



MARINE EMERGENCIES

FOR MASTERS AND MATES

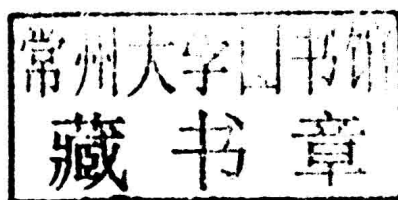
D.J. HOUSE

ROUTLEDGE

Marine Emergencies

For Masters and Mates

D.J. House



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Marine Emergencies

This book is an influential guide to marine emergencies and the current strategies that can be employed to cope with the immediate after-effects and ramifications of disaster at sea. Many mariners will at some point in their marine careers become involved in one sort of emergency or another, while in port or at sea, whether it is a fire on board, a collision with another vessel or an engine failure threatening a lee shore. Actions to take in such incidents can be the difference between survival and catastrophic loss.

This text provides a direct insight into some of the latest incidents and includes:

- case studies from emergencies worldwide
- checklists and suggestions for emergency situations
- everything from fire and collision right through to the legal implications of salvage.

D.J. House has written and published 18 marine titles, many of which are in multiple editions. After commencing his seagoing career in 1962, he was initially engaged on general cargo vessels. He later experienced worldwide trade with passenger, container, ro-ro, reefer ships and bulk cargoes. He left the sea in 1978 with a Master Mariner's qualification and commenced teaching at the Fleetwood Nautical College. Retiring in 2012 after 33 years of teaching in nautical education, David House continues to research and write for the ever-changing marine industry.

Other Works Published by D.J. House

Seamanship Techniques, combined volume (4th edition), 2013, Routledge.
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Marine Technology Reference Book (Safety Chapter), 1990, edited by Nina Morgan, Butterworths.
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About the Author

David House is a Master Mariner, starting his marine career in 1962, until the present day. He spent 15 years at sea on various ship types, from passenger liners to dredging operations, engaged in worldwide trades. His marine experience, including a limited time on warships, was gained aboard general cargo vessels, container ships, roll-on-roll-off (ro-ro) ferries and passenger liners. During his working life at sea he carried a variety of cargoes, including both dry and liquid products, reefer commodities, heavy lifts, containers, vehicles, bulk commodities and timber products.

His time in a seagoing capacity involved him in several real-time emergency situations which have been reflected within this work.* Engaged on worldwide trade he encountered considerable ice experience both in the Baltic and on the North Atlantic winter trades. Heavy weather, fog, tropical storms and a lack of under-keel clearance became influencing factors in his continued writings for the marine industry.



Figure 0.1 The author Mr D. J. House.

His later years were engaged in lecturing to marine students on most maritime disciplines. During this period of over 30 years, he successfully wrote 17 textbooks covering such topics as dry docking, anchor work practice, ferry transports, general seamanship, navigation, ship construction, heavy lift and rigging, cargo work, ship handling, marine survival and helicopter operations.

He continues to work within the marine education arena, teaching and carrying out ongoing research into a variety of marine-related topics. This current work has been enhanced by continued work with the International Institute of Nautical Surveyors, the Fleetwood Nautical Campus of the Blackpool & Fylde College and colleagues within the maritime industries.

NB. Merchant Navy officers are expected to wear many hats on different occasions, sometimes being a navigator, medical officer, cargo officer or naval architect. On some unusual occasions even being a cook to a legal counsellor.

Note

- * During his seagoing career, the author had firsthand experience of being aboard a ship running aground in fog and ice conditions on a voyage towards Montreal. His vessel was also torn away from the quayside by fast-flowing ice drifts. His ship was later to part all its mooring ropes and was cast adrift without power, in the restricted waters of the St Lawrence River, Canada.

He later experienced a head-on collision off the Northern Ireland coastline while aboard a ro-ro vessel. This particular incident caused contact with a cliff face at 16 knots. The subsequently damaged vessel was then taken with tug assistance to Belfast dry dock for major repairs.

His experiences also include a fishing boat rescue in the Irish Sea and two fires on board different ships. As the acting medical officer at the time he dealt with mental health problems in crew members and violent outbreaks among personnel, resulting in disciplinary procedures having to be taken.

