

# **3D/4D For Supply Chain Optimization A Real World Example**

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February 28, 2012

# EOS Corporate Overview

- 3D and 4D Software, Engineering and Services
- Focused Communities downstream from Engineering
  - Operations, Safety, Supply Chain
  - Maintenance, Repair and Overhaul (MRO)

- Business Partners



- Dassault Systèmes



- Siemens PLM



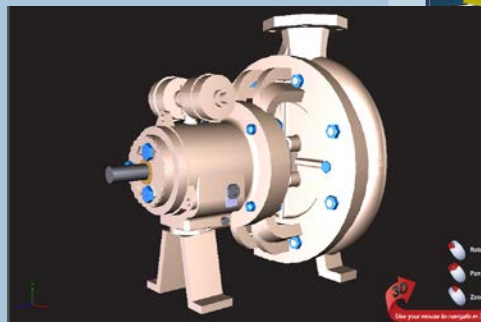
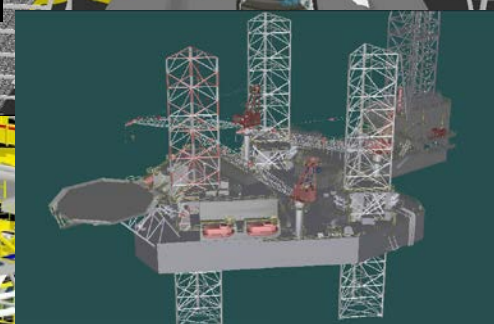
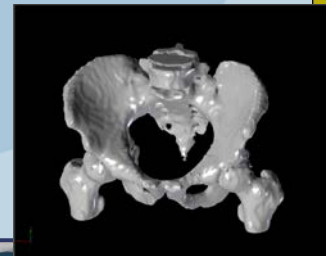
- AutoDesk



- Adobe



- IBM





## Norisol Norge AS

- Norisol is a Scandinavian corporation with offices in Norway, Denmark, Sweden. Norisol has in addition an office in UK, Aberdeen.
- The total turnover for 2011 was approx. 1 000 Mill NOK with 1100 employees.

### **Norisol is an multidiscipline company with core business within:**

- Insulation
- Scaffolding
- Surface treatment

### **Norisol has partnered with EOS to introduce this technology to Europe**

### **Other areas**

- Asbestos removal
- Cold Cutting
- Design and outfitting
- 3D Scanning
- 3D PDF
- 4D Simulation
- Decomissioning work
- Engineering



## Aera Energy LLC

- 100% owned subsidiary of Shell and ExxonMobil
- 148.000 barrels of oil and 42M ft<sup>3</sup> of natural gas / day
- Fields in production almost 100 years
- Manned and unmanned offshore platforms

