CLP Power Hong Kong Limited's
Power Supply System

Review Results Report

December 2025

機電工程署 EMSD

Background

1. In the first half of 2024, CLP Power Hong Kong Limited (CLP) experienced 9 major incidents in its power supply system, drawing public concern. Amongst, 4 incidents involved power supply interruptions, and the remaining 5 were related to voltage dips.

Date	Affected Area
Power Supply Interruptions (4 Incidents)	
7 January	Tsing Yi
19 March	Yuen Long
10 April	Sheung Shui
12 June	Wong Tai Sin
Voltage Dips (5 Incidents)	
1 January	Tsing Yi
30 March	Some areas in Kowloon and the New Territories
6 April	Some areas in Kowloon and the New Territories
14 June	Fanling
23 June	Some areas in Kowloon and the New Territories

2. The frequent power supply interruptions and voltage dips occurred in CLP's power supply system during the first half of 2024 had raised concerns on whether CLP's service level had declined. In particular, the power supply interruption incident in Wong Tai Sin district on 12 June 2024 resulted in a power outage of more than 4 hours, affecting more than 2 000 customers. In this connection, the Secretary for Environment and Ecology met with the Managing Director of CLP on 13 June 2024 and requested CLP to fund a comprehensive review of its power supply system, which would be

conducted by an independent consultant engaged by the Electrical and Mechanical Services Department (EMSD):

i. Re-examining all incidents related to voltage dips and power supply interruptions in the last three years and outlining the causes, improvement measures, implementation status and their effectiveness;

ii. Conducting a comprehensive review of the safety design of the power supply system, its resilience to the impact of external factors, the arrangements for corrective and preventive maintenance, the system for procurement and inspection of materials, supervision, and quality assurance standards, as well as personnel qualification, training and retraining requirements; and

iii. Providing comprehensive recommendations to enhance the stability and reliability of the power supply, and reduce the occurrences of similar incidents in the future.

3. Subsequently, EMSD appointed WSP (Asia) Limited (WSP) as the independent consultant to conduct a comprehensive review of all incidents of power supply interruptions and voltage dips that occurred in CLP from 2021 to mid-2024, and provide recommendations on enhancing the reliability and stability of CLP's power supply system.

4. This review exercise is conducted through a two-tier supervisory framework. The first tier is the "Task Force on Review of CLP's Power Supply System" (Task Force), and the second tier is the "Steering Committee on Review of CLP's Power Supply System" (Steering Committee). The Task Force, co-led by the Assistant Director (Electricity and Energy Efficiency) of EMSD and the

Senior Director (Power Systems) of CLP, is responsible for guiding and assisting the independent consultant's work. The Steering Committee, comprising the Director for Electrical and Mechanical Services (DEMS) and local experts and scholars invited by DEMS from various professional fields, is tasked with monitoring the progress of the independent consultant's work and advising on the review exercise. The members of the Steering Committee are as follows:

Members of the Steering Committee	**Qualifications**
Ir. Kelvin LO Kwok-wah (Chairman)	Director (Development & Works), Hospital Authority Former Director of Water Supplies Former Director of Drainage Services
Ir. CHAN Loong	Former Chairman of the Electrical Division, The Hong Kong Institution of Engineers
Prof. CHUNG Chi-yung	Head of Department of Electrical and Electronic Engineering, The Hong Kong Polytechnic University
Ir. HO Wing-ip	Experienced electrical and building services engineer
Dr. LAM Tze-shan	Assistant Executive Director, Vocational Training Council
Ir. POON Kwok-ying	Director of Electrical and Mechanical Services

5. The Task Force and the Steering Committee conducted 11 and 6 meetings respectively to guide and supervise the work of WSP.

They had reviewed the documents submitted by WSP and CLP, and offered comments and recommendations to enhance the review. EMSD expresses profound gratitude to the Chairman and members of the Steering Committee for their relentless efforts and insights.

