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European Transport Workers' Federation  
Fédération Européenne des Travailleurs des Transports  
Europäische Transportarbeiter-Föderation  
Federación Europea de los Trabajadores del Transporte

Brussels, 3 February 2017

## **TENDER SPECIFICATION FOR SUBCONTRACTING EXTERNAL EXPERTISE TASCS - TOWARDS A SUSTAINABLE CREWING SYSTEM (VP/2016/001/0001)**

### ***EXPERTISE IN HUMAN FACTORS - WORK LOAD, RECOVERY AND MANNING***

#### **1. GENERAL BACKGROUND**

Improvement of on-board living and working conditions and access to port side facilities, education and vocational training, as well as the harmonisation and modernisation of manning requirements have been, over the past years, central elements in the debate between the European Transport Workers' Federation (ETF) and the employers European Barge Union (EBU) and the European Skippers Organisation (ESO) within the framework of the Sectoral Social Dialogue Committee (SSDC) for Inland Waterway transport (IWT).

At present, the leading IWT manning regulation in force is the Regulation for Rhine Navigating Personnel (RNP). The regulation dates back almost 30 years and has not been revised in depth ever since. The last 3 decades however have witnessed a lot of changes that impact on the sector - be it technological or non-technological changes.

If you add to this reality the fact that a European manning framework is desirable in order to improve labour mobility, and face the general demographic challenges, then it is clear that a revision is long overdue - this was the Joint Social Partners' conclusion reached at the end of 2014 during a Round Table debate. In order to be well prepared and documented an in depth work load assessment is urgently needed.

The European Social Partners aim for the development of manning requirements for vessel crewmembers on the European Waterway Network. Besides aspects like working hours, competencies and enforcement, the European Social Partners recognise workload as a relevant dimension in developing new regulation. This project is in fact a workload assessment that shall also investigate whether and how these influences impact on the crewmembers at managerial and operational level.

This project will identify and assess all relevant critical elements and/or influences that have impact on the crew members on board of a vessel whilst at work/ rest. Some of the influences have already been identified - but this list is by far not exhaustive: AIS - radar - loading/unloading schemes - ballast installations - water levels - longer/wider/bigger vessels - containerisation - LNG fuel & cargo - new fuels - shorter turnaround times in ports - new functionalities in ports - EU Working time directive for IWT - stress - fatigue - single vessel/convoys - modes of operation - type of cargo - water stretch to be sailed - infrastructural bottlenecks - noise - vibrations - telematics - administrative burden (f.eg. food cargo a lot of red



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tape) - engines - physical equipment (winches etc) - passenger vessels - new electronic tools  
ESRB/E-Logbook - ...

The manning challenges that have been affecting the IWT Sector for many years speak in favour of the improvement of working and living conditions on board, an indispensable factor to make navigating professions more attractive, the enhancement of skills through modernised and up to date training programmes, and better prospects of a career path both on a vessel and ashore. In order to do so, a shift in the public perception of navigation is urged, particularly amongst youngsters who often have an old-fashion and outdated image of the profession.

As both technological and non-technological changes have had an impact on work processes in the last three decades, European Social Partners need insight in the workload aspects of crewmembers in order to develop a documented proposal for in depth revision of existing regulation. Contextual factors are e.g.:

1. Shortage of qualified staff
2. Ageing population
3. Technical developments or increasing automation both on/near waterways and on board, taking into account that the level of automation may differ between vessels
4. Changing required staff functions (education for some functions in actual legislation does not even exist anymore)
5. Need for operational excellence
6. Ongoing optimisation of logistics
7. Difficult enforcement of current, out dated manning practices and rest periods
8. Different regulations per waterway that inhibit transparent and effective operation.

In the light of what is stated above, the aims is to identify and assess all critical elements and/or influences that impact on the crewmembers on board of a vessel whilst at work or at rest

*The final ambition of the European Social Partners is a documented proposal with different options, for an easy to use (transparent, flexible, sustainable) and easy to enforce manning instrument for the European waterway network, taking relevant differences in characteristics into account.*

## **2. PURPOSE OF THE CONTRACT**

An external Research Partner (RP) with expertise in the field concerned will be given the task to answer the research questions by participatory human factors field research in selected EU Member States, preparing and chairing reflective and exploratory workshops with all necessary stakeholders. They will report on their findings and produce reports accessible for the targeted audience. They will develop a draft instrument for defining manning settings and planning.

