CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_01 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to Jun 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering<br>**Other Preference:**<br>Mechanical Engineering |
| | **Project Name** | GBG lifting equipment fault analysis & management enhancement |
| | **Business Objective(s)** | Support the heavy lifting team to enhance the fault analysis and management to upkeep the reliability of lifting appliances & lifting gears at GBG |
| | **Project Description** | • A database management system by using Microsoft office application to record historical operation and maintenance data of all LAs & LGs for fault analysis and routine maintenance plan review;<br>• Revised routine maintenance plan to improve the reliability of LAs & LGs at GBG based on the fault / defects records, especially the electrical and control systems;<br>• Formulated the long terms spares / parts procurement plan for the critical LAs to support GBG O&M activities.. Learning:<br>• Faults analysis, problem solving and inter-parties liaison skills;<br>• Fundamental Project Management Skills;<br>• Knowledge of Heavy Lifting equipment and associated statutory requirements, etc. |
| | **Required Skills** | • Good communication and analytical skills<br>• Electrical / mechanical engineering with advanced Microsoft Office application knowledge<br>• Fluent in both Cantonese / English |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_02 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to May 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering<br>**Other Preference:**<br>Mechanical Engineering |
| | **Project Name** | CPA 400kV Switchgear Reliability Enhancement |
| | **Business Objective(s)** | • To further improve the reliability and availability of the 400kV GIS as well as the safety of operational personnel.<br>• To support Project Controls Team to monitor a portfolio of over 1,000 projects in SHE, Cost, Schedule & Technical aspects in meeting GBG safety, health and environment (SHE) targets, international engineering standards and Project Management Governance System (PMGS) requirements. |
| | **Project Description** | CPA 400kV Switchgear Reliability Enhancement<br>• Refurbishment of the backportion and associated circuit connections equipment<br><br>Procurement of critical spare parts to ensure well operation of 400kV GIS.<br>• Partial discharge analysis<br>• Future 400kV substation refurbishment strategy study.<br><br>The PMGS system consists of project categorization, a project life-cycle with defined decision and review points and a governance system to review and manage project development and execution.<br>• Conduct health check of the PMGS & corresponding improvement areas<br>• Enrich Project Control and Monitoring.<br>• Promote Information Accuracy, Sharing and Learning. |
| | **Required Skills** | • Basic project management concept<br>• Analytical mind set.<br>• Computer skills (e.g. Word, Excel, Power Point) |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_03 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jul 2022 to Jun 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical / Mechanical / Electronic / Information Engineering / Building Services / Energy Management<br>**Other Preference:**<br>Broad discipline of Engineering |
| | **Project Name** | Smart and Integrated Energy Development in the Greater Bay Area (GBA) |
| | **Business Objective(s)** | • To assist in business development work in smart and integrated energy projects in the GBA, with technologies and solutions involving distributed RE, micro-grid, smart building management, energy storage, centralized cooling, EV charging, IoT energy management platform etc. |
| | **Project Description** | • Conduct detailed market research, business/product and strategic analysis on various innovative smart energy technologies and services, e.g. smart grid technology, distributed generation, battery energy storage system, electric mobility, district cooling, waste to energy, building energy management: carbon & electricity trading, green certification etc.<br>• Assist Business Development colleagues in preparing strategic roadmap, execution / implementation details, and business case for deploying different innovative technologies in China.<br>• Support tendering process for consultancy work, if any, such as drafting proposal, preparing bids, tracking documents and responses, etc. |
| | **Required Skills** | • Strong analytical skills for interpreting data and analyzing result required<br>• Basic technical knowledge about the power and energy industry<br>• Basic understanding of Information Technology (IT) and Operational Technology (OT)<br>• Proficiency in written and verbal English and Chinese (Putonghua) |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_04 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to Jun 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical<br>**Other Preference:**<br>Other engineering disciplines |
| | **Project Name** | Operation and maintenance readiness of new power projects |
| | **Business Objective(s)** | • Reliability Availability and Maintainability review of new Open Cycle Gas Turbine (OCGT) project.<br>• Setting up O&M infrastructure and business systems for OCGT project.<br>• Spares selection for new projects<br>• Thermal Power Plant Operational performance reporting and benchmarking |
| | **Project Description** | • To support supervisor to review implementation of Asset Management Standards at new power projects to achieve operational readiness in advance of startup..<br>• Involve in identification and selection of spare parts of new build.<br>• Involve in Information Technology Plan and road-map of OCGT<br>• To collect key performance indicators of operational plants and prepare annual reports and carry out benchmarking.<br>• Operational Readiness program implementation for OCGT. |
| | **Required Skills** | • MS Excel and Power Point |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_05 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to May 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering<br>**Other Preference:**<br>Nil |
| | **Project Name** | Condition Monitoring Technology for Transmission and Distribution Overhead Lines |
| | **Business Objective(s)** | • To explore CM technology to detect the incipient fault and identify the fault location for T&D OHL.<br>• To determine the best time for maintenance, refurbishment and replacement, it is required to monitor the conditions of our overhead line assets. |
