Rice Global E&C Forum
Engineering & Construction

RICE GLOBAL ENGINEERING & CONSTRUCTION FORUM

RICE

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amec

"Offshore, Brownfield Execution in West Africa"

Contents

1. Introduction: AMEC at a glance

Proud
100+ year
history

Market cap*
c. $6 billion (USD)
(£3.6 billion)

Revenue:
$6.2 billion (USD)

- £4 billion (GBP)
- $6.6 billion (AUS)
- $6.4 billion (CAD)

Employees:
27,000

Americas	13,000
Europe	9,800
Growth Regions	3,700

Operating in over
40 countries
and serving four markets:

- Oil & Gas
- Mining
- Clean Energy
- Environment & Infrastructure

* As at 24 April 2014

2. Definitions

Greenfield: a new development with no existing production infrastructure other than completed wells.

Brownfield: modifications to an existing facility. Typically, facility is in active production operation.

FPSO: floating production, storage, and offloading vessel

Focus on Angola

3. Local Understanding, Local Office, Local Content

Angola and Oil

1955-90s:	Oil discovered; produced at modest levels.
1961-74:	War of Independence
1975:	End of nearly 500 years of Portuguese influence
1975-2002:	Civil War
2002-present:	Relative political stability; Discovery, development of numerous offshore fields
2003-present:	Steadily expanding local content requirements
2007:	Joins OPEC

Establishing a Local Company

2002: Houston-based Paragon Engineering Services – now AMEC Oil & Gas Americas – recognizes Angola's tremendous growth potential.

2003: Major Angolan project award

2004: Establishment of Paragon Angola in partnership with major local company

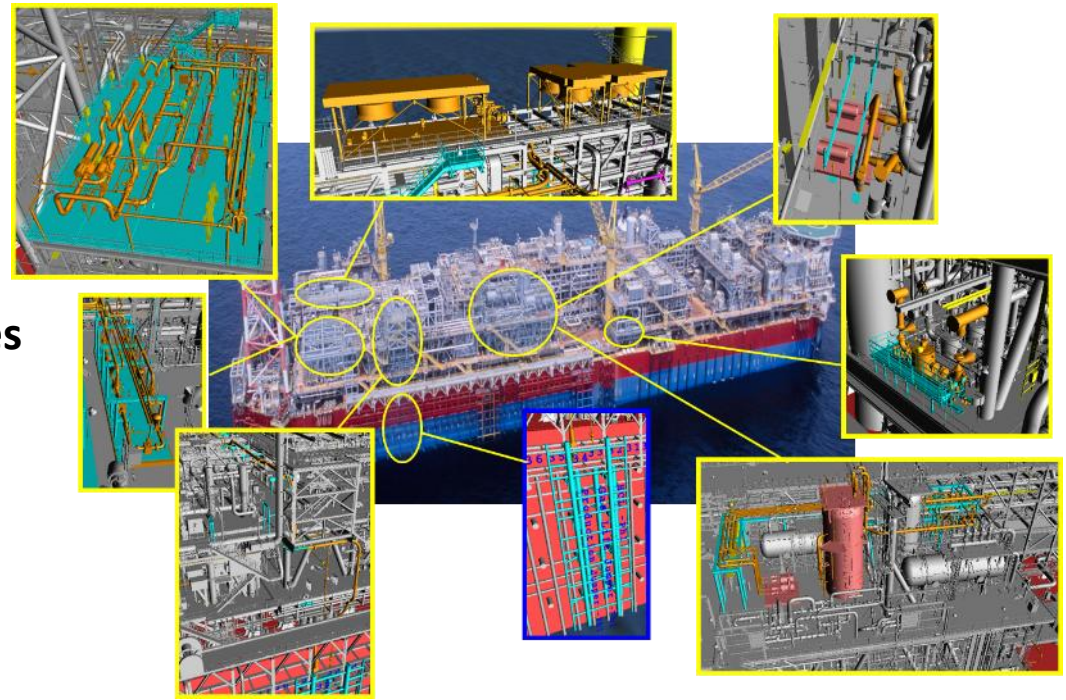
Addressing Challenges – Achieving Sustainability