The work of the external Research Partner will be monitored and supervised by a Steering Group (SG) composed of the European Social Partner Organisations EBU, ESO and ETF. The Research Partner will participate in all project events except the first Steering Group meeting during which the RP will be selected. (4 SG's, 2 Focal Group meetings, 1 Mid-Term Event, 2 workshops, Final Conference) and it goes without saying that he will closely collaborate with the project secretariat & project manager.



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### **3. TASKS TO BE PERFORMED BY THE CONTRACTOR**

#### **3.1. Description of tasks**

Existing regulations for vessels' crew manning are not a required basis for this study/research. The outcome of the project/study/research shall form the basis for new regulations to come. However, if part of the existing regulations are found to be adequate in this project this is also a result.

The scientific discipline of human factors systematically takes care of human strengths and weaknesses during the system-oriented design of work (workload), interaction with devices/machines and the organisation resulting in an optimal overall performance in combination with well-being. In this project the overall system with its elements that contribute to the performance shall be studied including at least the vessel and its crew, the organisation, customer, terminal, port, traffic control etc. Workload is characterised by several aspects including shift work and solo work. The project shall cover both physical and mental workload. These workload aspects can be clustered in three main aspects that determine mental and physical workload: task demands, (working) environment and individual factors & perception. The resulting workload determines system performance in combination with well-being. An unbalanced workload can be solved in different ways (underload/excessive load):

- Change in amount of crew
- Change in work-rest patterns (work schedules), apart from patterns in sail-lie still pattern of the ship (mode of exploitation)
- Change in task allocations (mechanisation or automation).

The RP must give an answer to at least the following questions, but during the project additional questions can be formulated if relevant:

1. Identify all critical elements in the process and corresponding task demands that contribute to mental and physical workload and recovery:
  - a. type of tasks to be performed (like acquiring work, preparation of the voyage, loading, unloading, departure, arrival, sailing, maintenance, administration, cleaning, planning, waiting, training, safety management of passengers, study, cooking, travelling etc.), amount of work, complexity of work, speed and quality in task performance needed, solo work all related to ship/workstation characteristics, stage in logistics processes and (need for) recovery;
  - b. different operational modes during task performance (e.g. normal, planned, disturbed mode (maintenance), unplanned disturbed mode (error mode), calamity);
  - c. different infrastructural parts of a journey (lock, bridge, port, traffic, tide, current, corners etc.);
2. operational characteristics<sup>1</sup>; Assess identified critical elements in the task demands during operation and rest on board and competencies needed taking into account;

<sup>1</sup> In all questions at least the following characteristics shall be evaluated on relevance:

- in loads: dry bulk, tank transport, container transport, sands, passengers, miscellaneous loads, ferryboats, dangerous goods, tugs;
- ship characteristics during work: length, degree of automation, age;
- ship characteristics during rest: cabins, position on the ship;





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Identify all critical elements in the process and corresponding working environment that contribute to mental and physical workload and recovery (like work and recovery place (in/ on/ around the vessel including private cabins), organization of the work, work schemes (duration of the shift, circadian rhythm, shift work) and staffing (type and amount of manning, social interaction).

3. Assess identified critical elements in the working environment that contribute to mental and physical workload and competencies needed.
4. Identify all critical elements in individual factors and perception (competency, level of experience and fatigue as a result of work schemes/ amount of work/ complexity).
5. Assess all critical elements in individual factors & perception.
6. Identification and assessment enforcement crewing settings.
7. Investigate experience with actual legislation: what elements do contribute to flexible, enforceable legislation and what elements hinder flexible application and clear enforcement.
8. Investigate future developments in IWT logistics and ship design (e.g. materials used, allocation of tasks to machines).
9. Develop a manning framework/ instrument that takes into account the IWT processes, tasks, proper task allocation and critical elements, applicable EU and national law/ regulations.

The questions have to be related to at least:

- Rhine Vessel Inspection Regulations (1995) (ship design like construction/ facilities, equipment and noise related to safety);
- 89/391/EC (Occupational Safety and Health) and the European working time Directive 2014/112/EU;<sup>2</sup>
- the RPN (2011) - CEVNI (2009);
- the national and international IWT regulations;
- ILO MLC2006 recommendation on working hours;
- ILO No. 8 of 1920 Hours of work - Recommendation concerning the Limitation of Hours of Work in Inland Navigation (this includes measures to manage vibration on ships to protect seafarers);
- collective agreements;
- ADN (2015);

- 
- infrastructural influences (locks, bridges, straight/ curved water, water level, traffic density, stream patterns, current, VTS coordination);
  - environmental/ meteorological influences (high/ low water, day/ night, wind);
  - destination, terminal characteristics;
  - customers' requirements;
  - composition of the crew in relation to competences needed in order to perform the tasks available in a safe, effective and efficient way;
  - modes of exploitation (the study should not be limited to the existing pre-set modes of exploitation that no longer seem to be fit for purpose);
  - organisation characteristics (cooperation, small personal enterprise, free-lance).

