
Presenting:

# A Must Do Project Without the Required Capital

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DAAG Conference 2016

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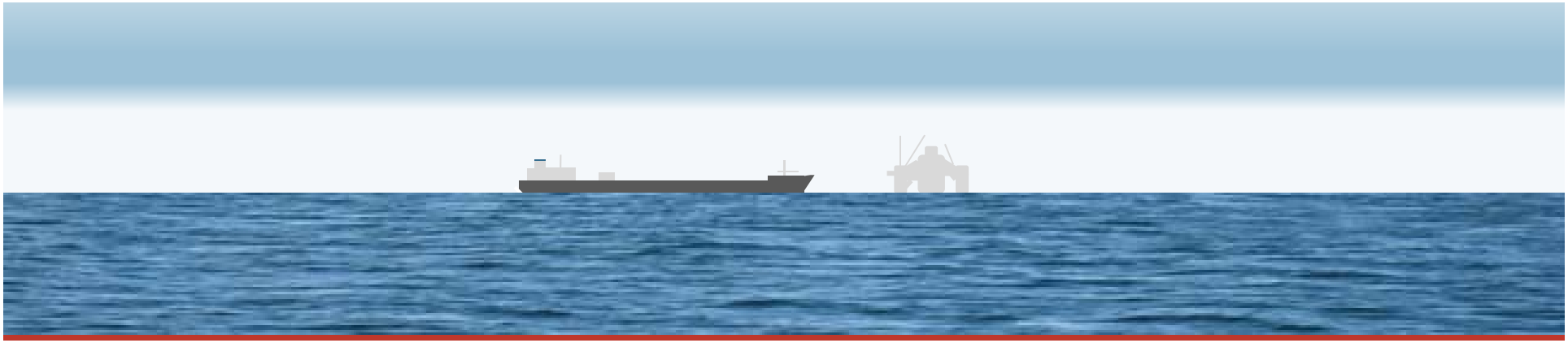