Review Results

6. CLP operates a vertically-integrated power business in Hong Kong. It covers power generation, transmission and distribution facilities, and serves over 6.2 million people, accounting for more than 80% of Hong Kong's population. In 2024, CLP achieved a power supply reliability rate of 99.999%, with an average unplanned power outage time of 1.2 minutes per customer. CLP has been accredited with the ISO 55001 certification since 2015.

7. This review exercise focuses on enhancing the reliability and stability of CLP's power supply system. To this end, the review analysed the causes of all incidents of power supply interruptions and voltage dips from 2021 to mid-2024. It has reviewed CLP's power supply system and proposed recommendations across the following 6 aspects:

(1) Resilience to the Impact of External Factors
(2) Arrangements for Corrective and Preventive Maintenance
(3) System for Procurement and Inspection of Materials, Supervision, and Quality Assurance Standards
(4) Personnel Qualification, Training, and Retraining Requirements
(5) Safety Design of Power Supply System
(6) Restoration Capability of Power Grid

8. Resilience to the Impact of External Factors

i. Based on incident data analysis, about 80% of medium-voltage and high-voltage network incidents were attributable to external factors. In this regard, CLP must further enhance the resilience of its power supply system against external factors,

and implement focused measures to alleviate the impact of external factors on CLP's grid. Following a review of the power supply interruptions and voltage dip incidents caused by third-party interference, environmental interference and extreme weather conditions, the review has identified the specific issues that had contributed to the relevant incidents.

ii. In CLP's power supply system, about 70% of the transmission network consists of underground cables. The underground space of Hong Kong is densely occupied by various utilities, with approximately 10 000 excavation works carried out in the vicinity of CLP's underground cables each year. Therefore, these underground cables are prone to damages by third-party interference, resulting in power supply interruptions or voltage dip incidents.

iii. Based on incident data analysis, the number of incidents caused by third-party interference has yet to show signs of decreasing. This indicates that CLP has failed to fully prevent third-party damage to its cables and components, nor has it fully and promptly detected the damaged cables and components. Therefore, the review results emphasised the need for CLP to take proactive measures to address these issues.

iv. About 30% of CLP's power transmission system comprises overhead lines, which are more prone to environmental interference. As multiple incidents were caused by trees, foreign objects and animals, it is evident that CLP has yet to implement full precautionary measures against these risks. Therefore, the review results recommended CLP to strengthen

its asset management and further enhance related risk management and control through innovative technologies to address these issues proactively.

v. The review results also recommended that CLP should further enhance its resilience to the increasingly frequent extreme weather events. In addition to leveraging innovative technologies and installing lightning protection systems, it is essential for CLP to prepare for potential disruptions to the power supply system caused by extreme weather conditions. This requires conducting risk assessments and developing corresponding measures.

vi. In summary, about 80% of CLP's medium-voltage and high-voltage network incidents between 2021 and mid-2024 were caused by external factors. Therefore, the review results recommended that CLP should formulate focused measures to proactively enhance its resilience against external factors, focusing on 4 action strategies: "Reduce Potential Risks", "Strengthen Collaboration with Different Parties", "Leverage Artificial Intelligence" and "Apply Innovative Technologies".

9. Arrangements for Corrective and Preventive Maintenance

i. CLP's maintenance regime complies with the ISO 55001 asset management standard. The review results indicated that CLP's current maintenance strategies align with the recommendations from the International Council on Large Electric Systems (CIGRE), and are consistent with peer benchmarks in other countries.

ii. However, among all power supply interruptions and voltage dip incidents occurred between 2021 and mid-2024, 20% of these incidents were still attributable to equipment failure. The review results recommended that CLP should further enhance its corrective and preventive maintenance arrangements under the "Enhance Asset Management" strategy to minimise the occurrence of equipment failure.

10. System for Procurement and Inspection of Materials, Supervision, and Quality Assurance Standards

CLP's existing system for procurement and inspection of materials, supervision and quality assurance standards is consistent with the peer standards in other countries. Nonetheless, given that there were still past incidents attributable to the contractors' operational faults, CLP should step up its supervision and management. The review results therefore recommended CLP to strengthen its supervision of the contractor's day-to-day performance in safety and quality. Recommendations were formulated under two strategies: "Strengthen Quality Management" and "Strengthen Contract Management" for CLP's further improvement.

