



TEN-T PROJECT NO: 2010-EU-21109-S

## *ACTIVITY II*

*ATTITUDES TO AUTOMATIC REGISTRATION OF CERTIFICATES*



Co-financed by the European Union  
Trans-European Transport Network (TEN-T)

*September 2012*



## **TABLE OF CONTENTS**

<b>Executive summary .....</b>	<b>1</b>
<b>Introduction.....</b>	<b>2</b>
<b>Objectives .....</b>	<b>3</b>
<b>Background .....</b>	<b>4</b>
<b>The studies.....</b>	<b>5</b>
<b>Participatory Action Research study .....</b>	<b>5</b>
Method.....	5
Research procedure .....	7
Results of PAR study.....	10
Method discussion of PAR study .....	14
<b>Discussion of combined study results.....</b>	<b>15</b>
<b>Overall method discussion.....</b>	<b>17</b>
<b>Concluding remarks and recommendations .....</b>	<b>18</b>
<b>References.....</b>	<b>20</b>
<b>Appendix 1: Listing of issues mentioned in free comments. ....</b>	<b>21</b>



**VERSION 01: BY:**

**Margareta Lützhöft, Chalmers University of Technology**

**Fredrik Karlsson, Swedish Maritime Administration**

**DISCLAIMER: THIS INFORMATION REFLECTS THE AUTHORS VIEW  
AND THE EUROPEAN COMMISSION IS NOT LIABLE FOR ANY USE THAT  
MAY BE MADE OF THE INFORMATION CONTAINED THEREIN.**



## **Executive summary**

The overall objective of the MONA LISA project is to contribute to the promotion of the Motorways of the Sea (MoS) concept in the Baltic Sea by implementing a range of measures that will provide a wider range of benefits, which are also included in, or fully in line with, the EU Strategy for the Baltic Sea Region. The project also contributes to the further development and implementation of the EU e-maritime initiative.

The aim of this part of the MONA LISA project is to create a pan-European feasibility study of an automated system that can control on board certificates, which is based on AIS technology. In that the system is based on AIS technology, a system that is already fitted to commercial vessels, it can comply with already existing systems and databases. The system will make the checking of certificates easier, however it will not to solve all certificate problems.

This deliverable comprises the work involved in six Technical Papers in order to conduct the feasibility study. Multiple methods were chosen across the papers, including Participatory Action research, website and desktop research, face to face, email and telephone interviews, social media interactions such as twitter feed setups, on line voluntary and hard copy questionnaires and a discussion website. This enabled the opportunity to triangulate the state of affairs by examining where the different data intersects (Mason 1996). Several researchers and investigators were also involved in the data collection and report production, hereby avoiding bias on the part of a single researcher.

An overview of the findings in the Technical Papers can be found in a matrix (pp.16-17). Overall, the studies point to the assumption that the system that the MONA LISA suggests will have a positive reception in the industry. This is however bound to the condition that the system avoids further administrative burdens. There is a lack of control of certification validation, and this based on a lack of standardisation of control criteria, training in control, personal experience by individuals, rumours and some evidence of certificate deficiencies from authorities. The latter deficiencies are however not systematically compiled and are inconsistent in some cases. However, the data shows that there is a problem, and it is therefore advised that further studies are conducted in order to establish how big a problem falsification of and deficient certificates is.

The study identified a multitude of interesting and relevant issues and perceptions to be kept in mind for future development. There are a range of issues that need to be addressed in either the MONA LISA system, or in the case of the implementation of a permanent system. These issues range from policy and organisational issues, national issues, organisational and educational issues and individual issues. This activity report serves as a basis to compile design recommendations for the technical design of the system.

## Introduction

The main objective of the MONA LISA project is to contribute to the promotion of the Motorways of the Sea (MoS) concept in the Baltic Sea by implementing a series of measures that will induce a wider range of benefits, which are also included in, or fully in line with, the EU Strategy for the Baltic Sea Region. The project will also contribute to the development and implementation of the EU e-maritime initiative.

The Motorways of the Sea concept in the Baltic Sea will further the development of an integrated maritime and land-based infrastructure and associated services across the Baltic. The aim here is to facilitate the internal cohesion of the Baltic Sea region and to improve its maritime access to the central regions of the Community and to reduce the high transport cost for serving these areas.

The MoS concept is an important tool for the further development of quality shipping and for making maritime transport more eco-efficient and integrated in the intermodal transport chain, together with a minimum of administrative burden for the operators. In order to achieve this, the main focus can not only be kept on developing infrastructure and operations in certain transport corridors. There must also be an emphasis on horizontal projects that can provide a wider benefit, and on projects that can provide a benefit to all operators. This also entails projects that are very concrete in their set-up.

Wider benefit actions within the MONA LISA project address areas such as simplification of administrative procedures for maritime transport, development and deployment of e-navigation, improvements of winter navigation, and facilitation of environmental performance of maritime transport.

### **This report addresses MONA LISA activity 2: Verification system for officer's certificates**

There are currently numerous education certificates that are held by officers and crew members, which must be valid and up-to-date, in order to allow a certain vessel to make passage into a certain harbour or fairway. The *inspection* of these certificates takes place in a random manner, it is not very frequent and often only verified via maritime radio. The latter can be communicated to some land central i.e. Vessel Traffic Centre (VTS) or Coast Guard station (source). There is in fact no existing system that actually verifies when a person informs of his PEC (pilot exemption certificate) or other STCW certificate to a harbour VTS centre is the officer he claims to be. This is only checked and verified via the different countries' Port state control authorities, and this only occurs sporadically.

