

## PROJECT FACT SHEET

**Customer:** British Aerospace Australia

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**Contractor:** Baulderstone Hornibrook

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**Project:** 50HZ & 60HZ Nelson Pier Upgrade

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**Completion:** September 2012

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**Project Profile:** The purpose of the electrical works to Nelson Pier is to upgrade the electrical components to facilitate the construction of two L.H.Ds.

These works included the replacement of Frequency Converter units in building 104, demolition of existing 50 Hz and 60 Hz switchboards and the installation of new 50 Hz and 60Hz switchboards to Nelson Pier.

**Nilsen Scope of Works:**

- Disconnection of 50HZ LV and 60HZ LV, removal of redundant cabling, this includes:
- Existing 50 Hz cope points and cabling
- Existing 50 Hz Take-off boxes from Bus duct
- Existing 60 Hz cabling
- Existing earth cabling
- Installation of cable ladders
- Supply of three (3) 50 Hz Main Switchboards
- Installation of four (4) 60 Hz Main Switchboards
- Installation of three (3) 1000A 60 Hz circuit breaker feeder boxes (secondary side of transformers)
- Replacement of one (1) 60 Hz transformer in Substation 05 with 60 Hz 7 kV transformer (BAE existing transformer)
- Installation of new 1350/1600A LV switch on 60 Hz 7 kV transformer
- Installation of five (5) 1250A 50Hz termination boxes
- Installation of two (2) 1400/1600A switches located on the load side of "Substation 04 & 05" 1000KVA 50Hz transformers

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- Installation of two (2) 1250A 50Hz Main Switchboards (both containing 2 x 1250A circuit breakers)
- Supply only of thirty (30) Spinefex Dist Boards (divided into 20 x 34R and 10 x 34M Units)
- Supply only of thirty (30) Spinefex LG17, ninety (90) Spinefex LG16 and ninety (90) LG6.15A
- Supply of nine (9) Ship-to-Shore power cables.
- Supply of one (1) set of 120mm<sup>2</sup> Submains cables for LG34M tripods
- Installation LV Submains 50Hz from three (3) off 1250A circuit breakers to each of the 50 Hz Main Switchboards via field termination boxes
- Installation LV Submains 50Hz from the two (2) 50 Hz Main Switchboards
- Installation LV Submains 60Hz from three (3) off 1000A circuit breakers and one (1) 1350/1600A circuit breaker to each of the 60Hz Main Switchboards
- Installation LV Submains 60Hz from "Substation 04 & 05" transformers (load side) to the three (3) 1000A circuit breakers
- Installation of power feed to Dolphin Hoist via isolator mounted at the end of Nelson pier
- Installation of power feed to Alimak via isolator located at Tower 1
- Installation of lighting to Tower 1 and Tower 3 and all relevant switching
- Install power feed to exhaust fan fed from Machine Shop DB
- Install power feed to line side of A/C unit isolator on lower deck east from Machine Shop DB
- Testing and commissioning of all equipment, with final energisation completed by BAE and Nilsen personnel.

### **Building 104**

- Disconnection and removal of existing transformers and associated cabling outside Building 104
- Disconnection and removal of existing Frequency Converters and associated cabling
- Disconnection and removal of existing Frequency Converter Motor Start units and associated cabling

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- Disconnection and removal of existing control cubicles and associated cabling
- Relocation of the existing 50 Hz control switch from existing frequency converter control panel to the new panel located in building 104
- Installation of cable ladder
- Installation of two (2) 6.6kV/960V Step Down Transformers
- HV Submains cable from existing 6.6kV High Voltage Switchboard to 6.6kV/960V Step Down Transformers
- Installation of two (2) Frequency Converters
- HV Submains from Step Down Transformer to 50/60Hz Frequency Converters (2 off)
- Installation of two (2) 960V/7kV Step Up Transformers
- HV Submains from 50/60Hz Frequency Converters (2 off) to Step Up Transformers
- HV Submains from Step Up Transformers to existing 7KV High Voltage Switchboard
- Protection settings and switching protection of cables
- Installation of LV cabling from transformers to Frequency Converters
- Upgrade of earthing system including installing a new earth bar, new earth rods and new earth cabling between the rods and the earth bar
- Test and commission all equipment, with final energisation completed by BAE personnel.

### Project Challenges:

The Frequency converters to be installed in building 104 supply Nelson Pier with the required 60 Hz power for the commissioning of the L.H.D. project presented a technological challenge. The frequency converters incorporate control panels and self diagnostic equipment to ensure operating efficiency and performance. This was a key mile stone of the project to operate two newly installed frequency converters with the ageing HV system.

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**Added value accrued to customer because of Nilsen involvement:**

The design and development cooperation between BAE, Thycon and Nilsen was a great success with the three companies working together to achieve the best possible frequency conversion system resulting in very high quality workmanship and a state-of-the-art frequency conversion system.

**Referees:**

**British Aerospace Australia**

Mr Neil Loft

**Boulderstone Hornibrook**

Mr Wade Matthews