ExxonMobil

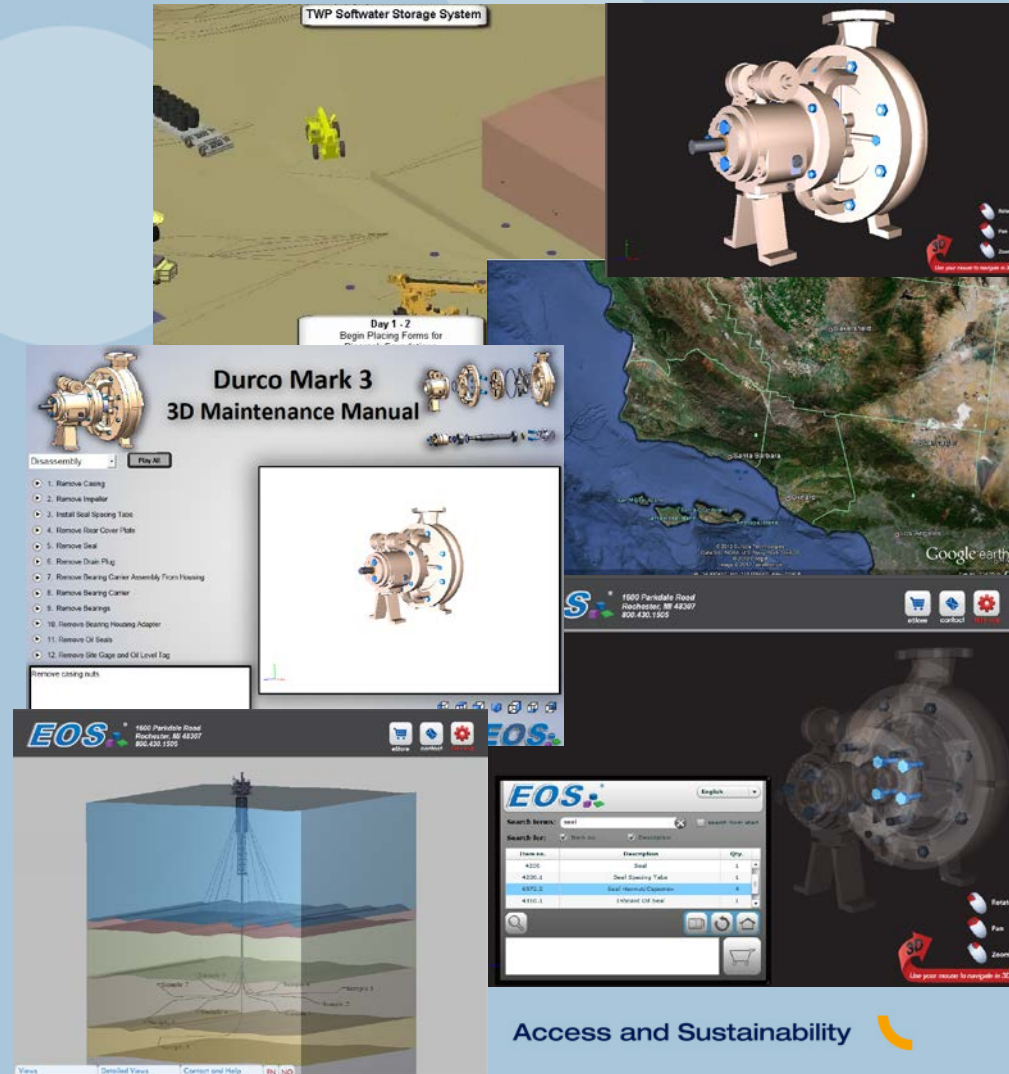


AERA



# EOS and Aera Engery Collaboration

- 3D Integrated Operations
  - Parts Ordering
  - Well Data
- 3D Work Instructions
  - Maintenance
  - Construction
- 4D Risk Assessment
  - Construction
  - Logistics

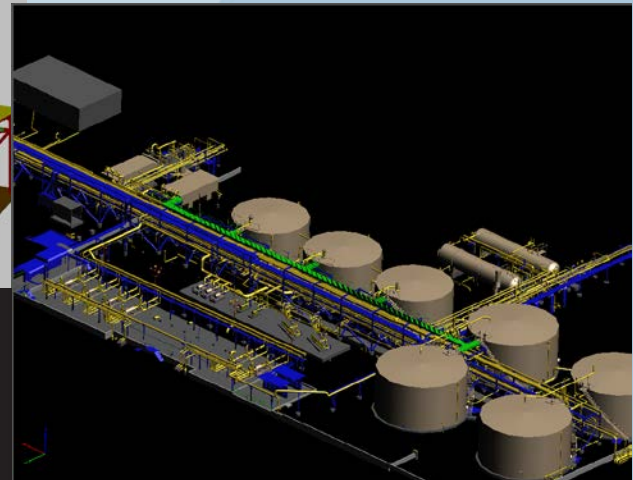
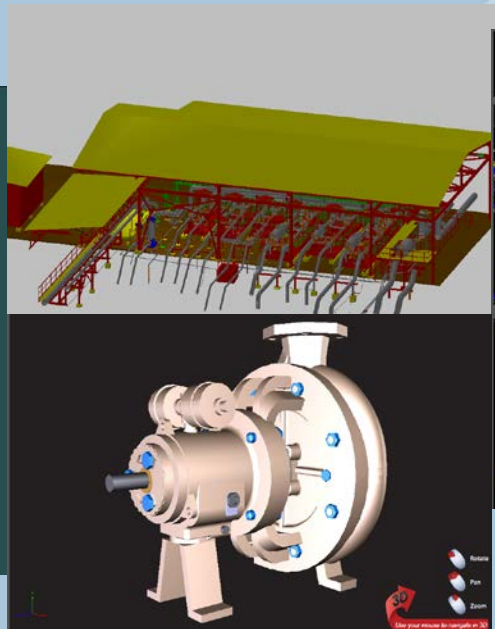
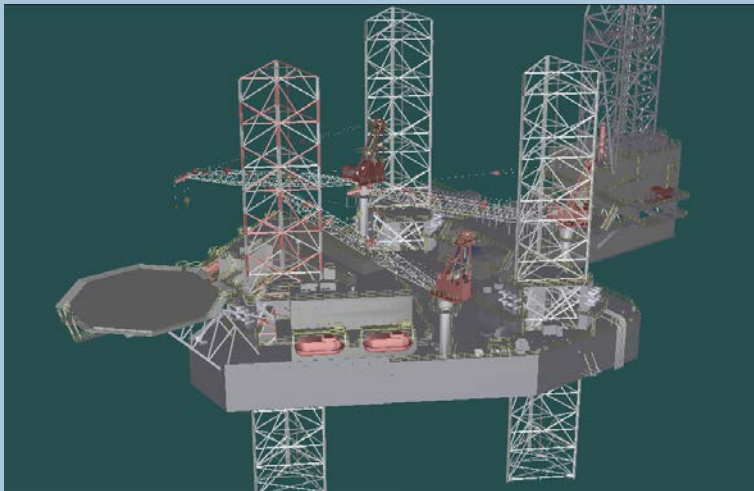


