



IALA GUIDELINE

G1118 MARINE CASUALTY / INCIDENT REPORTING AND RECORDING, INCLUDING NEAR-MISS SITUATIONS AS IT RELATES TO A VTS

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1. INTRODUCTION

This Guideline is intended to provide guidance and information to VTS providers and competent authorities on the development and establishment of harmonized casualty/incident/near-miss reporting, recording and analysis processes.

1.1. OBJECTIVES

The objectives of the Guideline are to provide guidance on:

- collecting material to improve the safety of navigation in the VTS area based on the conclusions drawn from the analysis of casualty/incident and near-misses;
- identifying, analysing and reporting near-misses; and
- enhancing a safety culture within a VTS.

1.2. BACKGROUND

The process of identifying and reporting marine casualties has been clearly established by IMO (*MSC Res.255(84)*[1]). The scope of this process could be enlarged to marine incident and near-misses (*MSC-MEPC.7/Circ.7* [2]).

Casualties are often preceded by many minor marine incidents or near-misses. The analysis of marine incidents and near-misses could help VTS providers and other authorities in reviewing its safety of navigation infrastructures, procedures and/or regulations.

The reporting and analysis of incidents and near-misses are recognized in environments where risk-management is essential as a fundamental aspect of safety management (see for example, the *ICAO Safety Management Manual* [3] for the aviation industry).

Through such analysis and reporting, it is possible to establish a “reporting culture” and this is often the first step in order to implement a “safety culture”. The ultimate goal from this activity is to learn lessons from incidents and near-miss situations and therefore avoid any future damage.

2. CLARIFICATIONS

For the development and understanding of this Guideline, it is necessary to clarify the differences between a casualty/incident/near-miss.

- A marine casualty is defined in IMO Resolution *MSC.255(84)* known as Casualty Investigation Code as an event, or a sequence of events, that has resulted in any of the following which has occurred directly in connection with the operations of a ship:
 - the death of, or serious injury to, a person;
 - the loss of a person from a ship;
 - the loss, presumed loss or abandonment of a ship;
 - material damage to a ship;
 - the stranding or disabling of a ship, or the involvement of a ship in a collision; or

- material damage to marine infrastructure external to a ship, that could seriously endanger the safety of the ship, another ship or an individual; or severe damage to the environment, or the potential for severe damage to the environment, brought about by the damage of a ship or ships.
- A marine incident is defined in *MSC.255 (84)*, known as the Casualty Investigation Code, as an event, or sequence of events, other than a marine casualty, which has occurred directly in connection with the operations of a ship that endangered, or, if not corrected, would endanger the safety of the ship, its occupants or any other person or the environment.
- A near-miss is defined in *MSC-MEPC.7/Circ.7 Guidance on near-miss reporting*, as a sequence of events and/or conditions that could have resulted in loss. This loss was prevented only by a fortuitous break in the chain of events and/or conditions. The potential loss could be human injury, environmental damage, or negative business impact (e.g., repair or replacement costs, scheduling delays, contract violations, loss of reputation).

