

EXTERNAL REVIEW

KOTKA MARITIME RESEARCH CENTRE

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M E R I
K O T K A

KOTKA MARITIME RESEARCH CENTRE PUBLICATIONS
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Kotka Maritime Research Centre (KMRC) in 2014-2018
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EXECUTIVE SUMMARY

The Kotka Maritime Research Association Merikotka ry (KMRA) was established in 2005 and during the past 15 years the Kotka Research Maritime Center (KMRC) has been built around it.

The performance and work of the Kotka Maritime Research Center (KMRC, earlier KMRA), have been reviewed twice before this assessment, by Uronen & Lahti in 2010 and by Varsta in 2014. This third international assessment aims at positioning KMRC nationally and internationally.

The quality of research is evaluated to be good or even very good on the basis of the quality of reviewed scientific publications. However, there are differences among the universities, Aalto University recognized to be the most qualified one.

It seems that interdisciplinary research and project based funding is a challenging combination for the KMRC researchers. In accordance, KMRC can be seen as an umbrella covering the three universities and one university of applied sciences, however, the universities and their expertise seems to stay in silos, and the linkage between the Aalto University, the Helsinki University and the Turku University is very weak. Accordingly, the conclusion is that the researchers of the KMRC have not identified the KMRC as an entity.

Additionally, it stays quite obscure, how the research work of the KMRC is having an impact at international level on decision-making as the researchers are not involved in IMO work at global level, or in EU, HELCOM or Arctic Council work at regional level. Even the researchers' knowledge of decision-making mechanisms at global and regional levels is limited.

A successful research community needs to make itself as a recognized player in solving global problems. Thus, especially as shipping is an international business, one of the recommendations is to reconsider what is international collaboration in the context of KMRC work and the future definition for international work.

Furthermore, to ensure real international collaboration there is a need to develop a good collaboration among different actors in Finland, in the Baltic Sea Region, in EU and beyond. Good and important first step could be strengthening of collaboration with and within both HELCOM and the EU's Baltic Sea Region Strategy and its policy areas PA Ship and PA Safe.

KMRC could also take more role as a coordinator for future international research projects, the EU financed COMPLETE project as a good example. Furthermore, KMRC could offer services for universities, administration etc. on preparing applications to the EU and other international calls. Additionally, good consultancy support on maritime issues (IMO, EU, HELCOM) would be very valuable e.g. for administration and maritime business. KMRC could have a role to play in this field and not only in Finland.

The KMRC should put more effort on dissemination on its work, research and possible future services to increase its visibility and funding options. One strong recommendation is that the double affiliation of the professors and the source of funding should be mentioned when submitting documents for publication.

The KMRC and its research group members should be more involved in regulatory developments. This could be done through collaboration with legal experts e.g. BALEX members. Another pathway at national level could be to be more involved e.g. in TRAFICOM's preparatory meetings prior to all the international meetings, e.g. at IMO.

To ensure research work and funding of KMRC in the long run, one option could be to consider what are the pros and cons in emerging KMRC to one of the collaborative universities or the university of applied sciences.

KMRC is the only one of its kind in the Baltic Sea region, which is a strength that should be developed future. Nowadays KMRC is an active teenager, however it should make the decision what it will be as an adult, i.e. to make decision what the future role and priorities for the Centre will be.



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1 | BACKGROUND AND INTRODUCTION

1.1 The Kotka Maritime Research Center (KMRC)

The Kotka Maritime Research Association Merikotka ry (KMRA) was established in 2005, and during the past 15 years, the Kotka Research Maritime Center (later KMRC) has been built around it.

KMRC is located in Kotka, in the southern-eastern Finland and nowadays it forms a research community that combines the research carried out by five different research group in three universities (University of Helsinki, Aalto University and University of Turku) and in one university of applied sciences (South-Eastern Finland University of Applied Sciences, XAMK) in Finland. Since 2017, also the KMRA has participated in research activities as recommended by Varsta (2014)¹ in one of the previous assessments.

When the KMRA was established in 2005, the focus of the work was planned to be in maritime safety and risks, technological development of maritime transport and oil spill prevention/ combatting technology and maritime logistics and business models. According to its self-assessment from the year 2019, the KMRC work is still focusing on multi- and interdisciplinary, applied research in order to improve maritime safety, prevent accidents and protect the marine environment. Additionally, according to the KMRC Research Agenda 2017-2020, the research of KMRC is of high scientific quality with international, national and regional relevance starting from general method and framework development and continuing to regional applications and analyses.

The KMRC finances its research by both public and private funding. Currently, main sources of public funding are international academic and non-academic EU-funding instruments such as H2020, BONUS, Baltic Sea Reagon, Central Baltic and ENI-programs. From its full members, defined in the rules of the Association, the KMRA collects membership fees that can be ordered to be of different amounts to municipality and community members. Currently, there are altogether 13 members: the Aalto University, Cursor Oy, the Etelä-Kymenlaakso Vocational College, the Helsinki University, Kotkan Maretarium Oy, the City of Kotka, South-Eastern Finland University of Applied Sciences, Metsähallitus, Natural Resources Institute Finland, the University of Turku, The Finnish Transport and Communications Agency Traficom, The Finnish Transport Infrastructure Agency and the Finnish Environment Institute. However, the total amount of collected money stays quite limited (pers. com Anna Kiiski). Additionally, according to agreement between the City of Kotka and the KMRC, City of Kotka is paying one

¹ Varsta, P. (2014) Maritime Research Centre Merikotka – Report on current state and a proposal for a future operational model

third of all the KMRC professors' salary directly to the Universities in question, and in turn, the professors allocate agreed amount of their working hours to the KMRC collaboration.

