Maintaining the Power Grid for 2010 Soccer World Cup

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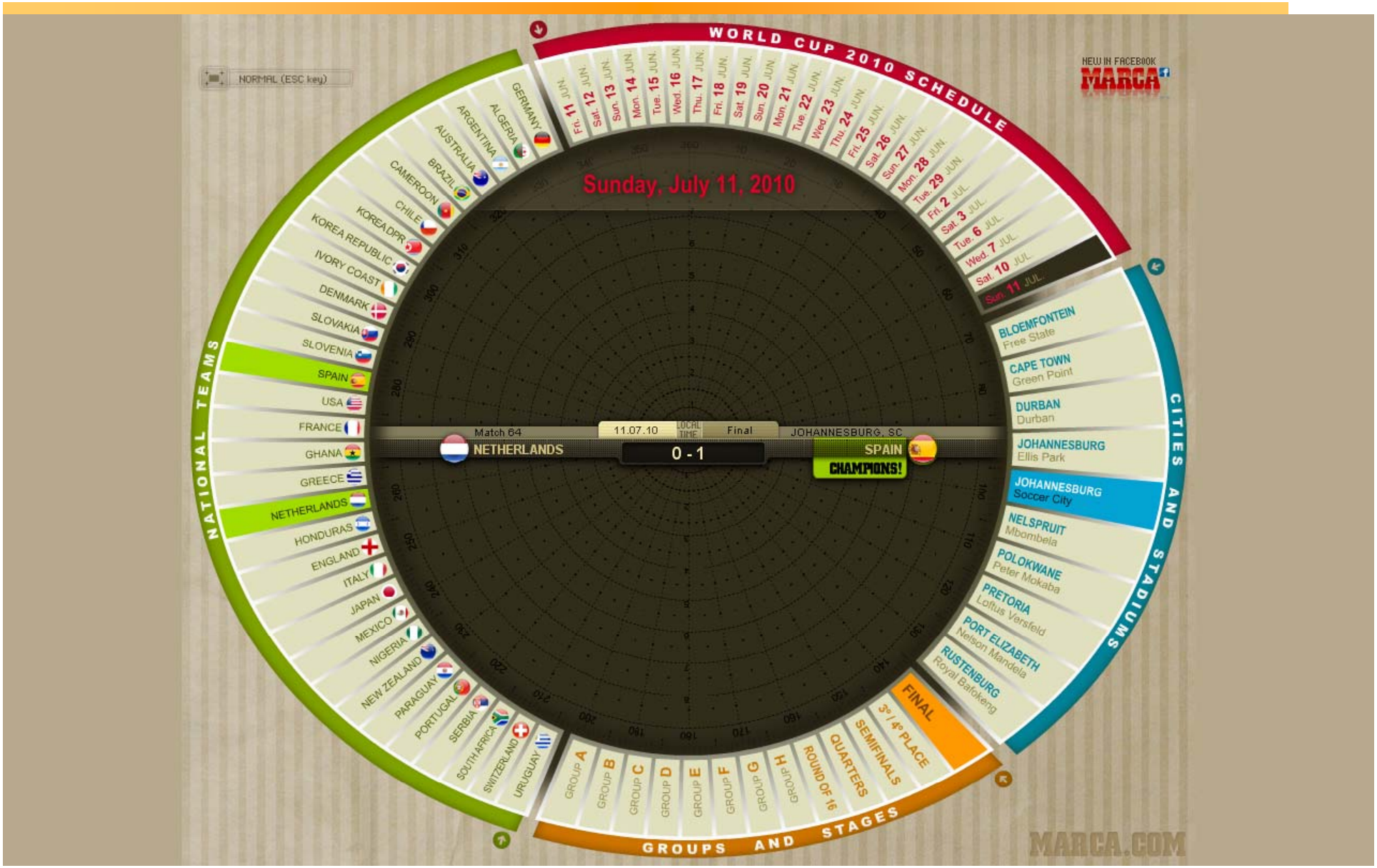
Dr. Johan Enslin
VP – International & Sustainable Energy
Quanta Technology
JEnslin@Quanta-Technology.com

Overview

- FIFA 2010 World Cup in South Africa
- Status of Power Grid in South Africa
- Uprating and Conductor Analysis
- Energized Solution to Uprate 88 kV System
- Emergency Support during World Cup
- Status of Uprating Project

