TRANSMISSION LINE CONSTRUCTION

PRESENTER: Dirk van der Westhuizen
ABOUT US

• ESTABLISHED IN 1997
• OFFICES AND WORKSHOPS IN BRITS
• THE COMPANY EMPLOYS 1100 PEOPLE
• ANNUAL TURNOVER OVER R300 million
• CONSTRUCTED IN EXCESS OF 500Km 400kV LINES
• INSTALLED IN EXCESS OF 8000Km OF FIBRE CABLE
• PIONEERED LIVE LINE INSTALLATION OF FIBRE
• FIRST AIR-MOBILE OPERATION OUTSIDE ESKOM
• ISO9001:2000 – FIRST DRAFT SUBMITTED
Optic 1: Overview

- Registered as Towertel (Pty) LTD t/a OPTIC 1
  - Fibre Worx
  - Live Worx
  - Transmission Worx
  - Distribution Worx
  - Rebar Worx
  - Survey Worx
  - Chopper Worx (Sister Company)
  - JV with IMAB Engineering – OPTIMAB (Pty) Ltd

- BEE
- CIDB Registered: CRS 145949 – 8EE
- Finalize ISO: 9000 implementation by December 2009
Optic 1: Current Projects

- Construction of Mercury – Zeus 765 kV line (Optimab) – 280km
- Construction of Grassridge – Poseidon #3 400kV line 117km
- Replacement of Earthwires with OPGW – Cape Peninsula 640km
- Day-by-Day Fibre Optic Cable Projects - +/- 400km Country Wide
- ADSS Deployment – Phase 3 Telecom Nigeria - +/- 1000km
- Line Surveys and Feasibility Studies – Dancomm Nigeria – 4200km
Our Opposition: Current Projects

• VISCAS CORPORATION & MKHULU JV
  - Construction of HYDRA - GAMMA 765 kV line 2 x 140km

• KEC and EDISON JEHAMO JV
  - Construction of MAJUBA – UMFOLOZI 765kV line Sect “A” 100km

• YOTI and PH MARKETING
  - Construction of MAJUBA – UMFOLOZI 765kV line Sect “B” 100km

• BABCOCK NTHUTHUKO POWERLINES
  - Construction of TABOR – SPENCER 275kV line 75km
THE OPTIC 1 MACHINE
WHAT DOES TRANSMISSION WORX MEAN?

• A BUSINESS UNIT EXECUTING LINE CONSTRUCTION PROJECTS
• CAPABILITIES TO CONSTRUCT LINES WITH VOLTAGE UP TO 765kV
• IN-HOUSE RESOURCES TO EXECUTE THE FOLLOWING:
  - SURVEY AND PEGGING
  - BUSH CLEARING
  - INSTALLATION OF SERVITUTE GATES
  - TOWER FOUNDATIONS
  - CUTTING AND BENDING OF REINFORCING STEEL
  - ASSEMBLY AND ERECTING OF TOWERS
  - STRINGING AND REGULATING OF PHASE CONDUCTORS
  - STRINGING AND SPLICING OF OPGW CABLES
  - APPLICATION OF BIRD GUARDS AND BIRD DIVERTERS
• ALL THE ABOVE CAN BE OFFERED TURN-KEY
SURVEY AND PEGGING DONE INHOUSE
EXCAVATION IN HARD ROCK IN PROGRESS – DE AAR
LIFTING OF A 400kV GUYED-V MAST
A 765kV GUYED V STRUCTURE – READY FOR LIFTING
LIFTING OF A 765kV GUYED – V MAST
ESKOM’S MOST COMMONLY USED CROSS-ROPE STRUCTURE
LOW VISIBILITY – LOW ENVIRONMENTAL IMPACT OF THE CROSS-ROPE STRUCTURE
16 TON PULLER – SUITABLE FOR STRINGING OF 400kV LINES – QUAD CONFIGURATION
15 TON PULLER-TENSIONER – SUITABLE FOR STRINGING OF 400kV LINES – QUAD CONFIGURATION
15 TON PULLER-TENSIONER – SUITABLE FOR STRINGING OF 400kV LINES – QUAD CONFIGURATION
SPECIAL SCAFFOLDING ERECTED TO ENABLE LIVE CROSSING OF CONDUCTORS OVER A 132kV LINE
400kV GUYED – V STRUCTURE DURING STRINGING OPERATION
WHO IS LIVE WORX?

• THE ONLY FULLY ESKOM ACREDITED ORGANISATION
• WE PERFORM MAINTENANCE ON ENERGISED LINES WITH
  THE FOLLOWING LIVE WORK PROCEDURES:
  - AIR MOBILE (HELICOPTER UNDER SLUNG)
  - INSULATOR REPLACEMENT UP TO 400kV
  - INSULATOR SPRAY WASHING
  - BROKEN CONDUCTOR REPAIRS
  - REPLACEMENT OF SPACER-DAMPERS
  - REPLACEMENT OF EARTH WIRES WITH OPGW – DPR SYSTEM
  - LIVE LINE AUDITS – PREVENTATIVE MAINTENANCE
TOWER LANDING TO DISPATCH LIVE WORKERS ON 400kV LINE
REFUELING UNIT – CONVENIENT WHEN WORKING IN URBAN SURROUNDINGS
SOME OF OUR LIVE LINE TOOLS
Chopper Worx – (Sister Company)

- **Fully licensed operator by Civil Aviation Authority**
  - Class 1, 2 & 3 licensed
- **Utility work**
  - Helicopter assisted power line work
  - Construction of Power lines in remote areas
  - Power line auditing
  - Infra Red scanning
  - Geo Technical Surveys
HELICOPTER ASSISTED CONCRETE CASTING IN THE ZUUR MOUNTAINS AROUND PATERSON – E CAPE
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FIBRE OPTIC PROJECTS
OPTIC 1: Fibre Worx

- OPGW Turnkey Installations
- ADSS Turnkey Installations
- Splicing
  - Complying to International Specifications
  - OTDR Testing
  - Power Budget
  - Dispersion Testing
  - “As Built” Documentation
Optic 1: More Fibre Worx...

- Complying to NRS 61-2: 2002 Para 4.4.1: System Testing
- Tensioner/Puller Eskom Compliant: Recording Devices for Tension Stringing
- ADSS: Equipotential Field Plots
- Finalising MASS Installation Techniques
Optic 1: Fibre Market Changes

- Pioneered: “DPR” Double Pulley Replacement System for live replacement of OPGW
- Proposed 10,12 & 16 kA OPGW Designs approved by Eskom Transmission Telecomm Division
- Engineered an improved ADSS Cable deployment technique for our Nigeria based Operations
HEALTH AND SAFETY AWARD

Presented to

OPTIC 1

for

1 Million manhours
without a lost time injury

31 March 2007

Managing Director

Date

Eskom Enterprises