

Radically new approach to Hull/Vessel design. Protecting Icelandic Coast Guard crewmen in extreme conditions



Icelandic Coast Guard

May 2015



RAF NAR

The cooperation between the Icelandic Coast Guard (ICG) and Rafnar

- Rafnar was designing and patenting a new hull design, the OK Hull, and needed to have it tested, challenged and used in extreme conditions by experienced operators => The logical proving ground for Rafnar was the ICG
- **The essence of the cooperation is instant, direct, and „no nonsense“ feedback based on real life situations, feedback that is instantly incorporated into the design process**
- The ease and the simplicity of the cooperation between ICG, being a government institution, and Rafnar, a private company, has a lot to do with the *characteristic of the icelanders*, being a small island nation

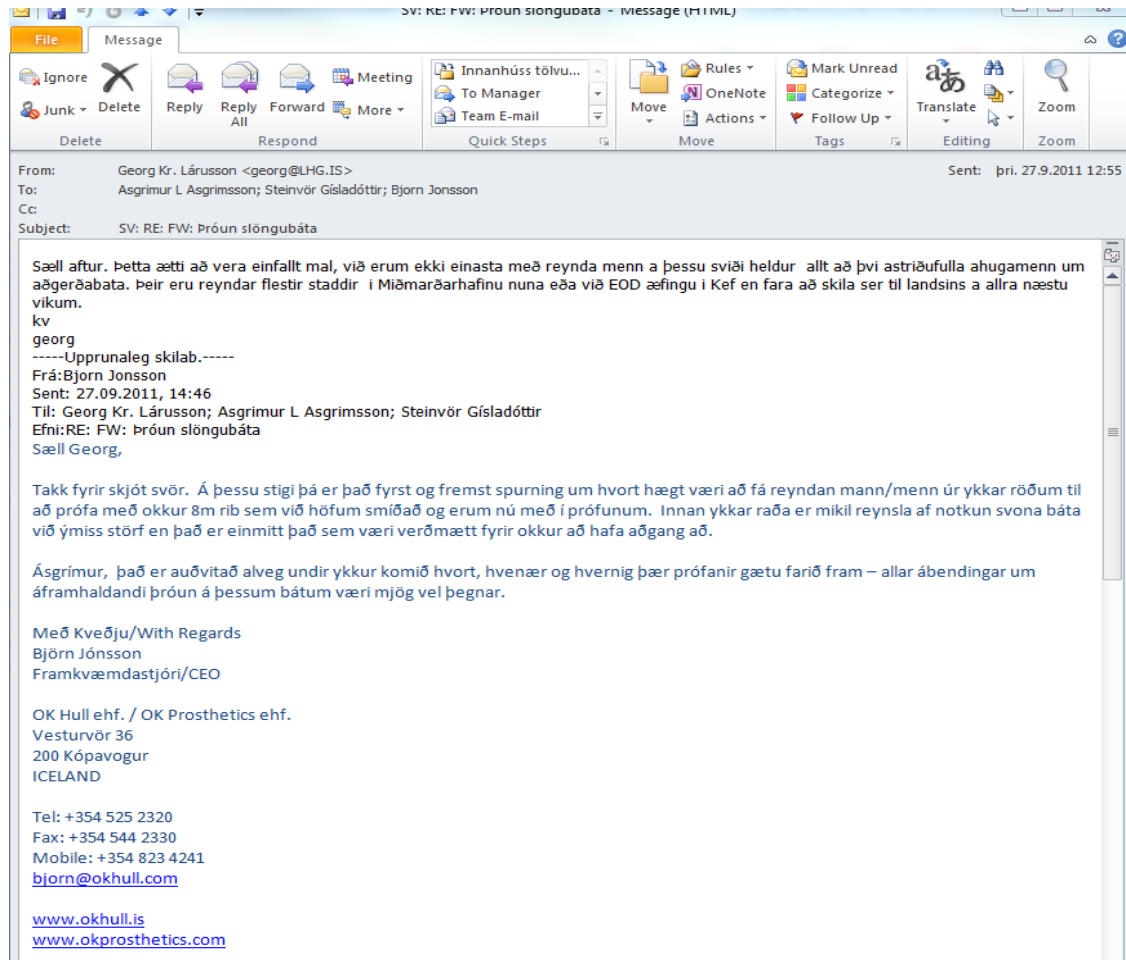
What is an Icelander?