1.2 The aim of the Evaluation

The performance and work of the KMRC (earlier KMRA), have been evaluated twice, by Uronen & Lahti in 2010 and by Varsta in 2014. Unfortunately, these two previous reviews from the years 2010 and 2014 are not comparable as they are not following the same structure and aims, although some of the key figures are given in both assessments.

The decision in 2015 to change the nature of KMRA from a purely (research and project) administrative organization into one with more expert organization influenced the need to get feedback on KMRC work.

Accordingly, in spring 2019, the KMRC invited two external persons to evaluate the scientific and other work performance of KMRC following the request by Varsta in 2014. Professor Jens-Uwe Schröder-Hinrichs from the World Maritime University (WMU) and Adjunct Professor (PhD) Anita Mäkinen from Helsinki University/Finnish Transport and Communications Agency Traficom were requested to conduct the external evaluation. The object of this third evaluation is the KMRC research and work performance in the years of 2014-2018. The assessment aims at positioning KMRC nationally and internationally. The target was to evaluate the quality and potential of research, the success of interdisciplinary collaboration within KMRC, and KMRC's research impact, societal impact and innovative capacity. The assessments are expected to give feedback on the KMRC's strengths and weaknesses and identifies future recommendations as requested in the terms of reference for the evaluators.

For the reason this reviewer is representing Maritime Administration of Finland and is attending international meetings of International Maritime Organization (IMO), following developments at EU, HELCOM and the Arctic Council, the focus of this review is on international research and international decision-making and research needs of administration. Professor Jens-Uwe Schröder-Hinrichs is focusing in his review on scientific level of the research by KMRC and benchmark institutions for KMRC, and their similarities and differences with KMRC, making the two assessment complementary to each other. The views expressed in this report are the personal and professional views of the reviewer and do not necessarily represent the views of Finnish Maritime Administration or Finnish Transport and Communication Agency Traficom.



2 | MATERIALS AND METHODS

The reviewers were requested to produce an assessment report covering the items listed under evaluation criteria. The evaluation is based on the written material (listed under background material for the reviewer), interviews conducted during the site visit and additional material requested by the evaluator before/during the visit. For the details see Annex I.

Background material for the evaluation

The following written materials were provided to the reviewers who were invited to familiarize themselves with the background material prior to the site visit.

- Self-assessment report by the researchers of the KMRC
- Bibliometric analysis in the years 2015-2018 and the list of publications
- KMRC annual reports 2016 and 2017
- KMRC strategy 2019-2021
- KMRC research agenda 2017-2020
- KMRC personnel and project volume figures in 2015-2018
- Summaries of the current and past projects including funding sources, consortia and project budgets: www.merikotka.fi

Evaluation criteria

In the assessment report, the evaluators were requested to present:

- A general statement on the focus and strategy of the KMRC research;
- Numerical ratings and written statements for the following elements:
- Research excellence, research quality, and the extent and impact of crossdisciplinary collaboration of the research;
- Impact of the research on the research community;
- Societal impact;
- Entrepreneurial and innovative capacity;
- Strengths and weaknesses of the research environment;
- Future potential

The scale to be used for the numerical ratings are 1= emerging; 2 = fair; 3 = good; 4 = very good; 5 = excellent and 6 = outstanding international level.

Site visit and Interviews

During the site visit in Helsinki on 25 April 2019, the reviewers had a chance to interview the KMRC researchers and management. The KMRC participants were Pentti Kujala (Aalto University), Päivi Haapasaari (University of Helsinki), Tommi Inkinen (University of Turku), Sakari Kuikka (University

of Helsinki), Ville Henttu (South-Eastern University of Applied Sciences), Maria Hänninen (KMRA) and Anna Kiiski (KMRA).

According to the KMRC Research Agenda for 2017-2020, the research of KMRC should not only be of high scientific quality, but also with international, national and regional relevance, starting from general method and framework development and continuing to regional applications and analyses, and additionally to have an impact on decision making. To collect data for the review and evaluation, the reviewer developed a questionnaire with the aim to clarify both the level of relevance of the KMRC work, and how big influence KMRC work has had on decision-making at different levels (IMO, EU, regional, national). Additionally, the aim of the questionnaire was to clarify, how well the staff of KMRC are aware about the international decision making context (International Maritime Organization (IMO), EU, Arctic Council and HELCOM). The questionnaire is given in the Annex II.

Recommendations for the future

The external reviewers were requested to give their recommendations for the future work of the KMRC to support KMRC in developing a roadmap from the present quality to the internationally excellent level and maximal societal impact, and in identifying necessary changes.



