



Lifeboats



UNIVERSITY OF
CAMBRIDGE



IfM Education and
Consultancy Services



**REPORT OF THE
COLLABORATIVE WORKSHOP:
EXPLORING THE FUTURE OF
SEARCH AND RESCUE COMMUNICATIONS
AND 'CALLING FOR HELP'**

Authors: Tim Robertson, Will Robert, Hannah Nobbs, Clemens Chaskel

EXECUTIVE SUMMARY

During the summer of 2016 the RNLI embarked on a Technology Roadmapping exercise with the support of the Institute for Manufacturing's Education and Consultancy Services (IfM ECS) and the assistance of third parties to help explore the future of search and rescue communications and 'calling for help' on, in or near the sea.

There were multiple needs for this work:

First, a decision was being sought as to whether the RNLI should continue the support of a 'Man Overboard' (MOB) safety product, which was underpinned by a confidential position and reporting system. This decision necessitated a deeper organisational understanding of the current and emerging technology landscape.

Secondly, the RNLI Community Safety Team are continually developing safety interventions to reduce the risk of incidents and fatalities in and around the UK and Republic of Ireland (ROI). To do so effectively, they need an understanding of what technologies people are using now, but also, critically, what they are going to be using in the future to call for help. Such knowledge not only enables them to make informed recommendations to water users, but also ensures that they are not missing any opportunities to leverage technology where possible, to save life and enable people to call for help.

Thirdly, there is a reliable current communications suite used on our lifeboats that has multiple interfaces; whilst reliable in the long term, these systems do suffer from a number of challenges. This work explored what a future system may look like and what technologies may be used.

Finally, the RNLI Innovation Team wanted to explore the utility of Technology Roadmapping to stimulate innovation, reveal gaps and opportunity areas for investment of time and effort.

To address these needs, the project team collated insights from industry, academia and research institutions through on-line sessions and face to face workshops. These insights were then synthesised into a series of top level roadmaps depicting the vision for the topic area, the trends and drivers affecting the change, the barriers and enablers to the realisation of that vision and the technological stepping stones required to get there.

This work effectively demonstrated the utility of the roadmapping process to the RNLI and its trusted partners. It proved to be a powerful tool for collating insights and technical intelligence and allowed the development of a single, coherent vision of each of the topic landscapes. Now, the team has a valuable and engaging way to communicate technical information with business leaders inside and outside of the RNLI and influence the direction of innovation resource and investment.

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ABOUT THE WORKSHOPS

Dates and venues

Main event

29th – 30th June 2016
ect.Venues, Prospero House, London

Synthesis workshop

11th July 2016
RNLI Headquarters, Poole

Visualisation workshop

18th July 2016
IfM, Cambridge

Facilitators

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A list of delegates is provided in the appendix.



WORKSHOP GOALS

BACKGROUND

The RNLI is a charity established to save lives at sea. The RNLI provides an on-call, 24-hour lifeboat search and rescue service around the UK and Ireland, and a seasonal lifeguard service.

To ensure the RNLI and the wider Search and Rescue (SAR) community leverages maximal value from existing and future safety communication systems, it is essential that it continues to develop its understanding of changes that may affect its maritime domain awareness and the Global Maritime Distress and Safety System (GMDSS). Furthermore, the continual growth of the space industry and the exploitation of space assets for new products and services means that there is a rapid proliferation of consumer technologies that could be used in 'calling for help' by people on, in, or near water bodies and are therefore at risk of drowning. The RNLI are acutely aware that organisational understanding of these fields needs to be improved.

The RNLI therefore approached IfM ECS to conduct a technology roadmapping exercise, which will develop pictures, or 'roadmaps', which clearly articulate the current state of the art and the planned and predicted changes across all functions of GMDSS and personal 'calling for help' technologies.

Aim

The aim of this work was to develop a coherent picture of these systems, their developmental trajectories, and understand their implications for the RNLI's lifesaving and prevention service, as part of UK & ROI SAR. Additionally, there was a need to understand the changing regulatory framework which may enable, or hinder, the emergence of potentially lifesaving technologies.

In increasing its understanding of these technology landscapes, the RNLI would be able to ensure that it is taking best advantage of advances in the industry to save lives. By conducting such an exercise, the RNLI mitigates the risk of technological surprise, informing the communications requirements of future lifesaving platforms and providing an objective look at where potential gaps may exist now and in the future. The outputs from this work would also inform any future RNLI Operational Communications Policy.



Vision

In order to set the direction for the workshops, the RNLI defined a vision focussing on future communication requirements, going beyond the simple provision of voice services to provide the delegates with a broader envelope to understand, discuss and map the future SAR communication landscape. The vision was defined as follows:

“Total, real-time maritime domain awareness”

– borne out of adoption of the most effective and affordable **maritime communications and locating technologies.**

Key to successfully changing the communications landscape in the maritime domain is the support of legacy systems, and an alignment with governing bodies and users. The RNLI therefore built on the expertise of a diverse group of subject matter experts.

METHODOLOGY

Roadmapping: Why and how do we use it?