- What are stereotypical „Icelandic traits“? How can you define an Icelander?
 - Generally hardworking, rooted in harsh terrain
 - High equality in Iceland, equal opportunities
 - Not easy to get to know, and considered rude by many
 - Small society, small island population of total 320 thousand people, therefore *everyone knows everyone*
 - The former president of Iceland, Mrs. Vigdís Finnbogadóttir once said that Icelanders might only be 320 thousand but we behave like 3.2 million

„Icelanders like losers, as long as they lose to Iceland that is“
„Xenophobe´s guide to the Icelanders“



Everyone knows everyone => an email to the Director General of the ICG in 2011

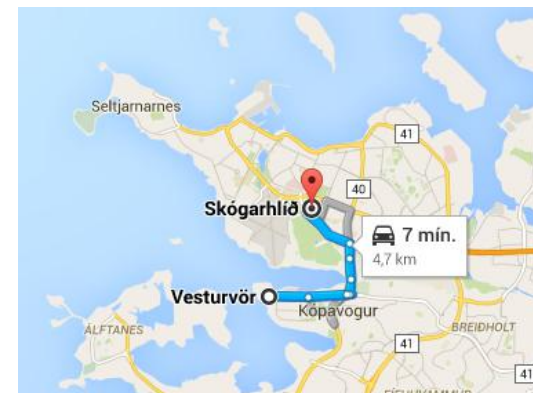


The essence of the cooperation

The cooperation is based on the following facts

- Everyone is easily reachable and can react at a short notice
- Short distance between the ICG and Rafnar
- Instant, direct, and „no nonsense“ feedback
- Quick feedback that can be instantly incorporated into the design process
- Based on dealing with real life situations
- Looking towards the criteria for the final product during the whole design process

„Early settlers had a hard time. Then the climate eased and by the mid 12th century there was spare time to devote to fighting“
„Xenophobe´s guide to the Icelanders“



The traditional tasks of the Icelandic Coast Guard

- **Safety and Security surveillance and Law enforcement at sea**
 - Protection against illegal activities such as illegal migration and illegal drug trafficking
 - Fisheries control and enforcement
 - Pollution surveillance and response
 - Natural resource and Environmental protection
 - Salvage and Rescue diving
 - International cooperation
- **Defence and Security**
 - Includes operation of the NATO Iceland Air Defence System and Control and Reporting Centre, CRC, Keflavik
- **Explosive Ordinance Disposal “EOD”**
- **Search and Rescue**
- **Emergency medical transport**
- **Hydro graphic surveying and nautical charting**
- **Assistance to Law enforcement on land**
- **Civil protection**



Icelandic EEZ and SRR

ICELANDIC COAST GUARD

The Icelandic EEZ (IEEZ)

