

### About GATERS Newsletter

GATERS Newsletter is published six-monthly reporting some activity highlights from the collaborative H2020 European project “GATERS” and introducing the project partners’ profiles.

### Activities Highlights (February-August 2021)

- The European Commission's H2020 Framework sponsors the three years of Innovation Action project GATERS with 18 partners with a 5.9M Euro total budget, and the project was kicked-off on 1 February 2021 with the following goals and details:
  - The project title “GATERS” stands for “GATE Rudder System as a Retrofit for the Next Generation Propulsion and Steering of Ships. The project promises the first retrofit application of a novel propulsion and manoeuvring device for ships, called “Gate Rudder System”. The successful project proposal specifically addressed the H2020 call text “to develop and demonstrate to TRL6 and higher innovative, cost-effective retrofit solution for marine shipping to provide substantial improvements regarding environmental impacts and life cycle cost”. Taking advantage of the remarkable fuel saving (max of 14% in trials and 30% in-service) and excellent manoeuvring ability of the gate rudder system, GATERS will demonstrate significantly reduced emissions from ships, particularly within coastal and port areas, challenging and even exceeding the current and future legislative requirements of the IMO and local regulations for emissions.
  - GATERS aimed to bring together eighteen technology expert project partners (listed in Table 1) and prime stakeholders, including the gate rudder patent holder, to demonstrate and exploit the benefits of the gate rudder system by two complementary deliverables. First is the retrofit demonstration of the system for the European short sea shipping operations by installing and operating on a target coastal cargo vessel. Second is the concept exploration (i.e. desk study) of the system for the oceangoing shipping operations, including fleet level. Hence, demonstrate if the gate rudder system can be the next generation propulsion and steering system for waterborne transport.
  - The three phases of the GATERS work programme includes the investigation of the technical challenges and solutions in Phase-1. The detailed design and manufacturing of the retrofit system on the target coastal vessel are to be conducted in Phase-2. The demonstration of the retrofit technology on the target vessel and its impact assessment comprising other ship types are included in Phase-3. The project will be completed in three years and by nine work packages (Table 2), with the project deliverables to be exploited by the partners and the European maritime industry to follow up through the comprehensive communication, dissemination and exploitation (CDE) activities implemented by the GATERS Management team (Table 3)
  - The GATERS project ID is 860337, while the proposal call ID (part) was H2020-MG-2019-Two-Stages
  - The partners signed the Grant Agreement <sup>[1]</sup> with the EC, including the Description of Work (Annex 1) and the Consortium Agreement <sup>[2]</sup> between them in 2021.
  - In the exploitation activities, there is a clear boundary for the commercial exploitation of the GATERS project in terms of the application type (i.e. retrofitting or new ship application) and the type, size, and operating range of the vessels GATERS partners can exploit the project results commercially. This boundary was described clearly as a result of the legal agreement with the Japanese Consortium that holds the Gate Rudder patent right in the sub-license document <sup>[3]</sup> signed between each GATERS partner and the Japanese Consortium representative, Wartsila Netherlands BV as summarised in the following legal statement: *“GATERS Innovation Action Project is sponsored by the EC H2020 Programme (ID: 860337) with the independent aim and objectives. The project has an official sub-license agreement [3] with Wartsila Netherlands BV to utilise the Gate Rudder Patent (EP 3103715) at specific retrofit projects of vessel sizes below 15000 DWT”*

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<sup>[1]</sup> Grant Agreement. GATERS — H2020-MG-2018-2019-2020 / H2020-MG-2019-TwoStages - Number: 860337. The European Commission. May 2020.

<sup>[2]</sup> Consortium Agreement. GATERS – GATE Rudder System as a Retrofit for the Next Generation Propulsion and Steering of Ships. Version 4. The University of Strathclyde, 1 February 2021.

<sup>[3]</sup> Sublicense Agreement. Wärtsilä Netherlands B.V. and GATERS Consortium (Except HSVA), “Sublicense Agreement” DocuSign Envelope ID: 6AA03A3C-0D57-45B0-B096-2043F1F9B1FFE. 18 December 2021.