# A Must Do Project Without the Required Capital

DAAG 2016, Banff, Alberta
Session on: Capital Decision Making Under Resource Constrained Circumstances
April 8, 2016

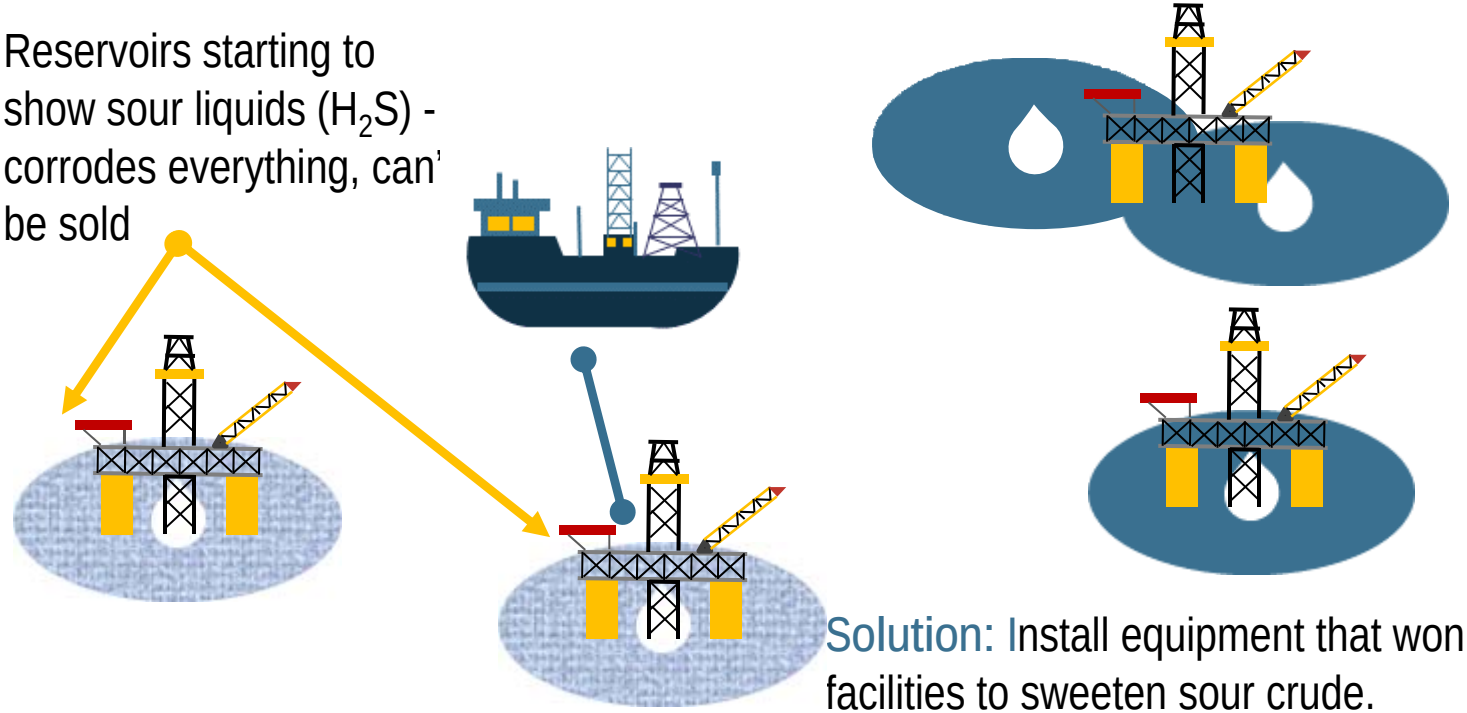
Purpose: Project level case study to illustrate approaches for a resource constrained environment.



