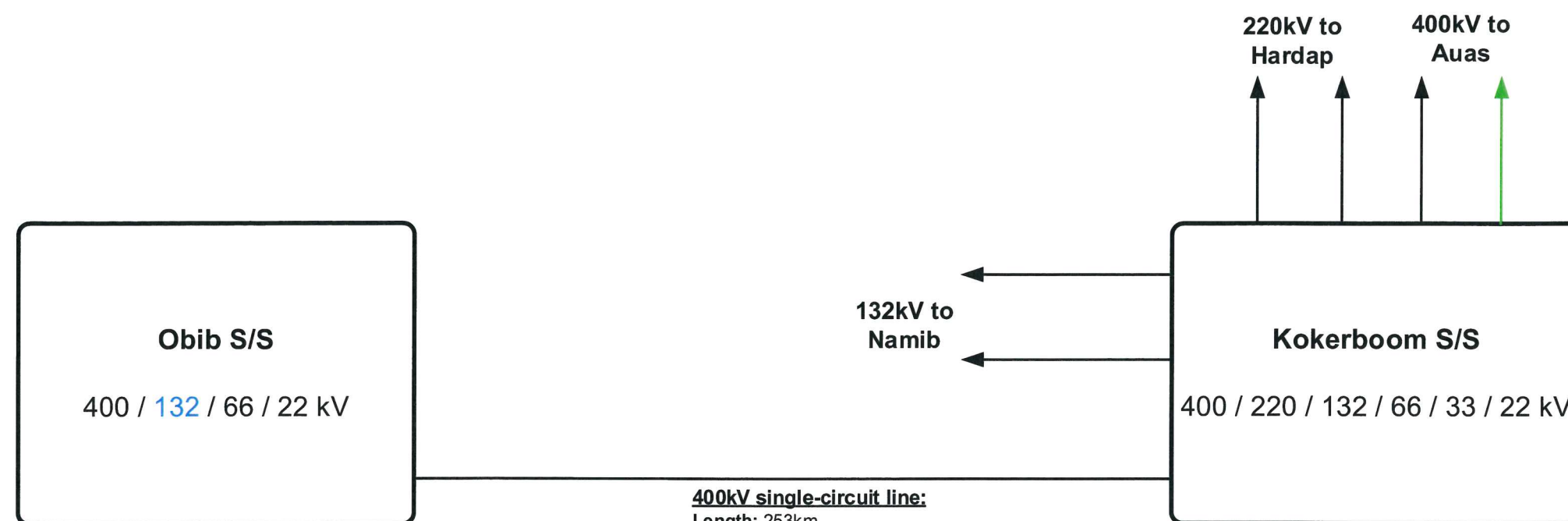


Kokerboom-Obib-Oranjemond 400kV Line Schematic

20 / 06 / 2019

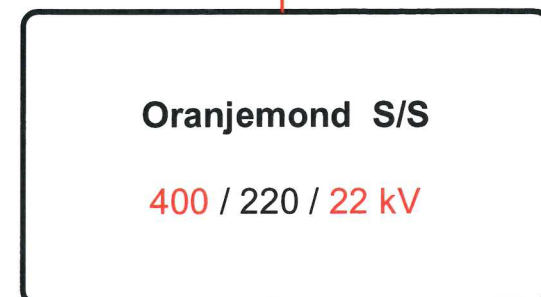


400kV single-circuit line:
 Length: 253km
 Voltage: 400kV
 Tower: Design 525
 Configuration: Delta
 Conductor: 4 x Tern per phase
 E/wire: 1 x E/wire; 1 x OPGW 48 core

400kV single-circuit line:
 Length: ±96.3km (to the border)
 Voltage: 400kV
 Tower: 422A Cross-Rope Suspension Tower
 Configuration: Delta
 Conductor: 4 x Tern per phase
 E/wire: 1 x E/wire; 1 x OPGW 48 core

NamPower (Namibia)
 Eskom (South Africa)
 BORDER (NORTHBANK)

±1.8km



NOTES:
 Underground portion of stays to be encased in concrete for corrosion protection.
 All line insulators to be composite silicone rubber.

PROTECTION REQUIREMENTS:

- Obib-Oranjemond 400kV line
 - Main – Distance protection (comms via FO)
 - Backup – O/C & E/F