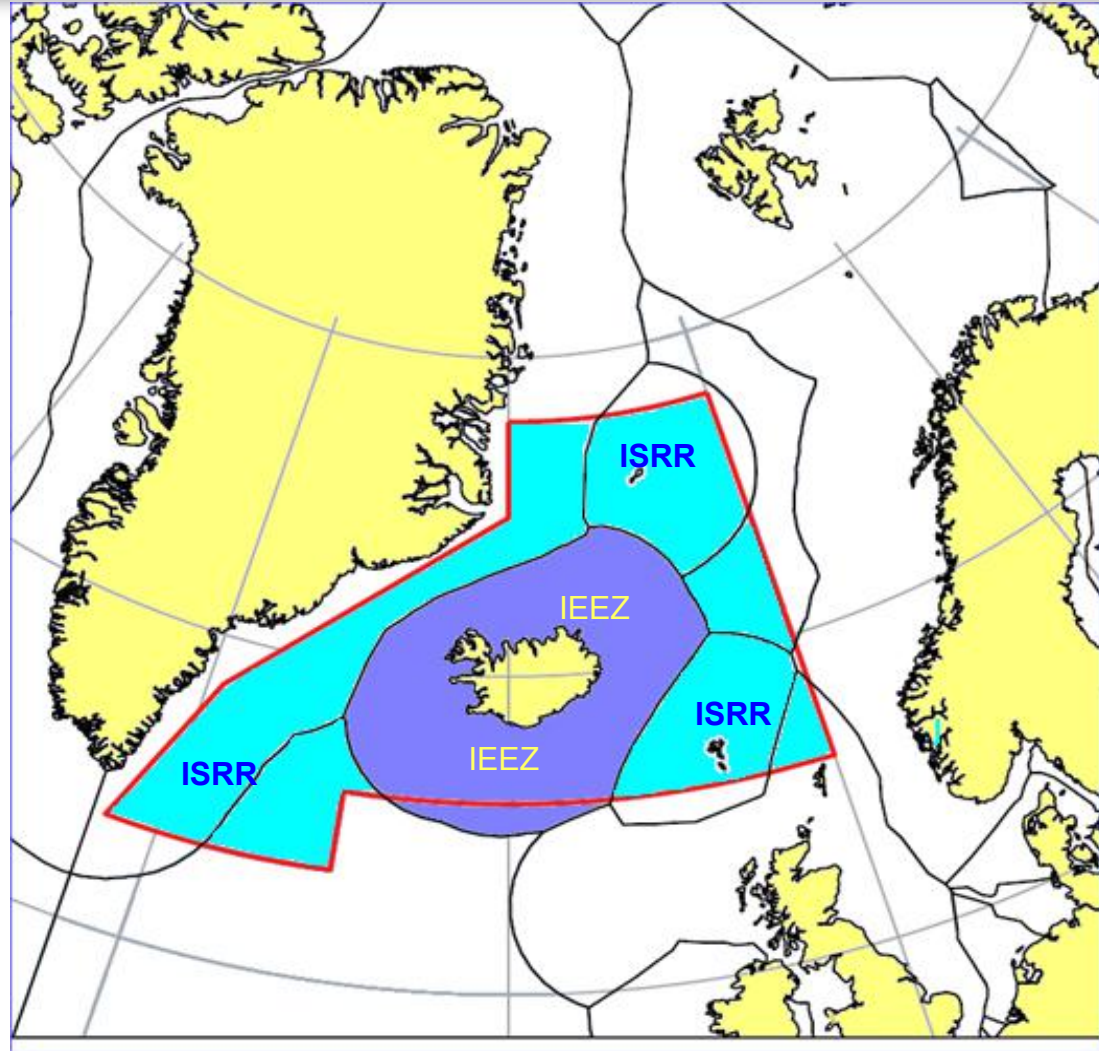
- **754.000 km²**

- There are ca. 1600 vessels on the Icelandic registry
 - Up to 1000 vessels at sea
 - Licensed foreign fishing vessels
 - Over 1800 arrivals from abroad every year

Icelandic SRR (ISRR)

- **1.9 million km²**

- ICG responsible for Maritime and Aeronautical SAR
- JRCC operated by ICG





SAR and EMS tasks

ICELANDIC COAST GUARD

- **Flights**

- **130 – 190 pr. year**

- 55 % EMS
 - 45 % SAR

- **Operations Centre (2013)**

- **Total incidents** **486**

- Emergency 60
 - Alert Phase 135
 - Uncertainty Phase 291

EMS flight to a Lithuanian vessel 115 NM SW of Iceland



ICG's take on the cooperation

- After the financial crisis in 2008
 - Reduced funding for the operation of the ICG
 - Changed operational platform, more cost efficient
 - Better use of funding with smaller and less costly equipment
 - Smaller vessels, good results in short time. Up to 1000 vessels at sea for coastal fishing during spring and summer
- Challenging conditions in which to operate
 - Ever changing weather
 - Significant wave height, avg. 3-4m
 - Long and difficult coastline, 2700nm
 - Strong coastal currents



