SHEEL

Final Activity Report

05 December 2007

SHEEL

SSP8-CT-2003-502153

Secure and Harmonised European Electronic Logbook

Specific Targeted Research Project (STREP)

Final Activity Report

05 December 2007

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Project Co-ordinator: INESC Inovação – Instituto de Novas Tecnologias (INOV)

Partners: INESC Inovação – Instituto de Novas Tecnologias (INOV); Omni Tracking Systems Limited (OTS); C-trace; Sainsel Sistemas Navales, S.A.; SODENA SA; Radiomidun Ltd; Directorate of Fisheries- Norway (Fiskeridir.no); UK Department for Environment, Food and Rural Affairs (DEFRA); National Board of Fisheries -Sweden (NBF); Latvian Marine Environment Board-Ministry of Environment (MEB); General Inspection Service of the Ministry of Agriculturen, Nature management and Fisheries (AID); The Portuguese General Inspectorate of Fisheries (DGPA); Secretaria General de Pesca Marittima (SGPM); The Icelandic Directorate of Fisheries (DoF-IS); Joint Research Centre (JRC); GlobalSign NV/SA; Fisheries Research Institute, University of Iceland (FRI); North East Atlantic Fisheries Commission (NEAFC); Navigs s.a.r.l.; INMARSAT; Thrane & Thrane A/S (T&T); Ubizen; Eutelsat; Direction des Pêches Maritimes et de l'Aquaculture (DPMA); ELSACOM.

SUMMARY SHEET	
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Deliverable N°	D16
Delivery Date	
Partners contributed	
Made available to	All partners, EC, public

SHORT DESCRIPTION
This SHEEL final activity report summarises all the important results, which have been obtained throughout the SHEEL project.

CHANGE RECORD			
Version	DATE	§: CHANGE RECORD	AUTHOR(S)
1.0	26-6-2006	It describes the progress in each work package as well as the results from each project activity.	Naouma Kourti
1.1	05-12-2007	Revised version	T. Bailly-Salins

Executive Summary

The SHEEL project had essentially four objectives:

1. to produce a technical specification for a European electronic fishing logbook.
2. to demonstrate the technical feasibility of an electronic log from the transmission end (vessel) to the reception end (fishing authority).
3. to evaluate communication solutions with regard to their suitability, reliability and cost
4. to create a secure end-to-end communication environment, with acknowledgement of messages, inspector access to data onboard the vessel and protection of data from unauthorised parties.

In terms of standards, the SHEEL project successfully defined a common XML data format that takes its roots in the North Atlantic Format (NAF), which was used until now for exchange of data between European authorities and a number of inter-governmental fisheries organisations. The SHEEL XML data format improves both on the flexibility and the capability to evolve with future developments. All of the SHEEL trials were based upon this specification and it is now a publicly available document.

The demonstration of feasibility of an electronic logbook involved 8 European countries and more than 15 fishing vessels. The trials covered a broad range of vessel types and gears, vessel crews working in several different languages and with a range of computer expertise. Although there was general acceptance by the skippers, it must be said that the vessels were handpicked for the project and it would be naive to unwise any conclusions from this acceptance.

Figures related to the reliability and cost of satellite communications are, by any measure, very satisfactory. During the project, SHEEL vessels made more than 1600 transmissions of electronic logbooks with a near zero failure rate. Furthermore, the size of the data file for a single logbook varied from 68 bytes to 12 kilobits and the cost of transmission of a single logbook varied from €0.05 (using GPRS) to €1.67 (using satellite). These variations can be explained by the size of the data files (related to effort of compression and optimisation made by developers) and also the communication system and provider used for transmission.

There were two aspects of SHEEL that achieved less significant results. The first was to create an end-to-end secure environment. An ambitious Public Key Infrastructure was foreseen in the technical annex but this solution required a certain expertise which not all the partners had, the complexity of managing such a solution was also a concern from the authorities based on the feedback that Norway and Iceland gave from their own national experimentations.

The other aspect that probably required more time and effort than the timeframe of the SHEEL project allowed for, was the onboard inspection of an electronic logbook. Specific training of inspectors, closer collaboration with the national authorities and definition of a common procedure would have been required, but time lacked.

