Future Fishing Vessel Technologies: Challenges for a Sustainable European Fishing Fleet

Session 2: Vessel safety technology and ergonomic workstations on board

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1. Maritime safety rules, Labour safety rules or Both?

	Globaly Enforced
● Maritime Safety Regulations and Directives	
IMO	
- Torremolinos Protocol ≥24 m, ≥45 m, ≥60 m, ≥75 m	**No**
EU	
- CE 97/70 & CE 99/19 ≥24 m	**Yes**
● Labour Safety Conventions and Directives	
ILO	
- C-188 (2 more countries left to sign it)	**No**
EU	
- 93/103/CE ≥15 m (new vessels) ≥18 m (old vessels)	**Yes**

Which of them are we taking account for fishing technology projects? USUALLY ONLY MARITIME SAFETY RULES

But on which of them should we focus? OBVIOUSLY BOTH

Maritime safety:

- Vessel safety (sinking, capsizing, foundering, flooding, fire or explosion and collision)
- Crew life safety: drowning, hypothermia, losing people overboard

Labour safety:

- Fatalities and personal injuries (fractures, amputations): slip, hit, trip, crushed
- Occupational sickness: (ergonomics, chemicals), overstrain, awkward postures, poor positioning, toxic substances and noxious environment
- Physical strain and long-term fatigue (lack of sleep)

2. Vessel safety technology: Where our ideas come from?

The origin of data in order to carry out new ideas on vessels technology safety are:

1. Maritime accidents: reports (maritime authorities)
2. Man Over Board: reports (maritime authorities)
3. Labour injuries: risk assessment, injuries reports
4. Occupational disease: medical controls, risk assessments

Do we need reliable source of ideas for our project planning?

Are they reliable?

- Maritime accident reports: Usually YES
- Man over board reports: YES (eye witnesses are present) but NOT (in case there are no direct witnesses)
- Medical examination: YES but sometimes it's too late (no medical surveillance)
- Injury reports: YES (only severe) but NOT always (most of them are not recorded)
- **Risk assessment: absolutely NOT reliable (no actual fishing maneuvers assessment) usually out of vessels, when moored at harbour**

3. Reliable source of ideas for vessel safety technology?

Do we need it for our project planning? YES WE DO




RELIABLE SOURCE

1. Vessel safety: most of projects
2. Man over board: many projects

NO RELIABLE SOURCE

3. Occupational injuries: few projects. The main aim of the carried improvements are corrective, but not preventive
4. Professional illnesses: very few projects

- **Risk assessment**: NOT RELIABLE (no on board fishing maneuvers assessment)

We need actual, specific and detailed on board risk assessments

- **Ergonomic workstation assessment**: NOT RELIABLE (available methodologies have been developed to be used on land)

We need ergonomic analysis methods, specific for jobs at sea

We need reliable fishing vessel's risk assessment and a new specific ergonomic analysis tool for jobs at sea

4. Ergonomic workstations on board: Real analysis results?

Ergonomic (musculoskeletal) risk assessment methods used:

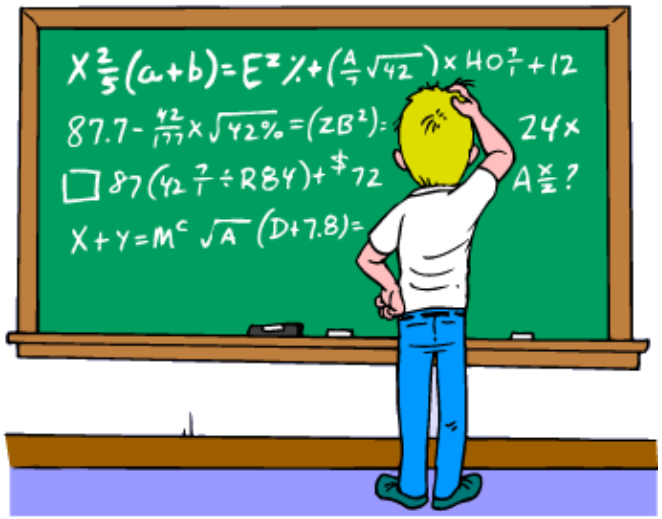
- Load handling: NIOSH Equation
- Unpredictable working postures: REBA (Rapid Entire Body Assessment)
- Upper limbs repetitive motions: OCRA (Occupational Repetitive Actions)

The mentioned tools :

- Have been developed to be used on land, where the working surface is not moving
- Usually considering very specific tasks and standard 8 h working days

None of them include variables crucial on board as the following:

- High task variability, both on performance and length of duty
- Vessel rolling, pitching and yawing
- Meteorological conditions (waves, wind…)
- Centre of gravity changes, both of sailors and loads that might be handling at a certain moment or during long periods



Proposed solutions:

- ***New design or adaption of a method that includes the actual conditions on board***
- ***Integration or sum of the ergonomic hazards of a job task with high variability***

5. Options for Prevention in Fishing vessel maritime safety: Stability loss warning system

Preventive measures are better than corrective ones:
Stability monitoring, warning display and advice decision maker for fishing vessels

Challenges to beat

1. Software has to be different to conventional commercial software used on big cargo ships. Costumized to fishing boat tonnage
2. It has to be very easy to understand and use
3. It is a must to minimize the entering of data by the skippers meanwhile maneuvering due to lack of time. Therefore the system has to be automatically sensorized

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