## GATERS – Partners

Participant No.	Participant organisation name	Acronym	Country
1 (Coordinator)	UNIVERSITY OF STRATHCLYDE	UoS	UK
2	HAMBURGISCHE SCHIFFBAU- VERSUCHSANSTALT GMBH	HSVA	DE
3	BUREAU VERITAS MARINE & OFFSHORE REGISTRE INTERNATIONAL DE CLASSIFICATION DE NAVIRES ET DE PLATEFORMES OFFSHORE	BV	FR
4	GLAFCOS MARINE EPE	GME	EL
5	CONSIGLIO NAZIONALE DELLE RICERCHE	CNR	IT
6	HIDROTEKNIK YAT GEMI DENİZ YAPILARI TASARIM TEKNOLOJİLERİ SANAYİ VE TİCARET LİMİTED SİRKETİ	HYD	TR
7	İSTANBUL TEKNİK ÜNİVERSİTESİ	ITU	TR
8	TWI LİMİTED	TWI	UK
9	NAVAL ARCHITECTURAL SERVICES LİMİTED	NAS	MT
10	CAPA DENİZCİLİK NAKLİYAT SANAYİ VETİCARET LİMİTED SİRKETİ	CAPA	TR
11	SİNTEF OCEAN AS	SİNTEF	NO
12	DANAOS SHIPPING COMPANY LİMİTED	DANAOS	CY
13	STONE MARINE PROPULSION LİMİTED	SMP	UK
14	GURDESAN GEMI MAKİNA SANAYİ VE TİCARET ANONİM SİRKETİ	GURD	TR
15	UNIVERSITY OF NEWCASTLE UPON TYNE	UNEW	UK
16	STAR BULK SHIP MANAGEMENT CO. (CYPRUS) LTD	STARB	CY
17	INFORMA UK LTD (LLOYD'S LIST INTELLIGENCE)	LLI	UK
18	CETENA S.P.A.	CETENA	IT

