Safe & Efficient Electricity System For Healthcare Facilities

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Relationship between Healthcare and Electricity?

Healthcare Engineering Systems



What will the talk deliver?

Key facts for health practitioners

Agenda



II. Design and Installation • Electricity Ordinance (Cap.406)

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- Energy Efficiency Ordinance (Cap.610)
- Back-up Power Supply Consideration
- Electrical Demand Loading & Protective Device Consideration

III. Operation and Maintenance

- Periodic Testing, Inspection and Certificate (WR2)
- Other Testing (e.g. On load test of emergency generator & discharge test on batteries)

I. Key Terminology (HTM 06-01)



Medical Location:

For the *purpose of diagnosis treatment* (including cosmetic) or *monitoring* a patient under medical supervision





I. Key Terminology (HTM06-01)

| Clinical Risk Grade | |
|---|--|
| E Support services and circulation | No immediate effect on the clinical treatment or safety of patients |
| D Ambulant Care | Disruption, inconvenience and a reduced environmental quality but would not directly compromise clinical treatment and safety. |
| C General Patient Care | Clinical treatment and patient safety will not be immediately compromised by an interruption of electrical power |
| B Complex treatment and diagnostics | Clinical treatment and patient safety may be compromised (but not endangered) by any minor interruption of electrical supply. |
| A Lift support/ Complex Surgery | Disconnection of the supply represents a threat to life |

| E | D | С | в | Α |
|-----------------|---------------|-----------------|-------------------|-----------------|
| upport services | Ambulant care | General patient | Complex treatment | Life support/ |
| and circulation | | care | and diagnostics | complex surgery |



Cap. 406 – Electricity Ordinance



Cap. 406 – Electricity Ordinance Code of Practice for the Electricity (Wiring) Regulations

Code of Practice for the Electricity (Wiring) Regulations 2015 Edition



 General technical guidelines on the statutory requirements in accordance with international electrical safety standards and latest technical development



What is WR1 – Work Completion Certificate?



Fixed Electrical Installation



What is the responsibility of owner in relation to installation?



- Employ Registered Electrical Contractor (REC)



 Employ Registered Electrical Worker (REW)

| | 電力條例(第 406 章) 電力(兼路)規例 | ELECTRI ELECTRI | CITY ORDINANCE (CHAPTER 406) RICITY (WIRING) REGULATIONS | |
|---|---|--|--|----------|
| * | 元工芸明書一次拾いた | WORK COM | LEHON CERTIFICATE - PORALWEI | |
| To the Own | er of Fixed Electrical Installation : | | | _ |
| | 第1部(對設計方面的 | 證明)PART 1 (For Cert | ification of DESIGN) |] |
| (1) 本人 406 東] 設明書 | 将註冊電業工程人員 第 59 後下形论的 (電力 (維路) 規門) 第 第 3 部所指面定電力装置的設計,符合後例的 | ・現該教(電力條例)(第 19(1)條的現定・證明本 現定。 sectrical worker(REW), | 註学確実に 校人 貝洛第: Signature of REW: 註門編明 Registration No.: 問題目 Explore Date - | |
| under s that the been de | It to regulation 19(1) of the Electricity (Wi ection 80 of the Electricity Ordinance, Cha Fload Electrical Installation depicted in Part esigned in accordance with the Ordinance. | ring) Regulations made pter 408, hereby certify : 3 of this certificate has | 新聞 Grade: 地方に 和 Permitted Works: 朝秋田田 Contact Tel. No.: | |
| ~ | | | 簽署日期Date Signed : 註乎國意來就即答案 : | - |
| (4) 木人 (第)・現 後・ | 2017天 建臣《笔力绘例》(第406章)第34(11)版/ | (経営職業未詳 の規定・在本證明書上加 | Signature of REC : IEFINIDE Registration No.: | |
| I | on behalf of | | 田橋日前 Expiny Date: 聯結電話 Contact Tel. No.: | |
| (a regis with set | tered electrical contractor(REC)), endorse stion 34(11) of the Electricity Ordinance, Cha | herewith in compliance pter 405. | 被₩日期 Date Signed : | |
| | 集2部(集 PART 2 /For Certification | 「安装・検査及実践方面」 | た た 変現) Section & Testing) |] |
| (3) 本人 | S註冊唯東工程人員。 | 現該照《電力條例》(第 | 該所屬東二代人具務署: | 1 |
| 406 章) 通用的 | 第59 條下就它的電力(線路)規則第 19(1) - 段文字,並在其亞指內加上V號):- | 條的規定、證明(讀書出 | Signature of REW : " | |
| Electric Ordinar by ticki | , a REW, pursuant t ity (Wring) Regulations made under sect ice, Chapter 400, hereby certify that (select t ig the appropriate loci below) : - | o regulation 19(1) of the ion 59 of the Electricity he appropriate paragraph | | |
| □ 本 電 | 人已於年月日檢查本 力裝置,本人認時說因定電力裝置符合條例的 | 遵明書第3部所指的固定 規定,而且操作安全。 | 註H編號 Registration No.: | |
| i h ote ins | ave inspected the Fixed Electrical Installation rificate on I am satisfie tallation complies with the Ordinance and is | depicted in Part 3 of this d that the Fixed Electrical in safe working order. | 展播日期 Expiry Date: | |
| 日本関税 | 人已於 <u></u> 年 <u>月</u> 日檢查不識 面的其中部分,至於該固定電力設置並未由本 因《電力(編為)綱列)第21(3)個的規定。 | 明書第3部所指因定電力 人檢查的各部分,本人已 和到由其集註野電業工程 | 紙別 Grade: 他的工程 Permitted Works: | |
| 1 | 力装置符合推刑的规定。而且操作安全。 ave inspected only part of the Fixed Electric | al Installation depicted in | 聯結電話 Contact Tel No.: | |
| the the the (W | r1.3 of this certificate on | however in respect of hich I have not inspected, (i) certified by REWs for in 21(3) of the Electricity xed Electrical Installation | 接著日期 Date Signed : | ings and |
| 00 | mplies with the Ordinance and is in safe wor | king order. | 1.58.624823: | - |
| (4) 不人 問) 現 簽: 副 | | (註形電菜水鮒 的規定・在本證明書上加 亦根據(電力(線路)規 | Signature of REC : | |
| 例)第 | 22 條保存費記錄的圖本。 | | BETHADIM Registration No.: | |
| I. (a REC | on behalf of, on behalf of | n 34(11) of the Electricity | 层描日期 Expiry Date: | |
| Ordinar | ce, Chapter 408, and confirm that the above | inspection records have | 副結業語 Contact Tel. No.: | |
| accords | ince with regulation 22 of the Electricity (Win E建築なららの上、彼 Lik the appropriate box | ing) Regulations. | |] |
| | | | | |
| | | | | |
| | | | | |
| | 由定電力装置受検討 Location & descrip | e部分的位置及說明 tion of inspection part of t | he Fixed Electrical Installation: | |
| | (c) 因主電力装置受検 | 本於公約該十個國際外級 | aka 开始,要的工程。 | |



