



# Chapter 2

## Engineering department organisation

## 2 Engineering department organisation

The engineering department comprises the chief engineer and the engineering team. The roles and responsibilities of the ship's crew are a fundamental part of the ship's SMS.

An effective engineering team should manage all the available resources efficiently and promote good communication and teamwork. It should be able to anticipate dangerous situations and respond to emergencies.

The information needed for effective engine room organisation should be included in the ship's SMS as a requirement of the ISM Code and should address:

- Safe crewing levels, including crewing levels required for simultaneous operations;
- Compliance with the International Convention for the Prevention of Pollution from Ships (MARPOL) and minimising the ship's impact on the environment;
- Effective communication and teamwork;
- Effective training and familiarisation;
- Sound shipboard operational procedures; and
- Robust and practised emergency responses.

### 2.1 Chief engineer

According to the STCW Convention, the chief engineer is the senior engineer officer responsible for the mechanical propulsion of the ship, and the operation and maintenance of the mechanical and electrical installations.

The chief engineer should follow company policies and procedures and is in overall charge of the engine room operations. In an emergency they have the overriding authority and responsibility for the ship's technical operation. Decisions about the engine room in emergency situations should be made alongside the master and should include all safety and pollution prevention systems. The officer in charge of the engineering watch (EOOW) should keep the chief engineer up to date with the status of all engine room plant, and the chief engineer should keep the master updated about any concerns.

In addition to providing support to the master for the safe and efficient operation of the ship, the chief engineer is responsible for the quality and availability of all operating fluids on the ship (e.g. fuel oil, lube oil and freshwater).

#### 2.1.1 Role as director of operations

The chief engineer should take on the role of director of engine room operations during critical times, especially arrival and departure. As director of operations, the chief engineer's duties include:

- Having a complete overview of the configuration and operation of machinery and equipment;
- Monitoring engine room officers and ratings, ensuring that they are maintaining a safe and efficient operation, and that the engineering team is not distracted by any external factors such as using mobile phones in the engine room, lack of rest, etc.;
- Ensuring that the work and rest hour requirements are adhered to and sufficient periods of rest are provided wherever needed, especially during periods of higher activity, e.g. cargo operations or navigational situations;

- Taking over the role of the watchkeeping officer if necessary, calling for back-up and returning to the director role as soon as possible; and
- Advising and guiding the engineering team.

### **2.1.2 Standing orders**

The safety management manual and its associated operational procedures, along with standing orders and instructions, form the basis of command and control on board.

The chief engineer should issue written standing orders for the engineering team. These should be based on the internal procedures of the company and reflect the chief engineer's own requirements, and take into account the master's standing orders, the circumstances of the ship and trade, and the experience of the engineering team on board.

Standing orders and instructions should not conflict with the SMS, but they provide a good opportunity to give specific guidance about the occasions when the chief engineer should be consulted or called to the engine room.

