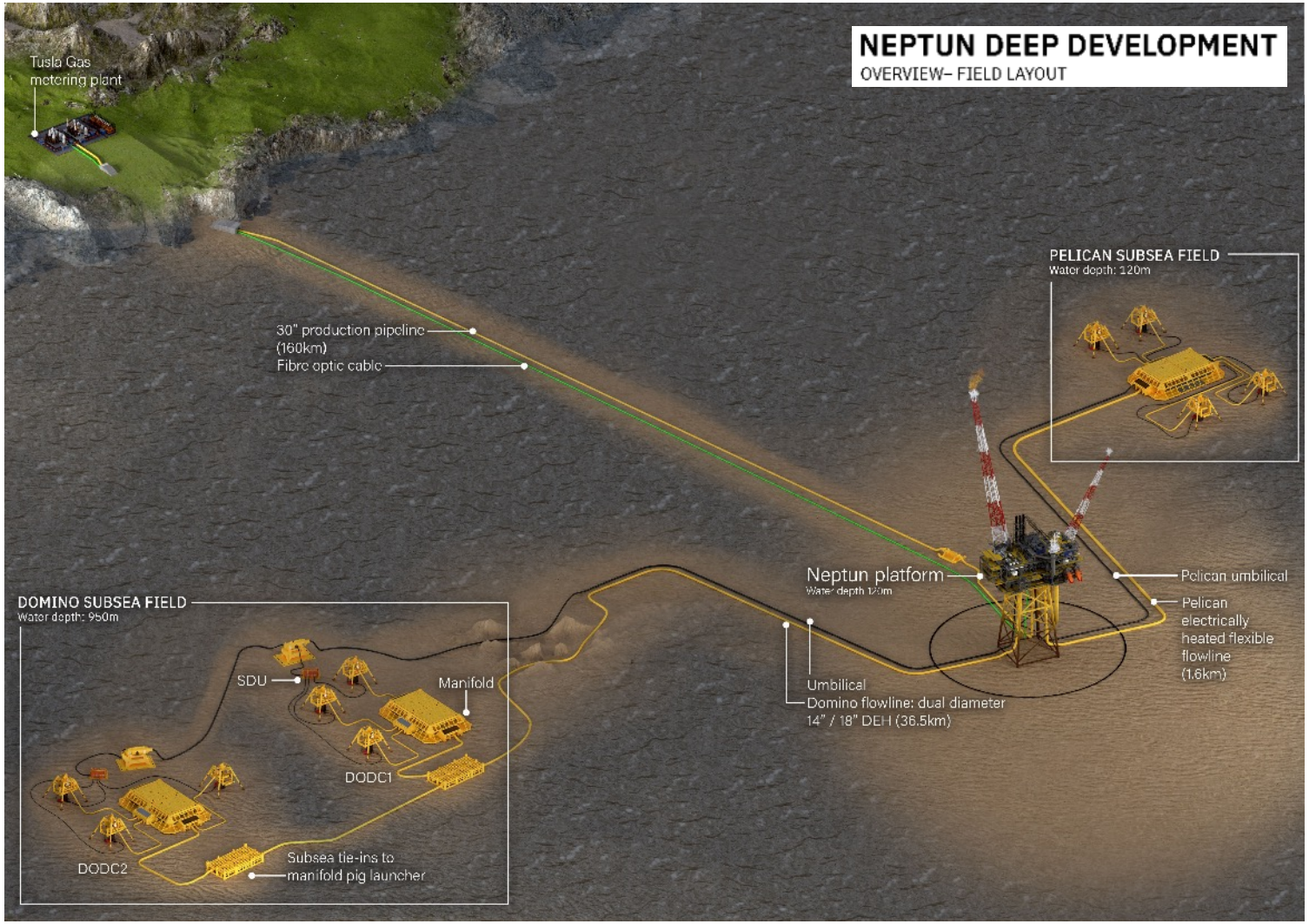
Vienna Project Academy

Neptun Deep

Facilities Delivery organization

September 2023



BLACK SEA DEEP ASSETS

OMV Petrom
The energy for a better life.

Your presenter

Lars Banke, Facilities Project Director for Neptun Deep

MSc in Mechanical Engineering, PhD in Offshore Engineering

25 years in oil & gas industry across 8 countries

- **Operations**: asset management, production & production support, brownfield modifications, engineering, integrity & maintenance and shutdown/turnarounds
- **Capital projects**: project & site management, engineering, contracting, procurement & supply chain, planning & controlling, risk/opportunity management, HSE and quality
- **Decommissioning**: Business case, strategy, business development, sales, tender & contracting, project execution, financial planning, P/L and balance sheet and governance

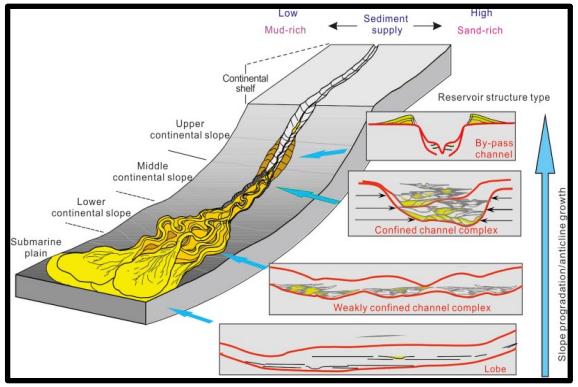
Joined OMV in March 2022 after a life-long spell in Maersk

Married to Louise, 3 children (12, 18 and 20)

Live in Bucharest

Neptun Deep at a glance

Subsurface: 7 TCF in place



- **Fields are ~180km Offshore**
- **Water Depth Pelican – 120m**
- **Water Depth Domino – 1000m**
- **Miocene Deepwater Sandstones**
- **Dry, biogenic gas, methane** (99.5%)
- **Technical Assurance Complete with conservative assumptions**

Note:

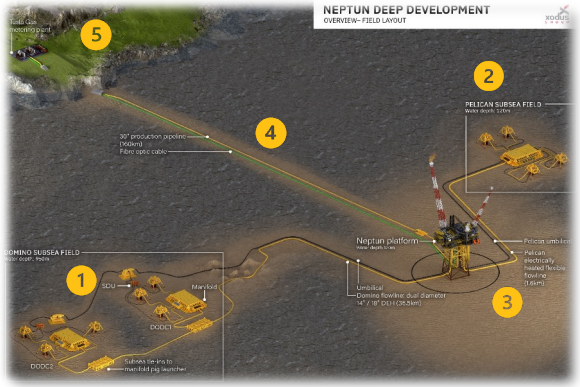
BSOG – Black Sea Oil and Gas

SPS – Subsea Production System

Wells and Completions: Drillable Wells

- **10 Medium/Low Complexity Wells:** 4 Pelican Shallow water, 6 Domino Deep Water, within standard drilling parameters
- **Exploration and Appraisal well drilling data integrated into plans**
- **Personnel transfer from OMV NZ & BSOG → perfect experience match**
- **Completion design identical to BSOG wells**
- **3 Tier 1 Drilling Contractors with rigs in play but market volatile**
- **XOM design deficiencies corrected, Technical Assurance Complete**

Offshore and Onshore Facilities



1. **Domino:** 2 SPS Tied back to SWP with a Direct Electrically Heated Pipeline
2. **Pelican:** 1 SPS Tied back to the SWP with electrically heated flowline
3. **Shallow Water Platform** (SWP):

   Normally unmanned, simple gas dehydration process & utilities

   Complicated by Rotating equipment
4. **Main Gas Export Pipeline**
5. **Natural Gas Metering Station**

- **Concept Integration Maturity**
  - Deepwater Subsea Element High
  - System needs Contractors/Transgaz

Operational Availability: A Key Driver in the Development Concept

- **Standalone Normally Unmanned Installation / Asset** (NUI)

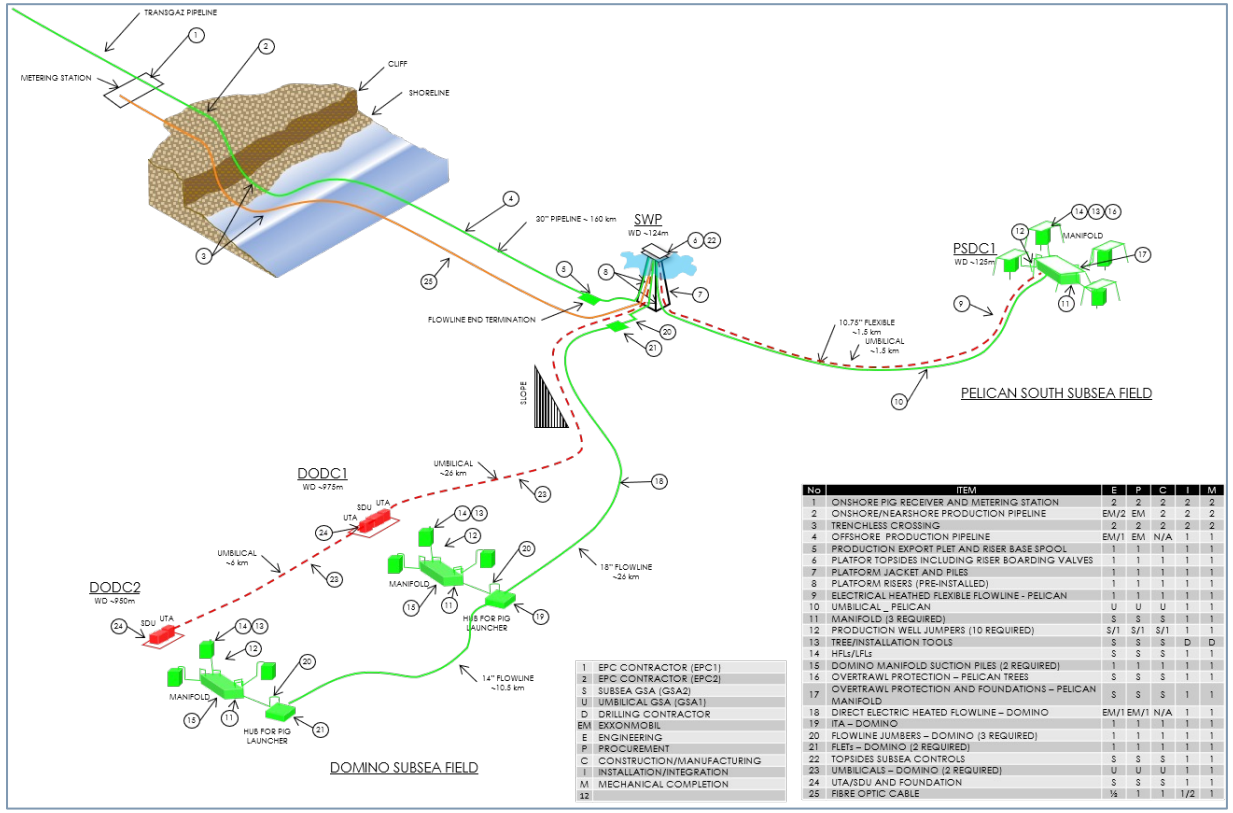
  Controlled from onshore via Fiber Optic
- **Digital Twin Asset Management**
- **Neptun 'A' support vessel: integral to development**

  Provides Accommodation, workshops

  Amplemann dynamic gangway
- **Plant Availability target 95% or higher** (challenging for a NUI)
- **Cost of downtime = F1 mindset**
- **OMVP added significant value in shadow phase**

Facilities scope

- Subsea wells (10ea) in three drill centers
- Subsea production system
- Direct electrically heated pipeline
- Heated electrical flexible pipe
- Control umbillicals
- Normally unmanned platform
- Gas export pipeline from platform to shore
- Fibre-optic cable connecting control room with platform
- Pipeline tunnel shore crossing
- Onshore metering station and control room
- Civil works