Globally, positive outcomes of SHEEL include the development of an electronic logbook specification capable of emulating the EC paper logbook and thoroughly tested on a broad range of vessels with an excellent transmission success rate at reasonable cost. The main pending issues are the data security question and the on-board inspection definition, they would require further work to improve the system specifications and better answer the needs. Nevertheless, the goals of SHEEL were largely achieved and most importantly, it is now difficult for anyone to dispute the technical or economic feasibility of a European electronic fishing logbook.

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Final Activity Report

Summary

The final activity report of the SHEEL project deals with the progress achieved in the last 12 months of the project. The first 18 months were dealt with in the periodic activity report D6.

The document provides an overview of the SHEEL project actions carried out based on the work packages. Together with the consolidation report D19, which focuses on the technical results, it provides a final wrapping up of the SHEEL project.

SHEEL objectives and achievements

SHEEL stands for Secure and Harmonized European Electronic Logbook. The main objective is to develop, implement and demonstrate a secure cost effective and harmonized European electronic logbook for fisheries, so as to drive European regulations. The key to a successful implementation of electronic logbooks in Europe is interoperability. Authorities must be able to interrogate all systems with the same facility. For this reason a number of different companies and authorities have been involved in the project. The aim is not to create a single electronic European logbook but rather to introduce an integrated secure scheme that manifests a seamless interoperation over different systems. The role of JRC is to manage the work done by other partners; help the authorities articulate their needs for a European Electronic Logbook and to ensure that the developments in each country are mutually compatible. Part of the JRC's work is to coordinate the trials and together with other experts in the consortium to assess and consolidate the systems.

In the project timeline below, the first 18 months of the SHHEL project were focusing on the preparation of the project and the trials. This period focused mainly on the requirements and the specification for a Secured and Harmonised European Electronic Logbook as well as the completion of the first two trial phases.
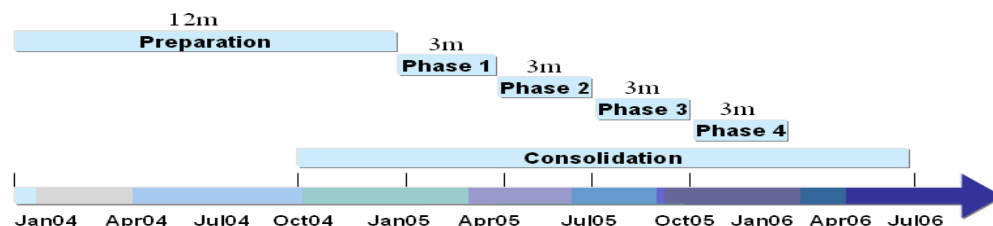
The main objectives for the last 12 month period were to:

Complete all work-packages successfully. The project focused on:

1. completing phase 2 of the demonstrations

   the aim of the second phase was to

   ➢ test the acknowledgement of receipt of the electronic reports

   ➢ understand the level of detail of information that should be sent back to the skipper in order to allow corrections

2. completing phase 3 of the demonstrations

   this phase dealt with the various aspects of deploying a Certification Authority in order to deal with the security and authentication requirements of electronic logbooks

3. completing phase 4 of the demonstrations

   This phase was mainly dealing with how fisheries inspections can be carried out in the electronic logbook era. Issues under investigation were:

   ➢ Ease of use of the electronic systems for inspectors

   ➢ Completeness of information visualized during inspection

   ➢ Software allowing inspection reports

4. consolidating the results

   Technical results, practical experiences, observations and possibilities of improvements were discussed among the various shareholders and consolidated. Furthermore elements of SHEEL developments that could reach standardization have been investigated.

5. wrapping up

   Making sure that all deliverables are prepared before the official end of the project and that all partners have submitted their cost statements.

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Work-package progress

Work-package 1: Management.
Work-package leader: Joint Research Centre (JRC)

The last part of the project was carried out smoothly, without major problems. Partners continued and finilised the work as expected. All reports foreseen in the technical annex were delivered as expected. JRC prepared and published the second project newsletter. It is made available on the website: http://fish.jrc.it/sheel/publications/newsletter2.htm and in the CIRCA forum, in the Library's Dissemination folder.

One of the deliverables D17 the so-called PIP (policy implementation plan) was not anymore required by DG Fish and could be dropped.

The last progress meeting was held in Spain Puerto Celeiro on January 20-21 2006 and the minutes were also made available soon after the meetings and posted on the CIRCA forum in the Library's Meetings folder.

Similarly the Sheel final meeting was held in Arona Italy the 30th June 2006. Also the minutes of this meeting were uploaded on the Circa forum in the Library's meetings folder.