11. Personnel Qualification and Training

From 2021 to mid-2024, there were 4 incidents involving operational failures caused by CLP personnel. While these human error-related incidents did not ultimately result in major power supply interruptions, these errors should not have occurred. The review results recommended CLP to strengthen personnel training and formulate relevant proposals under the strategy of "Enhancing

Peer Communication". By referencing the training experience of peers, similar errors could be prevented from recurring.

12. Safety Design of the Power Supply System

After reviewing the safety design of CLP's power system, the review results considered that CLP's design is on par with the other leading international power companies. Nonetheless, the review results indicated that there is room for optimising the safety design of CLP's power supply system. It has put forward recommendations under the strategy of "Optimise System Design" to reduce the impact of power interruptions and voltage dips on customers.

13. Restoration Capability of the Power Grid

CLP currently formulates different strategies based on risk factors and various incident scenarios to strengthen the grid's restoration capabilities. However, the review results indicated that there is still room for improvement for CLP in this area and proposed relevant recommendations under the strategies of "Enhance Response Capability" and "Optimise Incident Management" to minimise the impact of power outages on customers.

14. Upon completion of the review of the power supply interruptions and voltage dip incidents from 2021 to mid-2024, the review results indicated that similar incidents (such as those involving lightning strikes or typhoon impacts on the power grid, interference from trees or foreign objects, animal interference and third-party interference) have been recurring. While CLP has introduced measures to address these incidents, the number of similar incidents

has yet to show a downward trend, indicating that CLP's previous measures have failed to systematically address the root causes of these incidents.

Recommendations

15. Taking into account the review results of the various aspects, there are still rooms for improvement for CLP on top of its existing foundation. The review results have thus established 11 action strategies based on the 5 action objectives below. It has also formulated 43 recommendations to enhance the reliability and stability of CLP's power system. The details of the 43 recommendations are set out at the **Annex**.

Action Objectives	Strategies
(1) Reduce Incidents of Power Supply Interruption and Voltage Dip	Reduce Potential Risks Enhance Asset Management Strengthen Collaboration with Different Parties
(2) Alleviate the Impact of Power Supply Interruption and Voltage Dip on Customers	Optimise System Design Improve Response Capability
(3) Expedite Power Restoration After Power Supply Interruption Incidents	Optimise Incident Management
(4) Leverage Innovative Technologies for Maintenance and Monitoring of Equipment Conditions	Leverage Artificial Intelligence Apply Innovative Technologies
(5) Promote a More Proactive Maintenance Culture Comprehensively	Strengthen Quality Management Strengthen Contract Management Enhance Peer Communication

16. First Action Objective: Reduce Incidents of Power Supply Interruption and Voltage Dip

i. To achieve this objective, CLP should adopt three strategies, namely "Reduce Potential Risks", "Enhance Asset Management" and "Strengthen Collaboration with Different Parties". The review results have proposed 13 recommendations in this regard.

ii. "Reduce Potential Risks": This strategy aims to mitigate potential risks at the generation, transmission and distribution levels in relevant incidents, such as conducting tests on high-risk underground circuit and installing additional lightning arresters and flood prevention equipment, thereby reducing the chance of power supply interruptions and voltage dip incidents.

iii. "Enhance Asset Management": This strategy aims to enhance CLP's asset management to review the health conditions of its major assets. It also seeks to expedite the digitisation of equipment maintenance, thereby reducing the risk of related incidents.

iv. "Strengthen Collaboration with Different Parties": This strategy aims to strengthen CLP's collaboration with different parties (such as contractors) to enhance the effectiveness of the preventive measures.

