Schoonebeek; redeveloping the largest onshore oil field in North-Western Europe

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April 9, 2013
Koninklijk Instituut Van Ingenieurs KIVI NIRIA
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<tr>
<th>Role</th>
<th>Organization/Location</th>
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<tr>
<td>Ir.</td>
<td>University of Delft (Mechanical Engineering)</td>
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<td>MBA</td>
<td>University of Bradford</td>
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<td>RPP</td>
<td>Association for Project Management (APM)</td>
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<td>NAM</td>
<td>Nogat Onshore Treatment Plant (Holland)</td>
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<td>F3 Offshore Platform (Italy / Offshore)</td>
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<td>PDO (Oman)</td>
<td>Butane Plant (Oman / Yibal)</td>
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<td>Yibal Concept Engineering (Oman / Yibal)</td>
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<td>Shell International</td>
<td>Graduate Recruitment</td>
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<td>Shell Technology Ventures, Twister Venture</td>
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<td>Jacobs</td>
<td>Business Development Manager</td>
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<td>SEIC</td>
<td>Sakhalin Engineering Manager OPF</td>
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<td>Shell International</td>
<td>Engineering Manager, Major Projects</td>
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<td>NAM</td>
<td>Schoonebeek Project Executive</td>
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<td>Shell International</td>
<td>Front End Development Manager FLNG</td>
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The Schoonebeek Project Safety Moment

Key Safety themes;
- HSE Leadership
- Supervisor Mindset
- Permit to Work
- Unsafe Act Reporting
- Life Saving Rules
History Schoonebeek Oil Field


- 1943: Discovered
- 1944: Extend Field Identified
- 1945: Oil Production
- 1957: Peak Production
- 1959: Stop Production
- 1966: First Oil
- 2009: Start Construction

NAM
Project overview

Project Purpose
The Schoonebeek EOR Project revives oil production by injecting steam into the reservoir; heating the oil to lower the viscosity to allow pump off.

Scope Summary

- 18 Well Sites with 73 wells (44 Prod, 25 Steam & 4 Obs).
- Treatment Facilities (3,400 m³/d Oil & 12,500 m³/d Water).
- Combined Heat and Power Generation (365 t/h Steam, 120 MW Electricity)
- Ultrapure water supply, Connection to Power grid & Gas grid.
- 45 km Infield Pipelines, 44 road crossings.
- 22 km Oil Export Pipeline.
- 70 km Water Export System.
- 6 Water Injection Sites (Twente).
Project overview – scope elements

Lingen (BP Germany)

Water injection

Oil Export

Twente

Power export

Steam

Oil/water/gas

Emmen

Power export

Ultrapure water supply

Heat & Power and Oil Treatment Plant

WKC

OBI

Lingen (BP Germany)
Project volume: approx. 120 mln oil barrels
Steam injection in horizontal wells

- Steam injection in horizontal wells
- Depth: 600 – 800 meter depth
- Sealing shale layer
- 10-35 m
- Oil / water production
Project overview

Execution Model Surface Facilities

• One large EPC contract; target price mechanism.
• Four well known contractors;
  • Jacobs Engineering – Leiden,
  • Stork Technical Services – Utrecht,
  • Visser Smit Hanab (VSH) – Papendrecht,
  • Yokogawa – Amersfoort,
selected to execute project as an Alliance (SRT).
• Contract award; December 2007.

Execution model copied from the successful GLT Project.
Timeline:

- Draft design
- Environmental Impact Report
- Investment decision (FID)
- Detailed design
- Permit applications
- Construction / start-up
- Drilling
- Start of oil production (First Oil Milestone)
Schoonebeek Production Start-Up

Drill RD1 wells (10 locations)

Hook-Ups RD1 Locations

Build In-Field Pipelines Phase 1

Build Central Treatment Facilities

Build Oil Export p/l (min rate 600 m³/d)

Build Water Disposal System

Build Combined Heat & Power (Steam & Electricity)

Drill RD2 Wells

Hook-Ups RD2 Locations

Build In-Field Pipelines Phase 2

Build RD3 Wells

Hook-Ups RD3 Loc’s

Build Central Treatment Facilities

Build Oil Export p/l (min rate 600 m³/d)

Build Water Disposal System

Build Combined Heat & Power (Steam & Electricity)

First Oil

First Steam

240 tons/hour

E-Generation
NAM Site – current situation
Cogen plant & oil treatment
Infrastructure

LOCATION A

LOCATION D

LOCATION B

LOCATION C
Infrastructure
From nodding donkeys to long stroke units

1947-1996
250 nodding donkeys

2011
40 long stroke units
Compact drilling rig
Communication with local residents

Mogelijke herontwikkeling Schoonebeek-olieveld

De NAM heeft plannen om misschien opnieuw olie te gaan winnen uit het Schoonebeek-olieveld. Misschien, want een definitief besluit daarover is nog niet genomen.

De olie in het Schoonebeek-veld is taaig en stoppeloos. Mocht het met de technieken van toen niet meer rendabel zijn, dan is de oliewinning technisch haalbaar. De NAM stuurt de volgende bericht:

Op 23 april maakte de NAM de plannen op hoofdlijnen bekend. Op 24 juni verschenen de plannen in de openbare bijeenkomst in Mitterslitz en in de regionale media. De plannen zijn geplaatst in de openbare bijeenkomst in Mitterslitz, in de regionale media en op de website van de NAM. De NAM stuurt de volgende bericht:

Als alles volgens plan verloopt, zou de eerste olie in 2007 worden geleverd. In het boekje kunnen de plannen lezen van de NAM en de olie te go."
Project dimensions

- Oil production: 20,000 barrels daily
- 18 production sites
- 73 wells
- Total length 73 drillings: 105 km
- 40 long stroke units
- 15 km in field pipelines
- 22 km export pipe line to Germany
- Cogen plant: 120 MW → (90% for public net)
Wrap up

• NAM can produce another 120 million barrels (20,000 barrels daily) from one part of the field over the coming 25 years or so.
• Thanks to modern techniques, we’ll be converting some of the mineral resources of the Netherlands into valuable products for everyday use.
• The project is one of the most advanced oil production ventures in Europe.
• At peak some 900 people were active on sites to realize this project.
• Many local contracts, during construction/drilling 2000 man years & 50 permanent staff in production phase.

Thank You
**Extra Slide: Life-Saving Rules – what are they?**

1. Work with a valid work permit when required
2. Conduct gas tests when required
3. Verify isolation before work begins and use the specified life protecting equipment
4. Obtain authorisation before entering a confined space
5. Obtain authorisation before overriding or disabling safety critical equipment
6. Protect yourself against a fall when working at height
7. Do not walk under a suspended load
8. Do not smoke outside designated smoking areas
9. No alcohol or drugs while working or driving
10. While driving, do not use your phone and do not exceed speed limits
11. Wear your seat belt
12. Follow prescribed Journey Management Plan