

PORTUGAL SHIPPING WEEK

Workshop on Accident Investigation

Lisbon, 17-21 September 2018

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B.2.3 Marine Accident Investigation
Ship Safety



1. AI: a strategic asset for safety

2. EU/International instruments

3. EMSA and AI

- **EMCIP**
- **Data analysis methodology**



EMSA overview



- Set up in 2002
- 200+ employees
- Budget (2018): € 77 approx.

Provides technical advice to Commission and MSs

Ensures the proper implement. of the EU maritime legislation

Fosters technical co-operation and disseminate best practice

Manages operational tools: IMS, SSN, LRIT, CSN, **EMCIP**, THETIS databases

EMSA - Background



- 12 December 1999 off the coast of Brittany

Erika sinks



Decision to reinforce the EU maritime legislation

- Erika I safety package
- Erika II safety package



- EMSA established

Reg EC 1406/2002

Why investigate?

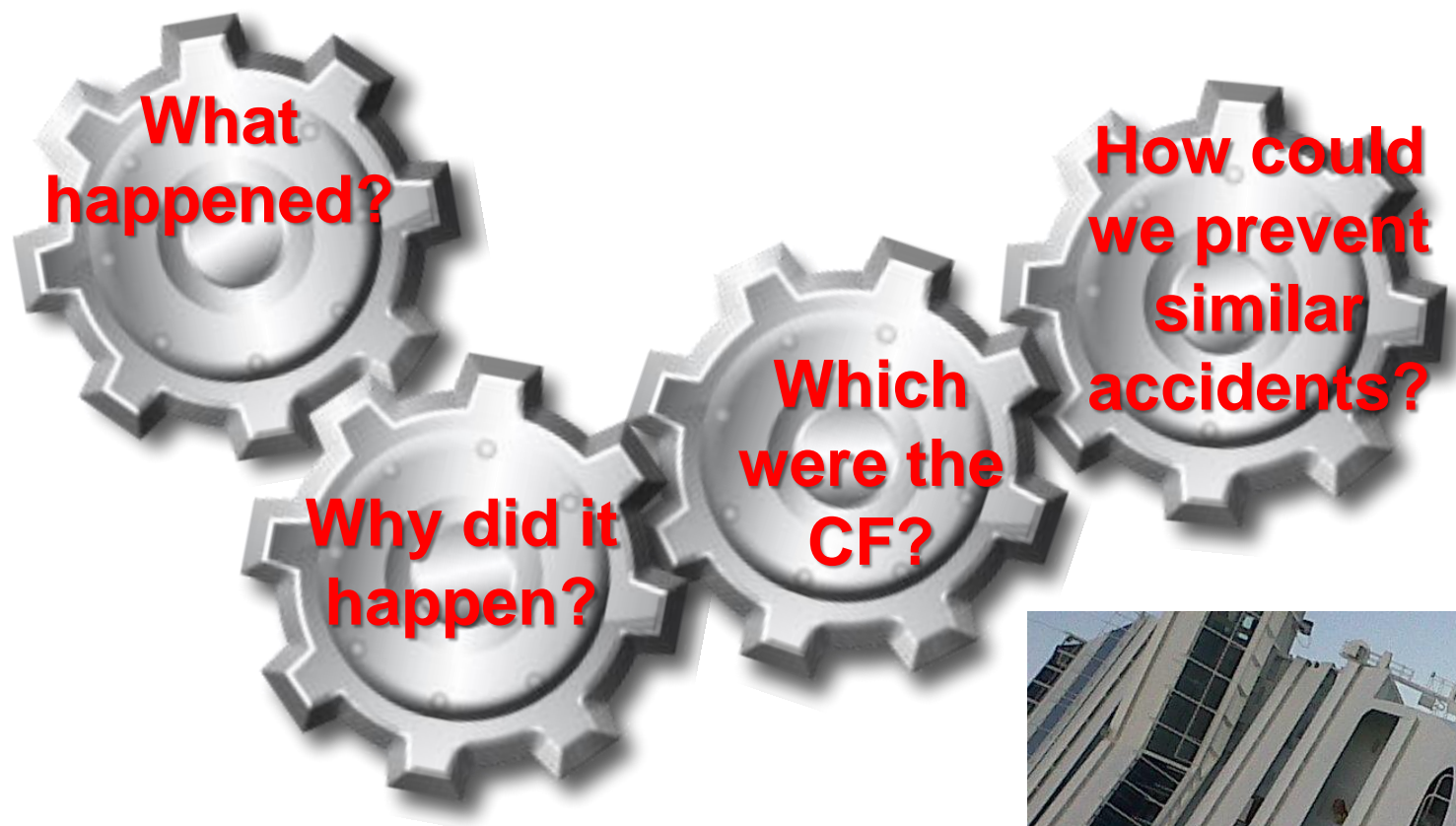


Safety investigation: key principle

- Goal: identifying the safety issues that led to the casualty
- “Investigations *do not seek to apportion blame or determine liability*”.



Investigating marine accidents means to determine...



Investigating marine accidents means to ...

Notif.

- Assess the situation & severity

Gather evidence

- Understand sequence of events

Analyse evidence

- Identify CF(s)

Draw concl.

- Identify missing/ breached barriers