The outcome of this activity will not only find a means to *automatically* execute *certificate* verification via the AIS (Automatic Identification System) that *is* fitted on board all ships. This can be achieved through a personal smartcard containing identity data of the cardholder,

an on bridge fitted card reader and existing databases onshore, which are all components that can interact with the system.

## **Objectives**

The objective of MONA LISA is to contribute to the promotion of continuous improvement and development of efficient, safe and environmentally sound maritime transport in the Baltic Sea by the implementation of a series of measures, which also are included in, or are in line with the EU Baltic Sea Strategy.

There are two objectives involved in activity 2 (the study underlying the present report). One is to develop and test an electronic system for an automatic verification of mandatory certificates and secondly, to use this verification as a method to prevent fatigue. It will be possible to use the method for verification of all required certificates. The activity is a pilot project where the aim is to test and demonstrate a new concept, which is why the activity is limited to “Pilot Exemption Certificates” and other relevant certificates of competency.

The work presented in this report activity provides an assessment of the current usage of invalid or outdated certificates. The report will also identify similarities and dissimilarities in the certificate process in different EU countries and elaborate on proposals for harmonisation. The legislations and methods for preventing fatigue on officers on watch in different selected member states will be collected and presented. The activity will also look into some legal and liability issues. Finally, the system’s impact on shipboard crew and the crew member’s opinions and attitudes of the system will also be studied.

## Background

The control of certificates for shipboard personnel, such as Pilot Exemption Certificate (PEC), Officer Class Certificate and cargo specific certificates is primarily limited to port state controls and other random inspections. Frequency and randomness of such inspections may implicate risk of unauthorized use of fairways, unlawful port access and loss of income due to outdated, obsolete or even forged certificates. A far greater threat, however, is that of safety at sea risking human lives and environment. This mentioned controls occur seldom and sometimes verified via radio, communicated to some land central i.e. VTS Centre (Vessel Traffic Service) or Coast Guard station. There is currently no system that verifies that the person communicating his PEC or other STCW certificates for that matter to a harbour or VTS centre is the officer he claims to be.

The pan-European MONA LISA project will conduct an exploratory feasibility study of an automated system for control of on board certificates, based on AIS technology. Within this study it is sought to create a demonstrator to find means to automatic execute certificate verification via the AIS (Automatic Identification System) that is already fitted to all commercial crafts, a personal device containing identity information will be created and means to compare data with existing databases onshore will be elaborated. The demonstrator will also create means to keep track on officer's time on watch, further studied in the next step of the project.

A significant part of the work is focused on assessment of the current situation for use of invalid or outdated certificates within the Union. The activity will also identify similarities and dissimilarities in the certificate process in different EU countries and elaborate proposals for harmonisation.

The activity will also look into some legal and liability issues of such system. Finally, the system's impact on shipboard crew will be studied as well as crew member's opinions of such a system.

## **The studies**

Five studies were performed in Activity II, which are all inter-linked but undertaken separately. Study 1 is described in the Activity II report. Studies 2-5, all inclusive, are available as individual Technical Papers.

1. Action research with maritime stakeholders to evaluate the attitude towards a new system
2. An evaluation of cadets' attitude towards a new system
3. A study on false certification and inspection in Europe
4. A study on the issuing of certification in the Baltic area
5. A study on the inspection of certificates in the Baltic area

This activity report will then proceed with the presentation of the Participation Action Research study which included the tasks involved in Technical Papers 1 and 2.

## **Participatory Action Research study**

A Participatory Action Research (PAR) study was set up in order to acquire user attitudes towards a new system such as the system suggested in MONA LISA. This study was also used in order to collaborate with stakeholders in creating a questionnaire. This questionnaire would then contain questions that would be relevant to answer as users. The following section presents the methods that were applied.

### ***Method***

The method used was a series of expert meetings where an upcoming change was discussed and performed. The method entails that researchers and experts cooperate in a way which leads to an understanding and improvement of practice and situations. The method is called PAR, Participatory Action Research – and the aim is to understand and improve the world through change (Baum, MacDougall, & Smith, 2006).

PAR is built on the notion that knowledge is a collaborative process in which each participant's diverse experience and skills are of paramount importance to the outcome of the process (Brydon-Miller et al. 2010). In other words, "...members of the organisation we study are actively engaged in the quest for information and ideas to guide their future actions." (Whyte et al. 1991: 20). PAR method combines both theory and practice in a process of reflection and action which are aimed at solving a concrete problem and obtaining a deeper understanding of the broader social, economic and political influences that play a role in

shaping the problem (Baskerville 1999). PAR has been extensively used in teaching environments in order to understand and improve teaching methods (Baum et al., 2006).

Deriving from traditional action research (AR), PAR is a variant of AR. An important change between the two is that in the case of AR, the researcher is responsible for theorising the phenomenon under investigation. In the case of PAR, this responsibility is shared together with participants, and it is the assumption in PAR that participants are professionals who have already acquired a great deal of knowledge through years of experience in the context under investigation. Another important difference is that PAR involves the alignment of the roles of the researcher and the subject into more collaborative forms (Baskerville 1999).

In practise, PAR involves the use of a facilitator and coordinator. Each individual organisation focuses on its own development but draws upon the parallel work in other participating organisations. It is essential that a realistic time plan is an integrated part of implementation. The optimal size is four to six organisations, and there should be some level of networking across sites (Fuller-Rowell, 2009).

Two motivational processes can come into play with this method: altruistic and competitive drives. Organisations can develop an awareness of relevant activities in similar organisations, gain perspective on their own functioning, and develop improvements. Another outcome may be hybrid ideas – a mix of internal and external (Fuller-Rowell, 2009).

