PROJECT REPORT
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Rannsóknastofnun fiskiðnaðarins

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ORKUSPAR
An Energy Effiency Improvement Simulator (2nd Report)

Eva Yngvadóttir
Helga R. Eyjólfsdóttir
Sigurjón Arason

Skýrsluágrip Rannsóknastofnunar fiskiðnaðarins
Icelandic Fisheries Laboratories Report Summary

Titill / Title	**ORKUSPAR-The Energy Efficiency Improvement Simulator**		
Höfundar / Authors	*Eva Yngvadóttir, Helga R. Eyjólfsdóttir, Sigurjón Arason*		
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Ágrip á íslensku:

Þessi verkefnaskýrsla greinir frá öðrum verkefnafundi í fjölþjóðlegu verkefni sem nefnist "ORKUSPAR-hermir til að bæta orkunýtingu." Um var að ræða tveggja daga verkefnafund sem haldinn var í Reykjavík 24-25 febrúar 2002.
Markmið fundarins var:

- að fara yfir þá vinnu sem búið er að framkvæma í verkefninu fram að þessu
- að ræða notkunarmöguleika og útlit hermisins
- að ræða næstu skref í verkefninu
- að gera framkvæmdarplan fyrir næstu skref í verkefninu

Verkefniðhefur gengið vel, það er aðeins á eftir í tímaáætlun þar sem lengri tíma hefur tekið að vinna að skilgreiningu fiskiskipa en gert var ráð fyrir í upphaf verkefnisins.

Þáttakendur í verkefninu eru frá:
Íslandi: Rannsóknastofnun fiskiðnaðarins, Tækniskóli Íslands. Orkustofnun, Grandi hf og Skipatækni ehf.
Svíþjóð: Evenesk Energi, Energivision EB og Fiskeriverket
Noregi: Vestlandsforskning

Lykilorð á íslensku: *Orka,sparnaður,hermir,sjávarútvegur,flutningaskip,verkefnafundur*

Summary in English:

This project report describes the second meeting in a European project called "ORKUSPAR – an energy efficiency improvement simulator", held in Reykjavík 24-25 February 2002.
The goal of this meeting was:

- to discuss the work that has been done in the project until now
- to discuss possible use of the simulator
- to make decisions about how to proceed in the project
- to make an action plan for the work that needs to be done in the project.

The project is proceeding well according to a slightly modified schedule. The specification part has taken more time than had been anticipated at the start-up meeting.

The participants in the project are as follows:
Iceland: Icelandic Fisheries Laboratories, The Icelandic College of Engineering and Technology, The National Energy Authority in Iceland, Grandi hf, Skipatækni LTd.
Sweden: Energivision Stockholm, Swedish Energy, National Board of Fisheries in Sweden
Norway: Western Norway Research Institute

English keywords: *Energy, economy, simulator, fishing industry, freight shipping, work meeting*

1. INTRODUCTION

The second meeting in the project "ORKUSPAR – An Energy Efficiency Improvement Simulator," was held in Reykjavík on February 24-25 2002. ORKUSPAR is a two year project that officially began on April 1. 2001.

Since the first meeting, which was held in Reykjavík in May 2001, the participants have worked on different phases in the project with the main focus on the specifications for a fishing vessel. The project has also been introduced at several occasions during this period. The next step in the project will be to focus more on the most relevant parameters that affect the oil consumption in a fishing vessel and to consider which questions and what kind of situations the simulator should take into account. When this will be finished, the work on the development of the prototype for the fishing vessel can start. Furthermore, a considerable work will be carried out to specify the energy usage in cargo ships as well as in land-based fishing industry.

2. OBJECTIVE

The goal of this second meeting was to:

1. Discuss the specification that have been made for a fishing vessel
2. Discuss possible use of the simulator. What kind of information should be used and in what form should this information be.
3. Make decisions about how to proceed in the project.
4. Make an action plan for the work that needs to be done in the project.

3. DISCUSSION

At the beginning of the meeting, the participants from the different countries introduced the work they have been doing since they met last time in May 2001.

