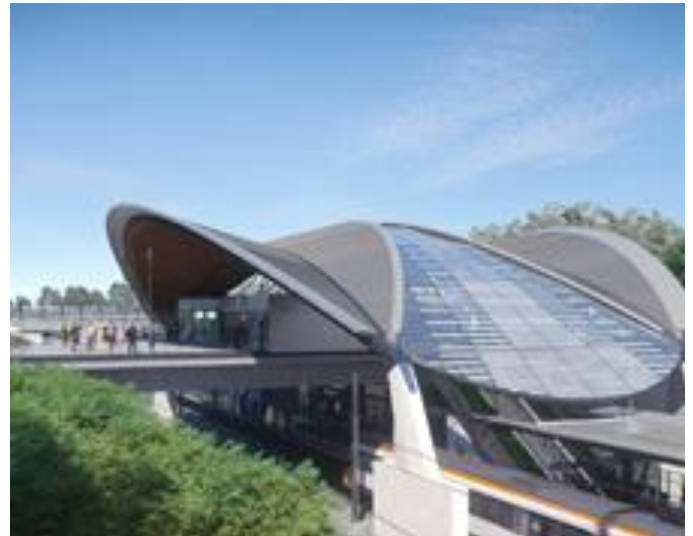


Project Location:	Sydney, NSW
Commencement Date:	July 2017
Completion Date:	June 2019
Client:	SJV (MTR & UGL JV)
Project Value:	\$8.3 Billion
Contract Value:	\$3 Million
Key People:	Matt Bradley, Wesley Hess Nick Cuevas, Stephen Foster, George Mansour, Tapas Thakker



Overview:

The Sydney Metro Northwest project is a large rail infrastructure project linking Sydney's North West region to the CBD via Chatswood. The project involves both greenfield and brownfield aspects including 8 new stations, associated tunnels, bridges, and tracks, as well as upgrades to existing sections of rail between Chatswood and Epping. Sydney Metro will be the first fully-automated rail system in Australia.

Scope:

Supporting the SJV team from July 2017, Key members of the Coengineer team lead the design, development, and commissioning of the power control system (PCS). Responsibilities & scope included the following:

- Project / Design Management
 - Acted as Principle SME for PCS Design from July 2017.
 - Lead Design team from April 2018
- Design / documentation
 - Redraft Sys Req development
 - Update Hardware and Software design specifications
 - Draft Detailed Device Interface specification in conjunction with Siemens
 - Update Detailed interface Specs
 - Complete redraft of Software Module specifications

- Complete redraft of Software Component specifications
- Complete redraft of Component and module test specs
- Alignment of documentation and activities with EN50128
- Draft HV control philosophies and module specifications for HV AC 33KV, 11KV and 1500VDC

- Software
 - Complete recode of PLC module logic for:
 - HV AC 132KV, 33kv, 11kv and 1500VDC modules
 - Review and design guidance for IP21 SCADA
- Communications
 - Re-design DNP3 to work with Pulse Signal
 - Re-design SoE to work with DNP3
 - Drive development of Network Design Specification
 - IEC61850 communications reverse engineering / investigations
 - Interrogate IED's for logic and IO using DIGSI 5, IEC Browser, IEC 61850 System Configurator, SICAM PAS Gateways
 - Assist with SICAM PAS gateway configurations



- Safety
 - Safety System Design & Specification for Automated OHW Isolation system
 - HAZOP / PHA – Review / Audit
 - SIL Assignment / LOPA report – Review /audit
 - Software SIL Assessment participation – review and response
 - Hardware SIL Verification Report – input, review, and response

- LV Electrical Design
 - Lead LV Electrical design
 - ACAD Design/Drafting
 - SCADA Control Panel Design
 - Cable Schedules, Termination Schedules, PLC I/O lists
 - Bill of Materials (BOM)
 - Panel Testing
 - Point to Point
 - Power Up Tests
 - Electrical Functional checks
 - Electrical drawing audit
 - Electrical Site support/ work Instructions for Site Electricians
 - Maintain Traceability for drawing changes, Drawing register
 - Site Panel Checks - Audits
 - Site Commissioning
 - New ECRL Design Drawings to incorporate redundant 24Vdc power supplies
 - Safety Audits of Electrical design and implementation of SIL2 safety standard.
 - General Electrical and Control Engineering.

- Site Commissioning
 - Software module L5 Testing
 - Network & Control Hardware configuration, implementation, and commissioning – Switches, RTU's, Gateways, Servers etc.

Project Challenges:

- Existing project well underway prior to joining - inherited legacy project issues placing constraints on possible solutions.
- Redesign was required for significant aspects of the PCS system.
- Significant pressure on project timeframe requirements, compounded by late stage head agreement to bring forward delivery dates.
- Limited authority in early involvement presented challenges to securing efficient decisions and limited influence over project direction.
- Liaising with key suppliers for equipment selection and system design.
- Multiple entity project structure complicated and reduced effective coordination between project teams.

Project Achievements:

- Integrated quickly with the existing team to identify requirements, progress, challenges, and key risk areas after being asked to join the project mid-way (approximately 1.5 years in).
- Quickly built rapport and confidence with key stakeholders. Effectively navigated the political landscape to ensure efficient progress on critical issues.
- Filled the Design Manager role and took on development lead roles for PCS after demonstrating specialist expertise and correcting several major pre-existing technical issues.
- Brought key experience and capability not present in existing project team to assist with HV Design and Safety / SIL areas of the PCS.