No	ITEM	E	P	C	I	M
1	ONSHORE PIG RECEIVER AND METERING STATION	2	2	2	2	2
2	ONSHORE/NEARSHORE PRODUCTION PIPELINE	EM/2	EM	2	2	2
3	TRENCHLESS CROSSING	2	2	2	2	2
4	OFFSHORE PRODUCTION PIPELINE	EM/1	EM	N/A	1	1
5	PRODUCTION EXPORT PLET AND RISER BASE SPOOL	1	1	1	1	1
6	PLATFOR TOPSIDES INCLUDING RISER BOARDING VALVES	1	1	1	1	1
7	PLATFORM JACKET AND PILES	1	1	1	1	1
8	PLATFORM RISERS (PRE-INSTALLED)	1	1	1	1	1
9	ELECTRICAL HEATHED FLEXIBLE FLOWLINE - PELICAN	1	1	1	1	1
10	UMBILICAL _ PELICAN	U	U	U	1	1
11	MANIFOLD (3 REQUIRED)	S	S	S	1	1
12	PRODUCTION WELL JUMPERS (10 REQUIRED)	S/1	S/1	S/1	1	1
13	TREE/INSTALLATION TOOLS	S	S	S	D	D
14	HFLs/LFLs	S	S	S	1	1
15	DOMINO MANIFOLD SUCTION PILES (2 REQUIRED)	1	1	1	1	1
16	OVERTRAWL PROTECTION – PELICAN TREES	S	S	S	1	1
17	OVERTRAWL PROTECTION AND FOUNDATIONS – PELICAN MANIFOLD	S	S	S	1	1
18	DIRECT ELECTRIC HEATED FLOWLINE – DOMINO	EM/1	EM/1	N/A	1	1
19	ITA – DOMINO	1	1	1	1	1
20	FLOWLINE JUMBERS – DOMINO (3 REQUIRED)	1	1	1	1	1
21	FLETs – DOMINO (2 REQUIRED)	1	1	1	1	1
22	TOPSIDES SUBSEA CONTROLS	S	S	S	1	1
23	UMBILICALS – DOMINO (2 REQUIRED)	U	U	U	1	1
24	UTA/SDU AND FOUNDATION	S	S	S	1	1
25	FIBRE OPTIC CABLE	½	1	1	1/2	1

Facilities contracts

	EXECUTE PHASE										
Project Element	**WELLS**			**OFFSHORE FACILTIIES**							**ONSHORE**
	10 Wells, Pelican and Domino			**Subsea Production System (SPS)**			**Pipelines Umbilicals Flowlines Risers (PURF)**		**Platform**	**Nearshore**	**NGMS**
Activity	RIG	Well Services (Cementing, Fluid and waste, completion and cleanout, mud logging, wireline etc	Tangibles - Casing, wellheads, Canductor, bits screens, floats	Umbilicals	Trees, Well Jumper, Connection Systems, Manifolds & Control System	Flowline Jumpers	Platform to Manifold to FLs.DEH, FLETs, PLETs,ITAs & Platform to Onshore & Fibre Optic Cables	Platform to Nearshore Export Pipeline	Shallow Water Topsides & Jacket	Nearshore to Onshore Pipeline, Trenchless Crossing & Dredging	Early Works and Natural Gas Metering Station (NGMS)
Detailed Engineering				GSA1 Umbilicals *Oceaneering* *Contract awarded on 24th of August*	GSA2 Subsea Equipment *OneSubsea* *Full scope awarded on 31st of July*	EPC 1: Offshore *Saipem* *Contract awarded on 3rd of August*				Options Amend Existing Contract / New Contract	EPC-2 Onshore Contract
Procurement								PO1 Linepipe			
Fabrication /Construction											
Transport Installation and Logistics											
Hook up and Commissioning											
Start Up assistance											

Contract award by September

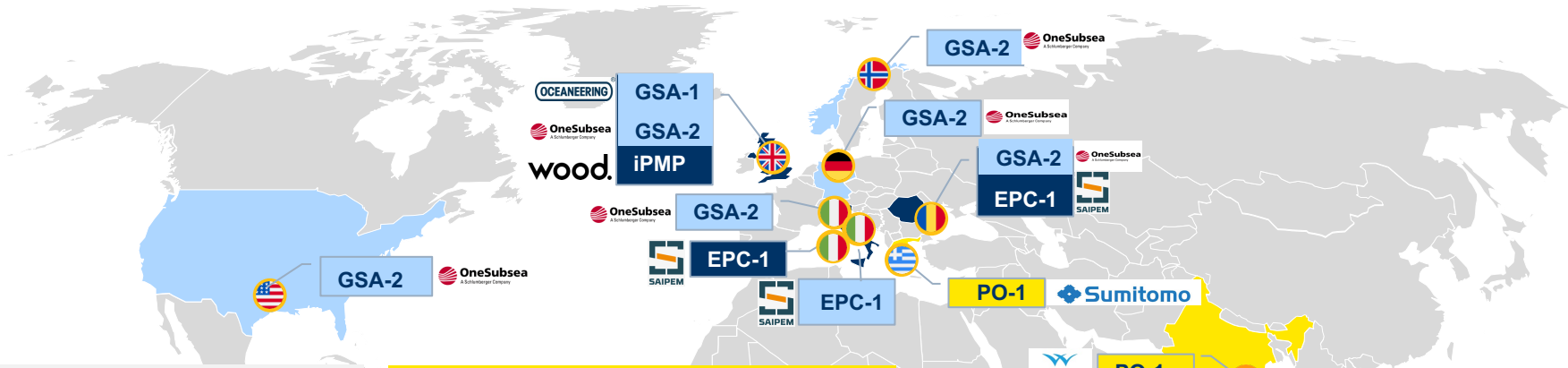
Tender looking more likely to ensure optimum cost

Tendering ongoing. Contract award by Jan-24

5-6 main facilities contracts – app 50% of overall project cost (> 2bn EUR)

Worldwide facilities delivery

- OMV Petrom owners team presence
- Awarded contractor locations
- Potential contractor locations



GSA-2

Chokes Manifold Valves & actuators (Engineering, DD, Manufacturing, Assembly & Test) — Colico

Control System (Engineering, DD, Manufacturing, Assembly & Test) — Celle

Trees, Connectors & Wellheads (Manufacturing, Assembly & Test) — Johor

WGFM System (Engineering, DD, Manufacturing, Assembly & Test) — Bergen

SPS Services & LOF (SRT, Support Services (I&C), Maintenance & Refurbishment, Storage & Preservation, Spares Management, Logistics) — Romania

Manifold Engineering, Connector Engineering, Wellhead Engineering — Houston

Project Management - (Project Services, QM, HSE & Risk Management); **Engineering -** (System Engineering, Tree Engineering); **Logistics** — Leeds

Sumitomo and WELSPUN

PO-1 (to be awarded in September)

30" Linepipe supply (fabrication and loadout FOB) — Thisvi

18" Linepipe supply (fabrication and loadout FOB) — Mumbai

GSA-1

Umbilicals (Project Management, Engineering, Qualification / Testing, Procurement (exc. Steel tubing), Fabrication, Testing and Loadout — Rosyth

iPMP

Project Management and Engineering Support — Staines

EPC-1

Shallow Water Platform (SWP) & Subsea: Overall Project Management, Project Controls, T&I Engineering. **Subsea Engineering & Procurement** — Fano