- Improving and maintaining essential communications, electrical, and utility systems
- Managing extremely high cost of living
- Dealing with in-country travel/logistical challenges
- Establishing reliable security
- Expediting complex Visa process
- Attracting and retaining Expats
- Attracting, training, and retaining Nationals
- Demonstrating commitment to local community, professional development, and infrastructure
- Establishing and continually promoting culture of safety – in office and at project sites
- Understanding cultural differences and taking them into account in work with partner and local personnel

4. Example Project

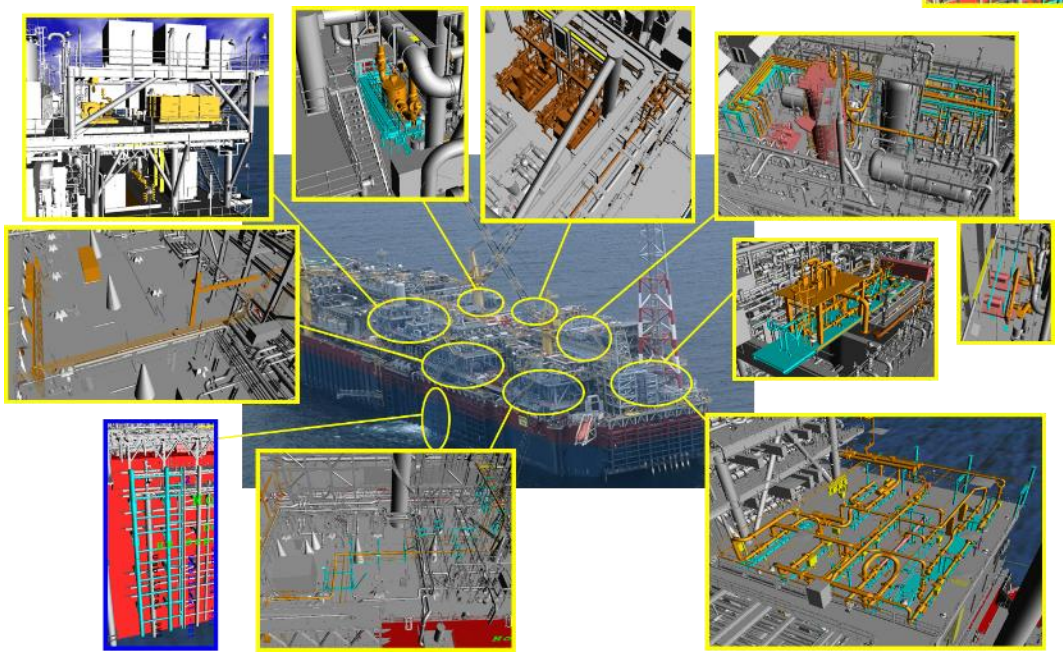
Modifications to Two FPSOs Offshore Angola

Project Description



Modifications to 13 topsides modules

Development of new fields with subsea tiebacks to the two FPSOs.



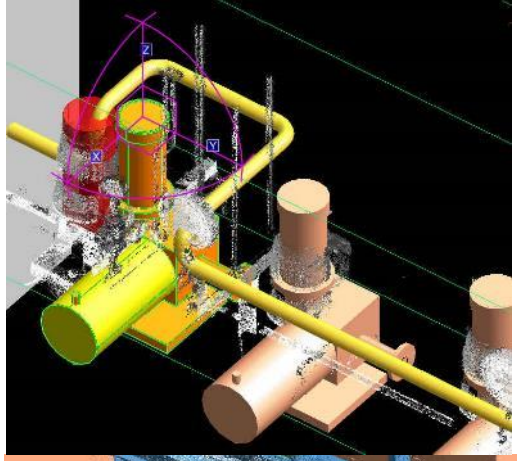
- Nearly 1 million AMEC man-hours
- Added more than 2,000 mT topsides weight
- More than 800 Purchase Orders
- More than 7,000 mt shipped