| | **Project Description** | • The study should cover the following areas:<br>• To review major pain points in transmission and distribution overhead lines and justify the need of condition monitoring;<br>• To explore transmission and distribution overhead line condition monitoring technologies available in the market;<br>• To assess various condition monitoring technologies that can be introduced to CLP to improve supply reliability, optimize maintenance frequency & requirements and determine the best time for refurbishment / replacement;<br>• To introduce various condition monitoring technologies for trial and evaluate their effectiveness, accuracy and benefits...Having considered that more and more condition monitoring technologies for overhead line assets are available in the market in recent years, we should study if they can be adopted by CLP. |
| | **Required Skills** | • Basic knowledge of Power System and overhead line system<br>• Knowledge in MS Excel, PowerPoint and Presentation Skill<br>• Good command of both spoken and written English and Chinese |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_06 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Aug 2022 to Jul 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering<br>**Other Preference:**<br>Nil |
| | **Project Name** | Electric Network Optimization with New Energy Sources to achieve efficient power grid management |
| | **Business Objective(s)** | • To study the application of electric network optimization to determine the best set of control strategies to coordinate new energy generation sources (e.g. solar PV and battery energy storage system) with voltage regulating devices to achieve efficient power grid management without violating any operating constraints (high/low voltage limits, load limits, etc).<br>• To review the applications of Conservative Voltage Reduction (CVR) to deliver energy efficiency benefits to customers and conduct the data analysis to evaluate the CVR factors. |
| | **Project Description** | • Electric network optimization is a recent hot research topic to optimally manage system-wide voltage levels and reactive power flow to achieve efficient distribution grid management. For many years, electrical engineers designed the electric distribution system to serve customers over a wide range of expected load conditions. The size and placement of many voltage regulating devices were typically based on off-line modeling of peak- and light-load conditions, and operating experience.<br>• With the increasing deployment of AMI and smart meters, this increases the operating visibility in distribution feeders and therefore provides the opportunity to optimize voltage and reactive power levels for constantly changing load conditions.<br>• This internship project aims to review and evaluate the existing common network optimization methods to control systems' voltages and Var control devices to accommodate higher penetration levels of new energy resources into our power grids<br>• Conservative Voltage Reduction (CVR) is commonly used to maintain and optimize voltage profiles.<br>• This internship project will provide the opportunity for the applicant to learn the big data analysis through a |

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| | | series of data mining studies, primarily examining the system data to evaluate the CVR factor. |
| | **Required Skills** | • Study in electrical engineering<br>• Good knowledge of programming skills<br>• Good interpersonal skills<br>• Self-motivated and proactive |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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|---|---|---|
| **Project Code** | E1_SAND_07 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to May 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering<br>**Other Preference:**<br>Engineering/Science |
| | **Project Name** | Research on Smart Grid Development in Global and HK context |
| | **Business Objective(s)** | • To research and monitor the smart grid development trends |
| | **Project Description** | • To conduct desktop research and study on Smart Grid development in below areas:<br>  ○ Intelligent Grid<br>  ○ Smart Metering<br>  ○ Digital Workforce<br>  ○ Digital Asset Management<br>• To monitor and to benchmark the development progress. |
| | **Required Skills** | • General understanding of electrical power systems<br>• Knowledge of smart grid development |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_08 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to May 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical &/ Electronic Engineering<br>**Other Preference:**<br>Nil |
| | **Project Name** | Data analysis and evaluation for Robot-assisted Monitoring of Substations (RAMS) |
| | **Business Objective(s)** | • Conduct Proof-of-Concept for RAMS in using robots and image analytics for substation monitoring.<br>• To understand through the project, the application of various monitoring tools for substation health maintenance. Development of data acquisition and analysis tools for substation equipment and environmental data. |
| | **Project Description** | • The project is to facilitate the evaluation of RAMS proof-of-concept project on substation equipment and collection of environmental data from sensors and site images.<br>• Develop data acquisition technique, data analysis and image processing to gain insight for substation condition monitoring.<br>• The outcome of the project will support the development of road map for smart substations deployment. |
| | **Required Skills** | • Experience in the use of data analytics tools such as Microsoft PowerBI is a plus; and<br>• Proficiency in the English and Cantonese language.. Conversational in Mandarin is a plus. |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_09 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Aug 2022 to Aug 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering<br>**Other Preference:**<br>Energy Engineering, Electronic Engineering, Information Technology |
| | **Project Name** | Power System Security Studies |
| | **Business Objective(s)** | • To enhance transmission and distribution network security and ensure power delivery in a secure and reliable manner.<br>• To improve the current practice on demand response, smart grid, and load forecast. |
| | **Project Description** | • Identify transmission and distribution network improvement areas;<br>• Conduct power flow and fault level studies by using different simulation tools;<br>• Conduct study on demand response, smart grid, and load forecast practice;<br>• Formulate contingency plans for power systems;<br>• Recommend improvement actions. |