3 | REVIEW OF THE RESEARCH AND PUBLICATIONS BY KMRC

3.1 Face-to-face meeting in Helsinki

During the general discussions of the face-to-face meeting, it became obvious that not all of the staff members of the KMRC have the similar kind of understanding what is meant by saying “to have an impact on decision-making”. Some of the staff members were of the view that if the scientific evaluation of their research is good/high i.e. their paper/s are published in recognized scientific magazines with high impact factor, those who are making decisions are responsible to take these results into account in their decision-making. Furthermore, some were of the view that if the researcher has published/discussed his/her results in a public media this is to be considered as an impact on decision-making – without any follow-up research among the decision-makers or the decisions made. However, when the staff members were challenged to discuss on shipping related issues at global level e.g. at the International Maritime Organization (IMO) or at the EU level the response was quite vague.

The reviewer found it quite interesting that the KMRC defined the wording “international level” in advance in a such way, that it shall not be equated with work on international themes. This can be considered to be a controversial, at least to some extent, to the KMRC Research Agenda 2017-2020, wherein the research of KMRC is mentioned to be of high scientific quality with international, national and regional relevance starting from general method and framework development and continuing to regional applications and analyses.

Likewise, the reviewers were guided that in this context “international level” indicates KMRC’s standing in comparison with internationally established research units or institutions in the same field of research. It was even mentioned that the quality of the interaction between KMRC and society (i.e. the societal impact) may be assessed to “Outstanding International Level” even if the interaction takes place mainly at the national or even local level, if this is the case also in the best international institutions in the same field of research. Similar attitude was noticed in reactions of the KMRC representatives, during the general discussions.

3.1.1 Results from the interviews

After the general discussions with the staff members of the KMRC, the reviewers were in a position to make interviews. The questions which were developed to clarify how big influence KMRC has had on decision-making and how well the staff members of KMRC are aware about the international decision-making context at global (IMO), regional (EU, Arctic Council and HELCOM) and national levels were used to guide the discussions.

Unfortunately, due to time constraints only two of the professors, Pentti Kujala from Aalto University and Sakari Kuikka from the Helsinki University were interviewed. Thus, the results perhaps cannot be generalized, but give a hint how the general situation could be as the interviewees are the two leading professors of the KMRC.

Shipping is international business and thus the shipping safety and environmental regulations are developed at global level at the International Maritime Organization (IMO), which is a specialized agency of the United Nations responsible for the safety and security of shipping and the prevention of marine pollution by ships. Furthermore, in Finland we try to avoid any national regulations on shipping beyond IMO and/or EU regulations.

When discussing, in-face-to face meeting, with the professors, if they have been involved in any of the IMO initiatives, or if they have submitted outcome from their research projects to any of the IMO's committee or sub-committee meetings, the answer was quite clear. The researchers have not been involved in IMO work nor submitted any of their research results to IMO meetings to support decision-making therein. In the self-assessment of the KMRC work, there was one remark referring to the IMO's Polar Code development. However, when the reviewer doubled checked this with the members of the Finnish Delegation to IMO, she discovered that professor Kujala and his research group from the Aalto University offered measurements and figures from their previous studies for calculations, how comparable the Finnish-Swedish ice classification rules are with the other ice classification rules. These calculations were vital when the Operational Limit Assessment Risk Indexing System (POLARIS) of IMO was developed. The basis of POLARIS is an evaluation of the risks posed to the ship by ice conditions using the WMO nomenclature. Professor Kujala confirmed during his later interview, that the Aalto University has been involved in the IMO's POLARIS development, but not the KMRC.

When discussing about the most important/relevant research topics related to IMO's work on safety and environmental issues, the response for the safety issues was the safety of passenger ships in Arctic waters and for environmental issues GHG emission reductions from shipping.

Although KMRC has been involved in making research on automation and digitalization of shipping, no reference was made to the ongoing regulatory scoping exercise on maritime autonomous surface ships (MASS) by Maritime Safety Committee (MSC) of IMO, activity that can be considered to be one of the most important one at the moment, concerning safety issue. Additionally, Finland has had a very active role in the MASS exercise process. For Marine Environment Protection Committee (MEPC), the hot topic is, without any doubts measures to decrease GHG emissions.

According to the interviews, none of the staff members of the KMRC has been involved in any of the EU's maritime transport related initiatives, at least not directly. However, according to the reviewer's understanding professor Kuikka has been involved and consulted in discussions concerning the sustainable fisheries annual quotas, i.e. the total allowable catches (TACs) for the EU's Common Fisheries Policy. If his contribution to these discussions was considered to be limited only to his work at Helsinki University is not stated clearly enough.

At the national level, staff members of the KMRC, through Aalto University, have been involved in discussions, how the strengthening of the IMO's mandatory Energy Efficiency Design Index (EEDI) for newbuildings would impact on the need for ice-breaking assistance and number of new ice-breakers in Finland in the future.

When discussing on definition for international collaboration, one of the professors considered it to mean Finnish-Russian-Estonian collaboration and in some context collaboration among all the Baltic Sea countries. His colleague defined the international collaboration to refer to international projects and publications without any reference to the geographic area.

Furthermore, when discussing if the researches of the KMRC have been collaborating with similar kind of international organizations such as the International Council on Clean Transport (ICCT)², Transport & Environment³, or classification societies such as DNVGL or Lloyd's or the Finnish NGO called Baltic Area Legal Studies BALEX⁴, the response concerning the mentioned ones, was negative. Furthermore, in spite of the fact that Lloyds' Register Foundation (LRF) has financed one of the KMRC projects, these two organizations have not been in contact/collaborated otherwise. One international organization for collaboration was mentioned by name, the Lighthouse –Swedish Maritime Competence Centre⁵.