Shallow Water Platform (SWP): Engineering, Procurement, Hook-up Management — Milan

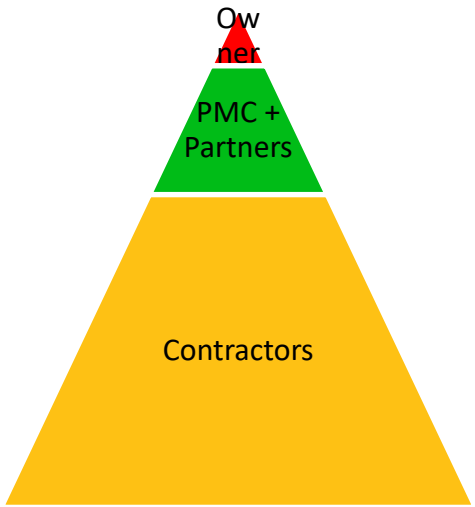
Jacket & Subsea Structures Fabrication — Sardinia

Topside Construction — Karimun Yard

Installation & Hook-up: **Utilizing vessels: Saipem 7000, JSD 6000, Normand Vision, Deep Ocean Volantis, additional ancillary vessel (dredging & rock placement)** — Offshore

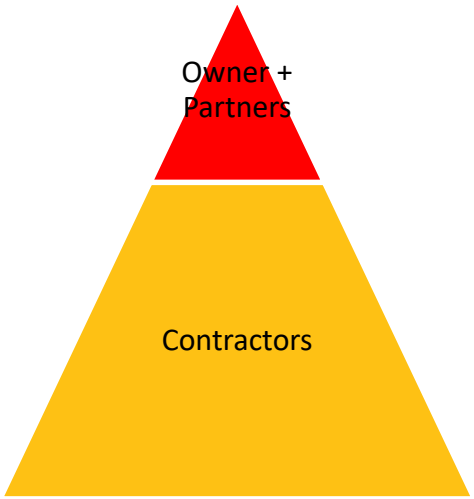
Example of Delivery models

"PMC"



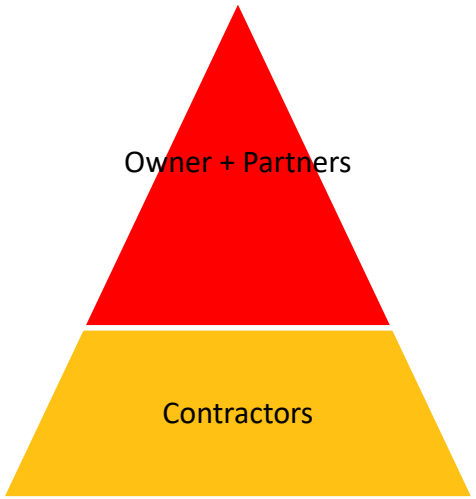
Petrobras
Qatar Energy
Saudi Aramco

"lean"



Petrom
Premier Oil (Harbour)
Maersk Oil

"insourced"



Shell
BP
Total
Nexen (CNOOC)

Delivery model – design considerations

Project **complexity** (size, economic margin, technical proven or outreach)

Contract strategy and commercial model (number of contracts, lump sum to fully reimbursable)

Level of definition at contract award (scope, commercial model)

Commonality with other executed projects (e.g is it a first off, or a third in a row of identical projects, do you the Contractor)

Existing in-house **experience** (e.g. does Corporate retain knowledge from previous projects)

Partners experience, know-how and desire/ability to contribute

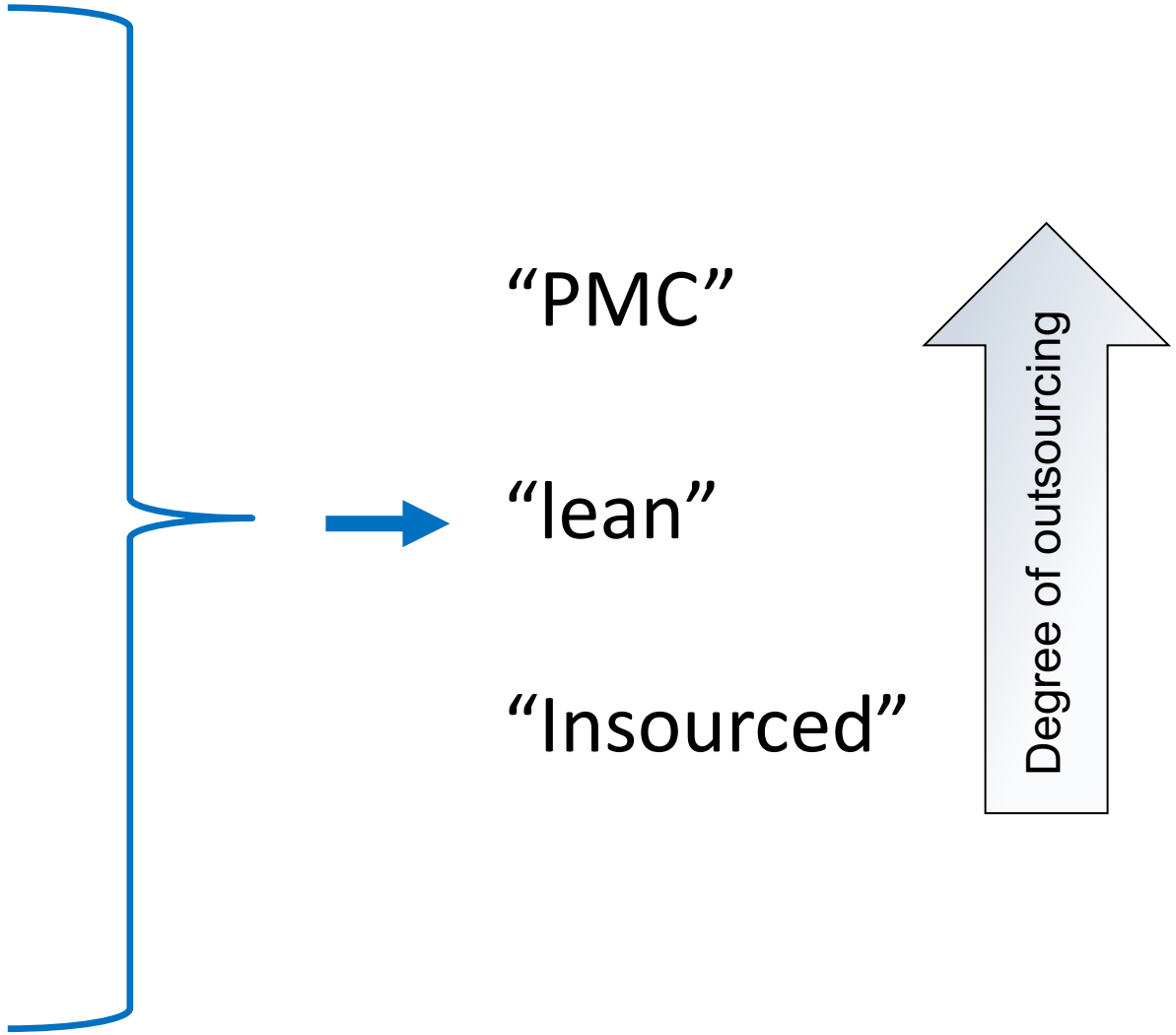
Desire to use project to **build experience for future** projects (ie invest to have more lean organization on next project)