Roadmaps provide a structured visualization of particular strategic aspects. They are used to support strategic planning across a broad spectrum of applications. A common roadmap layout, or architecture, will contain two axes. There is a horizontal, time-based axis; often encompassing the past, short-, medium- and long-term, as well as the vision. The vertical axis usually pertains to perspectives, or dimensions, relevant to the focal point of the roadmap; often represented as horizontal layers, forming a matrix across the time dimension.

A roadmap allows the integration and alignment of several different perspectives across a broad time range. In this way, the development of currently developing, or short-term, underpinning science and technology to support long-term market trends and drivers can be explored. As a result of this flexibility, roadmaps can be applied at different levels – international, industry, company and product-specific roadmaps have been produced (Phaal et al., 2004; Phaal & Muller, 2009). They can also be applied in a hierarchy – with industry-level trends and drivers cascading down through organizational objectives into specific products and technology features and parameters – a great benefit to the RNLI, who interfaces with manufacturers and policy makers, recreational users and professional mariners.

Roadmapping processes typically follow a pattern of divergence, convergence and synthesis (Phaal et al., 2010). Brainstorming and scenario planning are divergent activities which benefit the process by encouraging open and innovative thinking by participants. In contrast, convergence requires some discipline to focus the attention onto the most important issues identified in the divergent activity. Thus, workshops tend to employ a divergent-convergent cycle of activities, culminating in a synthesis stage where summarising and sense-making help create a coherent set of roadmaps (Phaal et al., 2010).

The activity of recognising and acting on the impact of trends is a vital element of competitive strategy (Aguilar, 1967). As technology becomes increasingly complex and has a larger impact on manufacturing firms, technology intelligence is vital for firms to remain competitive. Kerr et al. (2006) found that technology intelligence “provides an organization with the capability to capture and deliver information in order to develop an awareness of technology threats and opportunities.”

The roadmapping process employs similar techniques for scanning for trends in the external environment (Phaal et al., 2012). This information is typically drawn from the expert participants in the early stages of the workshop, however one mechanism to enhance the information generated and captured is to pre-populate the roadmap prior to the workshop. Approaches for this include a) participants can be requested to prepare in advance, or b) external researchers can be commissioned to identify important trends and drivers.



Roadmapping @ RNLI

Defining customer requirements

Prior to the initiation of the roadmapping exercise and engagement of external subject matter experts, the RNLI Innovation Team worked with internal stakeholders to clearly define their problems and what constituted success for this programme of work. Through a series of one to one meetings and after engagement with senior decision makers, a formal requirement document was developed.

Developing the approach

Working with the IfM ECS, the Innovation Team developed a roadmap framework / template that would facilitate the capture of insights and 'technical intelligence' provided by the external community and RNLI expert practitioners. Modifying templates already used by IfM ECS, it was decided to collect information and insights along the following themes:

- Trends and drivers
- Needs (products, services, systems etc.)
- Technologies and systems
- Barriers and Enablers

Identifying contributors

To develop the roadmap, it was essential that the RNLI gathered insights from a broad audience that was engaged with our purpose, understood the intent behind the roadmapping exercise and was sufficiently forward thinking to stretch our understanding of the current and emerging landscape of SAR communications and calling for help technologies. The Innovation Team hence sought a balanced mix of participants from government, industry and academia to contribute. Essential to the success of this exercise was the participation of each member without any commercial or political bias – a sentiment that was bought in to by all.

Pre-Work: Collating insights

Prior to the roadmapping workshop, key insights on the selected topic areas were gathered by the project team from the workshop participants. A blank roadmap template was sent to participants, soliciting comments and insights relating to trends and drivers etc. and when the participant thought they would impact the landscape (short, medium, longer term). Over a two-week period, over 1,500 insights from 20+ of the participants were collated.

Roadmapping literacy

Whilst most participants were aware of the roadmapping concept, few had actually participated in a roadmapping exercise. To ensure that everyone was on the same level and was able themselves to leverage most value from the exercise, the IfM ECS facilitator held two webinars. During these on-line exercises, participants were given an overview of the methodology, its origins and its utility to organisations like the RNLI. Participants were then talked through the Pre-Work and invited into a Q&A on the methodology. Both RNLI and external parties took advantage of this learning opportunity.

Rationalising and clustering insights

On receipt of the pre-work from workshop participants, the IfM ECS clustered and de-duplicated insights, rationalising all the information provided to yield a roadmap that could subsequently be taken into the workshop as a 'starter for ten' that could subsequently be built upon. Included in this activity was an analysis of the frequency and prevalence of certain insights and their emergence over time.

