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Department of Health

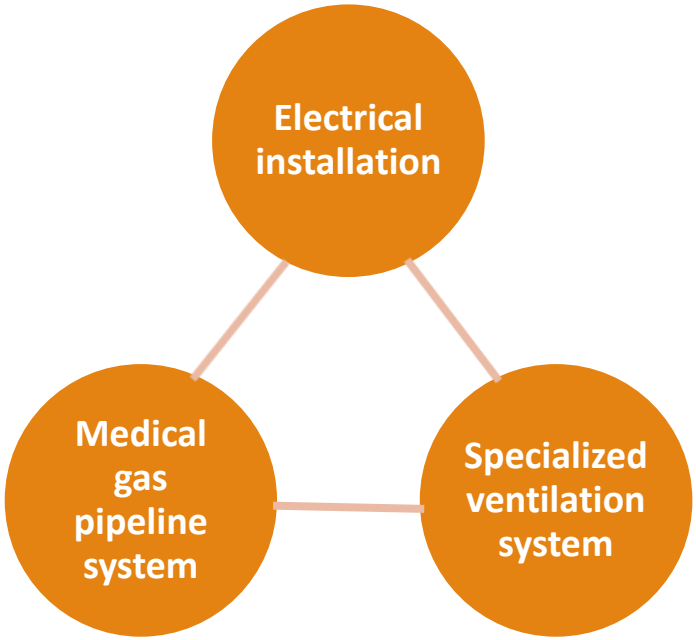
Guidelines for Healthcare Engineering Systems of Private Hospitals

21 FEBRUARY 2019

The Guidelines

- "Guidelines for Healthcare Engineering Systems of Private Hospitals" (The Guidelines) was promulgated by DH in 2018 Q4 with effect from 1 Jan 2019
- Provide general guidance on the standards and requirements of the healthcare engineering systems in private hospitals
- Serve, in conjunction with the CoP, as regulatory standards in respect of healthcare engineering systems for private hospitals

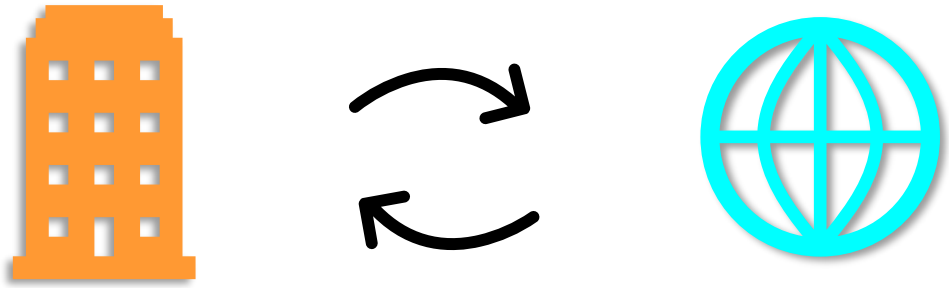
Healthcare engineering systems



- Essential facilities to support safe and effective delivery of medical services.