Issue SR

- (Re)set barriers.



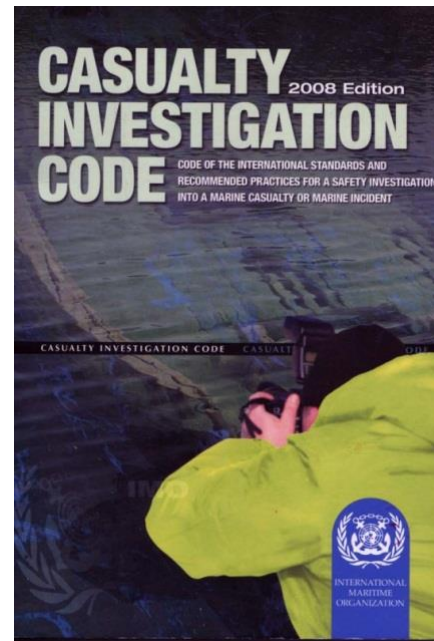
Key instruments

“an **investigation** or inquiry ... into a marine casualty or marine incident, conducted with the objective of **preventing marine casualties and marine incidents in the future**”, by “...**uncovering the causal factors and other safety risks** ... ”

(IMO Casualty Investigation Code)

“..improve maritime safety and the prevention of **pollution by ships**, and so reduce the risk of future marine casualties”

(Directive 2009/18/EC, article 1)



EMSA's tasks in Accident Investigation



- **Facilitate cooperation between EU MS**
 - Secretariat to PCF
- **Support the Member States**
 - Training initiatives / Capacity building
 - Technical notes for safety reports
 - Operational Support in investigation of VS/S
- **Database manager of EMCIP**
- **Analysis of casualty data and safety reports**
 - Safety studies
 - Annual overview
- **Assist the Commission in implementation of legislation**
 - Visit to MS.

Benefits from EMCIP

1. Improving **general background** about casualties
2. Maximise benefits of **lessons learned** on similar accidents:
 - Evidence collection
 - Analysis process
 - Safety recommendations
3. Preparing **statistics**
4. Detecting **trends**
5. Supporting **risk assessment**



Sharing information increases **data availability.**

How does it work?