Iceland: Participants from Iceland have been working on the specification part for the fishing vessel. Precise specification has been made for the fishing vessel and an

explanatory statement was made and sent to the participants before the meeting. The specification required much more work than had been anticipated at the start-up meeting in 2001. The specifications are in appendix 2. Those parameters marked with x will be used in a prototype. The project has been introduced in several ways:

- On the IFL homepage
- In a lecture and proceedings at an Energy conference, held in Iceland in October 2001.
- In an article, published in December 2001, in the Icelandic journal Ægir (a trade journal for the fishing industry).
- Some work has been done on the project's Internet homepage which will be stored on the IFL server in Reykjavík. The homepage contains links to other partner's homepages. http://www.rf.is/verkefni/Orkuspar/index.htm

Sweden: Participants from Sweden have gathered information about energy and simulation projects that are going on in Sweden, Norway and Denmark in this field. It seems there are lot of on-going projects in this field, especially regarding cargo ships. These projects, however, are not based on simulation or computer programming.

Norway: Participants from Norway looked into preliminary specification for cargo ships, see appendix 2. They have also introduced ORKUSPAR on the WNRI web page.

During this second meeting, the specification for the fishing vessel was introduced and the participants discussed them in detail, especially the purpose and possible use of the information the simulator will give. After the meeting an action plan was made. The plan indicates clearly the work which each participant needs to perform and the date when it should be finished. This action plan is in appendix 3. Following topics were discussed thoroughly.

Specification

1. The specification for a fishing vessel that was submitted before the meeting to the participants are too detailed but will be a good base for further work. When making the prototype it will be important to pick out the most relevant factors influencing the oil consumption on a fishing vessel. The prototype should be a simple version of the final simulator.
2. After the specifications for the fishing vessel are reviewed, the specification for cargo ships and land based fishing industry will be made. It is the participant's opinion that these systems will be easier to deal with because of the nature of those systems.
3. The specification needs to take into account cost parameters like investment cost, maintenance cost, payback time etc.

Input data

Input data should be based on either database or defined actions. It is important to define several situations concerning fishing vessels, fishing gear and fishing trips where the simulator should be able to give an answer, e.g. how do these circumstances affect the oil consumption or the environmental impact. Although this data will be stored in a database, it is important to have the possibility to change the predefined data.

Output, usage

1. The output should focus on oil consumption and greenhouse effects. The program will show graphically how the oil consumption is affected by different actions, for example (steam, fishing, freezing, processing, etc.)
2. The potential use of the simulator will for example be:

A.

- How will the oil consumption change if the weight of the trawl will change from 20 tons to 25 tons? Compare.

- If the strain on the engine is too much with this operation, the simulator will indicate this with a red light.
- What can I do to make this realistic? (the user changes parameters by hand, goes e.g. in the action of consumers usage of electricity and changes some parameters there.)

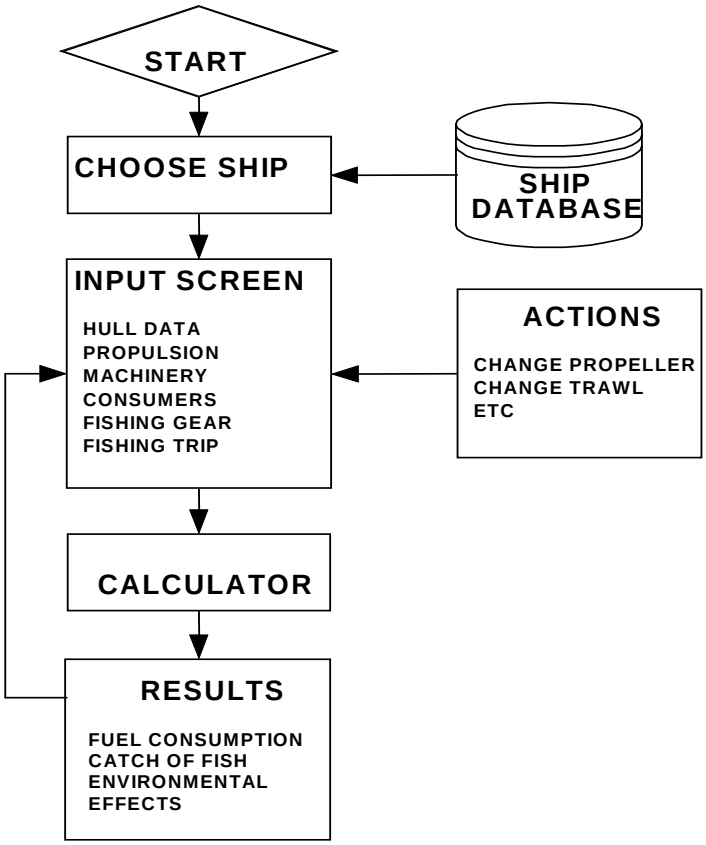
B. If the diameter of the propeller is altered, does the ship better manage the strain? Are changes needed to be done on the ship?