Table 1 – GATERS Partners

## GATERS – Work Packages

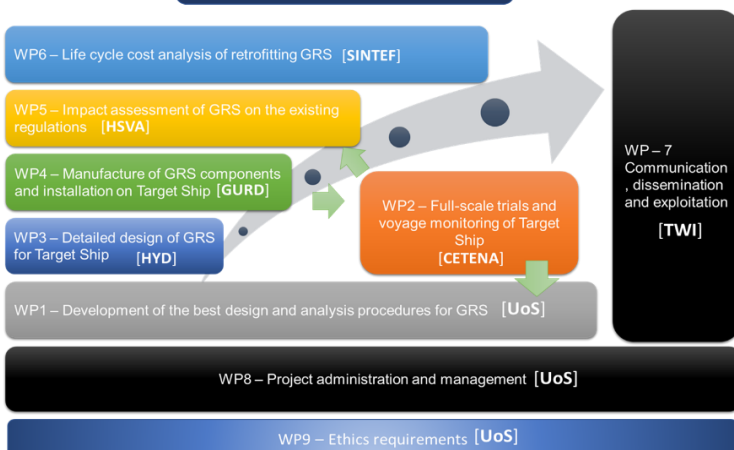


Table 2 – GATERS Work Packages

## GATERS – Management structure

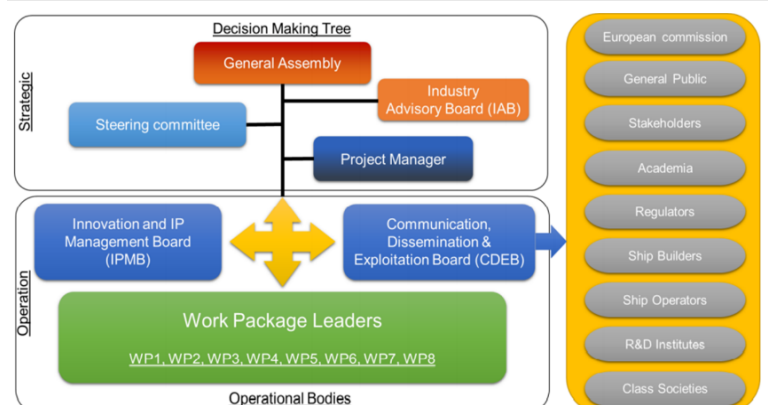


Table 3 – GATERS Management

- The GATERS partners' official website, the EC (CORDIS) website, the GATERS Social Media platforms can be accessed, and the Project Coordinator can be contacted in the following links and information:
  - Project partners' website: [www.gatersproject.com](http://www.gatersproject.com)
  - EC (CORDIS) website: <https://cordis.europa.eu/project/id/860337>
  - Social media platforms:
    - <https://twitter.com/gatersproject>;
    - <https://www.linkedin.com/company/gatersproject>
    - <https://www.youtube.com/channel/UCh0n9ruJt75bS64Js4vQEFw>
    - <https://www.facebook.com/gatersproject>
  - Project Coordinator: The University of Strathclyde (UoS);  
FAO: Prof Mehmet Atlar; ([mehmet.atlar@strath.ac.uk](mailto:mehmet.atlar@strath.ac.uk)), The Principal Project Investigator and The Coordinator  
Tel: +447900890228 (mob); +441415484947(w)
- In this *GATERS Newsletter* and upcoming issues, we will be highlighting some activities in the nine Work Packages (WP) of the project in the respective six-monthly periods, and the following is the first 6-monthly period:
- The GATERS kick-off meeting took place on 24 February 2021 via video conferencing with the participation of all project partners and the EC Project Officer, Dr Georgios Charalampous of INEA (Innovation and Networks Executive Agency). Since the kick-off, the main activities of GATERS took place in WP1 (Methodology development and Design), WP2 (Full-scale trials and monitoring), WP7 (Communication, Dissemination and Exploitation) and WP8 (Project Management).
- WP1 is the main engine of GATERS which develops the best methodology for designing and retrofitting a ship with a gate rudder system using the computational, model test-based and full-scale-based procedures. The project partner UoS leads WP1. To achieve the WP objectives, the computational and physical models of the 400TEU landmark container vessel, Shigenobu (Figure 1), the world's first gate rudder fitted vessel, are being developed and analysed together with her sister ship Sakura with the conventional rudder. In parallel to this activity, the preliminary design activities are taking place for MV ERGE, a 90m coastal cargo vessel owned by the project partner CAPA (Figure 2), to be retrofitted with a gate rudder system (Figure 3). Hence, these gate rudder design activities also involve modelling MV ERGE using the advanced CFD methods (Figure 4) and physical model tests (Figure 5) with different scale ratios in various testing facilities to study the effect of scale in performance prediction. Figure 4 illustrates the important scale effect phenomenon on the gate rudder flow (bottom) compared to the conventional rudder flow (top) in self-propelling conditions in three different sizes by using CFD.

SHIGENOBU			
Length overall	LOA	(m)	111.40
Length between perpendiculars	LBP	(m)	
Breadth	B	(m)	17.80
Draught (midship)	T	(m)	5.24
Displacement	$\Delta$	(ton)	
Service Speed	V <sub>S</sub>	knots	15.5
Rudder			GR



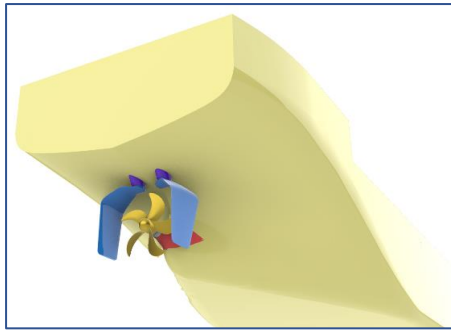
**Fig 1 – SHIGENOBU with world's first Gate Rudder System**

Parameter	MV Erge				
	Symbol	Units	Ballast Load	Design Load	Full Load
Length overall	L <sub>OA</sub>	(m)	89.95		
Length between perpendiculars	L <sub>BP</sub>	(m)	84.95		
Breadth	B	(m)	15.4		
Draught (midship)	T	(m)	3.3	5.6	6.45
Draught (AP)	T <sub>A</sub>	(m)	3.8	5.6	6.45
Draught (FP)	T <sub>F</sub>	(m)	2.8	5.6	6.45
Displacement	$\Delta$	(ton)	3607	6339	7241