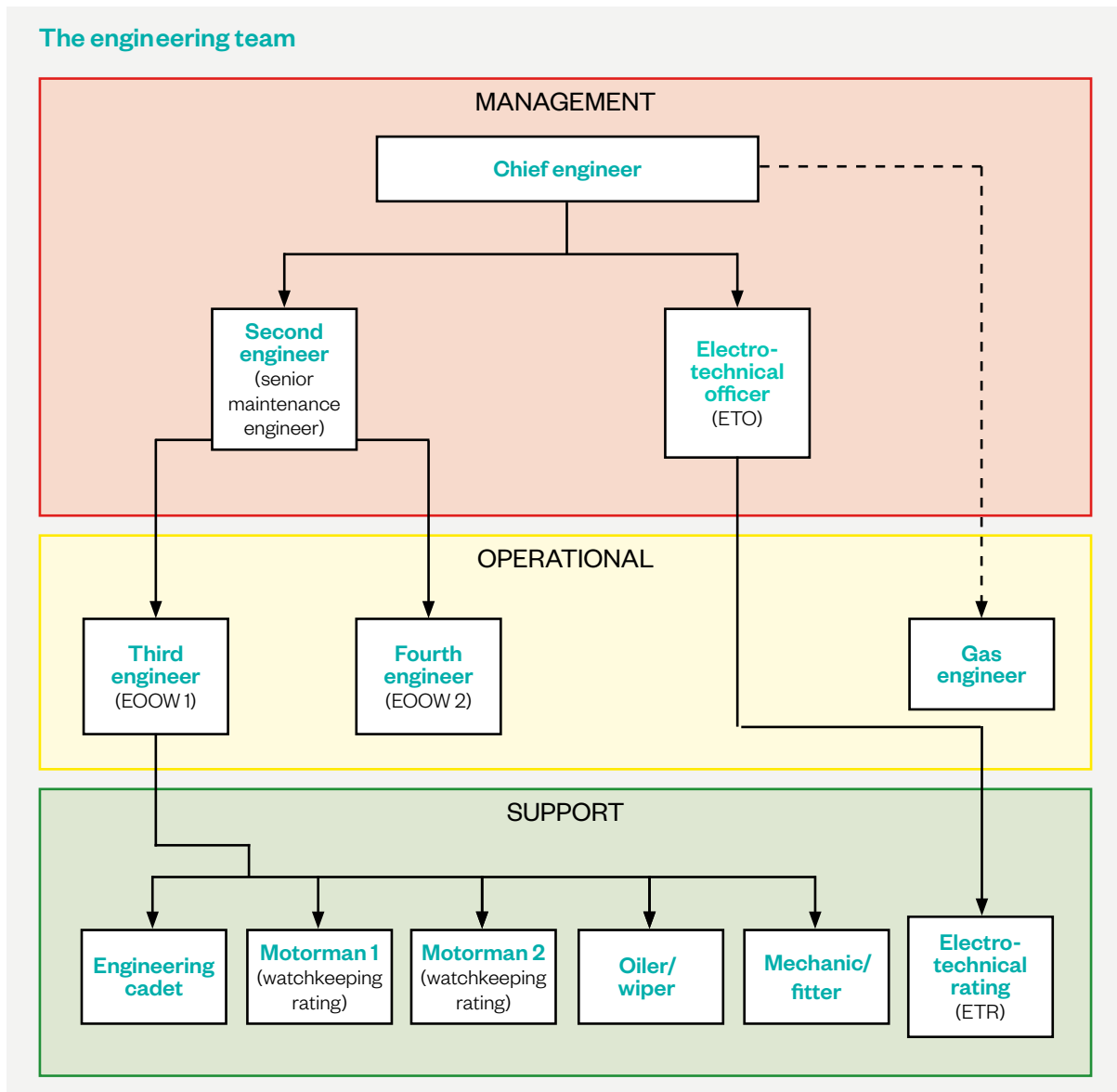
On joining the ship, all relevant engineer officers should read, sign and date the standing orders. A reference copy of the orders should be readily available in the ECR.

### **2.1.3 Night and day orders**

The chief engineer should issue night orders and day orders in the engineering department order book. These orders provide specific instructions to address circumstances and requirements outside the normal routines. All EOOWs should fully understand and acknowledge these orders when going on or off watch.



## 2.2 The engineering team



**Figure 2.1: Example engineering team**

The engineering team should be set up to make the most effective use of available crew, allowing them to follow established work procedures that ensure the ship is operated safely.

The engineering team consists of management, operational and support teams. The management team can differ by ship and company type, with the electro-technical officer (ETO) (and gas engineer, if carried) forming part of the management team.

