Dynamic Positioning Committee
Marine Technology Society

Keynote Speaker

Dynamic Positioning in Offshore Drilling
Increased Importance – Enhancing Performance

Steven L. Newman
Chief Operating Officer
Transocean Inc.

October 9-10, 2007

Return to Session Directory

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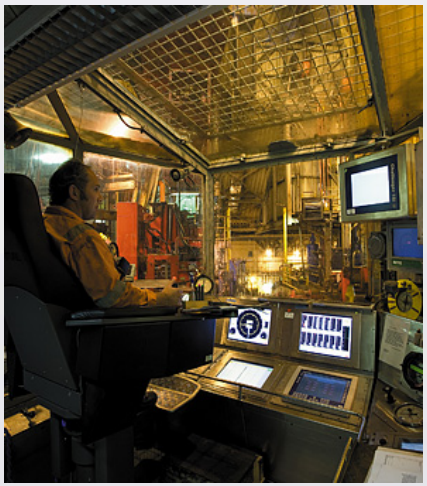
Your Next Generation Driller

Dynamic Positioning in Offshore Drilling:
Increasing Importance, Optimizing Performance

Steven L. Newman
EVP – COO
Transocean



October 9, 2007

2007 DP Conference
Houston, TX

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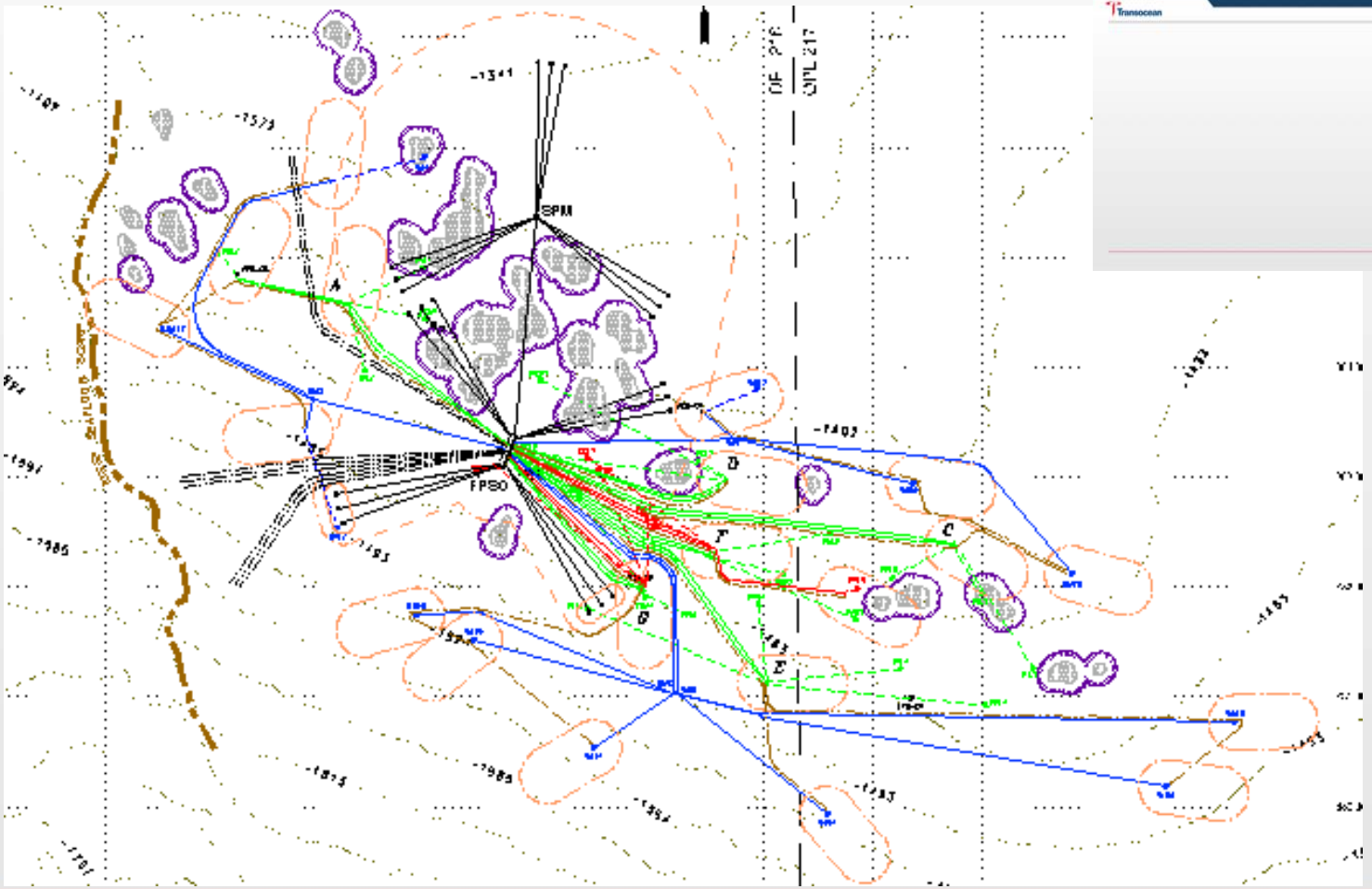
Discussion Topics

