Issue 015 - Boats under construction or maintenance 20 August 2013

Heads

Fire Research & Investigation Unit

BACKGROUND

Being a nation surrounded by water and a mild climate, boating is a popular pastime in New Zealand. With one of the highest rates per capita of boat ownership in the world there are boats of all sizes found around the country. Whether under construction in a boat builder's shed or up on the hard for maintenance there is always a large number of boats being worked on at any time. Many of these boats represent considerable investment as well as a strong emotional connection for their owners.

Unfortunately boats under undergoing work often have more ignition sources than usual. In addition, many of the materials commonly used in boat construction or maintenance, boat structures, furnishings, fuel and equipment are often very combustible. These factors create a very high fire risk for boats as the combustibles cause fires to develop extremely fast and cause extensive damage.



In New Zealand there's been a number of luxury yachts and many private boats that have been extensively damaged as a result of fires during construction or maintenance. Traditional fixed fire detection and suppression systems designed for buildings are not suited to boats temporarily located on land.

CASE STUDY - INCIDENT DETAILS

A 53 metre luxury yacht with an estimated value on completion of US\$50 million was under construction in Auckland and was approximately 75% complete after two years work.

Around 1.00a.m. on a Sunday morning a fire is believed to have started inside the building, external but adjacent to the yacht. The fire activated a security system motion detector and a guard responded to the scene within minutes of the activation. Six minutes later the yacht's internal fire detection system activated indicating smoke had penetrated into the vessel. The first fire engine arrived within 14 minutes of the initial activation and encountered a well developed fire inside the vessel. The onboard fire suppression systems were not commissioned at the time of the fire.

When the fire was finally declared extinguished the luxury yacht had been extensively damaged by fire.



The luxury yacht as it was to be



The remains of the yacht after the fire



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FURTHER INFORMATION

By their nature pleasure craft have relatively small compartments and openings compared to buildings. These factors lend themselves to the use of gas flooding as an effective form of fire suppressant. Even when a fire may be remote from the point of gas release the compartment would quickly become flooded with a gaseous fire suppressant enabling early containment and/or extinguishment. The challenge is to enable the gas to be directed into the fire affected compartment from a supply source without installing fixed pipework.

Available within the fire protection industry is a highly portable fire suppressant system that enables fire protection to be easily and temporarily placed into boats while maintenance or construction is underway. It works similar to a handheld fire extinguisher but uses an 6mm polymer tubing that can be easily run from a pressurized cylinder or combinations of cylinders. The tubing is rated to rupture

at a defined temperature (70°C to 140°C) and releases the cylinder contents at the point of rupture effectively creating a localised discharge nozzle where the fire is.

Any sudden change in pressure in the cylinder can activate a cellular monitor on the cylinder to notify a selected recipient that the system has activated.

The system can use most commercially available fire suppressing agents including gases, foam and dry chemicals although gases may provide the most effective medium for use in boats. Modern fire suppressant gases are non-toxic allowing people working in the vicinity to evacuate from the area on fire.

The advantages in using a pressurised system using flexible tubing include:

- it is very easily to place throughout a boat and can be easily shifted or removed as work progresses or finishes
- it becomes both a fire detector and extinguishing applicator providing protection 24/7
- combinations of different suppressing agents (as appropriate to the risk) can be used on the vessels
- it has a precise sensitivity so will activate at a known temperature
- it is leak resistant but ruptures when exposed to flame
- there is no control panel and system not reliant on an electrical source
- cylinders come in a range of sizes to suit the size of the compartment/boat (1kg 84kg)
- for multi-level vessels separate systems can be placed on each level

LESSONS LEARNED/RECOMMENDATIONS

The fire risk to boats under construction or undergoing significant maintenance can be significantly reduced by utilising a temporary fire protection system like this one. These self-contained pressurised fire protection systems could be used by:

- boat clubs and marinas who could manage stocks of these systems renting them to boaties for the duration of maintenance work
- commercial boat builders, marine engineers and shipwrights
- luxury yacht builders
- private individuals working on boats at home

Variations of the system with fixed nozzles can be used as permanent fire protection for boats at sea.

Further information on fire protection systems for boats can be sourced through the Fire Protection Association (NZ) at (09) 414 4450.





Pressurised cylinder

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