

# **QUESTOR HW**

## **Comparison**

**Offshore platform FEED**

# HW : Angola

## I. Input parameters

1. Oil field
2. Africa / Angola / Congo fan basin
3. Procurement Strategy – Angola (US \$)
  - A. Materials – Africa
4. Recoverable reserves = 150 MMbbl (Oil)
5. Gas oil ratio = 1000 scf/bbl
6. Reservoir depth = 3000 m
7. Reservoir pressure = 300 bar
8. Water depth = 1000 m
9. CO<sub>2</sub> content = 5%
10. H<sub>2</sub>S content = 100 ppm
11. Well productivity = 10 MMbbl/well
12. Peak well flow = 4 Mbbl/day
13. Distance to operation base = 110 km
14. Distance to delivery point = 100 km

## HW : Angola – Field Development Scenario 1

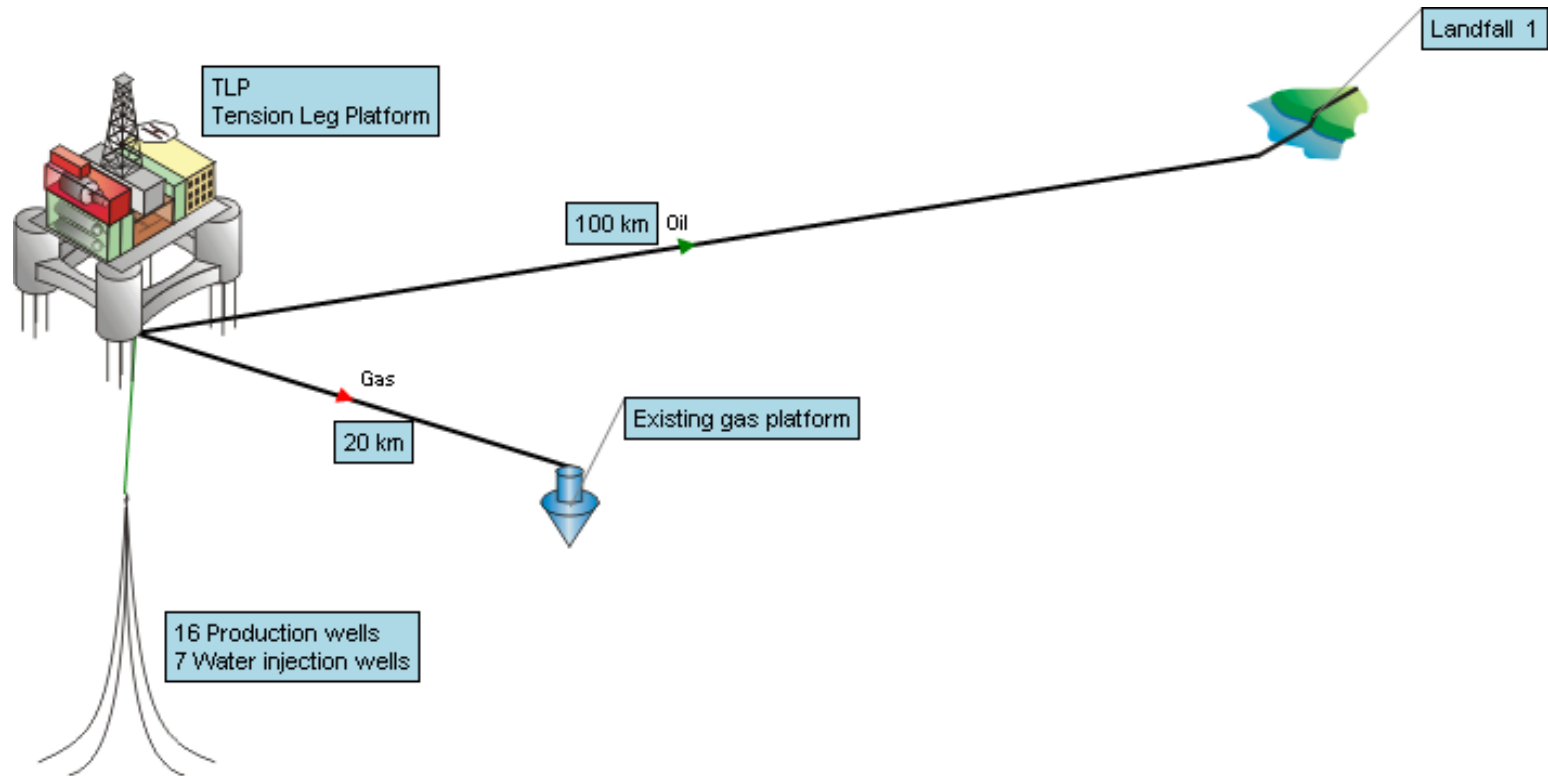
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### I. Development concept – Tension leg platform (TLP)