An action research program generally follows five phases (Caro-Bruce, 2000):

1. Problem identification. This involves making sure that all participants agree on why they want to do the research and state the problem as a question. The question should be broad enough to include multiple perspectives and yet narrow enough to be manageable for the participants.
2. Plan of action. A timeline is made as well as a choice of focus for the study. It must be decided whether the study will be performed on existing practices and it must be discussed whether the result will be a new strategy that can address the issue.
3. Data collection. It must be discussed which types of data are needed to answer the question and how to allow for multiple perspectives. Also, available resources must be charted, including whether other people can assist with information and interpretation.
4. Analysis of data. Patterns in the data and draw conclusions on them for the issue and usefulness for the participants and the practice.
5. Plan for future action. Summarize and write up recommendations, changes needed and publishing results.

The method of “snowball sampling”<sup>1</sup> was chosen, when the stakeholders in the PAR study distributed the 2 questionnaires that had been drawn up. Snowball sampling is a popular, non-probability sampling technique and is widely used in sociology and statistics research. Snowball sampling uses recommendations to find people with the specific range of skills that is considered as useful or strongly related to the phenomenon under investigation. This technique is a useful tool for building networks, increasing the number of participants and collecting a plethora of information, similar to a rolling snowball that increases in size as it collects more snow. Based on the principles of this method, participants of the PAR study were asked to use their professional networks in order to refer the questionnaire to other people who could potentially participate in or contribute to the study. In this way, snowball sampling was used to find and attract potential experts who are not easily located and accessible. The results of the “snowball” could not be controlled, thus a clear response rate of the respondents in the survey cannot be produced.

Finally, two questionnaires were used in the study. These questionnaires were created in collaboration between stakeholders and researchers as a part of the PAR study.

## ***Research procedure***

A group of experts from the shipping community was selected with the intention of performing a variation of multi-site PAR (Fuller-Rowell, 2009). It was agreed that the participants should be prepared to perform action research within their own sub-domains and contact networks. The following text was sent out (as was a short description of the project aims):

*“We invite you to participate in this study. The group will consist of 5-10 persons who will meet 2-3 times during 2011 and possibly a few times during 2012. Travel will be reimbursed”.*

A series of meetings were planned and the five phases of PAR (problem identification, plan for action, data collection, analysis and plan for future action) were distributed over the meetings in the following way:

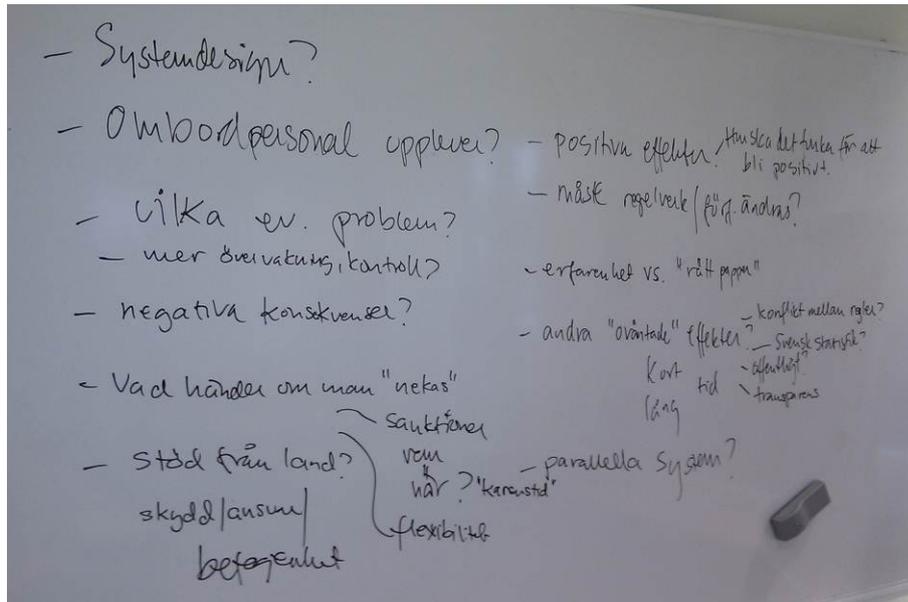
### ***Meeting 1, August 2011:***

The overarching project MONA LISA was presented and discussed, with prominence given to the present sub-activity. A general introduction to the issue was then given and we emphasised the focus on problem identification and mapping. The two first phases of a PAR were included and the rest of the meeting was dedicated further to problem identification (phase 1), see Figure 1 and making a plan for action (phase 2). During the discussion we addressed the completeness of the group and it was decided to include one more organisation to the next meeting. The question was defined and delimited to include only certificate issues,

---

<sup>1</sup> Also known as “chain sampling” and “chain-referral sampling”.

and we agreed to ask the same questions within all organisations. Furthermore, it was decided we would focus on Swedish shipping.



**Figure 1: Problem identification work in the group**

A time plan was drafted and preliminary dates for the following meetings were agreed upon. We also discussed who would document the process (the coordinators) and how issues of ethics (e.g. anonymity) would be handled. The participants were asked to chart the possible stakeholders within their own networks until the next meeting. A Dropbox account was set up and the participants were invited. Meeting notes and working documents were placed in it.

### **Meeting 2, October 2011:**

The meeting started with a sum-up and a discussion of any issues that had come to mind about the study. The project had since the first meeting been slightly negatively described in the media, and it was discussed whether to include some of those with a negative view in the meetings. One person who had written a negative editorial was invited but could not attend.

The theme of the meeting was data collection. A short lecture on data collection methods and data analysis was held and was followed by a discussion of which techniques to use. It was left open to the participants to use any technique they preferred. The conclusion was that we draft a questionnaire including the issues that had been raised at these two meetings and also in the media, see Figure 2. This questionnaire was to be distributed by the participants in their own networks before the third meeting.