17. Second Action Objective: Alleviate the Impact of Power Supply Interruption and Voltage Dip on Customers

i. Given the multiple causes of power supply interruptions and

voltage dip incidents, in addition to the recommendations set out in the first action objective, the review results recommended CLP to alleviate the impact of power supply interruptions and voltage dip incidents on customers under the following two strategies: "Optimise System Design" and "Improve Response Capability". The review results proposed 8 recommendations in this regard.

ii. "Optimise System Design": This strategy aims to optimise the system design from four aspects: urban distribution network, rural distribution circuit, distribution system switchgear and grid earthing design with a view to alleviating the impact of power incidents on customers. An example is increasing the number of interconnectors in the urban distribution network to strengthen the mutual backup ability and reduce the number of customers affected by power incidents.

iii. "Enhance Response Capability": This strategy aims to enhance CLP's response capability to power incidents, such as strengthening co-ordination and communication between CLP and various stakeholders (major public service providers, property management companies, Fire Services Department, etc.) and developing a joint crisis response drill plan, thereby minimising the impact of power supply interruptions and voltage dip incidents on customers.

18. <u>Third Action Objective: Expedite Power Restoration After Power Supply Interruption Incidents</u>

While the above recommendations may help to reduce the number

and extent of the customers affected, power supply interruptions would still cause inconvenience to the members of the public. Therefore, the review results recommended CLP to adopt the 4 recommendations under "Optimise Incident Management" to enhance power restoration arrangements, such as standardising mobile generator connection points in new substations and improve power restoration workflows to enhance CLP's response capability during power incidents, and reduce the time required for power restoration as much as practicable.

19. Fourth Action Objective: Leverage Innovative Technologies for Maintenance and Monitoring of Equipment Conditions

i. By leveraging innovative technologies to monitor asset health and enhance maintenance capabilities, CLP should be able to forecast and prevent potential risks at an earlier stage to ensure that their equipment is in optimal operating condition. The review results recommended that CLP, through two strategies, namely "Leverage Artificial Intelligence" and "Apply Innovative Technologies", consisted of 7 recommendations, to enhance its capabilities of equipment maintenance and equipment condition monitoring, and further enhance its resilience against external factors.

ii. "Leverage Artificial Intelligence": This strategy aims to identify potential risks and anomalies at an early stage to effectively enhance the resilience of its power supply system against external factors by measures such as leveraging Intelligent Management System (Grid-V) to monitor the condition of substations and overhead lines in real time and

round the clock, enabling a comprehensive understanding of system operation and enhancing responsiveness.

iii. "Apply Innovative Technologies": This strategy aims to comprehensively enhance CLP's capabilities in equipment maintenance and equipment condition monitoring, as well as continuously strengthening CLP's ability to implement and apply innovative technologies.

20. Fifth Action Objective: Promote A More Proactive Maintenance Culture Comprehensively

i. This action objective covers the 3 strategies: "Strengthen Quality Management", "Strengthen Contract Management", and "Enhance Peer Communication". Comprised of 11 recommendations, this objective aims to cultivate a proactive maintenance culture amongst CLP management and staff, foster teamwork, and support the recommendations under first three action objectives.

ii. "Strengthen Quality Management": This strategy aims to enhance the quality of work by promoting a more proactive maintenance culture. From management to frontline staff, the relevant recommendations adopt a top-down approach to cover such areas as personnel qualification certification, project planning and materials procurement.

iii. "Strengthen Contract Management": This strategy aims to establish clear and consistent quality and safety standards, thereby strengthening the management and monitoring of

contractors and suppliers for improvements in work quality.

iv. "Enhance Peer Communication": This strategy aims to encourage CLP to learn from peers by sharing experience in incidents handling and training, thereby promoting a more proactive maintenance culture and continuous improvement in training quality.

21. The specific causes of the 9 major power incidents occurred in the first half of 2024 cover various factors including equipment failure, operational errors, environmental interference, third-party interference and extreme weather. By implementing the 11 action strategies and the 43 recommendations, the stability and reliability of power supply will be effectively enhanced, thereby reducing the likelihood of future incidents.

22. For example, the power supply interruption incident occurred in Wong Tai Sin on 12 June 2024 was caused by the gradual deterioration of the insulation of two cables in a ring circuit supplying electricity to the affected area, each of which was previously damaged by a third party. During the emergency repair of the first underground cable, the second underground cable of the ring circuit failed concurrently. This had resulted in a power supply interruption in certain areas of Wong Tai Sin.