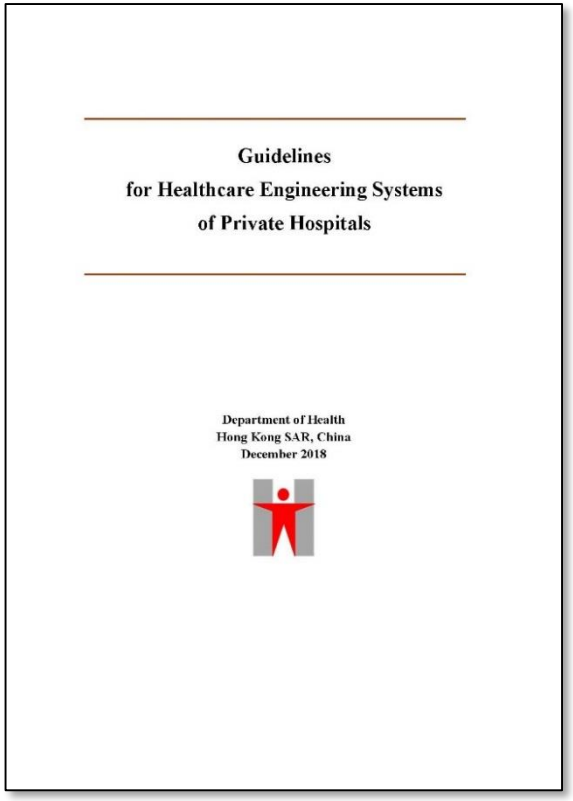
Approach

- Take into account:
  - current practices in private hospitals
  - prevailing local and overseas healthcare standards and guidelines



Contents

- General Requirements
  - Compliance with relevant legislation
- Design and Installation
- Operation and Maintenance

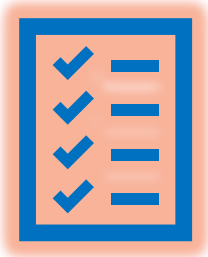


Design and Installation

- Requirements apply to
  - new installations, and
  - additions and alterations to existing installations.
- For existing installations, the current guidelines, codes and standards, etc. apply.

Certification of Healthcare engineering systems

- Design and installation of healthcare engineering systems are to be certified by Registered Professional Engineers (R.P.E.) of the relevant disciplines
- As a requirement in application for first registration or change in services of private hospitals from 2019 Q2



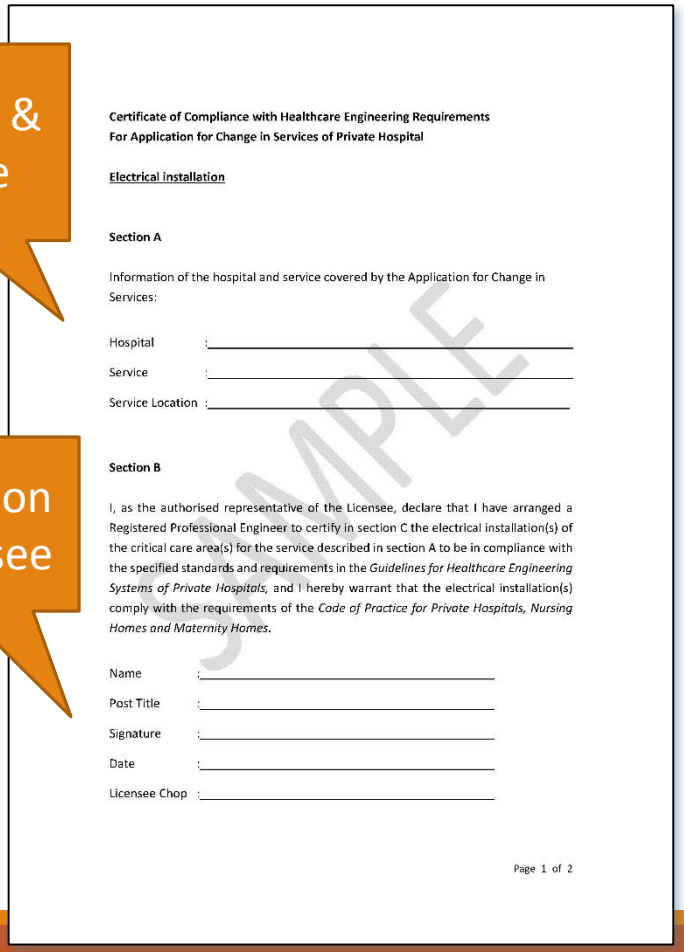
Disciplines for R.P.E. Certification

Healthcare engineering system	Acceptable discipline for certification
Electrical installation	Electrical, or Building Services
Specialized ventilation system	Mechanical, or Building Services
Medical gas pipeline system	Mechanical, or Building Services

Certificate of Compliance (Electrical installation)

Hospital & Service

Declaration by Licensee



Certificate of Compliance with Healthcare Engineering Requirements
For Application for Change in Services of Private Hospital

Electrical installation

Section A

Information of the hospital and service covered by the Application for Change in Services:

Hospital :_____

Service :_____

Service Location :_____

Section B

I, as the authorised representative of the Licensee, declare that I have arranged a Registered Professional Engineer to certify in section C the electrical installation(s) of the critical care area(s) for the service described in section A to be in compliance with the specified standards and requirements in the *Guidelines for Healthcare Engineering Systems of Private Hospitals*, and I hereby warrant that the electrical installation(s) comply with the requirements of the *Code of Practice for Private Hospitals, Nursing Homes and Maternity Homes*.