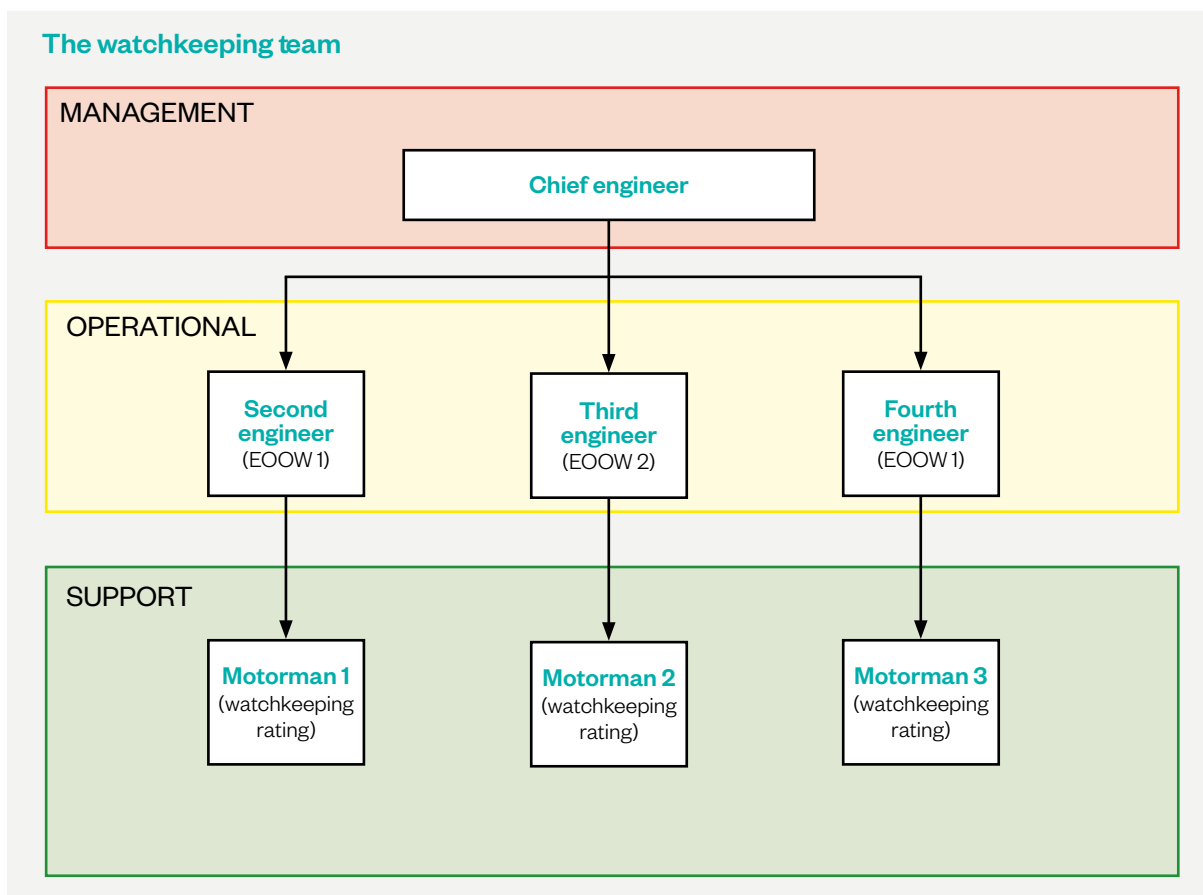
The operational team will consist of the third and fourth engineer, who will report directly to the second engineer. They will then be supported by any cadets that are on board, motormen, oiler/wipers and the mechanic/fitter.

A larger engineering team reporting to the chief engineer may comprise a senior maintenance engineer, senior and junior EOOW, ETOs, and supporting officers and ratings. Such a team can be sub-divided into the watchkeeping and maintenance teams.

The watchkeeping team takes care of the operational side of the engine room while the maintenance team is in charge of maintenance and housekeeping (and is available to help the watchkeeping team in certain situations).

### 2.2.1 The watchkeeping team, for ships that operate a watchkeeping system

While some ships operate a watchkeeping pattern, others operate on a UMS system. The structure described below is only applicable to those ships that run a watchkeeping system. For ships operating a UMS system, see section 2.2.2: The UMS team, for ships operating a UMS system.



**Figure 2.2: Example watchkeeping team**

The EOOW is in charge of the engine room and the watchkeeping team until relieved. If the engine room is occasionally unattended, the EOOW is the designated duty engineer. The EOOW may be on duty alone or have the help of other engineer officers and ratings.



The chief engineer should distribute the watch schedule in advance and the schedule should be posted in the:

- ECR;
- Bridge;
- Cargo control room (if applicable); and
- Chief engineer's office.

The watchkeeping team should work closely together in a particular watch and across watches (including during duty handovers on ships with unattended engine rooms), as decisions made on one watch may affect the next.

The watchkeeping team also has an important role in communicating with the bridge and other departments on board.

The watchkeeping team should be aware of:

- The need to keep the chief engineer fully informed;
- The types of information that should be routinely reported; and
- The circumstances when the chief engineer should be called.

The watchkeeping team should also assist the maintenance team by safely isolating and bringing back into service machinery for inspection and maintenance.

### **2.2.2 The UMS team, for ships operating a UMS system**

On ships that operate a UMS, the engineering team will normally work in the daytime and during periods when the engine room is required to be crewed, e.g. during manoeuvring. Each engineer will have a period of time when they are on duty. The duty engineer is responsible for responding to alarms in the engine room during night time and other time periods when the engine room is unattended.

When an engineer has been called out during their rest hours, the chief engineer should ensure that this is compensated for in their rest hours.

### **2.2.3 The maintenance team**

In a conventional cargo ship, each engineer officer will have assigned responsibilities for the maintenance of certain systems in the engine room. These responsibilities should be clearly indicated in the ship's SMS.

As an example:

- Main engines and their associated systems are the responsibility of the second engineer;
- Auxiliary engines and their associated systems are the responsibility of the third engineer; and
- Sewage systems, freshwater treatment and production, oily water separator (OWS) and associated systems are the responsibility of the fourth engineer.