EOS and Aera Energy Collaboration

# **3D INTEGRATED OPERATIONS**

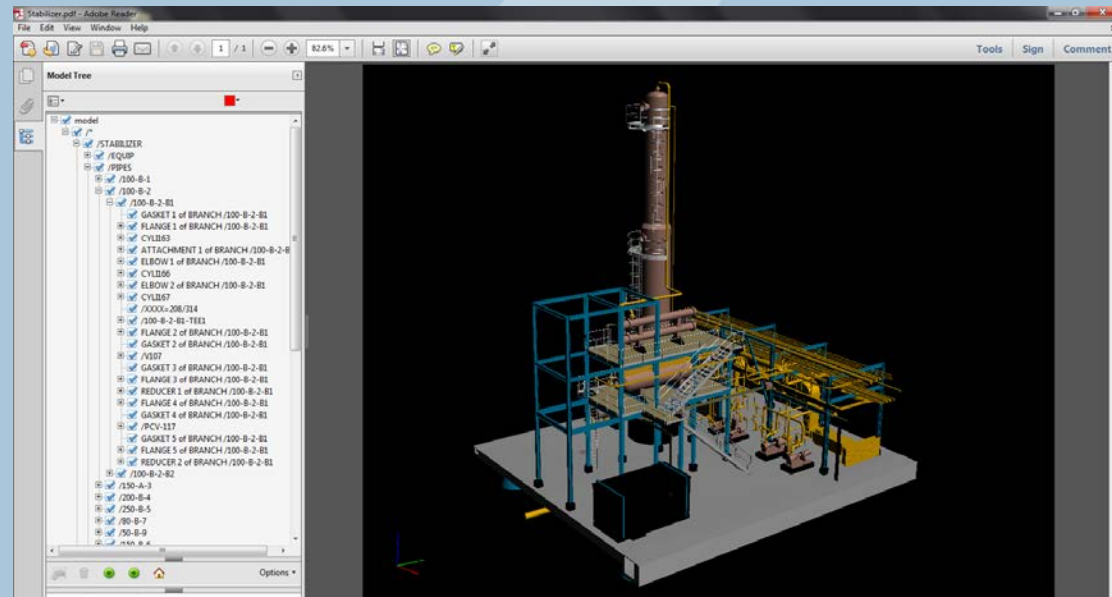
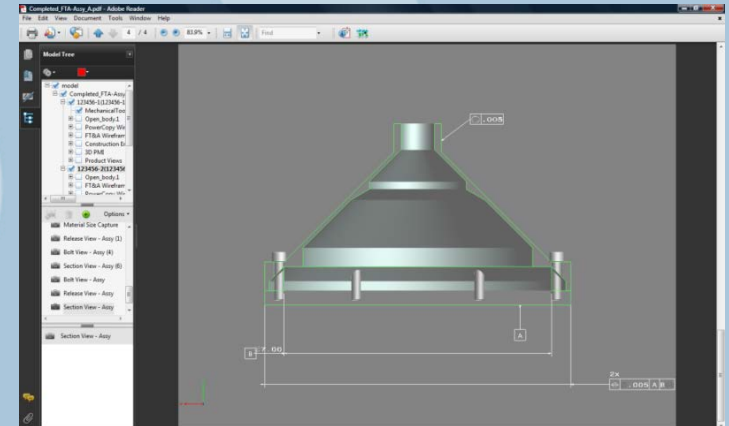
## 3D PDF Development

- 2007 - EOS receives US Army Research Lab (USARL) funding
- EOS partners with Adobe and key US Army suppliers
  - Boeing
  - BAE Systems
  - General Dynamics
- 2009 – EOS publishes results from USARL research
- 2010 – EOS patents and begin commercialization of MBE tools



# Adobe 3D PDF Technology

- CAD to Adobe 3D PDF
  - Convert 3D CAD to 3D PDF
    - Over 52 Supported Formats
  - View with free Adobe Reader
  - Geometry, Views, GD&T
  - Tracking and Collaboration
  - ISO 32000
- Adobe 3D Functions
  - 3D Navigation
  - Measurement
  - Cross-Section\*
  - Create Views