Name :_____

Post Title :_____

Signature :_____

Date :_____

Licensee Chop :_____

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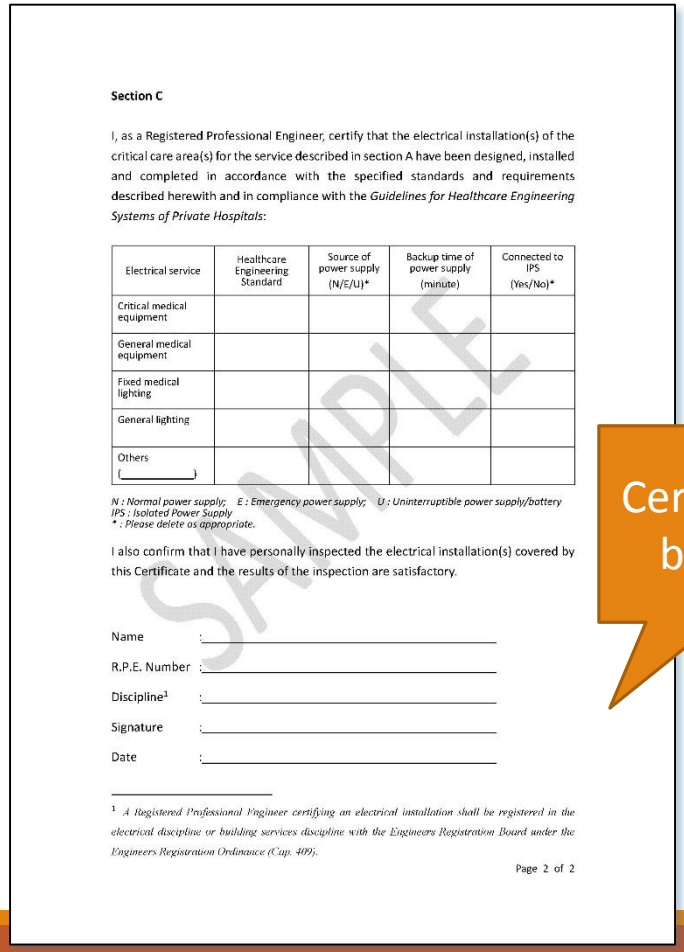
Certification by R.P.E.



Section C

I, as a Registered Professional Engineer, certify that the electrical installation(s) of the critical care area(s) for the service described in section A have been designed, installed and completed in accordance with the specified standards and requirements described herewith and in compliance with the *Guidelines for Healthcare Engineering Systems of Private Hospitals*:

Electrical service	Healthcare Engineering Standard	Source of power supply (N/E/U)*	Backup time of power supply (minute)	Connected to IPS (Yes/No)*
Critical medical equipment				
General medical equipment				
Fixed medical lighting				
General lighting				
Others (_____)				

N : Normal power supply; E : Emergency power supply; U : Uninterruptible power supply/battery
IPS : Isolated Power Supply
** : Please delete as appropriate.*

I also confirm that I have personally inspected the electrical installation(s) covered by this Certificate and the results of the inspection are satisfactory.

