshore structures takes place here

Engineering in removal phase

In addition, experience in structural design and knowledge in marine engineering are needed in these phases

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Concept(s) selection
An important part of the plan for Development and Operation

- Overall field solution is important parameter. A self standing field or a part of a cluster of fields.

- Type of field – gas field or oil field.

- Need of oil storage?

- Daily oil and/or gas production.

- Quality of oil and/or gas.
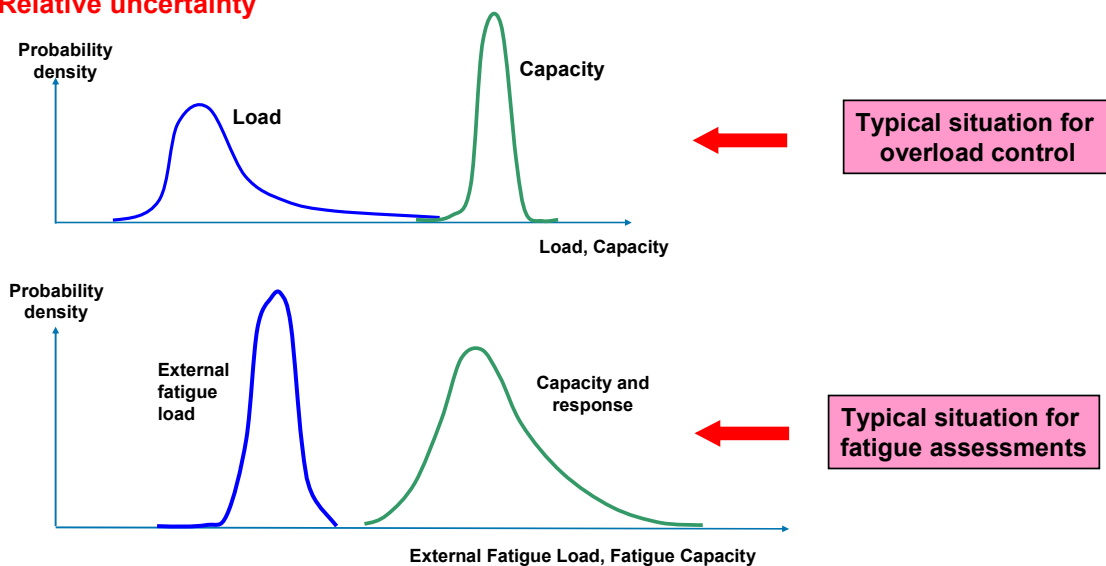
- Water depth

- aso

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Course: Design of offshore structures

- We will assume that a concept is chosen which fulfill field specific properties and specified functional requirements, i.e.:
we know forexample that for a given a field a semi-submersible is to be used.
The basic dimentions of structure are roughly known forexample through the required deck area and required capasity of deck weight.

- Our work is to know how to establish the environmental loads, permanent loads and functional loads and ensure that the structure can withstand these loads with margins required by rules and regulations.

- In view of this, the content of the course in 2008 is:
SH:
* A brief introduction to governing rules and regulations.
* Briefly review some primary standards and useful recommended practise documents (N-003 and DNV RP C-205).
* Methods for prediction of adequate characteristic loads for design work (focus on environmental loads).

JA:
* Limit state control regarding structural response.

- DNV:
* Introduction to Sesam – a very much used program for load predictions and strctural response calculation.

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Load side and capacity side
Relative uncertainty

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