

SAFETY ALERT

Findings from investigation into a fire involving Mobile Plant at Ports of Auckland



PORTS OF
AUCKLAND

TĀMAKI HERENGA WAKA

Incident Description

Overview

On 24th April 2020 at 19:47 a Reach Stacker owned by Ports of Auckland Limited (POAL) was damaged by a fire which occurred within the engine compartment.

An activation switch for the fire suppression system was being examined at the time, resulting in an accidental discharge of the system.

The system operated as designed and discharged the extinguishing medium within the engine compartment however it was noted that shortly after this, black smoke was observed issuing from the machine, following very quickly by flames which were visible underneath the machine.

These flames quickly developed into a fully involved fire which significantly damaged the entire engine compartment and components within, as well as the rear of the operators cab and other components fitted to the exterior of the machine.

Initial attempts to extinguish the fire by workers using hand held extinguishers were unsuccessful. Fire and Emergency New Zealand (FENZ) firefighters attended to control the incident.



Investigation Findings

The investigation involved an examination of the affected Reach Stacker and a reconstruction of the fire by constructing a test box fitted with identical components to closely mimic the conditions in which the fire occurred.

The test box was also fitted with a camera and thermal probes to accurately assess the conditions temperatures generated at various locations within the compartment.

The test was performed by an independent investigator engaged by Ports of Auckland, and was witnessed by the members of the Investigation Team.

Acoustic Baffling Material	<p>The investigation found that POAL had previously installed an acoustic baffling material to the inside of the engine compartments of the Reach Stacker fleet as a control measure to reduce engine noise as our Reach Stackers typically operate in an area close to residential neighbours.</p> <p>The servicing routine for the Reach Stackers includes steam cleaning the acoustic baffling, however the investigation determined that trace amounts of fuels, oils and other flammable liquids have contaminated the material over time.</p>
Fire suppression system	<p>The fire suppression system was retrofitted into the Reach Stacker fleet in 2018, and were installed in the engine compartments on top of the acoustic baffling material instead of onto the steel panels.</p> <p>As a result, the canisters of suppression agent were in very close proximity to the baffling which was contaminated with flammable products.</p>
Heat source	<p>The fire suppression system works by sending a low voltage electric current to the canister which contains the suppression agent, causing a small, controlled detonation which generates temperatures in excess of 500°C.</p> <p>The reconstruction verified that the detonation caused the ignition of the acoustic material, which retained heat and smoldered while the extinguishing agent was discharged, and develop into a fire once the agent had dissipated.</p>
Single shot suppression system	<p>The fire suppression system is a 'single shot' system which, once operated, is depleted and cannot discharge again until recommissioned.</p>

Outcomes

Fire suppression system	<p>The fire suppression system was reviewed and found to be fit for purpose. It has been recommissioned, and the Reach Stacker involved has been returned to service.</p> <p>We believe that in the event of another fire, the system will adequately control or extinguish the fire to enable the safe escape of the Operator.</p>
Proximity to heat source	<p>The investigation determined that the significant contributory cause was that the canisters of extinguishing agent were mounted directly over the flammable acoustic baffling material.</p> <p>POAL has removed sections of the acoustic baffling to ensure that the canisters are mounted onto steel panels only to significantly remove any flammable material or components from the vicinity of the identified heat source.</p>

Recommendations

Ports of Auckland is sharing this incident with the Port Industry Association and other stakeholders to provide our findings, and recommends that:

- Operators who have retrofitted fire suppression systems into their mobile plant inspect their fleet for the presence of items that could ignite as a result of heat generated by the activation of the suppression system;
- Consider trimming an appropriate sized portion of materials such as acoustic baffling away from sources of heat or removing completely from mobile plant;
- Be aware that in this instance the heat source was the activation of the fire suppression system, but other components that generate and sustain heat could also provide a source of ignition. Good maintenance regimes should include checks to ensure sufficient gaps between sources of heat and components which may ignite when exposed to heat.

Further Information

Any additional information relating to this incident can be obtained by contacting:

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