Name :_____

R.P.E. Number :_____

Discipline[1] :_____

Signature :_____

Date :_____

[1] *A Registered Professional Engineer certifying an electrical installation shall be registered in the electrical discipline or building services discipline with the Engineers Registration Board under the Engineers Registration Ordinance (Cap. 409).*

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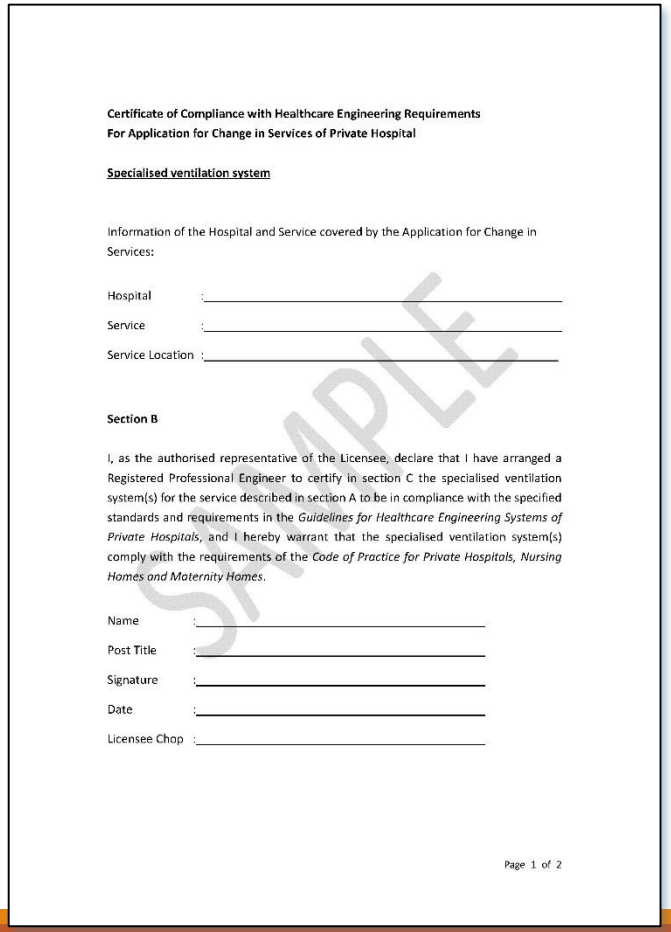
Certificate of Compliance (Specialized ventilation System)



Certificate of Compliance with Healthcare Engineering Requirements
For Application for Change in Services of Private Hospital

Specialised ventilation system

Information of the Hospital and Service covered by the Application for Change in Services:

Hospital :_____

Service :_____

Service Location :_____

Section B

I, as the authorised representative of the Licensee, declare that I have arranged a Registered Professional Engineer to certify in section C the specialised ventilation system(s) for the service described in section A to be in compliance with the specified standards and requirements in the *Guidelines for Healthcare Engineering Systems of Private Hospitals*, and I hereby warrant that the specialised ventilation system(s) comply with the requirements of the *Code of Practice for Private Hospitals, Nursing Homes and Maternity Homes*.

