DECOM Offshore 2017

PRINCIPAL SPONSOR

BUREAU VERITAS

Tyra Progress Update

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HEAD OF DECOMMISSIONING

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Decom Offshore 2017

UPDATE ON THE REDEVELOPMENT AND PART DECOMMISSIONING OF TYRA

24 MAY 2017

Dave Sinclair

Maersk Oil Head of Decommissioning

Tyra Future

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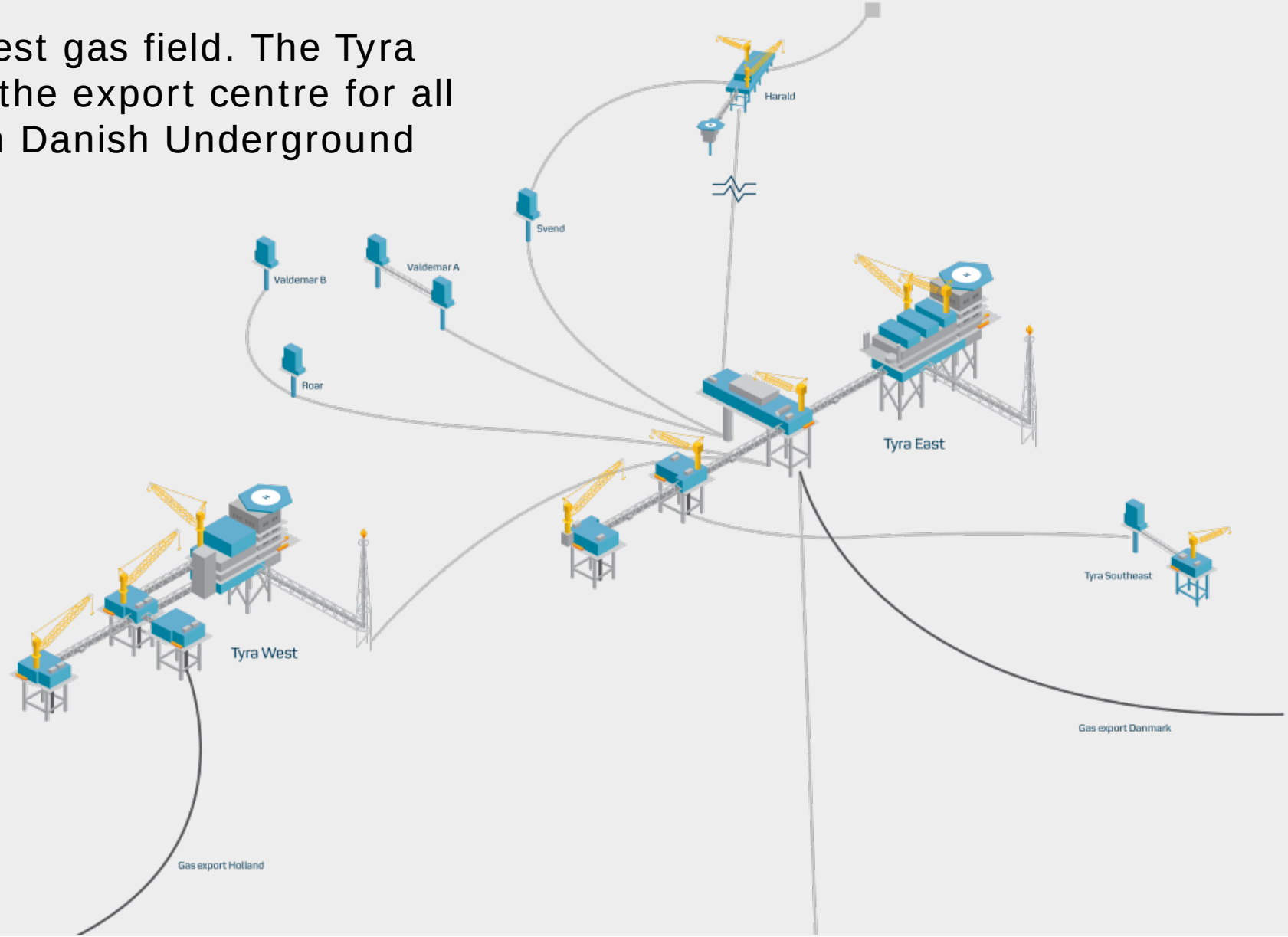
Tyra

Denmark’s largest gas field. The Tyra complex forms the export centre for all gas produced in Danish Underground Consortium

Total weight
81,558 tonnes



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Tyra plays a critical role

TREATMENT OF DANISH GAS
90
percent

UNMANNED SATELLITES
5

OIL AND GAS PRODUCTION
70
kboepd

UPSIDE POTENTIAL
‘significant’

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Why was redevelopment needed?

SUBSIDENCE
5
metres

AIR GAP
~15
metres

WAVE HEIGHTS
>15
metres

INCIDENT-FREE
better. safer. together

- More than DKK 1 billion has been spent on mitigating subsidence in the last decades
- Demanning rigs are in place during winter until subsided structures have been removed
- The redevelopment is needed to re-establish inherently safe operations

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Project Objectives

- Execute project with an Incident Free mindset
- Remove subsided topsides as soon as practically possible
- Minimize the deferment of oil and gas production during the Tyra shut-in
- Complete project within the approved budget
- Embed a prevailing "One Maersk Oil" mindset in Ways of Working
- Engage and leverage stakeholders and contractors to create value
- Operate the new facilities 'as per design and expectations after start-up