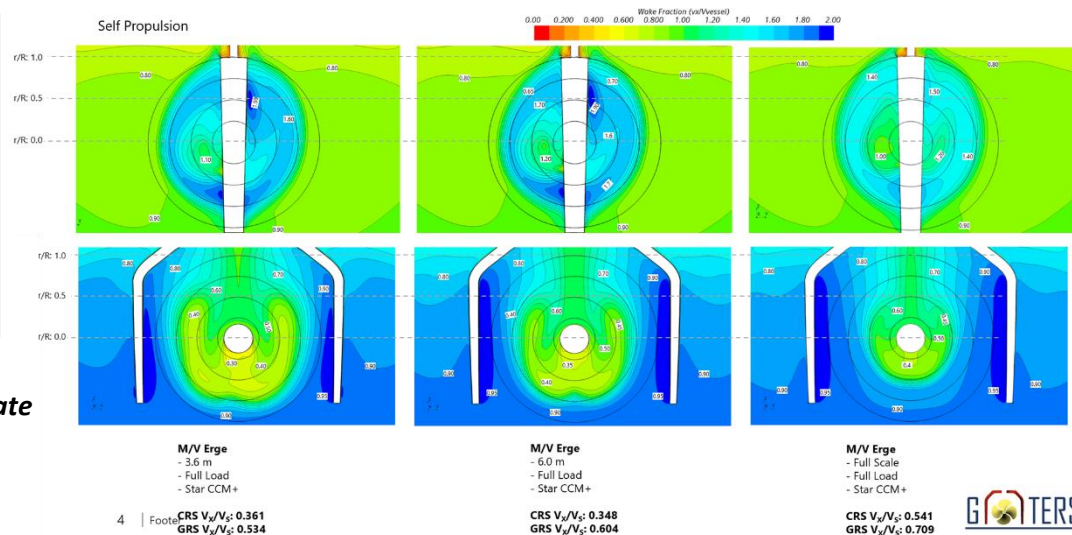


**Fig 2 – MV ERGE- GATERS Project Target Ship; First vessel to be retrofit with Gate Rudder System**





**Fig 3 – MV ERGE with preliminary gate rudder design**



**Fig 4 – CFD model of ERGE's wake demonstrating scale effects on different size models and FS ship with conventional rudder (top) and gate rudder (bottom)**



**Fig 5 – Physical model (3.6m) manufacture of MV ERGE and resistance tests underway in ITU Ata Nutku Towing Tank**

- WP2 is led by partner CETENA and involves the full-scale trials and voyage monitoring of the target ship before, and after the gate rudder system retrofitting to assess the benefits of this energy-saving device in terms of powering, manoeuvring, emissions, hull pressure, and vibration underwater radiated noise. For this purpose, comprehensive inspections and preparations have been underway to equip the target ship MV ERGE with special monitoring equipment in July by partners CETENA, CAPA, BV, and HYD to start collecting full-scale performance data in August 2021.
- Partner TWI leads WP7. This WP facilitates the communication, dissemination and exploitation of the project and its results. In this first six-month of the initial profile building-up stage of the project, the activities have involved the development of the project website, file management system, social media platforms, and various dissemination activities through press releases and presentations were mainly online. These included, e.g. project presentation in the 2<sup>nd</sup> Virtual Forum on Decarbonising Shipping on 21 April; a technical paper presentation at CAV2021 conference on 21 May; Gate rudder system presentation in Marine Propulsion Webinar Week on 21 June; Two written discussions in the 29<sup>th</sup> ITTC on 21 June; two Newsletter articles in the UoS media platform on 21 April. We are also in the process of establishing collaboration with other ongoing EU project RAMSSES, regarding the use of composite material in gate rudder structure to save weight.
- WP8 is managed by the project coordinator, UoS and involves GATERS' technical and financial management according to the structure shown in Table 3. During the first six months of the project, WP8 arranged the regular WP and task meetings for the active WPs, liaising with the WPLs and tas leaders to provide smooth information and data flowing inside and outside the project through effective management and avoiding potential bottlenecks. The WPL is currently busy collecting the first six-monthly financial reports and arrange the first General Assembly meeting to be held online on 26 July.

## Project Partners Profiles

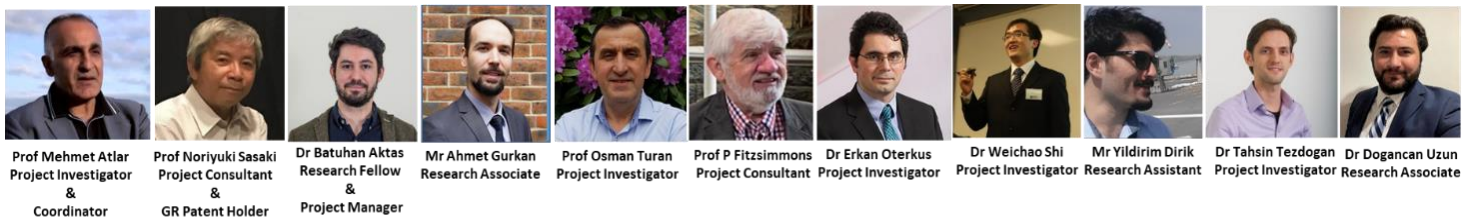
In each Newsletter issue, we introduce the three project partners, listed in Table 1, including their roles and key staff contributing to GATERS. In this issue, partners (1) Uos, (2) HSVA and (3) BV are introduced.