Roadmapping workshop

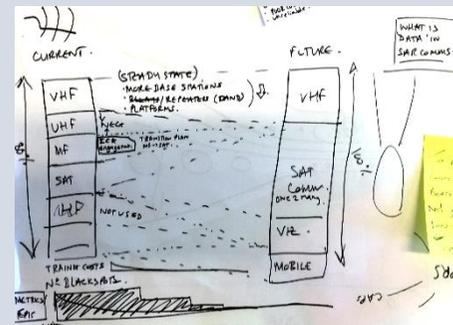
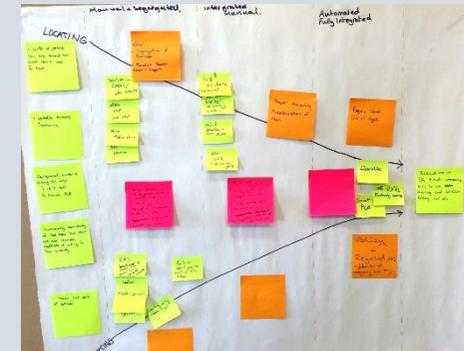
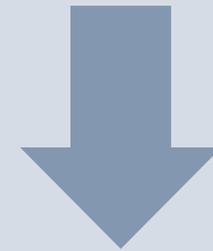
The main roadmapping activity was carried out over two days. Nearly 30 delegates from a range of backgrounds attended, reaching from academia, recreational user bodies and equipment manufacturers to the RNLI, the Maritime and Coastguard Agency and stakeholders from communication infrastructure providers and the aerospace & defence sector. During the first day, the delegates worked together to understand and map the SAR communications landscape as a whole. On the second day, the group was split into focus groups to work on detailed roadmaps of topics that are of particular importance to the RNLI, before again engaging the wider audience in a discussion on these topics.

Synthesis Workshop

Following the roadmapping event, all outputs were codified and recorded by the project team, including remote support from IfM ECS. This included audio recordings and physical content (i.e. roadmaps). The project team then, over the course of 3-4 days, synthesised the insights into a more concise set of individual roadmaps, simplifying and interpreting as they went. Throughout this intensive exercise, care was taken not to lose meaning from the content.

Visualisation Workshop

Roadmaps are visual devices for communicating to decision makers how a vision may be achieved, what needs to be done to get there, and what factors are enabling, blocking and driving the achievement of that vision. It is essential therefore, that the roadmap is designed in such a way that these things are effectively communicated and the desired result is achieved. A workshop was thus held by the IfM's Centre for Technology Management to upskill the project team in the development of roadmap visualisation skills and to develop the first iterations of each of the roadmaps.



OUTCOME

Strategic analysis of way forward

The process above led to the production of three technology roadmaps, each to be used with different audiences to achieve particular aims:

Alerting and ‘calling for help’

The RNLI is committed to halving the number of deaths from drowning by 2024. The Community Lifesaving Stream of the RNLI has a need to understand where development in technology could contribute to this goal, starting from a point where devices for distress alerting exist, but are not universally recognised by, or widely integrated with, Maritime Search and Rescue systems. From the data available to Community Lifesaving, it appears that approximately 50% of people who have died around the UK coast did not call for help.

The alerting and locating roadmap provides a basis for RNLI engagement with industry and academia to identify gaps in capability and to exploit developing technologies to reach a vision of affordable, easy to use alerting and location finding for all.

It will also be used to inform RNLI strategy, to ensure that development of future capabilities within the organisation interact with emerging technologies throughout development and adoption to maximise the potential lifesaving benefit.

Future communication

Communications are critical to safe and effective lifeboat operations – the RNLI places paramount importance on the safety of its volunteer crews. However, the RNLI recognises that there are areas of the current communication capability that could be improved upon. This includes the prevalence of a small number of VHF blackspots, the continued use of MF as a communication bearer and the training burden associated with keeping volunteer crew up to date with the relevant training protocols and standard operating procedures.

The Communications Team from the RNLI were fully engaged in this process and saw significant potential benefit in engaging with the external, non-RNLI community to ensure that they were still current and up to date in their thinking around the future of communications at sea. The SAR communication roadmap hence represents the collective vision of the RNLI subject matter experts, combined with insights from industry and academia.

This roadmap will be used by the team as a mechanism to engage with senior stakeholders and secure buy-in to the development of a communications suite that leverages the technology now available that tackles many of the problems cited above.

The future of CPRS

This roadmap answered a particular need within the RNLI Operational Policy directorate to support a time sensitive decision on the future of the Confidential Position Reporting System. Its audience is simply the decision maker at the RNLI, i.e. the Operational Policy Director. This clearly identified audience has allowed the author of the roadmap to include elements that would otherwise be considered unsuitable for accessibility reasons such as red/green elements.

This roadmap has already been used to support a discussion regarding the future use of the CPRS platform and it was well received, helping to ensure a properly informed decision making process with options well explored and clearly illustrated.

As a direct result of the support offered from the future roadmapping activity to the Operational Strategy Team at the RNLI a report was submitted and welcomed that clearly articulated a way forward with respect to the CPRS platform.



The future of communication needs to be effective, but simple – while still maintaining a link to current communication technologies

Roadmap

“Future for alerting and calling for help”

During the roadmapping activity, subject matter experts, internal and external to the RNLI developed the vision of “affordable, easy to use alerting and location finding for all”.

Based on the following characteristics:

- 100% worldwide coverage, accurate to within 5 metres
- Affordable and standardised across land and sea
- Integrated with ‘everyday items’

To achieve this vision for people both offshore and along the coast, there are several key enabling technologies shown on the roadmap on the following page.

It was felt that current systems available for personal distress alerting are segregated, not always recognised by Maritime SAR and are manual in operation.

