INTERNATIONAL MARITIME ORGANIZATION

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SUB-COMMITTEE ON FIRE PROTECTION
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Agenda item 16

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ANALYSIS OF FIRE CASUALTY RECORDS

Fire on the fishing factory vessel "Hercules"

Note by the Secretariat

SUMMARY	
Executive summary:	This document provides information on the very serious fire that occurred in April 2007 on the Faroese fishing factory vessel **Hercules** which FSI 17 requested the Sub-Committee to consider
Strategic direction:	12.1
High-level action:	12.1.2
Planned output:	12.1.2.1 and .2
Action to be taken:	Paragraph 6
Related documents:	FP 53/19/1; FSI 17/20, section 6 and MSC 86/26, section 23

Background

1 The Sub-Committee, at its fifty-third session, in considering document FP 53/19/1 (Denmark and Faroe Islands), providing information on the very serious fire that occurred in April 2007 on the Faroese fishing factory vessel **Hercules**, noted that:

.1 lamp fixtures of poor quality had caused the fire;

.2 fire-fighting and the search for crew members in the accommodation was transitory due to the lack of air supply in the smoke divers' air breathing apparatuses; and

.3 the submitters proposed relevant amendments to the 1974 SOLAS Convention.

Extracts from the accident investigation report, as set out in the annex to document FP 53/19/1, are annexed to this document for ease of reference.

2 Subsequently, FP 53 invited Denmark to submit a proposal to the Committee for a new work programme item, in accordance with the Guidelines on the organization and method of work and requested the Secretariat to forward document FP 53/19/1 to FSI 17 for further consideration.

3 FSI 17 referred the document to its Working Group on Casualty Analysis, noting that the investigation report had been included into GISIS as Incident: C0006872 and was also available on the homepages of the Faroese Maritime Authority and Danish Maritime Authority (FP 53/19/1, paragraph 2). Based on a preliminary consideration of the report, FSI 17 found some important safety issues, such as poor communication among crew members, inadequate instructions and drills, technical aspects of the electrical installations and provision of an air compressor on board, and referred the investigation report to the STW, DE and FP Sub-Committees for consideration.

Outcome of MSC 86

4 MSC 86, noting that Denmark and the Faroe Islands had submitted proposals for two new high-priority work programme items on "General requirements on electrical installations" and "Means for recharging air bottles for air breathing apparatuses" for the DE and FP Sub-Committees, respectively, agreed to refer the investigation report on the fire on the fishing factory vessel **Hercules** to the FP, DE and STW Sub-Committees for consideration.

5 With regard to the proposals for relevant new work programme items submitted in documents MSC 86/23/14 and MSC 86/23/15 (Denmark and Faroe Islands), MSC 86 took action as follows:

.1 concerning the proposal to develop amendments to SOLAS regulation II-2/10.10.2 regarding requirements for fire-fighters' breathing apparatuses, MSC 86 included in the work programme of the FP Sub-Committee and the provisional agenda for FP 54 a high-priority item on "Means for recharging air bottles for air breathing apparatus", with a target completion date of 2011; and

.2 concerning the proposal to develop amendments to SOLAS regulation II-1/40.2 regarding general requirements on electrical installations, MSC 86 included in the work programme of the DE Sub-Committee a high-priority item on "General requirements on electrical installations", with two sessions needed to complete the item.

Action requested of the Sub-Committee

6 The Sub-Committee is invited to consider the information provided in the document and to take action as appropriate.

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ANNEX*

EXTRACTS FROM THE ACCIDENT REPORT BY THE DIVISION FOR INVESTIGATION OF MARINE ACCIDENTS

Accident data

Type of accident (the incident in details)	Fire
Character of the accident	Very serious accident
Time and date of the accident	20 April 2007, about 2055 (local time, equivalent to Faroese time minus five hours)
Position of the accident	41°20´ S – 79°17´ W
Area of accident	South Pacific Ocean v
Number of perished persons	11
Evacuation of injured persons	None
Ship abandoned	All survivors were evacuated via the vessel's liferafts.
IMO Casualty Class	Very serious

Ship data

Name	HERCULES
Home port	Hósvík
Call sign	OW2433
IMO No	8907060
Registration No	VN 575
Register	Faroese Register of Shipping
Flag State	Faroe Islands
Construction year	1990
Type of ship	Factory trawler
Type of fishing ship	Stern trawler
Tonnage	7805 GT
Classification	Det Norske Veritas + 1A1 ICE-C Fishing Vessel & Stern Trawler KMC
Length	90.1 metre
Engine power	105.0 metre
Hull construction	5920 kW
Area served	Worldwide
Regulation	Notice from the Faroese Maritime Authority E, 1 August 2006, Regulations on the construction and equipment etc. for fishing vessels. Class rules from Det Norske Veritas

* For reasons of economy, this annex is provided in English only. Please refer to the original document FP 53/19/1, for French and Spanish text.

SUMMARY – SEQUENCE OF EVENTS

The fishing vessel **Hercules** was a factory trawler of 7805 GT, designed with plants for deep freezing fish. The vessel was built in 1990 and was purchased by a Faroese company in February 2007 and registered in the Faroese Register of Shipping together with her sister ship **Poseidon**. The vessels were fishing with pelagic trawls in the South Pacific Ocean. The catch was frozen without being processed and stowed into the freezing hold. There were 116 crew members, technicians and ship's officers on board, spread over 6 nationalities. On Friday, 20 April, a fire broke out on board **Hercules** in the hold where great amounts of plastic and corrugated cardboard packing were stored. Very dense smoke spread extremely fast all over the vessel and also to the bridge, because a large number of doors and hatches were open, and because a cable shaft was leading not divided into sections from the cargo hold on the second deck up to a low space below the bridge. The fire alarm systems functioned for a very short while and had only a poor effect. A distress signal was transmitted via VHF to other fishing vessels in the vicinity. Four vessels arrived to give assistance within approximately one hour. The crew gathered on the forecastle while smoke divers were searching in the accommodation to get all crew members out. Due to lack of air supply in their air breathing apparatuses it was necessary to dismiss the smoke divers quickly. No fire fighting was carried out inside the vessel due to lack of air supply in the air breathing apparatuses. 11 crew members perished due to smoke inhalation. 105 persons were evacuated from the ship to other fishing vessels by the use of the vessel's liferafts. The vessel was on fire for approximately three weeks. All processing compartments, cargo spaces, accommodation and other machinery spaces burned out. The engine-room remained almost undamaged by the fire. Approximately one month after the fire broke out, the vessel was towed to a Chilean port. It was declared a "Total Constructive Loss".

