

Electricity Legislation in Hong Kong Safeguarding the General Public in the Use of Electricity

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Abstract: The Electricity Ordinance (Cap. 406) in Hong Kong aims at protecting the general public at large in the use of electricity, which is supplied through generation, transmission and distribution. There are a number of subsidiary regulations enacted under the Electricity Ordinance. These include the Electricity (Wiring) Regulations, Electricity (Registration) Regulations, Electrical Products (Safety) Regulation, Electricity Supply Lines (Protection) Regulation, Electricity (Exemption) Regulations and others. The Electrical and Mechanical Services Department [EMSD] is the authority in Hong Kong responsible for the enforcement of the Electricity Ordinance and its subsidiary regulations. This paper briefly explains how the current regulatory framework in Hong Kong is being enforced to ensure the safe use of electricity. It will also discuss the public education and publicity activities carried out by EMSD in recent years to promote to the public and the trade about electrical safety and to educate them the potential danger of electricity.

1. INTRODUCTION

Electricity has significantly improved our lifestyle, our comfort and our communication efficiency to achieve globalisation. In Hong Kong today, safe and reliable electrical supply, electrical installations and electrical appliances continue to improve our quality of life and maintain our city as a world class international metropolis.

Although most of us understand that improper use of electricity can be lethal, not many members of the public are fully aware that the risks associated with the generation, transmission, distribution and utilisation of electricity have been greatly reduced and mitigated through effective enforcement of the current regulatory framework under the Electricity Ordinance (Cap. 406).

2. ELECTRICITY ORDINANCE

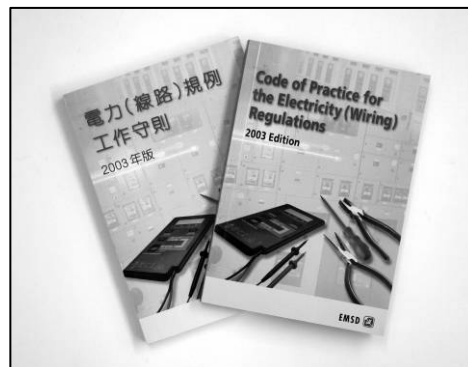
In 1911, the Electricity Supply Ordinance and its subsidiary regulations were first introduced to regulate the supply of electricity in Hong Kong. With rapid economic growth in the 1960's and 1970's, the Factories and Industrial Undertakings (Electricity) Regulations were then introduced in 1982 to protect employees from electricity-related hazards in the workplace. Throughout that period, the owners and workers carried out the electrical installations in Hong Kong in accordance with the requirements of the Wiring Regulations published by the UK Institution of Electrical Engineers (IEE) and the Supply Rules of the power companies in Hong Kong.

In 1990, the Electricity Ordinance (Cap. 406) was enacted to repeal and replace the outdated Electricity Supply Ordinance. With the aim of enhancing public safety, it governs the generation, transmission, distribution and utilization of electricity and was supported by a number of subsidiary regulations including the Electricity (Wiring) Regulations, Electricity (Registration) Regulations, Electrical Products (Safety) Regulation, Electricity Supply Lines (Protection) Regulation, Electricity (Exemption) Regulations and Electricity Supply Regulations. The enactment of the Electricity Ordinance signified the establishment of an embracing and systematic regulatory framework to ensure electrical safety in Hong Kong.

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2.1. Electricity (Wiring) Regulations (EWR) and its Code of Practice

The Electricity (Wiring) Regulations [EWR] which was enacted in June 1992, stipulate the safety requirements for the design, installation, testing and certification of fixed electrical installations. The key spirit of the EWR is to ensure the quality and workmanship of electrical installations in Hong Kong through a regulatory framework of registered electrical contractors and registered electrical workers [REC/REW]. The EWR specifically requires that whenever a fixed electrical installation is installed, and after any repairs, alterations or additions to it are completed, it must be inspected, tested and certified by a REC/REW before being energised for use.



