

*2010 FIFA World Cup ~ South Africa
Stadium electricity supplies*

Presented on behalf of 2010 ESI Forum

By

TR Edmondson & Dr C Carter-Brown



2010 FIFA World Cup – 2010 ESI Forum

- Jointly formed by AMEU and Eskom in 2007
- Information sharing and collaboration to ensure reliability of supply for 2010 FWC.

2010 FIFA World Cup – Background

- **Stadiums:** The 10 stadiums in 9 Host Cities at which the matches will be played.
- **Base camps:** Each of the 32 teams will have a “base camp”, and are expected to arrive at base camp up to 2 months prior to the start of the tournament. Base camps could be located anywhere in South Africa.
- **Training venues:** Each Stadium has up to two training venues within the Host Cities.
- **Fan parks:** FIFA fan parks will be located in Host Cities.

2010 FIFA World Cup – Background

- **Public viewing venues:** Non-FIFA accredited viewing venues that will be set up by municipalities and private enterprise.
- **FIFA hotels:** Hotels at which FIFA will establish their local offices and operations centre.
- **Media centres:** Journalists will be hosted at the International Broadcast Centre which will form the hub for broadcasting and reporting.
- **Supporters:** The accommodation, tourism and transport needs of visitors.

2010 FIFA World Cup – Overview of Stadium Power Requirements



**Domestic/Stadium
Power**



Technical Power

**Overlay/precinct
Power**

2010 FIFA World Cup –

Domestic/Stadia Power

Pitch Lighting:

- Host City is responsible for pitch lighting.
- Stringent lighting quality requirements.
- Available and functioning 100% during a match.
- Zero switch time tolerance. I.e. switching between electrical supplies must have no impact on the pitch lighting.
- Recommendation - Uninterruptable power supply (UPS) to ensure that any anomaly (Dips, surges etc) on the network (grid or generator) has no influence on the pitch lighting.
- Generators or alternate power supply capable of sustaining the pitch lighting for a minimum of three (3) hours.
- Maintenance and refuelling are the responsibility of the Host City.



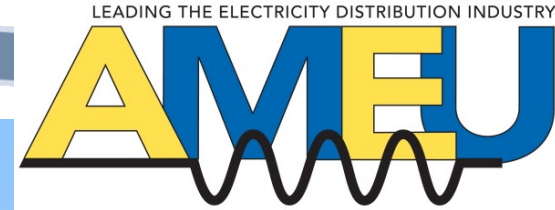
2010 FIFA World Cup –

Domestic/Stadia Power

Stadium building power:

Stadium building power is the required supply within the stadium to power appliances, facilities and lighting within the stadium i.e. General stand lighting, administration offices and suites.

- Backup power requirement in the event of a power failure is limited to that of the Occupational health and safety act (OHSACT)
- This power excludes any broadcast or media provisioning.
- Configuration of the MV power supply is at the discretion of the Host City and is recommended to have minimum n-1 redundancy.



2010 FIFA World Cup – Domestic/Stadia Power

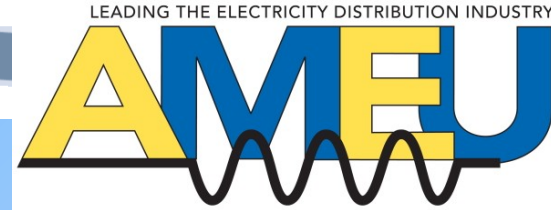
Summary:

- Supply from Grid, provided by the **Host City**
- Two sources of power supply (N-1)
- Public grid backed up by generators supplied by the Host City
- 100% Pitch Lighting available (Zero Tolerance)
- OHSACT



2010 FIFA World Cup –

Technical Power



This is power for the **broadcasting** and **television** requirements

- NO HOST CITY INVOLVEMENT. This is the responsibility of the LOC.
- NO GRID SUPPLY*. Islanded from the grid power supply. Supply is provided via diesel generators supplied by the LOC.
- Covers all broadcasting mediums.
- Total of three 500kVA generators each capable of taking the full load. Two generators run in parallel with the third being a backup. A fourth generator will be required for the venue hosting the final game.
- Zero supply switching tolerance.