Notification data

minimum data-set, covers
ALL accidents and incidents

How many records do we have?
60,000 total

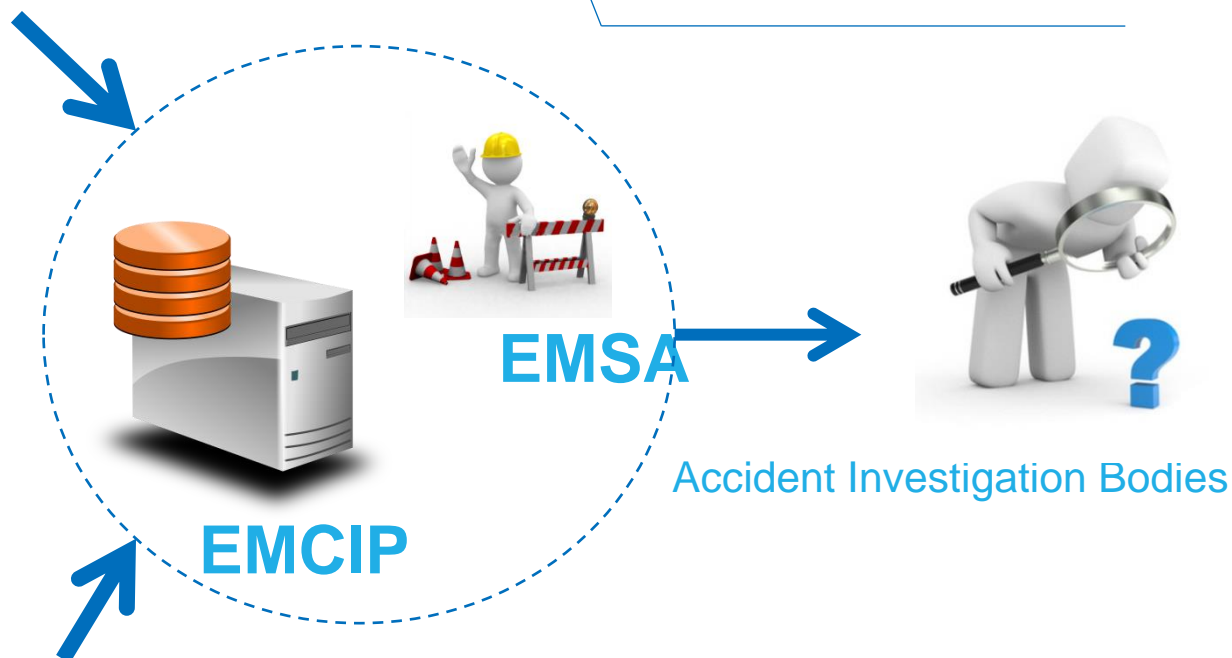
27,500 notifications (16.06.2011)
1,500 investigations

31,000 historical (1992-2011)



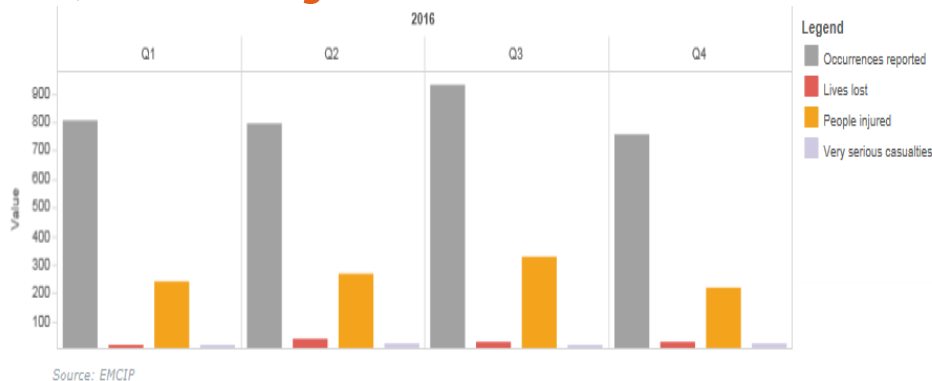
Investigation data

comprehensive data-set about
investigation findings



3,360 marine accidents in 2017...

77 very serious casualties
68 lives lost
1,046 injuries



3,647 ships involved

- 1,584 general cargo
- 872 pax vessels
- 590 F/Vs
- 404 service ships
- 197 others (inland etc)