In order to facilitate the trade and industry to comply with the statutory requirements of the EWR, EMSD published a Code of Practice for the Electricity (Wiring) Regulations [CoP]. The CoP provides comprehensive practical guidelines to help REC/REW to properly design, install, test and certify electrical installations. The CoP has been highly regarded as the “golden rules” by the local electrical trade and industry, since compliance with it means compliance with the relevant aspects of the EWR. To keep in pace with technological advancement and changes in the international electrical safety standards, EMSD regularly reviews and updates the CoP, which has therefore been revised in 1997 and again in 2003, supplementing it with the latest safety requirements subsequent to consultation with the electrical trade.

As the owners of electrical installations play an important role in ensuring electrical safety, the EWR stipulates the responsibilities of the owners as well as the requirements of electrical work carried out by a REC/REW, such as the owners shall regularly arrange for inspection, testing and certification of their installations by a REC/REW. Electrical installations serving a public entertainment place, dangerous goods store and high-voltage switch rooms shall be inspected once every year. Electrical installations in a hotel, hospital, school or child care centre shall be inspected once every 5 years. For a factory with an approved loading exceeding 200 amperes or any residential and commercial premises with an electrical installation of approved loading exceeding 100 amperes, it shall then be inspected once every 5 years.

Premises in which Fixed Electrical Installation is Located	Approved Loading	Inspection Frequency (At least once)
Place of public entertainment, dangerous goods store, high voltage switch room	Any	1 year
Hotel, hospital or maternity home, and school or child care centre	Any	5 years
Factory or industrial undertaking	> 200 A	5 years
Any premises	> 100 A	5 years

Table 1 - Inspection frequency for fixed electrical installations

2.2. Electricity (Registration) Regulations (ERR)

To ensure the quality and workmanship of the electrical work being carried out, the ERR specifies the qualifications and experience of registered electrical contractors and workers. Since electrical works in Hong Kong must be carried out by REWs, the quality and workmanship of these workers are the key elements in ensuring electrical safety. To be qualified as a REW, a person shall have specific academic qualification and working experience for the appropriate grade of electrical work (i.e. grades A, B, C, H & R). To be qualified as a REC, a company must employ at least one REW. EMSD constantly monitors the standard, performance and quality of work of REC/REWs through routine and random inspections, complaint and accident investigations.

2.3. Role of Electricity Suppliers

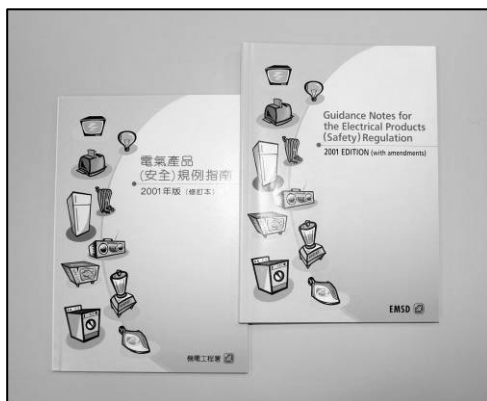
Power companies play a vital role in supplying safe and reliable power supply to the general public. In this context, the Electricity Ordinance also stipulates the powers and obligations of electricity suppliers. As a general rule, an electricity supplier shall not connect electricity supply to a fixed electrical installation unless he has inspected the installation and is satisfied that it is safe for use. For new installations, electrical safety is assured and certified by a REC/ REW and is further checked by the electricity supplier.

2.4. Electrical Products (Safety) Regulation (EPSR) and its Guidance Notes

Whilst paragraphs 3.1 to 3.3 stipulate the safety requirements for a fixed electrical installation, the safety of electrical products (with electricity supply fed by a power socket) is regulated by the Electrical Products (Safety) Regulation [EPSR]. Enacted since 1997, the EPSR aims at ensuring public safety of household electrical products. Key features of the EPSR are:

- (a) ensuring that an electrical product supplied in Hong Kong complies with the relevant international safety standards and has been issued with a certificate of safety compliance;
- (b) prescribing the safety requirements of household electrical products; and
- (c) requiring product suppliers to notify the public of the hazardous defects of their products (if they do not meet the prescribed safety requirements), and establish a mechanism for voluntary recall of products with refund to purchasers concerned.