Endeavor

# Situation: Offshore oil asset, shallow water, in production, not fully developed yet

Reservoirs starting to show sour liquids ($H_2S$) - corrodes everything, can't be sold

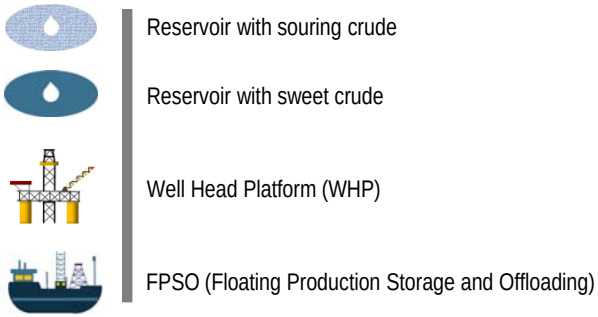




Solution: Install equipment that won't corrode and facilities to sweeten sour crude.

Must Do: Have known crude that cannot be recovered without sweetening facilities.

Resource Constraint: With low oil price, cannot generate cash flow or capital to pay for sweetening facilities.




## Analogy: Any Must Do project facing Resource Constraints

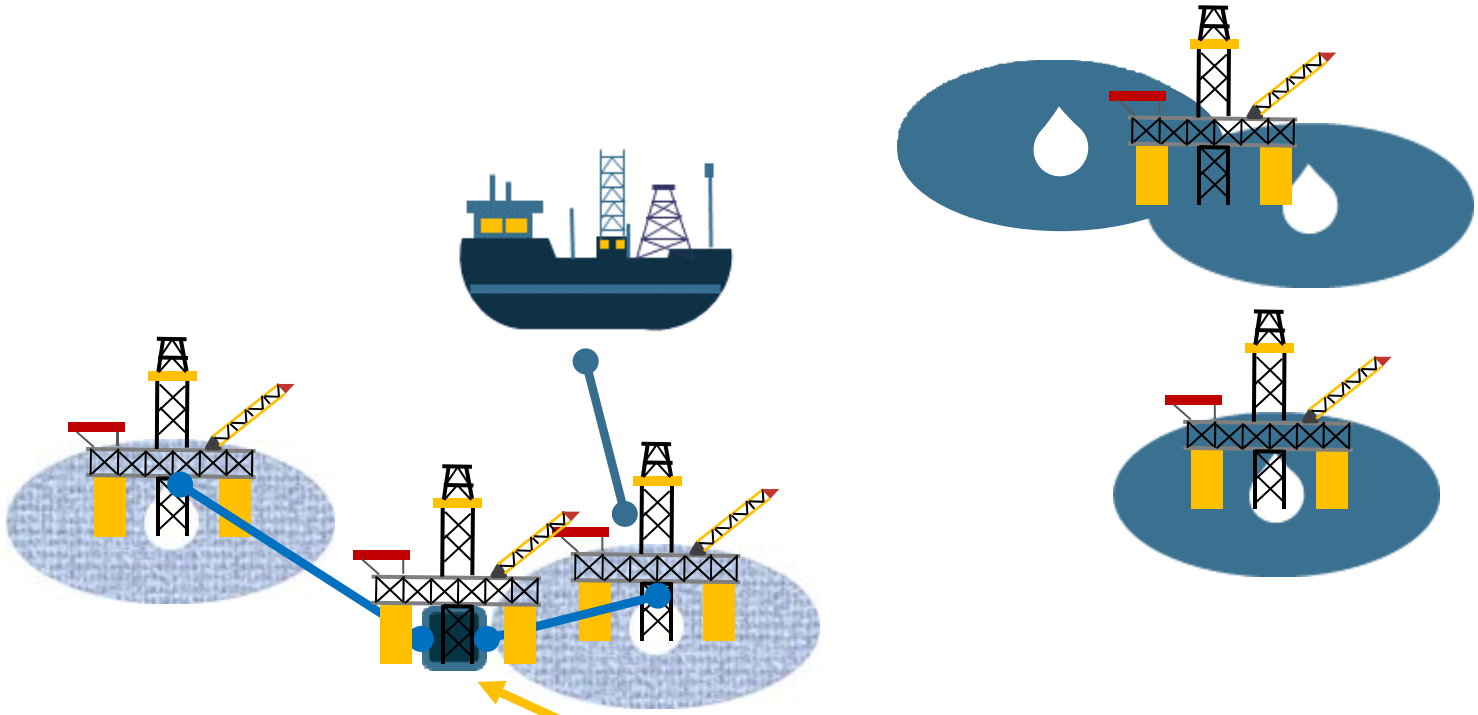
# Uncertainties / Risks

- How much crude will sour? How fast?
  - How much crude sweetening capacity?
    - More (traditional) assures sufficient capacity at higher cost
    - Less saves money, maybe insufficient

- How much more new crude exists? (Infill drilling, reservoir extensions, deeper strata)
  - How much added production capacity?
    - More (traditional) assures sufficient capacity at higher cost
    - Less saves money, maybe insufficient
  - Synergy: More production capacity can “piggy back” on crude sweetening facility at little extra cost.

- Oil Price: How far will it drop? For how long?

# Traditional alternative



Reservoir with souring crude

Reservoir with sweet crude

Well Head Platform (WHP)

FPSO (Floating Production Storage and Offloading)

Traditional: Crude sweetening and production capacity next to central WHP structure