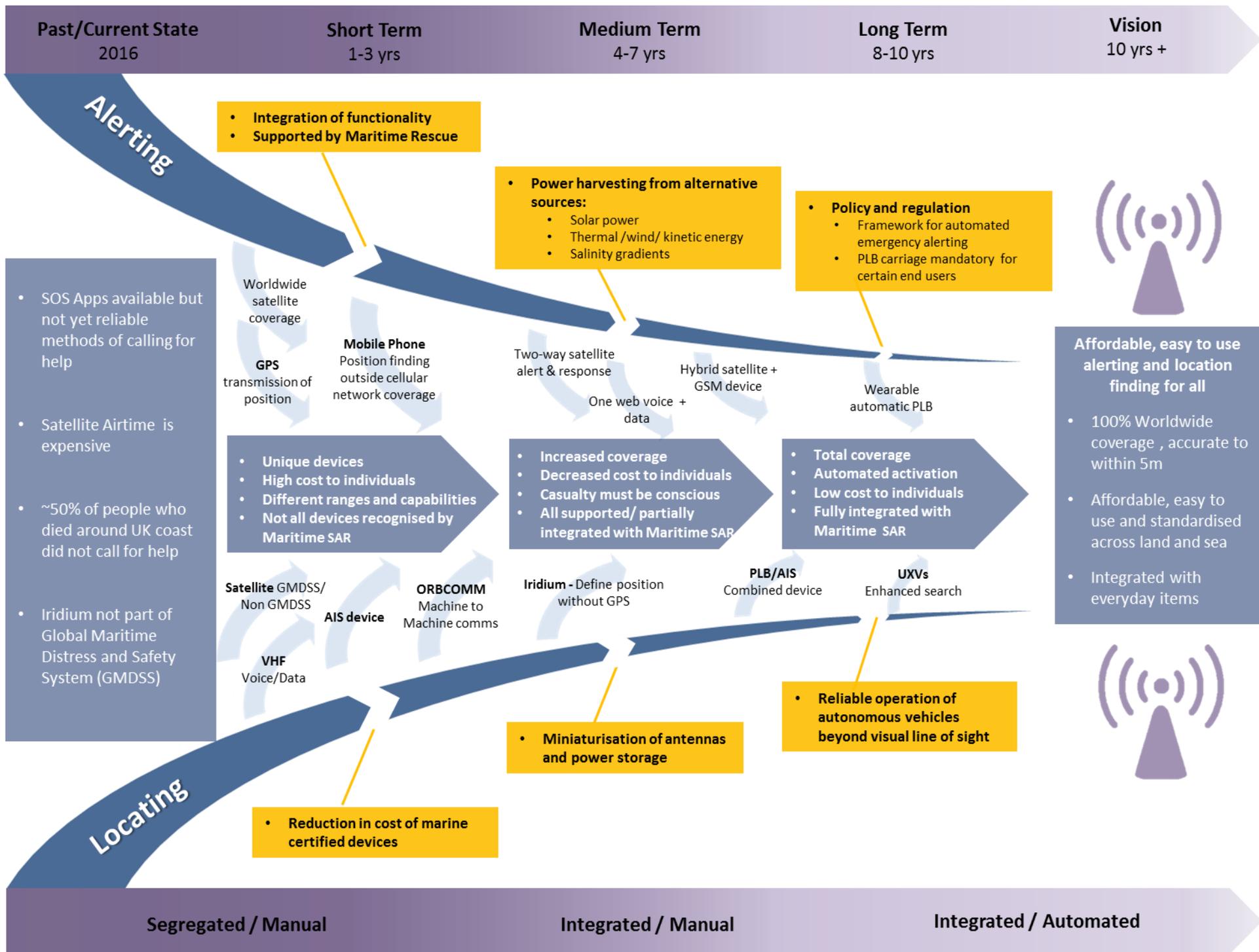
In the near term there was a recognition that the majority of people carry a mobile phone with them which could with the right equipment be used as a beacon as long as the phone is on.

There are more options becoming available for delivering voice and data through enhanced satellite coverage, impacting both GMDSS and non-GMDSS systems. This will enable the function of alert and response to be combined within one device. This, combined with the miniaturisation of power sources and antennas, could lead to personal locator beacon devices being incorporated into everyday wearable items such as clothing.

The Policy and regulatory framework that supports the carriage of personal beacons has been identified as a major driver in enabling the automated functionality of alerting, and mandating carriage for certain end users.

Reliable operation of autonomous vehicles beyond line of sight in non-segregated airspace would be a significant enabler in the use of UXVs for enhanced search.

ROADMAP: FUTURE ALERTING AND 'CALLING FOR HELP'



Roadmap

“Future maritime communication”

It is vital that the RNLI have a safe and dependable means of voice and data communication across all their operational environments. This need is only partially being met by current systems – some of our lifeboats experience communication ‘blackspots’ and are not able to communicate effectively using VHF etc. when needed. External factors affecting the use of these systems now and in the future (i.e. ‘Drivers’) include reduced time available for training, a pressure to reduce the cost of SAR operations, increasingly crowded communications channels due to increased maritime traffic and the increasing trend for the servitisation of communications services.