One of the questions was, if the present staff structure of the KMRC is supporting the strategy and work of the Center. The reviewer became informed, that the original plan that the University of Helsinki and the Aalto university are training doctors and engineers/naval architects, respectively, and after the graduation the KMRC hire them for the projects, has never come true. The professors emphasized, that the number of staff members is depending on external funding. Furthermore, one of the professors mentioned, that the present KMRC personnel in Kotka is not perhaps focusing enough on applying new research money.

² International Council on Clean Transport (ICCT) <https://theicct.org/>

³ Transport & Environment, <https://www.transportenvironment.org/>

⁴ Baltic Area Legal Studies BALEX, https://www.centrumbalticum.org/en/projects/baltic_area_legal_studies

⁵ Lighthouse –Swedish Maritime Competence Centre <https://www.lighthouse.nu>

Professor Kuikka or his KMRC research group from Helsinki University has not been involved in the decision-making at IMO or regional level, however, he wanted to emphasize that the oil-based risk analysis of his research group were the basis for the establishment of KMRA in 2005. He continued that currently global insurance companies and coastal countries are interested in to develop the future shipping insurance payments on the basis of his research group's results. Accordingly, many coastal states are calculating at the moment, what kind of impacts, including economic, a big oil spill could cause. These costs, in turn, will be reflected in the shipping insurance payments. Additionally, professor mentioned that the results from oilbased risk analyses has been discussed in Helsingin Sanomat, which is the biggest daily newspaper in Finland.

3.2 Review of the research projects

3.2.1 The KMRC's focus of work and projects in 2014-2018

When the KMRA was established in 2005, the focus of the work planned to be in maritime safety and risks, technological development of maritime transport including prevention/ combatting technology and maritime logistics and business models. Varsta (2014)⁹ in his review report describes the work of the KMRC to be problem-oriented, aiming to find scientific solutions for the occurring problems, including the impact assessments. After Varsta's evaluation, in 2015, a decision was made to change the nature of KMRA from a purely (research and project) administrative organization into one with more expert organization and the focus of work was widened.

According to its self-assessment shared with the reviewers in 2019, the KMRC research focus on multi- and interdisciplinary, applied research in order to improve maritime safety, prevent accidents and protect the marine environment. To support this multi- and interdisciplinary research, the KMRC conducts research to 1) understand and develop the functioning and dynamics of ship operations and technology, maritime traffic, logistics, and maritime governance; 2) to assess the environmental and safety risks related to maritime traffic, acknowledging the joint effects with the other, cumulative, stress factors; 3) to estimate the positive and negative impacts of maritime traffic on regional wellbeing, safety, and environment; 4) to develop new intelligent tools for navigation, maritime spatial planning and management purposes; and 5) to produce information for education and decision making, to support the sustainable development of maritime traffic. Additionally, the research of KMRC is described to be of high scientific quality with international, national and regional relevance starting from general method and framework development and continuing to regional applications and analyses.

One of the challenges for the reviewers was that the data and information provided for the review and evaluation were quite scattered, coming from different sources (see page 7 for materials) and was not too comprehensive, e.g. concerning the list of projects in 2014-2018.

3.2.2 Project work in 2014-2018

Lahti & Uronen (2010)⁵ are stating in their report that although the original plan was to establish 7 to 8 professorships or chief researcher positions, 50 to 60 researchers and 4 to 5 assistant positions, only four of those positions were fulfilled by 2009 i.e. 3 professorships and one research manager position. The professorships were established on fisheries at the University of Helsinki, on Maritime safety, technology and winter navigation at the Aalto University, and on Maritime Logistics at the University of Turku.

The research manager position was established on port activities at Kymenlaakson AMK (after 2016 part of the South-Eastern Finland University of Applied Sciences, XAMK). The conclusion was that the KMRA had not reached the original goals but was lacking a bit behind.

Varsta (2014) in his review of KMRA work reports that the total number of personnel varied from 45 in 2010 to 43 in 2013. He proposed that all the planned professorships should be established, and the work of KMRA in Kotka should be widened to all agreed key research areas. Additionally, he proposed that all the staff members should be employed by the KMRA. In the light of this assessment, the proposal has not materialized concerning the number of professorships and their employment. The professors still have a kind of double affiliation both to their parental universities and to the KMRC. And the professorships, except for one, are fixed-term works contracts for five years.

The figures of the personnel involved in research in 2015 -2018 at KMRA and each university are given in the table 1. The number of the active full-time personnel has not reached the figures that were originally planned, and during the last years stayed almost the same, even if the external funding for projects have varied.

TABLE 1. KMRC PERSONNEL INVOLVED IN RESEARCH IN 2015 – 2018

Active fulltime staff	Total	KMRA	Aalto	University of Helsinki	University of Turku	XAMK (KyAMK)
2018	31	5	11	9	4	2
2017	33	7	10	9	5	2
2016	34	4	9	16	3	2
2015	38	6	7	19	3	3

⁵ Lahti, S. & Uronen, P. (2010) Evaluation of Merikotkas operations and a future strategy

The volumes (€) of the KMRC projects in 2015-18 are given in the table 2.