- New structure and sour pipelines expensive

# Facility sizing alternatives

80 / 20 Cost Solutions

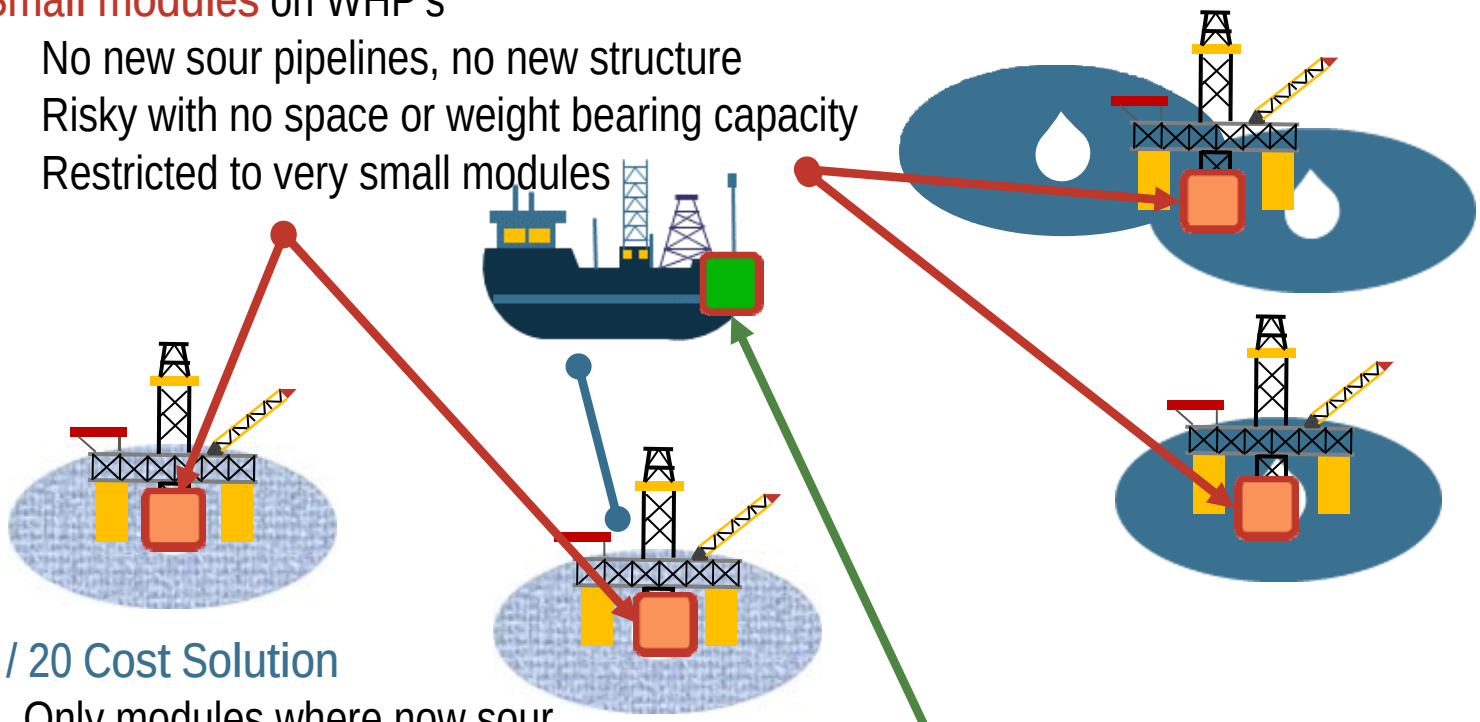
| Small | Right Size | Extra Deck Space | Super Size |
|---|---|---|---|
|  |  |  |  |
| Short on Capacity (Normal Practice Violation) | Little Spare Capacity | Create Option for more Capacity | Traditional with Extra Capacity |

Lowest Cost → Highest Cost

# Other facility location alternatives

Small modules on WHP's

- No new sour pipelines, no new structure
- Risky with no space or weight bearing capacity
- Restricted to very small modules