- Factors Driving DP Today
- Historical DP Performance
- Optimizing DP Performance

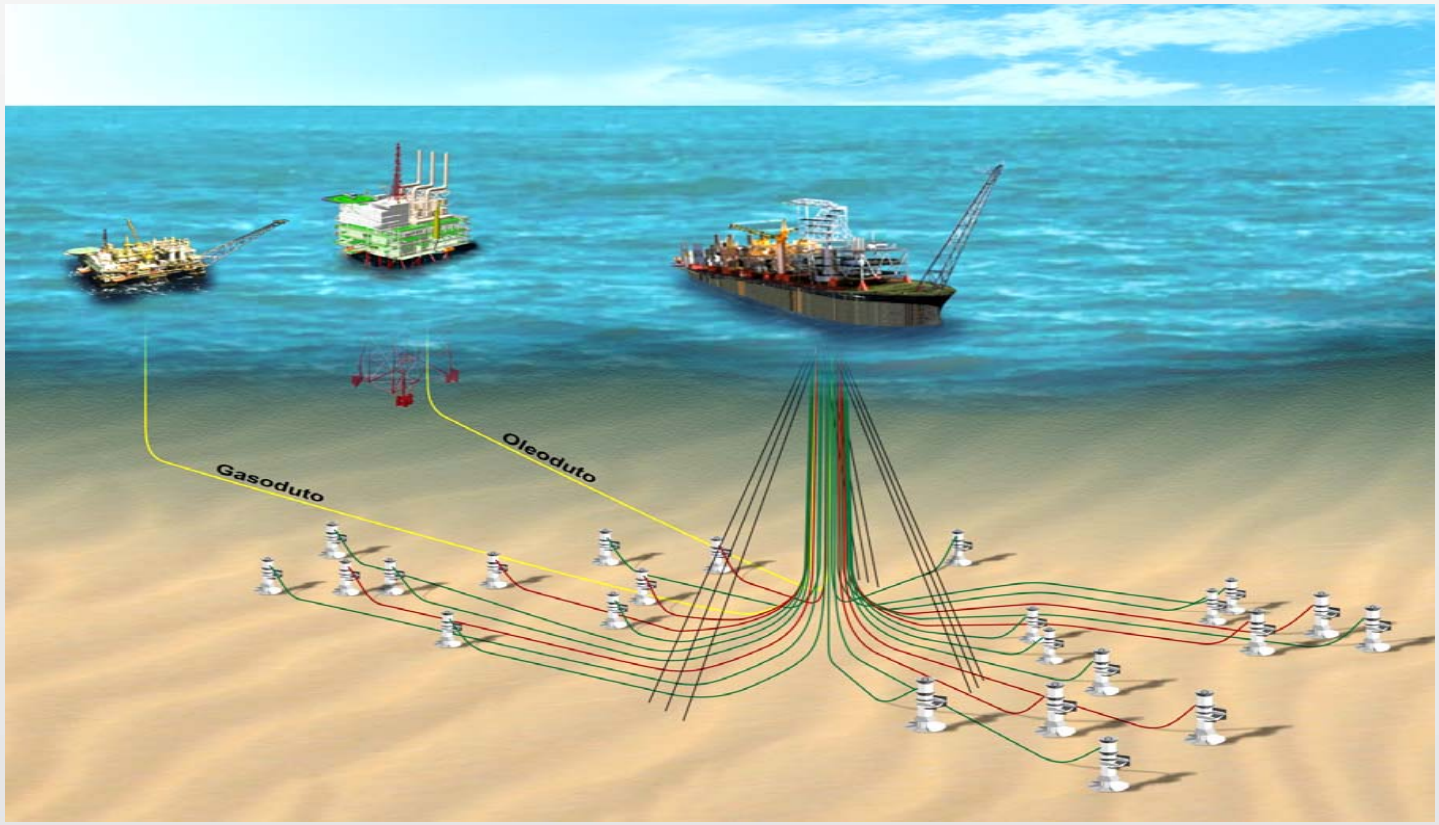
Factors Driving DP Today

- **More Complex Field Developments**