It was also discussed how and when other issues of for example technical compatibility would be addressed and it was concluded it was out of the scope of the present study. Before the meeting ended a draft questionnaire was made and sent out for reviewing by the group. Shortly after this meeting it was decided to be the final version and the group members were

asked to distribute them in the networks. It was also decided that it was acceptable to add questions to the questionnaire if they were relevant for a specific group of respondents. These might then be different for the different participants.

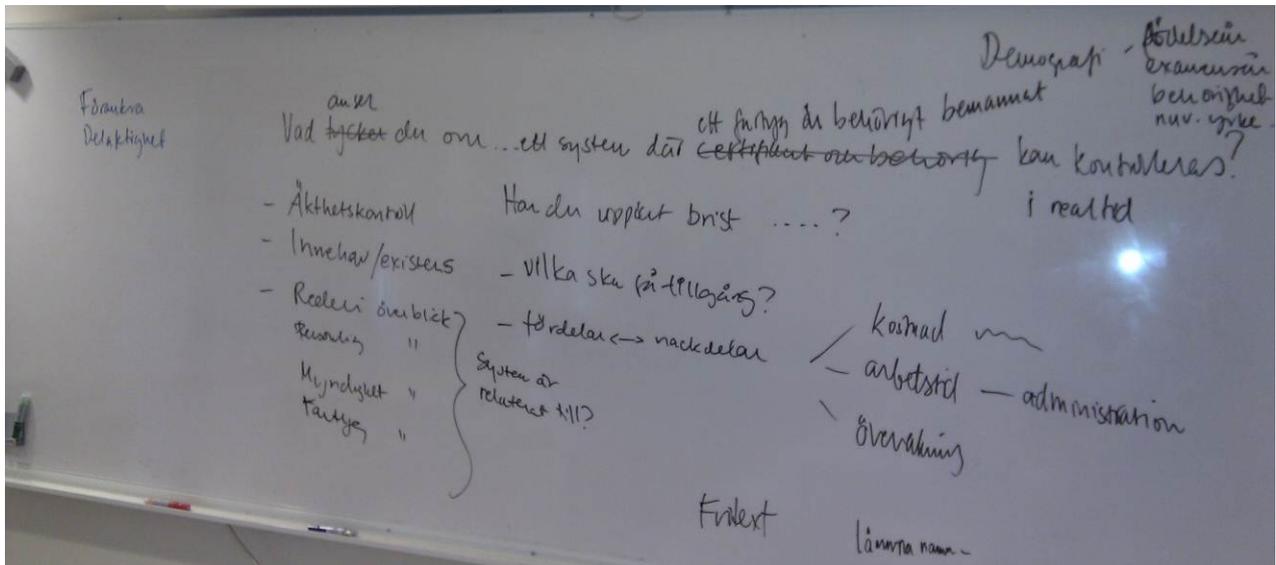


Figure 2: Drafting survey questions in the group

### Meeting 3, January 2012:

The original plan had been to perform a joint analysis during meeting three, but the project leaders decided to make a preliminary analysis of the answers to save time and have a basis for discussion at the meeting, in order to draw conclusions from them for the issue and usefulness for the participants and the practice – as action research suggests.

In total, 228 answers from 2 questionnaires (incl. 3 interviews) were collected. One questionnaire was created specifically for cadets and one for the maritime industry in general. The questionnaires were not identical, depending on the answering group; however the first three questions were always the same. The data was collated and counted when the answers were the same or very similar. Free text comments were transcribed. This first raw analysis was then presented to the research group at meeting three. There was a discussion on what the results contained and what they mean. It was also discussed whether some groups were underrepresented and the group was tasked with collecting more data from a few stakeholders. It was then decided to supply an English version of the questionnaire due to a request.

### Meeting 4 – April 2012:

A plan for future action was made. It was agreed that the project should be presented to a wider group for discussion. It was also agreed to summarize and write up recommendations, changes needed and to publish the results. The negative stakeholder (mentioned earlier)

participated in this meeting and was pleased to participate. The meeting and expressed opinions had changed his mind. This meeting was extremely focused and productive.

### ***Number of respondents and their roles in shipping***

The matrix below depicts the number of respondents and their individual profession that participated in answering the questionnaires.

<b>Nautical officers (kl I-V)</b>	76
<b>Fishermen (kl VI)</b>	5
<b>KBV officers</b>	19
<b>ABs</b>	3
<b>Engineering officers</b>	26
<b>Service/kitchen</b>	7
<b>Office (Ship-owners, DP, HR)</b>	10
<b>Union representatives</b>	2
<b>No answer</b>	4
<b>Cadets (in study 2)</b>	76
<b>Total</b>	228

