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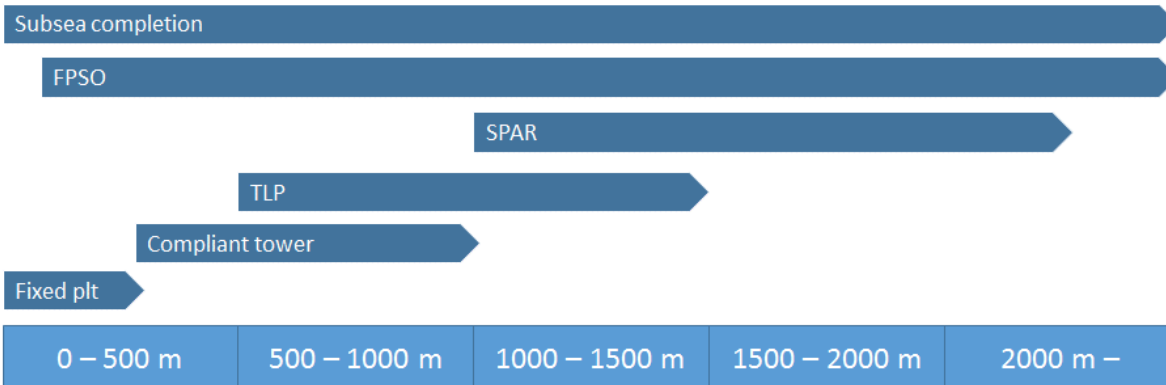
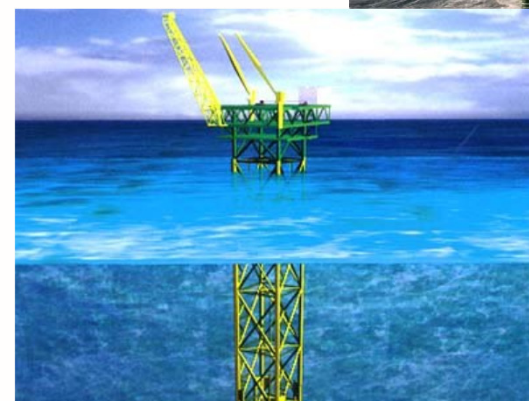
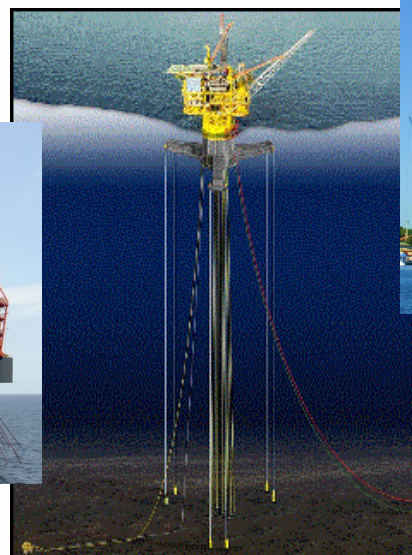
# Conventional offshore initiatives, new opportunities and success stories

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*MCEDD Conference, Milano, April 9-11th*

# Offshore structures typologies

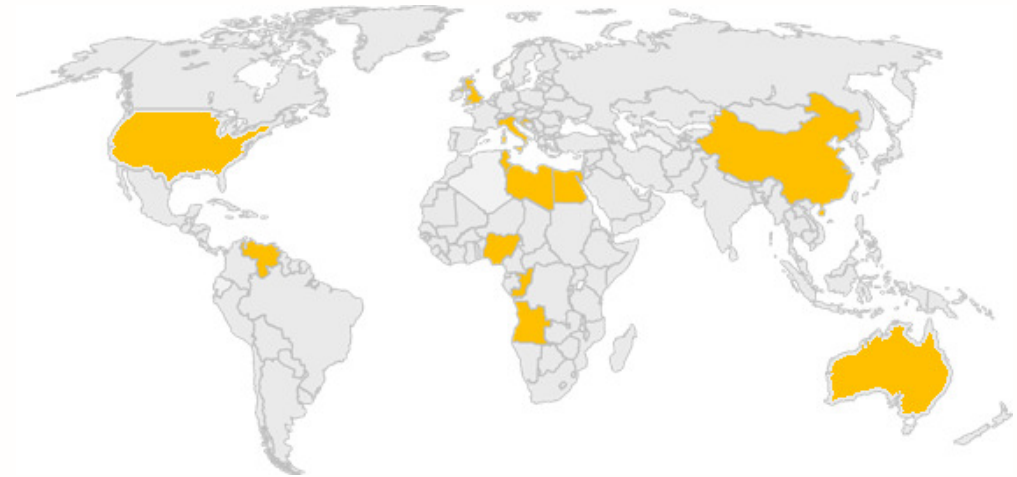


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## Fixed offshore structures operated by Eni