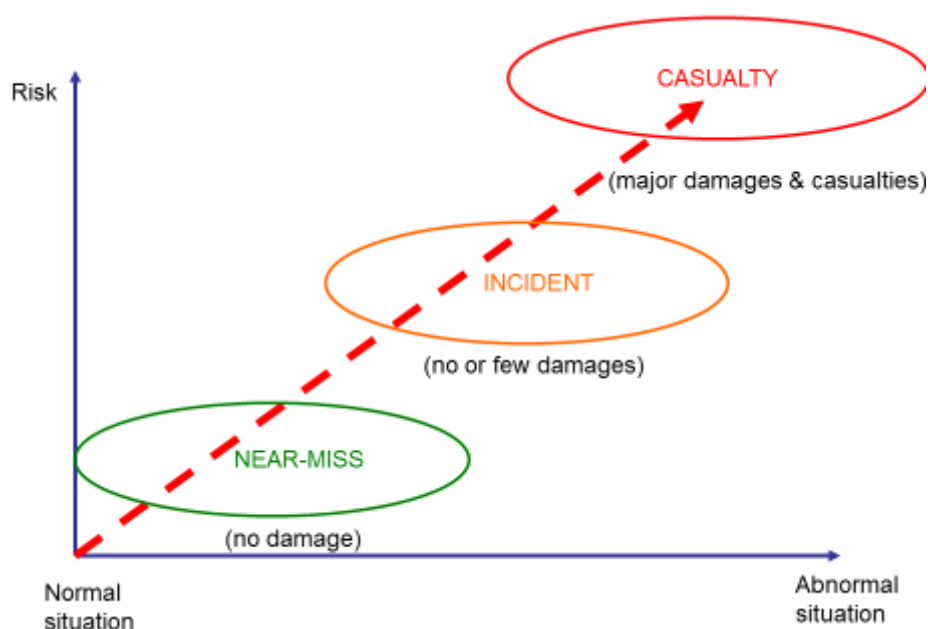


Figure 1 Classification of Near-Miss, Incident and Casualty situations

Initiatives such as the Line Operation Safety Audit (LOSA) clearly demonstrate that errors also occur in normal operations, therefore the identification of “normal situations” (or normal operations) does not preclude the possibility of incidents or near misses. It may be possible that a near-miss is not detected either on board a ship or by VTS personnel, then the situation still appears as a “normal situation” (N).

Figure 1 should be read based on a risk scale from no damage to few damages and casualties. Where the main difference between near-miss and incident can be described as follows, near-miss is only a fortuitous break in the chain of events prevented occurrence of a casualty and the incident is a situation that has involved no or few damages, however, if there are any damages they are minor, and casualties are prevented. The real situation assessment (R) should be compared under some defined criteria by VTS personnel in order to identify whether a casualty, an incident or a near-miss occurred. See annex A for the models and flowcharts for monitoring, recording and understanding developing situations.

3. UNDERSTANDING SITUATION AND ASSOCIATED DATA

The correct assessment of the situation by the VTS personnel is fundamental for the actions to be taken for preventing casualties or reducing navigational and environmental risks.

3.1. DECISIONS, CRITERIA AND INVESTIGATION TOOLS

A VTS provider should establish criteria that determine operational effectiveness, such as safety margins, monitor the VTS area with respect to these criteria, and use those criteria when investigating incidents.

These criteria might also be used for decision support tools within VTS. From a viewpoint of VTS personnel, managing and, where possible, reducing risks, depend to a great extent on the capability of the VTS sensors and the prevailing circumstances and conditions of the VTS area.

The procedures to identify situations where risk may be increasing, or where measures of operational effectiveness e.g., safety margins, have possibly been exceeded, should be integrated as routine procedures in the VTS Centre according to IALA Guideline *G1141* [4].

Decision and criteria of the risks should be based on the evaluation of various risks including:

Determining factors, for example:

- CPA/TCPA factor
- Emergency manoeuvre of a vessel
- Complaint addressed to the VTS centre
- Absence of lookout and watch-keeping

Contributing factors, for example:

- Weather and visibility conditions
- Density of traffic
- Dangerousness of the cargo on board
- Proximity of shallow waters
- Manoeuvrability of the vessel

When casualty/incident/near-miss do occur, it is appropriate to use a coding scheme or a framework to both guide the investigation and to categorize the contributing factors. The results of these investigations should be placed in a form that allows a VTS provider to detect patterns over time.

Frameworks that might be appropriate for this include the:

- Human Factors Accident Classification System (HFACS)
- Root Cause Analysis
- “Five Whys” or any approach that is comprehensive, assesses contributing factors at multiple levels of organization (i.e., individual, team, organization, system), which attempt to understand how the responses to the situation were considered logical and reasonable under the circumstances, and consider the event in the context of the complex maritime system.

3.2. REQUIRED TECHNICAL ABILITY OF VTS SYSTEM FOR DATA RECORDING, STORAGE AND RETRIEVAL

It is essential that a VTS should have the ability to record and store all relevant information regarding recognized casualty/incident/near-miss situations.

This should include:



- Sensors data recordings
- VHF and telephone communication recordings
- Recording and storing of other relevant information

It may also include (within legal limitations):

- Recordings of the internal conversations of VTS personnel inside VTS Centre
- Recordings of the actions of VTS personnel

IALA recommends a minimum of 30-day storage period of VTS data (IALA Guideline *G1111 Preparation of Operational and Technical Performance Requirements for VTS Systems* [5]) as the time-period to allow for the full retrieval of data post-incident. It can be assumed that this requirement is appropriate for all data sets that may be used for incident replay. As this data will be recorded in a rolling loop of, for example the most recent 30-days data, there should be a procedure to store recordings to safeguard recorded data in case of a casualty, an incident or a near-miss.

Technical means of a VTS should be in line with relevant technical requirements to ensure proper data recording and storage (refer to IALA Guideline *G1111*).