In this roadmapping activity, subject matter experts from the RNLI developed the following vision for the future Lifeboat communication system:

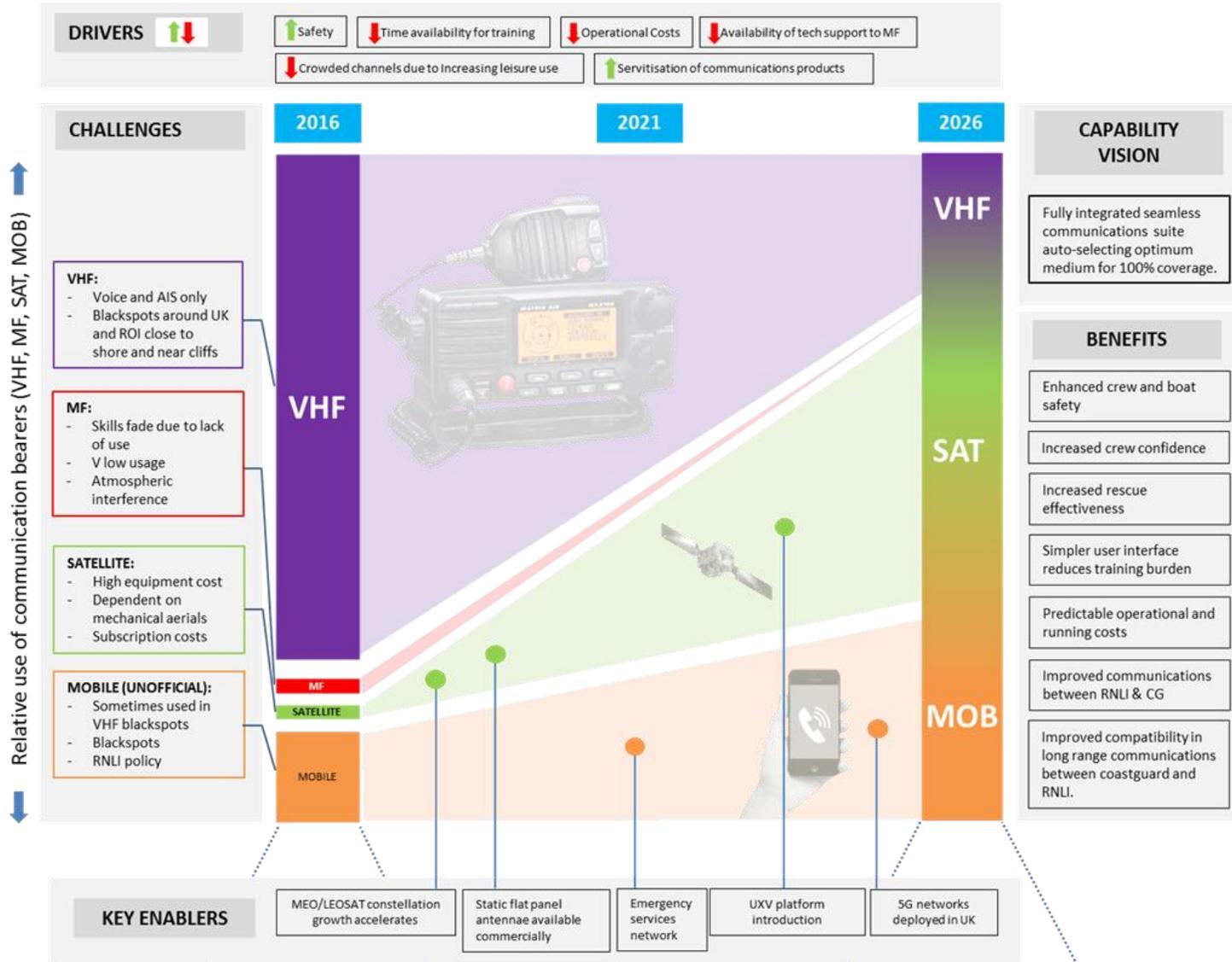
“A fully integrated, seamless communications suite auto-selecting the optimum medium for 100% communications coverage.”

VHF communication, the most widespread, dependable and easiest to use, suffers from blackspots, a lack of infrastructure for rebroadcasting seaward and is voice and AIS only. MF can be flaky due to atmospheric interference, is complex and has a high training burden; as it is used infrequently, there is a considerable risk of skills fade. Satellite communication systems are currently expensive, requiring high initial capital investment, the payment of subscriptions and are dependent on mechanical antennas. Mobile phones are unofficially used by crew members to communicate with management at the lifeboat station and to parties with whom only confidential information should be communicated – e.g. ambulance crews awaiting receipt of a casualty.

There is a need, therefore, to provide an integrated or ‘blended’ lifeboat communications solution that is self-sensing and capable of clear voice and data transfer over any distance. This system would be able to detect when it has a good path and is able to seamlessly switch between mobile phone, VHF / MF and satellite communications bearers. Taking into account the fact that lifeboats will often be crewed by volunteer crews, a simple user interface and low training burden would be essential.

Moving towards the vision of one, blended communications suite, this will be facilitated by a handful of key enablers – significant growth of the LEOSAT constellations, the Emergency Services Network, Flat Panel Antennas and the increasingly widespread introduction of UXVs into the maritime environment.

ROADMAP: FUTURE MARITIME COMMUNICATION



Roadmap

“Future of CPRS”

The roadmap for the Future of CPRS (Confidential Position Reporting System) was commissioned by Martyn Smith (RNLI Regional Policy Manager) specifically for George Rawlinson (RNLI Operational Policy Director) to inform a time critical decision regarding the potential for future use by the RNLI of the CPRS platform previously used to support the Man Over Board Guardian system produced by the RNLI in partnership with McMurdo for commercial fishermen. The Man Over Board Guardian system is to be switched of in 2017 as it is now considered obsolete, however the RNLI has the option to continue to utilise the CPRS platform upon which it was built.

