Postgraduate Certificate in Marine Salvage Operations

Marine Salvage Equipment and Techniques

Marine Salvage Equipment and Techniques are crucial components of the Postgraduate Certificate in Marine Salvage Operations. In this program, students will learn about the various types of equipment and techniques used in marine salvage operations, including their practical applications, advantages, and limitations. Here are some of the key terms and vocabulary related to marine salvage equipment and techniques:

1. Salvage Pumps: Salvage pumps are used to remove water from a sunken or flooded vessel. There are different types of salvage pumps, including centrifugal pumps, diaphragm pumps, and submersible pumps. Centrifugal pumps are commonly used for large-scale salvage operations, while diaphragm pumps are used for smaller vessels or delicate operations. Submersible pumps can be lowered into the water to remove water from the inside of a sunken vessel.
2. Airbags: Airbags are used to lift sunken vessels to the surface. They come in different sizes and shapes, and can be used for vessels of various types and sizes. Airbags are filled with air to provide buoyancy, which helps lift the vessel. They are typically made of durable materials such as rubber or PVC, and are equipped with valves to control the air pressure.
3. Divers: Divers are an essential part of marine salvage operations. They are trained to work underwater, and are responsible for inspecting and repairing damaged vessels, as well as attaching lifting equipment and rigging. Divers may also be responsible for locating and retrieving lost or sunken objects, such as anchors or cargo.
4. Lifting Equipment: Lifting equipment is used to lift sunken or damaged vessels to the surface. This includes cranes, winches, and hydraulic lifting systems. Cranes are used to lift vessels from the water, while winches and hydraulic lifting systems are used to pull vessels onto a barge or other type of transport.
5. Hot Tapping: Hot tapping is a technique used to create a new connection to a pipeline or vessel while it is still in operation. This is done by drilling a hole into the pipe or vessel, and then inserting a fitting or valve to create a new connection. Hot tapping is used in marine salvage operations to repair damaged pipelines or vessels, or to create new connections for temporary or permanent repairs.
6. Inert Gas Systems: Inert gas systems are used to prevent explosions in enclosed spaces, such as the tanks of a sunken vessel. The system introduces an inert gas, such as nitrogen, into the space to displace the oxygen and prevent combustion. Inert gas systems are critical for safe and effective marine salvage operations.
7. Oxy-arc Cutting: Oxy-arc cutting is a technique used to cut or remove metal in marine salvage operations. It involves using a flame or arc to heat the metal, and then blowing away the molten material with a stream of gas. Oxy-arc cutting is used to remove damaged or corroded metal, or to create openings for access or repair.
8. Plasma Cutting: Plasma cutting is a technique used to cut or remove metal using a high-velocity jet of hot plasma. Plasma cutting is more precise than oxy-arc cutting, and can be used to cut a wider range of metals, including stainless steel and aluminum. Plasma cutting is used in marine salvage operations to remove

damaged or corroded metal, or to create openings for access or repair.
9. Underwater Welding: Underwater welding is a technique used to repair or modify submerged structures, such as pipelines or vessels. It involves using specialized equipment and techniques to weld underwater, and requires highly skilled divers who are trained in underwater welding. Underwater welding is used in marine salvage operations to repair damaged structures, or to create new connections or modifications.
10. Remote Operated Vehicles (ROVs): ROVs are unmanned underwater vehicles that are equipped with cameras and sensors. They are used to inspect and survey underwater structures, and can be used to perform tasks that are too dangerous or difficult for divers. ROVs are used in marine salvage operations to locate and assess damaged vessels or structures, and to perform tasks such as cutting or welding in difficult-to-reach areas.

Practical Applications:

Marine salvage equipment and techniques are used in a variety of situations, including:

* Rescuing vessels that have run aground or are sinking
* Repairing or removing damaged or sunken vessels
* Inspecting and surveying underwater structures
* Recovering lost or sunken objects
* Performing underwater construction or modification
* Decommissioning or disposing of retired vessels or structures

Challenges:

Marine salvage operations can be challenging due to a variety of factors, including:

* Working in harsh or dangerous environments, such as deep water or extreme temperatures
* Dealing with unpredictable weather conditions and sea states
* Working with limited visibility or access to the vessel or structure
* Handling hazardous materials or explosive gases
* Ensuring the safety of divers and other personnel
* Meeting regulatory requirements and environmental standards

Examples:

Here are some examples of marine salvage operations that have used the equipment and techniques described above:

* In 2010, the Deepwater Horizon oil rig exploded and sank in the Gulf of Mexico, causing a massive oil spill. Specialized equipment and techniques, such as inert gas systems and remote-operated vehicles, were used to cap the well and contain the spill.
* In 2019, a container ship called the MSC Zoe lost hundreds of containers in the North Sea during a storm. Divers and remote-operated vehicles were used to locate and recover the lost containers.
* In 2020, a cruise ship called the Carnival Glory collided with a pier in Cozumel, Mexico, causing significant damage. Divers and lifting equipment were used to assess and repair the damage, and the ship was

eventually able to continue its voyage.

In conclusion, marine salvage equipment and techniques are critical components of the Postgraduate Certificate in Marine Salvage Operations. Students in this program will learn about the various types of equipment and techniques used in marine salvage operations, including their practical applications, advantages, and limitations. By understanding these concepts, students will be better equipped to respond to marine salvage emergencies and contribute to safe and effective marine salvage operations.