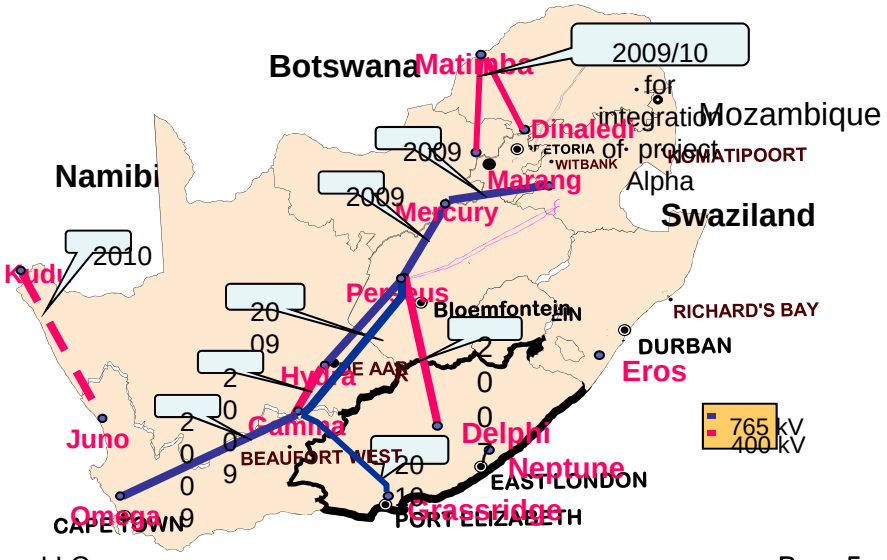
FIFA World Cup 2010

FIFA World Cup 2010



Status of Power Grid in South Africa

- Installed Capacity - 45 GW with Reserve Margin < 10%
- Johannesburg Old 88kV Network (1950 vintage)
- Last few years had rolling Blackouts
- Existing electrical transmission and distribution infrastructure have no or limited N-1 reliability
- System cant support an outage nor alternative route is available
- Restricted ROWs

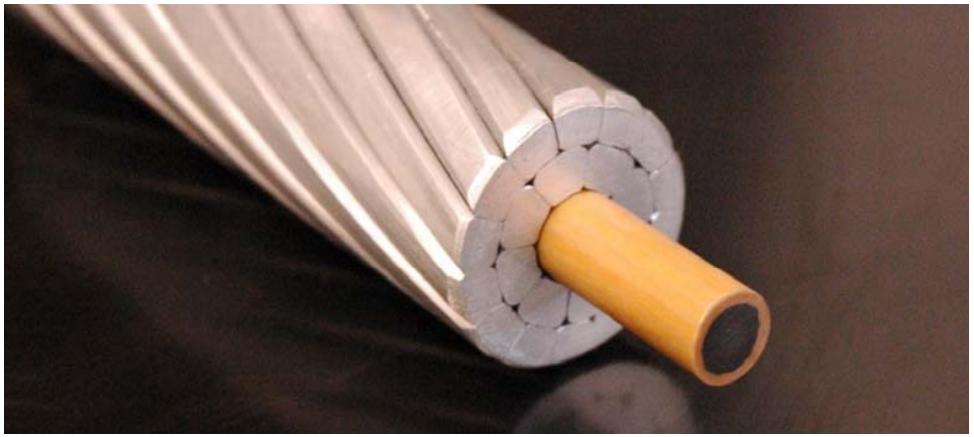


Energized Solution to Uprate 88 kV System

- Re-conductor the City Power 88kV system:
  - Uprade to High Temperature ACSS conductors
  - Increase individual circuit capacity – 100% target.
  - Mechanically harden transmission system, extend life.
  - Enhance system economic performance and end-customer satisfaction
- Energized Techniques and Robotic Technology:
  - Safe and economic solution to a complex operation.
  - Shorter project timeline
  - Securely holding energized lines/equipment intact during upgrades
  - Increasing personnel safety
  - Increasing utilization of existing transmission assets
  - Safely reconductoring, rebuilding and replacing/adding lines and equipment while not taking system out of service
  - Better asset maintenance and upgrade in restricted right-of-ways