Regulatory and **geopolitical** regime

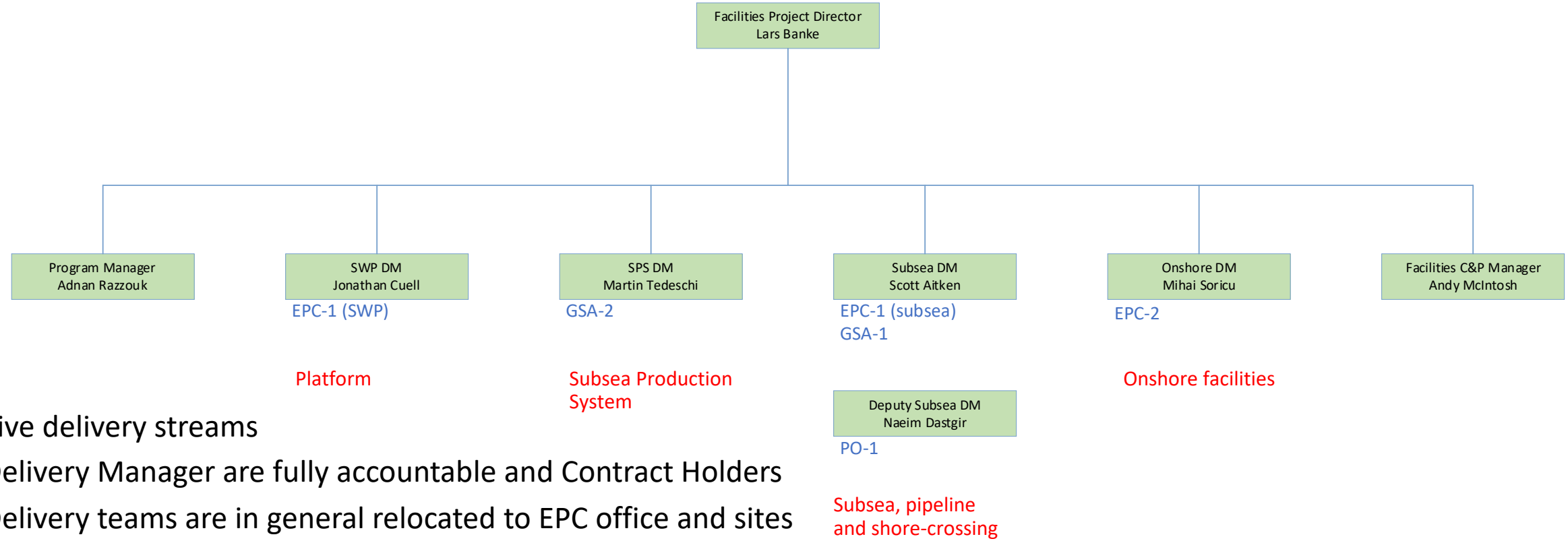
Geographical spread (all in one local location, spread around 4 continents)

Availability and **quality** of delivery team **personnel** (e.g. decision making at the work front, contract delivery experience)

Availability, quality and prior knowledge of **main contractors**



Neptun Deep “lean” facilities delivery principles



Five delivery streams

Delivery Manager are fully accountable and Contract Holders

Delivery teams are in general relocated to EPC office and sites

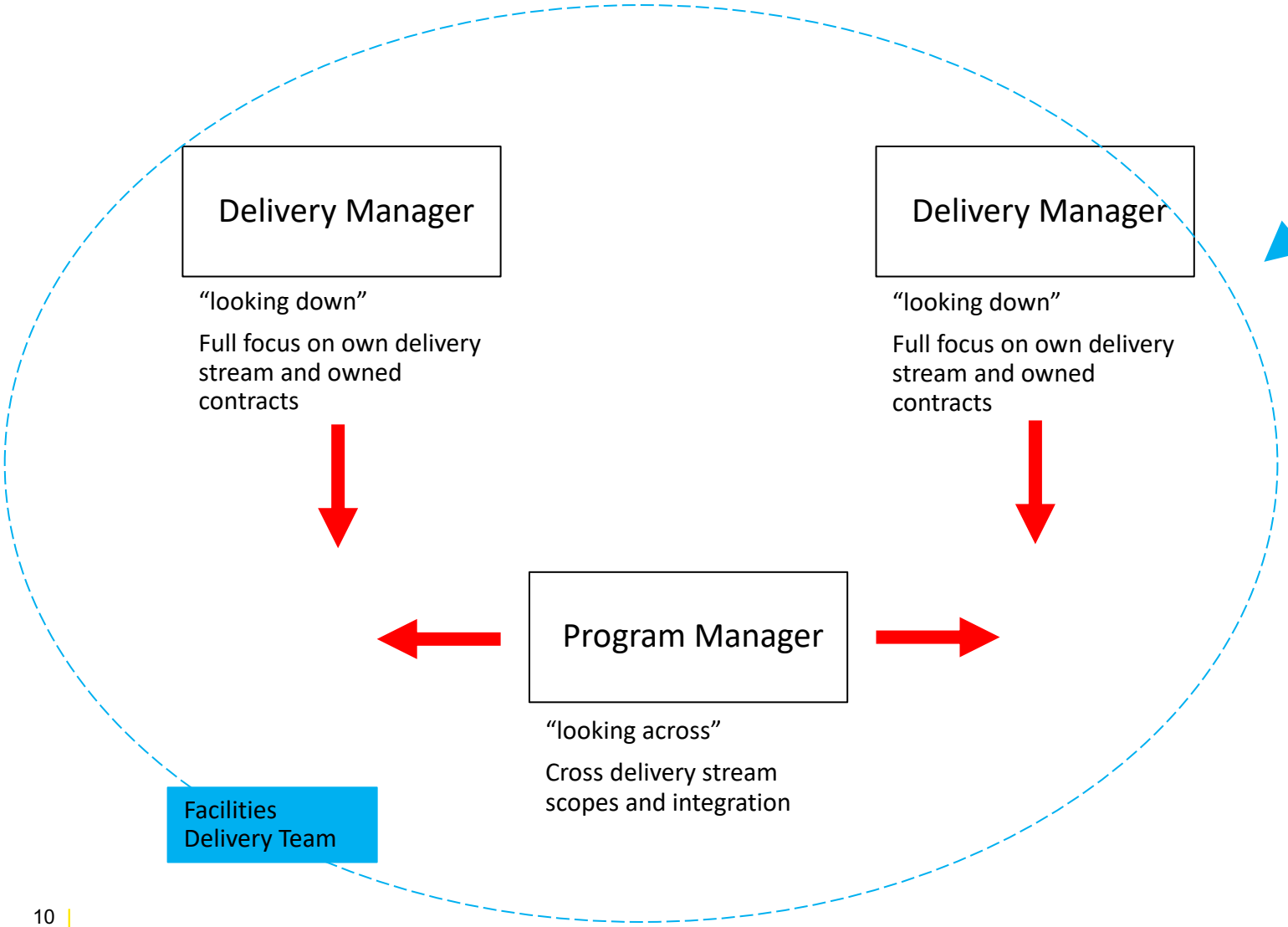
In general, one (1) engineer per discipline

