



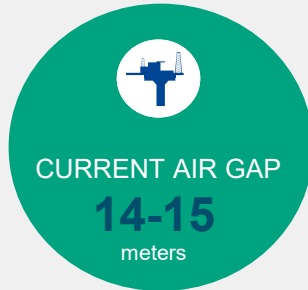
TYRA REDEVELOPMENT –THE BIGGEST JIGSAW PUZZLE IN THE NORTH SEA

Amin Abouardini, TOTAL



THE AIR GAP IS REDUCING

- +30 years of gas production has depleted and compacted the reservoirs thereby causing significant seabed subsidence (5-6 meters)
- The approximate subsidence after the redevelopment of Tyra has been estimated at 2 meters until 2042
- Future subsidence has been appropriately captured in the new design basis which stipulates an initial air gap of 27 meters





A GLOBAL JIGSAW PUZZLE..



- ▣ Frederikshavn, Danmark
- ▣ Esbjerg, Danmark
- ▣ København, Danmark
- ▣ Cadiz, Spain
- ▣ Milano, Italien
- ▣ Ravenna, Italien



- ▣ Kuala Lumpur, Malaysia
- ▣ Batam, Indonesien



Online sensors



Handheld devices



Electronic mustering



Big data insights



Performance monitoring

100.000 data points



Condition monitoring



OneShore



Installation of
by-pass pipeline

Preparations for
shutdown

Jacket installations

Removal of Tyra East
and Tyra West

Hook-up and
commissioning



Process and
accommodation
platforms –
first steel cut

Q4 2019
Tyra East and Tyra
West shut-in

Wellhead and riser
platform installations

Installation of new
process and
accommodation
platforms

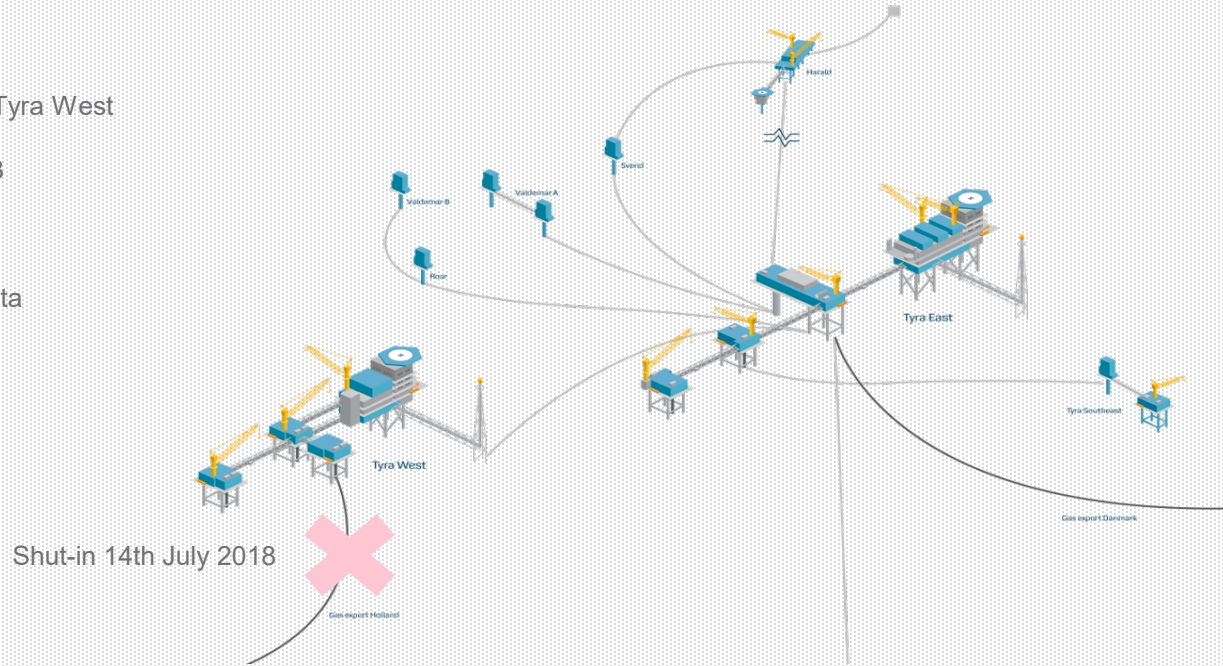
July 2022 First gas
from the new Tyra

TYRA HUB TODAY

EXISTING TYRA FACILITIES

Tyra Complex

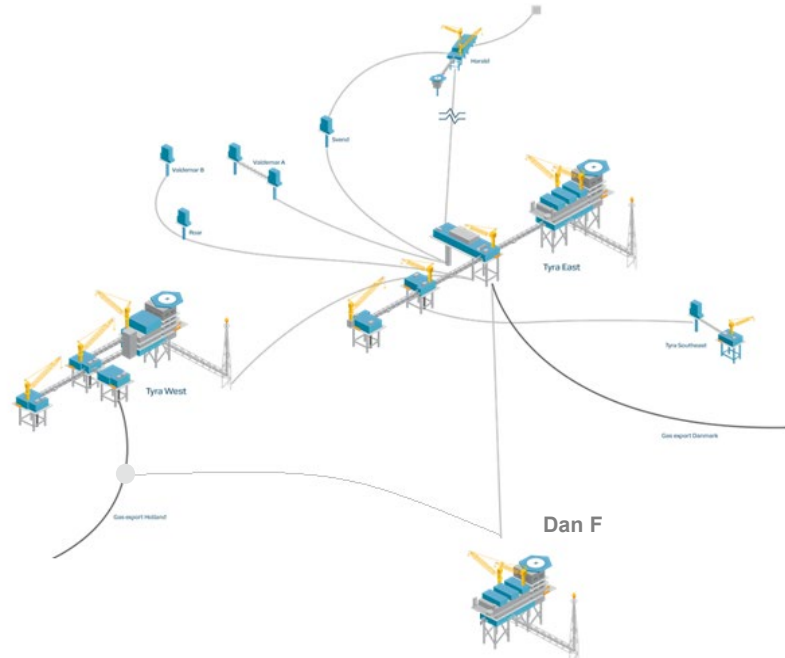
- Wells on Tyra East and Tyra West
- Satellites
 - Valdemar AA/AB
 - Valdemar B
 - Roar
 - Harald
 - Trym
 - Lulita



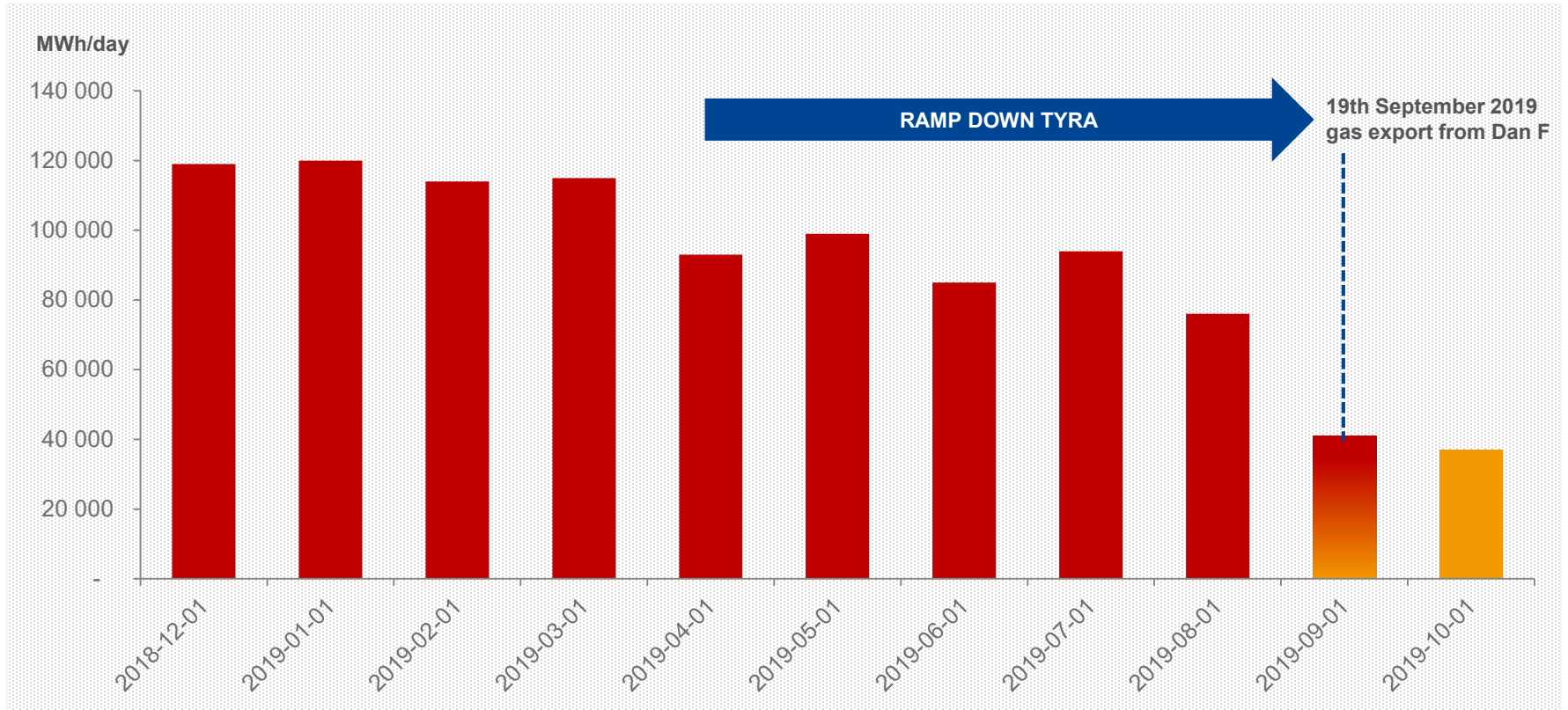
LONG BY-PASS – CONNECTING DAN F TO NOGAT