Instant, direct, and „no nonsense“ feedback



Instant, direct, and „no nonsense“ feedback



Timeline for the cooperation, 2011 to 2015

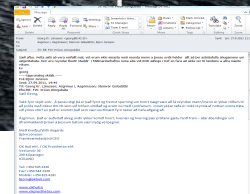
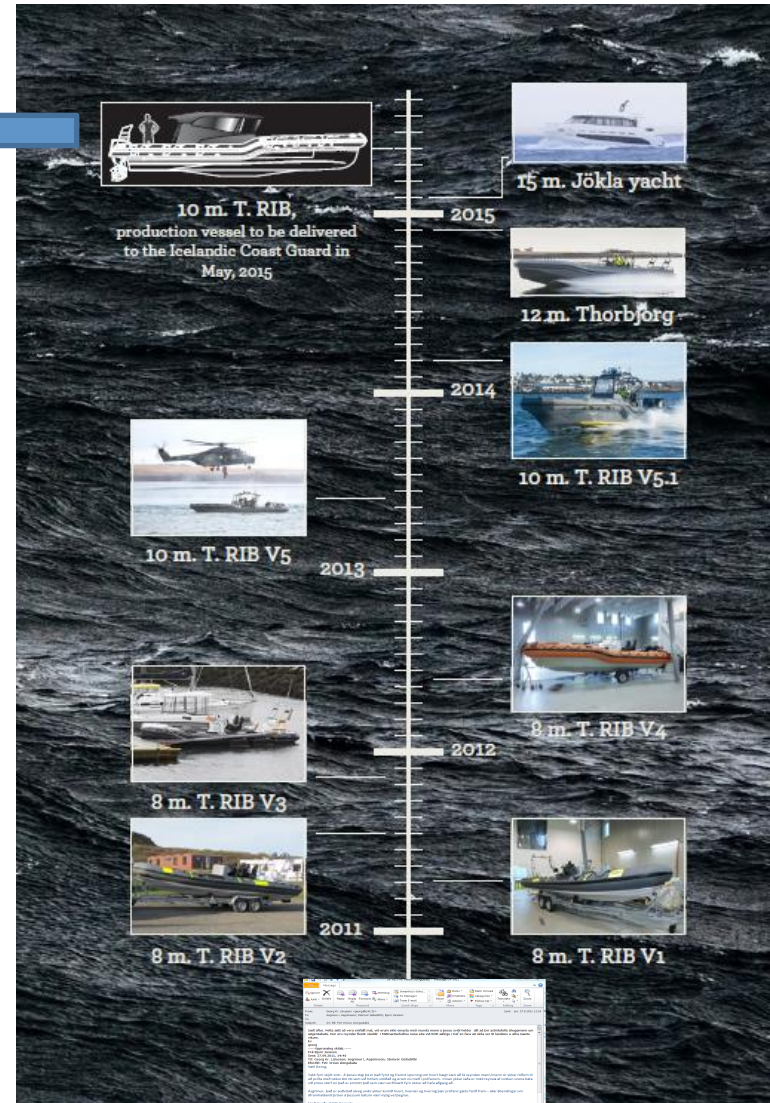
Leiftur 1000 Tactical
ÓÐINN
 #5001

Length 10.00 m
 Beam 3.30 m
 Draught 0.55 m
 Displacement 4.1 tonnes
 Max Speed 40 km
 Cruising Speed 29 km
 Fuel capacity 28.300 litres
 Range @ Cruising Speed 210 nm
 Deck Space 16 m²
 Engines 2x 450 HP Yamaha

May 2015

RAFNAR

„The average farmer is considered well able to solve most of life’s problems given 20 minutes, a hammer and a piece of string“
 „Xenophobe’s guide to the Icelanders“