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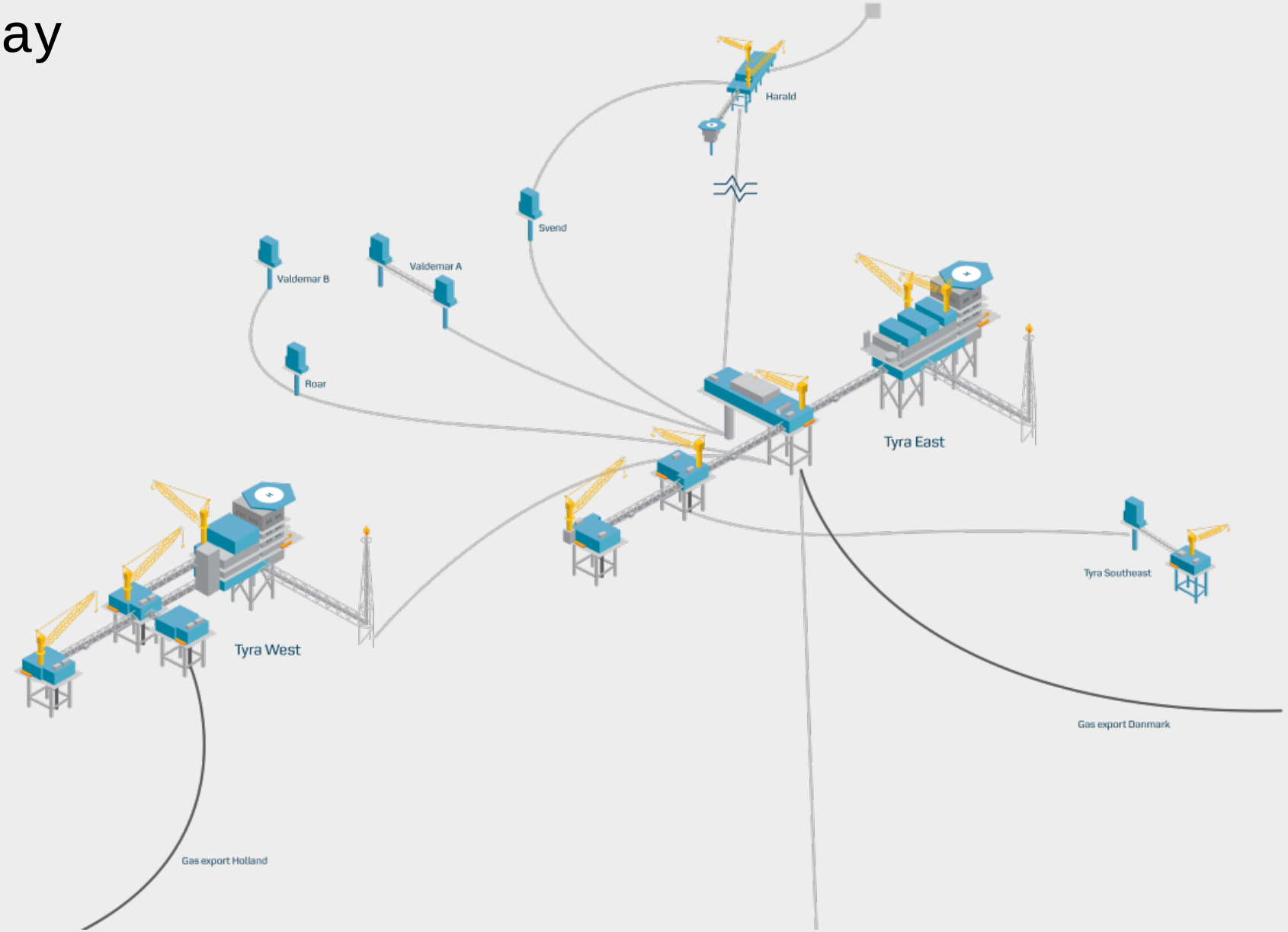
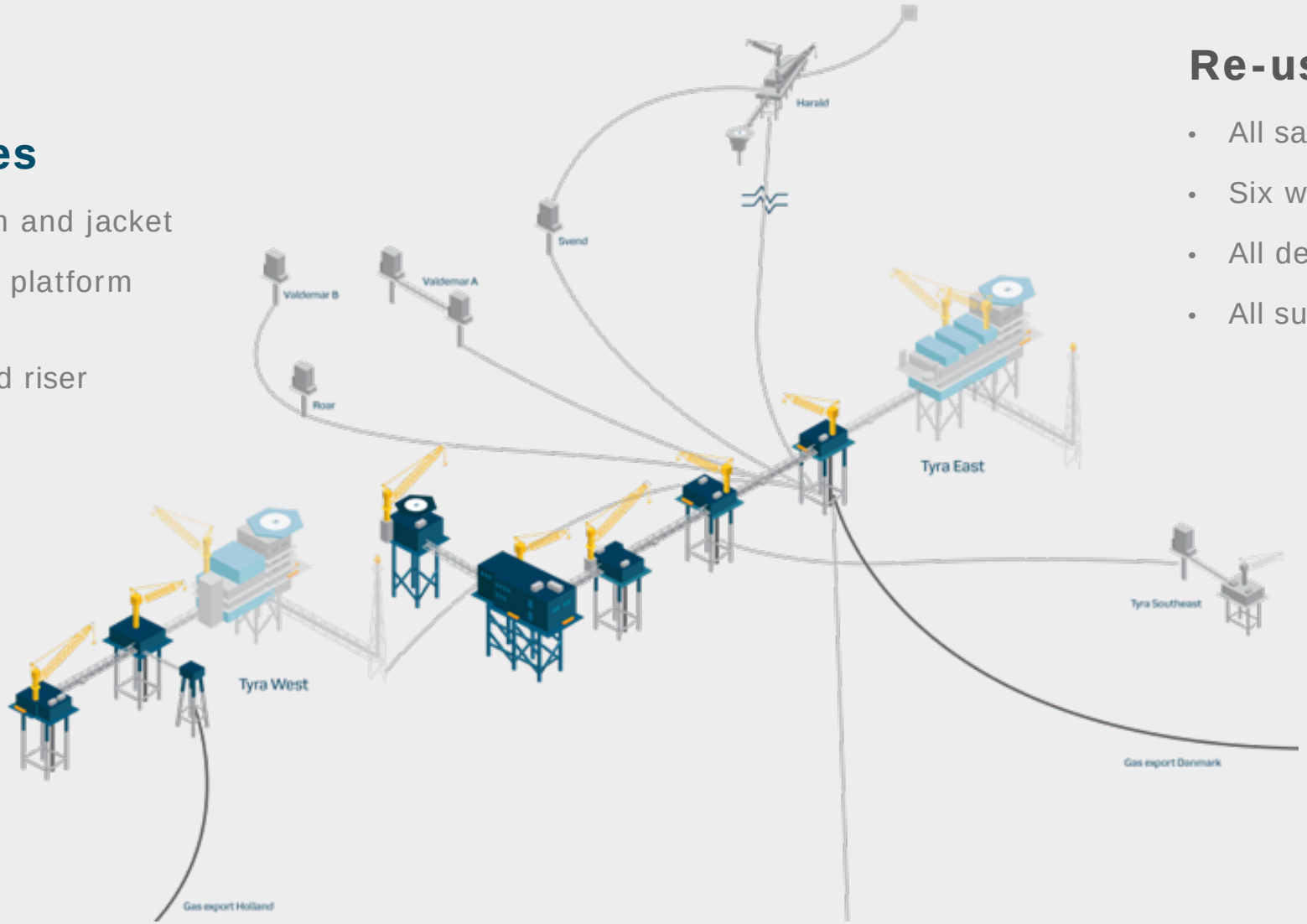
Tyra today