VTS systems may also have the capability for data analysing and automated report generation.

4. REPORTING PROCESS

The reporting process could be influenced by limitations and constraints. The reporting process could be internal or external, and mandatory or voluntary, and may depend on the nature of the situation.

4.1. LIMITATIONS AND CONSTRAINTS

Areas to be considered include:

- Legal issues
- Confidentiality and data protection
- VTS provider responsibility level
- Technical issues
- Administrative issues
- Organizational issues

4.2. NATURE OF REPORTING

4.2.1. MANDATORY REPORTING

There are mandatory standards for notification of marine casualty in chapter 5 of IMO-Res. *MSC.255(84)* known as Casualty Investigation Code. VTS providers should implement the mandatory requirements as defined in national regulations.

4.2.2. VOLUNTARY REPORTING

There is no mandatory international standard for notification of marine incidents or near-miss situations by a VTS, but there are some regional and national requirements to notify incidents (e.g., EU Directives *2002/59/EC* [6] and *2009/18/EC Article 6* [7]) by Flag State, masters of ships involved and coastal State. For those States, which do not



have requirements regarding incident situation reporting, it is advised to take into consideration establishing national regulations.

The analysis and reporting of near-miss situations can be used for assessment of safety of navigation in the VTS area. This can also be used as a component of a safety management or a quality management system and measuring the current effectiveness of a VTS.

4.2.3. ADDRESSING OF THE CASUALTY/INCIDENT REPORTS

VTS casualty/incident reports may be addressed to, amongst others, the following organizations in accordance with Casualty Investigation Code, regional or national rules and regulations:

- Competent authority
- Port authority
- VTS provider
- Adjacent VTS
- Port State Control authority (PSC)
- Marine Safety Investigation authority
- Law enforcement authority
- Flag State maritime authority
- Shipping company
- Class society delivering the ISM certification on behalf of the flag State
- Maritime Rescue Co-ordination Centre (MRCC)
- International Maritime Organization/Agreement (e.g., EMSA, PMoU, etc.)
- Pollution Monitoring and Response Centre
- Coastal State (Ref. to chapter 5 of Casualty Investigation Code)
- Any substantially interested States (i.e., because of the nationality of the crew, passengers, refer to chapter 5 of the Casualty Investigation Code).

4.2.4. ADDRESSING NEAR-MISS REPORTS

Near-miss reports should be reported internally within VTS providers and/or competent authorities. The analysis and reporting of near-miss situations may result in corrective actions on the VTS operational procedures and additional training of VTS personnel. If certified under *ISO 9001* [8], the certified body (i.e., VTS Centre) shall monitor, measure, analyse and improve quality management system of the VTS centre.

The VTS provider and/or competent authorities should decide whether to report near-miss externally in compliance with established QMS/SMS and/or VTS operational procedures.

4.3. SAFETY CULTURE

Conducting investigations and gathering statistics on marine incidents and near-miss situations is a part of developing the safety culture within a VTS Centre. The overall performance of a VTS can be facilitated by implementing corrective actions (adapting procedures, organizing training based on these statistics, etc.).

With respect to this, two aspects of safety culture are particularly important: a reporting culture and a just culture.

A reporting culture actively encourages personnel to take the time to report issues, near-misses or anything that might influence the safety of the VTS. Encouragement can be in the form of incentives, but in order to make



reporting sustainable, organizations need to demonstrate that the report has been appropriately considered and responded to.

An effective reporting system depends, crucially, upon how an organization handles blame and punishment. This lies at the heart of any safety culture. A prerequisite for a just culture is that all members of an organization should understand where the line must be drawn between unacceptable behaviour, deserving of disciplinary action, and the remainder, where punishment is neither appropriate nor helpful in furthering the cause of safety.

It is not the objective to determine liability in VTS reports. The VTS provider should not refrain from fully reporting on the causal factors.

4.4. CONTENT OF REPORTS

At least the following basic information should be included in casualty/incident/near-miss VTS report:

- Who and what were involved (e.g., vessel data)
- What happened (e.g., grounding, striking, collision, close quarter situation)
- Where, when, and in what sequence
- Weather and hydrographic information
- VTS operator and/or VTS supervisor on duty

Regardless of the nature of the casualty/incident/near-miss, the additional materials and/or VTS records may be enclosed, such as photographs, traffic image recordings, logs, etc.

It is advisable to keep a VTS report format as simple as possible. See example of near-miss/incident/casualty VTS report format in annex B.