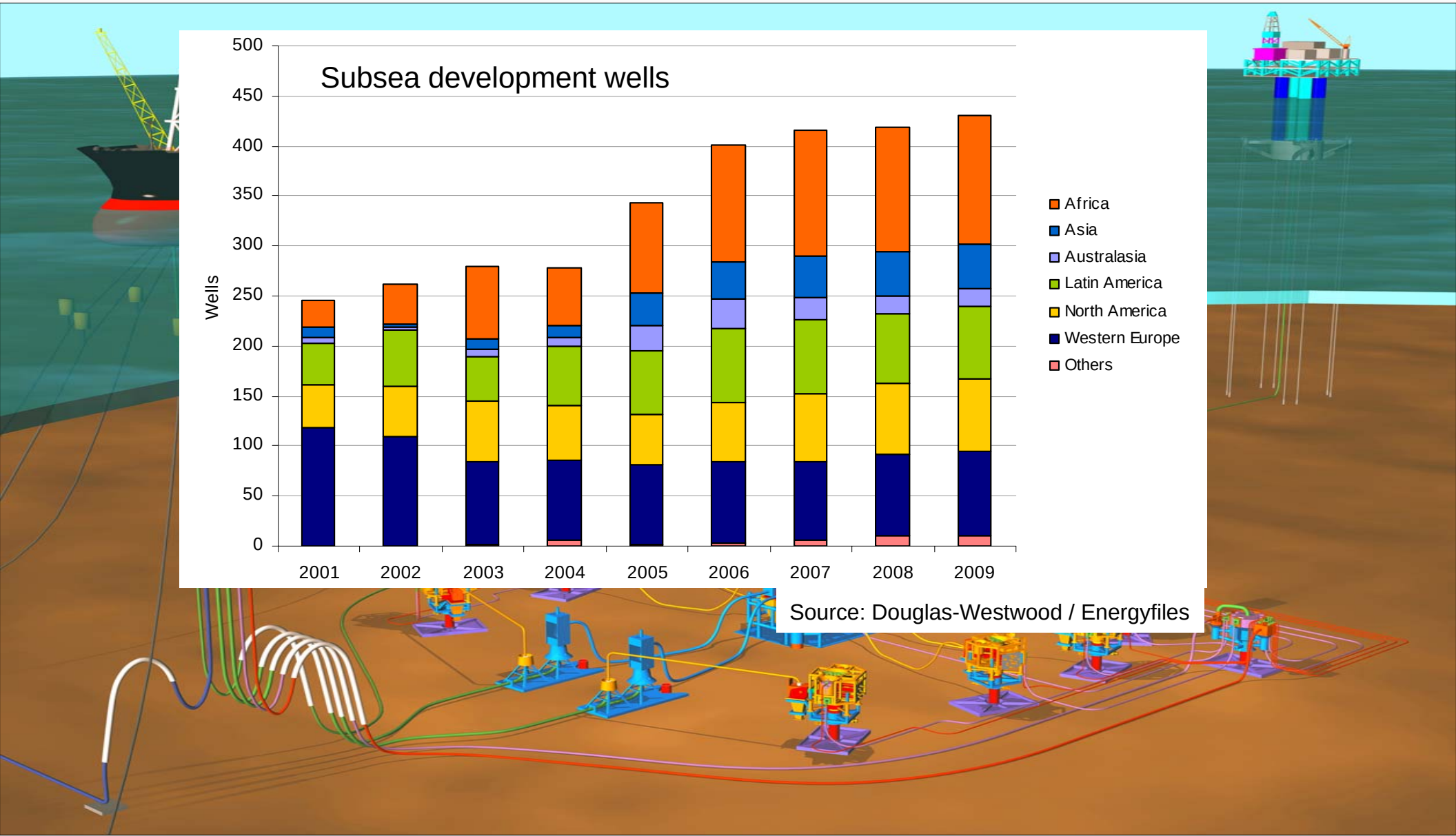


Factors Driving DP Today

- More Complex Field Developments
- **Increasing Subsea Architecture / Infrastructure**



