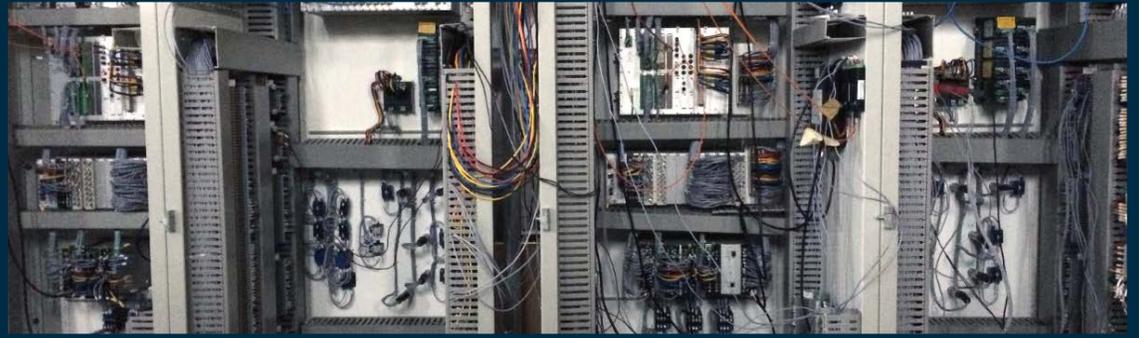# Bentley®
Advancing Infrastructure

Project Summary

Organization
ETD Transmission & Distribution Sdn. Bhd.

Solution
Power Generation

Location
Bukit Tagar, Perak, Malaysia

Project Objectives
- Design and supply 10, 11-kilovolt control and protection relay panels for the waste-to-energy plant at Bukit Tagar Sanitary Landfill.
- Deliver comprehensive electrical design drawings for the panels that comply with Malaysian standards on time.

Products Used
Promis.e® and Navigator

Fast Facts
- The team integrated existing CAD drawings and developed a database of intelligent symbols and device categories to facilitate engineering, calculations, reporting, and cross-referencing.
- With automated design processes and intelligent data that can be reused, ETD can use Promis.e to tailor deliverables for control relay and protection panels on future renewable energy projects.

ROI
- Using Promis.e to establish a standardized design process facilitated drawing production in compliance with Malaysian country codes, eliminated design errors, and cut drawing production time by 50 percent.
- The automated functionalities in Promis.e reduced delivery time by 65 percent.
- Navigator simplified and accelerated design review and revisions, enhancing collaboration and optimizing information mobility.

ETD Transmission Standardizes Design Process on Control Relay Panels for Malaysian Landfill
Automated Electrical Design Drawings Reduce Project Delivery Time by 65 Percent

A Need for Automation

Developed by KUB-Berjaya Enviro Sdn. Bdh. (KBE), Bukit Tagar Sanitary Landfill (BTSL) is a modern, state-of-the-art landfill facility located in Perak, Malaysia. The facility has a long-term capacity of 120 million metric tons of space to service the projected total municipal solid waste in the central region of Selangor and Kuala Lumpur over the next 40 to 50 years. BTSL is situated on a 1,700-acre isolated site, separated from the region's groundwater aquifers that, combined with the application of expert landfill engineering, ensures the local environment is protected.

Consistent with the goal of sustaining natural resources and the integrity of the environment, KBE takes a holistic, innovative approach to solid waste management, working with its technology partners to provide a total solution for solid waste treatment and disposal at the landfill. KBE's methodology includes a waste-to-energy plant, material recovery and recycling plants, and landfill gas management systems.

ETD Transmission serves as one of KBE's technology partners and provides design and manufacturing of control and protection relay panels for BTSL's waste-to-energy plant, enabling the reuse of waste as a source of renewable energy to meet the increasing demands for electricity in nearby areas. One of the few producers of control relay panels in Malaysia, ETD was tasked with supplying the site with 10 panels, delivered with comprehensive design drawings that comply with Malaysian standards. ETD decided to automate its electrical design drawings using Bentley software to meet the main contractor's tight timeline and ensure compliance with country codes.

Automated Features Enable Intelligent Functionality

One of the major challenges to begin this project was integrating existing AutoCAD DWG drawings for automation in Promis.e. Given the interoperability of Bentley's electrical design software, the project team was able to develop the graphical CAD files into intelligent symbols, create a new database from existing data in different file formats, and then choose from the newly developed catalog of symbols, device families, and macros to produce their design drawings. The software automatically assigned wire numbers to the symbols and parts numbers to the devices to generate the parts list reports, including the quantities of each device used in the project. This information was then sent to procurement to purchase the devices, reducing wire and device waste.

