



RETRO COOL FOR BUILDING OWNERS

Have we ever wondered why some of the air-conditioning systems in buildings do not work effectively?

We often see problems such as incorrect temperatures, inadequate fresh air supply causing stuffiness or odors, air leakages resulting in increased air-con loads and condensation.

It is easy to blame designers and condemn them for inferior designs, but the problem often does not lie with them.

In many cases, the blame lies with the subsequent change in use, as the occupation modes of a building invariably change with time, necessitating repartitioning, alterations from residential to business use and other modifications.

The most common issues involve the repartitioning of an office, segregating the supply and return air inlets/outlets, grouping the thermostat controls in one central location away from the occupants solely for aesthetic reasons, and ineffective doors and louvers, affecting the pressure distribution in various rooms.

Such alterations result in ineffective measurements and control of room temperatures, airflow and pressure deficiencies causing ingress of outside air into air-con spaces, or excessive leakages of cooled air to the outside.

To rectify this, we need more than a retuning; we need a complete scheme to plan, investigate, implement and train to ensure air-con systems can continue functioning effectively.

The technical term for this is "retro-commissioning."

This involves a full study of the original design intent as well as an investigation with on-site inspections to check what has changed from the original plan, likely deterioration of plant and control sensors, operation regime changes, and other factors that could affect operations.

With such technical information, engineers can then suggest redesign and equipment changes.

Even more important is the training of operating technicians to ensure they understand the need to update the operational regime so that it meets the



changed conditions and ensures the system can run in optimal conditions.

Retro-commissioning is far more complex than a simple retuning of the thermostats and airflows, which all building operators should undertake periodically to ensure system efficiency.

Building owners should be encouraged to conduct retro-commissioning at least once every 10 years.

In a fast-changing city like Hong Kong, office buildings and malls are renovated every few years to meet the expectations of occupiers and visitors, so that repartitioning has become almost an everyday occurrence.

Customer traffic may change with different types of outlets, and operating hours may change depending on whether they are used for offices, shops, restaurants or other purposes.

Such alterations are often done in great haste to avoid loss of revenue, as rents are high and prime office sites are in high demand.

For other building services, such as lighting and fire services, they are refitted to meet exact customer needs and comply with regulations, but air-con systems can sometimes be neglected as there are no prescriptive requirements that could be easily picked up and dealt with without professional input.

Fortunately, there has been a growing awareness of the need for retro-commissioning to ensure comfort and amenity to users, save energy and be socially responsible.

Building owners and operators have the responsibility not only to ensure business continuity, but also to provide reasonable comfort to occupants and meet the health and safety standards expected in a world-class city like ours.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over Hong Kong's iconic infrastructure