People able to cover more disciplines and more scope

Overall team size at peak: app 60 named individuals

External service provision in lieu of in-house resources for less than full time positions and for subject matter experts

“Lean” organization requires authority and decision making brought to the work front

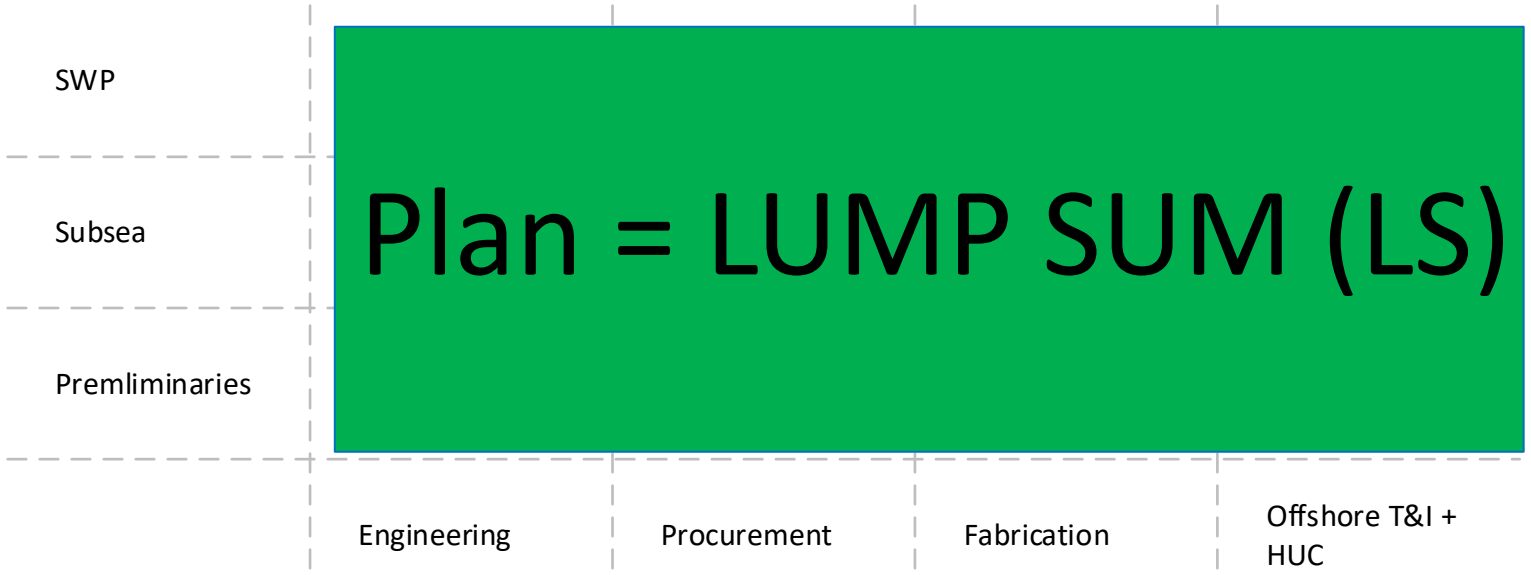


Delivery Managers focus is…**delivery**…**decisions**…**delivery….decisions**

Program Manager **integrates** across delivery streams

Engineering Manager **owns and controls technical frameworks** and reside outside Facilities Delivery

Commercial model and control – one to watch! Complexity may influence how “lean” it can be…



For Neptun Deep, plan was to have “fixed price lump sum all risk on EPC” type contract

Inadequate level of definition at time of tendering and market constraints forced a (relatively) sophisticated hybrid model to introduced

Alternative – no bid or bid including very high risk premium

Consequence – more Owner’s people to manage than with a fixed price lump sum

EPC contracts for a “lean” organization must have a simple and easily understood frameworks

Rely-upon information such as fluid characteristics, meteocean, seabed and soil conditions, flow assurance etc

Basis of Design

Which functionality must Contractor provided the facilities with

Functional Specification

Where shall Contractor buy main equipment packages

Approved Vendor List

Codes, standards, specifications, drawings etc that Contractor must deliver the Facilities in accordance with

Technical Information

How Contractor shall obtain independent verification that scope conforms with Contract