Factors Driving DP Today



Source: Douglas-Westwood / Energyfiles

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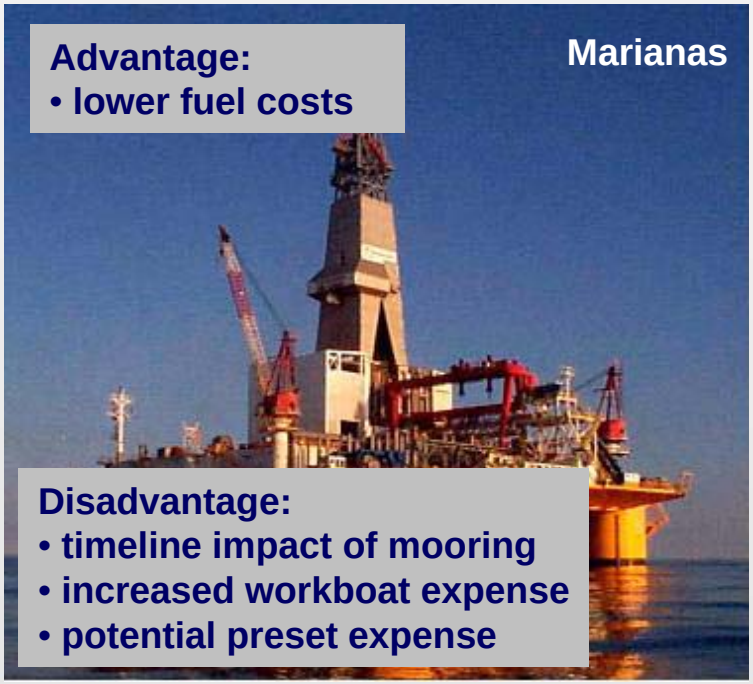
Factors Driving DP Today

- More Complex Field Developments
- Increasing Subsea Architecture / Infrastructure
- **Improved Economics**



Factors Driving DP Today

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Commercial Model - Version 1.0.0

Rig	Days	Dayrate	Fuel Cost per Day	Variable Spread Cost per day	Increase for Anchor Handling Vessels	Fixed Program Costs	Fixed Rig Costs Mob / Capex	Total Program Cost
4th Gen Moored	2401.0	$ 475,000	$ 10,000	$ 350,000	$ 50,000	$ 250,000,000		$ 2,374,885,000

x + =

Factors Driving DP Today

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Pathfinder	2068							
Discovery	2018							
Express	1595							
Spirit	1542							

Factors Driving DP Today

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Pathfinder	2068	$ 657,507	$ 20,000	$ 350,000		$ 250,000,000		$ 2,374,885,000
Discovery	2018	$ 682,966	$ 20,000	$ 350,000		$ 250,000,000		$ 2,374,885,000
Express	1595	$ 962,216	$ 20,000	$ 350,000		$ 250,000,000		$ 2,374,885,000
Spirit	1542	$ 1,008,006	$ 20,000	$ 350,000		$ 250,000,000		$ 2,374,885,000

Equivalent rig rate for the same program cost – not our bid rate!

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Factors Driving DP Today

- More Complex Field Developments
- Increasing Subsea Architecture / Infrastructure
- Improved Economics

Driving the Need

- **Industry Meeting the Need**
  - Vendors
    - DP Control Systems
    - Position Reference Systems
    - Power Systems
    - Thruster Systems
  - People
    - Maritime Academies
    - Industry Standards
    - Training and Development

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Historical DP Performance

- **Recent DP Events - 2003 through 2006**
  - 29,200 DP Operating Days
- **30 Red or Yellow DP events**
  - Power plant primary cause 14 of 30 (46%)
  - Human error primary cause 9 of 30 (30%)
  - Weather (4) … Thruster (2) … Position Ref (1)
- **Clear Improvement Trend over Last 10 Years**
  - 2006 Significantly Better Than 2003

99.9% Reliability

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Driving Towards 100% Reliability

- **Enhanced FMEA Emphasized Need for Improving Power and Propulsion Plant Robustness**
- **Elements Include:**
  - Eliminating Potential Faults
  - Improving Fault Detection
  - Improving Generator Performance
  - Improving Thruster Performance
- **Improved Casualty Response**
  - Improve Generator Availability
  - Improve Thruster Recovery Time (Autonomy)