Harald
Svend
Valdemar B
Valdemar A
Roar
Tyra East
Tyra West
Tyra Southeast
Gas export Danmark
Gas export Holland

Future Field Lay-out

New facilities

- Process platform and jacket
- Accommodation platform and jacket
- Six wellhead and riser topsides



Re-used facilities

- All satellites
- Six wellhead and riser jackets
- All development wells
- All subsea infrastructure

Removed facilities

- Process and Living Quarters at Tyra East and West

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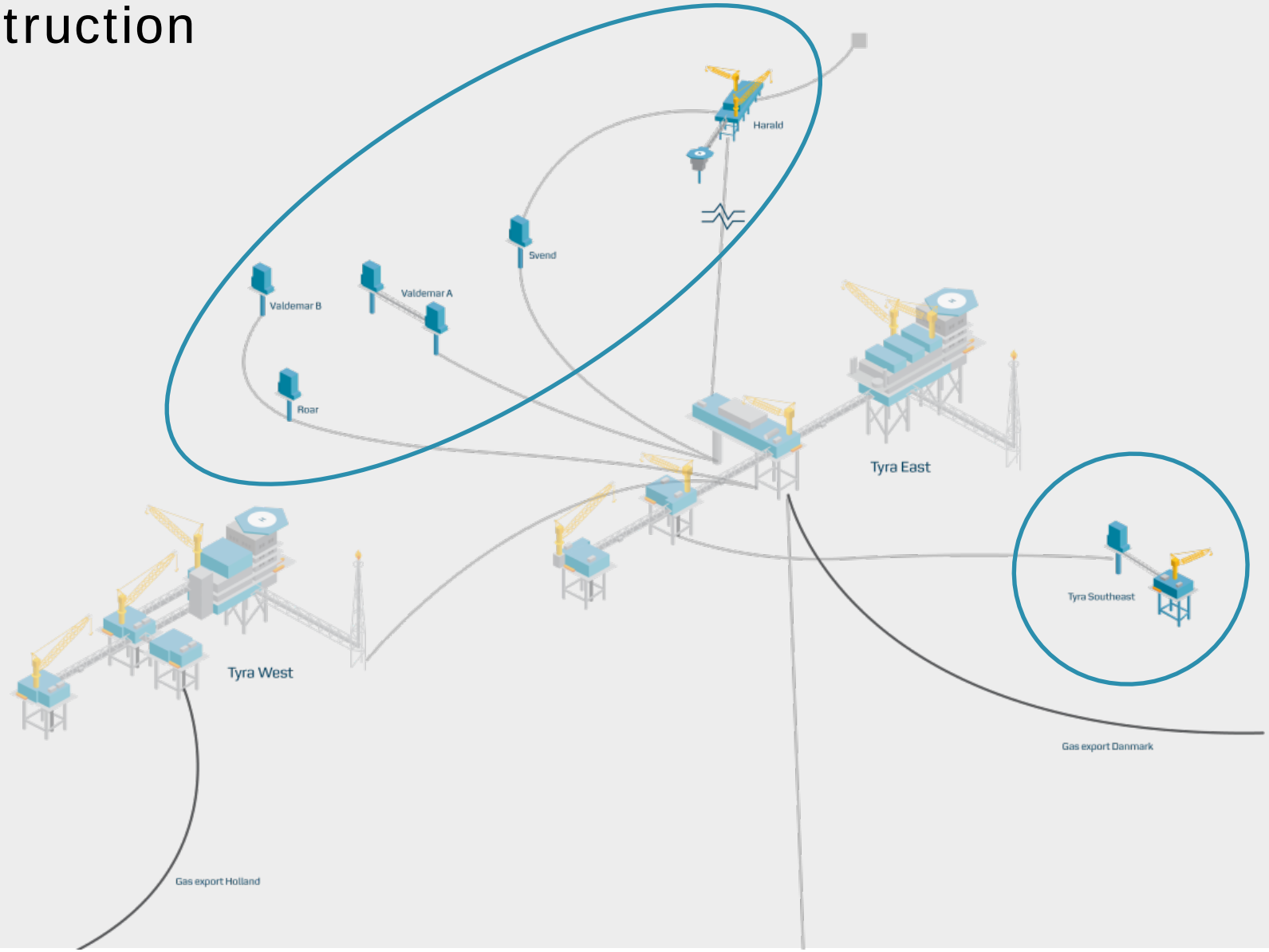
Satellites will remain as today but with production stop during construction