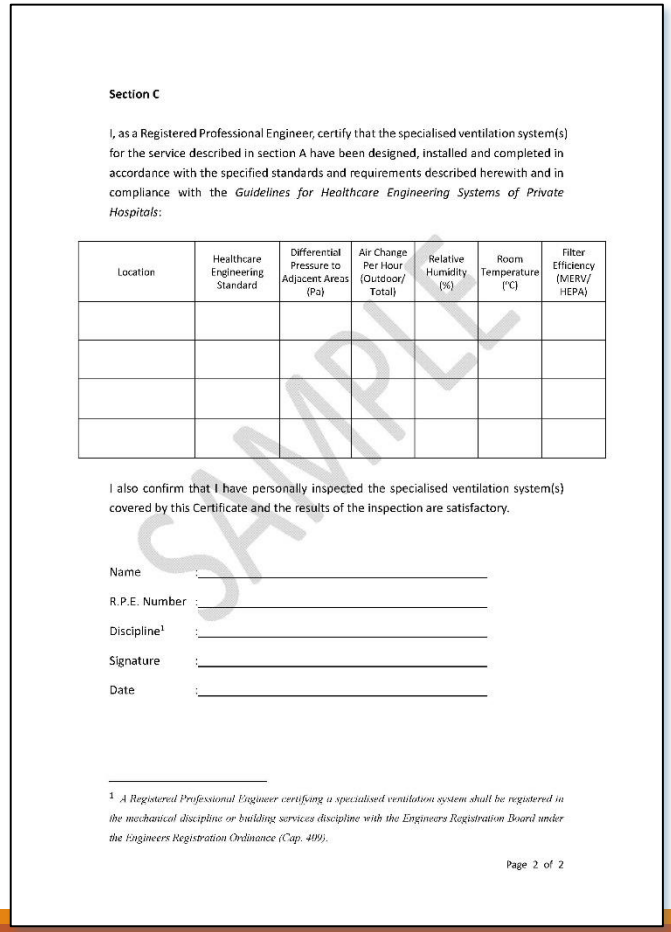
Name :_____

Post Title :_____

Signature :_____

Date :_____

Licensee Chop :_____



Section C

I, as a Registered Professional Engineer, certify that the specialised ventilation system(s) for the service described in section A have been designed, installed and completed in accordance with the specified standards and requirements described herewith and in compliance with the *Guidelines for Healthcare Engineering Systems of Private Hospitals*:

Location	Healthcare Engineering Standard	Differential Pressure to Adjacent Areas (Pa)	Air Change Per Hour (Outdoor/ Total)	Relative Humidity (%)	Room Temperature (°C)	Filter Efficiency (MERV/ HEPA)

I also confirm that I have personally inspected the specialised ventilation system(s) covered by this Certificate and the results of the inspection are satisfactory.

Name :_____

R.P.E. Number :_____

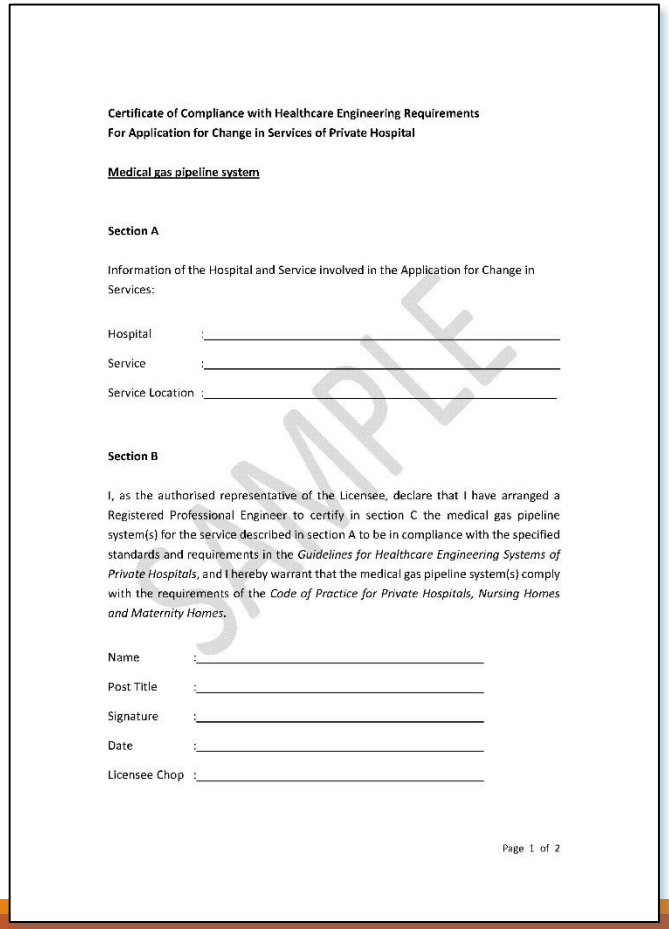
Discipline[1] :_____

Signature :_____

Date :_____

[1] *A Registered Professional Engineer certifying a specialised ventilation system shall be registered in the mechanical discipline or building services discipline with the Engineers Registration Board under the Engineers Registration Ordinance (Cap. 409).*

Certificate of Compliance (Medical gas pipeline system)