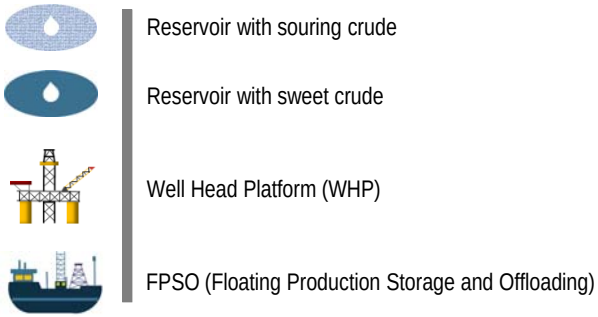


80 / 20 Cost Solution

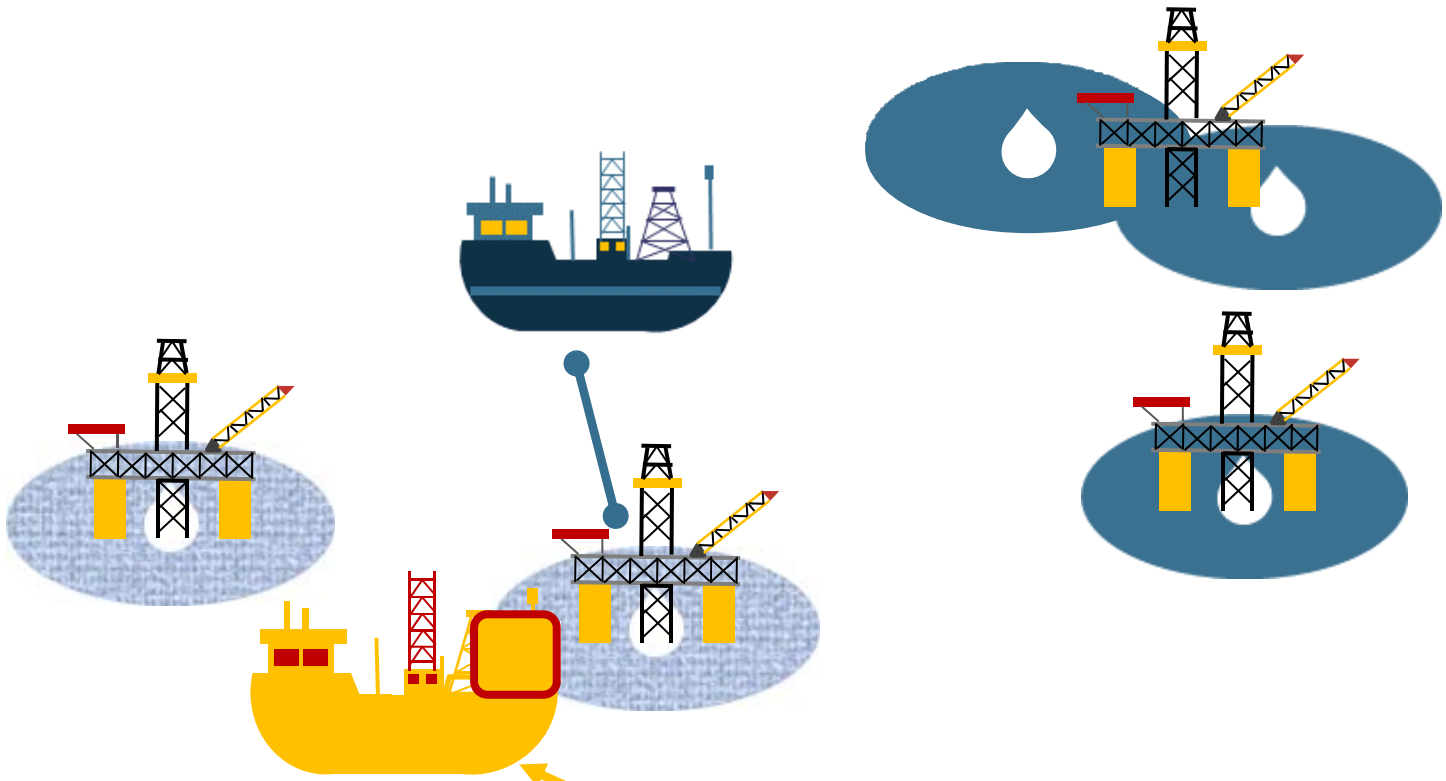
- Only modules where now sour
- Violates Normal Practice - Too small capacity

On FPSO (expensive installation)

- Save money with no new structure



# Facility on vessel alternatives – Save capital



Reservoir with souring crude

Reservoir with sweet crude

Well Head Platform (WHP)

FPSO (Floating Production Storage and Offloading)