- 250+ fixed offshore structures operated worldwide
- Majority is located in the Mediterranean sea
- 85% are wellhead unmanned structures
- 60% are for gas development



■ Italy	106	■ Nigeria	4
■ Egypt	85	■ Libya	3
■ Congo	22	■ Venezuela	3
■ Croatia	18	■ Tunisia	2
■ UK	12	■ Angola	1
■ USA	3	■ Australia	1

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# Introduction



2014

2015

2016

2017

Fauzia (Italia)  
Elettra (Italia)  
AEP (Congo)  
SIM (\*\*)

Bonaccia NW (Italia)  
Clara NW (Italia)  
Litchenjili (Congo)  
SIM (\*\*)

WHP4 (Congo)  
SIM (\*\*)

WHP3 (Congo)  
Zohr (Egypt)  
SIM (\*\*)

2018

2019

2020

2021

Mitzon (Mexico)  
SIM (\*\*)

Amoca (Mexico)  
Baltim SW (Egypt)  
Riser pltf (Congo)  
WHP2 (Congo)  
SIM (\*\*)

Tecoalli (Mexico)  
Booster pltf (Congo)  
SIM (\*\*)

**SIM (\*\*)** : structural integrity management, with at least nr 6 platforms life extension, per year

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## Main challenges for fixed structures management



### Fast Track from idea to installation

- Zohr CCP Platform engineering, procurement, installation



### Structures Riqualfication and Lifetime Extension

- Bouri DP4 requalification



### Pre-owned Structures Management

- Nenè Congo AEP, WHP3 and WHP4



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## Zohr CCP – Record time to installation

### Design and Follow-up

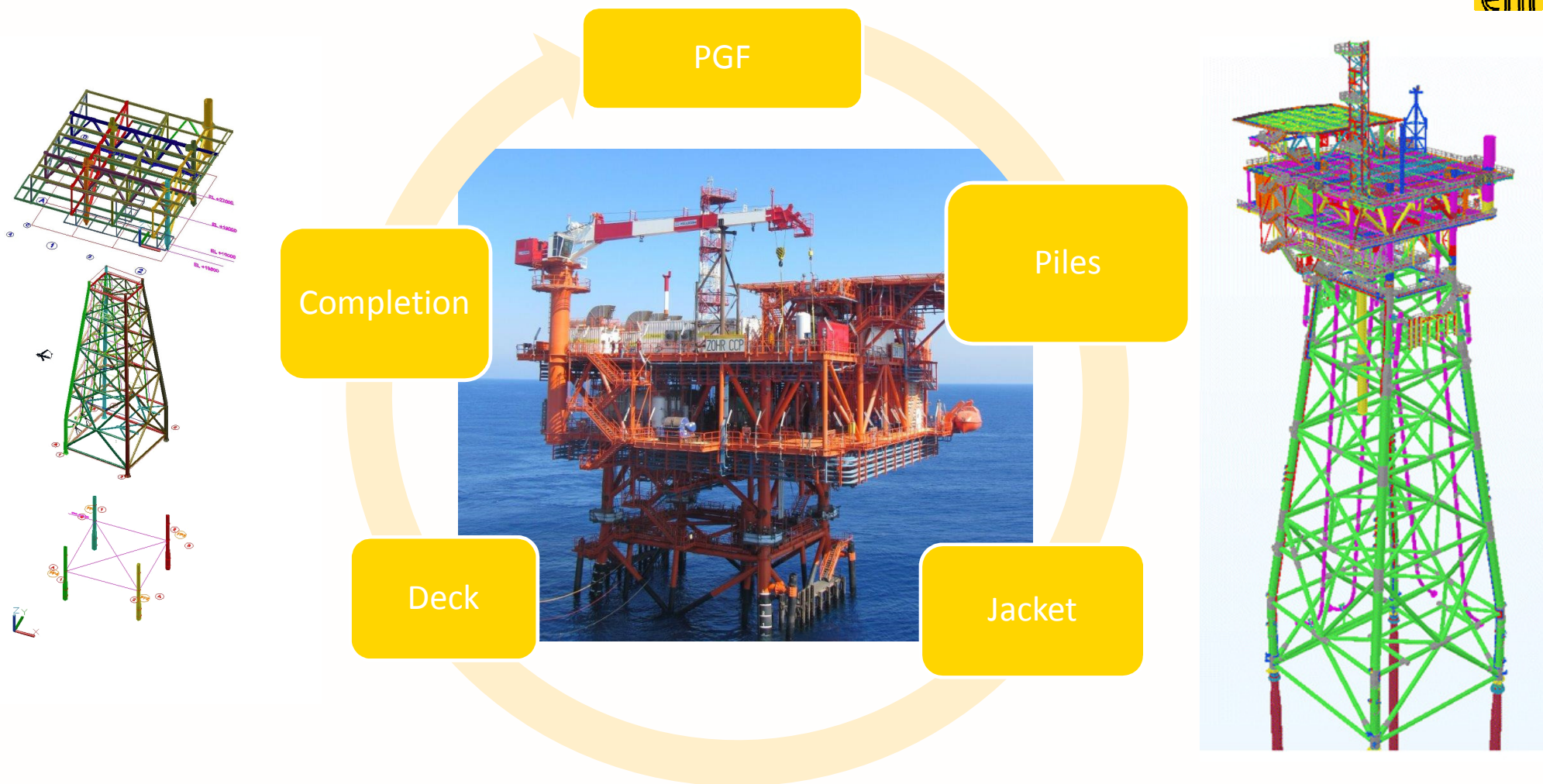
- Activities start: Nov 2015
- Order for steel materials: 03/2016
- End of FEED: 05/2016
- Final Platform Position and Geotechnical Data: 10/2016
- Detail design of all structures
- Follow-up:
  - Supply of steel material;
  - Supply of ancillaries (packers, grippers, anodes, etc.)
  - Fabrication in yard
  - Installation.
- Offshore installation: 06/2017