Under the EPSR, an electrical product shall comply with essential safety requirements (ESRs) including a label or marking on the product to show the rated voltage and frequency, model number and trade mark. The main purpose is to ensure that under normal circumstances, users are protected from electric shock due to direct contact, the risk of fire or explosion due to over-heating, and personal injury due to any electrical or non-electrical danger which may arise. In addition to meeting the ESRs,



certain prescribed products shall also comply with the specific safety requirements derived from international and/or national standards. Currently, there are 6 types of prescribed products under the EPSR, namely plugs, adaptors, extension units, lampholders, flexible cords and unvented thermal storage type electric water heaters. Additional prescribed products may be introduced as and when required. EMSD has also published Guidance Notes for the EPSR [GN] to help the trade and industry understand the requirements of the EPSR. In general, electrical products that are designed to meet the International Electrotechnical Commission (IEC) standards or compatible standards satisfy the prescribed safety

requirements of the Regulation.

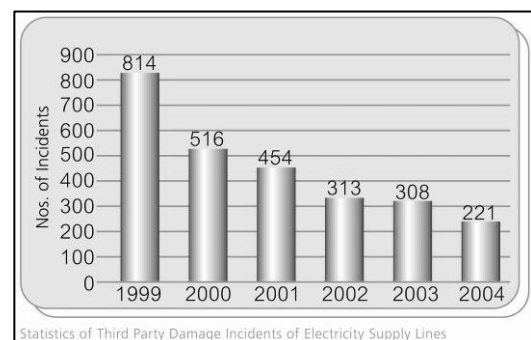
In addition, the EPSR also stipulates that every model of household electrical product supplied in Hong Kong must be issued with a certificate of safety compliance. For a prescribed product, the test certificate or report issued by a EMSD recognised certification body or recognised manufacturer is acceptable. In general, test certificates issued by national certification bodies participating in the CB Scheme of the IEC System for Conformity Testing to Standards for Safety of Electrical Equipment, testing laboratories accredited by the Hong Kong Laboratory Accreditation Scheme [HOKLAS] or by the Hong Kong Accreditation Service [HKAS] or those bodies having mutual recognition agreements with HOKLAS or HKAS are acceptable. For a non-prescribed product, a self declaration of conformity issued by the product manufacturer is also acceptable as the certificate of safety compliance. In essence, this means that every model of household electrical product shall be tested and certified to meet international safety requirements. As the endorsed test certificate or test report adopted in international trade is normally acceptable as a certificate of safety compliance under EPSR, and electrical products that have been tested for such purpose need not be tested again for compliance with the Hong Kong regulatory requirements.

2.5 Electricity Supply Lines (Protection) Regulation and its Code of Practice

Damage to a live electricity supply line during work may lead to an explosion, and the site workers as well as other persons in vicinity, may be electrocuted or burnt. In addition, the damage will also cause a power interruption and serious inconvenience to the general public. The Electricity Supply Lines (Protection) Regulation [ESLPR] was promulgated in 2000 with a view to preventing power interruptions and electrical accidents arising from damages by third parties.

The main objective of the ESLPR is to regulate construction site activities including the use of heavy machinery to prevent damaging the underground power cables and overhead lines. The “Code of Practice on Working near Electricity Supply Lines” was published in 2000 to elaborate the requirements of ESLPR. This Code outlines the “Safe System of Work”. It requires site contractors and workers to obtain relevant information from power companies, engage a qualified competent person to locate underground cables, and adopt safe working practices when carrying out works in the vicinity of underground power cables and overhead lines. In addition, power companies are also obligated to provide information relevant to power cables and lines in the vicinity of works upon request. As regards the competent persons, EMSD also maintains and administers a list of approved competent persons for locating underground power cables.

The ESLPR has been in force for over 4 years. The results are encouraging, with a sharp 73% drop in cases concerning damages to underground power cables and overhead lines (from 814 cases in 1999 to 221 in 2004, see the chart).



3. DISCIPLINARY ACTION AND PROSECUTION

A REC/REW shall follow the requirements stipulated in the EWR and its CoP when carrying out electrical work, failing that he may face possible disciplinary action undertaken by EMSD. According to the Regulations, RECs and REWs who fail to comply with the safety requirements are liable to a maximum fine of \$100,000 and \$10,000 respectively. At the same time, their registration may be revoked. In the past three years, 10 RECs and REWs have been disciplined. In order to further enhance the quality of electrical installations, EMSD is reviewing the disciplinary system implemented since 1999.