23. By implementing the recommendations, such as enhancing risk prevention and control by conducting tests on high-risk underground circuits to identify and expediting the replacement of compromised components in potentially risky circuits, continuously examining and updating risk assessment to identify emerging risks,

particularly the “low-probability-high-impact” risks as well as collaborating and following up with the road excavation contractors proactively to strengthen underground cable route patrol, thereby reducing the risk of damage to underground cable caused by excavation works, the power supply interruption incidents caused by third-party interference could be effectively reduced in a focused manner.

Action Plan

24. To ensure full implementation of the recommendations, EMSD required CLP to submit a practical action plan, which should cover the establishment of performance indicators and service pledges, formulation of standard operating procedures (SOP), the setting up of an action plan timetable and the development of a feedback mechanism. The actions seek to achieve the goals of reducing incidents, mitigating the impacts on customers and expediting the restoration of power supply in the case of power outages.

25. CLP has, according to the requirements from EMSD, developed an action plan based on factors such as risk assessment, scale of measures, and the time required for implementation, with a view to ensuring the effective and orderly implementation of the recommendations. CLP's specific approach to prioritise the implementation and execution of the recommended measures can be categorised into the following three levels:

(1) Proactively prioritising and executing effective measures that significantly reduce power supply interruptions and voltage dips for high-risk circuits and critical power supply equipment to mitigate impact on customers;

(2) Optimising the existing maintenance routine and preventive measures to further enhance power supply reliability; and

(3) Conducting feasibility studies on strategic grid design proposals to minimise impact of power supply interruptions and voltage dips on customers in the longer run.

26. In terms of performance indicators and service pledges, CLP has proposed the following expected performance outcomes:

(1) If the failure of CLP's equipment causes a power outage that continuously affects more than 300 customers: Where feasible, CLP will first contact the major property management office or the Home Affairs Department District Office concerned within 30 minutes in general to notify them of the outage;

(2) If the failure of CLP's equipment causes a power supply interruption that continuously affects more than 300 customers with an anticipated impact duration of over 2 hours: Where feasible, CLP will provide on-site support to affected customers within 2 hours in general;

(3) The average arrival time for the CLP Emergency Crew to the scene for supply loss inspection will be shortened to 25 minutes on average;

(4) The average connection time by temporary power supply connection in the urban areas will be shortened to 3 hours upon new standby regime facilitated by extra mobile generators; and

(5) For supply areas reinforced with extra interconnectors, the number of affected customers will be reduced by approximately half on average by switching the power supply paths through these interconnectors.

Conclusion

27. The Steering Committee agreed with the 5 action objectives, 11 action strategies and the 43 recommendations proposed in the review results, and provided feedback and suggestions in the course of the review to enhance the comprehensiveness of the review. The Steering Committee expects CLP implement these recommendations in full.

28. CLP has fully adopted the recommendations in the review results, and has developed an action plan as well as established performance indicators and service commitments for post-incident crisis handling according to EMSD's requirement, with a view to pursuing comprehensive improvement from the internal system to external practices.

29. CLP had already implemented some of the recommendations during the review exercise. In particular, to address the around 80% of the medium-voltage and high-voltage power incidents caused by external factors, CLP is strengthening the system's resilience against such impacts by identifying and expediting the replacement of compromised components in potentially risky circuits, increasing the number of interconnectors for high-risk circuits, increasing the number of remote-controllable pole-mounted switches for the rural overhead distribution circuit and expediting the installation of lightning arresters on overhead transmission lines. CLP is also extending the application of Intelligent Management System (Grid-V) to monitor the condition of critical supply facilities in real time, thereby continuously enhancing the resilience of medium-voltage and high-voltage networks and preventing potential issues. To date, CLP has commenced the implementation of all recommendations.