Four generations of ODINN



Leiftur 1000 Tactical

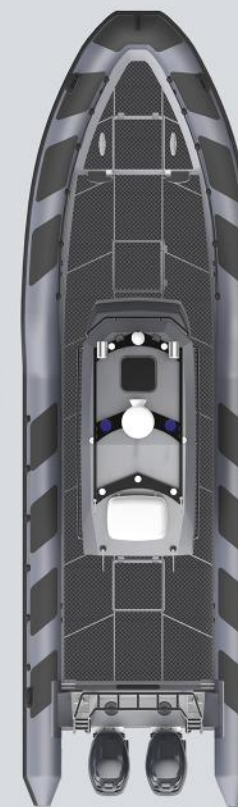
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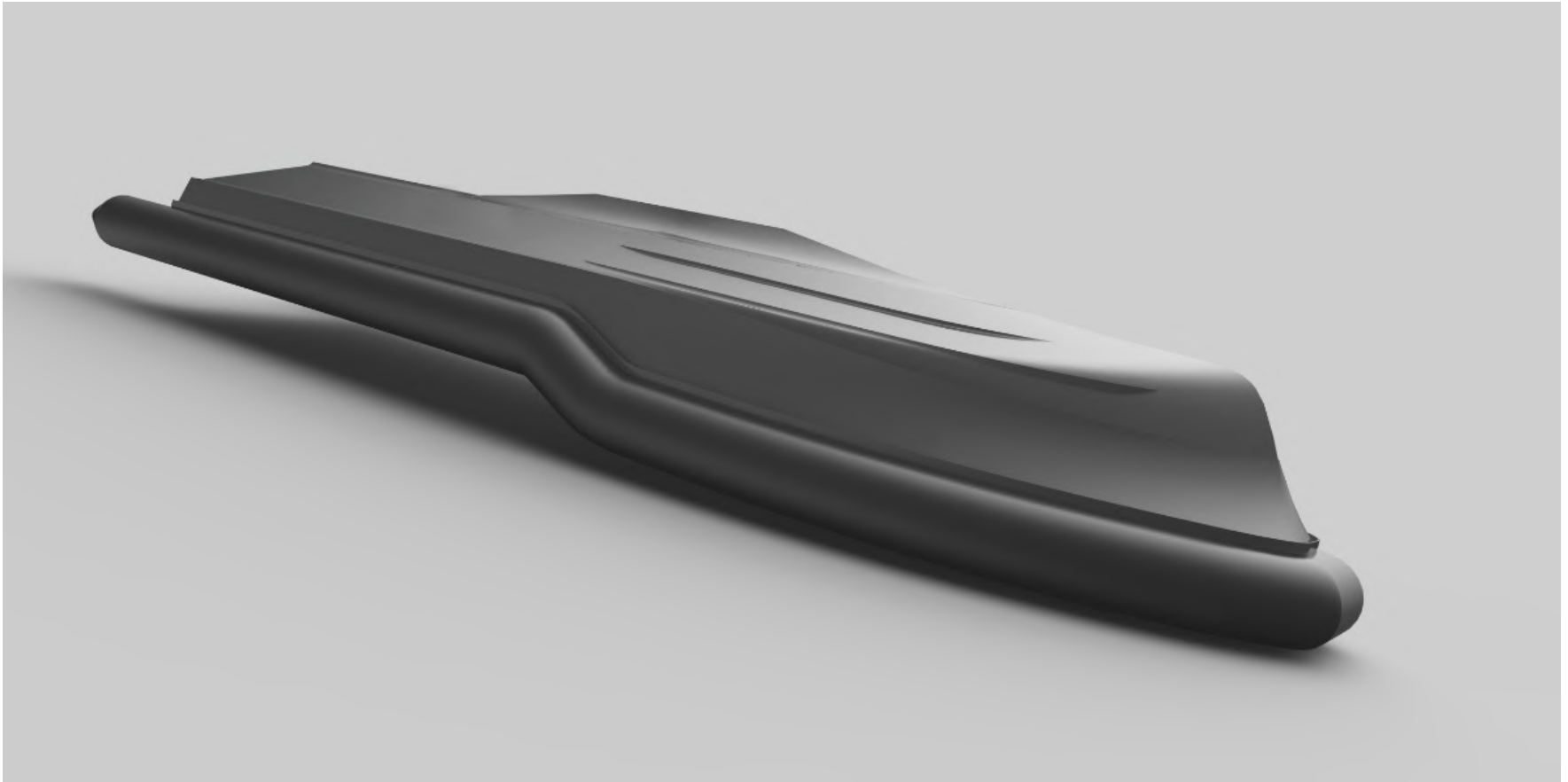
Length	10.00 m
Beam	3.20 m
Draught	0.55 m
Displacement	4.1 tonnes
Max Speed	40 kn
Cruising Speed	29 kn
Fuel capacity	2x 300 litres
Range @ Cruising Speed	210 nm
Deck Space	16 m ²
Engines	2x 250 HP Yamaha