### ➤ 1. The University of Strathclyde (UoS):



The University of Strathclyde (UoS) is a leading international technological institution ranking among the top-20 research-intensive universities in the UK and has received the Entrepreneurial University award for four consecutive years. The Engineering Faculty is one of the largest in the UK, and joint research of the Department of NAOME (Naval Architecture, Ocean & Marine Engineering) with the other Faculty's Departments is rated fourth in "Research Power" in the UK by the last Research Excellence Framework. The Department currently has a strong workforce of 27 full-time academic staff, more than 170 Postgraduate researchers, including PhD and MPhil students, research assistants and fellows addressing a wide range of topics in marine technology covering naval architecture, marine engineering, ocean engineering, energy efficiency, marine design, operations and safety and fluid-structure interaction. With a staggering number of almost 170 postgraduate researchers, NAOME is one of the largest research resources in the maritime field in Europe and the world. The research vision in the Department is to uphold our position as a world-leading Department of Marine Technology by nurturing a sustainable research environment that supports continuous improvement and growth.

The UoS is the Project Coordinator and contributes in all WPs and as the WPL in WP1, WP8 and WP9 with the following member of staff and their roles



### ➤ 2. Hamburgische Schiffbau Versuchsanstalt GmbH (HSVA):



HSVA is a private, self-supporting, non-profit ship model basin. The main business is advice to the maritime industry within the field of hydrodynamics. With its sophisticated experimental research facilities, HSVA has been among the world's leading ship model basins since its foundation in 1913. HSVA developed a detailed understanding of the intricate problems in ship hydrodynamics, hull form design and optimisation, propeller design and ice technology based on pioneering contributions from its scientists and engineers. In addition to its experimental facilities, HSVA has pioneered maritime CFD development and applications for a long time. Starting in the 1980s, a range of dedicated numerical codes, including potential flow (panel) and RANS methods, have been developed and are applied in routine work and research. These address a wide range of ship and offshore hydrodynamic problems. HSVA has a long record of successfully run EU projects dating back already to early Framework Programmes. Notable examples being: the VIRTUE Integrated Project and the Hydro Testing Alliance (FP 6) and GOALDS, STREAMLINE, TARGETS, TEFLES and GRIP in FP 7 as well as HOLISHIP and TrAM in H2020. The UoS is the Project Coordinator and contributes in all WPs and as the WPL in WP1, WP8 and WP9 with the following member of staff and their roles. HSVA leads WP5 and contributes in WP1, WP5, WP6, WP7 and WP8 with the following member of staff and their roles.



➤ 3. Bureau Veritas Marine & Offshore SAS (BV):



Founded in 1828, Bureau Veritas is the world's second-largest group in conformity assessment and certification services. Bureau Veritas helps more than 400,000 clients worldwide to improve their performances by offering services and innovative solutions to ensure that their assets, products infrastructure and management systems meet all quality, health and safety, environmental and social responsibility standards and regulations. Bureau Veritas Marine & Offshore (M&O) SAS is a subsidiary of Bureau Veritas and has vast experience in ships and offshore platforms classification, ship and marine equipment certification and technical assistance. Bureau Veritas M&O performs studies and classes of ship and offshore technologies in various technical fields covering in particular risk analysis, hydrodynamics, structural reliability, energy efficiency, safety, environmental impact assessment and software development. For approval, surveyors refer to Bureau Veritas rules, which are continuously maintained and updated, and internationally recognised standards. The research teams of Bureau Veritas M&O have been (and still are) involved in many research projects both at national and international (European Commission co-funded projects, JIPs,...), either as project leader or as contributing partners.

BV contributes in WP1, WP2, WP7 and WP8 with the following member of staff and their roles



Stéphane PABOEUF  
Head of Composite  
Materials Section



Benjamin Collier  
Specialist Engineer  
in Composite  
Materials Section



Luc Mouton  
Project Manager in  
Composite Materials  
Section



Vincent LAMAISSON  
Acoustic and  
vibration project  
manager



François BRULIARD  
Acoustic and vibration  
engineer

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