Certificate of Compliance with Healthcare Engineering Requirements
For Application for Change in Services of Private Hospital

Medical gas pipeline system

Section A

Information of the Hospital and Service involved in the Application for Change in Services:

Hospital :_____

Service :_____

Service Location :_____

Section B

I, as the authorised representative of the Licensee, declare that I have arranged a Registered Professional Engineer to certify in section C the medical gas pipeline system(s) for the service described in section A to be in compliance with the specified standards and requirements in the *Guidelines for Healthcare Engineering Systems of Private Hospitals*, and I hereby warrant that the medical gas pipeline system(s) comply with the requirements of the *Code of Practice for Private Hospitals, Nursing Homes and Maternity Homes*.

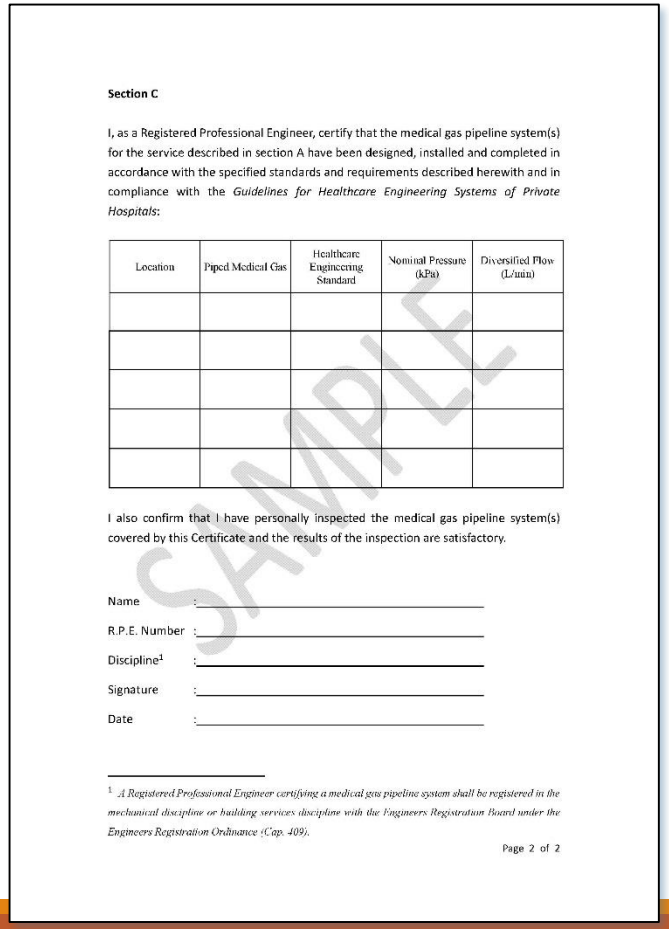
Name :_____

Post Title :_____

Signature :_____

Date :_____

Licensee Chop :_____



Section C

I, as a Registered Professional Engineer, certify that the medical gas pipeline system(s) for the service described in section A have been designed, installed and completed in accordance with the specified standards and requirements described herewith and in compliance with the *Guidelines for Healthcare Engineering Systems of Private Hospitals*:

Location	Piped Medical Gas	Healthcare Engineering Standard	Nominal Pressure (kPa)	Diversified Flow (L/min)

I also confirm that I have personally inspected the medical gas pipeline system(s) covered by this Certificate and the results of the inspection are satisfactory.

