DAMAGE CONTROL

If you've read Briefing Note #41, you'll know that personnel assigned to ships of the Royal Canadian Navy (RCN) spend a significant amount of their time training. Much of this training is focused on damage control.

Damage control pertains to the category of unfortunate events that cannot be avoided but can be managed in order to minimize the loss of life and the loss of the ship, while still accomplishing the mission in which the ship is involved. It is the response to an event such as battle damage, fire, flood and/or engineering emergency/machinery breakdown, both at port and at sea. It should be noted that these events can be inter-related. For example, a flood in a compartment can lead to an electrical fire (or a hazardous material spill), which could lead to smoke inhalation (or chemical burns) and the need for medical assistance. The goal is to continue to Float, Move and Fight, despite damage.

Unlike an emergency on land where you can call the fire department, at sea a warship can't rely on external help. The crew itself has to fight to save the ship, otherwise they could end up on rafts in the middle of the ocean. Thus, every crew member is trained in damage control. As noted in Briefing Note #41, the RCN has a special group of trainers – Sea Trainers – who are experienced sailors. They test the training and readiness of the ship's company both in port and at sea.

Fire is considered the most likely event, and this is why the response to a fire emergency is practiced most frequently. Exercises involve scenarios ranging from a toaster fire to a helicopter crash on deck to an engine room fire. Whoever first detects the fire is responsible for taking initial action by raising the alarm, attempting to extinguish flames using extinguishers and fire suppression systems. If this is not possible, first responders start to lay out fire hoses and confine the zone (close all doors and hatches) to stop the spread of smoke and heat. The Attack Team replaces the original response team to fight the fire. The Attack Team is dressed in fire resistant clothing, boots, masks and individual breathing apparatus. They are equipped with thermal imaging devices (as the dense smoke makes it impossible to see).

The primary fire suppression systems, which can be activated locally or remotely, automatically or manually as necessary, on a warship include:

- a sprinkler system and high-pressure seawater pipe (the 'firemain') with fire hydrant hook-ups throughout the ship to connect fire hoses wherever they are required;
- the Aqueous Film Forming Foam (AFFF) system for fighting fuel tank and engine room fires; and
- a system that includes a special gas (Halon) that displaces oxygen to suppress a fire in spaces containing high-voltage electrical systems or high-value electronic equipment.

The firefighting effort is monitored by the Damage Control Organization (DCO) via closed-circuit TV cameras and controlled by Damage Control consoles. These consoles are part of the Integrated Platform Management System (IPMS) which was installed on the *Halifax*-class frigates during the last round of modernization. They monitor and control fire suppression systems, heat sensors, smoke detectors, fire pumps and electrical systems (so that high-voltage

electrical circuits can be turned off if necessary) throughout the ship. As you might imagine, special attention is given to monitoring and extinguishing fires in ammunition storage spaces (i.e., torpedo magazine or vertical launch missile silos) and helicopter fuel storage areas.

At sea, three groups work together to maximize a ship's ability to respond to damage inflicted in emergency situations:

- the Damage Control Organization (DCO), primarily consisting of personnel from the Marine System Engineering Department (MSE). The role of the DCO is to respond to internal emergencies and damage including fire, flood, structural damage and damage to ship's systems.
- the Emergency Response Team (ERT) under the direct control of the Combat Systems Engineering Office. During conflict, this team is responsible for managing all aspects of the internal battle (preserve life, localize the damage, fix essential combat equipment and restore/maintain operation of the ship) that are related to the ship's external battle (fighting the enemy). Specifically, the ERT maintains the ship's operational capability through maintenance and repair of the combat equipment so the Combat Team can continue to do its job.
- the Action/Emergency Medical Organization which is led by the Medical Officer or Physician's Assistant and is responsible for casualties.

At sea the Executive Officer (XO) of the ship coordinates the overall activities, and keeps the Commanding Officer informed of the progress of control efforts and implications of damage.

There are two damage control facilities in Canada – one near Halifax on the East Coast, and the other near Victoria on the West Coast. The East Coast Damage Control Training Facility (DCTF) was opened in 2003 and is named for HMCS *Kootenay*. *Kootenay* was a Canadian warship that experienced a fire in October 1969 that killed nine crew members and seriously injured at least 53, the worst peacetime accident in the history of the Royal Canadian Navy. The *Kootenay* fire taught the RCN how important it was to make sure that everyone on a ship is trained in the basics of firefighting and damage control. The fire also illustrated how important it is to ensure that firefighting equipment is accessible at a variety of places on a ship. In the case of *Kootenay*, most of the firefighting equipment was stored in a main passageway that was inaccessible because of the fire. As well, because the electrical system was destroyed in the fire – and it took a while for the backup generator to be started – the ship could not radio for help, and communication within the ship was compromised. Many important lessons were learned from this unfortunate accident.

There have been fires onboard RCN ships in recent years – for example, HMCS *Regina*, HMCS *Calgary* and HMCS *Halifax* had fires in 2018 and 2019. And in November 2021 there was an engine room fire onboard HMCS *Fredericton* while the ship was participating in NATO exercises off the coast of Norway. These were all fairly minor incidents. There have, however, been several significant fires aboard RCN ships since the *Kootenay* incident. In 2004, when the submarine HMCS *Chicoutimi* was on its maiden voyage with the RCN, a fire caused severe damage, and resulted in the death of one crew member and injuries to eight others. *Chicoutimi* did not sail again for almost 10 years. In 2014 HMCS *Protecteur* had an engine room fire while returning to Esquimalt, BC, from an exercise. The fire was put out after 11 hours. There were no casualties, but the ship was paid off early after the fire.

With incidents in mind, these damage control facilities are specially designed to train naval personnel how to conduct damage control. At the facilities, events can be simulated in a realistic manner (i.e., real water and real fire) in a space designed as a ship. The facility has all the alarms and equipment that would be found in a ship. The facilities can also produce the smoke of a fire to introduce personnel to the smell and feel and sound of a fire onboard a ship.[1] It is not practical, or smart, to flood an actual ship but in a specially designed facility, the flood waters can pour in.

Although Canada has been at peace for many years, damage control must also focus on the possibility of damage during a conflict. Therefore, in addition to damage caused by rough seas, faulty equipment or an accident, personnel onboard warships must be prepared to deal with battle damages as a result of an enemy attack. In the event of a direct hit, explosion, collision or grounding personnel are trained to carry out a rapid survey of all compartments within their section of responsibility, and to make initial assessment of damages.

Warships are expensive and, even more significant, lives are important. Ships cannot completely avoid incidents/accidents, nor can they count on all enemy missiles missing. A threat may not even be from a state – non-state actors have also attacked naval ships. (For example, in October 2000, USS *Cole* was hit in harbour in Yemen with a suicide attack claimed by al-Qaeda, via a small fast boat loaded with explosives. In addition to extensively damaging the ship, this attack killed 17 US Navy sailors and injured 39 others.) All this provides incentive to practice damage control on all RCN ships.

[1] For more information, see Mayya Assouad, "A look inside: the Kootenay damage control training facility," Global News, 12 April 2013, https://globalnews.ca/news/476272/a-look-inside-kootenays-damage-control-training-facility/.