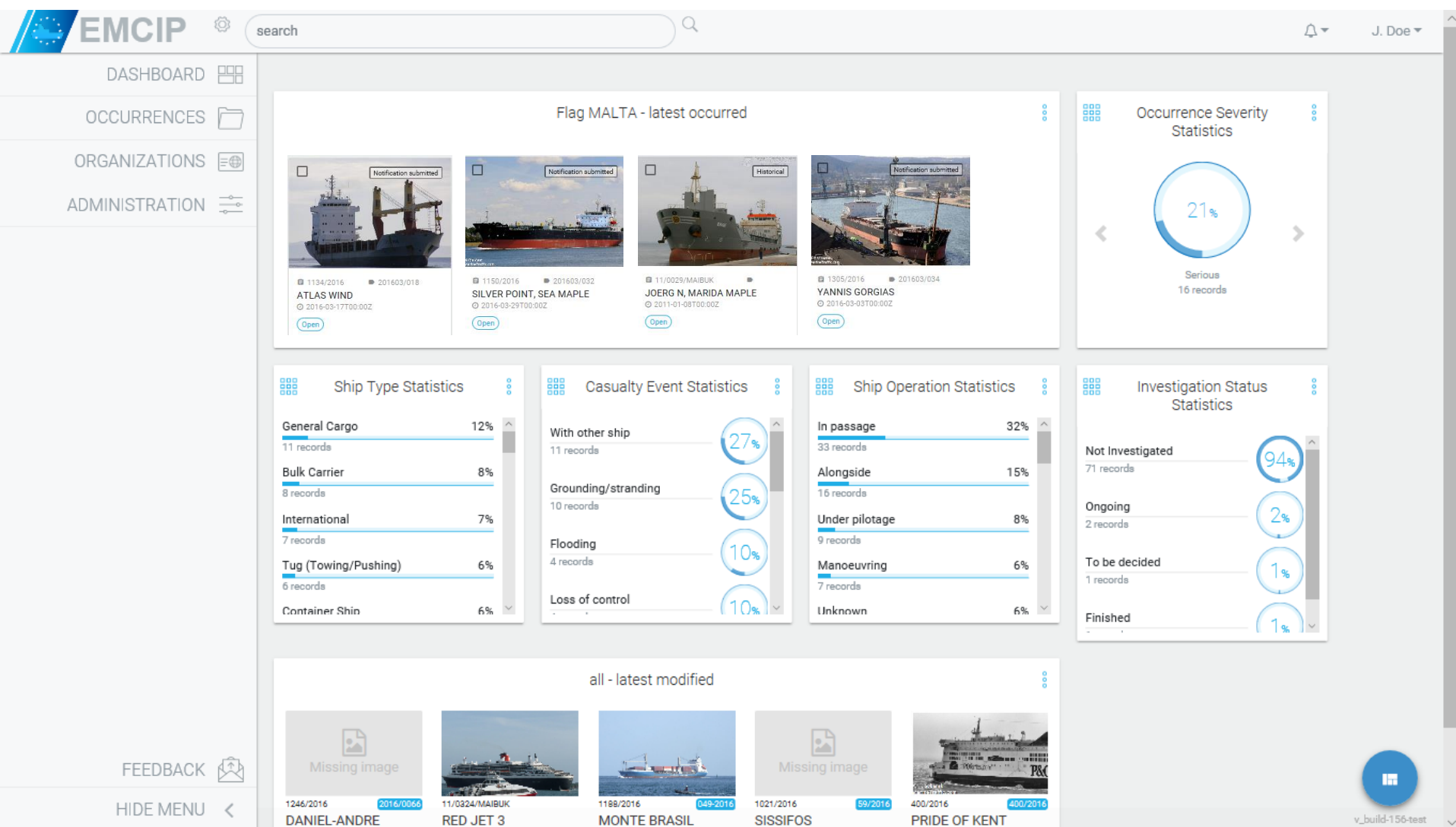
Accident Investigation - Quarterly Key Figures