RAF NAR



The OK hull



The OK Hull is patented in the U.S. as U.S. Patent no. 8,726,823 and has patent application protection in Europe

The OK Hull => the rough-weather seakeeping is better

The unusual hull-shape slips through the water more comfortably

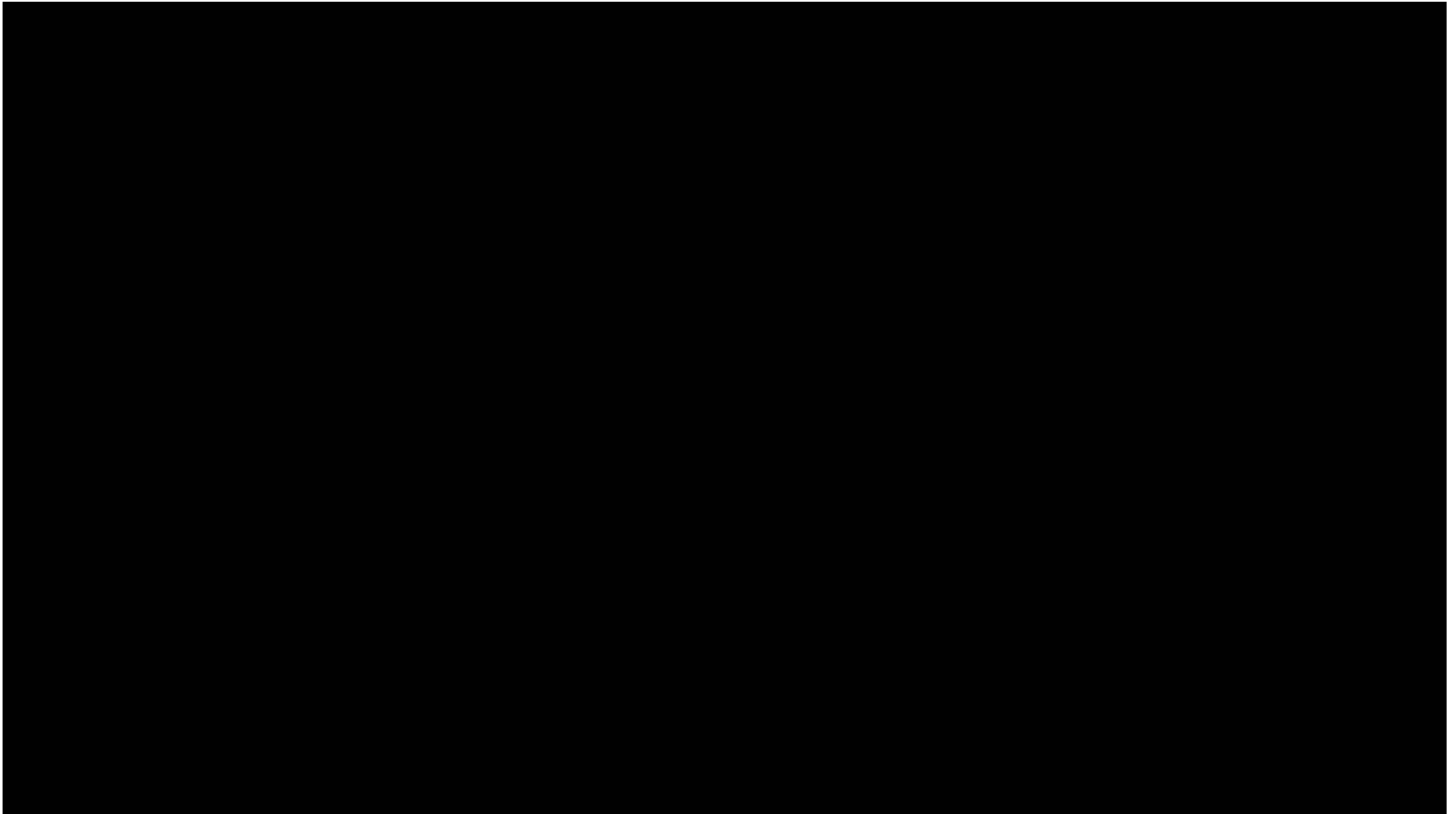
It remains „glued“ to the water instead of bouncing over the top