For the wire connection and device connection list reports, engineers typically spend significant time revising drawings manually and regenerating the reports to incorporate customer changes. With capabilities in Promis.e, drawings were updated and reports were produced automatically. From the wiring diagram, multiple reports were generated in a unique and intelligent manner with a single click that refreshed the entire electrical schematic and drawing details in live mode.

The original CAD drawings, although graphical, did not have this intelligent functionality. With automated features facilitating intelligent output, Bentley software allowed the engineering team to provide accurate connection details of the wires and devices that were immediately shared with the wiring team to assemble the devices for the control relay and protection panels.

The Promis.e PDF exports from the drawings also had intelligent functionality, enabling navigational cross-referencing of details between schematics and reports, as well as interlinking between PDF pages. These capabilities facilitated a virtual review and approval process, saving time and costs. Promis.e used the schematics and the project database together to automate and optimize engineering and reporting and deliver intelligent design drawings that were in industry standard file formats.

Standardized Design Process Facilitates Engineering Efficiencies

Having automated functions in place within Promis.e, ETD now has a streamlined, organized design process to accelerate information sharing and project delivery times while minimizing the risk of errors. "With the implementation of Promis.e, the electrical drawing works are now produced in

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a more organized and consistent manner, producing drawings that are using the same symbol sizes, font, color codes, and template that drives the company toward standardization," said Pudin Mat Yusoff, design executive at ETD.

Using the software allows ETD engineers to develop and produce accurate and intelligent electrical design drawings that can be linked, cross-referenced, and error-checked, eliminating discrepancies and mistakes. ETD automated its drawings and improved project efficiencies by customizing report templates and standardizing the electrical symbol libraries, device categories, macros, parts database, and title blocks.

More specifically, the revision control functions in Promis.e accelerated and streamlined collaboration among the engineering team, enabling changes to be incorporated and the entire project automatically updated accordingly. The ability to share design drawings in DGN, DWG, and PDF file formats simplified communication with the customer for a more efficient client review and revision process. Integrating Navigator further enhanced collaboration, ensuring device quantities and cross-references were correct. Using Bentley's flexible, interoperable technology to automate tedious tasks, streamline design workflows, and standardize processes reduced errors and enhanced engineering efficiencies, enabling ETD to remain competitive and reliable within the industry for future projects.

Promis.e Delivers Savings

The decision to implement Promis.e to supply the BTSL waste-to-energy facility with control and relay protection panels enabled ETD not only to overcome the project challenges, but also to reap numerous benefits that resulted in savings. Faced with existing drawings in CAD file formats, ETD relied on the interoperability of Bentley technology to integrate and reuse these designs and information to develop the company library and templates for the new database, saving significant time and eliminating rework. The intelligent functionality of the software standardized production of accurate schematic and layout drawings reducing time and costs, cutting design and drawing production time by 50 percent.

The automated features in Promis.e facilitated accurate cross-referencing and instant report generation, eliminating manual calculations, reducing errors, and saving time. Compared to

the three days required using conventional CAD technology for manual drawing reviews, revisions, and report production, Promis.e enabled same-day turnaround time. ETD developed a federated database and delivered the 10 control and relay protection panels for this project in 11 days as opposed to 30, for a 65 percent reduction in delivery time with Bentley's electrical system design software.
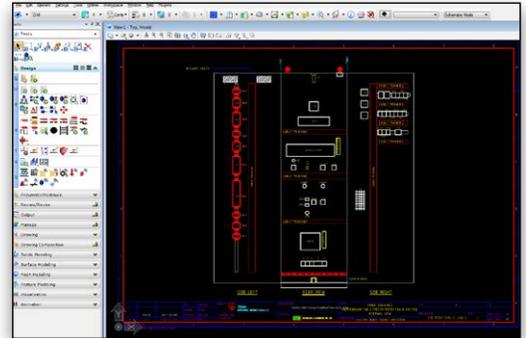
The project team used Promis.e to produce schematic and layout drawings.

A Sustainable Solution for Future Projects

Using Promis.e to automate and produce schematic and layout drawings for its electrical control and protection panels facilitated standardization, ensuring all catalogs and templates within the company database are developed in accordance with Malaysian electrical design codes. Having intelligent, compliant data and information that can be copied, modified, and reused on future projects establishes credibility among ETD clients, enabling the company to generate more profits and rise to the forefront of the industry.

Malaysia's innovations in electricity generation from waste offer global lessons for converting trash and biomass into useable energy; and BTSL has set new standards in landfill design, meeting the strictest environmental and international design requirements. As part of the team to supply control relay and protection panels, ETD developed an automated and standardized process to produce and deliver its electrical design drawings timely, accurately, and efficiently in compliance with Malaysian standards. With upcoming renewable energy power plants being planned, Promis.e is a powerful capability for ETD to secure future projects.

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