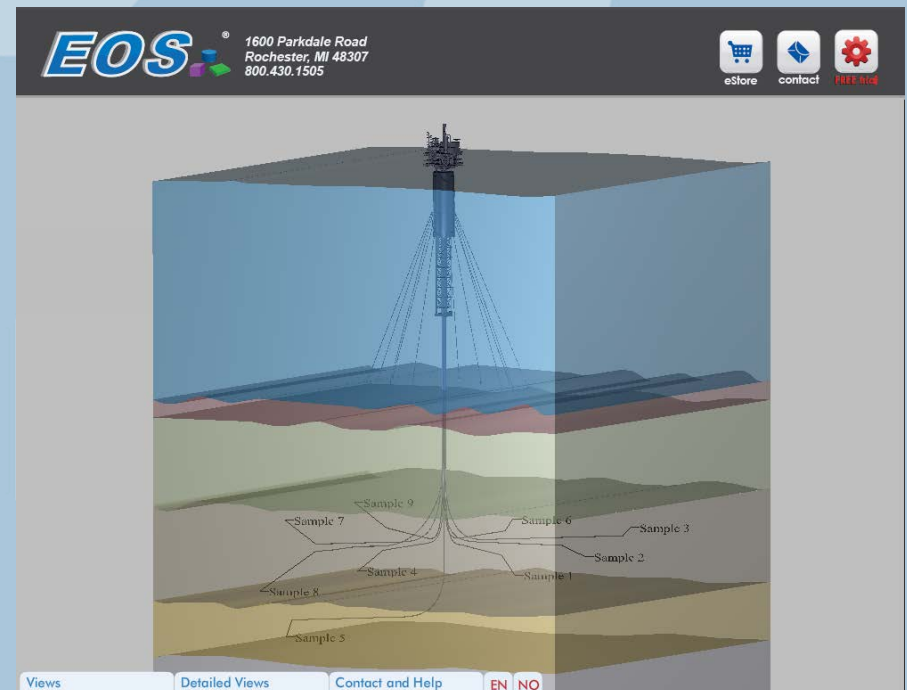
## 3D Integrated Operations – Well Data

### Challenge

- Reduce engineering hours for well development and decommissioning

### Solution

- 3D PDF Document
  - Adobe Reader
  - Multi-Language
  - Single, Small File
- Modeled Platform, Geology, Well Specific Data



## 3D Integrated Operations – Parts Ordering

### Challenge

- Difficulty in ordering spare parts from remote fields and offshore

### Solution

- 3D PDF Document
- Part Name / Number search
- Visual Recognition
- Cost < 1 unit



EOS and Aera Energy Collaboration

# **3D WORK INSTRUCTIONS**

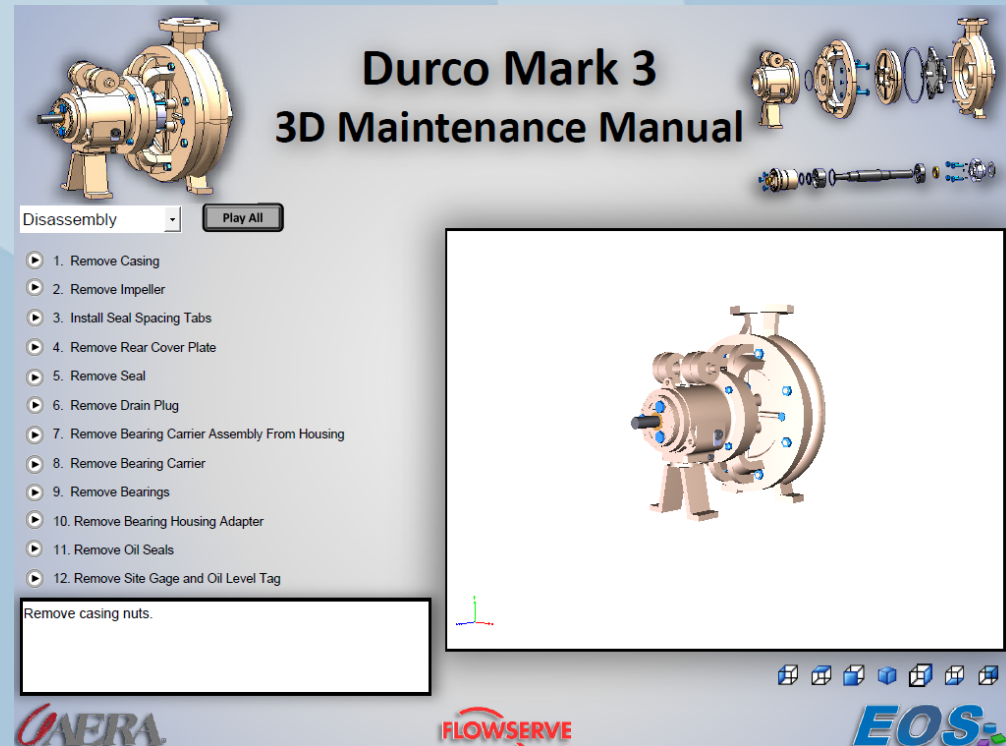
## 3D Work Instructions – Maintenance

### Challenge

- Improve repair time on infrequent or complex processes - overhauls

### Solution

- 3D PDF Document
- Repair Library on Tablet PC
- Configuration specific
- Ability to record lessons
- Cost < 1 unit



## 3D Work Instructions – Construction

### Challenge

- Reduce rework from improper methods and field changes

### Solution

- Modeled Processes in detail
- Step by step representation
- Cost < 1 day of operation