Company Radiumidum asked for a change in their work as described in WP 6. The company has preferred to use the payment dedicated to the last part of the development and demonstration phase, i.e. the inspection one, to develop new items that would appear more attractive to the skipper. Such items are those that facilitate the skipper's management of fishing activities. The contract amendment is in annex 1.

Table 1 Deliverables-WP1

Deliverable No	WP No	Deliverable name	Date due	Actual/Forecast delivery date	Lead Contractor
D6	1	Periodic activity, mid-term review and reported cost.	31/07/2005	31/08/2005	JRC
D11	1	Newsletter 2	31/12/2005	15/12/2005	JRC
D14	1	Workshop 2 / Conference proceedings	30/04/2006	30/06/2006	JRC
D15	1	TIP	30/06/2006	30/07/2006	JRC
D16	1	Final report	30/06/200	30/07/2006	JRC

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Table 2 Milestones-WP1

Milestone	Work-package No	Date	Actual/Forecast Delivery date	Lead contractor
SHEEL final workshop	1	04/2006	30/06/2006	JRC
Final report	1	06/2004	30/07/2007	JRC

Work package 2: System specifications

Work package leader: Fisheries Research Institute (FRI)

Contributing partners: Fisheries Research Institute (FRI), Ubizen, GlobalSign

This WP was completed during the first project phase and reported about in the first periodic review. There was some delay in the delivery of the Security specifications.

Deliverable No	WP No	Deliverable name	Date due	Actual/Forecast delivery date	Lead Contractor
D5	1	Security specifications part	31/127/2004	31/07/2005	Ubizen

Workpackage 3: Communications

Work-package leader: Navigs S.A.R.L – France

This WP was completed during the first project phase and reported about in the first periodic review.

Work package 4: On board system development

Work-package leader: INESC Inovação - Instituto de Novas Tecnologias (INOV)

The on-board system development continued all over the demonstration phase. The companies were in contact with both authorities and skippers. They were collecting feedback in a continuous basis and were improving their systems.

The skippers involved in the demonstrations were very keen in having their ideas influencing the software development. They were particularly interesting in as much automatisation as possible. They had also concrete ideas for how should the user interface look like and what functionalities should be added. In particular the Spanish skipper preferred the user interface to be an exact copy of the paper logbook. Indeed SainSel spent a great deal of effort to meet the skippers needs and at the same time be SHEEL compliant.

INOV the Portuguese company gave priority to the compression of the reports so as the messages produced stay in the limits of the Inmarsat C package.

Two further companies, the French Adicio and the South African Olrac have followed the SHEEL specifications and have accordingly adapted their electronic logbook software. Adicio has equipped 2 French vessels and Olrac 2 Dutch vessels.

JRC has visited the various SHEEL developers and the vessels on which the various prototypes were installed. All JRC's mission reports can be found in Annex2. The on board prototypes are treated confidentially. The reader may request them directly from the developer company and it is up to them to release them or not.

Deliverable No	WP No	Deliverable name	Date due	Actual/Forecast delivery date	Lead Contractor
D7	1	On board system description	31/06/2005	31/08/2005	INOV
D8	1	On board prototype	31/06/2005	31/08/2005	INOV

Work package 5: On shore system development
Work-package leader: Omnitracking Systems (OTS)

All companies installed successfully their on shore systems to receive and store the messages from the vessels. Some companies preferred to keep the on-shore system in their premises throughout the first demonstration phase in order to eliminate bugs and ensure its smooth running. The main adaptations needed concerned the acknowledgement of receipt and the Certification Authority (CA) implementation.

A certain degree of freedom was given to the companies in developing their on shore systems. Some companies such as Olrac tried to include as much information as possible in the acknowledgement of receipt, some such as OTS included only the essential. Sodena arranged a system of conservation of the Inmarsat service provider communication messages.

Similar was the situation with the CA implementation. Some companies such as Olrac fully implemented it and tested it thoroughly, some such as OTS and INOV implemented it but tested it only marginally, some didn't implement it at all such as Sodena. Sodena used a different type of authentication system for its messages.

Generally at this stage both authorities and skippers were more concerned with the actual system performance and user friendliness problems than with legal issues of the electronic submissions as such.

Similarly to the on board system also the on shore system has been often demonstrated to the JRC. The descriptions of these demonstrations can be found also in Annex2. Also here the on shore prototypes are the ownership of the developer company and it is up to them to release the prototype to third parties.