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6th Generation Power and Propulsion Plant

- **Difference:**
  - Lower Fault Probability
  - Better Fault Tolerance
- **Reliability Improved In:**
  - Power Generation Plant
  - Power Distribution System
  - Propulsion Power and Control System

Advanced Generator Protection (AGP)

Improved Power Distribution

Advanced Thruster Control and Protection (ATCAP)

(It's not about the mathematics or the processors…
…and it's not about "DP-3")

Improvements in Practice

- **Traditional Transformer Closing**
  - Substantial Inrush Currents Peaking at 2000 amps
  - DC Circulating Currents for 20 Seconds
  - No Verification of Health before Closing

- **6th Generation Transformer Closing**
  - No Inrush Current or Mechanical Shock
  - Full Verification of Transformer Health before Closing

Improvements in Practice

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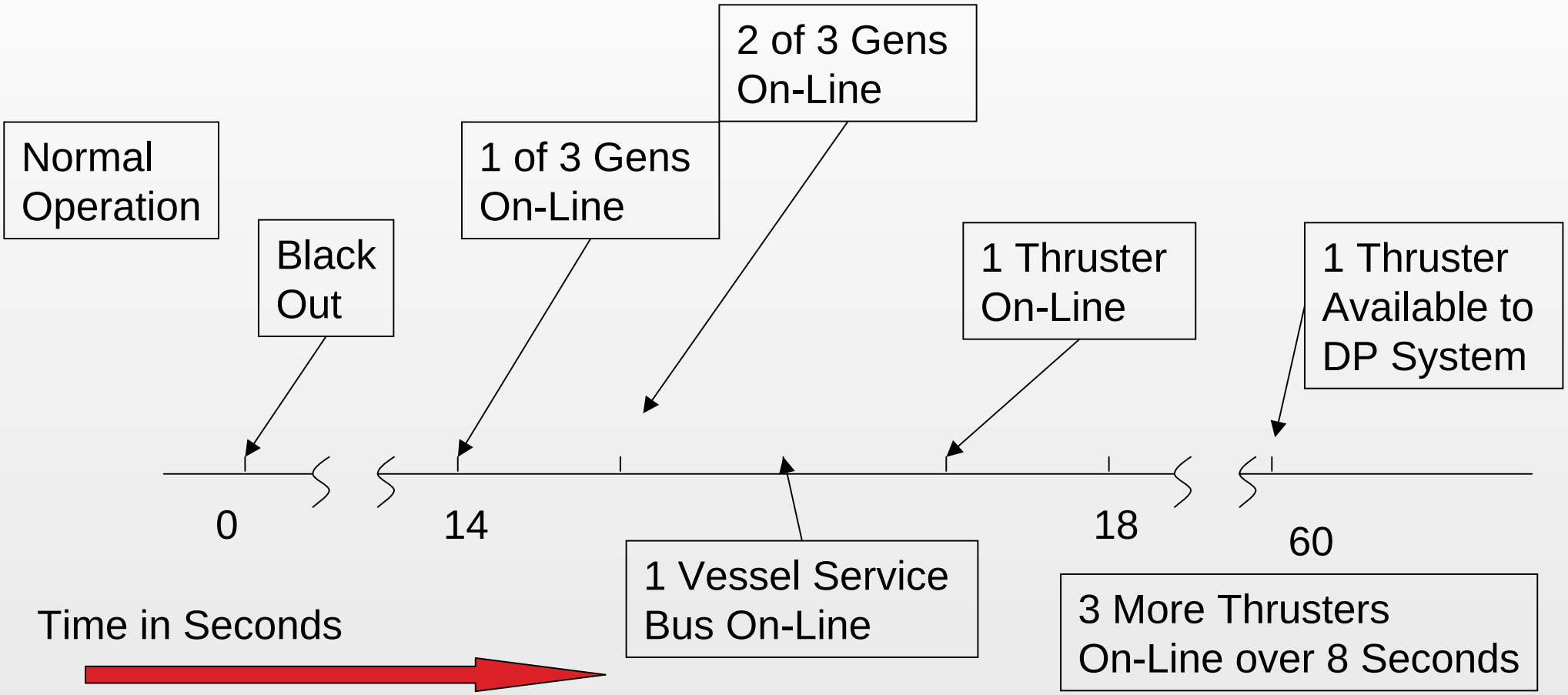
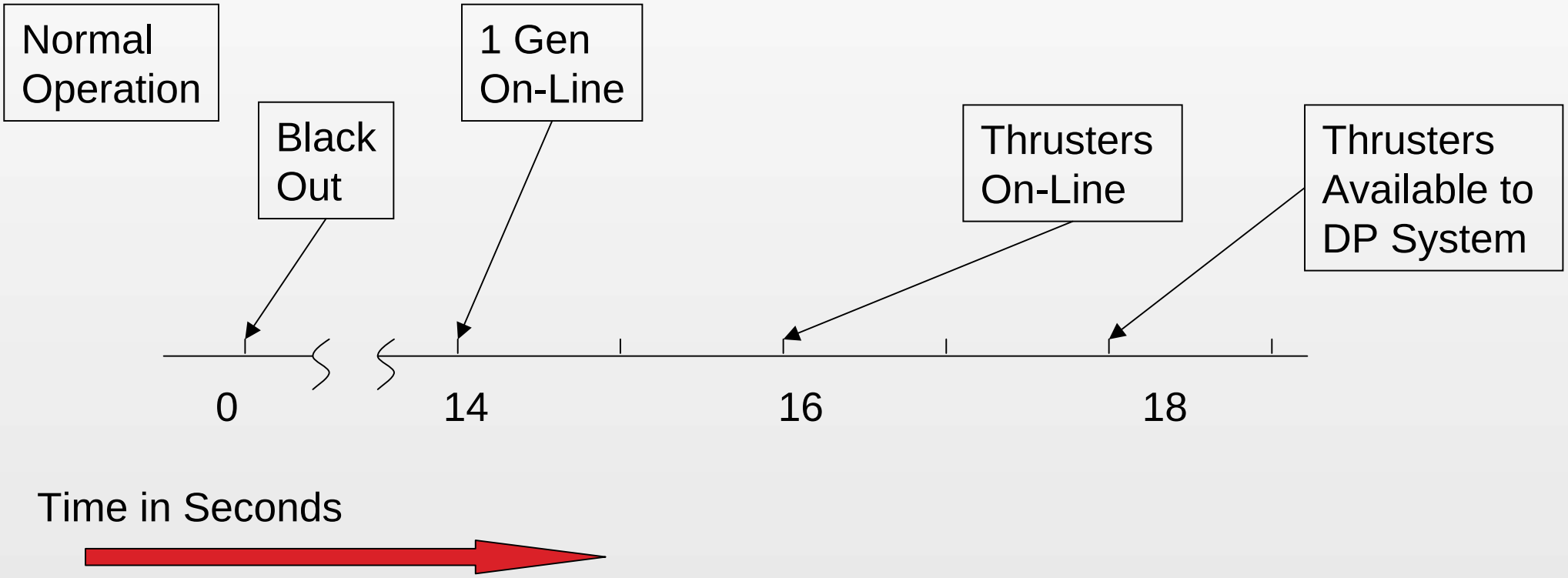
Recovery Time Line – Existing Power Plant