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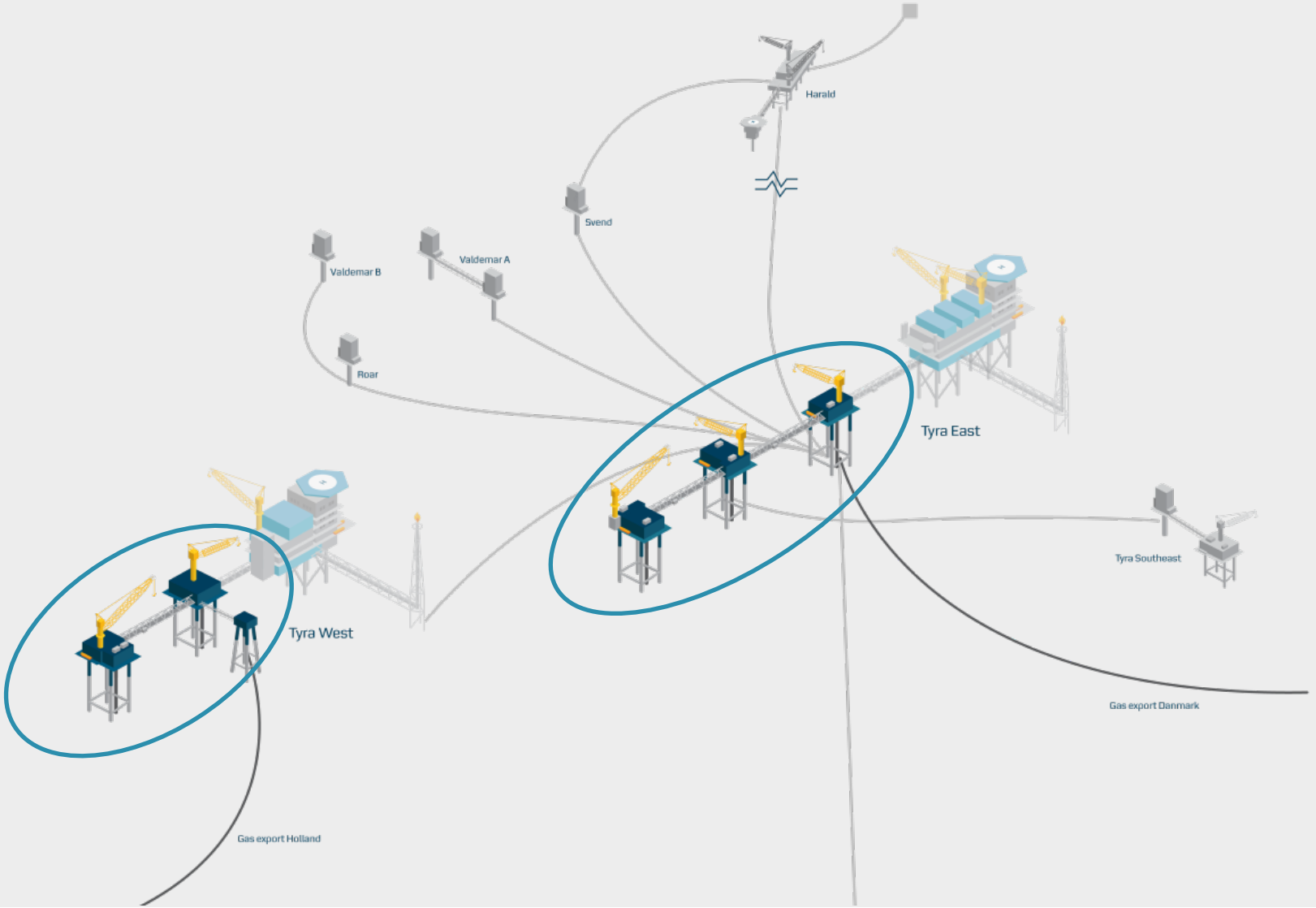
Wellhead and riser platforms to be extended and topsides replaced



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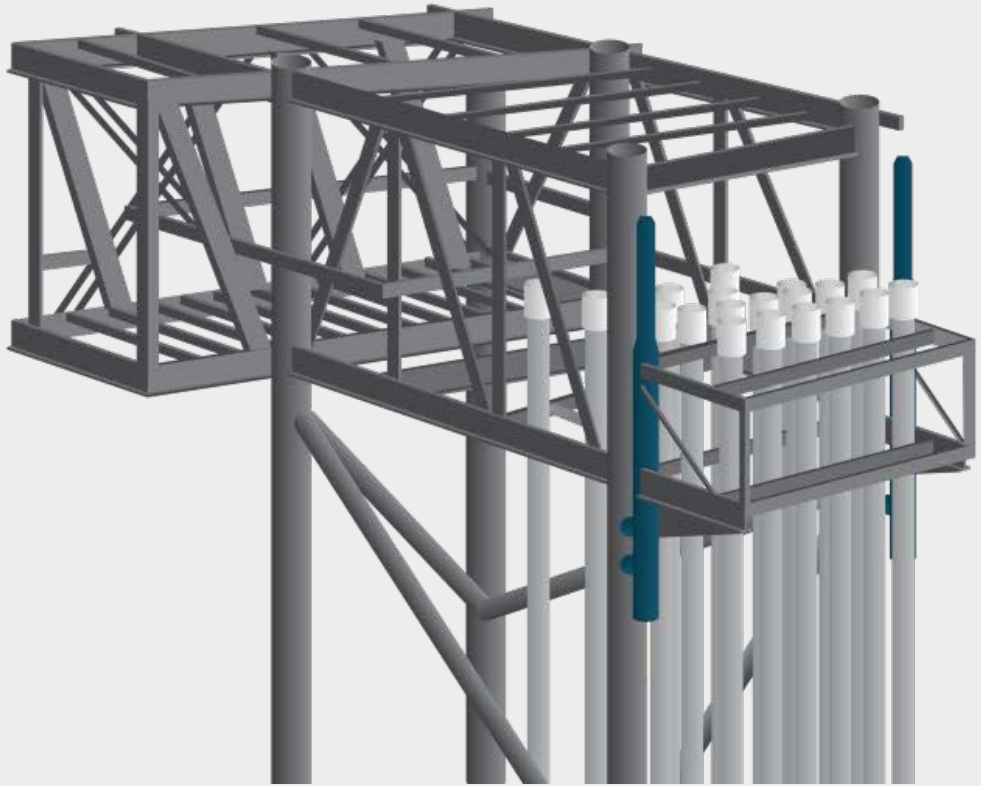
Jackets will be reused