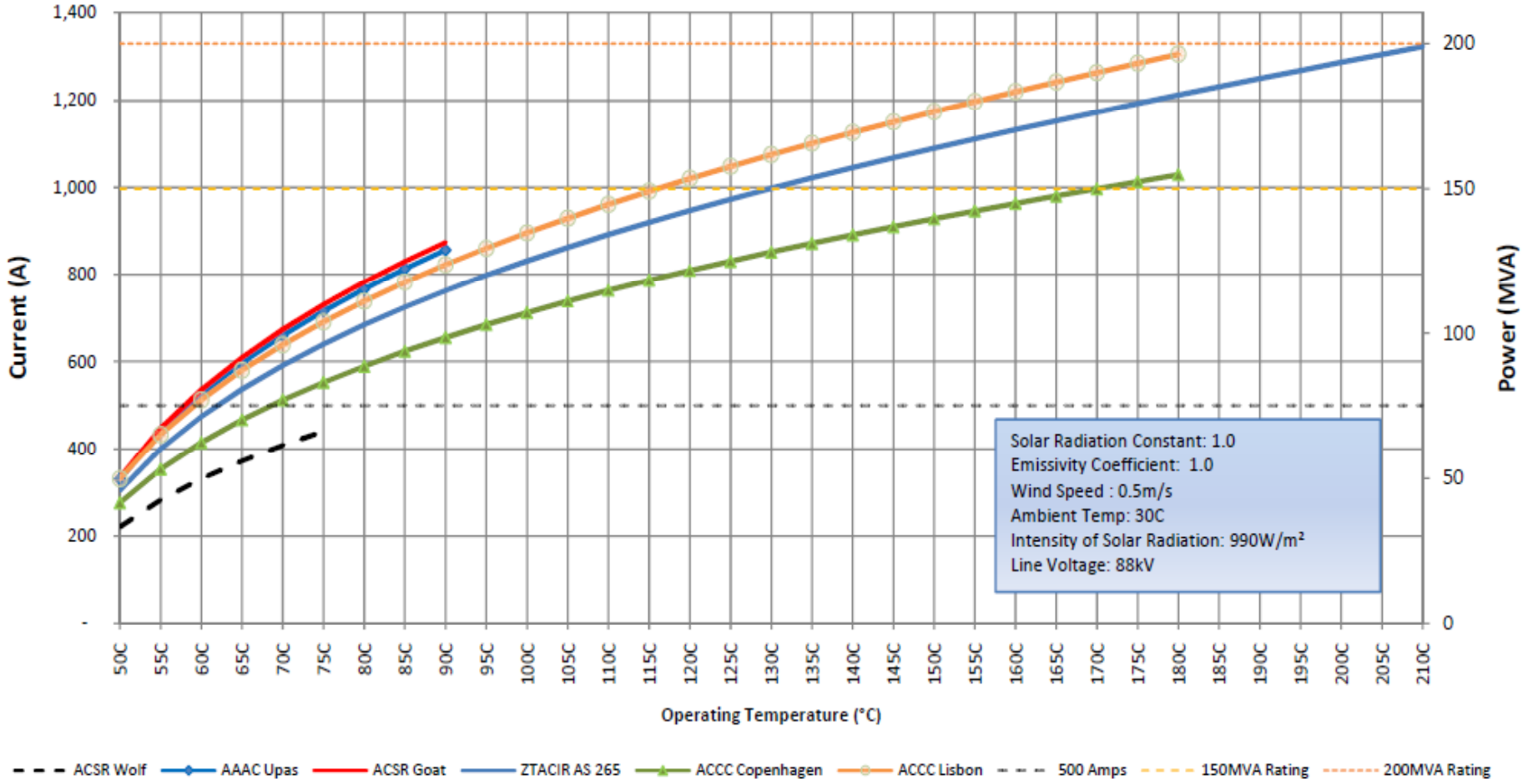
Uprating and Conductor Selection

- Require 50-100% power increase on 88kV system
- Provides power throughput from 100 MW to 200 MVA
- Select High Temperature ACCC Conductors
- Replaced UPAS and WOLF conductors with the ACCC Lisbon and ACCC Copenhagen conductors
  - 28% More Aluminum
  - Greater Strength
  - Lower Coefficient of Thermal Expansion
  - Less Sag at Higher Temp.