1. Oil export – Pipeline to shore (100 km)
2. Gas – via existing production platform (20 km)
3. Oil export
  - A. Carbon steel X80
  - B. Pipeline size : 12"
4. Dry oil tank
  - A. Storage capacity : 1500 bbl

# HW : Angola – Field Development Scenario 1

## I. Development concept – Tension leg platform (TLP)



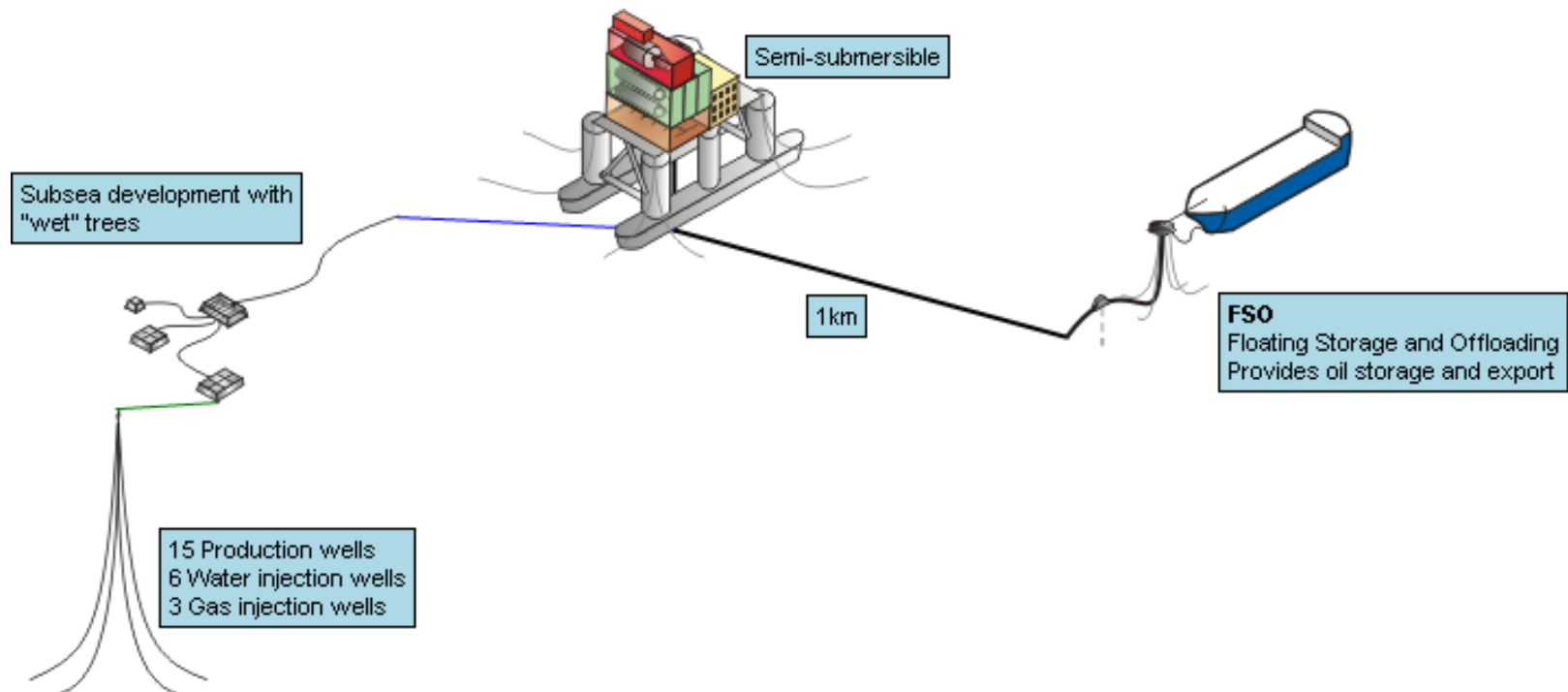
## HW : Angola – Field Development Scenario 2