20 months from idea to installation



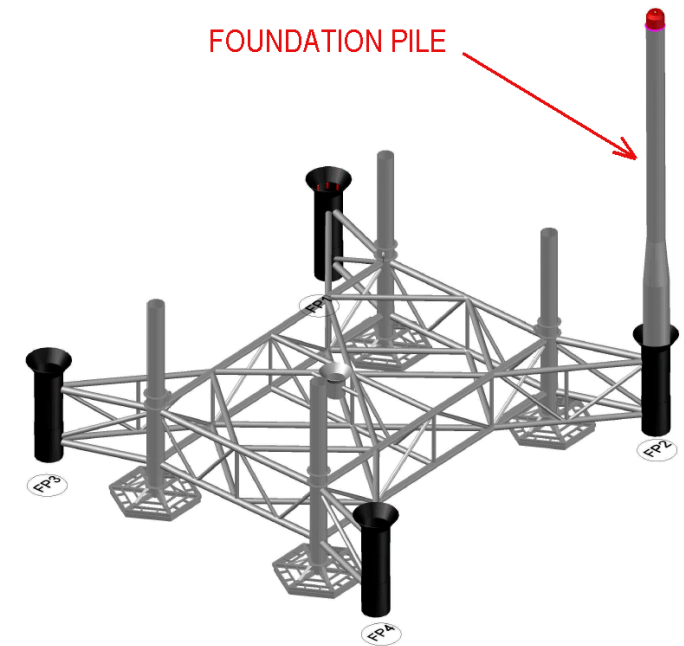
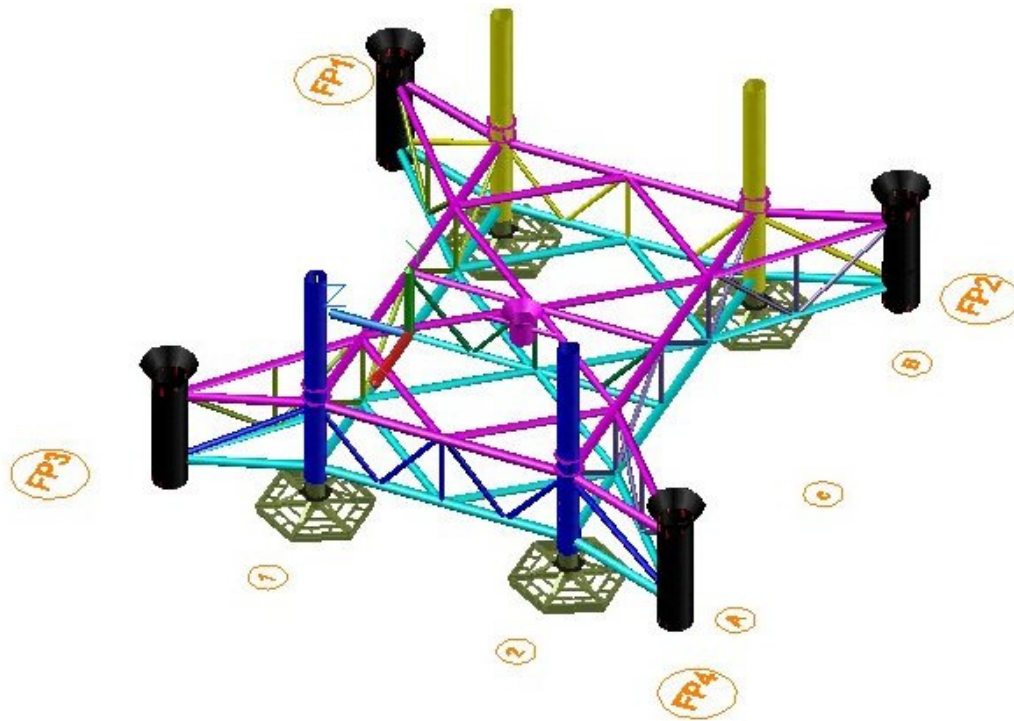
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# Offshore Fast Track from idea to installation – Zohr Central Control Platform