Occurrences Reported & Investigations Launched

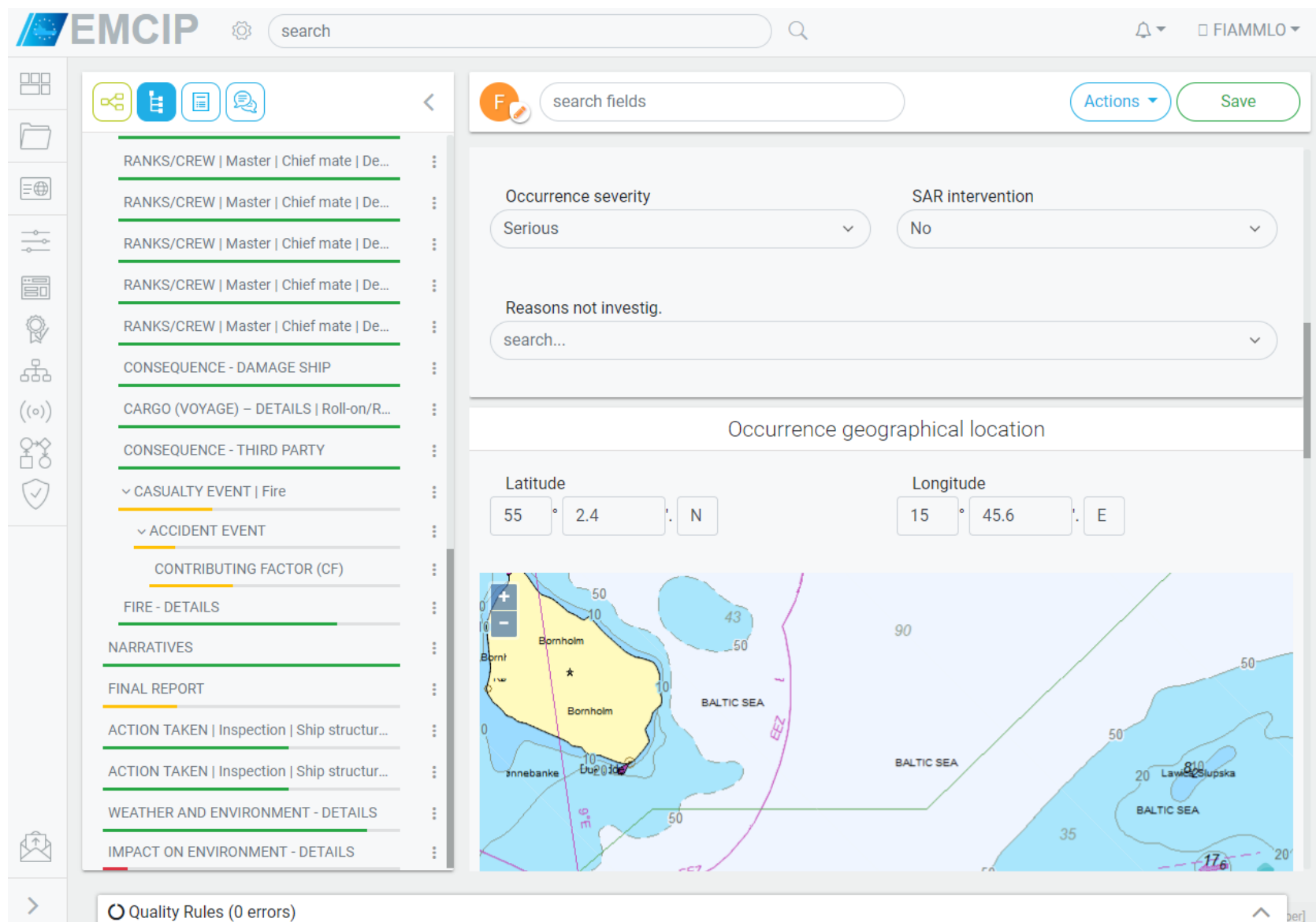
The number of occurrences reported in EMCIP under the scope of Directive 2009/18/EC is shown on the right-hand Y axis and the number of launched investigations (ongoing and finished) can be found on the left-hand Y axis. These are compared to the date of casualty, provided in yearly quarters (X-axis). Users can filter data using the "select period" function and visualise the figures hovering the mouse over the charts.



How does it look like?



How does it look like?