TABLE 2. KMRC PROJECT VOLUMES (€) IN 2015 – 2018

Project volume (EUR)	Total	KMRA	Aalto	University of Helsinki	University of Turku	XAMK (KyAMK)
2018	2 661 556	331 252	615 786	508 676	756 000	449 842
2017	3 305 284	297 093	1 000 000	892 000	578 000	538 191
2016	2 033 594	177 502	579 542	798 000	150 113	328 437
2015	1 860 484	218 648	798 000	798 000	141 972	201 373

Compared to the project volumes in 2010-2013 when the annual number of the projects was approximately 20, and their volume in euros approx. 100 000/ project (Varsta 2014), the volumes have increased only moderately. In turn, this is reflected in the number of employed researchers, which have stayed almost the same during these two compared periods of time, 2010-2014 and 2015-2018.

In the project portfolio of KMRC in 2014-2018 there were some new initiatives related to e.g. automation and digitalization of shipping, maritime spatial planning, challenges related to spills of biofuels and control of invasive species indicating the willingness and capability to reform the research topics. Among new the topics, there is also a couple of investigations on Black Carbon and its impacts on polar areas. This is a timely topic, however, more interdisciplinary know-how would had improved the performance.

KMRC and its researchers do not publish any KMRC project reports, but limit their dissemination on the results of the projects to seminars and sporadic articles in newspapers or magazines, which could be seen as a shortage.

For the detailed review of the scientific publications by KMRC, please see Professor Jens-Uwe SchröderHinrichs review document (2.2.2).



4 | THE ASSESSMENT

In this chapter, following the given evaluation criteria, is given the general assessment and using numerical ratings (see page 7) and written statements on the elements of KMRC's work as requested in the ToRs for the evaluation work.

Uronen & Lahti (2010) are making in their report some remarks concerning the sporadic/ fragmentary nature of research, business collaboration is recognized to be slight, especially if financing is included in consideration, and researchers are encouraged to express their affiliation to KMRA in their publications and presentations. International collaboration was identified to be vivid, however mainly limited to collaboration with the Estonian and Russian researchers. Furthermore, they are missing university training that was included in the original plan for the work of KMRA and making their proposal to clarify the situation. Additionally, they are recommending a review on media coverage and visibility of KMRA.

Varsta (2014) raised in his report, among other issues, the need for international evaluation on KMRC's performance by using quantitative measures. In his view, the international evaluation could give a reliable frame/view on the performance of the KMRA and could also recognize valuable recommendations for improvement. He is also reflecting in his report the proposal made during one of the interviews (Toikka 2014) to emerge the KMRA to the local University of Applied Science to ensure both future work of the KMRA and to strengthen financing of the University of Applied Science.

4.1 Focus and strategy of the KMRC research in general

The focus and strategy of the KMRC work should be on multi- and interdisciplinary, applied research in order to improve maritime safety, prevent accidents and protect the marine environment.

In this review, it became discovered that both individual researchers and research groups of Aalto University, the University of Helsinki and the University of Turku have published increasing number of qualified scientific papers in 2014-2018. However, it is still very difficult to see too many marks on interdisciplinary research within the KMRC and among the universities. The KMRC can be seen as an umbrella covering the three universities and one university of applied science, however, the universities and their expertise seems to stay in silos.

When interviewing professor Kujala (Aalto University), he confirmed that collaboration between Aalto University and KMRC is good without any challenges, however, he did not mention anything about collaboration among other universities. To some extent the KMRC research can even be considered to be a bit sporadic without any clear strategy. Accordingly, the conclusion is that the researchers of the KMRC have not identified the KMRC as an entity and strategic goals are missing.

It is easy to agree with Varsta (2014) who states in his review, that interdisciplinary research and project based funding could be challenging combination for the KMRC researchers. Furthermore, it can take long time to get used to paradigms of different disciplines, especially in international research projects.

Additionally, it stays quite obscure, how the research work of the KMRC is having an impact at international level on decision-making as the researchers are not involved in IMO work at global level, or in EU, HELCOM or Arctic Council work at regional level. Even the researchers' knowledge of decision- making mechanisms at global and regional levels is limited. However, in this respect, the research activities of the KMRC are in line with the Center's existing Strategy, where it is given that the KMRC is focusing its research in the Gulf of Finland area.

4.2 Research excellence and the extend and impact of multi- and interdisciplinary collaboration in KMRC's research

Issue	Rating
Research excellence	Very good (4)
Research quality	Very good – Excellent (4-5)
Extend of multi- and interdisciplinary research	emerging-fair (1-2)
Impact of multi- and interdisciplinary research	emerging-fair (1-2)

When considering the research excellence, it is quite natural to consider the performance of the parental universities of the professors in question, as they and their research groups are key pillars for the KMRC's work. The Aalto University was established in 2010 through a merger of three renowned universities in the Helsinki metropolitan area in Finland, and is known about cross-disciplinary projects and learning in practice. It is ranked globally to be the 181th in 2019. The University of Helsinki, the oldest university in Finland (established in 1640), in turn, is ranked globally to be the 99th and Turku University among the 351-400th ones in 2019. The South-Eastern Finland University of Applied Sciences (through a merger of Kymenlaakson ammattikorkeakoulu (1996) and Mikkelin ammattikorkeakoulu (1992)) was established in 2016, and ranked to be globally the 3789th in the same reference year.