Who can perform electrical work?

| | Registered Electrical Contractor | \checkmark |
|---|---|--------------|
| | Non-registered Electrical Contractor | × |
| | Employing Registered Electrical Contractor via Non-registered Electrical Contractor | × |
| 電業工程人員註冊證明書 Certificate of Registration of Electrical Worker 電力條例(第406章)ELECTRICITY ORDINANCE (CAP. 406) 註冊編號 Registration Number: W0000001 谜面 姓名:陳安全 Name: CHAN ON CHUEN 工程級別 Grade: A 准許工程 Permitted Work: AO 有效日期由 Valid from: 02/06/2009 | Sub-contracting to Registered Electrical Contractor via Registered Electrical Contractor | \checkmark |
| 至 until: 01/06/2012 ^{赛發機構} Issued by: 機電工程署 <mark>②</mark> EMSD | 11 | 機電工程署 🛐 |

Cap. 610 – Buildings Energy Efficiency Ordinance (BEEO)



Scope of Buildings Energy Efficiency Ordinance (BEEO)





Exemption on premises s4 BEEO and Schedule 2 of BEEO

1.Small building (3-storey each \leq 65 m²)

2.Building with approved electrical load ($\leq 100A$, 1-ph/3-ph)

3. Historical or Monument building

4. Building to be demolished in 12 months

5.BS installations, with specific operational & technical natures such as fire protection, life safety... etc.







Exemption on installation





What is Major Retrofitting Works?

Works Area

Addition/replacement of a BS installation specified in the BEC at the following conditions –

total floor area covered by the works (i.e. works area) $\ge 500 \text{ m}^2$ in a unit or a common area



If the works are conducted as a same series of works in phases or at different places in a unit or a common area, total floor area covered by these works (i.e. works area) within 12 months aggregating to $\geq 500 \text{ m}^2$

Central BS installation

Addition/replacement of a main component of a central BS installation, incl. –



a complete electrical circuit at rating \geq 400A;

or



a unitary air-conditioner or a chiller at rating ≥ 350kW (cooling or heating);

or



motor drive + mechanical drive of a lift, escalator or passenger conveyor



What is the Form of Compliance (FOC) and when should it be submitted?





III. Back-up Power Supply Consideration

What are the consideration factors?



200 Department of Health

> Health Technical Memorandum 06-01 Electrical services supply and distribution 2017 editor







III. Back-up Power Supply Consideration

Definition in HTM06-01?



III. Back-up Power Supply Consideration

TPS: UPS Installation

 TPS supply for the clinical risk grade A or B areas (e.g. OT & ICU).

- E.g. In HTM06-01, it ...a dedicated TPS capable of sustaining adequate lighting levels for a minimum 1~3 hours following failure of the electrical supply.
- The battery autonomy in line with the procedures should be coordinated with Clinicians, equipment's suppliers and designers.





Load Demand & Protection Device Consideration



III. Operation and Maintenance

What is the responsibility of owner in relation to installation?



- Inspected, tested and certified periodically in accordance with the Cap. 406
 - Periodic Inspection, Testing and Certification (PITC)
 - Owner's Approved Electricity Supply > 100A, 1Phase or 3 Phases
 - At least once every 5 years for premises covered in Cap. 165



- Testing to ensure proper function upon loss of the normal power supply
 - On-load test of emergency generators;
 - Discharge tests of batteries.



III. Operation and Maintenance

What is WR2 – Certification of PITC?



Report submission by REW: within 1 month Submission of WR2 form by owner or his/her representative:

within 2 weeks after the date of certification Endorsement by DEMS, the Form WR2 will be returned Record keeping by REC:

not less than 5 years



What has the talk delivered?





Overview of the statutory requirements on "Electrical Installation" regime Highlight the internationally acceptable healthcare standard (HTM 06-01 "Electrical Services Supply and Distribution"

Design & Installation Considerations of Healthcare Facilities from "Electrical" point of view Operation & Maintenance Considerations of Healthcare Facilities from "Electrical" point of view





Thank You!

