Issue 008 - *released 11 February 2011*

Fire Research & Investigation Unit

Heads Up

BACKGROUND

This edition summarises a fire that occurred in a small residential care facility. At the time of this fire the building was occupied by two residents and one care assistant. Due to the nature of their disabilities the residents required constant monitoring.

It appears that one of the residents lit a fire at the head of a bed with a lighter they had obtained.

This 8m x 16m building was timber framed and clad, with a sloping corrugated iron roof consistent with standard housing. It had manual call points and hard wired heat and smoke detection supplemented with some battery powered residential smoke detectors. The building also had a sprinkler system installed.

While it is likely that the sprinkler system had a positive effect on reducing the rate of fire growth and the development of toxic gases, it failed to control the fire as it should have.

Due to the apparent failure of the sprinkler to control the fire a post incident investigation team was established to look at this incident. The team consisted of engineering staff from the New Zealand Fire Service along with three specialists from the sprinkler and fire protection industry.

This document summarises the incident and the investigation teams findings.

INCIDENT DETAILS

This days routine was no different from any other. A shift change of caregivers occurred at 11am directly after which the on coming caregiver went into the laundry room to load the washing machine. It appears that one of the residents had managed to obtain a cigarette lighter and whilst the caregiver was in the laundry a fire was lit at the head of a bed.

The care assistant was alerted to the fire by the activation of a smoke alarm at about 11.10am. Their first action was to silence the alarm and then investigate. The alarm sounded again only seconds after being silenced.

The room the fire was in had its door closed. On opening the door the care assistant noticed the head of the bed adjacent to an open window on fire. The covers were drawn back and there were flames about 70mm high at the head end of the bed. Flames were also 'crawling' up the curtains at that stage.

The care assistant went to the laundry to get a dry powder extinguisher and returned attempting to extinguish the fire with little effect. The care assistant had been instructed in the use of an extinguisher but had not had any practical training.

The sprinkler system did not appear to be discharging much water, the extinguisher was left on the floor and the care assistant evacuated the two residents, lodged a 111 call and contacted the manager.

The first 111 call was received at 11.20am, the closest fire appliance arrived in 4 minutes and 6 seconds.

On arrival the bed was still alight, any discharge from the sprinkler in the room of the fire was not noticed. As a fire crew entered to extinguish the fire the sprinkler in the hall had operated although the amount of water being discharged was so minimal it was initially thought to be a leaking pipe.

The fire was extinguished by fire-fighters and the remains of the bed and curtains removed to the outside of the building during salvage operations.

FURTHER INFORMATION

The building sprinkler system was thought to have been installed to the following standard - NZS4517, however there was no documentation pertaining to the design, installation, testing or maintenance of the system.

The building had a WOF although there was no mention of a sprinkler system on this.

There was a building consent record for a type 2 fire alarm system being installed about 3 years prior to this incident .

A thorough investigation of the sprinkler system installation was carried out including a hydraulic analysis of the water supply .

It was discovered that the water supply was not adequate due to the undersized supply pipe. The water demand of the washing machine at the time of the fire also had an adverse effect on the available water.

Issues were also discovered with the installation of unapproved sprinkler guards which would have effected water discharge patterns. Some recessed heads would not operate effectively as they could not drop down far enough due to misalignment during installation or due to the covers being fitted with adhesives affecting their operation.

Guard fitted to sprinkler head in room of fire origin

Recessed sprinkler head in hallway unable to drop down

LESSONS LEARNED/RECOMMENDATIONS

The report strongly recommended that independent surveys take place in similar properties to ensure that the installations correctly meet the requirements of the relevant standard.

It also recommended that regular testing and maintenance routines be established for these systems and that a manual should be on the premises that includes as built drawings, commissioning data, and records of testing.

It was noted during this investigation that the decision to attempt to extinguish the fire by the care assistant who had no practical training caused a delay to the evacuation of the residents and the notification of the incident to the Fire Service. The evacuation of the residents and calling of 111 should have been the first priority in this instance.

One of the extinguishers in the premises did not appear to have been inspected for 2 years and the pressure indicator showed that it required recharging. The regular inspection and maintenance of equipment like this, and suitable training in its use and evacuation procedures are vital in premises of this nature.

INFORMATION SOURCE

New Zealand Fire Service Post Incident Fire Engineering Audit, R05.03.PIFEA.