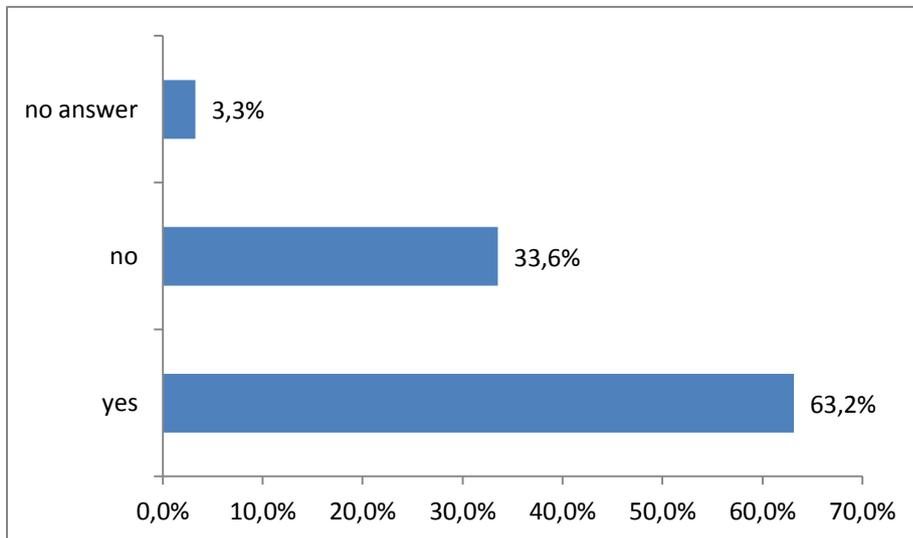
### ***Results of PAR study***

It is impossible to bring all of the results here in the same format. Some of the results are in the appendix of this report, and other results are presented here. The results below are presented in this format as they show experiences of both respondents in the shipping industry and the experience of cadets in the industry. The latter is presented in Technical Paper 2: An evaluation of cadets' attitude towards a new system. Finally, it can be mentioned that free text commenting was possible and encouraged after each survey question.

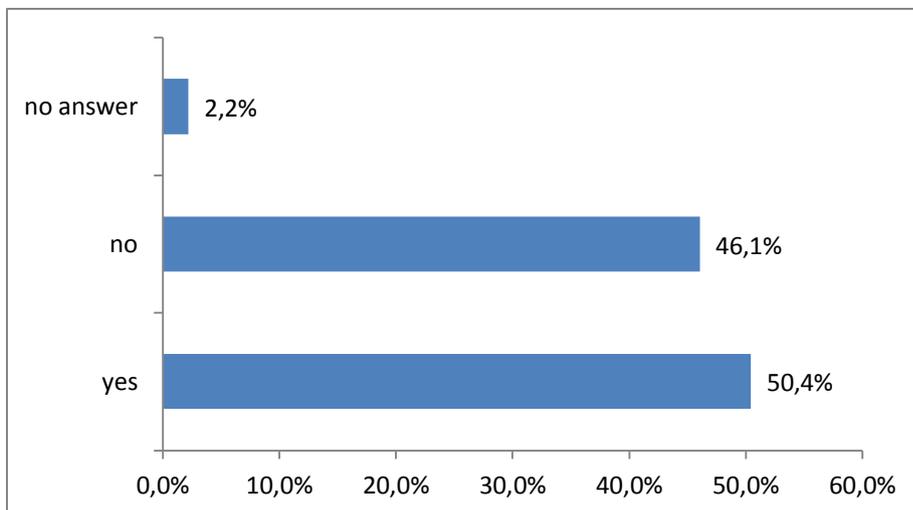
Question 1 in the survey.

**1. Do you have experience of shortcomings concerning seafarers' certificates and ratings, such as neglect, missing or falsified documents?**

Yes No



**Figure 3. Question 1: Do you have experience of shortcomings concerning seafarers' certificates and ratings, such as neglect, missing or falsified documents? 152 respondents, active in shipping**



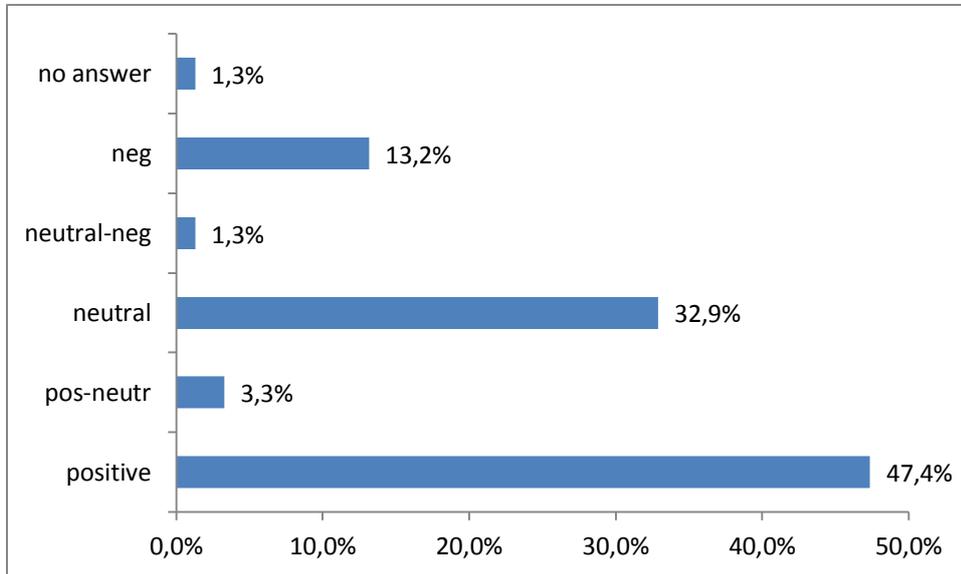
**Figure 4. Question 1: Do you have experience of shortcomings concerning seafarers' certificates and ratings, such as neglect, missing or falsified documents? 228 respondents incl. cadets**

Question 1 portrays a predominant amount of experience of deficiencies in certificates and this can be seen in figure 3. However, figure 4 depicts a fall in experience and a rise in non-experience. The reason for this can be the addition of cadets in the number of respondents. It is not likely that cadets come close to situations where deficient certification comes into play.