When taking these rankings as a starting point, it is clear that research excellence in these three universities and one university of applied sciences of KMRC varies. Although, it is not only the research excellence that is reviewed when ranking the universities, but also university training and employments of graduates are taken into account, the starting point for research in these institutions is quite different, which in turn, can potentially has an impact on the development of interdisciplinary research. However, regarding the KMRC projects, their funding sources and published scientific papers, research excellence as a whole can be considered to be very good.

The quality of research can be evaluated to be either very good or excellent on the basis of the quality of reviewed scientific publications. However, there are differences among the universities, Aalto University recognized to be the most qualified one. See the external review by professor Schröder-Hinrichs.

When considering the interdisciplinary collaboration of research, the KMRC can be seen as an umbrella covering the three universities and one university of applied sciences, however, the universities and their expertise seems to stay in silos, and the linkage between Aalto University, Helsinki University and Turku University is very weak. Thus, both the extend and impact of multi-and interdisciplinary research and its impact on decision-making are reviewed to be at the level from emerging to fair.

4.3 Societal impact

Issue	Rating in numbers
Societal impact	emerging-fair (1-2)

In many of the background documents it is highlighted, that the KMRC aims to have societal impact and have an influence on decision-making. However, it stays quite obscure, if the research work of the KMRC and in which way, is having an impact on decision-making. The researchers are not involved in IMO work at global level or regionally at EU, in HELCOM in the Baltic Sea or in the Arctic Council the Arctic area. Furthermore, even the knowledge of the researchers on decision-making mechanisms at global or regional level (in EU, HELCOM and Arctic Council) seems to be limited. However, as many of the projects are introducing important data for regulators e.g. on maritime safety issues and on the control of invasive species, there is an option for clear improvement. Especially, as KMRC is planning to develop a roadmap from the present quality of research to the internationally excellent level and maximal societal impact.

According to the list of publications, some of the researchers have been interviewed at Finnish TV and they have written articles in magazines and daily newspapers, which is a good progress in right direction. However, according to the information provided to the external reviewers, none of the researcher have been representing Finland at IMO, EU or at regional levels or attended public hearings in the Parliament. Accordingly, there is a clear window of opportunity for improvement including dissemination of the research results.

4.4 Entrepreneurial and innovative capacity

Issue	Rating in numbers
Entrepreneurial and innovative capacity	very good (4)

As highlighted earlier, in the project portfolio of KMRC in 2014-2018 there were some new initiatives related to e.g. automation and digitalization of shipping, maritime spatial planning, challenges related to spills of biofuels and control of invasive species indicating the willingness and capability to the reform of research topics. Likewise, Arctic issues, such as safety of shipping and mitigation of oil spills in Arctic waters are clear indicators of very good innovative capacity.

During the interview, professor Kuikka explained that global insurance companies and coastal countries are nowadays interested in to develop the future insurance payments on the basis of the results of his research groups. Many coastal states are, at the moment, estimating what kind of impacts, including economic, a big oil spill could cause. The costs, in turn, will be reflected in the insurance payments. Furthermore, professor Kuikka mentioned the plan to conduct an international risk analyses of the oil transportation along the Northern Sea Route.

4.5 Strengths and weaknesses of the research environment

Issue	Rating in numbers
Strengths and weaknesses of the research environment	strengths – good (3)

According to its self- assessment shared with the reviewers in 2019, the KMRC researches focus on multi- and interdisciplinary, applied research in order to improve maritime safety, prevent accidents and protect the marine environment. Additionally, according to the KMRC Research Agenda 2017-2020 the research of KMRC is of high scientific quality with international, national and regional relevance starting from general method and framework development and continuing to regional applications and analyses.

This focus is very broad and as the number of the researchers has not increased since the establishment of the KMRC, and the geographical focus has been widened to cover also Arctic areas, the focus is perhaps too broad, which can be considered as a weakness. Thus, the KMRC should consider carefully the future focus of its research.

Another weakness of the KMRC work is that there seem to be no real multi- or interdisciplinary research among the universities and the interlinkage between the KMRC and the universities seems to be very weak. Furthermore, the researchers seem not to have a knowledge of decision-making mechanisms at global, regional or national level and accordingly they do not have knowledge how to make an impact, on what, and when, and what are the means.

Business collaboration does not seem to be improved since the previous review. This can be considered as weakness, especially if the aim is to collaborate closely with the business partners, like the Finnish Maritime Cluster, the Finnish Shipowners' Association or the Finnish Port Association.

One of the strengths of the KMRC is the innovative capacity, as discussed above. Likewise the future potential can be considered as a strength with new research topics on sustainability.

KMRC is the only one of its kind in the Baltic Sea region, thus, this is a strength, that should be developed further.

4.6 Future potential

Issue	Rating in numbers
Future potential	very good (4)

Kotka Maritime Research Center (KMRC) – is advertising itself with a phrase: Research for sustainable maritime transport. As sustainability is high on agenda globally, regionally and at national level, the KMRC has a good starting point to develop its expertise in sustainability further.

Intelligent traffic, including digitalization and automation, is a topic for future shipping, not only from the technological point of view but also from the governance and legal angle. However, it seems more or less, that this is a topic only for the Aalto University and the role of KMRC in this field, has not yet materialized. Digiport project, although with a local approach, sounds a very interesting and relevant start for discussions on the topic, especially now when

the role of ports is growing e.g. in reducing GHG emissions from international shipping, also at IMO.