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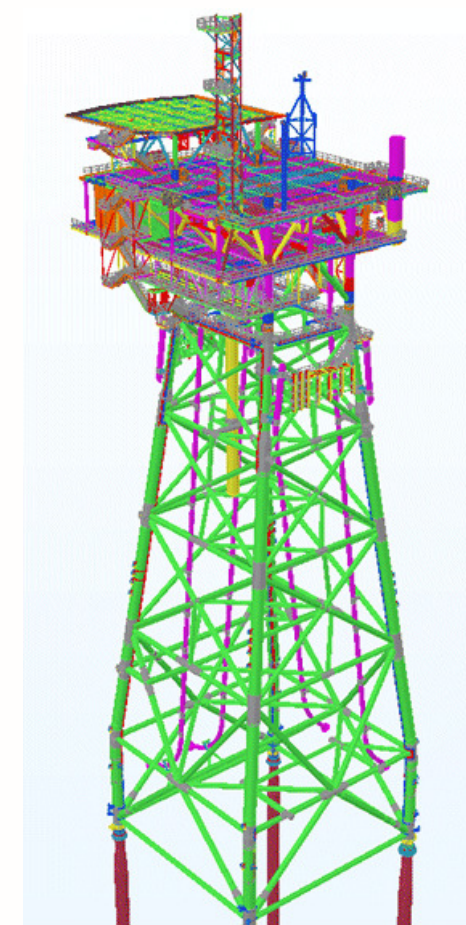
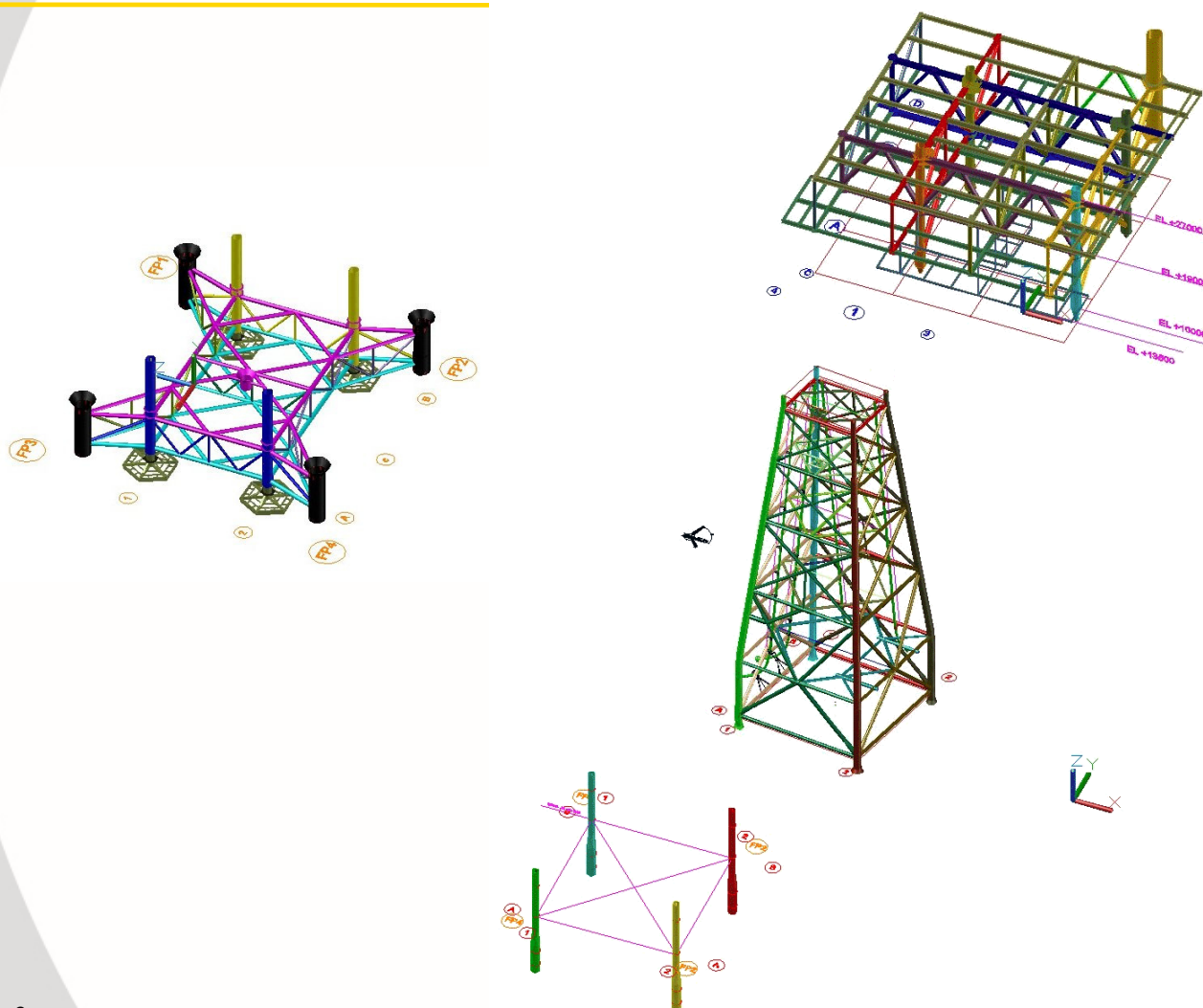
## Offshore Fast Track from idea to installation – Zohr Central Control Platform