Abbreviations

A.C.	alternating current
ABS	American Bureau of Shipping
ACAS	Advisory, Conciliation and Arbitration Service
ACGIH	American Conference of Government Industrial Hygienists
AHV	anchor handling vessel
AIS	automated identification system
AMVER	Automated Mutual-Assistance Vessel Rescue System
API	American Petroleum Institute
APM	anchor position mooring
APP	aft perpendicular
B & V	Blohn +Voss Industrietechnik GmbH
B	representative of the ship's centre of buoyancy
B/A	breathing apparatus
BHP	brake horse power
BIMCO	Baltic and International Maritime Council
BL	breaking load
BP	bollard pull
BS	breaking strength
BT	ballast tank
BV	Bureau Veritas
C of A	certificate of approval
C of G	centre of gravity
CBT	clean ballast tank
CD	chart datum
CG	Coast Guard
CMI	Comité Maritime International (International Maritime Committee)
CO ₂	carbon dioxide
CSM	cargo securing manual
CSP	commencement of search pattern
CSS	Cargo Stowage and Securing (code)
CSWP	Code of Safe Working Practice
D.C.	direct current
DNV	Det Norske Veritas
DP	dynamic positioning
DPA	designated person ashore

DSC	digital selective calling
DSV	diving support vessel
DWA	dock water allowance
dwt	deadweight tonnage
ECDIS	Electronic Chart and Display Information System
EEBDs	emergency escape breathing devices
EFSWR	extra flexible steel wire rope
EPIRB	emergency position indicating radio beacon
ETA (i)	estimated time of arrival
ETA (ii)	European Tugowners' Association
ETA (iii)	emergency towing arrangement
ETV	emergency towing vessel
EU	European Union
F.O.	fuel oil
FLOFLO	float on, float off
FPSO	floating production, storage and offload vessel
FRC	fast rescue craft
FSE	free surface effect
FSWR	flexible steel wire rope
FW	fresh water
G	representative of a ship's centre of gravity
GA	general average
GHz	gigahertz
GL	Germanischer Lloyd
GM	metacentric height
GMDSS	global maritime distress and safety system
GMT	Greenwich Mean Time
GPS	global positioning system
grt	gross registered tonnage
GZ	righting arm (righting lever in stability)
HDFD	heavy duty floating derrick
HF	high frequency
HLO	helicopter landing officer
HMCG	Her Majesties Coast Guard
HMPE	high molecular weight polyethylene
HNS	hazardous and noxious substances
HP	high pressure
HSE	Health & Safety Executive
HSSC	Harmonised System of Survey and Certification
HW	high water

IACS	International Association of Classification Societies
IALA	International Association of Lighthouse Authorities
IAMSAR	International and Aeronautical Maritime Search and Rescue
IAPPC	International Air Pollution Prevention Certificate
IGS	inert gas system
IMDG	International Maritime Dangerous Goods (code)
IMO	International Marine Organisation
INS	integrated navigation system
IOPP	International Oil Pollution Prevention (MARPOL Certificate)
IPS	integrated power system
ISGOTT	International Oil Tanker and Terminal Safety Guide
ISM	International Safety Management (code)
ISO	International Organisation of Standardisation
ISPPC	International Sewage Pollution Prevention Certificate
ISU	International Salvage Union
IUA	International Underwriting Association
IUMI	International Union of Marine Insurers
IWS	in water survey
K	representative of the position of a ship's keel
kg	kilograms
kHz	kilohertz
kNs	kilonewtons
kts	knots
kW	kilowatt
LAT	lowest astronomical tide
LBP	length between perpendiculars
LFL	lower flammable limit
LOA	length overall
LOF	Lloyd's Open Form of Salvage
lo-lo	load on-load off
LP	low pressure
LPG	liquid propane gas
LR	Lloyd's Register
LRS	Lloyd's Register of Shipping
LSA	life saving appliances
LSSA	Lloyd's Standard Salvage and Arbitration
LW	low water
M (i)	metres
M (ii)	metacentre
	representative of the metacentre

