Marine Safety Forum – Safety Flash 15-09

Issued: 11th February 2015
Subject: Spontaneous Combustion

We had an incident on a vessel recently that could have quickly escalated into a Galley fire during the night. The night watchman was carrying out his usual tasks and after washing the Galley tea towels, they went into the tumble dryer. Once this had finished approximately 20 tea towels were stacked in a pile and placed on top of the galley freezer. Between 3-4 hours later, the night watchman discovered smoke coming from the pile of tea towels. This was quickly dealt with and 4 – 5 tea towels in the very centre of the pile were found to be scorched and smouldering. The crew member also stated that the top of the actual freezer was not hot in any way on the top.

Most of you will be aware that oil contaminated cotton cloth or overalls can spontaneously combust in certain circumstances and the fire training DVD does highlight this. Not all oil types cause this effect but the main ones that do are; Linseed oil, rapeseed oil, safflower oil (vegetable oil ingredient), & peanut oil. Fish oils are also notorious for self-heating. However mineral oil used for lubrication are not prone to self-heating and will not cause spontaneous combustion. Below is an extract from a Fire Service info sheet;

"Spontaneous ignition occurs when a combustible material is heated to its ignition temperature by a chemical reaction involving the oxygen in the air. The oxidation of the combustible material creates heat. If this heat cannot be dissipated, it will build up in the combustible material until ignition occurs. Generally, the build-up of heat to ignition point occurs when the material is in a pile so that the heat being generated cannot adequately escape.

Fires in commercial laundry facilities (and sometimes also in hospitals and laundromats) have been attributed to the spontaneous ignition of cotton or linen that has been dried and then either stacked while still hot or dumped into bins without cooling. The oxidation of cotton and linen can be initiated by the laundry process. If the materials are stacked or binned at high enough temperatures (above 90 degrees Celsius), the heat accumulated in the centre of the pile may be enough to trigger spontaneous ignition of the cotton materials.

If towels and linen that contain oil (such as cooking oils or the oils from physiotherapy or massage clinics) are sent for laundering, a residue of oil may remain after the laundering process. The heating and drying after laundering may cause this residue to self-heat and spontaneously ignite."

Uncontaminated cotton or linen can spontaneously combust if piled up when still hot straight from a tumble drier. It is likely in this case that there was some contamination from cooking oil still on the tea towels in the centre of the pile and enough residual heat from the tumble drying process remained to start the exothermic reaction (releases heat) that resulted in the scorching. This is initially a slow process hence the 3-4 hour delay before smoke was seen.

The final advice of the info sheet says that; "In laundries, the washing should be spread to cool after it has been dried, not placed in bins or piles while still hot."

ACTIONS:
Please ensure all crew are made aware of this and it is discussed in depth at your next Safety Meeting.