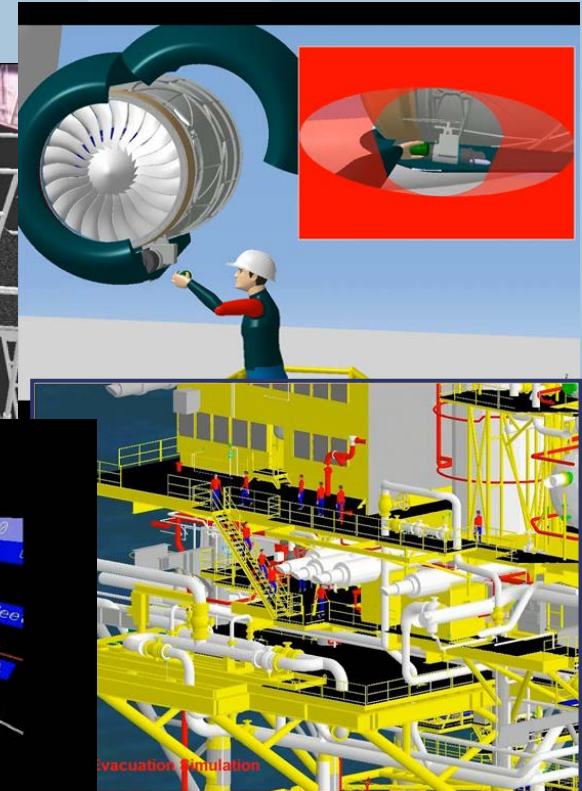
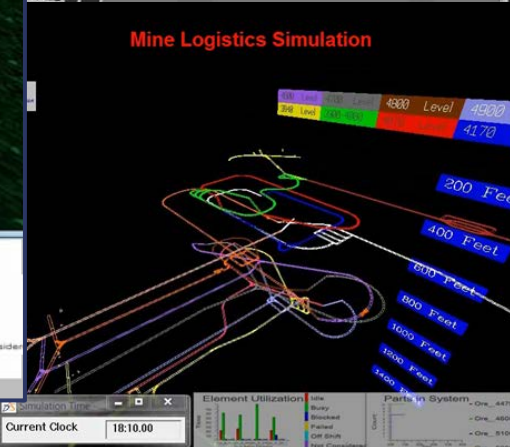
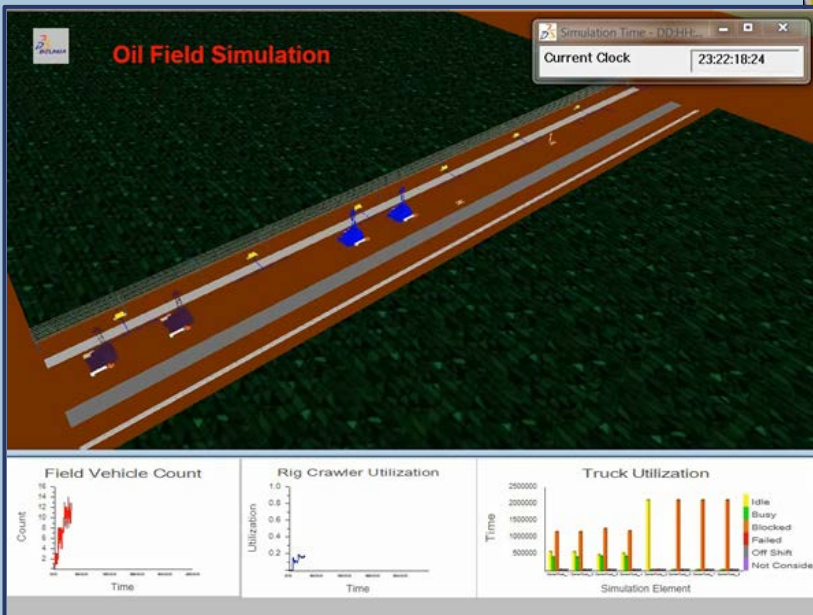


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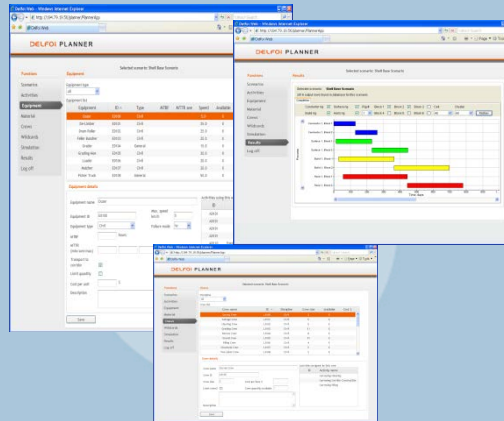
# **4D RISK ASSESSMENT**



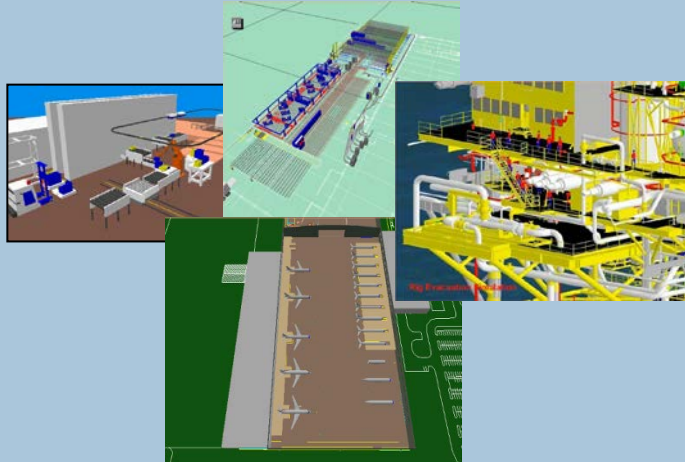
- 4D Process Simulation & Analysis
  - City, Plant, Assembly Line, Work cell, Individual
  - Aerospace, Industrial, Auto, Defense, Civil
  - Material, People, Energy Use
  - Process Improvement
  - Disaster and Evacuation