M.V.	motor vessel
MA	mechanical advantage
MAIB	Marine Accident Investigation Branch
MARPOL	International Convention for the Prevention of Oil Pollution
MBL	minimum breaking load
MCA	Maritime Coastguard Agency
MCTC	moment to change trim by 1 cm
Medivac	medical evacuation
MEPC	Marine Environmental Protection Committee
MES	Marine Evacuation System
MF	medium frequency
MFAG	Medical First Aid Guide
MGN	marine guidance notice
MHWN	mean high water neaps
MHWS	mean high water springs
MHz	megahertz
MIN	marine information notice
MLWN	mean low water neaps
MLWS	mean low water springs
mm	millimetres
m/m	mass by mass
MoB	man overboard
MoD	Ministry of Defence
MODU (MOU)	Mobile Offshore Unit
MPCU	Marine Pollution Control Unit
MRCC	Marine Rescue Co-ordination Centre
M/S	Merchant Shipping Act
MSC (i)	Marine Safety Committee (of IMO)
MSC (ii)	Mediterranean Shipping Company
MSI	maritime safety information
MSL	maximum securing load
MSN	merchant shipping notice
MSR	mean spring range
MTSA	Marine Transport Security Act (US)
MW	megawatt
NP	national publication
NBDP	narrow band direct printing (telex)
NFU	non follow up
NLS	noxious liquid substances
NRV	non-return valve

NUC	not under command
OBO	oil, bulk, ore carrier
OCIMF	Oil Companies International Marine Forum
OLB	official log book
OOW	Officer of the Watch
OPIC	Oil Pollution Insurance Certificate
ORB	oil record book
OSC	On Scene Coordinator (Military On Scene Commander)
OSHA	Occupational Safety and Health Administration
P & I	Protection and Indemnity Association
P/V	pressure vacuum
PEL	permissible exposure limit
PHA	preliminary hazard analysis
PIC	person in charge
PNG	pressurised natural gas
PPM (ppm)	parts per million
PRS	Polish Register of Shipping
PSC	Port State Control
psi	pounds per square inch
RD	relative density
RINA	Registro Italiano Navale (Classification Society – Italy)
RNLI	Royal National Lifeboat Institution
ro-pax	roll-on–roll-off passenger vessel
ro-ro	roll-on–roll-off
ROV	remote-operated vehicle
s.h.p.	shaft horse power
SA	Salvage Association
SAR	search and rescue
SART	search and rescue radar transponder
SBE	stand-by engines
SBM	single buoy mooring
SCOPIC	Special Compensation Protection and Indemnity Clause
SCR (i)	Shipowners Casualty Representatives
SCR (ii)	Special Casualty Representative
SF	stowage factor
SL	summer load line
SLS	serviceability limit state (design condition)
SMC	Safety Management Certificate
SMS	safety management system
SOLAS	Safety of Life at Sea (convention)

SOPEP	Ship's Oil Pollution Emergency Plan
SSA	Ship Building and Repair Association
SSHP	Site Safety and Health Plan
STEL	short-term exposure limit
SU	search unit
SW	salt water
SWL	safe working load
SWR	steel wire rope
T (t)	tonnes
Te	tug efficiency
TEU	twenty-foot equivalent unit (container)
TF	tropical fresh
TLV	threshold limit value
TPC	tons per centimetre
TPR	towline pull required
TVAS	Towing Vessel Approvability Scheme
TWA	time-weighted average
UFL	upper flammable limit
UHMPE	ultra-high molecular mass polyethylene
UK	United Kingdom
UKC	under-keel clearance
UKSTC	United Kingdom standard towing conditions
ULC	ultimate load capacity
ULCC	ultra-large crude (oil) carrier
ULS	ultimate limit state
US	United States
USCG	United States Coast Guard
VDR	voyage data recording unit
VDU	visual display unit
VHF	very high frequency
VLCC	very large crude carrier
VR	velocity ratio
VTs	vessel traffic services
W (i)	representative of the ships displacement
W (ii)	winter loadline
W/L	waterline
WBT	water ballast tank
WMO	World Meteorological Organisation
Wp	waterplane area
w.p.s.	wires per strand
WPS	Welding Procedure Specification

Terminology and Definitions Associated with Marine Emergencies

Anchor handling vessel (AHV) – A high horse-powered vessel usually constructed with a wide, ample-spaced working deck, aft. They are frequently employed in offshore areas as a general-purpose work boat. They carry very long anchor cables in large lockers for their own use. These vessels are also used for transoceanic towing operations, usually having a high bollard pull (BP) capacity in excess of 130 tonnes.