By roadmapping four potential options in the RNLI promotion / application of future alerting systems it has been possible to illustrate the strength and weaknesses of each approach in moving the RNLI towards the 2024 strategic target of reducing accidental drowning by 50% and eventually ending preventable drownings altogether.

The options considered were:

- Support and promote use of existing commercially available GMDSS / SARSAT based beacons
- Develop CPRS based tracking and alerting system with partner
- Develop CPRS based tracking and alerting system independently
- Do nothing

The ‘force field’ diagrams (opposing green and red arrows of varying dimension according to ‘strength’) within each option swim lane give a good indication of the strengths and weaknesses relating to each. Option one clearly shows the fewest negatives in the shortest time frame while still impacting on reducing drownings.

ROADMAP: FUTURE OF CPRS

Future use of CPRS / GAP?



CPRS - Obsolete



Global Alerting Platform

- One of many
- Costly
- Incumbent supplier inertia?
- Not widely adopted beyond RNLI
- Capable platform (Low latency / High Capacity)

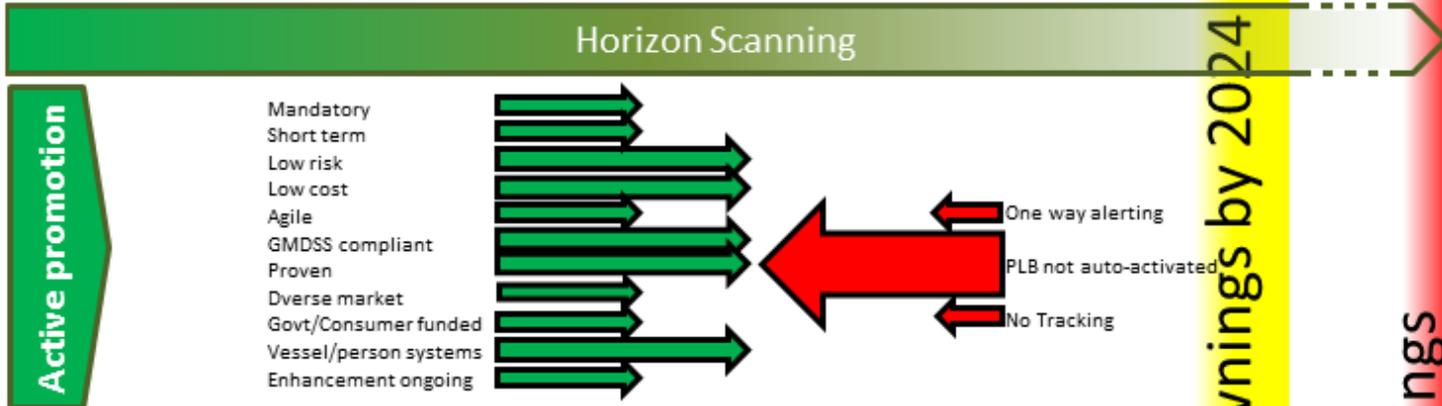
Current state:

- Confidential tracking, independent of government (fishing vessels only)
- Auto-alert for MOB event
- Vessel distress alerting active and passive (heartbeat)

BUT!

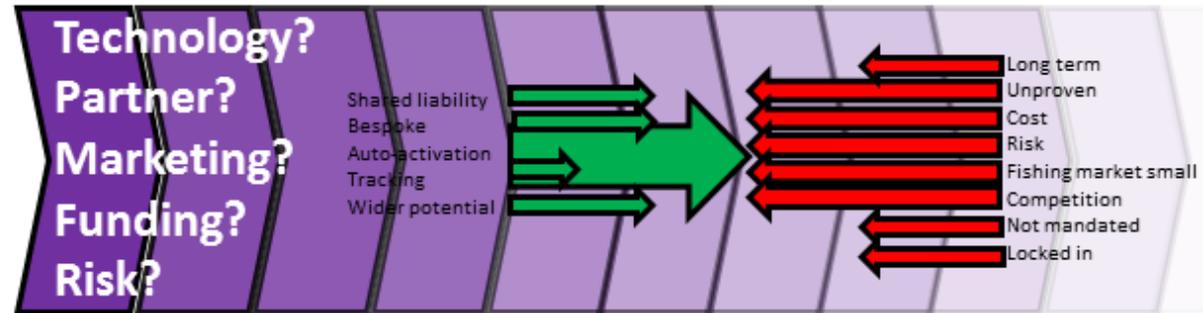
- Airtime expired & expensive
- Equipment obsolete
- High repair costs
- Incorrect operation (eg. Fob pairing)
- Doesn't help catch fish = Poor take-up by fishing community
- Not GMDSS recognised
- Fishermen = small market segment - lack of commercial value / interest