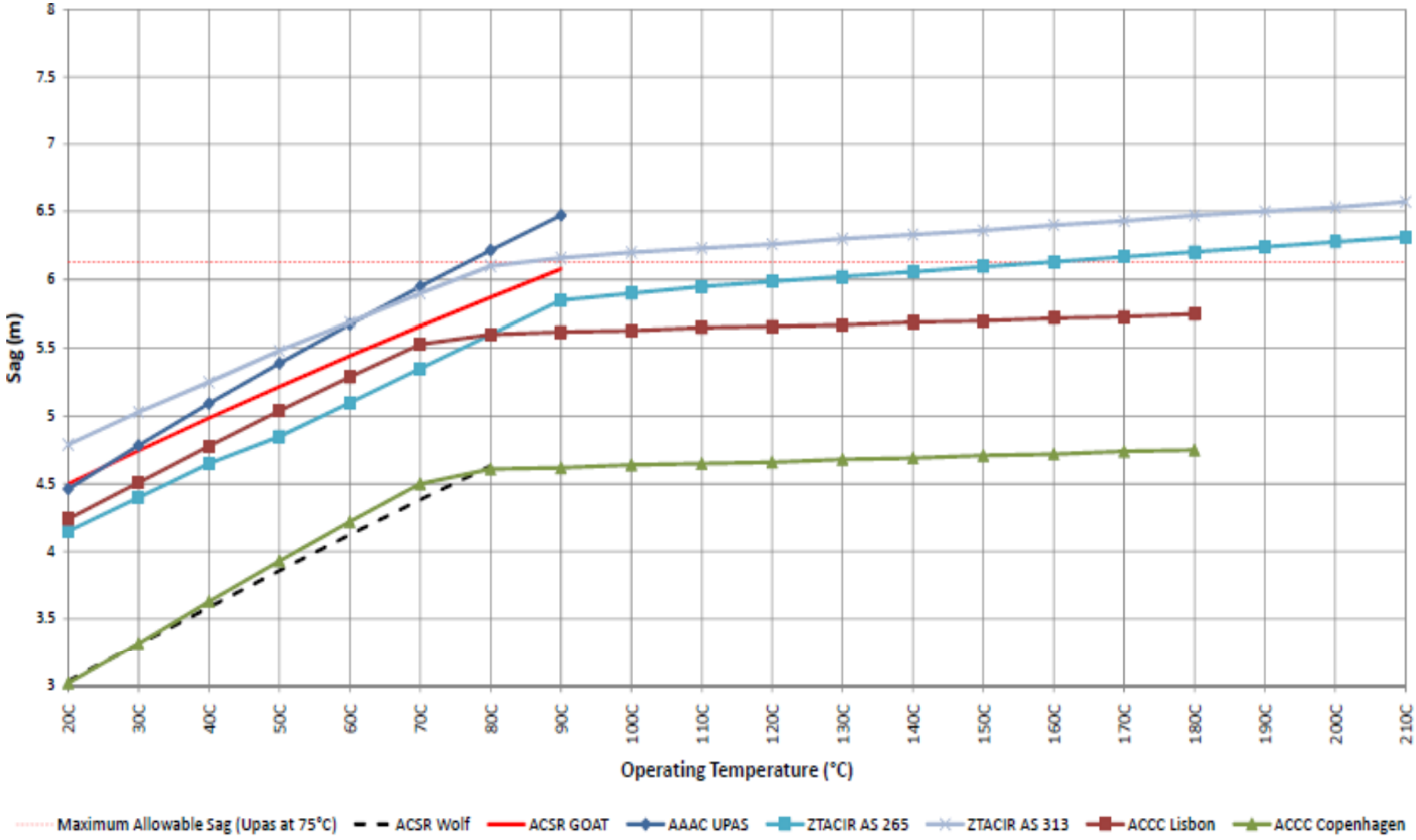


ACCC uses a carbon fiber core that is 25% stronger and 60% lighter than a traditional steel core