<sup>2</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0112>





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- required professional competencies for crewmembers;<sup>3</sup>
- current studies on noise and whole body vibrations;
- current human factors standards and regulations and state of the art knowledge;
- clear and easy to control and enforcement by authorities.

Thus the workload study shall focus on the direct journey including travelling to and from home, as this has a direct impact on the crewmembers' well-being.

The RP will be asked to look after:

- ✓ answering the research questions by participatory human factors field research in selected EU Member States, preparing and chairing reflective and exploring workshops with all necessary stakeholders; (approx. 50 ship visits – a balance is to be struck amongst following commodities: dry bulk, tank transport, container transport, sands, passengers, miscellaneous, ferryboats, dangerous goods, tugs)
- ✓ reporting findings and reports needed, accessible for the target audience;
- ✓ developing a draft instrument for defining manning settings & planning.

### **Approach:**

The research must give an answer to at least the questions, earlier mentioned, but additional questions can be formulated if relevant during the project. An expected approach is included for each question.

Questions (summarized)		Expected approach (not mandatory)
1	Identification task demands during travelling (work -home v.v.), sailing, on deck and in engine room	a. Exploring field research with generic human factors task analysis for all crew members: which human tasks, amount of work, level of automation/ complexity of work, quality and speed needed in task performance, communication patterns, frequency and duration of tasks, process characteristics/ planning/ seasonal influences, etc. b. Literature review of (inter-) national publications on known task characteristics and demanding influences. c. Standardized detailed human factors task analysis crew members considering diverse operational modalities: daily operations, calamities, maintenance, etc. (see a) d. Workshops with end-users (crew) for identification of elements and situations not observed e. End user participation sessions (crew) for feed-back for verification and additional information
2	Assessment/ classification of task	a. Mixed methods: objective observations and measurements during field research, subjective

<sup>3</sup> [https://www.unece.org/fileadmin/DAM/trans/doc/2014/sc3wp3/IEG\\_01/Item\\_3\\_IEG-2014-2\\_STCIN\\_tables\\_PLATINA.pdf](https://www.unece.org/fileadmin/DAM/trans/doc/2014/sc3wp3/IEG_01/Item_3_IEG-2014-2_STCIN_tables_PLATINA.pdf)





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	demands ad 1	<p>experienced workload (e.g. interviews, short questionnaire), human factors expert judgement</p> <p>b. Covering all characteristics e.g. load, ship, terminal (footnote 1)</p> <p>c. Workshop with end users of the manning requirements to explore needs and expectations for possible tool, including enforcement services (e.g. Aquapol)</p>
3	Identification (working) environment during travelling (work - hoe v.v.), recovery, sailing, on deck and in engine room	<p>a. Exploring field research with generic human factors task analysis for all crew members: working place and recovery place in and around the vessel and private cabine, information &amp; controls, level of automation, man-machine interaction, organisation of the work, solo work, work schemes (duration of the shift, circadian rhythm, shift work), type and amount of staffing</p> <p>b. Literature review of (inter-) national publications on known demanding working environment characteristics</p> <p>c. Standardized detailed human factors working environment analysis crew members considering influence of diverse operational modalities: daily operations, calamities, maintenance, etc. (see a)</p> <p>d. Workshops with end-users (crew) for identification of elements and situations not observed</p> <p>e. End user participation sessions (crew) for feed-back for verification and additional information</p>
4	Assessment/ classification of working environment ad 3	Mixed methods: objective observations during field research, if necessary measurements (e.g. whole body vibrations, noise), added with qualitative experienced workload
5	Identification individual factors and perception	Exploring field research on relation between task demands and experienced competencies, level of experience, stress coping, fatigue, social aspects on board, personal affairs in private life.
6	Assessment/ classification of individual factors and perception ad 5	Mainly qualitative techniques, with e.g. short questionnaires or observation scores.
7	Identification and assessment enforcement crew manning	Human factors task analysis and exploration of needs and expectations for draft instrument for enforcement services (e.g. Aquapol)
8	Investigation future (non-) technical developments	a. Workshop with representatives on non-technical developments on board (e.g. logistics, materials, infrastructural elements)