The procedure of casualty notification is clearly defined in Chapter 5 of Res.MSC.255 (84) known as Casualty Investigation Code, including format and content of such notification.

5. BENEFITS OF CASUALTY/INCIDENTS/NEAR-MISS REPORTS

Benefits of marine casualty/incident/near-miss reporting are as follows:

- Enhancement of navigation safety in general.
- Prevention of casualties in future.
- Proactive protection of marine environment.
- Further investigation.
- Emergency notification.
- Evidence (for insurance and/or other stakeholders in interest)
- Lessons learned and training.
- Collection of statistics to identify trends and risks.
- Support of risk assessment.
- Revision of VTS procedures.
- Improvement of a VTS decision support tool.
- Share a safety culture in the maritime sector.



Casualty reports together with relevant recorded VTS information can be used by Marine Safety Investigation Authority for further investigation (according to *MSC.255(84)* Casualty Investigation Code).

Operational/law enforcement authorities may be interested in receiving information regarding marine incidents/casualties in their area of responsibility as soon as possible.

Incident reports can serve as a source of experience for all stakeholders (VTS personnel, pilots, shipping companies, etc.) and contribute to safety culture.

VTS providers and stakeholders can take into consideration the positive learning from casualty, incident and near-miss reports. These reports provide opportunities to how the VTS may further improve the safety and efficiency of navigation, safety of life at sea and the protection of the marine environment and/or the adjacent shore area, worksites and offshore installations from possible adverse effects.

6. DEFINITIONS

The definitions of terms used in this Guideline can be found in the International Dictionary of Marine Aids to Navigation (IALA Dictionary) at <http://www.iala-aism.org/wiki/dictionary> and were checked as correct at the time of going to print. Where conflict arises, the IALA Dictionary should be considered as the authoritative source of definitions used in IALA documents.

7. ABBREVIATIONS

Circ.	Circular (IMO)
CPA	Closest Point of Approach
EMSA	European Maritime Safety Agency
EU	European Union
HFACS	Human Factors Accident Classification System
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
ISO	International Standardization Organization
kt	knot(s)
LOA	Length overall
LOSA	Line Operation Safety Audit
m	metre
m/s	metres per second
MEPC	Marine Environment Protection Committee (IMO)
MRCC	Maritime Rescue Co-ordination Centre
MSC	Maritime Safety Committee (IMO)
N	Normal situation
PMoU	Paris Memorandum of Understanding
POB	Persons on board
PSC	Port State Control
QMS	Quality management system
R	Real situation
Res.	Resolution (IMO)



SMS	Safety management system
TCPA	Time to Closest Point of Approach
VHF	Very high frequency (30 MHz to 300 MHz)
VTS	Vessel traffic service or vessel traffic services (dependent on context)

8. REFERENCES

- [1] IMO. MSC Res.255 (84) Casualty Investigation Code
- [2] IMO. MSC-MEPC.7/Circ.7 Guidance on near-miss reporting
- [3] ICAO Safety management manual
- [4] IALA. Guideline G1141 Operational Procedures for Delivering VTS
- [5] IALA. Guideline 1111 Preparation of Operational and Technical Performance Requirements for VTS Systems
- [6] EU Directive 2002/59/EC
- [7] EU Directive 2009/18/EC
- [8] ISO. (2015) ISO 9001:2015 Quality Management System