Conductor Thermal Rating Comparison



Approximate Sag for Spans of 200m - ACCC vs. ZTACIR



Kelvin – Cydna

Kelvin – Cydna:16.8 km, 88kV, 100MVA to 150/200MVA

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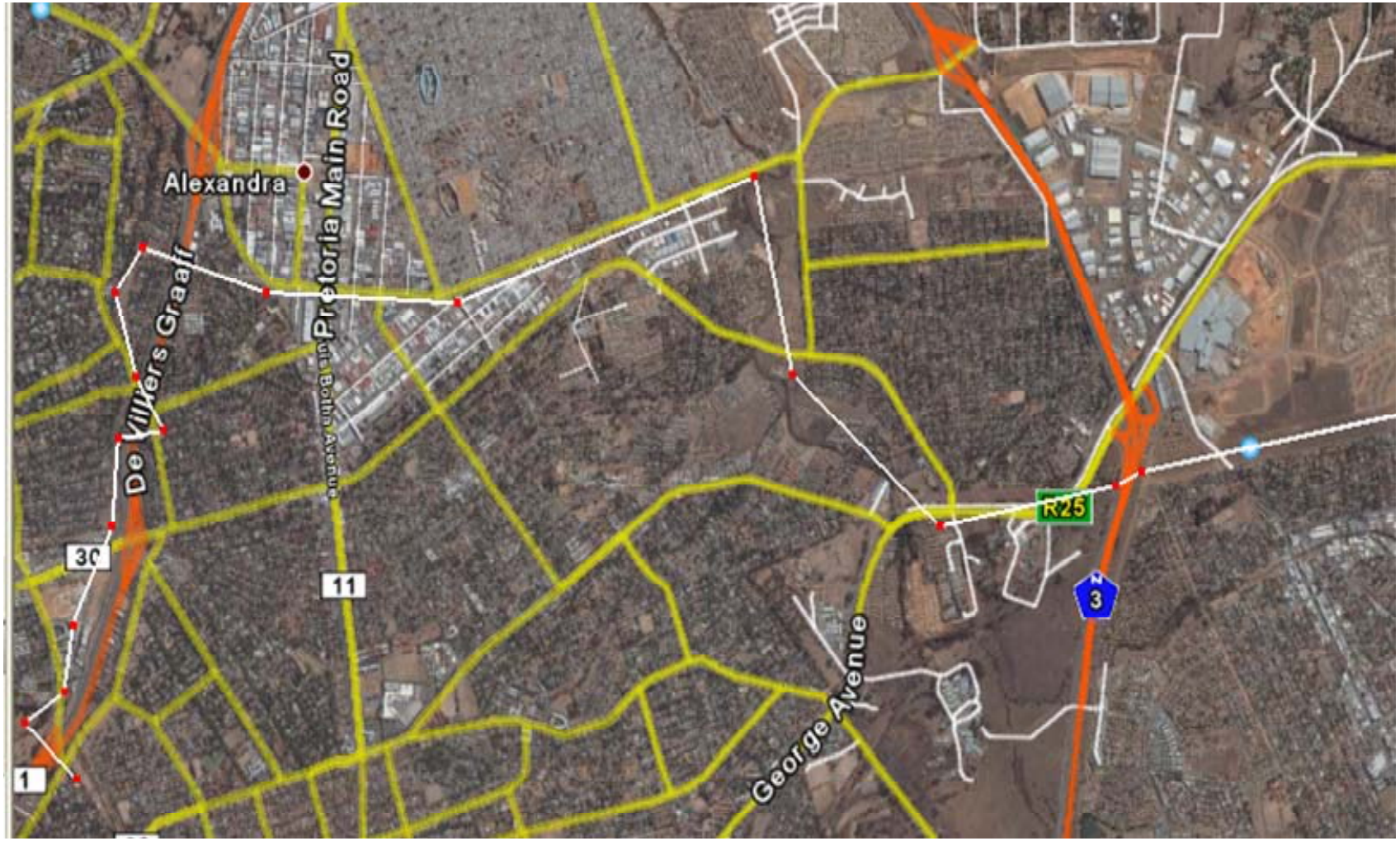

Quanta Energized Services Team

South Africa - Re-conductoring

88 kV Energized Uprating using LineMaster™ with an additional delta circuit

South Africa - Re-conductoring

- Equipotential string technique used in South Africa to increase efficiency – necessary safety measures in place

Emergency Support During World Cup

- Support was provided during the World-cup
- Emergency repairs and standby
- Quick response to break downs
  - Prospect - Robertsham (stabilize tower)
  - Orlando - Fordsburg (conductor down)
- Live-Line inspections / Audits
- Section of Kelvin – Delta upgraded

Distance	Cond. Type	Voltage	New Cond.	SOW
Str 1-52	Upas	88kV	Lisbon	Line Reconductor

Phase II - Delta – Rosebank

Delta – Rosebank: 1.3km, 88kV, 60MVA to 150/200MVA

Phase II - Kelvin – Sandringham

Kelvin – Sandringham: 8.6km, 88kV, 100MVA to 150/200MVA

Phase II - Kelvin – Greswold

Kelvin – Greswold: 11.4km, 88kV, 100MVA to 150/200MVA

Thank You – Questions?

For more information about our services please contact:

Quanta Technology

Johan Enslin, PhD, PrEng

Vice President – International & Sustainable Energy

+1 (919) 334-3037

JEnslin@Quanta-Technology.com

www.quanta-technology.com