

## **INTERNATIONAL ASSOCIATION FOR COLD STORAGE CONSTRUCTION (IACSC)**

### **Decommissioning of Temperature Controlled Insulated Structures for either Refurbishment or Closure**

#### **Introduction**

Temperature controlled buildings allow the user the flexibility for cold/chilled or ambient conditions for food production and storage.

Market requirements change rapidly within the food industry and so do production techniques and methods of production. This may lead to the replacement or relocation of production equipment with the need to alter the layout and/or increase the size of the facility. There may have been a change in space requirements and/or new production techniques and changes in operations. Any of these changes will provide an ideal opportunity to consider the properties and characteristics of the panel construction in specific parts of the building and whether refurbishment is a cost effective option.

The expected life span of an insulating panel is approximately 15 – 25 years in a temperature controlled building. Although most core materials still perform well beyond these periods of time, there may be some areas where the insulation has been compromised, for example at panel junctions and joints or from damaged areas resulting from impact by pallets and fork lift trucks.

Over many years the effectiveness of the insulation can be reduced through water penetration and ice build-up resulting in damage or failure of the panels. This can be due to failed vapour sealing, a lack of maintenance or inaccessibility to check and rectify any problems with the panels.

Water penetration can also have a detrimental effect on the coatings and the facing steel of the panels. This can cause hygiene and loss of strength problems

Some panels may have been incorrectly specified resulting in inadequate insulation standards and high running costs.

Following the mandatory regular Risk Assessment carried out by the employer under the Workplace Regulations panels may need to be replaced due to a change in the perception of the hazard that the panels present, let alone any damage they may have sustained.

Since the millennium, insurance has become a major issue, with premiums increasing significantly for structures built using combustible insulating sandwich panels. Two ways of substantially reducing insurance premiums are to ensure that the building has been

built using the correct materials and with due consideration to fire risk. (See IACSC Guidance Note 2)

In any of the above cases there will be a degree of de-commissioning in order to alter or improve the building ie refurbishment. In extreme cases where a building is no longer to be used it is good practice to consider how it may be used in the future by a different owner if it is not to be demolished but is to be left vacant.

This document is intended to highlight and identify the areas, which should be considered when altering a temperature controlled insulated structure in any way. The terms are defined as follows:

#### *Refurbishment*

*This involves alterations and modifications to an existing insulated structure including the implication of measures that may make the building more stable and less prone to ignition/combustion in use.*

#### *Decommissioning*

*Decommissioning may facilitate a major refurbishment that will require the total replacement of panels or permanent decommissioning of the building. Usually decommissioning is the total removal and disposal of insulated panels in order to take the facility out of operation; it may be followed by demolition of the external structure, as the building is no longer required.*

The above can have significant financial implications to the cost of running the business

### **Prior to starting the on site works for decommissioning/refurbishment.**

#### **1. Informing the Authorities**

Under the Construction (Design and Management) Regulations it is necessary to appoint a Planning Supervisor who will consult Building Regulations and the local fire authority as necessary. The Appointed Planning Supervisor (APS) may be a member of staff or contracted in from an appropriate consultancy. He/she will be responsible for Health and Safety issues on site and must have adequate resources to achieve this. Clients who do not provide sufficient resource may become involved in criminal proceedings.

#### **2. Information Required on the Existing Building**

Most cold storage related buildings are single storey with perhaps an office mezzanine. It is desirable to refer to the site plans, which will give data on how the structure was actually put together rather than the plans submitted for Building Regulations approval. Any Asset Register, information on specifications, certifications etc must also be included.

There will need to be a survey of the existing building. All services will need to be identified and whether they are wall or ceiling mounted or run in any voids.

Identification of existing materials within the insulated panels (Hazardous / Non Hazardous CFC Free etc) is essential. The panels should already be labelled under the IACSC scheme, see Guidance Note No 1. Any other insulation materials may also need to be identified.

### 3. Design Brief for the works to be implemented

The first decisions must come from the client, eg:

- Is the building to be completely demolished (see 4)?
- Is the building to be used during the works?
- What will be the programme for the works?

At the same time the Structural Stability of the existing building frame will need to be assessed if it is intended to refurbish. New panels may be heavier than the old ones if there is, say, a change from polymeric to mineral fibre cored panels. Such considerations may in turn inform the choice of the new panels. This also provides an opportunity to check and upgrade the fire protection to the existing building frame to reduce the potential for disproportionate damage, if deemed appropriate (see Guidance Note No 2).

In addition both insurance requirements and Fire Service requirements and approvals will be needed for the Planned Works

### 4. Decommissioning Works

Whether the decommissioning is temporary or permanent the APS will in any case need to consider Health and Safety requirements and the resources needed. He/she will need to carry out Risk Assessments to identify likely hazards during the refurbishment or decommissioning and then prepare Method Statements outlining the approach to limiting the risks presented.