The hull is particularly stable and unperturbed underway

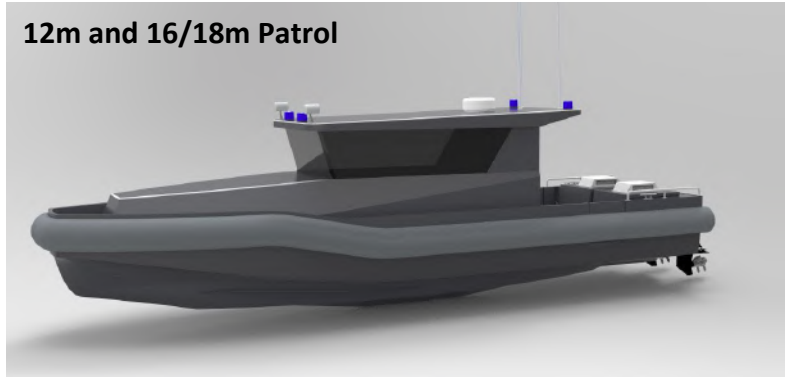
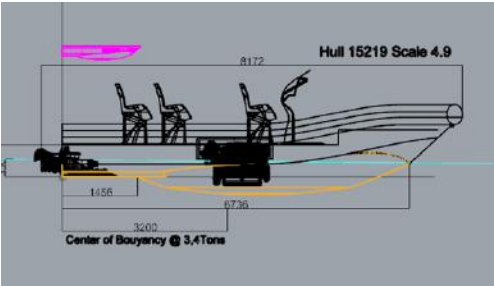
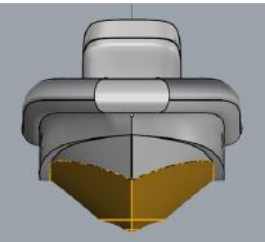
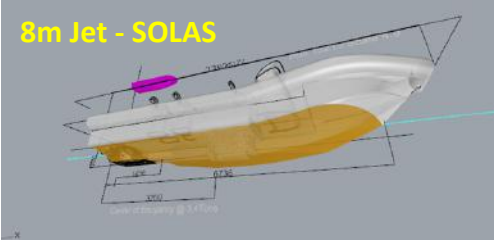
The hull is scalable to larger vessels



Testing with the ICG what is to become
12m+ SAR or Patrol boats



Examples of Rafnar projects that are in the pipeline



**„Their history gives rise to the dual
personality of the Icelander. He values
both his artistic heritage and his
hardiness“**

„Xenophobe´s guide to the Icelanders“

<http://www.lhg.is>

<http://rafnar.is>