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- I. Gas is reinjected, rather than exported, resulting in greater recovery:**
  - 1. Recoverable reserves = 180 MMbbl
  - 2. Well productivity = 12 MMbbl/well
  
- II. Concept – Semi-submersible + Subsea tie-back**
  - 1. Oil export – Offshore loading (1 km)
  - 2. Gas – Inject into reservoir

## HW : Angola – Field Development Scenario 2

- I. Gas is reinjected, rather than exported, resulting in greater recovery:
- II. Concept – Semi-submersible + Subsea tie-back



# HW : Angola – Field Development Scenario 3

## **I. Development concept – Spar buoy + Subsea tie-back**

1. Oil export – Pipeline to shore (100 km)
2. Gas – Inject into reservoir

## **II. Oil Export**

1. Carbon steel X80
2. Pipeline size : 12"
3. Dry oil tank
  - A. Storage capacity : 1500 bbl

## **III. Spar platform wells**

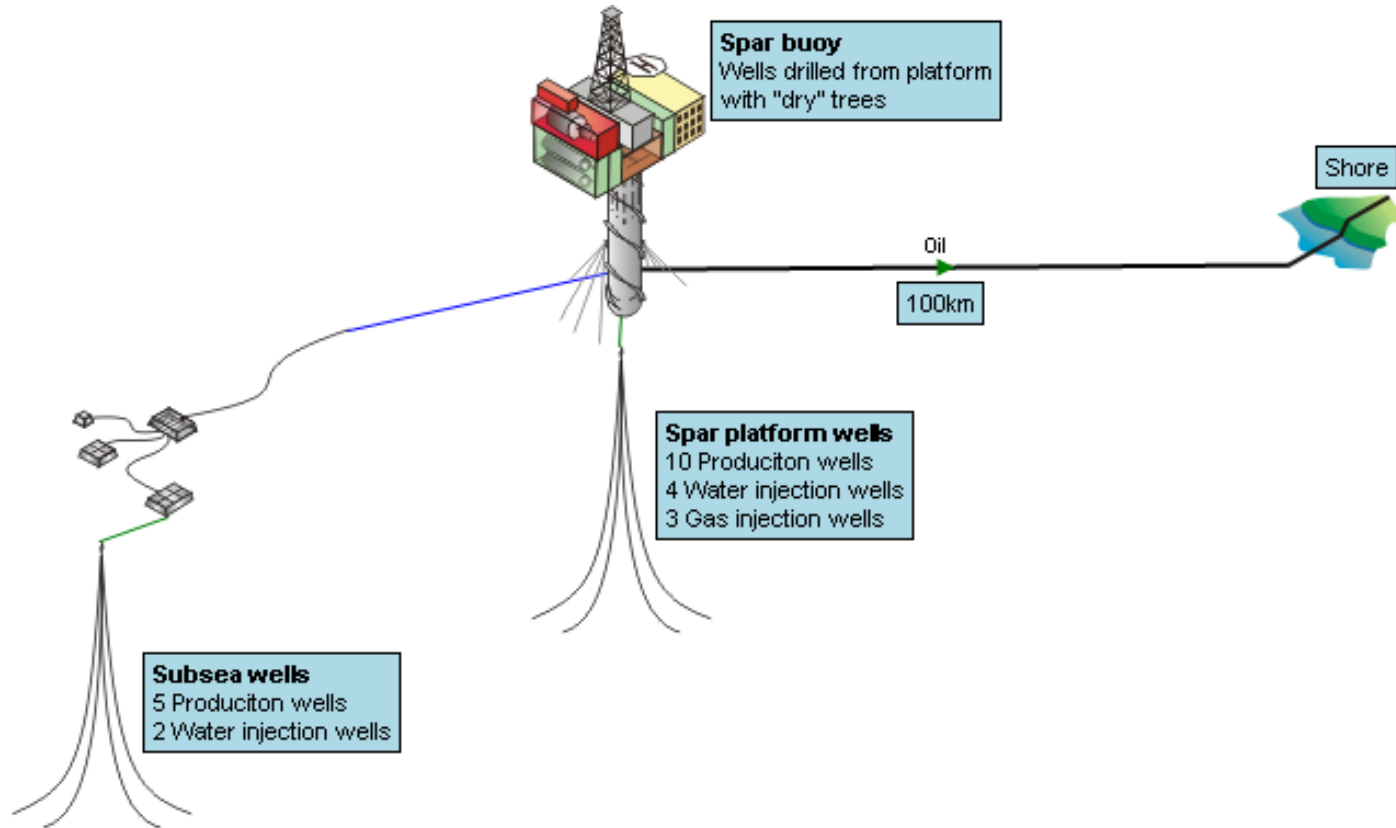
1. 10 Production
2. 4 Water injection
3. 3 Gas injection