Other topics will need to be addressed which include determining the Access to the site and what sort of restrictions on works and working hours need to be in place. The Programme of Works will include the sequencing of actions such as removal of services and the insulated panels. Disposal of materials must be in compliance with EU regulations.

***Although BSIRIA /government advice on an environmental code of practice for buildings and their services recommends the reuse or recycling of materials, the SECOND-HAND USE OF PANELS IS NOT RECOMMENDED as there is no guarantee of likely performance day-to-day or in the event of fire.***

Decommissioning, whether in preparation for a refurbishment or a demolition, invariably leaves the building in a vulnerable state for a period of time. Before any decommissioning starts all existing safety precautions, equipment and procedures, need to be reviewed to ascertain the degree to which they will be compromised. It is common,

for example, for fire detection systems to be disabled either in total or in part, and during such periods increased vigilance will need to be introduced, possibly on a 24/7 basis. If suppression systems are decommissioned the consequences can be even more serious and certain high risk processes should be discontinued whilst such equipment is unavailable. In any event the work should proceed in compliance with the recommendations given in the Fire Protection Association guide on '*Fire Prevention on Construction Sites*', which includes buildings under renovation.

Decommissioning a building constructed from combustible-core sandwich panels is a process that is very vulnerable to both 'hot work' problems and arson. Suitable counter measures must be introduced.

## **5. Refurbishment**

The same processes as for decommissioning will need to be considered and planned. There is one further aspect to the planning and that is the Design of the replacement facility. Any new build should incorporate the recommendations contained in the IACSC's Guide to '*Design, Construction, Specification and Fire Management of Insulated Envelopes for Temperature Controlled Environments*' and where possible be constructed in accordance with the IACSC's '*Model Building Specification for Design, Installation and Commissioning of Insulated Envelopes and Insulated Floors for Temperature Controlled and Ambient Environments*'.

## **6. Disposal of Materials**

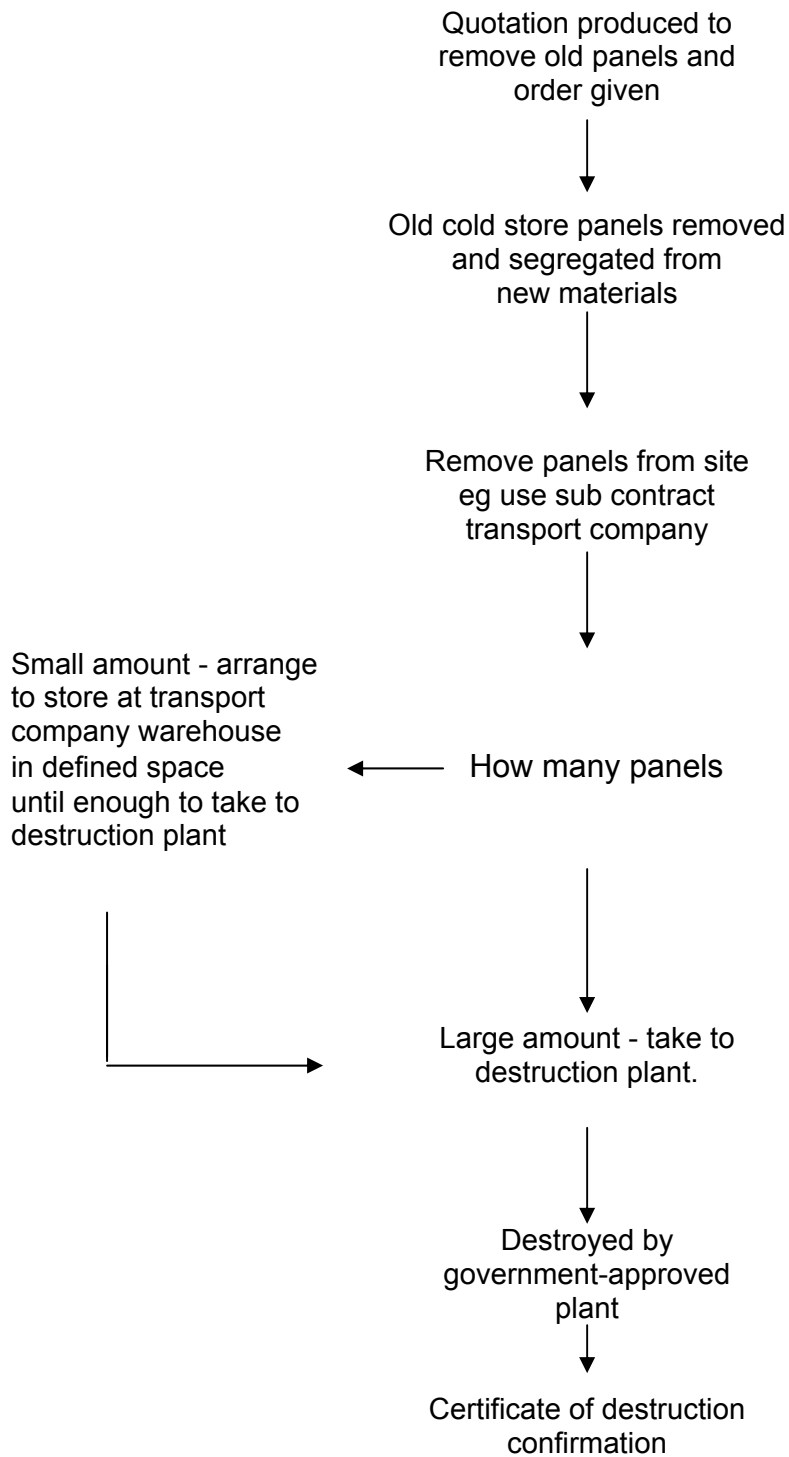
The demolition of the internal insulated panel structure may need to be the subject of a specialist contract which will address the impact of the work on neighbouring buildings and where and how the materials are to be removed and disposed of. Care will be needed in setting up links between the producer/carrier/ processor of the dismantled materials. The contractor for this type of work should be licensed and expect to be the subject of random checks.