”LONG BY-PASS” PIPELINE

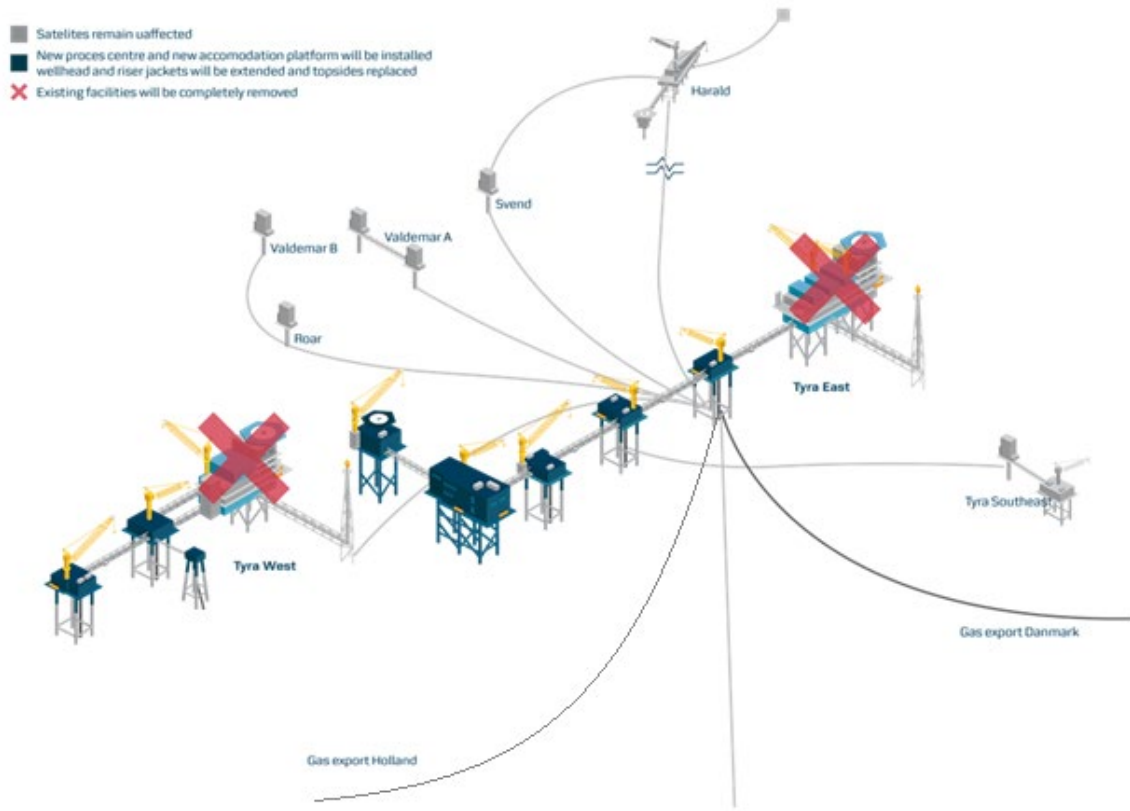
- To facilitate gas export from the Southern oil fields during Tyra shut in
- Expected gas export from Dan FC to NOGAT estimated to **37,000 MWh/d starting 19th September 2019**
- Emergency export route if earlier shut in required



TYRA RAMP DOWN – PRODUCTION PROFILE



NEW TYRA HUB





REMIT PROCEDURE CHANGED

- Update on export capacity from Tyra every month for a 4 month period (average daily rate)
- Reductions will be reported if above a certain limit to the average rate
- Quaterly update for a 12 month period; next time end June 2019

QUESTIONS?