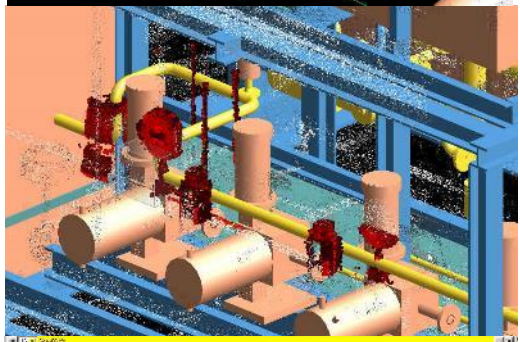
Design

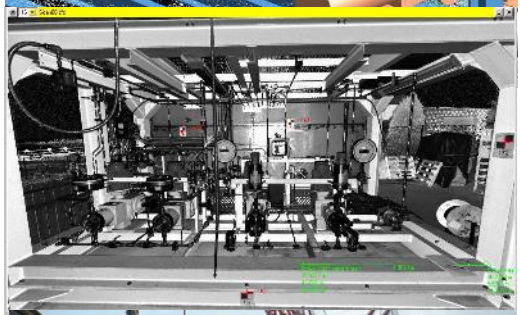
- Reduced size and rating of key piping component
- Relocated riser to reduce structural requirements
- Eliminated need for major equipment items

Results:

- Lower cost
- Reduced weight
- Reduced offshore installation scope and risk
- Reduced likelihood of need for shutdowns





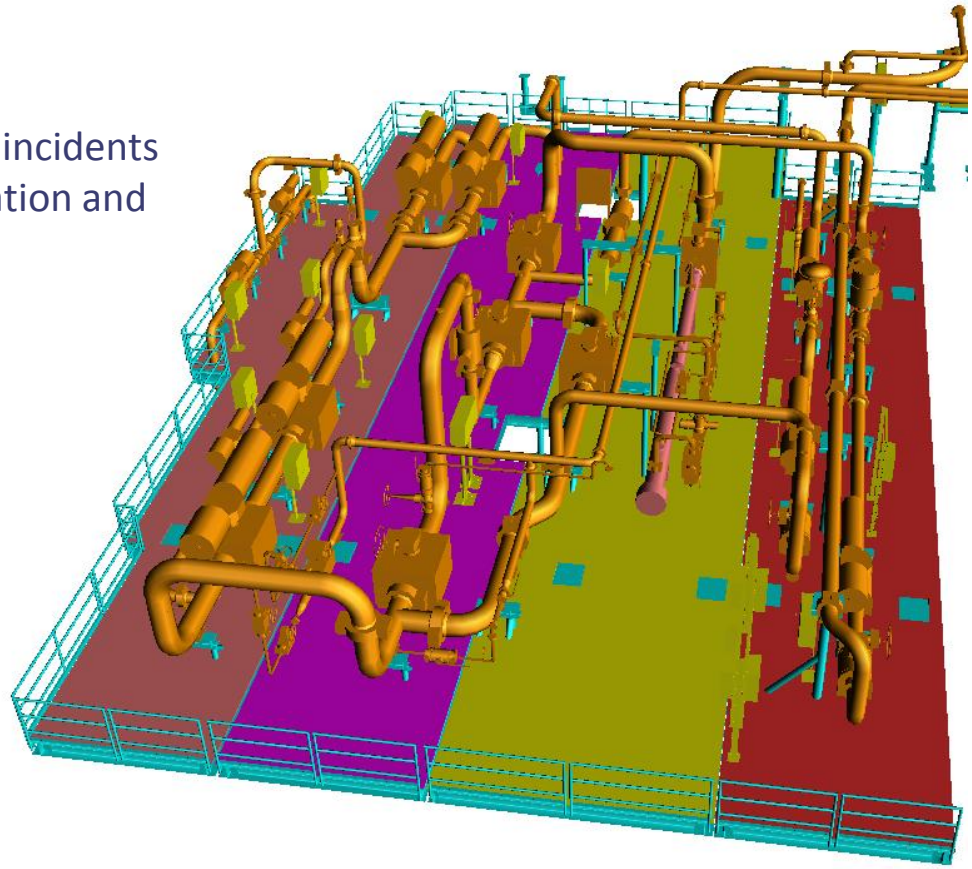


Fabrication

- Capitalized on opportunities to build full assemblies onshore
- Performed significant portions of required E&I testing, hydrotesting and painting onshore