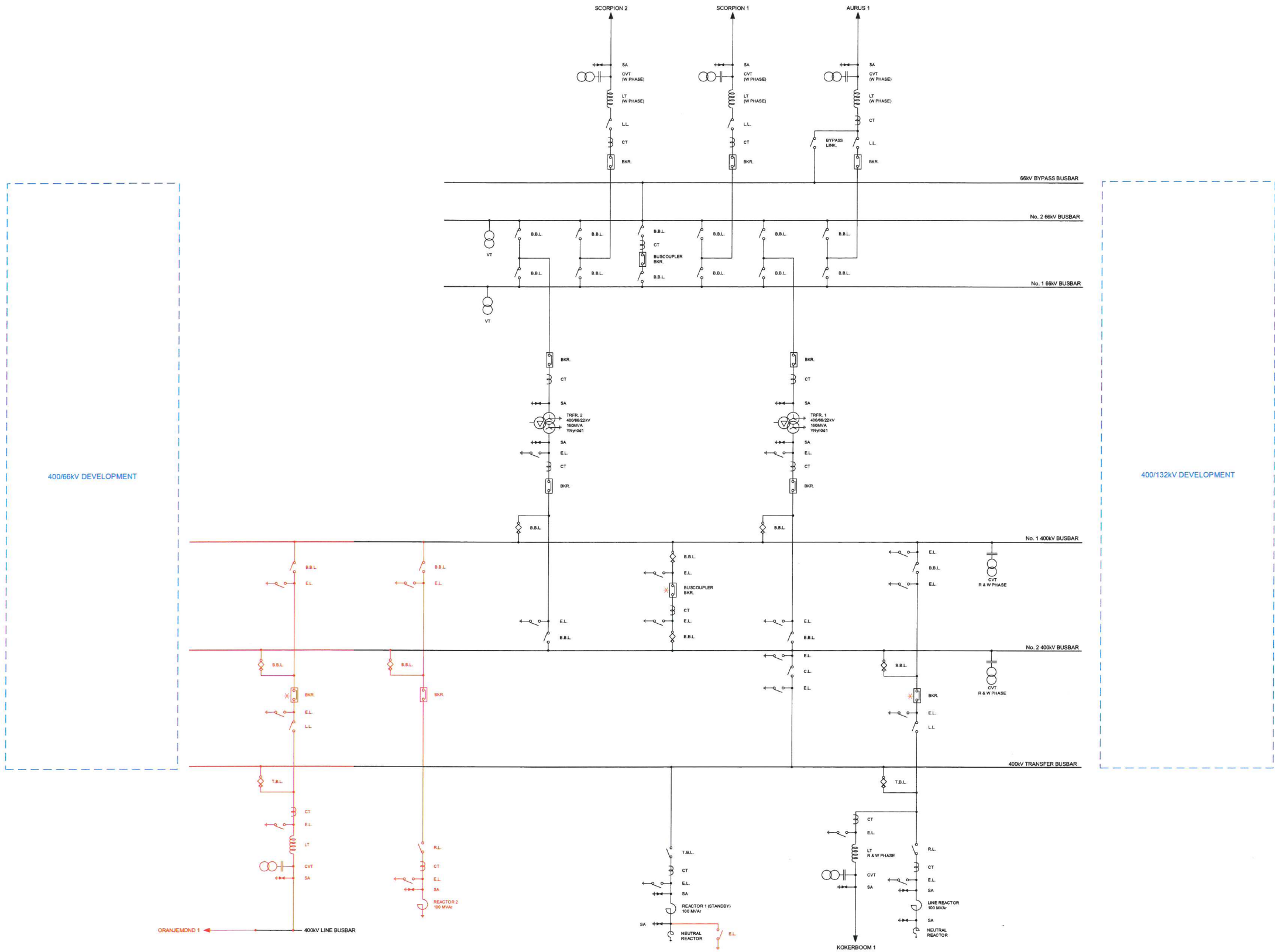
COMMUNICATION REQUIREMENTS:
 Equip the 400kV Tx line with 48 core OPGW.

Note:
☐ Items in black = existing
☐ Items in red = new
☐ Items in green = Auas-Kokerboom 400kV project
☐ Items in blue = future

SIGNATORIES

SENIOR MANAGER: System Security and Planning	Signature:	Date: 20/06/2019
SENIOR MANAGER: Wires Business	Signature:	Date: 21/06/2019
SENIOR MANAGER: Engineering Services	Signature:	Date: 21/06/2019
DIVISIONAL MANAGER: Transmission Division	Signature:	Date: 26/6/19
CHIEF OFFICER: Power Systems Development	Signature:	Date: 26/06/19

DRAWN BY: R.J. JACOB
 REVISION: 0



NOTES:

- * Auto synchronising facility
- Relocate the existing 400kV line busbar and use it for Oranjemond 400kV feeder
- Construct a new fence to accommodate Oranjemond 400kV feeder bay and the extended section of the busbars
- All works at Obib Substation to comprise similar steel lattice structures, busbar equipment, etc. as currently installed
- Reactor 1 to serve as a standby line and busbar reactor
- Reactors to be procured on international tender specifications for 100MVA/r reactors if not already available in store

CONDUCTORS FOR STRINGING:

- 400kV Busbars
Tubular same as is already installed
- 400kV Line Feeder bays
3 x BULL (same as is already installed)
- Stringing to connect 400kV reactors
2 x BULL per phase (minimum for corona)

PROTECTION AUTOMATION CONTROL (PAC) REQUIREMENTS:

- All schemes shall be IEC 61850 compliant and integrate into existing station automation and control.
- 400kV line feeder bays (EHV Scheme, M1 & M2)
 - Main – Distance protection (comms via FO)
 - Backup – O/C & E/F
 - Integrated transfer facility
- 400kV reactors
 - Differential protection and Restricted E/F
 - Backup O/C and E/F
- 400kV buszone
 - Integrate into the existing scheme

COMMUNICATION REQUIREMENTS:

- 400kV Tx lines fitted with 48 core OPGW.

Note:
□ Items in black = existing
□ Items in red = new
□ Items in blue = future

DRAWN BY: R.J. JACOB
REVISION: 0

SENIOR MANAGER: System Security and Planning

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