Deliverable No	WP No	Deliverable name	Date due	Actual/Forecast delivery date	Lead Contractor
D9	1	On shore system description	31/06/2005	31/08/2005	OTS
D10	1	On shore prototype	31/06/2005	31/08/2005	OTS

Work package 6: Demonstration
Work-package leader: Joint Research Centre (JRC)

The vessels involved in the trials can be seen in table 3. All vessels are VMS vessels. The table also includes the company providing the on board electronic logbook. There has been some variations from the original plan. As an example Olrac provided solutions for the Netherlands and not OTS as originally planned. In order to do so Olrac further to the electronic logbook provided also the communication facilities to the vessels. These were 2 Iridium terminals. Except of Iridium other communication satellites used were the InmarsatC and Inmarsat Fleet, MiniM, the EMsat as well as the simple GPRS (mobile telephone).

All vessels used in the trials were highly computerized and the skippers were trained in the use of personal computers.

Table 3: List of the Sheel vessels

Vessel	Company	Fisheries Authority
Centaurus (28m) Ria de Aveiro (31m)	INOV	Portugal
Duddy Gisla Sturlaugur H Bodvarsson (46m)	Radiumidum	Iceland
Montero (28m) Tronio	SainSel	Spain
UK243 - Jan Van Den Berg (42m) Vertrouwen (40m)	Olrac	Netherlands
Carmona (37m) Zaima (35)	OTS	Sweden
Aeolus Harvest Reaper (17m)	Traceall	UK
Cedre bleu Amour de la mer (20 m) Vaubau Marie Catherine	Sodena Adicio	France
Marina (25m) Vaal (25m)	OTS	Latvia

Figure 1: Swedish trawler Carmona (2 pictures on the left) and the Icelandic longliner Duddy Gisla (right)
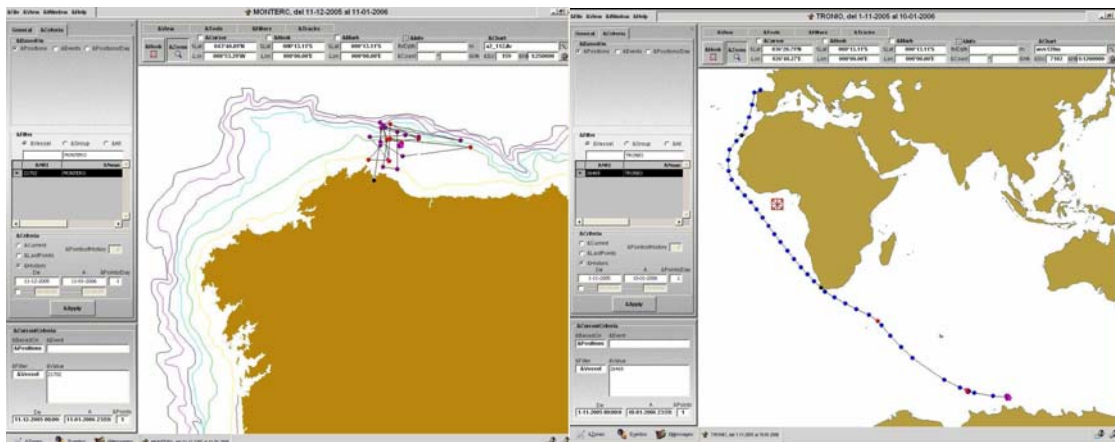
Figure 2:Montero (left) is a trawler operating in Spain's jurisdictional waters, Tronio (right) is a longliner operating in CCAMLP (Antarctic)

The project included 4 testing phases.

Phase 1	Phase 2	Phase 3	Phase 4
-XML/NAF reporting -Message length -Communication costs	- Encryption/Authentication -Acknowledgement of receipt	- Certification authority	- Inspections

XML/NAF reporting

The first step in the chain of the demonstrations was the testing of the XML schemas for the various reports. The specifications foresaw 26 reports. However companies developed only those reports most representative for their vessels. Similarly the Norwegian authorities tested the NAF (North Atlantic Format) format of nearly the same reports. JRC developed a translator from NAF to XML and vice versa. One can find it under http://fish.jrc.cec.eu.int/sheel/publications/tools.htm

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Message Length

While most of the reports remain relative short due to the limited amount of information they include, the report with the most variable size is the catch report. Catch reports depend on the number of caught species on board. Even if a vessel may target one species it is unavoidable to have more than one on board. We found that the size varies from 200-900 bytes approximately for catch reports of one species and from 300-1400 bytes for 10 species. This includes all companies except INOV who only use 60 bytes for one species and 150 bytes for 10 species. This however is not the XML message length but a binary coded file that is produced for submission through the INMARSAT C satellite and can be translated into XML, once it is in the flag state authority.