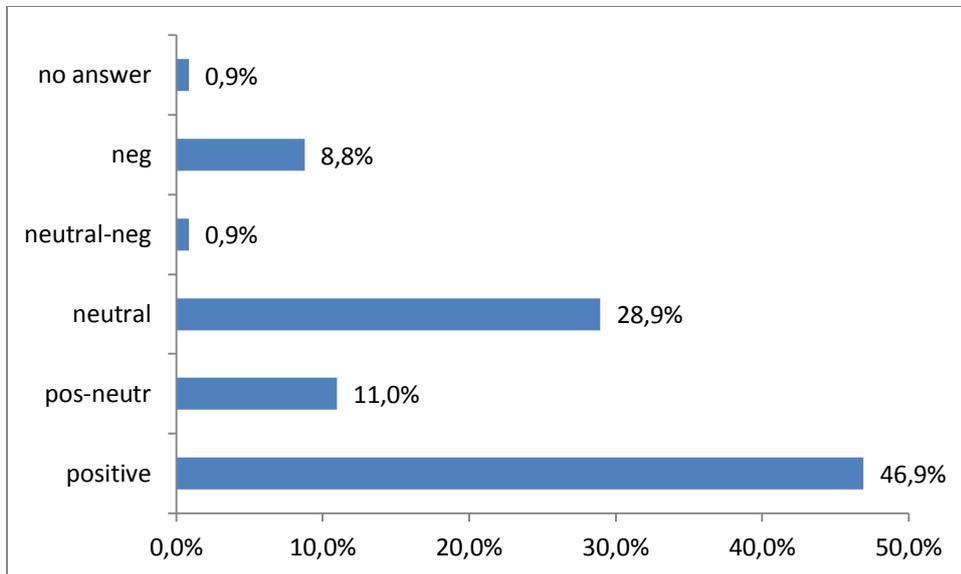
Question 2 in the survey.

**2. What do you think of a potential system that will check in real time if a vessel is properly manned regarding certificates?**

negative-----neutral-----positive



**Figure 5. Question 2. What do you think of a potential system that will check in real time if a vessel is properly manned regarding certificates? 152 respondents, active in shipping**



**Figure 6. Question 3. What do you think of a potential system that will check in real time if a vessel is properly manned regarding certificates? 228 respondents incl. cadets**

Question 2 is also predominantly answered positively. However there is a detectable hesitance which can be seen in the small measure of negative and the larger measure of neutral responses.

Question 3 in the survey.

**The following aspects may change with such a system, please rank them. Rank the one highest that you / your organization considers most important not to increase with a new system.**

- A. Administrative burden
- B. Working hours
- C. Increased Costs
- D. Increased sense of surveillance

This question was answered by 145 respondents and the ranking was as follows:

- A. Administrative burden 63%
- B. Working hours 26%
- C. Increased Costs 5%
- D. Increased sense of surveillance 6%

This question clearly points to the necessity of ensuring that administrative burdens are not increased by the new system.

The free text answers are included in the appendix and summarized in the conclusions. The PAR study identified a multitude of interesting and relevant issues that can be kept in mind for the future development of the demonstrator system. For example, negative media coverage can give a proposed system a negative image, which was the case when the Voice Data Recorder technical system was introduced. This experience led the research team to believe that the attitude towards a MONA LISA system would be negative, as it had also been negatively portrayed in the media. However, the study showed a surprisingly positive attitude, including benefits not planned (i.e. gaining a better overview of one's certificates).

One predominant concern voiced by participants was the risk of added or even duplicated, redundant administration work. However, if the system was integrated into existing systems and well tested before implementation, the view was that it may reduce the amount of work and checking that takes place on board. Another concern was regarding who would have access to the system. This concern entailed questions about who will be responsible, who would have jurisdiction, and would the final responsibility still be on board? These concerns are partly addressed in the Technical paper 4. There were also legal issues that were brought up when checking identity, due to national laws on personal data protection and similar legislation. This may be legal and ethical issues that can be incorporated into an eventual pilot testing of the system.

A question raised in the meetings concerned when the project is started on a limited scale in Sweden or a few countries – what are the effects on the following?

- The possibility of globally implementing a technical solution
- Redundant work; use of parallel systems on board and ashore– and for how long before systems can be incorporated?
- European and international legislation – will it allow for example the comparison of several registers and records?
- Public and political perception. If/when Sweden gets the highest amount of certificate claims, how will that be regarded? A comparison may be made with incident reporting – a reasonable amount of reports is seen as “good”, whereas too few or too many are not.

The participants envisioned that the system would address several deficiencies identified in the study, such as cases where originals were left at home, out of date, missing, incorrect education or course, or certificates not valid for trade, and in part, corrupt systems and nations. However the system would not be able to battle instances where another colleague’s certificate is used, inconsistent quality of education or cases where foreign flagged ships forget to report sea-time.

### ***Method discussion of PAR study***

As presented earlier, PAR is a method where researchers and participants collaborate in generating knowledge and reflection about a specific problem, linking theory and practice together in a democratic process. Questions lead to more reflection and further action, networks and work focus. In this sense, the method of PAR battles the many complaints of studies that ‘lack a user-focus’ or are ‘far from the constraints and contingencies of reality’.

However, PAR has received a lot of criticism over the years. The collaborative framework that PAR builds on decreases the researcher’s ability to have a full control of the process and the outcome of the research. This lack of control can make it difficult for the researcher to insert the PAR in an overall research program, and researchers are not free to select topics that they wish to pursue. Furthermore, there can be participants who experience very serious challenges who dominate the process.