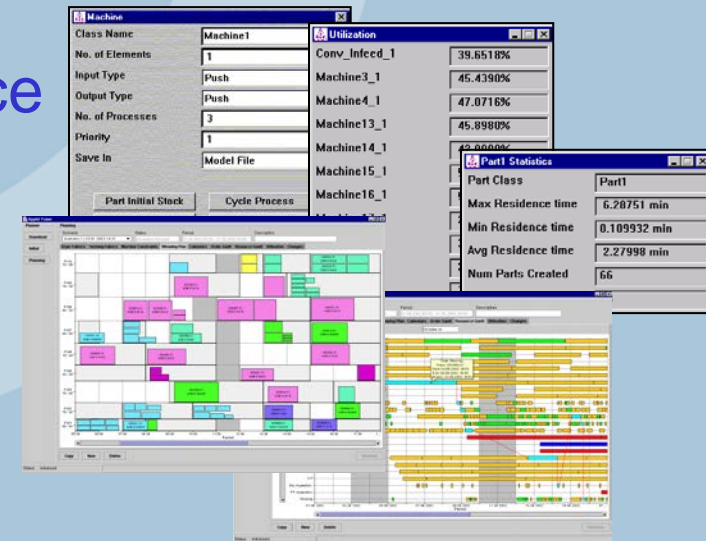
# 4D Process Simulation Solution



User Interface



3D Model



Mathematical Model

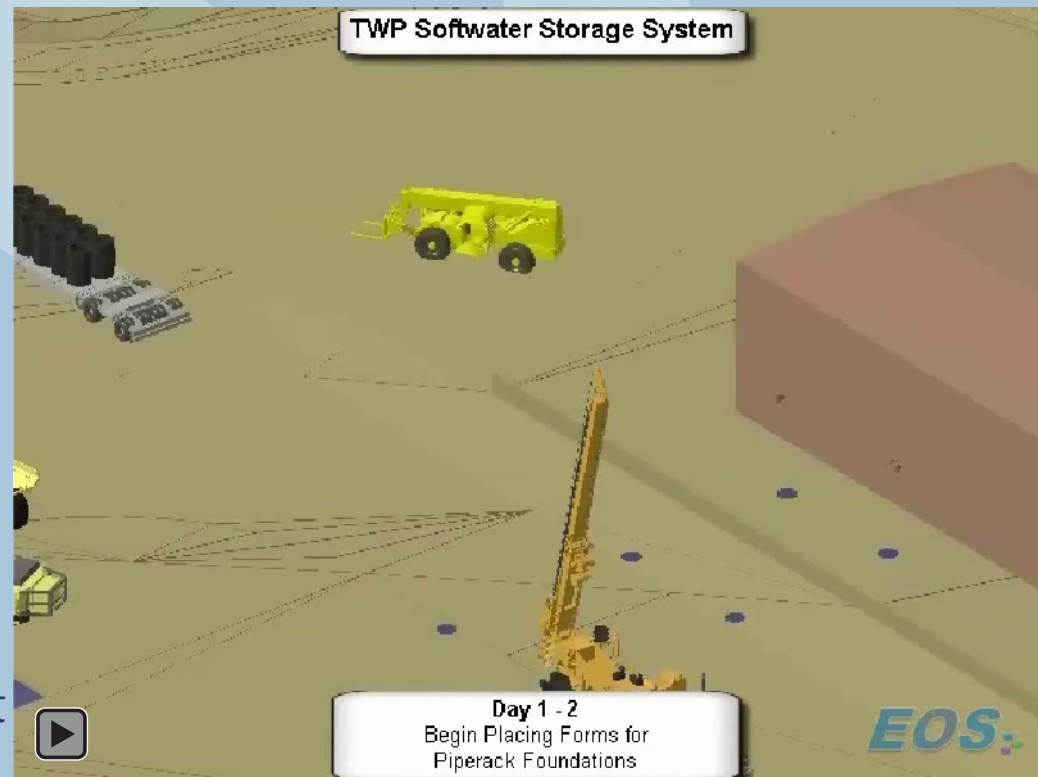
## 4D Risk Assessment – Construction

### Challenge

- Optimize complex plans and new construction methods

### Solution

- Modeled construction processes, equipment and locations
- Included seasons, weather, learning curves
- Included random variability
- Cost = less than 1% of project