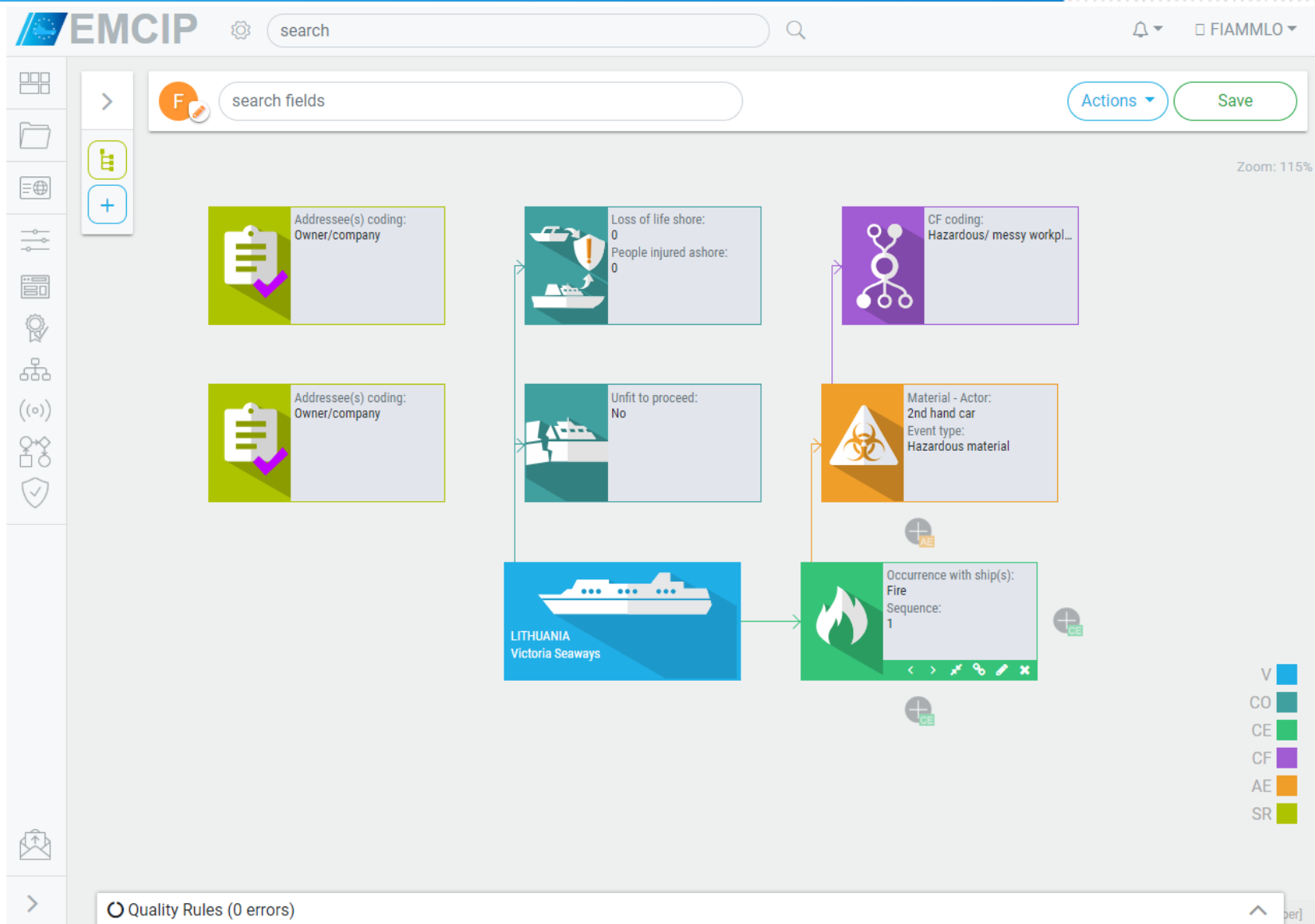


The screenshot displays the EMCIP (European Maritime Casualty Investigation Platform) Data Entry Interface. The interface is divided into several sections:

- Header:** Features the EMCIP logo, a search bar, and a notification bell icon.
- Left Sidebar:** Contains a vertical menu with icons for various data entry sections: RANKS/CREW, CONSEQUENCE - DAMAGE SHIP, CARGO (VOYAGE), CONSEQUENCE - THIRD PARTY, CASUALTY EVENT, ACCIDENT EVENT, CONTRIBUTING FACTOR (CF), FIRE - DETAILS, NARRATIVES, FINAL REPORT, ACTION TAKEN, WEATHER AND ENVIRONMENT, and IMPACT ON ENVIRONMENT.
- Main Content Area:**
 - Search Fields:** A search bar labeled "search fields" with "Actions" and "Save" buttons.
 - Form Fields:**
 - Occurrence severity:** A dropdown menu currently set to "Serious".
 - SAR intervention:** A dropdown menu currently set to "No".
 - Reasons not investig.:** A search bar labeled "search..." with a dropdown arrow.
 - Occurrence geographical location:**
 - Latitude:** Input fields showing "55" degrees, "2.4" minutes, and "N".
 - Longitude:** Input fields showing "15" degrees, "45.6" minutes, and "E".
 - Map:** A map of the Baltic Sea region, showing the coastlines of Denmark (Bornholm), Poland (Gdansk), and Lithuania (Lauva Slupska). The map includes depth contours and a red line indicating a search area.
- Footer:** A status bar at the bottom left shows "Quality Rules (0 errors)".