The KMRC has been involved in a couple of maritime spatial planning (MSP) projects. Maritime spatial planning has been a research topic in the Baltic Sea and in the whole European Union due to the Maritime Spatial Planning Framework Directive (2014/89/EU) for some time. MSP and ocean governance are also high on Agenda globally e.g. in the UN, where the negotiations on Biodiversity Beyond National Jurisdiction (BBNJ) are in progress under the UN's Law of the Sea (UNCLOS). This is the field of research, in which the KMRC could develop its expertise further, however, legal know-how needs to be involved more actively.

In his interview, Professor Kuikka stayed very positive on the future of the KMRC and its work. However, he emphasized the need for and importance of EU and other international funding for the projects. Furthermore, he stated, that if the KMRC wants to stay in the forefront of science, the Centre needs to develop its operating models, and to be brave enough for new and unforeseen openings. He also mentioned the idea to conduct an international risk analyses of oil transportation along the Northern Sea Route.

There are good individual players, representing separated branches (on fisheries, maritime safety and environment, logistics and ports), among the KMRC researchers, who need to find each other, as in the current world, multi- and interdisciplinary research is even more needed to solve the complexed challenges we are facing today.



5 | RECOMMENDATIONS FOR IMPROVEMENTS

The reviewers were requested to give recommendation to support KMRC in developing a roadmap from the present quality to the internationally excellent level and maximal societal impact, and in identifying necessary changes.

In the light of the review, this reviewer is giving the following recommendations:

1. The abbreviation for Kotka Maritime Research Center (KMRC) may refer also to a) "Kolkata Metro Rail Corporation - a rapid transit system in Kolkata, India", b) KMRC (AM) - a radio station in Louisiana and c) USA and Kenya Mortgage Refinance Company (KMRC). Thus, perhaps it would be good to consider the abandonment of the use of the abbreviation, and use only the whole name of the Center, at least in the international context.
2. It became obvious during this evaluation and review process, that the research groups of the three universities and one university of applied sciences involved have not identified themselves as an entity but are working through separated branches on fisheries, maritime safety and environment, logistics and ports, and therefore, integration should be strengthened. There are good individual players, among the KMRC researchers, who need to find each other, as in the current world, multi- and interdisciplinary research is even more needed to solve the complexed challenges we are facing today.
3. When reading the list of publications on the KMRC webpage, there are many publications with affiliation to one of the Universities but not clearly to the KMRC. Thus, one strong recommendation is that the double affiliation of the professors and the source of funding should be mentioned when submitting documents for publication.
4. A successful research community needs to make itself as a recognized player in solving global problems. Thus, especially as shipping is an international business, one of the recommendations is to reconsider what is meant by international collaboration in the context of KMRC work, and the future definition for international work.
5. Likewise, it is recommended to reconsider what is meant by having an impact on decision-making, or at least to consider developing criteria for follow-up studies to validate how big the impact has been.

6. Furthermore, to ensure real international collaboration there is a need to develop a good collaboration among different actors in Finland, in the Baltic Sea Region, in EU and beyond. Good and important first step could be strengthening of collaboration with and within both HELCOM and the EU's Baltic Sea Region Strategy and its policy areas PA Ship and PA Safe. At national level, it could be beneficial to consider the possibility to widen the collaboration at Turku University to cover future work of the new technical faculty, which is under development, and with the closed located Lappeenranta-Lahti University of Technology LUT.
7. The KMRC could also take a bigger role as a coordinator for future international research projects, the EU financed COMPLETE project as a good example. Furthermore, the KMRC could offer services for universities, administration etc. on preparing applications to the EU and other international calls.
8. Additionally, good consultancy support on maritime issues would be very valuable e.g. for administration and maritime business. KMRC could have a role to play in this field, and not only in Finland but in all the Baltic Sea states.
9. The KMRC should put more effort on dissemination on its work, research and possible future services to increase its visibility and funding options.
10. The KMRC and its research group members should be more involved in regulatory development. This could be carried out through collaboration with legal experts e.g. BALEX members. Another pathway on national level could be to be more involved in TRAFICOM's preparatory work and meetings for all international meetings, e.g. at IMO.
11. To guarantee research work and funding of KMRC in the long run, one option could be to consider what are the pros and cons in emerging KMRC to one of the universities or the university of applied sciences it is collaborating with.
12. The KMRC is an active teenager, however it should make the decision what it will be as an adult, i.e. to make decision what the future role and priorities for the Centre will be.

ANNEX I

GUIDANCE FOR THE EXTERNAL EVALUATOR PROVIDED BY KMRC

The aim and expected outcome of the assessment Kotka Maritime Research Centre (KMRC, “Merikotka”) research assessment will evaluate the activities carried out within the KMRC network (<https://www.merikotka.fi/merikotka/?lang=en>). Instead of evaluating the research groups separately, the network will be assessed as a whole. The assessment is the first international evaluation to be conducted in the KMRC history and aims at positioning KMRC nationally and internationally. The idea of doing such evaluation was originally proposed in KMRC operational model analysis report published in 2014 and the assessment has been initiated by Kotka Maritime Research Association (KMRA). In 2015, a decision was made to change the nature of KMRA from a purely (research and project) administrative organization into one with more expert organization. This change also influenced the need to get feedback on KMRC work.