* Grid supply may be requested for the local media site offices

2010 FIFA World Cup – Technical Power

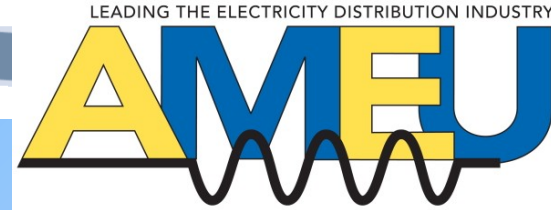
Summary:

- Generators only
- Twin packs run load shared as 0 switch time tolerated
- Also referred to as Broadcast Power.
- Power that is required for the match to be televised continuously
- May require a small supply during non-match periods



Technical Power

2010 FIFA World Cup – Overlay/Precinct Power



Area immediately surrounding the stadium including ticketing offices, hospitality, accreditation etc

- Host City responsible to supply a medium voltage (11kV) point/s of supply. For 2010 there may be as many as four required per stadium and the number and location of these bulk supply points will be stadium dependent.
- The requested capacity for the confederations cup was around 2MVA. 2010 is expected to require greater capacity.
- The LOC will install and operate the temporary MV/LV distribution network linking the MV bulk supply point with the individual loads.
- The LOC will install and operate backup diesel generation for the overlay supply.
- Approximate 1 minute switch time tolerance between grid supply and backup supply.

2010 FIFA World Cup – Overlay/Precinct Power

Summary:

- Supply primarily from Grid, provided by the **Host City**
- Potentially multiple points of supply at 11kV
- 2009 FIFA CONFEDERATION CUP requirements 2MVA
- 2010 FIFA WORLD CUP requirement expected to be 2 to 3 times greater
- Backed up generators and reticulation to be supplied by DoE/LOC Appointed Contractors
- Switch time tolerated (approximately 1 minute)



2010 FIFA World Cup – Stadia

- Soccer City
 - Grid supply from multiple firm Sub Stations
 - 4x 500kVA and 1x 630kVA installed generators to supply backup power for both Pitch lighting and OHSACT requirements.
 - Five UPS systems ensuring “clean power” to the five pitch lighting sections within the stadium
 - UPS has a 30 Minute capacity

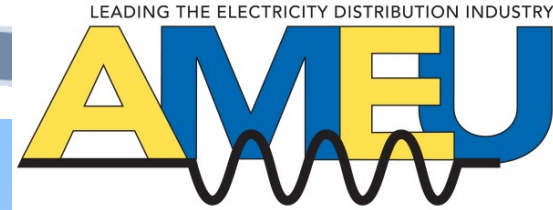
2010 FIFA World Cup – Stadia

- Nelson Mandela Stadium
 - Grid supply from firm Sub Station (Mount Rd S/S 22/66kV)
 - Backup supply from a Gas Turbine.

- Four rotary UPS systems ensuring “clean power” at each of the stadiums four internal Sub Stations

– Source: Carl Hempal – NMBM

2010 FIFA World Cup – Stadia



- Free State Stadium

- Primary power for the stadium during the event will be Generator power (2x1250kVA)
- Backup supply from firm grid supply
- Configured to run in parallel during the event

– Source: Leon Kritzinger –CENTLEC (Pty) Ltd

2010 FIFA World Cup – Other focus areas

Focus Area	Grid Supplies	Generators - Host City (Backup)	Generators – Venue Owner	Comment
Official FIFA Fan Parks:	City/Eskom	OHSACT		
Public Viewing Areas:	City/Eskom	OHSACT		Not FIFA Official site
FIFA Official Offices	City/Eskom		OHSACT	City Responsibility
Training Venues	City/Eskom			
General Media Centre's	City/Eskom		OHSACT	
Base Camps	City/Eskom		OHSACT	
Hotels, B&B's etc	City/Eskom		OHSACT	
Transport	City/Eskom			Rail, Air and Road

- Heightened response from the local electrical supplier
- Prioritising of faults in relation to the potential impact of fans/customers

2010 FIFA World Cup – Points to Note for Stadiums

- FIFA Exclusive use period is 15 business days before first game at stadium and 5 Business days after last game at stadium. - electricity readiness needs to mirror this.
- Heightened response and restoration has to be in place effective +/-2 weeks prior to event.
- Require personnel on site at key supply points from match day - 1.
- Fuel supplies and spares to be sent to site at least 48 hours before match and if used replaced within 24 hours.

– Source: Arup Consulting

2010 FIFA World Cup – Acknowledgements

- Arup Consulting
 - 2010 ESI Members
 - 2010 Task Team Members
-
- Note:
 - The information presented has been collated from various sources and may change in the lead up to the 2010 FWC