Independent Verification

How shall Contractor document the Facilities they have delivered

Information Management

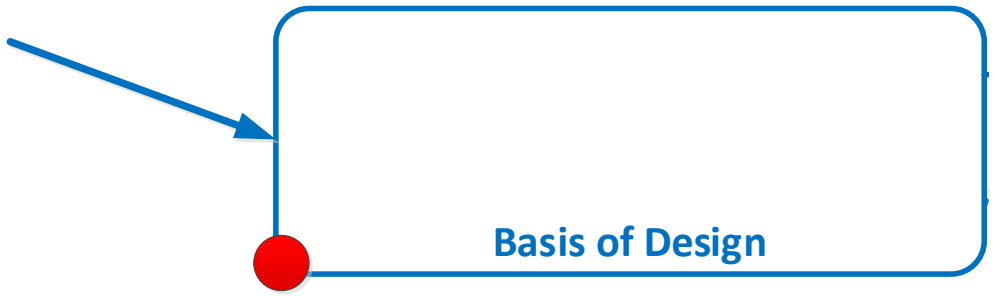
Note

Design Responsibility entirely sit with Contractor

To support outsourcing of Design Responsibility, Company does **not approve** Contractor's documentation, **only review & comment**

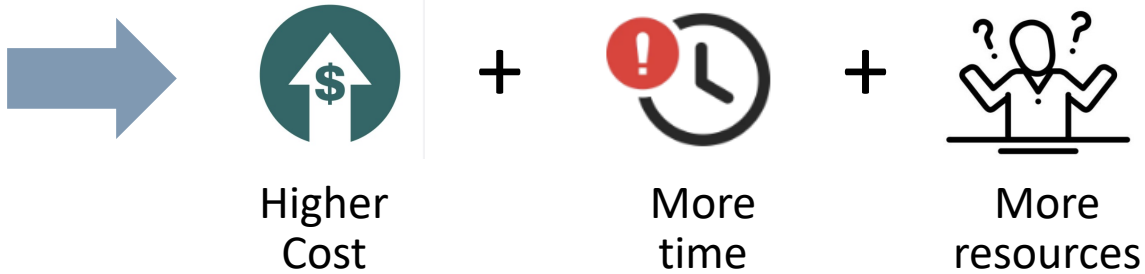
To be “lean”, provide Contractor freedom under control

Example of a Technical Facilities Framework – the Basis of Design

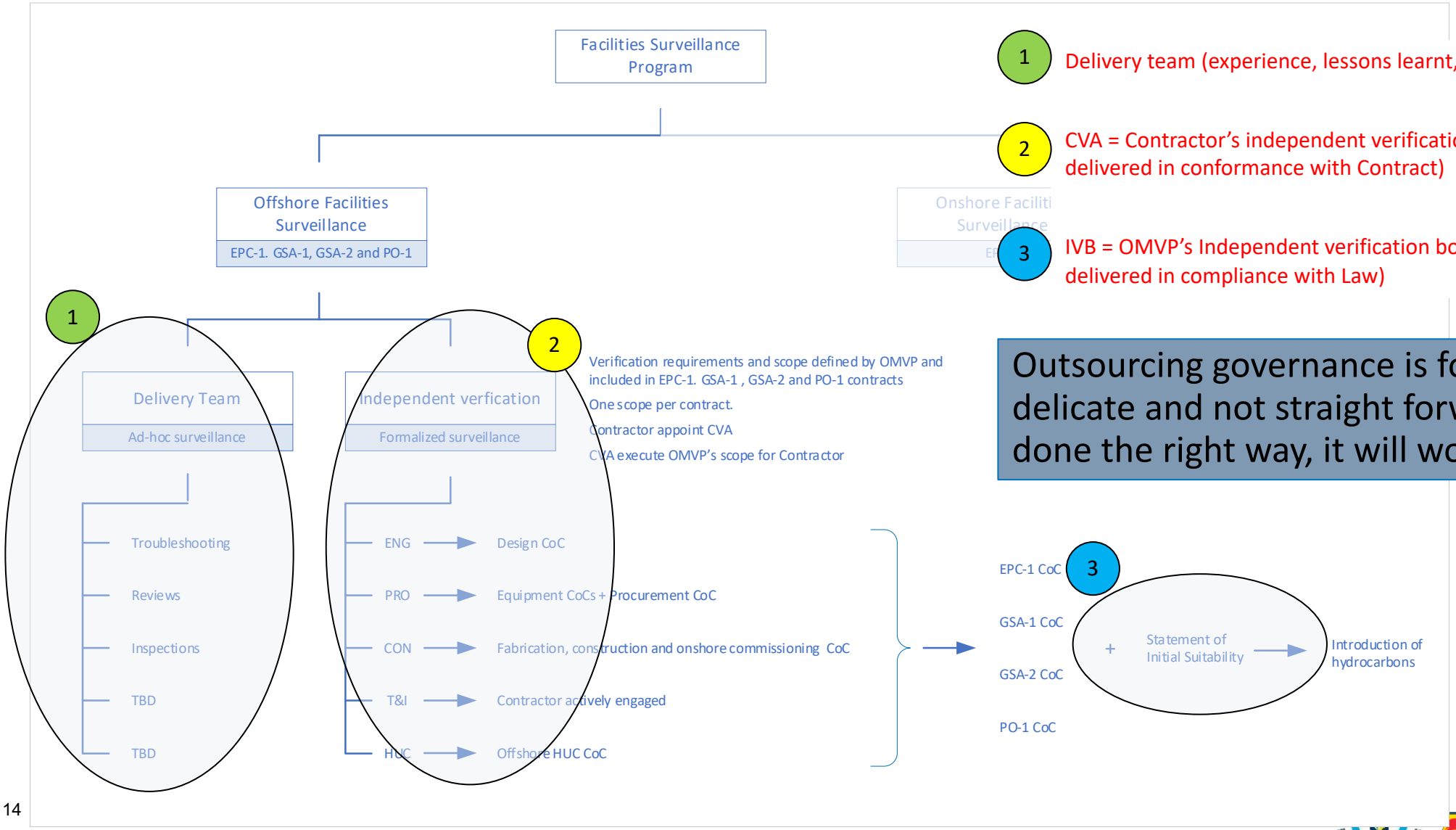


With a good and well-defined Contract, at least 95% of the delivery should take place within the frameworks of the Contract **by Contractor**

Change of frameworks after contract award



Three layers of contract governance incl. partly outsourced assurance to enable “lean” approach