Speciality towing with offshore structures and working in the salvage role are not uncommon. Such units are used extensively in the offshore industry for laying patterns of anchors for positioning offshore installations. Also employed for the recovery and deployment of anchors within the salvage sector.

Anchor warp – A wire hawser, sometimes combined with a heavy-duty fibre rope, which acts as an alternative to the anchor chain cable as fitted to conventional seagoing vessels. More often used on smaller or specialised craft where an all-chain cable would be considered inappropriate.

Arbitration – Defined as a method of settling disputes between two or more parties. Decisions from arbitration are usually binding on the parties concerned. The term is often common to ‘charter parties’.

Arbitrator – A person designated to hear both sides of a dispute. The person is very often a Queens Council and in the case of salvage, such a person is likely to be practising at the Admiralty Bar under English Law relating to civil claims of salvage.

In determining any salvage award, account would have to be taken of the value of the ship, its cargo and freight at risk. Assessment would also be made of the dangers and difficulty in establishing salvage.

Archaeological salvage – A type of salvage for the recovery of either cargo or artefacts usually submerged and may involve the use of scuba diving. This type of salvage has evolved, with governments wishing to preserve wrecks and involve themselves in contracts to effect recovery of property of value and interest.

Backstays – An additional feature rigged to a mast or Samson Post structure to provide additional support when an attached derrick is expected to make a heavy lift.

Beaching – A term used to describe the deliberate action of running the vessel into shoals to take the ground. It is usually carried out to prevent a total constructive loss from the possibility of the vessel sinking in deep water. It would generally be expected that, following

repairs, the vessel could be re-floated at a more favourable time in the future. An alternative is to break the vessel up in controlled conditions. The act of beaching would be cause for a declaration of 'general average' (GA).

Bimco Towcon – A widely used contract for sea towing. This towing contract was first introduced in 1985. It was drawn up by the Baltic and International Maritime Council (BIMCO), the European Tugowner's Association (ETA) and the International Salvage Union (ISU). This type of contract tends to incorporate 'Standard towing Conditions', and provides detailed and explicit conditions affecting both parties to the towing operation.

Bitter end – The opposing end of the anchor cable which is secured to the vessel in the region of the cable locker.

Bollard pull (BP) – A measured pulling capacity associated with the towing power of a tug. It is an influence on the charter towing rates when a tug is hired for a charter. The greater the BP, the higher the towing rate charged. It is defined as the amount of force, expressed in tonnes, that a tug can exert under given conditions.

Broken stowage – Considered to be that space contained between cargo parcels that remains unfilled.

Broker (insurance) – A third party who acts between the client who wishes to insure his operation and the underwriters who offer to take the risk on. The 'broker' acts to advise the client on an appropriate level of policy. The broker is informed by the Warranty Survey Company of changes to the operation or additional risks being incurred.

Bulk density – The weight of solids, air and water per unit volume. It includes the moisture of cargo and the voids, whether filled with air or water.

Bull wire – A single wire often used in conjunction with a 'lead block', rigged to move a load sideways off the line of plumb, to an acceptable position.

Cargo salvage – An occasion when a vessel is so badly damaged that it cannot be saved or the hull cannot be saved economically, but the cargo or part of the cargo can.

Cargo shift – A generic term used to describe an unwanted movement of the ship's cargo. It is usually experienced in bad weather where the vessel experiences violent motions in pitching or excessive rolling. The ramifications could affect the positive stability of the vessel, causing the ship to develop a list or even go to an unstable position. Avoidance of the problem is generally achieved by ensuring that the cargo is correctly and adequately secured after loading, before putting the ship to sea.

Carpenter's stopper – A heavy duty stopper employed to hold steel wire ropes (SWRs), used within the salvage industry.

Cement box – A temporary repair method applied to minor leaks about the ship's hull. It is established by the construction of a box in steel or timber around the area of the leak and fitted with a drain. It is then filled with cement and allowed to dry. The drain is led to a bilge compartment which can be conveniently pumped out.