## **IV. Subsea wells**

1. 3 Water injection
2. 6 Production

# HW : Angola – Field Development Scenario 3

## I. Development concept – Spar buoy + Subsea tie-back





## **HW : Angola – Field Development Scenario 4**

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**I. Gas is exported, rather than reinjected**

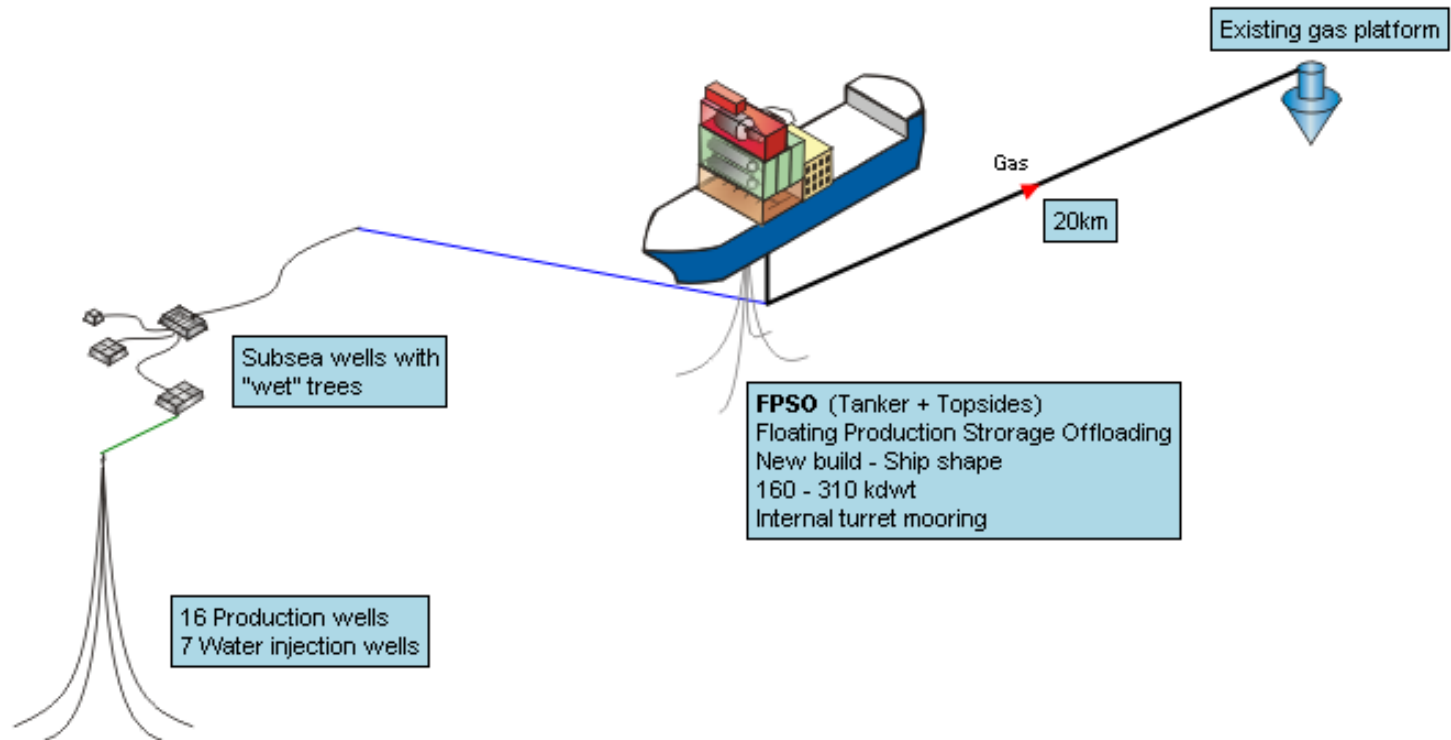
**II. Development concept – FPSO + Subsea**