Communication Costs

A variety of sea-to-shore communications were tested throughout the project. Also here there were 2 "schools" those that insisted to use Inmarsat C and those who tried other broad-band communication systems such as Inmarsat Fleet and Iridium or even just GPRS. Those faithful to Inmarsat C worked a lot on the message compression such as INOV or used the NAF format such as the Norwegian authorities. Indeed the Inmarsat C transmissions were the most expensive reaching 5$ per kbyte. Those using other terminals often didn't give as much attention to the compression as the few Kbytes messages had a negligible cost when compared to the whole set of the skipper's communications throughout the trip.

Encryption/Authentication

Encryption with a symmetric key was applied by some companies before compression. Encryption has a compression effect on large messages however in small messages (up to few hundred bytes it adds length. This becomes critical in case of Inmarsat C transmissions.

Some companies such as Sodena and Traceall used hard locks to create electronic signatures and to attach them to the messages for authentication. The hard lock's number combined with the vessel's number create a hash which is attached to the message and is destroyed if someone else will try to modify the content of the message. Only the authorities can check the correctness of the hash.

These methodologies were proposed as fast solutions without investigating their legal validity and their capability to withstand the court's investigations in the case of a suit.

Acknowledgement of receipt

Acknowledgement of receipts (ACKs) were tested as a method as a legal evidence for the reception of the message by the authorities. There were two types of messages tested in Sheel. Those including only one report, i.e. each report was submitted individually, those including a bunch of reports, i.e. all reports prepared in a day sent to together as a single message. Some companies provided solutions of ACKs message per message, some report by report. Some further issues were investigated such as the acknowledgement of the message acceptance by the shore system. Olrac developed some ACKs containing reasons in case of the failure of the message to be accepted by the system such as XML scheme incompatibility, missing information etc.

Certification Authority

Company Ubizen developed a solution for a simplified certification authority. The concept of the Certification authority is based on the principle that some entity with legal validity distributes a set of 2 keys to certified users of its service. The 2 key concept one private and one public is the only concept legally accepted by the courts all around the world since it doesn't require key exchange in order to work. The certification authority is in charge of

ensuring private keys remain secret and in use for only certain periods of time and certain user characteristics. The private key of a user is used to certify his identity and the public key of some other user is used to send encrypted messages to him. He can only decrypt them by using his private key.

In Sheel each flag state should act as certification authority and distribute the keys to their skippers. In order to reduce this effort Ubizen preferred to create only to fake countries "Portugal" and "Sweden" and to assign all Sheel vessels to those two. The certificates produced used the standards ?????, had only a few characteristics, name of the skipper and vessel radio call sign and a validity until the project's end.

Although the technology was applied and tested it was hardly used routinely, since no issues of legal approval were arisen throughout the project. Both skippers and authorities were rather concerned with the electronic logbook's user friendliness than with legal aspects and they didn't take the extra effort to authenticate their messages by using their private keys. Most companies didn't create a sufficiently easy environment for the use of the 2 keys and skippers had to go through complicated procedures. Furthermore the authorities didn't want to take, at least in this stage, the extra effort to the complicated operation of managing keys. Therefore the benefits of using a CA could not be sufficiently highlighted in this project.

Inspections

Testing the inspections in the electronic logbook era was the aim of this part of the demonstrations. Issues to be looked at were:

> ➢ Is the electronic logbook installed and properly running?

> ➢ Can the information needed for inspection be retrieved easily and with the required detail?

> ➢ Are reports stored together with their acknowledgements of receipt

> ➢ Can the inspector sign the inspected reports or leave any type of evidence of his on-board inspection

> ➢ Can the systems provide all possibilities for inspection if coastal state different to the flag state?

In Sheel only landing inspections were carried out and only by flag state inspectors. All inspectors could confirm that the software was up and running and they could the various reports. However most complaint that it was not easy to retrieve the information concerning the whole trip. In most of the cases reports were not stored together with their ACKS and if yes only in the e-mail inbox. No software provider had foreseen possibility for the inspector to leave an evidence of his on-board visit.