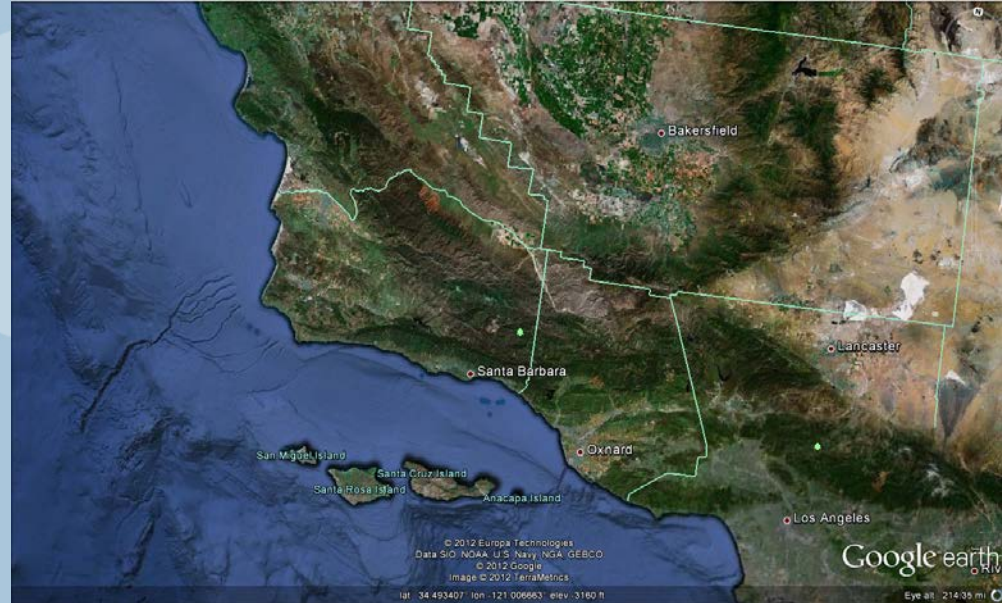
## 4D Risk Assessment – Logistics

### Challenge

- Optimize offshore resupply and maintenance support

### Solution

- Modeled platform operations and maintenance procedures
- Modeled transport and routes in Google Earth
- Included seasons, weather, learning curves
- Included random variability
- Cost = less than 1% of budget



## EOS Solutions

[www.3eos.com](http://www.3eos.com)

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USA

General Information  
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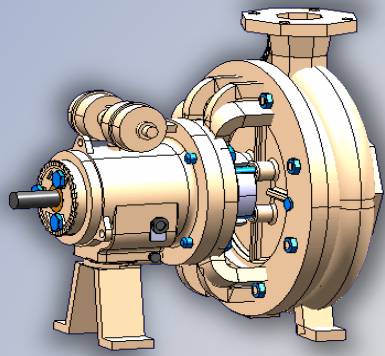
## Norisol Norge AS

[www.norisol.no](http://www.norisol.no)

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4050 Sola  
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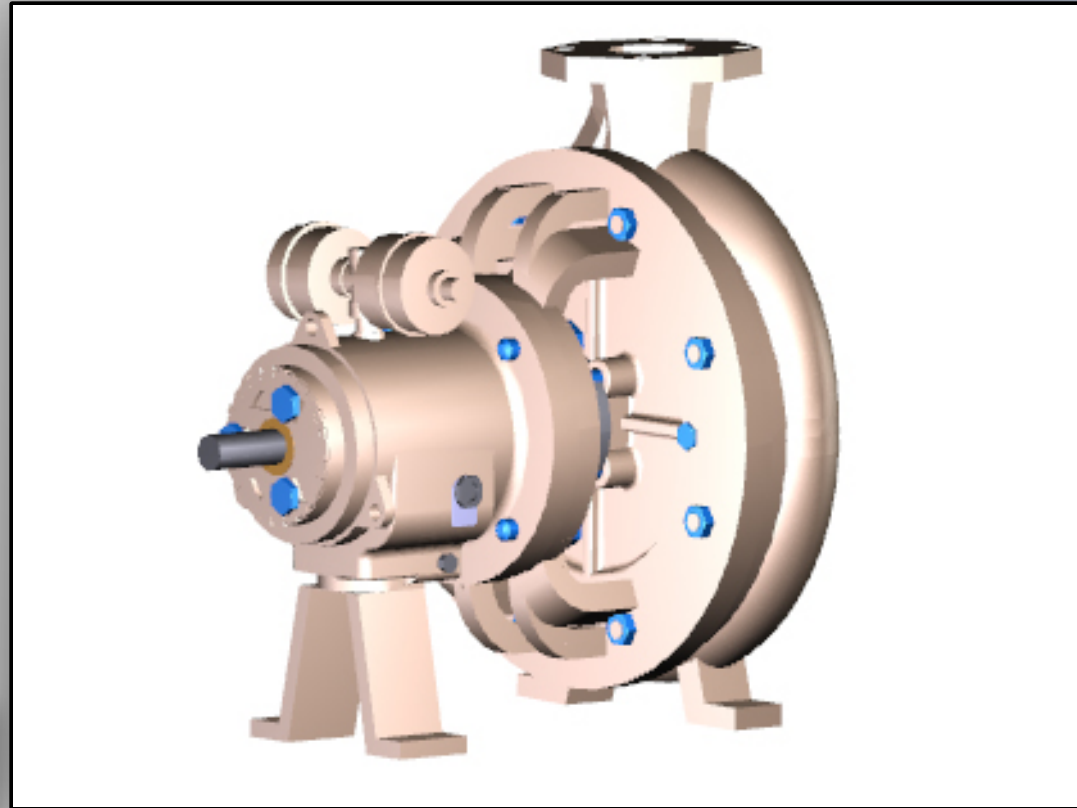
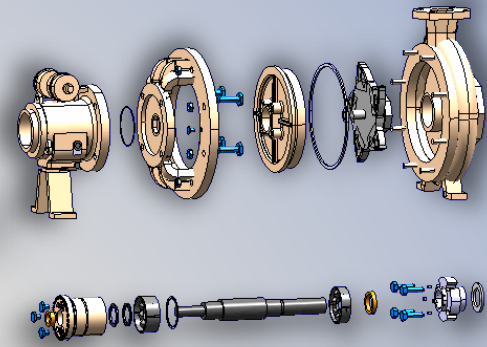
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# Durco Mark 3