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## Offshore Fast Track from idea to installation – Zohr Central Control Platform



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## Fast Track from idea to installation – Zohr Central Control Platform



### DESIGN AND FOLLOW ON

**PROCUREMENT AND PREFABRICATION**

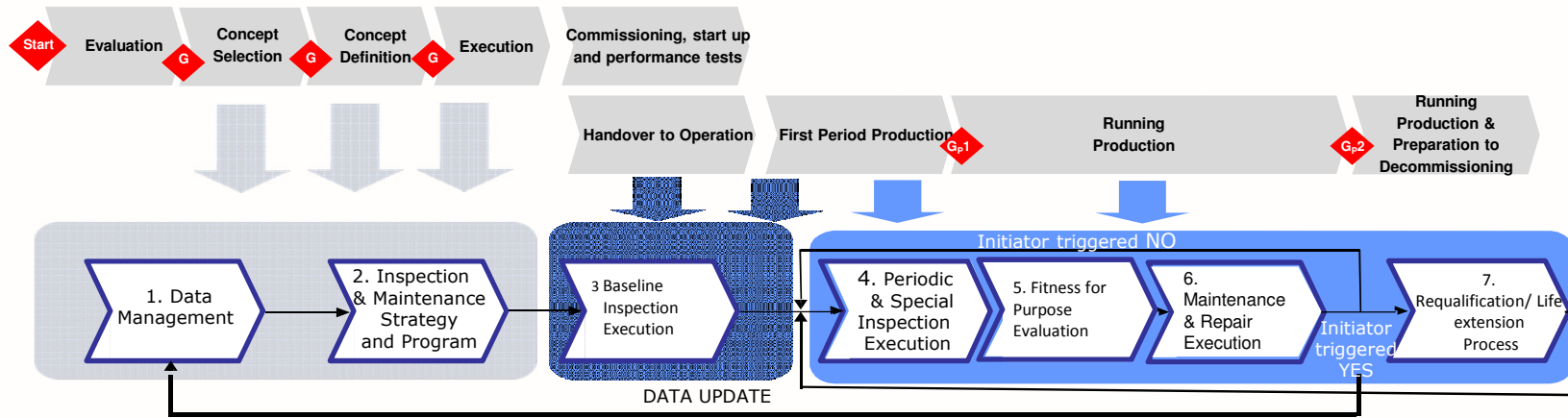
**CONSTRUCTION - YARD ASSISTANCE**

**INSTALLATION AND SITE ASSISTANCE**



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# Structures Requalification and Lifetime Extension