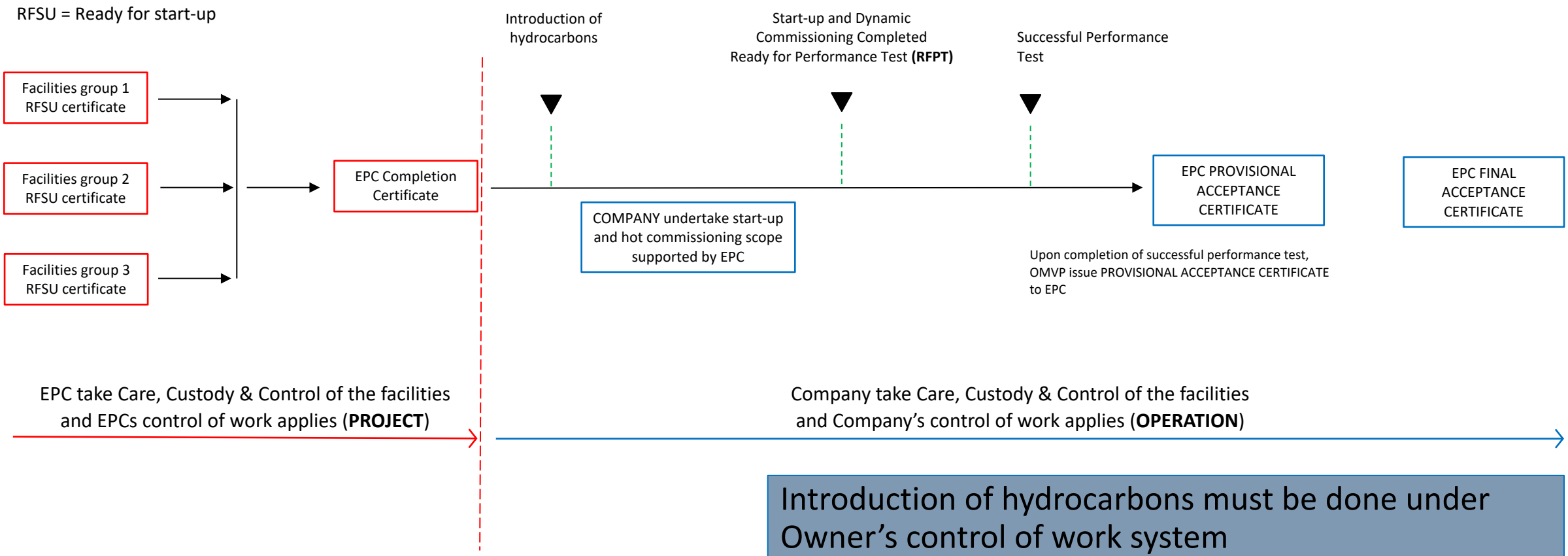
1 Delivery team (experience, lessons learnt, spot checks, guide Contractor)

2 CVA = Contractor’s independent verification agent (verify facilities are delivered in conformance with Contract)

3 IVB = OMVP’s Independent verification body (verify facilities are delivered in compliance with Law)

Outsourcing governance is for many Owners a delicate and not straight forward matter – but done the right way, it will work well

Completion & Start-Up…there is a time where Company must be in full control

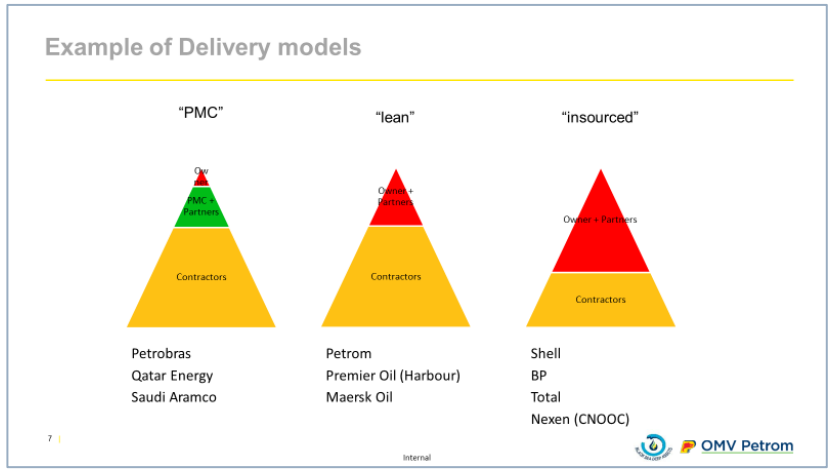


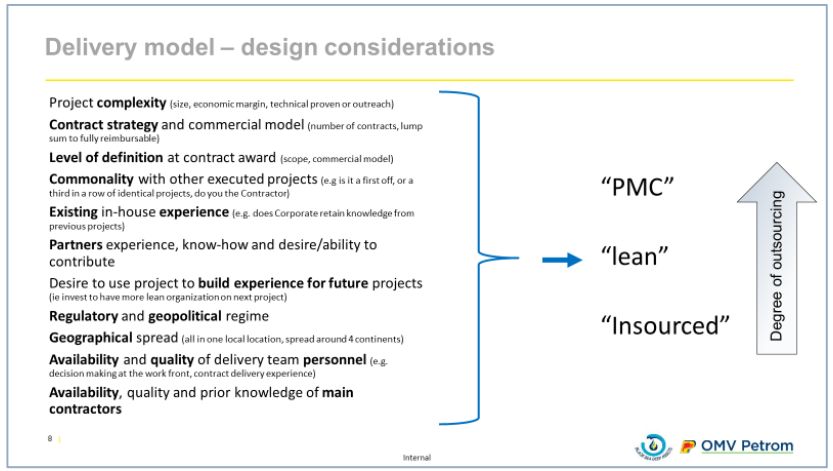
Change of "ownership" - EPC delivery complete

Introduction of hydrocarbons must be done under Owner's control of work system

This is done by the incoming Ops team, so no real up-manning, just transfer of responsibility

No one size fits all





The organizational model must be tailored to fit the project, carefully consider project scope and environment when doing so

Rarely two projects are identical so rarely two organization models are identical, but there are always lessons to be learnt from the previous project and there is always a view on the next project in the pipeline

The organizational model can be tailored to match the contract strategy and the Contractors available

Be prepared that external factors can create a scenario where the contract strategy must be tailored to the organization (people) or Contractors available

Highly likely the organizational model will have to adapt as project develops, but get it as right as possible from the outset

Your organizational model and its people is key to enable safe & efficient delivery….and it is really mostly about the people

OMV Petrom

Q&A