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		b. Workshop with representatives on technological developments on board (e.g. instrumentation, ship design)
9	Investigation experience actual legislation framework	a. Workshop with end users of manning instrument (fleet manager, boatmaster) b. Workshop with enforcement staff on experiences actual means
10	Development of manning instrument	a. Workshop with all EU delegates for feedback b. Workshop with end users of manning instrument (fleet manager, boatmaster) and enforcement staff c. Try-out with draft manning instrument

### 3.2. Guidance and indications on tasks execution and methodology

The work of the external Research Partner will be monitored and supervised by a Steering Group composed of the European Social Partner Organisations EBU, ESO and ETF. The Research Partner will participate in all project events. ( 4 SG's, 2 Focal Group meetings, 1 Mid-Term Event, 2 workshops, Final Conference) and it goes without saying that he will closely collaborate with the project secretariat & project manager.

### 4. EXPERTISE REQUIRED

The tenderer shall prove his/her expertise with examples of his/her work. The contract will be awarded to tenderers that can prove that they fulfil most the following criteria:

- Expertise in the scientific discipline of human factors/ergonomics;
- Expertise in workload assessment and recovery in the field;
- Affinity with maritime sectors (Maritime or Inland Waterways or Fisheries)
- Ability to set up field research according the approach set out above
- Ability to cross analyse data and information
- Reflect international liaisons/expertise
- Able to convey information to people not specifically familiar with the topic
- Diplomacy.

### 5. TIME SCHEDULE AND REPORTING

The research will take possibly take place between January 2017 and September 2018. Duration of the research is estimated on 20 months.

The Research Partner needs ample time to be able to conduct the field research/ship visits. As IWT vessels are constantly on the move throughout Europe it is a very challenging exercise planning the ship visits as boarding/leaving the vessel can only be done at certain locations.

The Research Partner will have to draft the discussion papers and a final report of approx 30 pages.

It goes without saying that RP will closely collaborate with the project secretariat & project manager.



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## **6. PAYMENTS AND STANDARD CONTRACT**

The Research Partner will receive an advance and payments according the EU rules and upon receipt of a correct invoice.

Payments will be made to the Research Partner in three phases:

- 30% upon presentation of the first draft of the analysis
- 35% upon delivery and presentation of the first final draft analysis
- 35% once the work is finalised.

The payment of the 2nd and 3rd installments will be made once the Project Steering Group has considered that the quality of work to be completed by that respective stage of the project is satisfactory.

## **7. PRICE/BUDGET**

The maximum budget available (All included, also travel costs and covering all taxes including VAT<sup>4</sup>) is €229.680€.

## **8. SELECTION CRITERIA**

The selection will be done based on the model of “best value for money”.

The offers will be examined by the Steering Group against the following criteria:

		<b>Award Criteria</b>
<b>Price</b>	Best value for money	30%
<b>Quality &amp; expertise</b>	Quality of the research is the key priority - expertise in: in human factors work load and recovery assessment user participation	30%
<b>Approach</b>	Structured & open approach	35%
<b>Ability to write and speak in a clear and concise English</b>		5%
<b>TOTAL</b>		<b>100%</b>

## **9. AWARD CRITERIA**

The contract will be awarded to the tenderer offering the best value for money, taking into account the selection criteria developed under point 8. The respect of the principles of transparency and equal treatment with a view of avoiding any conflict of interest will be undertaken.

It should be noted that the contract will not be awarded to a tenderer who receives less than 70% on the award criteria. For the award criteria see table above.

<sup>4</sup> Services delivered from outside of Belgium are subject to Belgian VAT of 21%



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## **10. CONTENT AND PRESENTATION OF THE BIDS**

### **10.1 Content of the bid**

The bids must cover all the elements stated above and in particular prove suitability of the tenderer and his expertise.

### **10.2 Presentation of the bids**

The bids, including CV of team members from the tendering partner, must be sent by **e-mail to:**

Myriam CHAFFART  
ETF Political Secretary for Inland Waterways and Logistics  
E-mail: [m.chaffart@etf-europe.org](mailto:m.chaffart@etf-europe.org)  
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**Deadline for the bids: 20 February 2017 23:59h – at midnight the tender will be closed.**



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