| | **Required Skills** | • Proficiency in both spoken and written Chinese and English;<br>• Being customer-oriented, self-motivated, good team player, analytical, and able to work under pressure and tight schedule;<br>• Strong sense of responsibility with good interpersonal and communication skills;<br>• Proficiency in Microsoft Office and Visual Basic for Applications (VBA). |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_10 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to May 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering<br>**Other Preference:**<br>Information Technology / Computer Engineering |
| | **Project Name** | Energy Management System (EMS) busbar clearance process enhancement |
| | **Business Objective(s)** | • Enhancement of the EMS functionalities to cope with the power system busbar clearance process and cyber security requirements by designing and implementing software applications.<br>• Extend the system life of the EMS by both software and hardware upgrade to maintain the continuous monitoring and control of the power grid network and generation. |
| | **Project Description** | • The EMS is used to monitor and control the power system to ensure safe, reliable, and economic operations.<br>• The projects are to enhance the functionalities of EMS to cater for the busbar clearance operation of the power grid and cyber security requirements through the process of application design and implementation.<br>• It also requires to extend the life of EMS by upgrading the software and hardware components. |
| | **Required Skills** | • Critical Thinking<br>• Software engineering and programming skills<br>• Good English writing skills |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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|---|---|---|
| **Project Code** | E1_SAND_11 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to May 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering<br>**Other Preference:**<br>Electronic Engineering |
| | **Project Name** | Develop Smart Metering and AMI Operation Procedures |
| | **Business Objective(s)** | • Identify differences between traditional operations and AMI operations<br>• Identify gaps of existing operation in AMI<br>• Establish KPIs and KSFs for AMI operations<br>• Identify of competencies requirement and training needs<br>• Establish control procedures for AMI operations<br>• Establish monitoring tools (e.g. dashboard) for AMI operations |
| | **Project Description** | • More than 1.1M meters have been replaced with smart meters. The existing operations, including on-site meter reading, remote meter reading, data upload, data validation and event monitoring should have reviewed.<br>• This project is to establish new operation procedures with new KPIs and monitoring and reporting approaches. |
| | **Required Skills** | • Data analytics<br>• Power BI<br>• Process review<br>• Electricity measurement<br>• Telecommunication |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_12 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to Jun 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering (E1)<br>**Other Preference:**<br>Electronic Engineering (E2) |
| | **Project Name** | Modern Protection Systems: Real-World Practice |
| | **Business Objective(s)** | • Perform power system protection asset management and facilitate protection system operation and maintenance with digitalized data platform.<br>• Introduce brand new protection equipment to the power system.<br>• Investigate power system faults, verify protection equipment integrity and formulate corrective actions. |
| | **Project Description** | Join Us Now, Novice Protection Engineer!<br>• Partner with experienced power system protection engineers to enhance protection data platform for strategic planning of asset management and the activities of operation and maintenance.<br>• Support engineers to conduct on-site and laboratory tests for various types of protection equipment.<br>• Practice investigation and fault analysis of protection systems. |
| | **Required Skills** | • A customer-oriented team player with strong analytical skills<br>• Good interpersonal and communication skill<br>• Proficiency in MS Word, PowerPoint & Excel etc.<br>• Experience in programming (e.g. Visual Basic for Application (VBA)/ Power Automate Proficiency is an advantage) |

CLP Internship Programme 2022

Project Focus – Electrical Engineering (12-month)

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| **Project Code** | E1_SAND_13 | |
| **Project Detail** | **Internship Category** | Sandwich |
| | **Internship Period** | Jun 2022 to Jun 2023 |
| | **Preferred Discipline** | **First Preference:**<br>Electrical Engineering<br>**Other Preference:**<br>Electronic Engineering |
| | **Project Name** | Power Quality Analysis, Mitigations and Applications |
| | **Business Objective(s)** | • To conduct research study on new industrial products / applications for effective power quality mitigations and evaluate their performance with the consideration of customer equipment and power supply arrangement.<br>• To assist the annual voltage dip analysis and ad-hoc power quality studies after the familiarization with various power quality monitoring systems. |
| | **Project Description** | • Our intern will be given a full year to explore CLP's supply network and customers equipment with a focus on power quality. The adoption of advanced equipment, which are susceptible to power quality issues, results in rising concern of power quality. Our team works with customers for cost-effective mitigations to tackle the operational inconvenience due to power quality issues..<br>• Our intern will learn the common power quality issues in Hong Kong and the corresponding mitigations. With deeper understanding on the mitigation rationale and power quality standards, he/she will be guided to research on new options for mitigation followed by a technical evaluation, which facilitates our team to offer prudent recommendations to our customers..<br>• Hands-on experience on the improvement projects of our power quality information systems will be expected. And ad-hoc assignments may be given considering the operational needs. |
| | **Required Skills** | • General knowledge in power system arrangement<br>• Basic knowledge in power quality and. electronics circuit design<br>• Basic programming skills<br>• Experience on analytic tools / platforms is preferred<br>• Hands-on experience on power testing equipment is preferred |