Generally speaking SHEEL was not properly prepared for dealing in detail with the on-board inspection in an electronic logbook era. Although the on shore authorities requirements were taken into consideration in detail, not the same was the case for inspections. Much more work is required in the future to sufficiently prepare the system for on board inspections and in particular cross country inspections.

Deliverable No	WP No	Deliverable name	Date due	Actual/Forecast delivery date	Lead Contractor
D12	1	Demonstration planning and performance	01/01/2006	31/06/2006	FRI
D13	1	Demonstrator	01/01/2006	01/01/2006	JRC

Work package 7: Consolidation

Work-package leader: Navigs S.A.R.L – France

Sheel in general achieved its objectives also due to the non paid collaboration of the skippers that gave access to their vessel facilities for the demonstration. The 15 skippers of Sheel have been the main interface with the fishing industry. They helped to develop user friendly on board software, they gave allowed installations on board, they learnt themselves how to use the software, produce reports and send them to the authorities. The Sheel skippers remained in the project until the end and although they often expressed themselves against the use of the electronic logbook as enforcement tool they also understood the simplification it offered for their jobs and the new opportunities this technology would offer them in the long term.

A number of technologies as defined in Sheel could be standardized or further developed so as to reach standardization maturity. These could be:

o   The reporting system

o   The XML schemes

o   The report exchange methodology

o   The acknowledgement of receipt system

o   The authentication and security methodology

More work should be carried out to standardize the inspection mechanism, prepare procedures and provide training to the inspectors.

Deliverable No	WP No	Deliverable name	Date due	Actual/Forecast delivery date	Lead Contractor
D18	1	Guide for developing a draft standard	01/07/2006	01/06/2006	FRI
D19	1	Consolidation assessment	01/07/2006	15/07/2006	Navigs

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Consortium management

All deliverables
All project deliverables can be found in the web-site:

http://forum.europa.eu.int/Members/irc/jrc/jrc_sheel_project/library?l=/deliverables&vm=detailed&sb=Title

Figure 3: All Sheel deliverables

Summary of meetings and workshops

Puerto Celeiro 4th progress meeting summary

The 4th SHEEL progress meeting took place in Puerto Celeiro – Spain on the 19th and 20th of January 2006. The goal of this last progress meeting was to draw a last picture of the software development status. During the SHEEL trials, the 4 phases were the following:

- Phase 1: Installation onboard the trial boats and successful transmission of electronic reports to the shore side systems.

- Phase 2: Implementation of acknowledgments of the sent messages. Use of encryption to secure the message transmission

- Phase 3: Testing of the CA/PKI infrastructure with cross border message exchange

- Phase 4: Simulation of onboard trial inspections using the SHEEL software.

Not all the software developers and national authorities have managed to complete the full set of trial phases and this last meeting was the chance to share experiences with the other partners. The reasons why some haven't been able to implement or test certain aspects of the trial requirements are very valuable for the global understanding and the assessment of the difficulties that the deployment of electronic logbooks represents.

The software houses were asked to summarize the experience they gained from the trials, outlining both successes and difficulties in the following fields:

- Software interface (modifications of the software based on skipper feedback)

- Communication cost analysis (euros per report or day of reporting)

- Acknowledgment (response time, delay problems, technical implementation)

- Security (overhead to the message size, key management)

- Inspections (inspector feedback, feature wish list, benefits and drawbacks of the E-logbook)

National authorities were also encouraged to share their experience on the trials, how they perceived the introduction of the E-logbook in terms of managing the fisheries activity in general.

Other partners stepped in to contribute to the discussion, satellite communication providers, contributors and observers.

The slides of the presentations can be found on the CIRCA website at:
http://forum.europa.eu.int/Public/irc/jrc/jrc_sheel_project/home

Final SHEEL meeting Arona: Conclusions

This final SHEEL meeting was a meeting to draw the following conclusions on the project:

SHEEL has undoubtedly proved the technical feasibility of the European electronic logbook.

SHEEL has addressed the main issues concerning the e-logbook while fueling an intense debate and constructive discussions amongst all the stakeholders: fishermen, authorities and software developers.

The project ends, the SHEEL acronym will most likely disappear and will not become a standard as such. On the other hand the ideas, the experience and the outputs of the project have greatly influenced and will continue to influence the future shape of the e-logbook.

From the developers' standpoint, an extensive and valuable experience was gained from the project. It allowed them to make contact with several national fishing authorities and fishing industries, which will be very useful when a larger scale software deployment will take place.

