**Welding**

***Training/instructions***

* Instruct the user in the rules for welding and the use of equipment
* Take account of the surroundings and the material to be welded. This includes the positioning of tanks, electric cables, insulation and other flammable materials.
* Ensure there is nothing flammable or explosive nearby or in equipment nearby
* There are special requirements for welding equipment used on deck or other wet places. Make sure that workpieces to be welded are kept dry and consider using an insulated mat
* Use breathing gear when TIG welding
* Use breathing gear when the surface or weld location is painted, galvanized or made of aluminium
* Grind surfaces clean before starting to weld
* Use breathing gear when welding in enclosed spaces without ventilation
* Ensure the area is marked and install barriers
* All flammable material must be removed or shielded
* Have fire crew in vulnerable locations. Firecrew must use the same personal protection as the welder
* Firecrew must be properly equipped with firefighting equipment
* At the very least, there should be room ventilation in the area. Ensure that welding fume does not get recirculated during welding. Alternatively, use a mobile point extraction unit to remove contamination at source
* Exhaust from the mobile unit should be either connected to the ventilation system or fitted with a gas and dust filter
* Ensure that welding gear is maintained
* Organize work so as to prevent difficult working positions as much as possible
* Always get a work permit before work is started
* Electrical safety when inserting electrodes, footwear, handling welder power cables
* Fire safety and danger of fire from tanks. Welding the materials concerned. Location of personnel relative to escape routes and fire fighting equipment
* When checking welding gear, check cables, switches, insulation, backlash preventer, gas cylinders, connectors, clamps, earthing and electrode holders
* If an accident occurs:
  + Burns - cold water and contact medicine chest personnel
  + Arc eye - treat with Cincaine ointment, watergel or other eye ointment

***Accidents and injuries***

* Electric shock, e.g. when working without gloves or with wet clothes/shoes
* Burns from welding spatter and UV light
* Metal fume fever
* Arc eye
* Sore throat or hoarseness

***Illness***

* Asthma and allergy
* Risk of chronic bronchitis and lung cancer
* Risk of reduced fertility and harm to the unborn child
* Diarrhoea from inhaling welding fumes
* Wear and tear on shoulders, back and arms due to poor working positions

***Prevention***

* Choose low smoke welding electrodes
* Fume Class 1 is the lowest fume level - Class 7 is highest
* Local ventilation
* Procedures for when, how and where welding can be done
* Ensure you have good lighting and working position
* Plan the job in advance in line with ship and other operations
* Screen the area
* Thoroughly clean the area where welding is to be done

***Personal protection***

* Welding mask
* Welding gauntlets
* Cotton boiler suit or leather apron
* Knee protection
* Point extraction
* Ear defenders
* Glasses
* Insulating rubber mat
* Visor
* Protective goggles - suitable welding method
* Breathing gear
* Air filter: either fresh air or as gas/dust filter
* Protective underlay if working kneeling or standing for lengthy periods

***Aids***

* Trolley for moving welding gear
* Cincaine eye ointment, watergel or some other eye ointment can relieve pain from 'arc eye'
* Eyewash bottles

***More reading***

* Ergonomics