QUE$TOR HW

Offshore platform FEED

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_2 content = 5%
10. H_2S 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

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 2

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 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 4

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 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

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