## 3D Maintenance Manual







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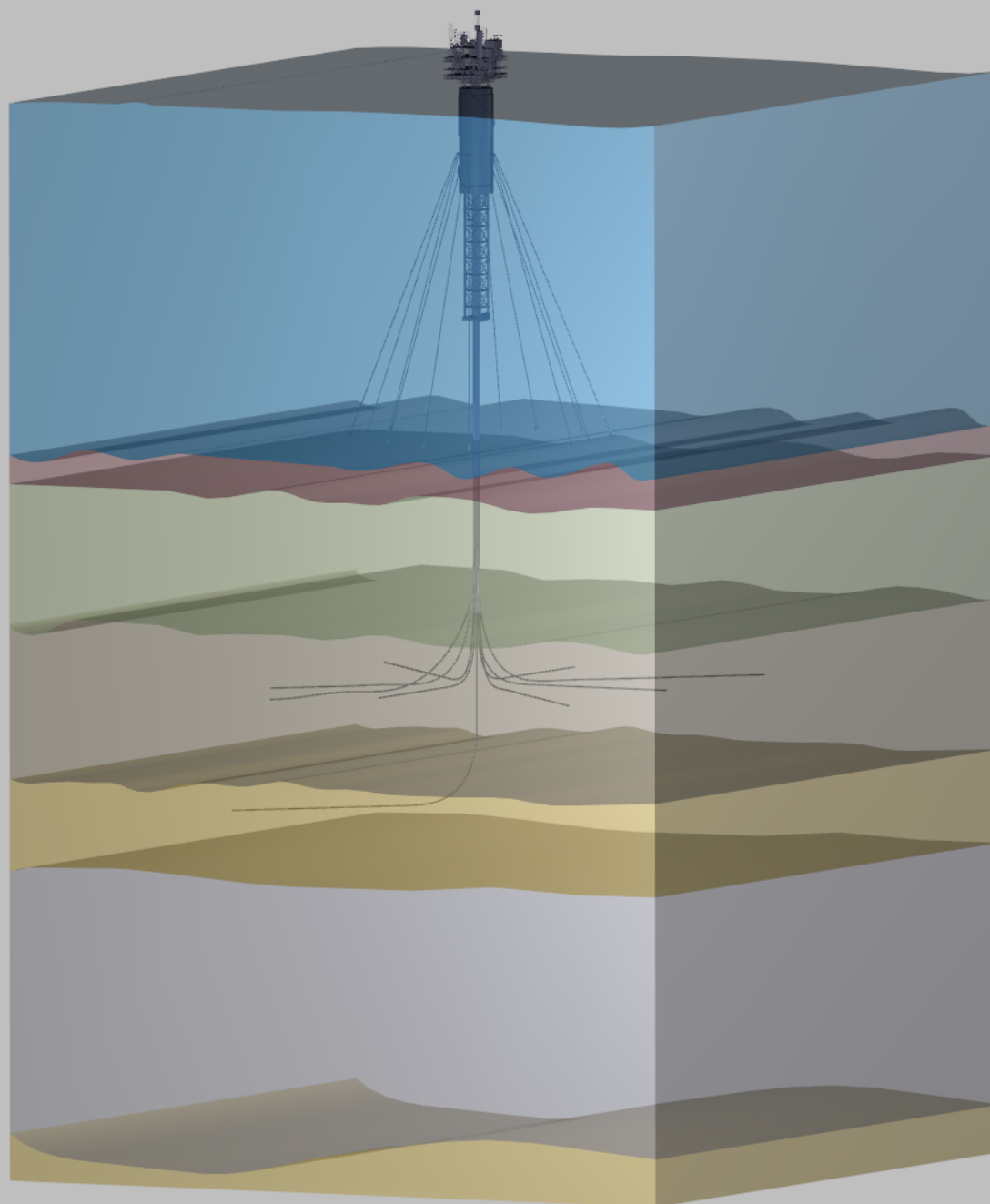
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Views

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