The target of the assessment is to evaluate

- the quality and potential of research,
- the success of multi- and interdisciplinary collaboration within KMRC, and
- KMRC’s research impact, societal impact and innovative capacity.

The evaluation will provide high-quality feedback on KMRC strengths and weaknesses and identify future recommendations. The results can be utilized in improving KMRC activities during the strategy period 2019-2021: in steering KMRC’s research focus areas and research themes, in improving the quality of interdisciplinary collaboration and in enhancing the interaction between KMRC and society. KMRC 2019-2021 strategy update lists several planned actions which will utilize the evaluation results.

The assessment is carried out by two external evaluators. As an outcome of the assessment, the evaluators are asked to produce assessment reports. Each evaluator produces their own report. The deadline for delivering the report is agreed with each evaluator.

The report shall cover the items listed under evaluation criteria. The evaluation is based on the written material (listed under background material for the evaluator), interviews conducted during the site visit and additional material requested by the evaluator before/during the visit.

Background material for the evaluation

The following written material will be provided to the evaluator:

- Self-assessment report
- Bibliometric analysis 2015-2018 + list of publications
- KMRC annual reports 2016 and 2017
- KMRC strategy 2019-2021
- KMRC research agenda 2017-2020
- KMRC personnel and project volume figures 2015-2018
- Summaries of the current and past projects including funding sources, consortia and project budgets: www.merikotka.fi

The evaluator is asked to familiarize her/himself with the background material prior to the site visit.

Interviews

An interview visit will be organized on 25.4.2019. During the visit, the evaluators have a chance to interview KMRC researchers and management and get acquainted with KMRC. The evaluators can conduct the interviews as they find best (who to interview, how to interview etc.). In case of desiring to interview other personnel than the research management (such as researchers or project managers) and/or if the interviewees need to prepare something for the interviews, KMRC would appreciate it if the evaluators would inform about these in advance.

Evaluation criteria

In the assessment report, the evaluator is asked to present:

1. A general statement on the focus and strategy of the KMRC research;
2. Numerical ratings and written statements for the following elements:
 - Research excellence, research quality, and the extent and impact of multi- and interdisciplinary collaboration of the research;
 - Impact of the research on the research community;
 - Societal impact;
 - Entrepreneurial and innovative capacity;
 - Strengths and weaknesses of the research environment;
 - Future potential

The scale to be used for the numerical ratings: 1 = emerging; 2 = fair; 3 = good; 4 = very good; 5 = excellent; 6 = outstanding international level.

Recommendations for the future

The recommendations shall support KMRC in developing a roadmap from the present quality to the internationally excellent level and maximal societal impact, and in identifying necessary changes.

For the purposes of defining quality levels, “international” is a quality benchmark. The wording “international level” shall not be equated with work on international themes. Here, “international level” indicates KMRC’s standing in comparison with internationally established research units or institutions in the same field of research. For example, the quality of the interaction between KMRC and society (i.e. the societal impact) may be assessed to “Outstanding

International Level” even if the interaction takes place mainly at the national or even local level, if this is the case also in the best international institutions in the same field of research.

Documents shared with the reviewers for the review process and the assessment

The following documents were provided by KMRC for the external review process:

Initial planning of KMRC

Lahti, S. & Uronen, P. (2004) Merikotka – Kotka Maritime Research Centre, a report commissioned by the City of Kotka and the Regional Council of Kymenlaakso

Earlier reviews of KMRC

Lahti, S. & Uronen, P. (2010) Evaluation of Merikotkas operations and a future strategy

Varsta, P. (2014) Maritime Research Centre Merikotka – Report on current state and a proposal for a future operational model

KMRC rules and strategic documents

Rules of Kotka Maritime Research Association 2016 (PRH journal number 2016/513159Y, document number 39556479)

KMRC Research Agenda 2017 – 2020

KMRC Strategy Update 2019 – 2021

Documents related to research and other activities of KMRC

KMRC Research Assessment Self Evaluation Report

- Merikotka Annual Report 2017
- Merikotka Annual Report 2016
- KMRC Publications 2015 – 2018 (Excel)
- KMRC Indicators (Projects etc.) (Excel)
- Bibliometric Analysis for KMRC 2014 - 2018 undertaken by Helsinki University Library

ANNEX II

QUESTIONNAIRE FOR THE INTERVIEWS

I Impact on Decision making

One of the focuses of KMRC's Strategies is to have an impact on decision-making. Thus, I would like to ask you what is your understanding, how big influence, in your view, the KMRC has had on decision making.

Q: Are you aware in how many decisions KMRC's research have been taken into account and at which level? Could you please give me some examples?

Q: Could you please give me an example/s on this new initiatives?

A. International Maritime Organization (IMO):

A.1 In how many IMO initiatives have you been involved?

What is the number of the submissions based on the outcome of MERIKOTKA's /your studies have been submitted to one of the IMO's committees or subcommittees?

A.2 What are the most important/relevant research questions related to IMO's work on

.1 safety?

.2 environment protection?

B. EU-level

– In how many EU initiatives have you and been involved?

C. National level

– In how many IMO initiatives have you been involved?

II International collaboration

How do you define international collaboration?

Other similar international organizations:

Are you familiar with or collaborated with the International Council on Clean Transportation (ICCT) or Transport and Environment? Classification societies such as DNVLGL? BALEX?



KOTKA MARITIME
RESEARCH CENTRE

