Presentation of a project for crew reduced vessels for the transport of dangerous goods by inland waterways

Submitted by the Government of Belgium

Presentation of the joint project between SEAFAR and HGK Shipping
Joint project between SEAFAR and HGK Shipping

ADN Safety Committe 40th Session
Geneva 22nd – 26th August

Janis Bargsten (Chief Commercial Officer, SEAFAR) & Maria Schippers (Head of Group Projects & Digitization, HGK)
Agenda

1. Introduction SEAFAR
   • Market challenges
   • SEAFAR’s solution
   • Owner’s value add by SEAFAR

2. Introduction HGK
   • Introduction HGK Group
   • Business Case for semi autonomous sailing in Belgium
   • Route Selection

3. Risk Analysis ADN
What do we see in the market?
SEAFAR Solves 3 Majors Challenges
Our Focus Inland Shipping

1. **Crew shortage** as limiting factor
   - Limiting growth of the fleet
   - Limiting earning potential per vessel
   - Quality/Safety concerns

2. **Investments** needed to meet **sustainability targets**
   - Fleet renewal process slowed down
   - Uncertainty around technological readiness
   - Extended time to achieve positive ROI

3. **Low safety record**
   - 80% of accidents due to human error
   - Overworked crews resulting in unsafe operations
   - Operations in grey zone

*Intergo Phase 2b Report 2021 - [Link to Report]*
How does SEAFAR help solve the industry’s challenges?
Seafar
Operating vessels from a Shore Control Center.

SEAFAR empowers owners to increase their asset's productivity by either increasing the operational hours with the same crew onboard or operating the same hours with a reduced crew.

Future unmanned ship designs can deliver even further benefits with higher cargo carrying capacity and lower investments required.
SEAFAR's safe and trusted trajectory towards Autonomy

Levels of autonomy:

1. Steering Assistance
2. Partial Automation
3. Conditional Automation
4. High Automation
5. Full Automation = Autonomous

*Levels of Autonomy defined by CCNR - Source

- In line with regulators’ approach (human in the loop)
- Build experience and trust first by sequential development
- “Business case ready” as of today
The E2E technology & service provider for semi-autonomous shipping

Full Tech Stack Ownership

- Situational Awareness
  - Sensory Equipment
  - Data Collection
- Decision Making & Control
  - AI, Rules, Control System
- Communication / Data Transfer
  - Latency, Coverage, Reliability
- SCC Control / Monitoring
  - SEAFAR Service Model

Onboard

Onshore

- Unmistaken liability
- Reliable Interopability
- Synchronized improvements
Seafar Control System

The Seafar Control System integrates with all onboard systems. The hardware and software are engineered by Seafar.

The system can be integrated on existing vessels or new built projects.
SEAFAR offers full service navigation package

Current scope around navigational tasks*

SEAFAR’s services

Navigation
- Voyage Planning, administration
- Sailing & Maneuvering
- Mooring & Unmooring
- Organize and Control Work

Operation
- Bunkering, Ballast Water & Waste Management

Cargo handling
- Handling hoses, cleaning tanks, documentation, control/checking
- Stowage planning

Inspection
- Periodic inspections (vessel / hardwared / software, etc.)

Maintenance & Repair
- Maintenance (preparation & coordination)
- Planning maintenance by external parties

Communication
- Crew management & shift handover
- Organisation & execution of training

Entrepreneuring
- Cargo Acquisition
- Accounting
- Personnel administration
- Vessel account (port duties, etc.)

HSE, Emergencies & Calamities
- Control work & rest time, develop safety plans, safety drills

Other tasks
- Studying, waiting, housekeeping (cooking, cleaning accommodation)
- Teaching apprentices

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*Source: TASCS TOWARDS A SUSTAINABLE CREWING SYSTEM, 2018 - Link
Successful collaboration with regulators
Joint framework towards issue of permit
Regulatory Landscape
Current Operations

- Remotely operated /full crew onboard
- Remotely operated / crew reduced
- Remotely operated / unmanned
Regulatory Landscape
Application stage

- Remotely operated / full crew onboard
- Remotely operated / crew reduced
- Remotely operated / unmanned
Seafar
Shore supported fleet

Seafar currently operates 10 vessels on the Flamish waterways and coastal waters, ranging from 38m (400T) up to 110m (3000T). All vessels navigate supported by the SCC.