Name :_____

R.P.E. Number :_____

Discipline[1] :_____

Signature :_____

Date :_____

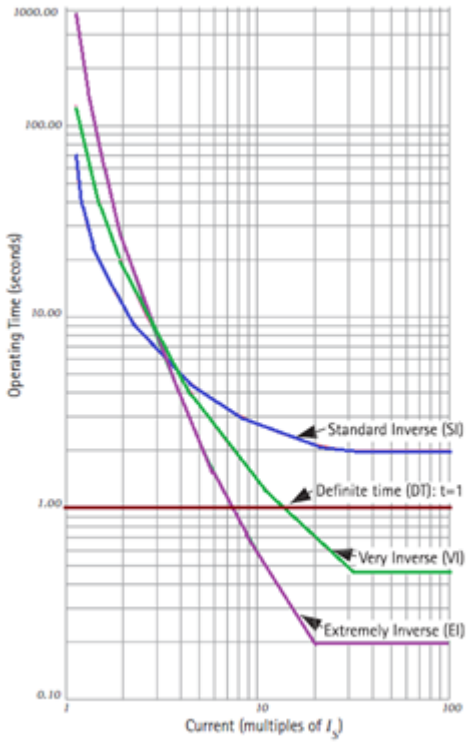
[1] *A Registered Professional Engineer certifying a medical gas pipeline system shall be registered in the mechanical discipline or building services discipline with the Engineers Registration Board under the Engineers Registration Ordinance (Cap. 409).*

Electrical Installations (1)

- To provide safe and reliable electrical supply and lighting
- Design and installation are of internationally acceptable healthcare standards, e.g. HTM 06-01, or equivalent.
- Certification of compliance by a registered professional engineer (R.P.E.) of electrical or building services discipline

Electrical Installations (2)

- Adequate capacity to meet electrical demand
- To minimise the effect of an electrical fault to the clinical areas, by effective discrimination of protective devices



Electrical Installations (3)

- Back-up power supply to ensure patient safety upon loss of normal power supply to critical care areas
  - Emergency generators
  - UPS
  - Batteries
- Isolated power supply to maintain power supply continuity for life critical medical equipment in critical care areas upon first earth fault

Electrical Installations (4)

- Critical care areas in a private hospital:
  - that provide life support or complex surgery, or
  - where failure of equipment or a system is likely to jeopardize the immediate safety or even cause major injury or death of patients or caregivers.
- Examples:
  - operating theatre/room
  - cardiac catheterisation service
  - interventional angiography room
  - intensive care unit, etc.

Electrical Installations (5)

- Proper operation and maintenance with records
- Backup power are maintained, inspected and tested regularly to ensure its proper functioning upon loss of the normal supply

Specialized Ventilation Systems (1)

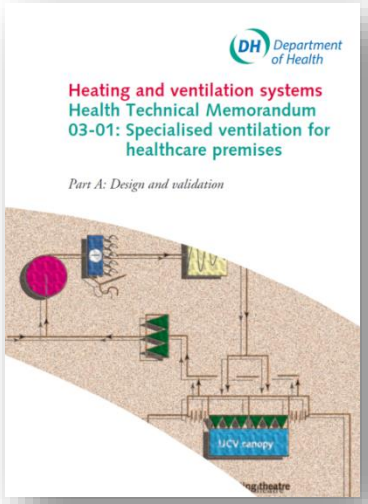
- For areas in a hospital with special ventilation design for infection control and/or occupational safety.
- Examples:
  - operating theatre/room,
  - isolation room,
  - laboratory with biosafety risk,
  - burns unit,
  - labour room, etc.

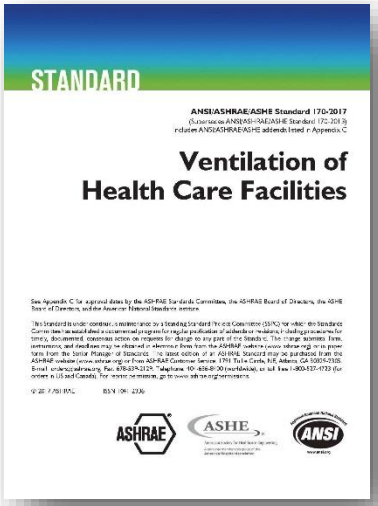
Specialized Ventilation Systems (2)

- Objectives:
  - to prevent spread of airborne infectious disease
  - to prevent and control healthcare-associated infection
  - to dilute and remove contaminants and fumes where used

Specialized Ventilation Systems (3)

- Design and installation are of internationally acceptable healthcare standards, e.g. HTM 03-01, ANSI/ASHRAE/ASHE Standard 170, or equivalent