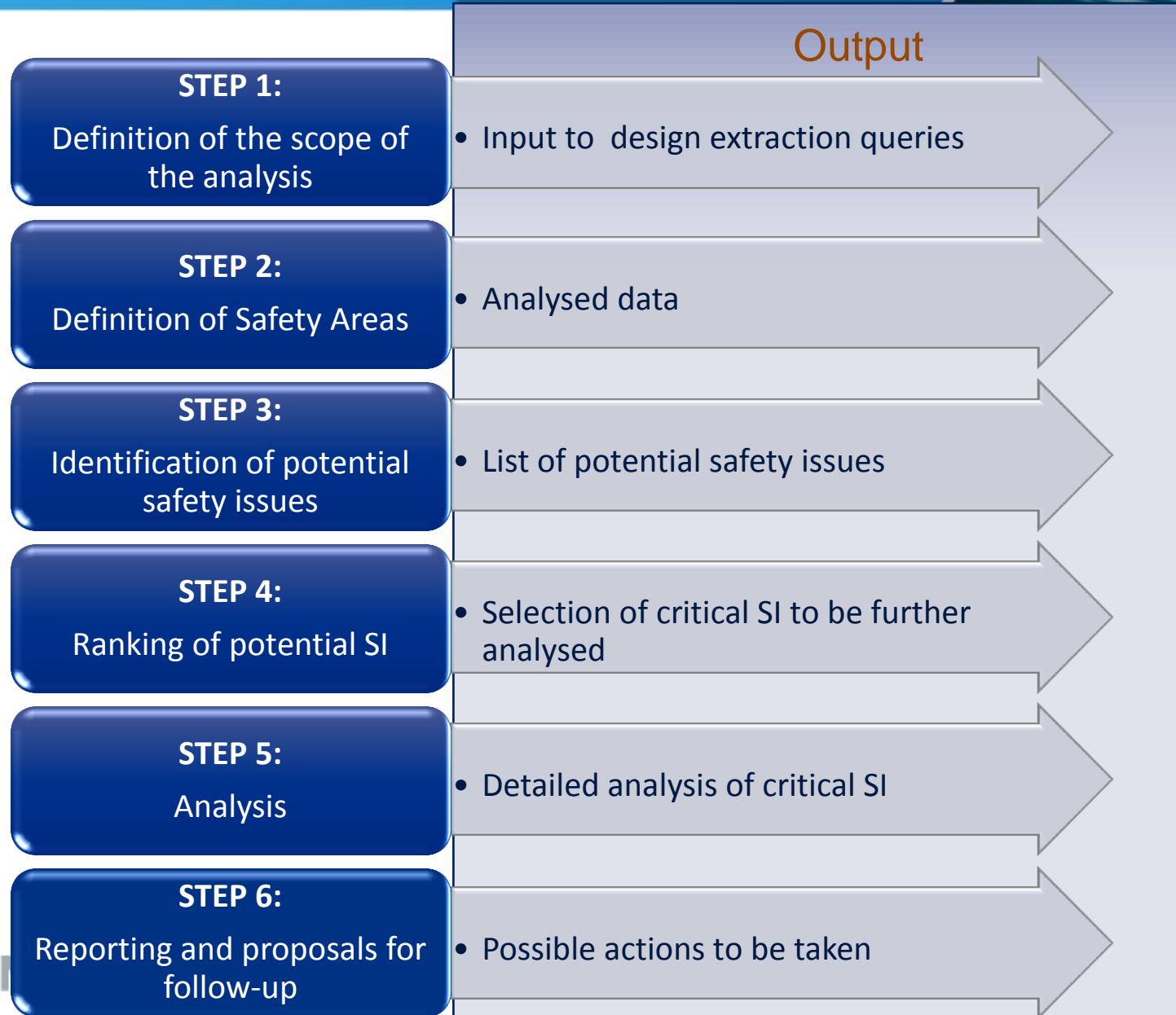
Data Entry Interface

How does it look like?