10

Flanders is pioneer in legislation and permits for smart shipping, making the legislator the true accelerator for innovation in shipping.
Turning vision into reality
Shore Control Center

Redundancy & Safety
Proven and continuously improved procedures and protocols

Optimal working conditions
Systems supporting precise and efficient navigation

Remote operator profile (Social Impact!)
Modern work environment on shore, close to home
Shore Control Center
DESIGN + Traffic Control

Proven design
• Control station + Traffic control
• 2 captain control rule / four-eyes principle
• Traffic control support
How does SEAFAR add value to owners?
Operations
Ship Name

Observations
• Long trajectory
• Port calls at busy terminals

February 1\textsuperscript{st} – 7\textsuperscript{th} 2022

Past 12 months
Observations
Ship Name

Specs:
Vessel Type: Containership (Rhine)
Length: 110m
Breadth: 10.4m

Operational profile:
Countries: 90% NL, 10% BE
Ports: Amsterdam, Rotterdam, Antwerp
Distance travelled 12m: 13,312 km
Ø hrs effect. navigation/day: 9,3hrs
Average speed: 7,4 kn

Implications:
1. Current operations require Name Shipping Company to operate under B regime.
2. Challenge to find qualified personnel, which requires owner to sail himself at times.
The best helmsman stand on shore.

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2000 Antwerp
Belgium
Remote Ship Management for transportation of hazardous goods
HGK Group at a glance

Key Facts
- Largest inland shipping company in Europe
- Germany’s largest inland port network
- One of the largest private owned German rail freight companies
- Regional railway network; 250 km owned network
- Owner-operator of specialised locomotive- and railway technology

Business division (revenue)
- 54% Shipping
- 37% Logistics & Intermodal
- 6% Infrastructure & Maintenance
- 3% Real Estate

Business Units
- HGK Shipping
  - Dry Bulk-, Gas Tanker- and Chemical Tanker Shipping, Ship Management
- HGK Logistics and Intermodal
  - Ports & Terminals, Freight Forwarding, contract logistics
- HGK Rail Operations
  - Railway freight transport
    - Regional- & Long-distance traffic, plant traffic
- HGK Infrastructure and Maintenance
  - Regional railway network, maintenance rail vehicle technology
- HGK Real Estate
  - Management, development and operation of port- and logistics properties

Assets
- Fleet: more than 300
- Freight locomotives: 90
- Ports & Terminals: 21
- Storage capacity: >700 ha

Performance numbers
- Container-Handlings: abt. 3 Mio. TEU
- Handling capacity ports: abt. 20 Mio t
- Cargo volume freight services: 68.0 Mio t
- Transport performance: 8.7 Mrd net tonne-kilometres

Key Customers

May 25, 2022

Seite 23
With its Business Units, HGK today offers integrated logistics solutions for sustainable transport chains
HGK Shipping at a glance

Wide product range of transported goods; from coal to windturbines and sulphuric acid

950 employees across Europe with a deep experience in highly complex industries i.e. liquid chemicals

350 inland vessels and barges, partly highly specialised, i.e. for the transport of hydrochloric acid and pressurised gases

Shipping Design Center in cooperation with INEC

45 Mio. Tons moved tonnage p.a.

Established partnerships over numerous decades with our customers. We develop individual solutions for our customers’ specific requirements

Maintaining a high level of Safety- and Innovation Culture onboard and ashore

12 locations in 5 European Countries

Own Trainingscenter for employees onboard and ashore
Organisational Structure HGK Shipping

<table>
<thead>
<tr>
<th>HGK Shipping</th>
<th>Steffen Bauer (CEO), Christian Möhrmann (CFO)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dry</strong></td>
<td>Steffen Bauer</td>
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<tr>
<td><strong>Liquid Chemical</strong></td>
<td>Norbert Meixner</td>
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<td><strong>Gas</strong></td>
<td>Anke Bestmann</td>
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<tr>
<td><strong>Ship Management</strong></td>
<td>Tim Gödde</td>
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</table>

- Transport of dry bulk and breakbulk commodities
- Treaty business (Push Barging sector) and niche business (Short Sea and Canal sector) performed with owned and chartered units
- Specialised in transporting coal and ores, metal and steel products, alumina, heavy bulk cargo, cereals, fertilisers and timber products
- Integrated supply concepts incl. operation of plant ports
- Transport of various liquid chemicals using specialised equipment
- Predominant use of own barges
- Owner of various specialised inland barges, unique in Europe
- Supplying the chemical- and paper industries as well as metallurgy and trade
- Transport of compressed and liquefied gases using exclusively our own special barges
- conception, design and construction supervision of customer-specific barges as well as operation of those barges
- Supply of various customers in the chemical industry
- Crewing
- Fleetmanagement including maintenance management, CAPEX Projects, engineering services and building supervision
- Shipping Design Center
- QEHS-Management incl. in-house training centre
Business Case for semi autonomous sailing in Belgium
Since decades Wijgula BV (being a 100% subsidiary of HGK Shipping) is transporting Sulphuric Acid for one of the world’s largest zinc producer from smelters located in the Netherlands, Belgium and France.

The product transported and especially sailing routes do require specialized barges having special dimensions and being called “Kempenaare”.

HGK Shipping is currently the only inland waterway operator for those dedicated transports.
A fleet of 9 respective 10 specialized vessels is being operated and individually dispatched according to the sailing routes’ special characteristics.