From an authority's standpoint, they have now a much clearer idea of what the e-logbook is, what the benefits are and what the challenges are likely to be when time comes for deployment.

So as a final word we can say that SHEEL has greatly influenced the shaping of the future European e-logbook. The process is now a political one and it is out of our hands.

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Use and dissemination

SHEEL Electronic Mailing List: sheel@jrc.it

The SHEEL e-mailing list aims at facilitating the communication between potential stakeholders and the partners of the consortium. Any member of this mailing list can post messages.

SHEEL Web site: http://fish.jrc.it/sheel/

In addition to the use of the electronic mailing list, a Web site has been launched containing information about the project itself and its activities including contact details, background information, working papers and information on events. The site keeps up to date information about the meetings, public documents and dissemination materials.

SHEEL Interest Group:
http://forum.europa.eu.int/Public/irc/jrc/jrc_sheel_project/home

This is a web based forum that offers a private space on the Internet. It aims to fulfil needs such as sharing information, viewing documents, organizing meetings, participating in discussions and in general maintaining project data in a secure Internet site. The SHEEL Interest Group is available under the Commission's CIRCA server and users can access this through a log in User ID and Password. CIRCA provides authentication and security through data encryption (SSL).

SHEEL Newsletter

"SHEEL News" aims to improve the communication among people who are interested in fisheries logbooks. It is published once every year and includes regular features about the progress of the SHEEL project. Given the limited duration of the project (30 months– starting in January 2004), we expect to publish 2 issues in total. This newsletter is available on the SHEEL web site at http://fish.jrc.it/sheel/publications/newsletter.htm and posted to the SHEEL mailing list sheel@jrc.it. Through this newsletter, the SHEEL consortium wants to create a space to disseminate information and keep interested people informed about initiatives undertaken by the consortium. Each newsletter will include an update of the progress of the project as well as a brief description of future actions, meetings and other relevant events.

SHEEL brochure

A SHEEL brochure is available at http://fish.jrc.it/sheel/publications/reports.htm in 19 European languages providing an overview of the project.

SHEEL Discussion Group: http://pta.jrc.cec.eu.int/login.gx

This is a discussion group made in an early stage of the project to accommodate very urgent needs. Therefore, it is considered as a first attempt to make a private space for sharing and exchanging information about the project. However, after the launch of the SHEEL Interest Group, its use is deprecated. Users who want to access this discussion group need a log in User Name and Password.

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Annex1

Modification of the work of Partner 6 (Radiomidun).

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Modification of the Work of Partner Nr. 6 (Radiumidum)
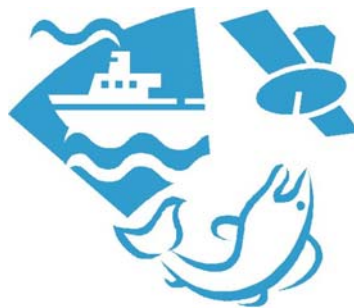
Annex2

All JRC's mission reports can be found in the Circa web site

http://forum.europa.eu.int/Members/irc/jrc/jrc_sheel_project/library?l=/management/mission_reports&vm=detailed&sb=Title

			Title+	Items	Owner	Size	Date	Version	Language	
			Previous Section							
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	i	☐	2005-05-27_NETHERLANDS.pdf		baillto(cec)	2375K	06/07/2006	1.0	EN (English)	✉
	i	☐	2005-06-13_SPAIN.pdf		baillto(cec)	665K	06/07/2006	1.0	EN (English)	✉
	i	☐	2005-06-30_SWEDEN.pdf		baillto(cec)	1471K	06/07/2006	1.0	EN (English)	✉
	i	☐	2005-10-06_SCOTLAND.pdf		baillto(cec)	488K	06/07/2006	1.0	EN (English)	✉
	i	☐	2005-11-19-23_SWEDEN.pdf		baillto(cec)	521K	06/07/2006	1.0	EN (English)	✉
	i	☐	2005-11-25_NORWAY.pdf		baillto(cec)	182K	06/07/2006	1.0	EN (English)	✉
	i	☐	2005-12-07_HOLLAND.pdf		baillto(cec)	2247K	06/07/2006	1.0	EN (English)	✉
	i	☐	2005-12-22_SPAIN.pdf		baillto(cec)	221K	06/07/2006	1.0	EN (English)	✉