There are some ethical issues connected with the approach. For example, if a researcher does not explain the required research orientation, participants who are expecting more consultancy type performances, can be misled. There is also a danger that the researcher becomes so involved with the discussions and their role, that they forget their obligation to generate new knowledge about related theories (Baskerville 1999). PAR has also been criticized of abandoning covert research in favour of political, economic, and social perspectives in order

to ensure that the ‘cause’ and the solidarity with the participants overrides the research, hereby compromising the quality of scientific research (Clausen and Lorentzen 1992).

For the participating research leaders in this study, several advantages were discovered, such as an opportunity to compile data from a widespread group of participants. Another advantage was that there was a certain degree of control through the selection process and the choice of core group. The drawback of the method however, is the level of data diversity in that the group of participants was so widespread, which has also been mentioned above. However, the method involves the production of a specific richness of the data that can balance this.

The results of the “snowball” sampling that was used in the PAR study could not be controlled, thus a clear response rate of the participants to the survey cannot be produced. However, the amount of 228 received answers was a large sample.

## Discussion of combined study results

The overarching aim of this activity in the MONA LISA project is to make the checking of certificates easier, not to solve all existing certificate problems. The present study has focused on assessing the current situation of invalid or outdated certificates, identifying similarities and dissimilarities in the certificate process within the EU, and possible solutions for harmonisation and the liability issues of such a system. The present study also investigated the impact of a new system on shipboard crewmembers and their opinion of such a system.

This chapter is based on all the projects in this study i.e. 1 to 5.

The conclusions of the Technical papers 3-5 can be seen in the matrix below. The matrix provides an overview of the individual paper, the method used and conclusion of the paper.

<b>Matrix of Technical Papers in the MONA LISA activity II</b>	
<b>No.</b>	<b>Document</b>
<b>TP 1 &amp; 2</b>	<p>Title: Activity II &amp; An Evaluation of cadets’ attitude towards a new system</p> <p>Method: Participatory Action Research</p> <p>Conclusion: Four meetings were held with stakeholders in the shipping industry, including cadets, and 2 questionnaires were collaboratively created and sent out. One questionnaire was specifically for the cadets and one for the general maritime industry. 228 answers were received. Respondents had a predominant amount of experiences of deficiencies in certificates. Apart from single instances, it is less likely that cadets experience situations with deficient certificates. Respondents are largely positive towards the system suggested in the MONA LISA, although it is essential for respondents that this must not be a system with</p>

	<p>increased administrative burdens. Finally legal and ethical issues involved with identity checking must be resolved as must issues regarding possible problems with nations who participate in a pilot testing of the system.</p>
<b>TP 3</b>	<p>Title: Evidence of false seafarer certification</p> <p>Method: A website for anonymous comments, an online voluntary questionnaire, IMO STW records for 2007-2009, face to face and telephone interviews, a discussion group website on the BIMCO discussion forum, and a twitter feed setup.</p> <p>Conclusion: There is evidence to support the conclusion that there is falsification of certificates. However this evidence is inconsistent. For example the STW42/4 records for 2009 showed that there were only 4 deficient documents out of the 350 listed. However, these reports are the results sent in by only six of the 170 IMO flag state administrations. Some respondents reported deficiencies in sea-service time, certification, qualifications, and medical certificates. The problem is seemingly not only certification deficiencies, but also standardization amongst IMO member states as to how certificate validation is conducted.</p>
<b>TP 4</b>	<p>Title: A study on the issuing of certification in The Baltic sea Area</p> <p>Method: Desktop research</p> <p>Conclusion: The interest in the control of certificates seemingly lies with the master of a ship, as there is no interest from classification or insurance companies. Officers do not have the necessary education to identify false certificates, and the individual shipping companies seldom see the original certificate. Ship owners and cargo owners have begun to keep manning agencies responsible for their employees' certificates.</p>
<b>TP 5</b>	<p>Title: A study on the inspection of certificates in The Baltic Sea Area.</p> <p>Method: 4 interviews with maritime stakeholders in the Swedish cluster; the Swedish Transport Agency, The Swedish Coastguard, The Swedish maritime Authority and The Swedish Vessel Traffic Service.</p> <p>Conclusion: It was primarily the experience amongst the respondents that there is little or no control of certificates in The Baltic Sea Area. There are rumours in the industry of instances of false certification. However, the problem exists, and one</p>

respondent reported that out of 138 controlled vessels and persons in the period of January-August 2012, there were 21.7% deficient <sup>2</sup>certificates. Although small in scope, the study shows that attitudes towards an implementation of a new system such as the one suggested in the MONA LISA project were predominantly positive. The study indicates that more studies should be conducted in order to unveil how big a problem falsification of certificates in the Baltic Sea really is.

All of the above studies that have been conducted point to a lack of control of certification validation being either respondents' personal experience, or rumours of instances of false certification or deficiencies. There is some evidence of certificate deficiencies, which is however inconsistent and not systematically compiled.

These inconsistencies comprise a range of challenges. Firstly there are standardization issues amongst Member States as to how certificate validation is conducted. There are also issues of unwillingness amongst flag states to control certificates. Nor are there any official guidelines regarding whether Officers, Masters, Ship owners or manning agencies should have the task or receive the training to be able to identify false or deficient certificates. As stated earlier, the European Commission verifies whether nations comply with the STCW convention in regards to Maritime education and training and whether appropriate measures are taken in order to avoid falsification of certificates. However, this verification takes place at a national level, and in many cases, it is therefore left up to the individual seafarer.

## **Overall method discussion**

Overall it can be said that the Technical Papers in sum provide studies using a wide range of methods, including Participatory Action Research, website and desktop research, face to face, email and telephone interviews and social media such as twitter feed setups, online voluntary and hard copy questionnaires, and a discussion website. Multiple methods have ensured an accumulative view of data from different contexts, thus providing the opportunity to triangulate the state of affairs by examining where the different data intersect (Mason 1996). Several researchers and investigators have been involved in the data collection and report production, which provides the opportunity to avoid bias on the part of an individual researcher.