As regards prosecution, 745 persons were prosecuted in the past 3 years for failing to comply with the safety requirements of the EO or its subsidiary regulations. Common offences include failure to arrange periodic test for fixed electrical installations, supply of household electrical products not in compliance with safety requirements, damages to underground electricity supply cables/overhead lines, and carrying out electrical work without a valid registration.

4. PROMOTION AND PUBLIC EDUCATION

EMSD always believes that public education is the most effective way to enhance electrical safety. Thus, we arrange promotion and public education activities through various channels, whilst we consider prosecution or disciplinary action as the last resort. To make our educational materials more appealing, EMSD has adopted popular cartoon characters to enliven the design of posters, newsletters, booklets, leaflets and other materials since 2003. This approach has proven to be extremely effective, as high public demand for these promotion materials readily speaks for themselves. To sustain public interest and to reinforce our safety messages, EMSD continues to adopt other famous cartoon characters in its promotional work.



For a number of years, EMSD has worked with the Housing Department, the Hong Kong Housing Authority, property owners associations, mutual aid committees and the Information Services Department to promote electrical safety in public housing estates, private estates and government departments. Through these partnerships, we display safety posters in areas of high commuter flow (including in the interior of buses and trains and on station concourses).



Moreover, EMSD works closely with the Information Services Department to produce announcements of public interest (APIs) on electrical safety and broadcast these on television and radio in different time slots to capture the attention of various audience groups.



To better bring our electrical safety messages to the public in all walks of life, EMSD has also been publishing articles in a popular local newspaper every Friday since June 2004. These articles are uploaded to EMSD's website (www.emsd.gov.hk) for browsing by the public.

In addition, EMSD organises regular activities such as talks, carnivals and TV shows and distributes posters, leaflets and pamphlets to educate the public about the importance of the proper use and maintenance of electrical products and electrical installations. EMSD also publishes the half-yearly "E&M Safety Newsletter" and distributes more than 110,000 copies to schools, public and private housing estates and new immigrants. Moreover, EMSD conducts outreach visits to kindergartens and nurseries throughout Hong Kong to teach students about basic household electrical safety.





In addition to educating the public, EMSD maintains close communications with the electrical trade to help raise the standard of electrical work carried out in Hong Kong. Through collaboration with the trade, large-scale technical seminars have been organized annually since 2001. To ensure that all RECs and REWs are familiar with the EWR, its CoP and other relevant safety requirements, we have published the “Electricity News” newsletter twice a year since 2002 and distribute over 70,000 copies to REC/REW for each issue.

5. CHALLENGES AHEAD

EMSD will keep abreast of the latest developments in international safety standards and electrical technology and take a proactive part in updating and establishing safety codes and guidelines. We will continue to take a role in the preparation and enforcement of safety legislation in all matters relating to the use of electricity to ensure public safety. We will also keep in close contact with the trade and industry on all matters relating to electrical safety. EMSD is currently working together with power companies to monitor statistics on incidents involving damage to underground cables and overhead lines. Although there has been a consistent reduction of these incidents in the past years, we are not complacent and it is our aim to continue achieving a steady decreasing trend in the years ahead. Also, EMSD will continue to monitor the incident statistics with a view to adjusting our enforcement actions as necessary.

EMSD has critically examined the content of the Code of Practice on Working near Electricity Supply Lines in light of the experience gained in the past few years. In collaboration with trade organisations and other government departments, this Code is now being revised to provide a practical and up-to-date guideline for the construction industry, and complete with detailed working procedures and illustrations. The revised Code is expected to be published in August 2005.

A new challenge facing us now is the proposed adoption of new cable colour in Hong Kong. The use of new cable colour in Hong Kong will ensure a continuous supply of cables from European suppliers at steady and reasonable prices, since all European countries including the United Kingdom have already adopted the new cable colour. The proposed change of new cable colour has received widespread support from the electrical trade and industry in Hong Kong. In collaboration with the trade and industry, EMSD will carefully work out relevant technical guidelines, fully assess the safety implication and devise the training plan for the trade with a view to implementing the new cable colour step by step and in a safe and prudent manner. An implementation plan will also be tabled to the Electrical Safety Advisory Committee for endorsement later in the year.

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