Result:

Reduced potential for offshore safety incidents through reductions in offshore fabrication and testing scopes

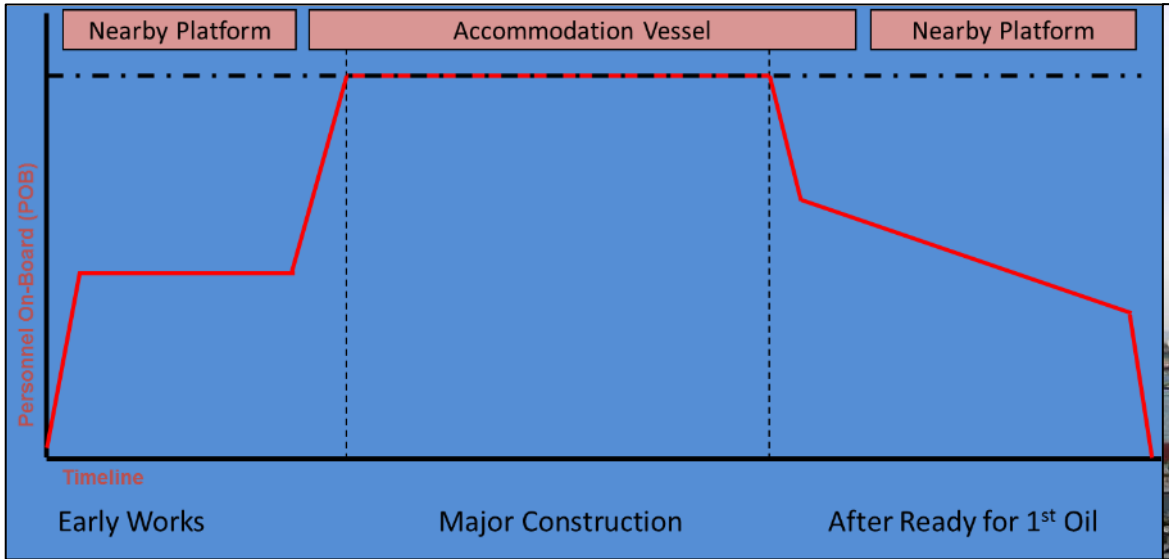


Offshore Execution

- Reduced peak offshore manhours
  - Carefully planned early works
  - Accommodation vessel savings & reduction in operating facility impact
- Optimized timing of material deliveries and fabrication

Result:

Ongoing production at planned rate without interruptions



Project Outcome

- Largest brownfield project executed by customer
- Delivery on time and within budget
- Minimal impact to ongoing operations
- Recognition from highest level of customer's management organization for health, safety, security, and environmental achievements

More than 5 million man-hours worked without a lost-time incident (including all contractors)

5. Offshore Brownfield Principles

Planning and Design

- Maximize early works
- Consolidate scope areas
- Laser scanning and point-cloud technologies
- Dimensional control
- Construction optimization during design
- Avoid offshore hot work
- Avoid shutdowns through careful planning of tie-ins
- Limited offshore lift capacities
- Closing spool / clear access around umbilical pull-in
- 3-plane closing spools
- Flanged / hubbed spools

Supply Chain Management

- Number of shipping hubs
- Freight forwarding
- Customs clearance and hand-over process
- Ongoing reporting of materials status
- Logistics for import and transfer of materials
- Inspection of materials entering the country

Construction Optimization

- Starts early in design
- Reduce number of work faces
- Reduce material, fabrication, and installation man-hours
- Minimize job cards
- Reduce tool and equipment hiring requirements
- Reduce number of work permits