ISSA International Forum on Occupational Heath and Safety Management in the 21st Century

Managing H&S behaviour by engagement - on the London 2012 Construction Programme - a view from 'the inside track'.......
What I would like to share with you....

• Intro, about.....
• Setting the scene
• Some metrics
• The challenge
• The pictures, the evidence - we definitely where there, we definitely were effective and we definitely left a defining lasting legacy!
• Collaboration and teamwork
• A mature, developed and pioneering client
• 7 years of our lives and that of our colleagues in 20mins, a few slides - do able - of course, we don't do failure!
• The occasion
• The enjoyment
• The outcome
By 2013, how many Olympic Games had London hosted?

Quiz Question...
Setting the scene - Introduction

• Electricity Network operator for London & South East
• Leading and developing the transmission and construction team and professional/supply chain since July 2005, first involved as an SME from November 2004….! No escape!!
• Responsible for all aspects of 132kV project construction works – including raising the standards of traditional H&S management to be pioneering, UK & world leading and ‘best in class’…..for 2012 infrastructure and beyond…..embed back into our business…
• Performing the role as the ‘good corporate citizen’, perfect partner…
• Achieving and sustaining enduring H&S standards, targets, training, application & awareness (plus contract performance) while ensuring the network performs during the Games…..
• Promoting and driving ambitions, but importantly doing all (and more!) we could to ensure NO-ONE gets injured or hurt, no matter how inconsequential; or damage to systems/assets, and the public…
• Early works set the context for the ODA’s and IOC’s delivery ambitions wrt health, safety….. and the environment…..
Setting the scene....

• “Health and safety management, the focus on occupational health, healthy eating, and the impact of tools, processes and equipment has moved the whole area of construction site safety and awareness along way from humble beginnings - with an extremely positive effect on assuring the workforce is safe and with less incidents and accidents - so what next, where do we go from here?” Liam G O’Sullivan

• 3 million man hours, 3 consecutive 1m mhrs without incident

• One project - Kings Yard Primary Substation (KYPS) - 686,762 mhrs; Riddor LTI 1; Minors 8; Near misses 4; AFR 0.14
Our challenge

• To do it safe…..
• To do it right…..
• To do it on time…..
• To do it to budget…..2012 WAS FIXED

• These are not in conflict - although they are always seen as being…perhaps sometimes are deemed to be – they AINT!!
Iron Age Settlement

Unearthed Roman road

Roman coin

An old friend
Olympic Park Site: Location

- Stratford
- New Stratford City Development
- Athletes Village
- Olympic Site Offices
- O2 Arena
- Docklands Canary Wharf
- New Kings Yard PSS
London 2012 Electricity Infrastructure Projects

- PLUG – Powerlines Undergrounding Tunnel Project
- Overhead Line Removal Project
- Hackney Reinforcement Project
- Bow Substation Upgrade Project
- Kings Yard Primary Substation : Section 22 Phase 1 and Phase 2
- Kings Yard Primary Substation
- HV - 11kV Electrical Network (LVU)
- LV Network
- Operational Readiness
- Various connections and disconnections for Olympic Venues
Powerlines Undergrounding Project

New Hackney
132kV Substation

Eastway
Tunnel Shaft

New Kings Yard
132kV Substation

Stratford
Network Rail Substation

Carpenters Road
Tunnel Shaft

New Bow
132kV Substation and tunnel shaft

West Ham
132kV Substation
Concept to reality - Powerlines

• 13 kilometres of tunnel, 8 Wembley's full of muck…..
• Over 200km of power cabling, London to Belfast and back….
• 52 overhead pylons, beautiful they were……
• 80km of overhead line conductor, lots of scrap……
• 1000 days, 3 years of my life…..
• 420 workers….lots of mates, & friends made along the way…..
• £280 million………a little project
• Other power projects – £110million………

• But most of all, a great team effort, no serious injuries; incidents, yes, but a relatively small number
CONCEPT TO REALITY

— “PLUG is probably the highest risk and toughest project we’ll do on the Olympics and sets a fantastic benchmark to every other project that follows. A great start.”

David Higgins, Chief Executive, Olympic Delivery Authority

• “The completion - on time and on budget - of the work on the powerlines tunnelling is a tremendous achievement. It is important not just for the creation of the Olympic Park, but also as a crucial part of our ambitious regeneration plans. It demonstrates clearly the excellent progress being made to deliver a fantastic Olympics.”

• Olympics Minister Tessa Jowell
POWERLINES - PEOPLE
Health, Safety & Environment

- Structured, communications & co-ordination
- Health, Safety & Environment Plans
- Matrix of responsibilities
  - Pre-construction
  - Construction
  - Commissioning
  - Operation & maintenance
- Matrix of CDM regulation duty holders by contract
- Monthly project H&S meetings with open invitation to HSE Inspector/s
- Construction site facilities – welfare and occupational focus
- Excavated material stored ready for profile use on Olympic Park
- Lorry movements minimised by use of conveyors for tunnel muck shifting
Risk Management Process

- Continuous workshops prior to and during works commencing.
- IMT lead continuous weekly and monthly UKPN had held a number, and attended many combined risk review mtgs.
- Continuing combined review mtgs (monthly) and management of risks – risk review mtgs
Moments of laughter - ENJOYING THE JOB!!
Powerlines – Teamwork, People
What we started with!
The Park – as was!!
Carpenters Shaft Site – from above
Hackney Shaft – before being dug and sunk
Difficulties of the shaft sites – live assets!
WHAT ELECTRICAL ENERGY CAN DO....
WHAT ELECTRICAL ENERGY CAN DO

• These overalls were being worn by one of our contractors during excavation in a busy central London street.