---

<sup>2</sup> Please note that a deficiency is not necessarily a false certificate

## **Concluding remarks and recommendations**

The overall findings in the studies conducted under this deliverable, this meaning, all of the technical papers and the present study altogether, are that a new system would acquire a positive reception in the industry. In general, if such a system can minimize administration and surveillance burdens, respondents will find the system beneficial.

There are different user needs at different levels that need to be assessed and incorporated into the system, be this for the individual, on board, for companies and for authorities. These different levels contain challenges and issues for future design considerations. The issues can be seen as recommendations to the stakeholders of the system and to whom it may concern at a legislative level.

### **1. Policy or high-level organizational issues**

- The relationship between the validity of a certificate and needed experience.
- Temporary or long-term lack of personnel
- If you have to pay for your own certificate
- Endorsement

### **2. National administration level issues**

- Quick change of ship [slow administrative system?]
- Certificate may expire while onboard... (due to an unexpected longer stay)
- Courses not given at times when “needed”, or often enough (full)
- Copy protection
- Identity – diverse national laws
- Standardization and quality of certificates

### **3. Organizational or educational issues**

- Misunderstandings or lack of knowledge – either thought it was ship or company’s responsibility to keep up to date, or personally thought it was valid.
- Not knowing which certificates are needed onboard.
- Draw out a necessary outline for the training of certificate verification at the individual level for Masters.

### **4. Individual issues**

- Falsification on purpose, cheating

- Sloppiness, forgetfulness
- Stolen or Lost luggage

If these issues are not addressed in the demonstrator of the new system, it is important to ensure that they be taken into consideration in the case of a permanent system being implemented.

This activity report will be used to compile design recommendations for the technical design of the system.

## References

- Baskerville, R.L. (1999). Investigating information systems with action research. *Communications of the Association for information Systems*, Vol 2, article 19, October 1999.
- Baum, F, MacDougall, C, & D. Smith (2006). Participatory action research. *Journal of Epidemiology & Community Health*, 60, 854-857.
- Caro-Bruce, C. (2000). *Action Research facilitator's handbook*. Oxford, OH, USA: National Staff Development Council.
- Fuller-Rowell, T.E. (2009). Multi-site action research: Conceptualizing a variety of multi-organization practice. *Action Research*, 7(4), 363-384.
- Goodman L.A. (1961), Snowball sampling. *Annals of Mathematical Statistics*, 32(1): 148–170.
- Mason, J. (1996). *Qualitative researching*. London, Sage.
- Whyte, W.F., D.J. Greenwood and P. Lazes (1991). Participatory Action Research. Through practice to science in social research. In: W.F. Whyte, (ed.) *Participatory Action Research*, Newbury Park, CA: Sage, 19-55.

## **Appendix 1: Listing of issues mentioned in free comments.**

No internal order or ranking is applied to these comments.

### ***Type of certificates***

- a. Pilot (used colleagues)
- b. 2<sup>nd</sup> officers (false)
- c. Missing the theoretical part of exam
- d. Engineers'
- e. Special courses such as forklift, hot work and H&S
- f. What about basic safety, health cert.??

### ***Type of deficiency***

- a. Originals at home (sometimes copies onboard)
- b. Missing
- c. Using a colleagues certificate
- d. Certificates not valid for trade
- e. Wrong course/education
- f. Keep people signed on (who are not onboard)
- g. Out of date (several)
- h. Corrupt systems/nations (both of certifier or port of call)
- i. Foreign flagged ships forget to report sea time

### ***Why?***

- a. Misunderstandings or lack of knowledge – either thought it was ship or company's responsibility to keep up to date, or personally thought it was valid.
- b. Not knowing which certificates are needed onboard.
- c. The relationship between validity and needed experience.
- d. Temporary or long-term lack of personnel
- e. If you have to pay your own
- f. On purpose, cheating
- g. Sloppiness, forgot [is this on purpose?]
- h. Quick change of ship [slow administrative system?]

- i. Certificate may expire while onboard... (unexpected longer stay)
- j. Courses not given at times when “needed”, or often enough (full) – need longer look-ahead
- k. Lost luggage

***Negative, fears***

- a. Is the right person onboard or just his ID?
- b. Double checking – old AND new system?
- c. Can have negative impact on Swedish shipping
- d. If only applied in Sweden, need to carry certificates anyway
- e. Continuous control from shore – isn’t the ship responsible for itself?
- f. Increased cost for employee
- g. Vetting and inspection will continue anyway (small risk) – make sure it does not increase
- h. Loss of flexibility
- i. Can the system address anomalies, i.e. a higher education or competence than specified?

***Positive, benefits***

- a. Not woken up for inspection
- b. Easy to follow-up and check, overview
- c. Not carry certificates with you all over the world
- d. If less paperwork, if not more
- e. Use it to separate the serious from the less serious personnel, the good from the bad
- f. Good to check certs relevant for maritime safety
- g. If it is simple and easy to use I see no problems
- h. Especially good for tankers and passenger ships
- i. Good for transportation board, coast guard and port state control

***Other***

- a. Does not address quality of education
- b. Must be an international system
- c. Depends on who has access and who are involved/who has control

- d. Not lead to more work onboard
- e. Must be a benefit onboard too
- f. Means we have to be “online”
- g. If industry and company take care of this the problem will disappear for onboard and administration
- h. If you have nothing to hide, I see no problem with this
- i. Shipping company needs to take care of those certificates not included in the system anyway