An existing offshore structure shall undergo an assessment to demonstrate its fitness for purpose in case of:

- **Damage or deterioration** of primary structural component (dropped objects, vessel impact, etc.)
- **Changes from the original design**, due to facilities modifications, addition of personnel, change of platform exposure level
- **Exceedance of Design Life**

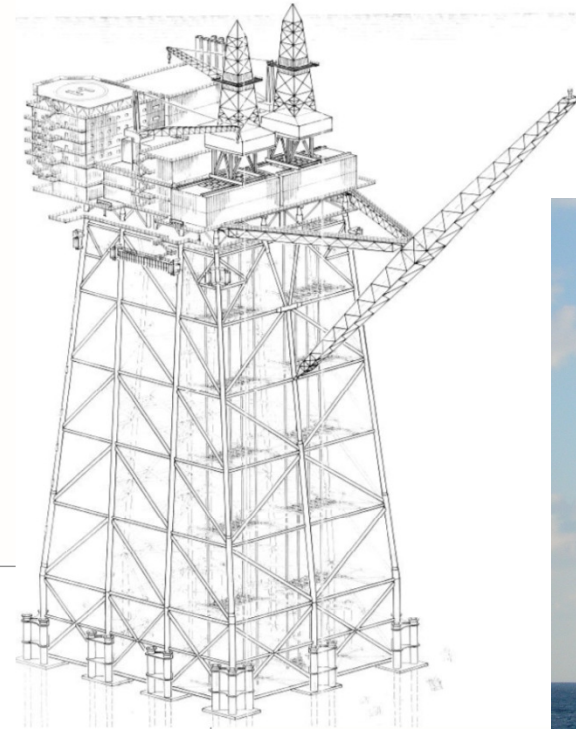
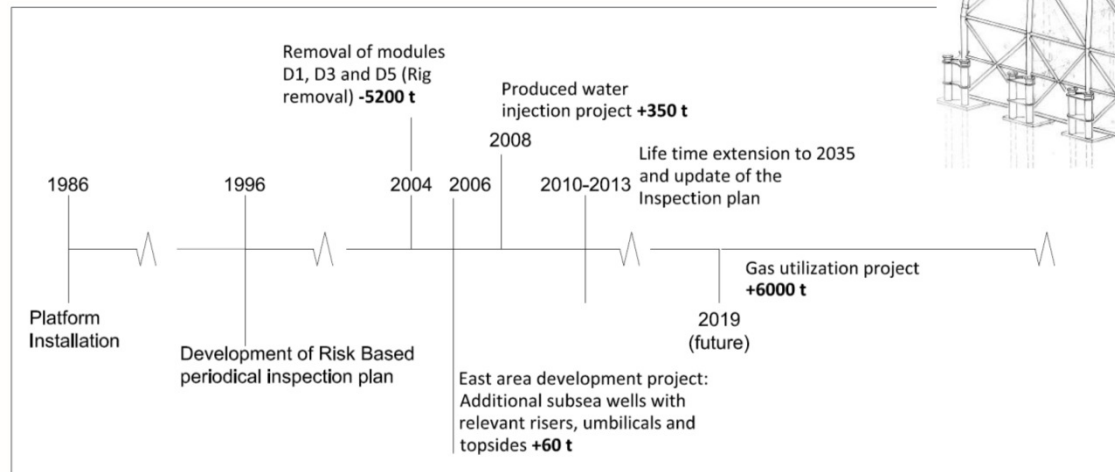
Requalification