MODELS AND FLOWCHARTS FOR MONITORING, RECORDING AND UNDERSTANDING DEVELOPING SITUATIONS

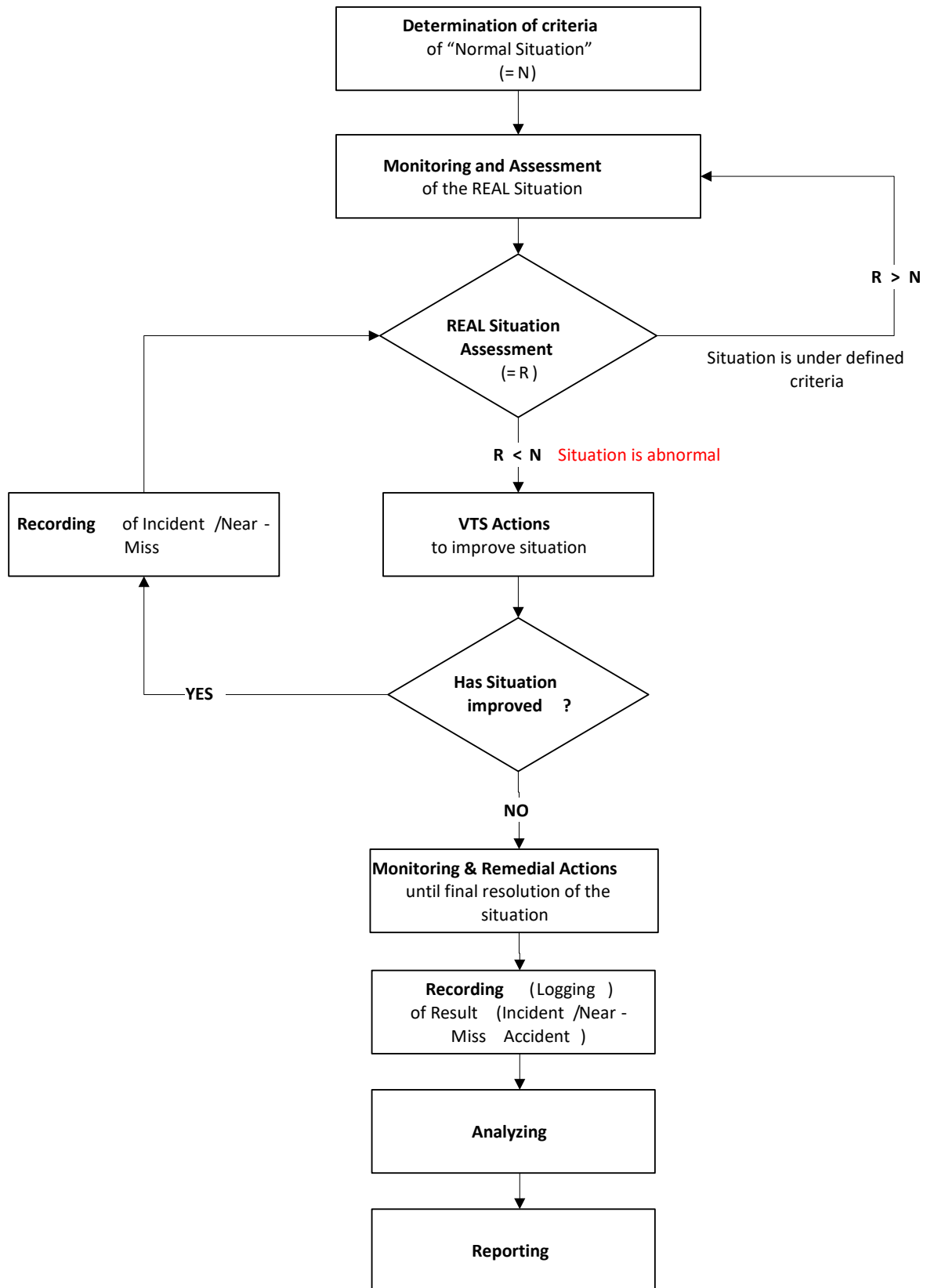


Figure 2 Flowchart for monitoring, recording and understanding developing situations

EXAMPLE OF CASUALTY/INCIDENT/NEAR-MISS VTS REPORT FORMAT

Table 1 Example of casualty/incident/near-miss VTS report

Date		Time (UTC)	
VTS Area		Position (lat. – long.)	
Type of incident		Vessel information	
<input type="checkbox"/> Grounding		Name	
<input type="checkbox"/> Collision		Callsign	
<input type="checkbox"/> Fire on board		IMO No.	
<input type="checkbox"/> Not under command		LOA	
<input type="checkbox"/> Near miss		Beam	
<input type="checkbox"/> Approach of shallow water		Flag	
<input type="checkbox"/> Violation of reporting requirements		Type	
<input type="checkbox"/> TSS violation		Draught	
<input type="checkbox"/> Violation of pilotage regulations		Port of departure	
<input type="checkbox"/> Ship dimensions exceeding fairway limits		Next port of call	
<input type="checkbox"/> Anchor dragging		Port of destination	
<input type="checkbox"/> Pollution		Cargo	
<input type="checkbox"/> Other (specify)		No. of POB	
		Pilot on board (Y/N)	
Weather information			
Wind direction (degrees)	Wind speed (m/s)	Direction of current (degrees)	Speed of current (kt)
Visibility (m)	Water level (cm)	Wave height (m)	Met. Stn. (by geographical name)
Incident information			
Description of incident			
Actions taken by VTS			
Name of VTS Operator/Supervisor	VTS Centre	Telephone	