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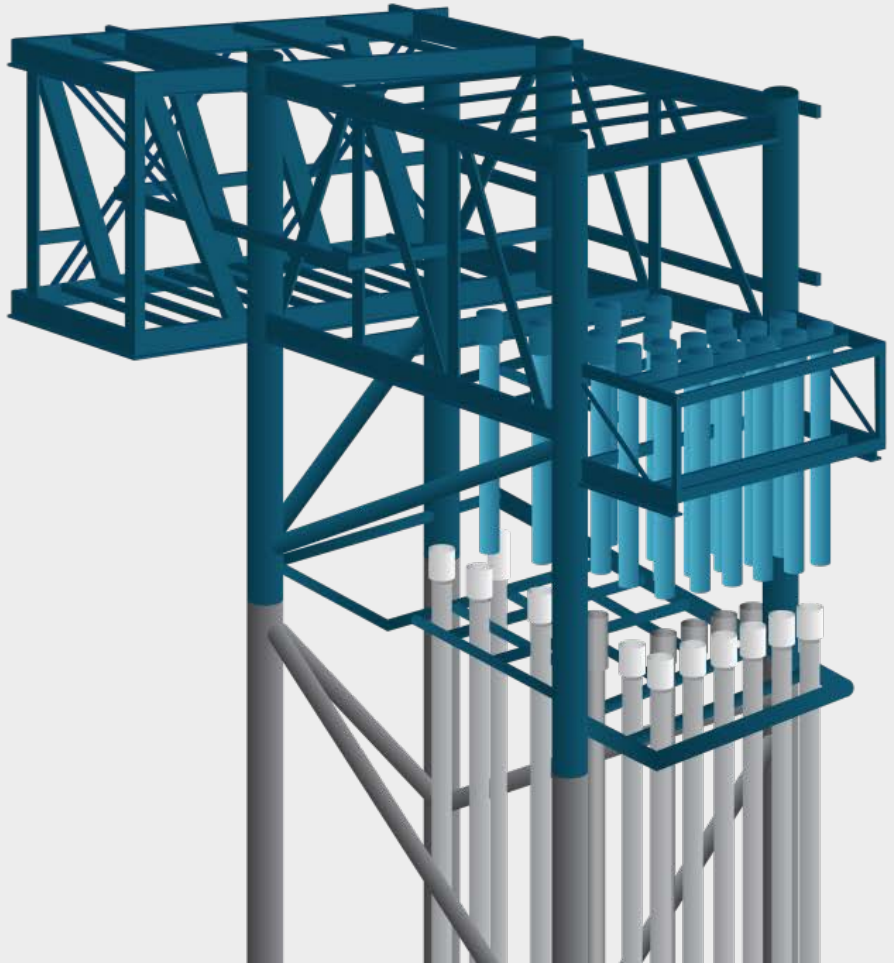
The topsides will be removed