1. Oil export – Ship to Ship
2. Gas – via existing production platform (20 km)
3. New build (ship shape)
4. Tanker size = VLCC 160-310 kdwt
5. Mooring option = Internal turret

# HW : Angola – Field Development Scenario 4

I. Gas is exported, rather than reinjected

II. Development concept – FPSO + Subsea

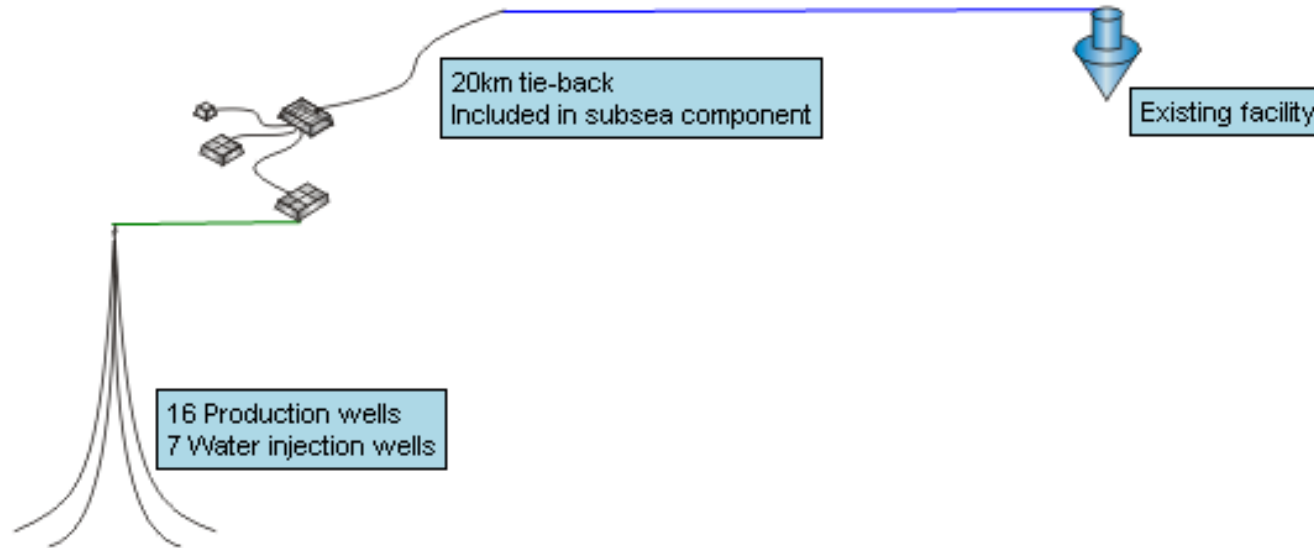


## HW : Angola – Field Development Scenario 5

- I. Field is tied-back to an existing facility with capacity to handle production**
  1. Existing facility is 20 km from the field
- II. Create the concept by adjusting the schematic of scenario 4**
  1. Delete tanker and topsides
  2. Join the subsea tie-back to the Sink
  3. Set the tie-back distance to 20 km within the subsea component
  4. Chemical injection required to prevent hydrates over longer tie-back
  5. Add HIPPS on commingling manifold

# HW : Angola – Field Development Scenario 5

## I. Field is tied-back to an existing facility with capacity to handle production



### **I. Compare the cost of each project using the project viewer**

1. Open the project viewer
2. Open the projects to compare
3. Sort the projects by Total CAPEX
4. Save the graph of
  - A. X axis : Recoverable reserves  
Y axis : Total CAPEX
  - B. X axis : Recoverable reserves  
Y axis : CAPEX/BOE
5. Save the comparison sheet in excel form
6. Discuss your result