

## Fire Research & Investigation Unit

# Heads Up



### BACKGROUND

On the 24th of September 2014 a fire occurred on the second floor of a five storey administration building which forms part of a hospital. The building was fitted with a Type 7 automatic sprinkler system with smoke detection and manual call points.

The sprinkler service agent was conducting works on the sprinkler system at the time of the incident. To allow these works to be conducted the agent isolated the sprinkler system of the entire building for the duration of the works. Moreover to prevent false alarms and brigade callouts, the sprinkler service agent also isolated the fire alarm system of the entire building.



Figure 1: Room of origin of fire

The service agent indicated that previous experience had shown that the fire safety systems were incorrectly setup at the site, so that activation of a sprinkler flow switch would immediately cause a brigade call out through the Fire Alarm Panel (FAP), even if the direct connection of the sprinkler system to the monitoring centre was isolated. This issue was thought to date to the original commissioning of the fire safety systems within the building. To bypass this issue it became common practice to deactivate all fire safety systems whenever sprinkler works were conducted within the building.

### INCIDENT DETAILS

The fire was caused by a faulty light fitting and discovered by staff. Subsequent attempts by several of the staff to alert Fire Service and building occupants to the fire were severely hindered by the failure of the manual call points and emergency telephones as these were all deactivated because of the works.

Serious consequences were avoided thanks to the actions of the deputy fire warden, who was able to initiate the evacuation of the building occupants and the Fire Service was eventually notified by mobile phone.

The isolation of the fire detection systems also directly compromised the passive fire protection of the building. As the fire alarm did not activate, hold-open devices did not release the fire and smoke doors, allowing smoke and heat to travel freely within the building.

The fire was extinguished when the attending Fire Service crews requested the reinstatement of the sprinkler system, but only after significant damage had already occurred in the room where the fire started. The rest of the floor suffered extensive smoke damage.

**Figure 2: Showing extensive smoke damage throughout building**



## LESSONS LEARNED/RECOMMENDATIONS

### 1. Local isolation

Where possible, local isolation is preferable to a complete decommission of the system. This guarantees that the rest of the building, unaffected by the works carried out, remains fully protected. It's particularly important in the case of a building that remains occupied during the works.

The system isolation must be carried out in line with the recommendations of the standards for fire alarms (NZS4512) and sprinkler systems (NZS4541). Following these standards would have resulted in appropriate notifications, limited isolation of part rather than the whole system and the implementation of mitigating measures for the duration of isolation.

### 2. Agent contact

The incident highlighted the effectiveness of the sprinkler system as, once recommissioned, it was sufficient to quickly extinguish the fire. Therefore, even in the event of an isolation, the ability to quickly re-instate the fire safety systems is critical.

On arrival, the first attending fire appliance would typically respond to the location of the fire alarm panel in order to gather information about the incident. Consequently, the fire safety systems contractor should:

- leave clearly visible signs stating that parts of the systems have been isolated or decommissioned; and
- provide contact details so that they can be easily contacted by responding fire crews.

### 3. Incorrect fire safety system setups

The specific fire safety system setup within this building was found to be deficient and directly led to the decision to isolate the whole system. However, by making system isolation common practice, rather than fixing the issue, the building occupants were exposed to great risk. Any issues around faulty setups should be clearly highlighted and addressed accordingly by reprogramming the system instead of adopting an alternative work practice which may lead to increased occupant risk.

To avoid future similar incidents both the sprinkler service agents and Fire Service personnel should be trained to identify and highlight similar faulty fire safety system setups.

**References:** NZFS internal incident report; NZS4512: 2010; NZS4541:2013