SUPPORT & PROMOTE GMDSS / SARSAT BASED BEACONS

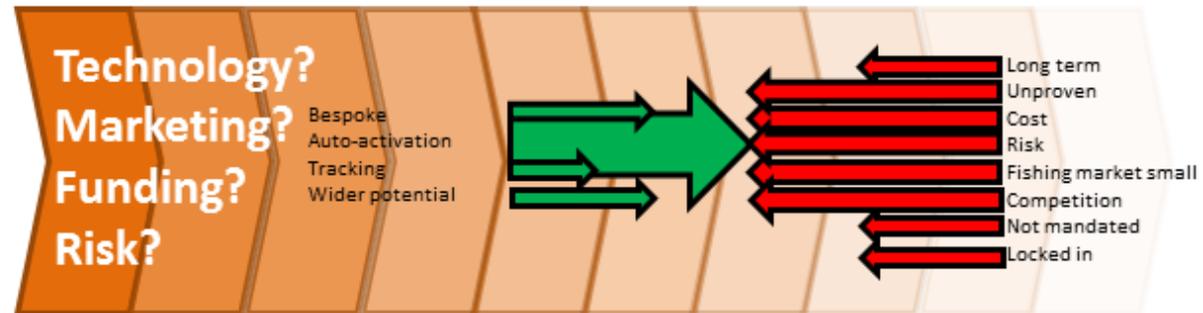


MOB Guardian ceases to operate June 2017

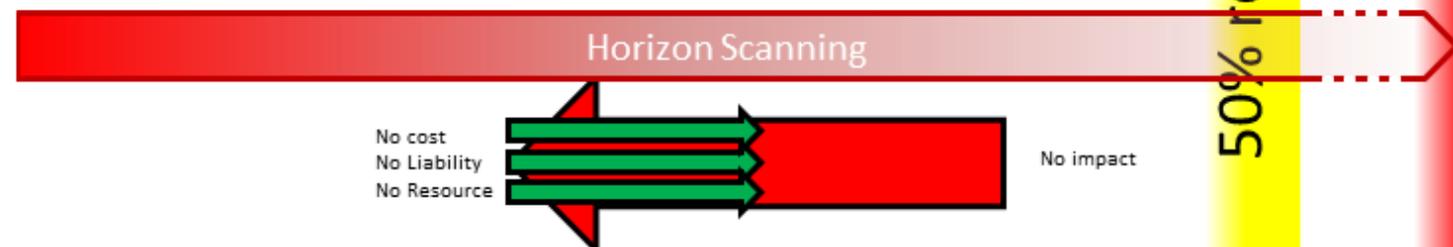
DEVELOP TRACKING & ALERTING SYSTEM WITH PARTNER



DEVELOP TRACKING & ALERTING SYSTEM INDEPENDENTLY



DO NOTHING



50% reduction in preventable drownings by 2024

End preventable drownings

DISCUSSION

What value has the Future Technology Roadmapping exercise realised for the RNLI?

Across all three areas of interest the roadmapping process has allowed the gathering of deep technical insight from external subject matter experts. It has connected our RNLI technical community with a community who are now aware of our technical challenges and lifesaving ambitions.

The RNLI has been able to learn more about current and emerging capabilities across a wide range of communications / location and calling for help technology areas. These opportunities to share understanding, challenge and network within the communications technology community in a structured well-facilitated process has benefitted the members of the RNLI team attending as they now have a shared understanding and language for the future communications technology landscape.

The open and unbiased conversation, catalysed by the roadmapping process has enabled the development of roadmaps that articulate a shared vision for the future that can be used to illustrate and inform thinking within and without the organisation when people are considering specific questions around the future of the CPRS system, SAR-specific maritime communications or consumer technologies for alerting and calling for help. When engaging internal stakeholders, these roadmaps can now be used as a catalyst for conversation and raise awareness in decision makers of the wider landscape and factors that may come into play.

The future technology roadmapping process for the specific questions around maritime communications and alerting & calling for help has also drawn the attention of RNLI senior managers to the essential value of the roadmapping process itself and consideration of what value it might add to other areas of the business. The RNLI Engineering and Asset Management Team particularly have expressed interest in involving the Innovation Team with further technology roadmapping exercises.

How may interested parties access more of the data that informed and underpinned the visualised roadmap summaries contained within this report?

The information captured to inform the creation of the 'Future Maritime Communications' and 'Alerting and Calling for Help' roadmaps has been captured and presented in topic specific roadmaps which are available for distribution. If you have not been provided with a copy but would like to learn more about the thinking behind the visualised roadmaps, please request copies of these from Tim Robertson (trobertson@rnli.org.uk).

What next for the RNLI and future technology roadmapping?

The roadmapping process has revealed a small number of potential project opportunities that the Innovation Team are working up with internal stakeholders.

As referenced in the earlier discussion about value to the RNLI realised by the technology roadmapping process in general, the Innovation Team are currently supporting other teams within the RNLI to develop future questions to which the Institute for Manufacturing Future Technology Roadmapping process could be applied to develop compelling and accessible visions of technological development that could help the RNLI achieve its vision of ending the preventable loss of life to drowning. Currently the Engineering and Asset Management Team are showing the most interest in developing future technology roadmaps in areas including hull materials and propulsion systems.

INSIGHTS INTO THE COMMUNICATIONS ‘TECHNOLOGY ROADMAPPING’ AND ‘VISUALISATION’ WORKSHOPS

**THOUGHTS FROM
MARTYN SMITH**

Martyn Smith is a roadmap customer from Operations Policy at the RNLI and attended all workshops.