30. While the number of large-scale power interruption incidents affecting over 2 000 households for CLP has reduced by half year-on-year, and CLP's power supply system remained generally intact during the earlier Super Typhoon Ragasa and Typhoon Wipha when Hurricane Signals No. 10 were issued, the power interruption incident occurred in Kowloon City in the afternoon of 18 December 2025 has served a stark reminder to CLP that maintaining a safe and reliable power supply system is an ongoing endeavour requiring unwavering commitment, and with no room for complacency.

31. In the incident mentioned above, CLP acted upon the review report's recommendation to "increase the number of interconnectors in the urban distribution network to strengthen the mutual backup ability". It activated the interconnectors to allocate backup power and conducted remote operations, restoring supply to over 70% of affected customers within 4 minutes. CLP has also, in accordance with the newly established service pledges, dispatched a maintenance team to the site within 22 minutes after the incident to conduct a power outage inspection, and notified the relevant property management offices and District Office within 28 minutes. EMSD will stringently follow up with CLP on this incident according to the Electricity Ordinance.

32. To ensure the continued stability and reliability of CLP's power supply system, EMSD will scrutinise and urge CLP to fully implement these recommendations in a timely manner, with particular emphases on fostering a more proactive maintenance culture within CLP, so as to address both the symptoms and the root causes of the issues identified. EMSD has also requested CLP to continuously review, supplement and optimise the

recommendations based on the 11 action strategies under the 5 action objectives to enable CLP to continuously improve and leverage its professionalism in the power industry for driving Hong Kong's future development.

Annex – Recommendations on CLP's Power Supply System

Action Objective	Strategies	Recommendations
Reduce Incidents of Power Supply Interruption and Voltage Dip	Reduce Potential Risks	Enhance risk prevention and control by conducting tests on high-risk underground circuits to identify and expedite the replacement of compromised components in potentially risky circuits
		Strengthen the resilience of overhead transmission and distribution systems against external factors, including accelerating transplant trees posing potential impacts on overhead lines, applying " high voltage insulation coating" to overhead transmission systems in the vicinity of major infrastructure construction sites, and expediting the installation of lightning arresters on overhead transmission lines
		Strengthen assessment of wooden poles and promptly replace those identified with potentially risks to enhance the resilience against super typhoons
		Enhance water prevention facilities for high-risk substations, including installing flood gates and water shelters to strengthen equipment protection
		Improve the lightning protection systems of power stations for enhancing their ability to withstand risks from lightning strike
		Assess the sealing condition of medium voltage equipment to promptly identify and expedite replacement of potentially risky equipment
	Enhance Asset Management	Continuously examine and update risk assessment to identify emerging risks, particularly the "low-probability-high-impact" risks
		Tighten health assessment standards for key assets to identify and expedite the replacement of transmission and distribution network equipment with declining performance
		Incorporate and standardise condition indicators in maintenance programmes to enhance the accuracy of predictive maintenance
		Submit review reports of transmission and distribution equipment to EMSD regularly, for continuous optimisation of the power grid's ability to adapt to climate change
		Fully expedite the digitisation of equipment maintenance to drive the equipment condition trends analysis, and to strengthen preventive maintenance and improve reliability of the equipment
	Strengthen Collaboration with Different Parties	Collaborate and follow up with the road excavation contractors proactively, to strengthen underground cable route patrol, thereby reducing the risk of damage to underground cable caused by excavation works
		Enhance customer education on the causes and preventive measures of customer-side power equipment failures, to reduce their impact on the power grid

Annex – Recommendations on CLP's Power Supply System (Con't)