Life time extension

# Structures Requalification and Lifetime Extension



## Bouri DP4 plt (Libya)





# Bouri DP4 - Updated design data

## Topsides Loads Updating

taking into account rig removal and additional modules installation

## Environmental Loads Updating

updated values relevant to Sabratha project

## Seismic Loads Updating

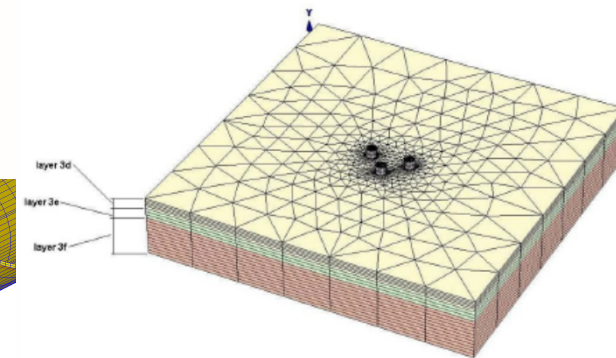
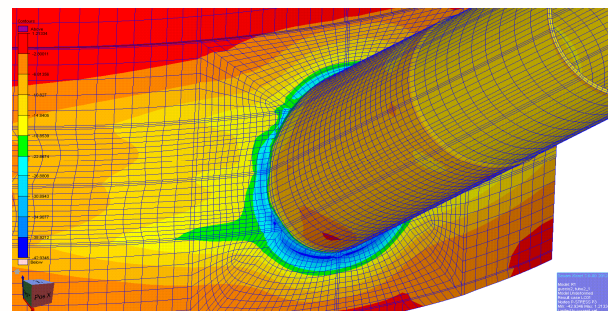
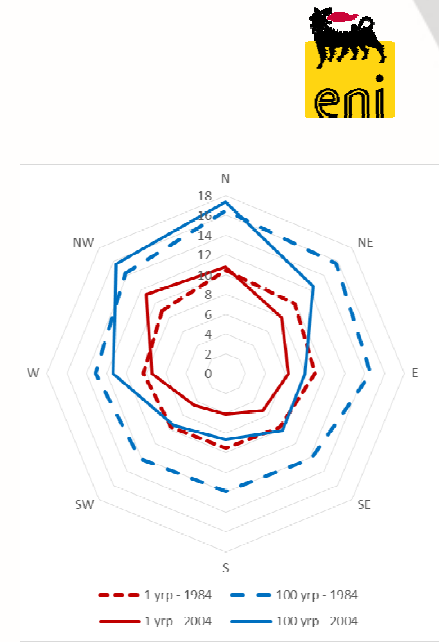
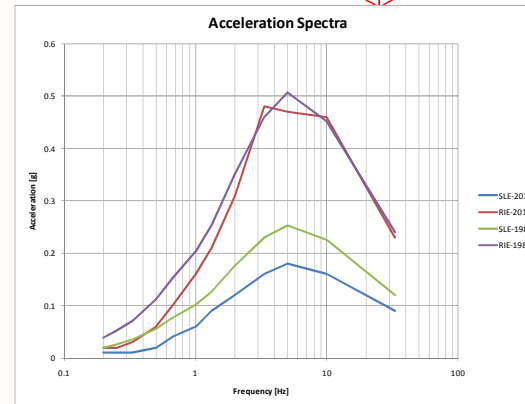
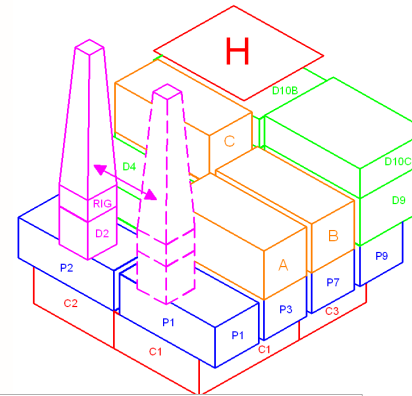
reduced accelerations

## Soil Parameters Re-evaluated

pile bearing capacity increase

## Joints Local FEA

SCF evaluation



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## Bouri DP4 - Structural Analyses

### In-Service Static Analysis

few members not compliant with APIRP2A

### Dynamic Analysis

model calibration thanks to natural periods measured by platform structural monitoring system

### Boat impact assessment

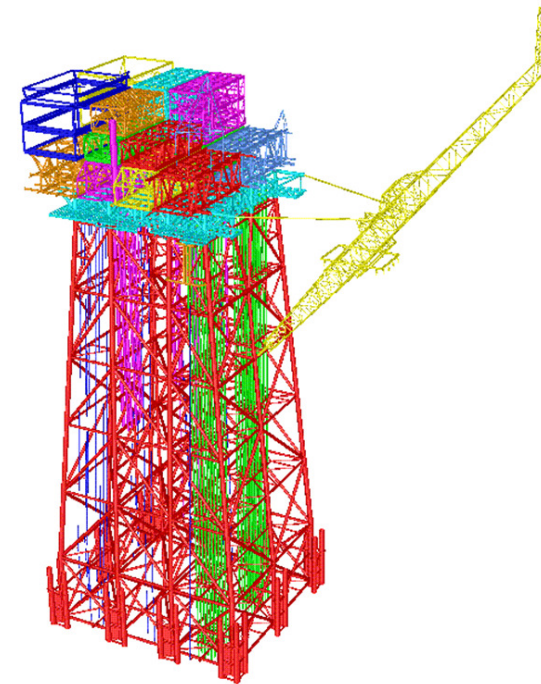
updated values relevant to Sabratha project