• Although made of special flame retardant fabric, they were still extensively damaged by the fault energy after damaging a LOW Voltage cable.
Typical shaft set up – finished article
Shaft sinking – mainly caisson, but under pinning also!
Carpenters Road, EDFE2 Shaft site
Shaft site – from above
Bow, EDFE2B Shaft post construction and substation basement construction
Carpenter’s Road Shaft – EDFE 2
Carpenter’s Road Shaft – one of the 1\textsuperscript{st}, making good progress!
Oops - Carpenter’s Road Shaft – not supposed to happen!!
Carpenter’s Road Shaft – going, going, gone!!
Hackney EDFE4 - Shaft sinking excavation and trimming
Start again, but we got there!
Not all straight forward - problems encountered!
Complex and challenging sites!
Complex and challenging sites!
TBM – workhorse of the industry, refurb!
Pipe jack being lifted into position at Bow 2A shaft
TBM in pre launch, being lowered to position
TBM in pre launch
Shaft site – from above, machine breakthrough
Tunnel TBM Train
It’s about the journey!!

870m North drive

05.01.2007
It’s about the journey!!

Murphy Express

05.01.2007
The moment we all wait for – breakthrough!!
Tunnel Headhouse – part constructed
Tunnel Ventilation Control and Monitoring Equipment – MCC Rooms
Tunnel Ventilation Control and Monitoring Equipment
Concept - Bow GIS Substation Design
Bow GIS substation – we worked in all weathers!!
132kV GIS Switchgear being delivered to Bow GIS Substation
132kV GIS Switchgear being delivered to Bow
Hackney

Key Milestones

• 3 x National Grid Supergrid connections commissioned February 2010
• 132kV circuit transfers completed
• Third circuit to Kings Yard – commissioned September 2011
Network Reinforcement – Hackney GIS and EDFE4
Substation works completed.....
Bow traction transformers being offloaded into position
132kV Cable manufacture – factory testing
Cable drums being delivered to site
Cables being spooled off into position
Cables being spooled off into position
Cables being spooled off into position
Tunnel – cabling part way
Cable installation in basements
Shaft steelwork and 132kV cable installations
Tunnel cable installation – project part way
Typical OHL towers we had to grapple with!
Powerlines – OHL Removal
Working on the lines
Powerlines – OHL Removal
Powerlines – Tower being dismantled
Powerlines – OHL Removal, Towers being collapsed
Powerlines – OHL Removal, Towers being collapsed
Review of what we did POWERING THE GAMES

- Main tunnel works and 132kV and 25kV cabling complete and commissioned – on time/budget/safe!!!!
- West Ham GIS Substation, Bow GIS Substation, Bow NWR and Hackney AIS Substation commissioned – on time/budget/safe!!!!
- PKD OHL completely decommissioned and removed and c. 95% recycled
- Hackney 132kV GIS substation – building completed, 132kV GIS switchgear and ancillaries installed and commissioned
- NG incomers installed and commissioned by end of Jan 2010
- Kings Yard Primary Substation - commissioned
- Kings Yard S22 Non Contestable Works, Phase 1 - 132kV and auxiliary cables commissioned
- Kings Yard S22 Non Contestable Works, Phase 2 - 132kV and auxiliary cables commissioned
- HV and LV network installed and commissioned – ahead of time/budget/safe!!!!
Lines all gone!
Kings Yard Primary Substation

What Powers the Park and POWERED the GAMES?

- Power-on October 2009
- Shortlisted for
  - Institution of Civil Engineers – ‘London Civil Engineering Award’
  - Royal Institute of British Architects – ‘London Area’ - Won 1st prize
  - World Brick Awards - Vienna
Kings Yard Primary Substation – Final Views
Kings Yard PSS – Construction Early Stages
Kings Yard PSS – Construction well underway
Kings Yard Primary Substation
Kings Yard PSS – Transformer Deliveries
Kings Yard PSS – Transformer Installations
Key initiatives and actions

• Founding member of SHELT, monthly UKPN and supply chain programme SHE forums
• PLT: cascaded - everyone has a voice & deserves to be listened to
• Designers forums - risk assessments, lead teams and workshops
• New procedures – scaffold licence, SSTI, RAMS assessment and assurance, site and behaviour exchange inspections
• Dedicated Site foremen and site managers – a departure from the norm…..
• Forums, quarterly workshops for infrastructure utilities workforce - time to think, stop, act!
• Site engagement tours - top to tail, broad and deep – engagement, reward, consequence – lessons learnt and actually APPLIED!!
• Going Live/Dig Safe Forums and Workshops….train the trainer…..
• One vision, one team, one goal (set of)…..
• Hazard spotter, best practice, ideas to action
• Evidenced and rewarded by 3 consecutive 1 million man hours without incident achievement awards……
The outcome

• Communication is key!

• Leadership is vital!

• Engagement, empowerment and support/coaching is absolutely essential

• Effective teamwork gets you the Gold, Silver AND bronze

• Infrastructure delivery was the backbone of the GAMES
So, back to the question……

• ....what next, where do we go from here?....

• "Act into a new way of thinking, not think of a new way of acting“....

• The Learning - by doing, by observation, and most importantly sharing....

• Do it ALL again, make it better....share and learn, not....
• The night view of London we would like to see all the time but especially in July, August and September 2012 when London hosted the next summer Olympics and the eyes of the entire world were on the Capital, London and we, UKPN, our industry, did us proud......!!
Thank you, any questions?

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