Action Objective	Strategies	Recommendations
Alleviate the Impact of Power Supply Interruption and Voltage Dip on Customers	Optimise System Design	Increase the number of interconnectors in the urban distribution network to strengthen the mutual backup ability and reduce the number of customers affected by power incidents
		Increase the number of remote-controllable pole-mounted switches for the rural overhead distribution circuit to strengthen its network design and reduce the number of customers affected by power supply interruptions
		Replace non-remote-controllable-switchgears on distribution network to enhance real-time incident handling and power restoration capabilities
		Conduct feasibility study on redesigning of power system earthing arrangement to mitigate the impact of voltage dip
	Improve Response Capability	Formulate a joint crisis response drill plan with major public service providers to enhance crisis response capability
		Strengthen incident response drills with property management companies to improve power incident responsiveness
		Enhance communication with FSD for timely information exchange on hill fires and voltage dip incidents to mitigate the impact of hill fires on the power grid and minimise inconvenience caused by disruption of lift operations
		Submit an annual extreme weather emergency preparedness plan to EMSD with the objective of continuously optimising the plan and exploring opportunities for enhanced collaboration
Expedite Power Restoration After Power Supply Interruption Incidents	Optimise Incident Management	Optimise incident handling and power restoration workflows to minimise outage duration
		Increase flexibility in deploying temporary power supply sources and improve standard operating procedures for mobile generator deployment to minimise outage duration
		Standardise mobile generator connection in new substations to further shorten the lead time for temporary power supply deployment in the event of an incident
		Explore the feasibility of adopting mobile substations as temporary supply sources to further reduce the restoration time during equipment failures in substations

Annex – Recommendations on CLP's Power Supply System (Con't)

Action Objective	Strategies	Recommendations
Leverage Innovative Technologies for Maintenance and Monitoring of Equipment Conditions	Leverage Artificial Intelligence	Extend the application of Artificial Intelligence Management System (Grid-V) for comprehensive monitoring of critical power supply facilities, potential risk and abnormality detection in real time and automatic alarms for engineers, to reduce power incidents
		Uplift construction site activity monitoring by deploying AI-powered camera to reduce the risk of third-party damage to the transmission and distribution cables
		Leverage data analytics of advanced metering infrastructure (AMI) to proactively detect low voltage network overloads and reduce low voltage power incidents
	Apply Innovative Technologies	Establish a CLP management-led mechanism to reinforce promotion and hasten the adoption of innovative technologies
		Invite EMSD to join CLP's innovation and technology working group as an adviser to continuously follow up and review CLP's innovative technology applications in enhancing power supply reliability
		Participate in the Government's Low-altitude Economy Regulatory Sandbox Programme to conduct trials on using drones for enhanced monitoring of critical power facilities and supporting incident investigation
		Explore the use of innovative technology on transmission cable condition monitoring, including electromechanical sensing technology, an integrated distributed acoustic and temperature sensing system and online partial discharge monitoring
Promote A More Proactive Maintenance Culture Comprehensively	Strengthen Quality Management	Establish a cross-departmental quality management committee, led by CLP's senior management, to set performance-driven targets and proactively enhance work quality management
		Enhance the staff incentive scheme to foster collective wisdom, strengthen team spirit and enhance work quality performance
		Enhance CLP management's commitment to quality management of operational and maintenance work, including strengthening unannounced assurance inspections to frontline workplaces to ensure effective implementation of control measures
		Extend the existing personnel qualification schemes to additional work scopes, such as incident investigation, condition assessment and drone operation, with a view to enhancing staffs' competencies across multiple professional fields
		Advance verification of operator qualifications at the work planning stage to ensure that the tasks are carried out by proper authorised personnel to improve efficiency and quality management
		Explore the feasibility of establishing an independent material sampling and testing mechanism for quality assurance

Annex – Recommendations on CLP's Power Supply System (Con't)

Action Objective	Strategies	Recommendations
Promote A More Proactive Maintenance Culture Comprehensively	Strengthen Contract Management	Clearly define mandatory compliance requirements in supplier contract tender documents to ensure clear communication of expected quality and performance standards. Incorporate standardised quality assessment weightings in the tender evaluation process to maintain quality consistency
		Adopt an integrated approach to assess the performance of suppliers across multiple contracts, standardise supplier improvement plans, and incorporate quality indicators into contractor reward and penalty mechanisms to strengthen quality control and enhance performance
		Establish a comprehensive communication channel with contractors to ensure top-down alignment on safety and quality requirements from board level
	Enhance Peer Communication	Strengthen information exchange platform with other power companies to share and discuss incident handling experiences and collaboratively address emerging challenges
		Conduct regular exchanges with other power companies on training modules of maintenance to leverage experience of other power companies and proactively enhance training quality