IHEA

INSTITUTE OF HOSPITAL ENGINEERING, AUSTRALIA

SUPPORTING HEALTH FACILITIES MANAGEMENT

IHEA Research Project

Operating theatre ventilation and validation standards

IHEA
INSTITUTE OF HOSPITAL ENGINEERING, AUSTRALIA
SUPPORTING HEALTH FACILITIES MANAGEMENT

Introduction

- This IHEA funded study is investigating current cleanroom validation practices. The objective is to create a standardised methodology for the maintenance of operating room ventilation systems enabling the creation of standardised maintenance guidelines.
- The study has created significant interest and has been expanded in scope to include theatre design

IHEA
INSTITUTE OF HOSPITAL ENGINEERING, AUSTRALIA
SUPPORTING HEALTH FACILITIES MANAGEMENT

Objectives

- To design a methodology to quantify acceptable levels of non viable particle counts from various theatre types and create an analogue to existing Australian Standards for cleanrooms.
- To review a number of theatres to assess their current air quality parameters against their design intention and to establish whether annual auditing will yield positive benefits for early problem solving.

IHEA
INSTITUTE OF HOSPITAL ENGINEERING, AUSTRALIA
SUPPORTING HEALTH FACILITIES MANAGEMENT

Objectives

- Assess the parameters mentioned above giving consideration to the theatre design and the overall development of standard testing criteria and benchmarks for each parameter.
- Extrapolate data to create a guideline for air quality in operating rooms using existing Australian Standards.
- Make collected data freely available to assist engineers in future theatre design.

IHEA
INSTITUTE OF HOSPITAL ENGINEERING, AUSTRALIA
SUPPORTING HEALTH FACILITIES MANAGEMENT

Methodology

- Collect data from hospital operating rooms to;
  - Quantify non viable particle counts from various theatre types and configurations. This differs from current practice of only validating the HEPA filter
  - Quantify pressure differentials between clean and dirty areas for various theatre types and configurations.
  - Quantify air change rates for various theatre types and configurations.
  - Quantify HEPA filter integrity for various theatre types and configurations.

IHEA
INSTITUTE OF HOSPITAL ENGINEERING, AUSTRALIA
SUPPORTING HEALTH FACILITIES MANAGEMENT

Methodology

- Quantify non viable particle counts from various theatre types and correlate with;
  - ISO 14644 series - Cleanrooms
  - AS/NZS ISO 14644.1- Classification and air cleanliness
  - AS 1386 - Cleanrooms
  - AS 1807 series - Cleanroom test methodology

IHEA
INSTITUTE OF HOSPITAL ENGINEERING, AUSTRALIA
SUPPORTING HEALTH FACILITIES MANAGEMENT

Results to Date

- Testing is confirming initial estimates of theatre performance
- Most theatres tested are falling into the Class 7 and some into Class 6 cleanroom categories – Class 6 being the anticipated standard for ultra clean theatres
- We have confirmed that with careful design and attention to detail these classes can be easily achieved

IHEA
INSTITUTE OF HOSPITAL ENGINEERING, AUSTRALIA
SUPPORTING HEALTH FACILITIES MANAGEMENT

How you can contribute

- We need hospitals to be involved in the data collection
- This involves the validation of the theatre by Australian Air Science or your contractor using the projects test methodology

IHEA
INSTITUTE OF HOSPITAL ENGINEERING, AUSTRALIA
SUPPORTING HEALTH FACILITIES MANAGEMENT

Still to come

- Bassett Applied Research have agreed to sponsor the project by providing CFD modelling and professional services up to $20k and will be co-authors
- The second stage will be challenging current design practice. This will involve researching the fundamental principles of theatre design to produce a set of solid performance standards hopefully aligned with the cleanroom standards