## MODU (Mobile Offshore Drilling Unit)

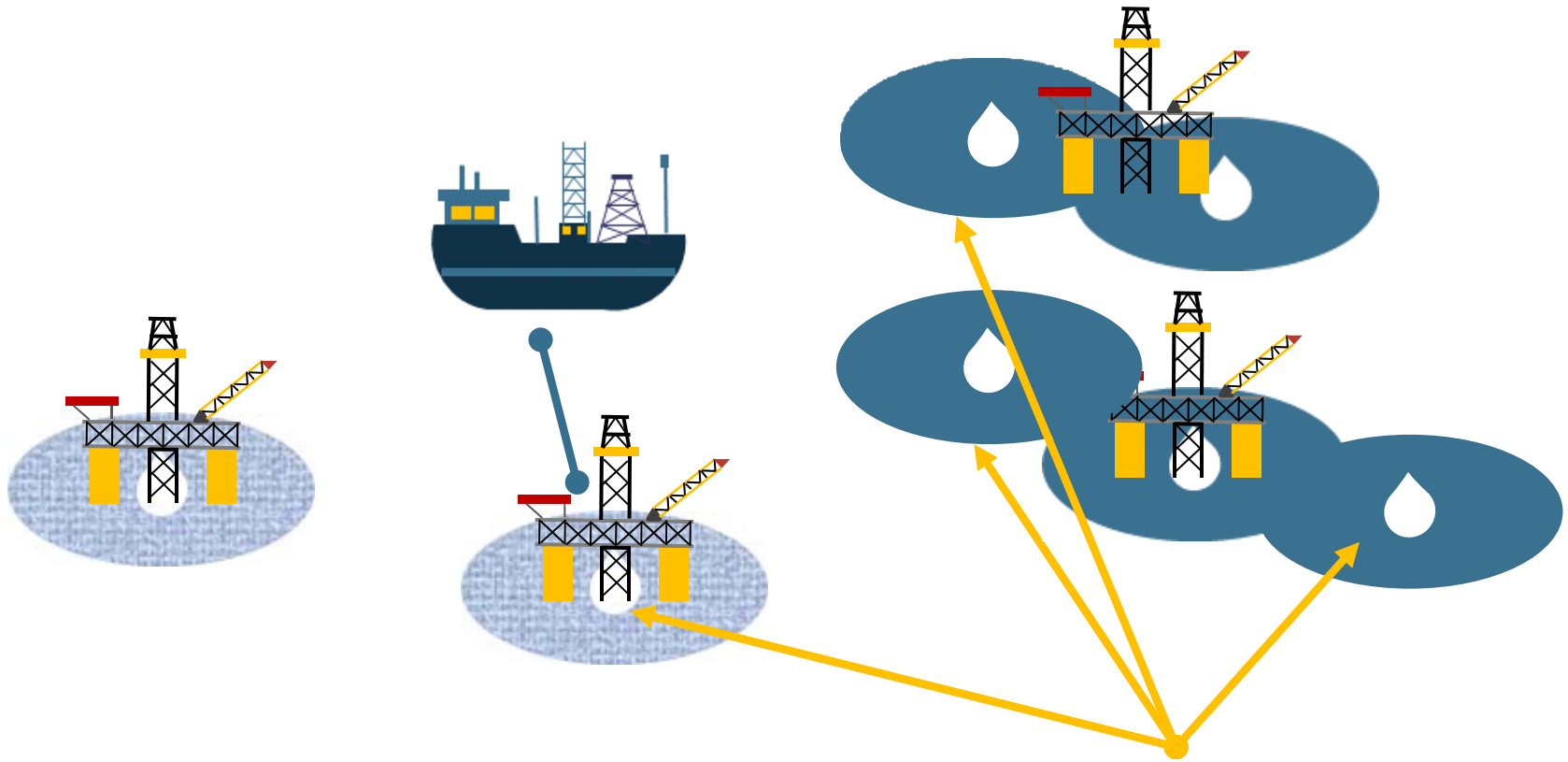
A converted tanker with production and sweetening facilities:

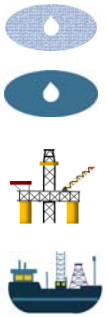
- Since vessel can sail away, vessel owner can make capital investment and lease to operator, turning CapEx into OpEx.
- Someone else's capital

# Summary: Alternatives to get an economically viable project

- Smaller Sizes: Just enough or not enough capacity
- Optionality: Build deck space w/o equipment
- 80 / 20 Cost Solutions: E.g. small modules only on WHP's with current souring
- Violate normal practices
- Someone else's capital: E.g. lease MODU and use vessel owner's capital
- Pricing Creativity
  - Explore breakeven oil prices: When could we afford project?
  - Consider oil price hedging to "guarantee" above breakeven price.

# Analytical insight led to positive reframing






## Expand production of sweet crude

More value from producing added sweet crude than from sour:

- Just drill and produce more sweet wells
- No need for new facility capital
- More production to sustain operations and cash flow
- Risk: More wells could sour and strand investment

# Outcome and Learnings

- Oil prices kept dropping during the project life:
  - At start, had a chance for economic viability.
  - At end, project delay until prices recovered.

    Real hope for price exceeding breakeven.

    Near Term / Phase 1:  Drill and produce more sweet wells.

- In a capital and cash flow constrained environment, don't get trapped into not studying the opportunity:
  - Be creative with a different approach than in normal times, looking for lower cost, non-traditional, creative solutions.
  - If you try to find a way to make the project work, you might succeed.

- Take what you learn to reframe project for success.

Do some of these learnings apply to your situation?