And replaced more than 10 metres higher as the wells are extended



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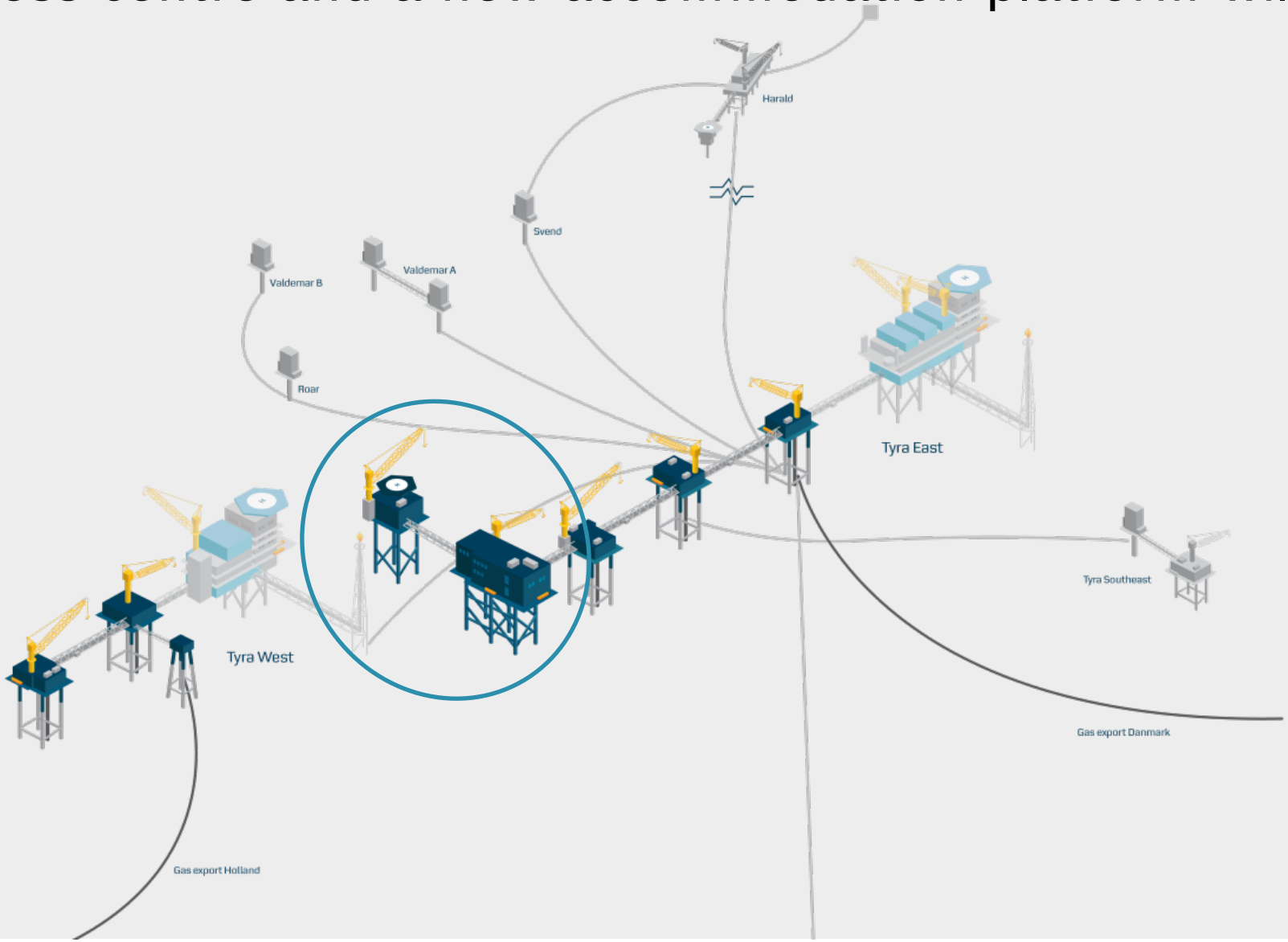
A new process centre and a new accommodation platform will be installed



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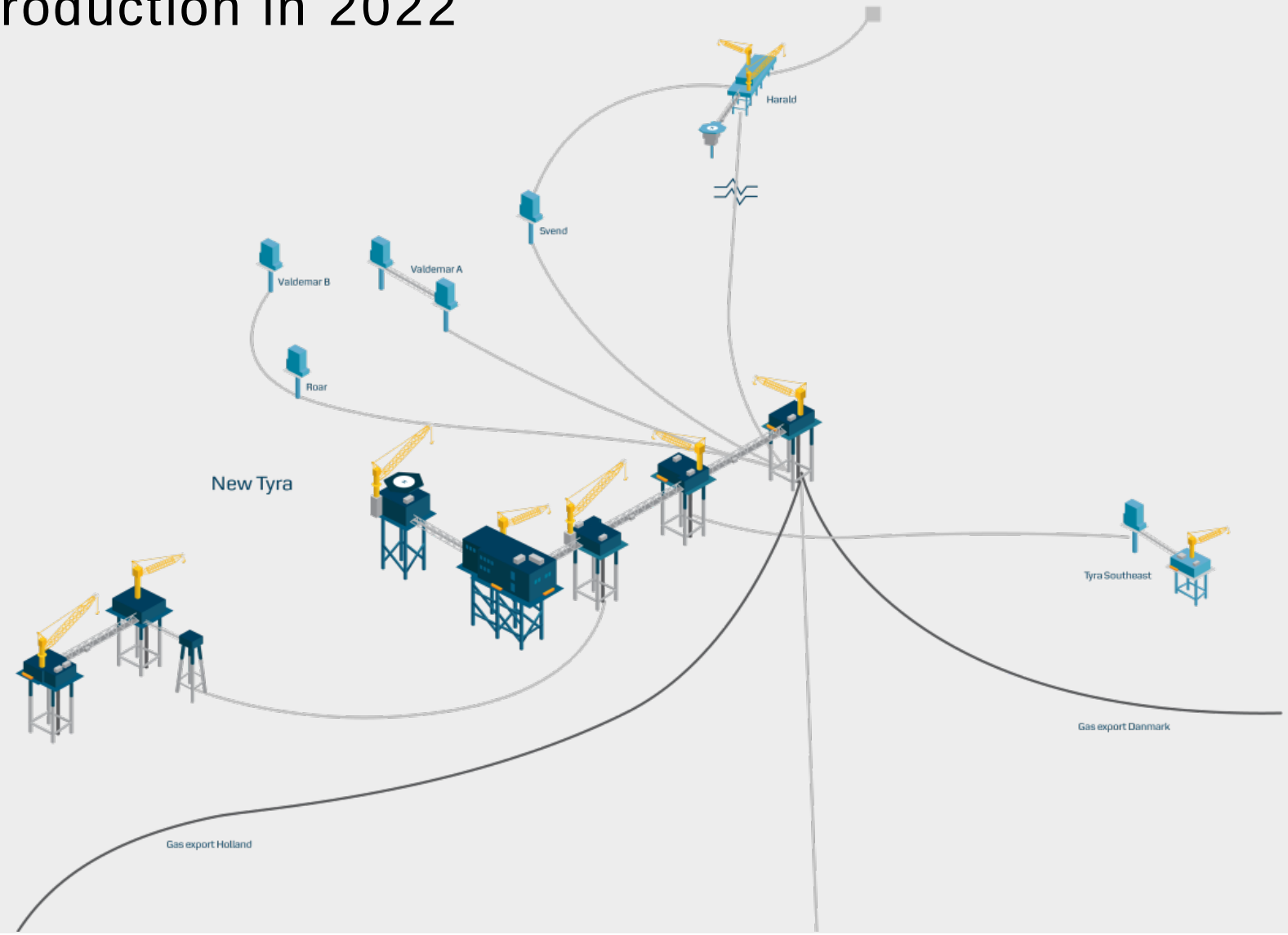
The old installations will be removed and the new Tyra will be ready for production in 2022