Investigation Analysis Tool

Turning data into information – EMSA safety analysis methodology:



F/V: Ranking Safety Issues (step 4)



Safety Issues	Safety Areas (investigated cases)									Consequences (investigated cases)			
	Fire/ Explosion	Flooding	Collision	Grounding/ Contact	Foundering	Listing/ Capsizing	Damage to ship/ hull failure	Loss of control/ containment	TOTAL	Lives lost ¹	People injured	Ships sunk	Pollution - bunkers (Tons)
Training and skills	14	6	9	7	5	3	0	2	46	8	5	17	4191
Safety assessment – review	6	4	11	9	2	4	3	1	40	25	7	19	699
Legislation, rules and standards	10	11	3	2	5	2	0	0	33	7	4	16	349
Work / operation methods	5	4	9	0	4	2	2	1	27	5	4	11	223
Maintenance	10	5	0	0	5	0	1	2	23	0	1	13	121
Tools and hardware design or operation	7	3	1	1	3	0	4	2	21	5	1	11	245
Tools and hardware (emergency)	11	6	0	0	3	0	0	0	20	0	1	12	217
Planning and procedures	6	1	2	5	1	0	2	0	17	6	1	9	202
Management factors	2	4	5	3	1	1	1	0	17	10	0	10	10
Anthropometric or personal factors	1	3	3	4	2	1	0	1	15	8	1	9	30
Emergency handling	5	1	1	0	1	4	0	3	15	3	0	8	65
Fatigue	0	1	4	5	0	0	0	0	10	5	1	3	0
Natural environment	0	1	1	1	0	1	0	0	4	0	1	4	28

An example: SI “Training and skills”



Areas of concern	Main SRs
Dealing with emergency	<ul style="list-style-type: none">• acquirement of skills on proper watch-keeping (COLREG and emergency situations by conduction of drills)• familiarization with the vessel’s safety equipment• swimming skills
Knowledge of on board equipment and procedures	
Establishment of effective training program and implementation of required training and drills	

Outcome of F/V analysis

What can we learn from the EMCIP data on accidents involving fishing vessels ?

ANALYSIS ON FISHING VESSELS

"Fishing at sea is probably the most dangerous occupation in the world" (UN FAO)

2404









OCCURRENCES
ANALYSED

196

COMPLETED
INVESTIGATIONS

June 2011 - July 2017

SAFETY AREAS (INVESTIGATED CASES)

-  Fire/ Explosion
-  Flooding
-  Collision
-  Grounding
-  Foundering
-  Listing
-  Damage to ship/
hull failure
-  Loss of control/
containment



CASUALTY
WITH A SHIP

-  Fall of persons
-  Loss of control
-  Gas or Liquid
effect
-  Involving a
material agent
-  Body movement



OCCUPATIONAL
ACCIDENT

TOP SAFETY ISSUES

- 46** TRAINING AND SKILLS
- 40** SAFETY ASSESSMENT – REVIEW
- 33** LEGISLATION, RULES AND STANDARDS
- 27** WORK / OPERATION METHODS
- 23** MAINTENANCE
- 20** MANAGEMENT FACTORS
- 17** TOOLS AND HARDWARE (EMERGENCY)

- 19** SAFETY ASSESSMENT – REVIEW
- 19** WORK / OPERATION METHODS

AREA OF CONCERN

- DEALING WITH EMERGENCY
- KNOWLEDGE OF ON BOARD EQUIPMENT AND PROCEDURES
- ESTABLISHMENT OF AN EFFECTIVE TRAINING PROGRAMME AND DRILLS
- SAFETY ASSESSMENT ON THE WHEELHOUSE
- SAFETY ASSESSMENT ON WATER INGRESS
- ASSESSMENT OF TOOLS' AND AIDS' STATUS
- INSPECTION AND COMPLIANCE WITH SAFETY PROVISIONS
- APPLICABLE STANDARDS
- WATCH-KEEPING ON THE BRIDGE
- OPERATING AROUND THE LIMIT OF "UNSAFE"
- PRIORITIZATION AND STANDARDS OF MAINTENANCE
- INSPECTION AND TESTING OF EQUIPMENT
- MANNING
- PROMOTION OF SAFETY
- DESIGN AND OPERATION OF SYSTEMS IN PLACE IN CASE OF FIRE
- UNSAFE POSITIONING ON BOARD
- USE OF LIFE JACKETS
- POOR SUPERVISION OR COMMUNICATION
- OPERATING AROUND THE LIMIT OF "UNSAFE"

Thank you for your attention!



<http://emsa.europa.eu/implementation-tasks/accident-investigation.html>

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 **EMSA**
European Maritime Safety Agency