C. Input: The cost of a new gear. Output: The oil consumption has gone down X%

D. Input investment cost. Output: The payback time in years, relative to the price of the oil at a certain time.

Simulator

1. During the making of the prototype, the programmers want to have as few parameters as possible. Fewer parameters make the testing phase easier.
2. The participants want to make a user friendly program. In that way, the data the user will need to put into the program will be minimized.
3. Each vessel, machine, fishing gear has its own name or id number. Included in the simulator will be a database with a certain numbers of ships, machines and fishing gears with the most important parameters affecting the oil consumption that end-user can use. Also, there will be a possibility for advanced users to define their own vessel.
4. A flow-chart of the simulation program is shown here. Each input will be changeable.



Other matters

1. The participants will continue to use every opportunity to introduce the project and the simulator.
2. Participants will continue to send quarterly reports to the project coordinator so that the progress of the project can be properly monitored.

Status of the project

A decision was made in November 2001 to wait with the questionnaires until an agreement has been reached about what the real output will be from the simulator and what information will be put into it.

The specification part has taken more time than had been anticipated at the start-up meeting, but otherwise the project is proceeding well according to a slightly modified schedule.

4. RESULT

Productive discussions between participants lead to the following main decisions:

Specification

1. Reconsider the specification for a fishing vessel according to point 1 above. Go over the formulas. Label the end results of each formula that will be used.

Simulator

2. The simulator can be used before and after a fishing trip. It will not be used on-line during a fishing trip.
3. A fishing trip will be the unit. The end-users define the length of a fishing trip.
4. The simulator should calculate the oil consumption and the greenhouse effects, according to certain situations.
5. In the beginning the program will be more like an advanced calculator than a dynamic program
6. After SCIMUS has received the revised specification for a fishing vessel they will go over the tables and put the parameters into certain categories. They will check which are constants (definition here; values that do not change between fishing trips) and which parameters will change.
7. The simulator will be an Internet-based program. That makes all the update easier. All updates will be available for everyone at the same time.
8. The simulator will be a static program where it will be easy to enter the parameters, but these are based on actions. Dynamic program-smart solver, would be too big to build for this project (budged wise)

9. A prototype version of the simulation program will be completed by September 2002. The program is then going to be tested and modified. A complete version of the program is planned to be in use by the end of this year.

Possible use, output

10. The end-users will make a list of the questions they think the simulator should answer, what kind of situations do the end users want to get answers for?
11. Define selected actions that affect the oil consumption
12. Specify what kind of actions Grandi wants to get out of the simulator.

5. CONCLUSIONS

During this two day meeting, the participants had successful discussions about the specification of the fishing vessel and the possible use of the simulator and the results of the project. The participants got to know each other better, both socially and professionally. The group had a good visit to one of Grandi's fishing vessels, Venus. The participants need to work well together between meetings and continue to be in good E-mail and/or phone contact.

The date of the next meeting will be decided later.

6. APPENDIX

1. Proceedings from the meeting
2. Specification for fishing vessel
3. Action plan