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Decommissioning - Tyra Future

Campaign 1 - Replacement

Tyra East Facilities		Dry Weight [mT]
Campaign 1 - Remove		
TEB Topsides	Wellhead module	1.120
TEC Topsides	Wellhead module	830
TEE Topsides	Riser platf.	1.450
TEB-TEC bridge	Bridge	390
TEE-TEB bridge	Bridge	440
TEE-TEA bridge	Bridge	340
TEF bridge module	Module	2.390
TED flare tower	Flare tower	180
TEA-TED bridge	Bridge	360
SUM		**7.500**

Tyra West Facilities			Dry Weight [mT]
Campaign 1 - Remove			
TWB topsides		Wellhead module	760
TWC topsides		Wellhead module	1.100
TWB-TWC bridge		Bridge	510
TWB-TWA bridge (lower)		Bridge	525
TWE-TWA/IPF bridge (upper)		Bridge	295
TWD flare tower		Flare tower	240
TWA-TWD bridge		Bridge	350
TWE	TWE NOGAT module (on the side on TWB-TWE bridge module)	Process module	640
	TWB-TWE bridge module	Process module	3.660
	TWE MSF structure (separate lift)	Utility deck	540
SUM			**8.620**

Tyra East Facilities		Dry Weight [mT]
Campaign 1 - Install		
TEB topsides	Wellhead module	1.500
TEC topsides	Wellhead module	1.300
TEE topsides	Riser platf.	1.600
TEB-TEC bridge		620
TEE-TEB bridge		390
TEE-TEA temporary bridge		340
TEG-TEC bridge		825
SUM		**6.575**

Tyra West Facilities		Dry Weight [mT]
Campaign 1 - Install		
TWB topsides	Wellhead module	1.200
TWC topsides	Wellhead module	1.200
TWE topsides	Riser platf.	400
TWB-TWC bridge		250
TWB-TWE bridge		50
TWB-TWA/IPF temporary bridge		295
SUM		**3.395**

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Decommissioning - Tyra Future

Campaign 2 – Removal of Process Topsides

Tyra East Facilities		Dry Weight [mT]
Campaign 2 - Remove		
TEA topsides	Accommodation & Process module	16.000
SUM		**16.000**

Tyra West Facilities		Dry Weight [mT]
Campaign 2 - Remove		
TWA topsides	Accommodation & Process module	7.500
TWA/IPF topsides	Process module	1.000
SUM		**8.500**

Tyra East process platform

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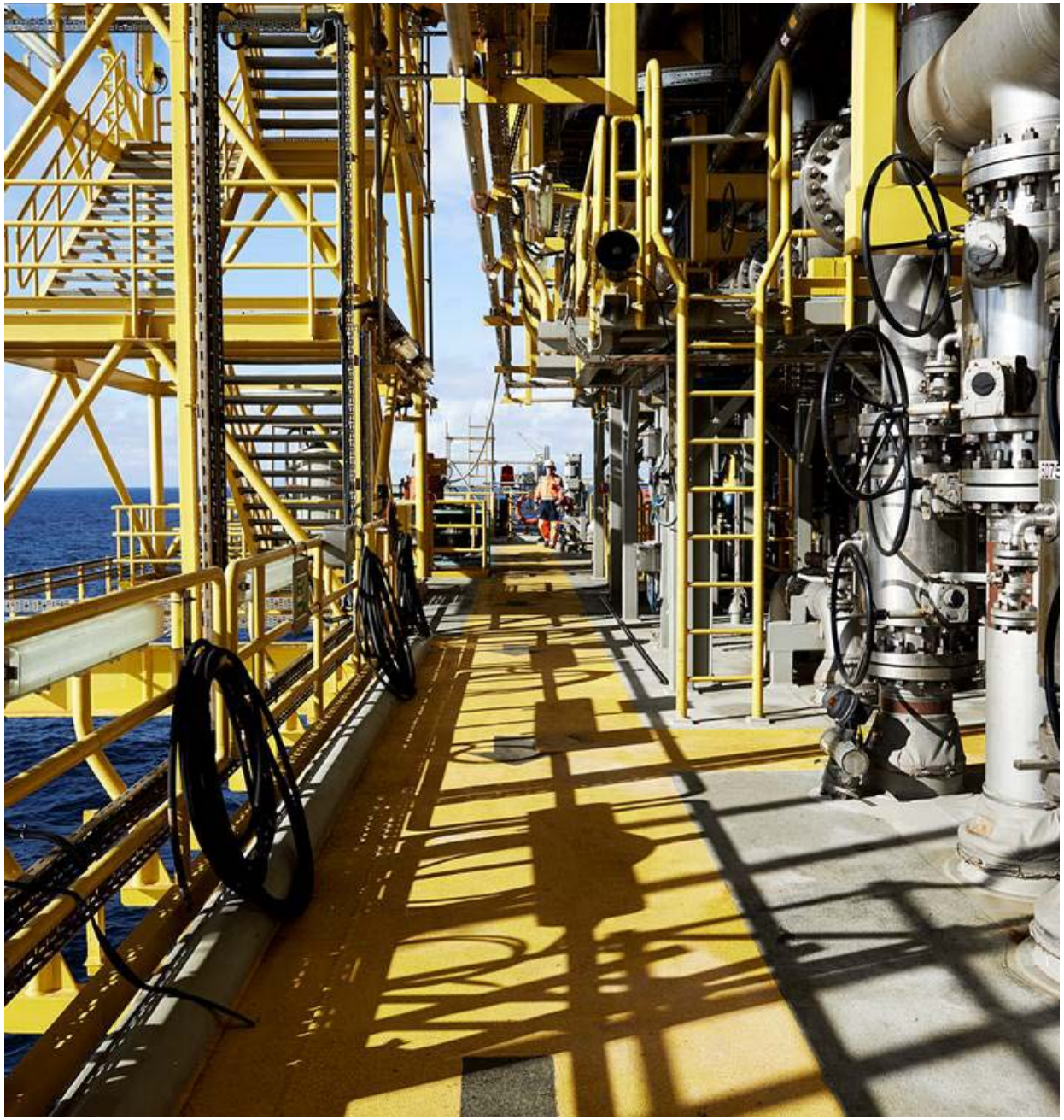
Decommissioning - Tyra Future

