Chapter 1

The Greening of Air Conditioning

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INTRODUCTION

During the last fifty years air conditioning has become commonplace in commercial buildings and, in this time, we have managed to generate a poor image, both in the press and among the people who occupy air conditioned buildings. How have we succeeded in turning what people in hot countries regard as a blessing into a target for criticism and even abuse?

THE CRITICISMS

Handing over air conditioned premises to a customer often involves dealing with the complaints of the people who are then having to work in the building. They sometimes say the most astonishing things:

"I cannot breath in here."

"There is no air in the building."

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"The air is too humid."

"My eyes smart."

"The air conditioning system causes me to catch colds."

"It is too hot"

"It is too cold."

"It is draughty."

"There is no air movement."

"There is no way of controlling the conditions."

"The air is not clean."

"I cannot open the windows."

And so on.

It will be clear to an air conditioning engineer that many of the above objections can be dealt with but people standing next to one another sometimes make contradictory statements. There is certainly no way in which a discussion with some of the people who are complaining like this will lead to a satisfactory outcome. A rational discussion is not even possible in many instances. Such criticisms often come under the label of the sick building syndrome and may be related to indoor air quality.

We have also been criticised, on rather more scientific grounds, that the systems we put in are not hygienic. There has been humidifier fever, otherwise sometimes known as "Monday morning sickness" and related to the use of spray water for humidification purposes. There are also, of course, the familiar, recurring cases of legionnaires' disease.

This situation is not unique to the UK. For some years now similar criticisms have been levelled at air conditioning installations in Germany and Scandinavia. So one naturally asks why such criticisms arise. One reason is that we have a temperate climate. If it is 25° C inside when it is 35° C outside, the advantages of air conditioning are perfectly obvious, even to people who are difficult to please. On the other hand, in our temperate climate, we have to point out that the office building is in a noisy, urban environment, heavily polluted with exhaust fumes

from the traffic, and to make life bearable the windows must be shut, hence causing the temperature to rise within, because of the heat gains, thus making air conditioning necessary.

Air conditioning capital costs are four or five times more than the costs for heating. Having bought an air conditioning system a client then finds that it costs some four or five times more to operate than would have been the case for a simple heating installation. The higher capital and running costs do not make our case any more palatable.

ENVIRONMENTAL ISSUES

This is not the end of the story. Even if the system is a delight for the occupants and an acceptable economic case can be made for the capital and running costs, the building and its systems are likely to be increasingly criticised to-day on environmental issues. It is not green enough. The systems use a lot of energy which, in terms of the equivalent amount of carbon dioxide, are making an unwelcome, large contribution to global warming. Further, the refrigerants used often leak to atmosphere where they not only contribute to global warming but, through the chlorine they may contain, also help to destroy the ozone layer.

DEALING WITH THE CRITICISMS

So what can we do about it? The following few suggestions are offered here. Some are obvious. Some may not be and, in terms of achievement for a particular building, may present difficulties.

- 1 We can make all our systems beyond reproach. This involves ensuring the best possible design, installation, commissioning, maintenance and operation.
- 2 We must recognise that fan power makes a signifant contribution to energy consumption and we should tailor our designs with this in mind.
- 3 A quiet system is more likely to be efficient in its use of energy than a noisy one.
- 4 We must resolve the difficulties associated with refrigerants. The problems may be capital and running costs. One might argue that

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the aims and the reality are irreconcilable, but we should think again about this: to quote the old truth, one gets what one pays for. Good air conditioning systems produce satisfied clients and generate an image of quality and success. They are quiet, efficient in their use of energy, give lower global warming potential and must offer zero threat to the ozone layer.