### Progressive Collapse Analysis

updated values relevant to Sabratha project

### Fatigue Analyses: three fatigue time periods

taking into account topsides history



### Inspection Plan

INSPECTION	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
GVI topside jacket	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPM topside jacket	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
GVI subsea jacket	•				•				•				•				•				•	
CVI + NDT critical nodes	•				•				•				•				•				•	
FMD	•				•				•				•				•				•	
CPM sample nodes	•				•				•				•				•				•	
CVI+CPM sample anodes	•				•				•				•				•				•	

Table 2-1 – Periodical inspection summary

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# Pre-owned Structures Management



«As it is»



Structures revamping in USA



Towing to Congo



Installation at field (Congo)



8 months project duration, from «pre owned» purchase to first oil

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## Pre-owned Structures Management



### Pre-owned structures use in offshore exploration

#### Pros

- Competitive Time-to-market and less than ever according to eni experience
- Steel material saving

#### Cons

- Restraints due to the available structures
- Overlapped engineering and construction phases



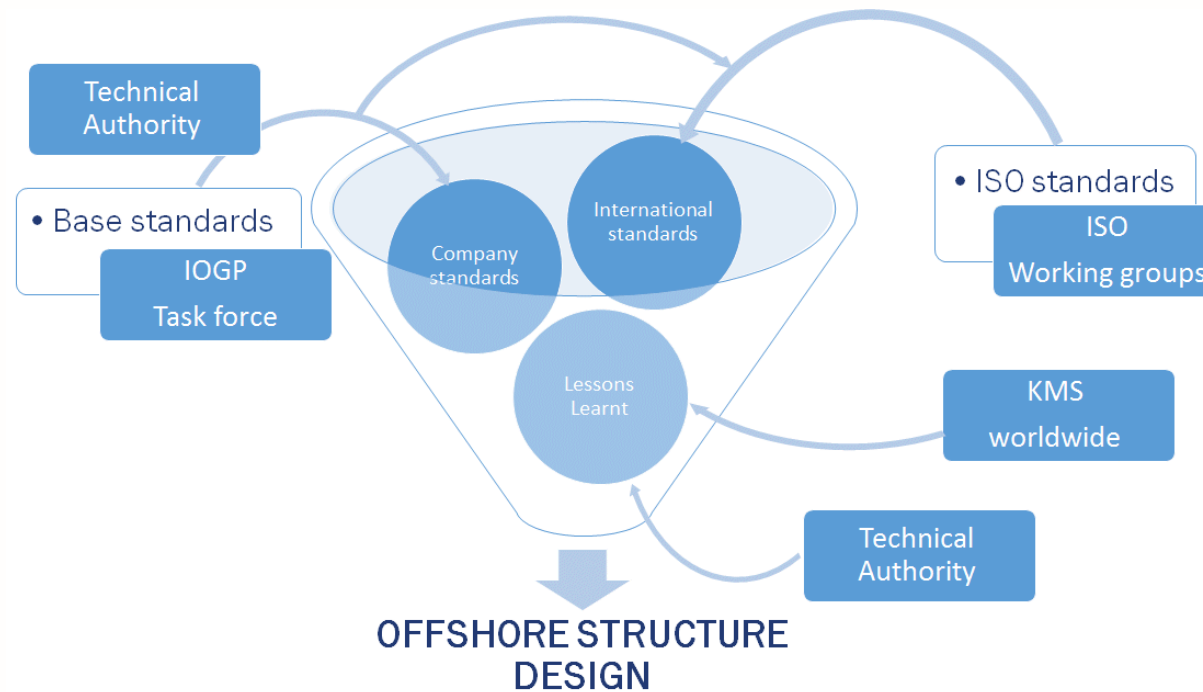


## Conclusions



By means  
of

- solid know-how and experience
- high flexibility during the project
- synergy between company and engineering
- ad hoc SOW



## Conclusions



The results  
of a  
success

- time schedule reduction and high performances (Fast Track from idea to installation)
- 10-15 yrs on average of life extension per plt, i.e. 50% of plt design life (Structures Riquification and Lifetime Extension)
- time schedule reduction and cost saving (Pre-owned Structures Management)



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**MCEDD**  
DEEPWATER DEVELOPMENT

MILAN MARRIOTT HOTEL • MILAN, ITALY • 9-11 APRIL 2018

# Thank You

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