Campaign 3 – Removal of Jackets

Tyra East Facilities		Dry Weight [mT]
Campaign 3 - Remove		
TEA jacket	8-legged	3.500
TED flare jacket	3-legged	590
TEF jacket	Tripod	880
SUM		**4.970**

Tyra West Facilities		Dry Weight [mT]
Campaign 3 - Remove		
TWA jacket	4-legged	1.600
TWA/IPF Monopole	ø3000 monopole	500
TWD jacket	3-legged	1.020
SUM		**3.120**



Offshore construction

- The preparation, hook-down and hook-up scope will be done under Maersk Oil supervision
- Over the next 5 years, around 1.5 million construction man hours will be executed at the installations

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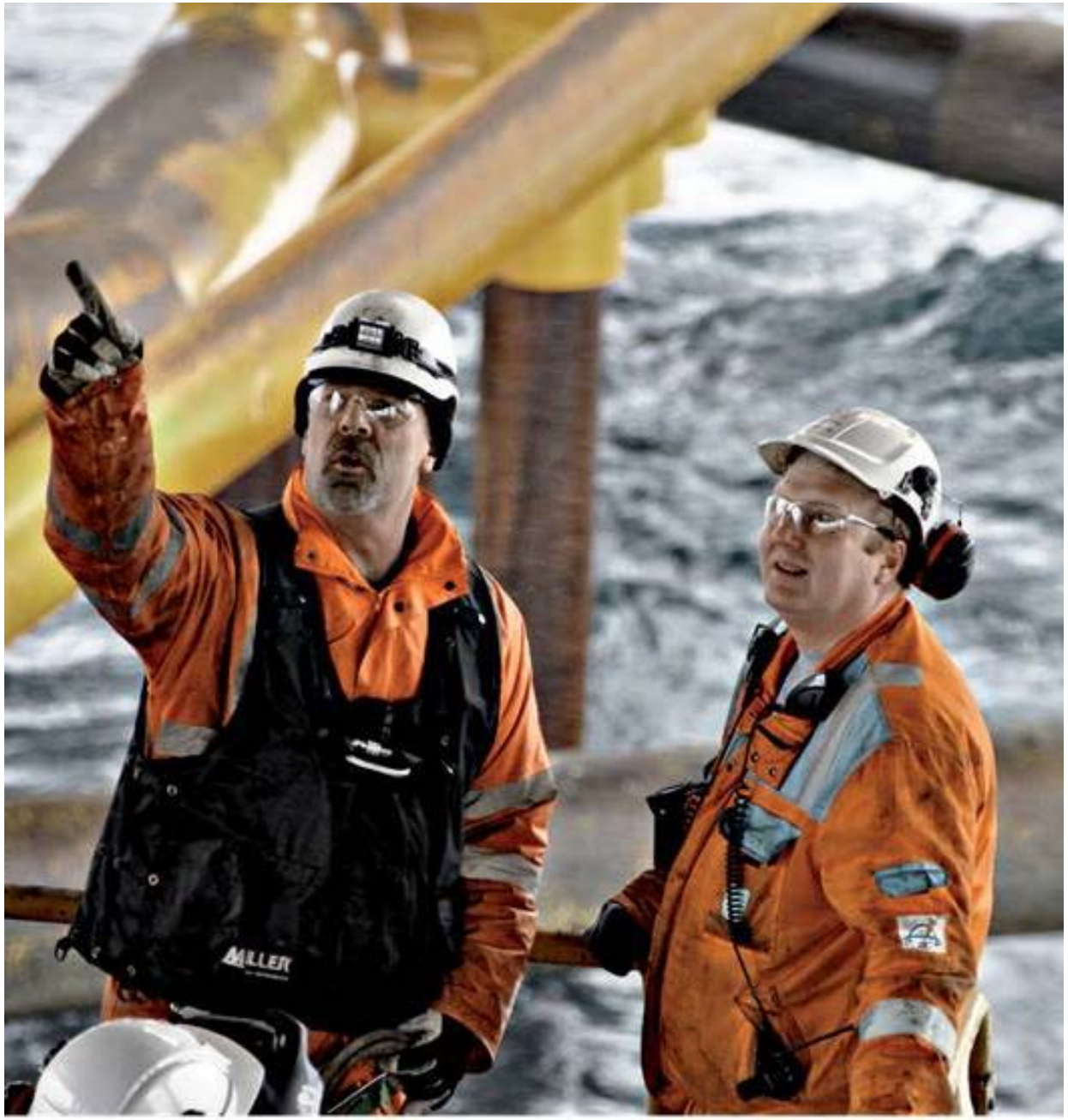
Decommissioning

- The method for removing the smaller topsides has been matured in collaboration with multiple suppliers
- The method for removing the large integrated process and accommodation topsides is being established as part of the tender process
- This approach was selected to optimally leverage capabilities and expertise in the market



Next steps

- Tenders for Decommssioning received and under evalation
- Bids out for the major EPC packages
- Final Investment Decision (December)
- Award major contracts (December/January)

End + Q&A

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