Fire Research & Investigation Unit

Heads

BACKGROUND

In April 2007 a shopping mall on the North Shore of Auckland City was filled with smoke one afternoon after a fire broke out in the store room of one of the tenancies. During a post incident audit into the event some issues were found with the smoke control and suppression systems.

The mall is approximately 36,000m² constructed circa 1994 of concrete floors and iron roofing. The external walls are generally concrete and steel portals with timber framing and iron cladding. The ground level consists of retail shops with two separate offices above on the first floor. The mall also had two basement levels of undercover parking.

There had been varying staged additions and alterations to the mall over the years. Different tenancies had been outfitted to suit their particular needs, this included cosmetic changes such as suspended ceilings.

Fire safety systems for the complex included:

- Four (4) sprinkler systems, installations followed the staged building works therefore systems were installed under different Standards versions.
- A building hydrant system.
- Smoke detectors and manual call points.
- A smoke control system, the controls for this system were somewhat confusing and even contractors who had worked on the system seemed unclear as to how it should work.
- The mall had an approved and current evacuation scheme and building WOF.

INCIDENT DETAILS

One afternoon the New Zealand Fire Service was notified by alarm activation of a smoke detector/manual call point having operated at 15:18hrs. This was followed by a 111 telephone call approximately one minute later confirming a fire, additional 111 calls came in over the following minutes.

At 15:21hrs a sprinkler system activated above the tenancy where the fire originated, a total of nine (9) sprinkler heads in this system operated.

At 15:30 hours a signal was received from another sprinkler system covering a neighbouring tenancy where a further five (5) sprinkler heads had operated.





For more information, or to contribute to 'Heads Up' e-mail fireinvestigation@fire.org.nz As the closest stationed fire appliance was already out, and as traffic was heavy, the first appliances arrived at 15:24hrs. On entry to the building it appeared to be fully evacuated, some tenancies had closed doors to prevent people re-entering. Fire-fighters could hear the smoke extraction system going as they boosted the building riser system and launched a 3 point fire attack. It was however noticed that the smoke extraction system appeared to stop working after a few minutes enabling the mall to continue filling with smoke.

Despite the sprinkler system detecting the fire it had failed to extinguish it. The fire had spread between some tenancies, and was continuing to grow when extinguished by firefighters.

FURTHER INFORMATION

A preliminary fire report which had been completed for the building in 1994 recommended a fire resistant rating of 60 minutes (FRR 60/60/60) between tenancies, it appeared that this was not the case as linings used were not rated to this and some additions to the mall had created penetrations in the separation.

The sprinkler system was not effective, this is possibly due to heads being incorrectly placed or more likely that alterations to the building had taken place after sprinkler installations which meant that some areas had no coverage. These deficiencies had not been picked up during sprinkler system checks.

There were inconsistencies between the recommendations of the fire report that was labelled as 'preliminary' and the final consented documentation for the building. A final version of a fire report could not be located. For some building alterations there was no consent documentation at all.

The smoke control system did not operate as it was designed and therefore did not effectively control smoke spread, it is unclear what actually caused the system to stop working.

LESSONS LEARNED/RECOMMENDATIONS

Clearly there were deficiencies in this building which led to the failure of the fire and smoke control systems within it. As well as control systems not working correctly fire separations between tenancies proved to be insufficient. The following recommendations were made specific to this building:

- A thorough Sprinkler Survey of the entire complex needs to be carried out as soon as possible. This is to determine other un-permitted works that affect the performance of the sprinkler systems.
- A review of all the existing fire reports comparing them to what was required and what has been built should be carried out.
- The building as completed, does not match the consented design. The fire design engineer should inspect the finished construction and issue a producer statement that this complies with his design.
- Recommendations were also made regarding the Fire Service response to confirmed fires in buildings of this nature and local operational procedures. Prompt requests for additional resources to attend this fire and the charging of the hydrant system proved to be effective and helped control the fire early reducing damage. It was therefore felt that these procedures should be more formally adopted.

While the recommendations in this particular report were building specific, the questions could be asked as to how many other buildings are operating that could have similar deficiencies.

Building owners, IQPs, Fire System maintenance contractors, Fire Service staff and all other interested parties should take a vested interest in pointing out any possible deficiencies prior to an incident occurring so that they can be investigated and if need be rectified.

What can appear to be minor variations to requirements and fire reports have the potential to have serious consequences if an actual fire event occurs.

INFORMATION SOURCE

New Zealand Fire Service Technical Report/Post Incident Audit, event number A705531.



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