Since 31 December 2001 EC 2037/2000 has made it an offence to tip insulating sandwich panels that contain CFC blowing agents in landfill sites. When removing old panels it may not be possible to determine where the panel was manufactured. Therefore if the blowing agent is not known, it must be assumed to be CFC and will be unsuitable for landfill site; the CFC must be reclaimed and the panel destroyed. There are currently a small number of specialist destruction sites in the UK which can handle such panels. The presence of CFC can be identified in a spectrometry test but this is expensive and time consuming.

The method of destruction is to strip off and dispose of the outer steel sheet. The panel core is sent through an automated machine that shreds and then spins it at high speed. The blowing agent is spun to the outside, collected and frozen before being transferred to a refrigerant destruction plant. The shredded panel core is then reclaimed and used as a mopping agent for oil and other liquid spills.

The recording of the processes involved will be invaluable in handing over a cleared building for refurbishment or change of use, see Flow Chart below.

**Destruction of old cold store insulating panels with polyurethane cores where the blowing agent is unknown**



## **Advantages of Careful Planning of Works**

Once the purpose of decommissioning the building has been established, the future of the building in terms of recommissioning, demolition and rebuilding can be considered. If the building is to continue in use then during the survey of the building, siting of services can be reconsidered to allow straightforward cleaning and to minimise panel penetrations. Taking into account the need to accommodate both present and future requirements will maximise the use of the building. Government research on Key Performance Indicators for the design and use of buildings stresses the need to consider all fire and safety strategies at the design stage, and not just at handover, that continue throughout the life cycle of the building. This also ensures that the cost of temporary or permanent decommissioning will be included in the strategies using capital and running costs as part of the equation and not just as a one off expenditure at the time of the building work. In other words the changes to the building can be built in as part of the running costs.

Thus the feasibility of the Planned Works will be confirmed or the design will be adapted with respect to a particular building. Remember that new installations in an existing building can cause disruption to other systems and involve more work before the recommissioning of the building can go ahead. Unless there are strong arguments to replace existing panels a more cost effective alternative may be to upgrade the fire stability of the structure in accordance with the criteria in the IACSC '*Fire Stable Certification Scheme for Insulated Panel Systems and Structures*' approach which allows through fixing and sealing of existing panels producing an internal structure that will resist fire for a good hour or more.

Careful records of what was done and the decisions leading to the Planned Works will be invaluable at a later stage in the life cycle of the building when further decommissioning on a temporary or permanent basis is considered and such information should be incorporated in a building 'log-book' that remains with the building for life.

## **Following completion of a refurbishment**

After completion of a major refurbishment the building should be labelled in accordance with the IACSC/IFC Labelling Protocol, see Guidance Note No 1. This should include the preparation of an Enhanced Fire Plan for use by the Fire Service for fire ground planning.

If the building that has been refurbished was previously labelled then it is vital that the labelling is corrected/extended and the enhanced fire plan is suitable amended. It is recommended that if the facility is large then the local Fire Service is invited to become familiarised with the new structure.

## Contact Points for further information

For any of the IACSC documents referred to please contact:

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