Recovery in 65 seconds with many dependencies.

Recovery Time Line – 6th Gen Power Plant

Probability of Recovery Much Higher



Recovery in 18 seconds with few dependencies.

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Summary

- **Industry is Driving Increasingly Towards DP**
  - ALL 66 Newbuild Floaters Under Construction are DP
- **Transocean is Committed to Safe and Reliable DP Operations**
  - Enhancing Robustness and Performance
  - Leveraging Operating Experience to Improve Training
- **Initiatives Currently Underway Delivering Results**
  - State-of-the-Art Technology Deployed Offshore

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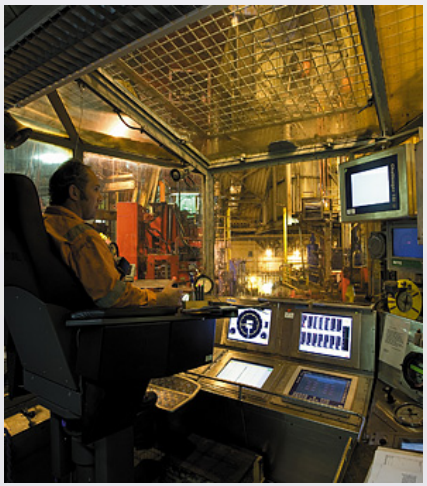

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