3 July 2016

As a member of the Operational Policy Team and in the light of the recent decision to cancel the RNLI's satellite based vessel tracking and distress alerting system, known as Man Overboard Guardian, I was tasked to prepare a paper to determine whether or not the RNLI could make further use of the technology underpinning the system. Specifically, this referred to the potential future use of commercially available cloud based global alerting platform (GAP) and the RNLI's confidential position reporting system (CPRS) front end application.

In addition, I had previously written a paper on long range communications within the operational arm of the RNLI and had highlighted some concerns as to effectiveness of our systems beyond VHF range and the subsequent risk posed to our crews. Finally, within the RNLI, it had become clear that a number of individuals were actively looking at the future application of satellite and other communication technologies as part of the R.I.S.E model (Rescue, Influence, Supervision and Education.) The roadmapping process appeared to me to be the ideal opportunity to bring together these various strands, assist me in my deliberations over MOB Guardian and provide an insight into how the RNLI could overcome long range communication issues between SAR assets beyond 40nm and shore authorities.

The process has provided me with a number of significant benefits. Firstly, it achieved the aims outlined above. Of particular value was the visualisation of the options and the use of a number of strategic tools to clarify my mind with regard to Man Overboard Guardian and develop the appropriate recommendations.

Secondly, the sessions did bring together individuals from within the RNLI working in the communications field and informal feedback suggests the collaboration was productive and well received.

Thirdly, RNLI staff interacted with representatives of relevant industries which both broadened minds and facilitated networking.

On a more general note the exposure to a new set of strategic tools will help me to contribute in a more structured way to the development of operational policy whatever the subject matter.

In conclusion, it is my belief that the increased knowledge and awareness of communications technology and the new relationships established have the potential to inform and direct both the development of future effective search and rescue communications and the targeting of effective RNLI water safety interventions in both the commercial and leisure worlds. Ultimately the output of the exercise was a clear and considered recommendation to the RNLI Operations Director and Executive Team as to the way forward.

CONCLUSIONS

The Institute for Manufacturing's Education and Consultancy Services provided a structured and well managed process for future technology roadmapping that enabled the RNLI to explore the future of Search and Rescue communications and 'calling for help', confident that the content and facilitation was professional, well proven and would deliver meaningful outputs that would add value to the institution.

The involvement of 3rd parties in the main workshop enabled different perspectives and specialisms to inform the foundations of the roadmaps produced while the synthesis and visualisation workshops ensured that the value captured during the main consultative workshop was processed and then presented in the most impactful way across the three interest areas.

The key messages that each roadmap has highlighted and attempted to communicate clearly to the chosen audience are:

- **Alerting and calling for help** – In this roadmap the future is seen to enable a move from the current state of segregated and manually operated systems to a future where systems are integrated and automated, enabling affordable and easy to use alerting and location services for all.
- **Future Maritime Communications** – The priority for future maritime communications systems identified within this technology roadmap was highlighted as the integration of platforms to provide a seamless blended solution operating on the best 'carrier' available at the time with a low training burden and simple user interface that enables voice and data communication reliably and at affordable cost.
- **Confidential Position Reporting System (CPRS)** – The preferred route for the RNLI to pursue in the future was identified within the roadmap to be that the RNLI should seek to encourage mariners to exploit commercially available and GMDSS compliant systems rather than creating a bespoke RNLI system based upon the Confidential Position Reporting Platform. This had many benefits, the greatest being seen as low risk and cost, GMDSS compliance, proven technology and scalable systems suitable for individuals or vessels. The largest drawback of pursuing this route was seen to be the current regulatory requirement that PLB systems are not auto-activated, meaning that an unconscious casualty entering the water would be unable to raise an alert. The one-way communication and lack of tracking on the systems available were seen as more minor drawbacks.

APPENDIX

Workshop attendees

Name	Organisation
Ayan Ghosh	EE
Bob Cockshott	KTN
Brian Pemberton	Iridium
Carl McGowan	RNLI
Chris Hoffman	ACR
Christine Sams	NOC
Clemens Chaskel	Institute for Manufacturing
Colin Horne	SRT
Corine Wood-Donnelly	Scott Polar Research Institute
Geoff Mathews	MCA
Hannah Nobbs	RNLI
Jim Watson	BSAC
John Dodd	INMARSAT
Justine Heeley	McMurdo
Kieran Arnold	Satellite Catapult
Martyn Smith	RNLI
Mike Toft	Atlas Elektronik UK
Neil Watson	Thales Group
Nick Lambert	Nick Lambert Associates
Nick Sherwen	Institute for Manufacturing
Paul Fisher	RNLI
Phill Corsi	RNLI
Pip Hare	RNLI
Richard Saull	Scisys
Robin George	McMurdo
Russ Coxon	RNLI
Sean McCarty	Satellite Catapult
Steve Howard	RNLI
Tim Robertson	RNLI
Tony Sephton	ESA
Will Roberts	RNLI

ROYAL NATIONAL LIFEBOAT INSTITUTION

The RNLI is the charity that saves lives at sea.

Royal National Lifeboat Institution, a charity registered in England and Wales (209603) and Scotland (SC037736). Registered charity number 20003326 in the Republic of Ireland

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