- Certification of compliance by a registered professional engineer (R.P.E.) of mechanical or building services discipline

Specialized Ventilation Systems (4)

- To provide specialized ventilation areas with appropriate:
  - pressure relationship
  - air change rate
  - filtration efficiency
  - temperature
  - relative humidity
- Air movement generally from clean to less clean areas

Specialized Ventilation Systems (5)

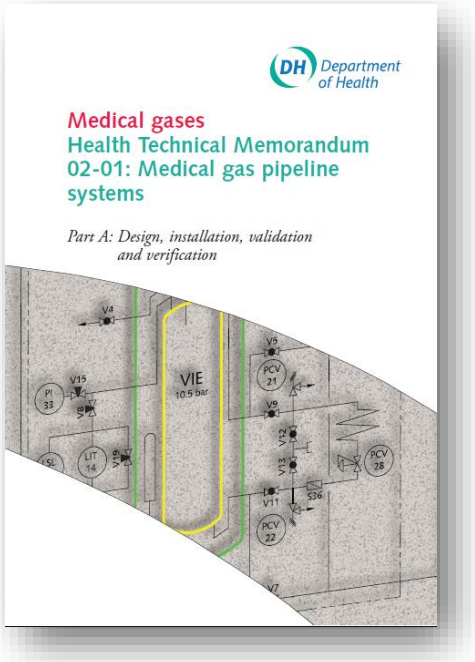
	Pressure	Min. ACH (Outdoor/ Total)	Min. Filter Efficiency	Deign Temp (^{0}C)	Design RH (%)
OT / OR	Positive	4 / 20	MERV-14	20 - 24	20 - 60
All room	Negative	2 / 12	MERV-14	21 - 24	Max 60
PE room	Positive	2 / 12	HEPA	21 - 24	Max 60

Specialized Ventilation Systems (6)

- Proper location of air intakes and discharges
- Redundant chiller units to cater for breakdown or maintenance
- Ventilation rate and pressure gradient in AII rooms, PE rooms and operating theatres/rooms are maintained by back-up power supply
- Proper operation and maintenance with records
- Maintenance of fresh water cooling towers

Medical Gas Pipeline Systems (1)

- To ensure a safe and reliable provision of medical gases in respect of quantity, identity, continuity and quality of supply
- Design and installation are of internationally acceptable healthcare standards, e.g. HTM 02-01, or equivalent.
- Certification of compliance by a registered professional engineer (R.P.E.) of mechanical or building services discipline



Medical Gas Pipeline Systems (2)

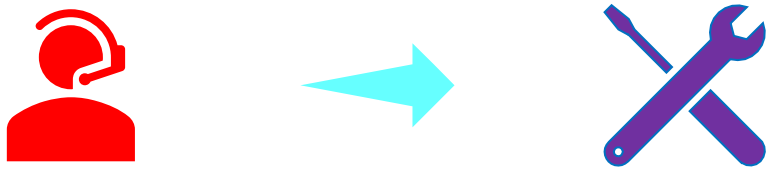
- Adequate capacity to meet gas demand
- Back-up sources of medical gas supply to ensure continuity and security of supply of medical gases during normal operation and contingent situations
- Connected to back-up power supply
- Pipeline distribution system to deliver medical gases at the required flow rates and pressure

Medical Gas Pipeline Systems (3)

- Proper provision of terminal units for services
- Gas-specific connections
- Warning and alarm system
- Testing and commissioning in accordance with HTM 02-01 or equivalent

Medical Gas Pipeline Systems (4)

- An authorized person appointed for supervising the operation, maintenance, repair and alteration work of MGPS
- Works on MGPS governed by a safety management system (e.g. permit-to-work)
- Proper operation and maintenance with records
- Emergency call-out service arrangement in place with a specialist contractor



Further Information

- The Guidelines

  www.orphf.gov.hk

- Enquiry

  Email: orphf@dh.gov.hk
  Tel: 3107 8451

Thank you!