CONCLUSIONS (EXTRACT)

1 The outbreak of the fire was caused by unsuitable lighting equipment in a space where highly combustible materials were stored.

2 The rapid spreading of smoke and fire in the vessel was facilitated by great amounts of ignitable materials and good draft conditions.

3 The draft conditions were created by constructions (cable shaft) and work conditions (open doors and hatches).

4 The vessel's structural fire protection was not effective.

Outbreak of the fire

The fire broke out in the hold on the 1st deck because an electric arching occurred in one or more sockets in a fixture for fluorescent tubes. Plastic material in the fixture became overheated and was ignited by the arching. Melted and burning plastic material dropped upon and ignited corrugated cardboard in the hold.

The spread of smoke and fire

The rapid spreading of smoke and fire in the vessel was due to the fact that to a wide extent the passages between the various spaces, decks and compartments in the vessel were open. A vertical shaft was leading not divided into sections up to the ventilating room below the bridge from the

cargo hold on the second deck, which contributed to the fast spreading of smoke and fire to the bridge and the accommodation.

Detection of the fire and fire alarm

The automatic fire alarm and detecting system went off late in the course of the fire and stopped again shortly after. The general alarm sounded for only a few seconds only. An effective and early alarm in the vessel's accommodation could have alerted all crew members in due time and thus provided them with a better chance to escape to open deck.

Search for crew members

The search for crew members was transitory due to lack of air supply in the air breathing apparatuses.

Evacuation to open deck

105 persons escaped to open deck. 11 persons perished due to smoke inhalation inside the vessel. Not all persons came out in due time, because the fire alarm was not effective and early, and because the smoke spread extremely fast in the vessel.

Fire fighting

No fire fighting was carried out by smoke divers with fire hoses and nozzles in the vessel's interior. The crew was prevented from carrying out a dedicated and effective fire fighting – mainly due to lack of smoke diver capacity. The crew was prevented from entering smoke filled areas to for instance close openings and fight the fire with water.

Evacuation from the vessel

All 105 persons, who had escaped unharmed from the inside of the vessel, were evacuated from the vessel. The evacuation from **Hercules** took place in an orderly manner without any harm to persons. The evacuation was not carried out in accordance with the abandon-ship muster list, but on the ship management's decisions and orders, determined by the situation. The evacuation of all survivors was handled in a good manner by the skipper and the flag captain in cooperation with the chief engineer and the factory manager. The evacuation was characterized by foresight and consideration of adequate precautions by the ship's management.

Instructions and drills

The instruction to the crew about the fire alarm system has not been adequate. Language barriers entailed that some of the crew members did not understand the instructions sufficiently. The abandon-ship muster list, the fire muster list and the fire and safety plan were not concordant with the actual circumstances and thus worthless.

Technical faults

There was an inherent risk of fire ignition in a great number of recently installed fixtures for fluorescent tubes. The type of fixtures in question was of a poor quality, which ought not to be used on board ships. Cables, which had been wired in the cable shaft, including cables for fire

alarm systems had been highly exposed to destruction in case of fire in the cargo hold on the second deck. In the cable shaft an incorrect penetration had been made for wiring a cable in the bulkhead between the shaft and the ship's office.

Structural fire protection

In the Investigation Division's opinion, the vessel did not meet the requirements for bulkheads' and decks' fire integrity. Among other things, because the hold on the second deck had been converted after the ship was built from being a processing compartment into a hold. The structural fire protection of the vessel was not effective. A cable shaft, leading not divided into sections from the cargo hold on the second deck to the ventilation room below the bridge acted as a funnel for smoke and fire. The design of the cable shaft implied that the cargo hold on the second deck was not duly fire insulated from the bridge.

Fire fighting and life-saving appliances

The smoke divers' air supply quickly came to an end which limited the possibility of search for persons. The limited smoke diver capacity made it impossible to get close to the fire and carry out effective fire fighting. No information available indicates there were any concrete defects in the air breathing apparatuses. There were difficulties in connection with the release of two liferafts. One liferaft could not be released at all.

Regulations on lamp fixtures

Lamp fixtures shall be made so to prevent increase of temperature, which could damage the wiring, and to prevent surrounding material from becoming excessively hot. The fluorescent tube fixtures in question did not meet this requirement. No regulations prescribe that lamp fixtures should be of a type approved by authorities or by organizations e.g., classification societies.

Warning about fluorescent tube fixtures

In June 2007, the Investigation Division and the Faroese Maritime Authority issued a warning about the fire risk connected with the use of fluorescent tube fixtures of the same type that had recently been installed on **Hercules**.

Recommendations (extract)

The Investigation Division recommends that the Faroese Maritime Authority takes the initiative internationally in laying down requirements for:

- type approval of lamp fixtures used in ships; and
- air compressors for refilling air bottles for air breathing apparatuses.

The Investigation Division made further recommendations to the Flag State Administration and to the shipowner concerned.

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