<table>
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<tr>
<th>Vessel's name</th>
<th>Year of construction</th>
<th>ENI</th>
<th>ADN Type</th>
<th>Max. Tonnage</th>
<th>Length</th>
<th>Width</th>
<th>Max. Draft</th>
<th>No. of Cargo Tanks</th>
<th>Tank's material / Coating</th>
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</table>
Liquid Chemical Fleet

10 customized Kempenaare for sulfuric acid
Operational Matrix / Background

- Vessels are manned according to RheinSchPersV (regulation for vessel's manning on the river Rhine)
- Current modes of manning are A1 (14 hours sailing) and A2 (18 hours sailing)
- A1 for motorized vessels having a length < 70 m = One captain + one sailor
- A2 for motorized vessels having a length < 70 m = One captain + one helmsman
- HGK Shipping to ensure 3.100 operational days per year, resulting in a demand of at least 9 vessels
Route Selection
Operational Matrix

• Only three different transport routes are being served

**Route A**
Auby, France  ➔ Antwerp, Belgium (sailing distance approx. 180 km)

**Route B**
Budel, Netherlands  ➔ Antwerp, Belgium (sailing distance approx. 130 km)

**Route C**
Balen, Belgium  ➔ Antwerp, Belgium (sailing distance approx. 90 km)
Sailing routes & critical waypoints

• Small bridges (smallest height of 4.80 m)

• Small locks (max. vessel’s width 6.60 m)

• Limited draft (e.g. max. 2.0 m)
Project Goals

1. Step → Trajectory Balen – Antwerp (only Belgium)
   - 1-2 dedicated vessels
   - 220 to. p.a. on this route

2. Step → Trajectory Balen – Antwerp (Belgium & the Netherlands)
   - 1-2 dedicated vessels
   - 200 to. p.a. on this route

1. Step → Balen-Antwerp (only Belgium)

- Max. vessel dimensions 55.00 m x 6.60 m x 2.3 m
- Passing of 6 locks in total
Sailing routes & critical waypoints

2. Step → Balen-Antwerp (Belgium & the Netherlands)

- Max. vessel dimensions 61.00 m x 6.60 m x 2.3 m
- Passing of 8 locks in total
Risk Analysis
Product’s characteristics

Sulfuric acid (> 51% = UN 1830):
• Corrosive
• Non-Flammable
• Avoid dispersing into the environment

The management and employees of HGK are very well aware of the risks to be associated with the transport of dangerous goods and many measures have been taken to minimize the risk. Measures have been laid down in several documentations, for example:
• The HGK Shipping quality manual
• The ADN (regulation for transport of dangerous goods on inland waterways)
• Training schedule for HGK Shipping employees incl. individual trainings for respective assets, transports and products at HGK Shipping’s own Trainingcenter
**HGK Shipping´s Safety Culture**

**Zero Incidents**
- Zero Severe Incidents to people
- Zero Incidents to the Environment

**Strong Safety Culture**
- We actively encourage our Crew for Safety underlined by personal visits of our senior management

**Strong Safety Record**
- Low Incident rates and low numbers of remarks during independent inspections, e.g. EBIS or BIRE

**Best in Class Safety Equipment**
- Our Barges are equipped with additional equipment that is unique in Inland Navigation

**Certificates**
- ISO 9001, ISO 50001, Ecovadis Silver, Green Award
Why Remote Ship Management is necessary?

Actual and future lack of qualified personnel

Potential to counter issues related to crew shortage and to optimize operational matrix and vessels occupancy

- Realization of manning mode „A1“ = 14 hours of sailing with support of SCC only having a sailor aboard
- Realization of manning mode „A2“ = 18 hours of sailing with support of SCC for vessels currently being manned according „A1“ requirements
- Realization of manning mode „B“ = 24 hours of sailing with support of SCC for vessels currently being manned according „A1“ or „A2“ requirements

Vessels dimensions don't allow 3rd crew member on board at all

One-of-a-kind fleet required but not offering the welfare more modern and bigger inland vessels are

Potential to decrease amount of vessels required to operate

- Decrease gasoil consumption
- Decrease emissions
- Decrease traffic on Belgian canal waterways

Remote ship management has the potential to tremendously support the modal shift in favour of IWT and related sustainability targets set for the whole logistics business.
Status quo and why ADN?

- Seafar has very good experience with more than 10 operating dry cargo vessels on the Flemish waterways.
- To realize a holistic strategy for the inland waterway industry we cannot exclude gaseous and liquid chemicals product flows.
- This group reflects 15% of the European inland waterway vessels.

- About 25% of HGK Shipping´s fleet are chemical and gas tankers.

HGK Shipping wants to be a pioneer for safe and innovative ADN transportation in the inland waterway industry, to empower the whole transport mode to realize its full potential.
Risk Analysis

Please see attached Excel file „Risico Inventarisatie ADN 25-05-2022“
Thank you for your attention

May 25, 2022