Ship Evacuation during Emergency
The Lynceus Project

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Lloyd's Register Marine

Working together
for a safer world

1. **Introduction**
2. Project
3. Technical part
4. Achievements and future steps

How we started

Our heritage is genuinely historic

- ✓ Formed in 1760 in Edward Lloyd's coffee house to examine and 'classify' merchant ships according to their condition.

We have 250 years of global marine history

- ✓ The world's first ship classification society and this remains our core activity today.

…and over 100 years serving other industries across society from energy, rail, food safety to power and manufacturing.

Our governance

Organisation has new structure from July 2012

- ✓ New parent, Lloyd's Register Foundation, a registered charity concerned with safety of life and promoting education and research.
- ✓ Lloyd's Register Group Limited (Lloyd's Register) heads operating group, 100% shares owned by the Foundation.
- ✓ No external shareholders, non-profit distributing.
- ✓ Lloyd's Register Foundation compliant with UK Charities Act.

Lloyd's Register today

REVENUE BY BUSINESS 2012/13

1	Marine	**38.4%**
2	Energy	**37.9%**
3	Management Systems	**19.2%**
4	Transportation	**4.5%**

What we do

http://www.lr.org/en/marine/

Lloyd's Register Marine

Research priorities

Research Priority 1

Minimum environment impact

Ship pollution and emissions are the primary societal concerns. Research towards a zero pollution and zero emission ship is a priority to minimise the impact on the environment.

Research Priority 2

Zero accident shipping

Research towards zero accident shipping remains a primary focus of investment. Development of technologies for improved prevention of unwanted events, enhanced ship damage resilience, lifesaving measures and environment clean-up are necessary to achieve the goal.

Research Priority 3

Cleaner and greener ship power

Research into cleaner and greener ship power is considered as a high priority for sustainable, emission free and efficient shipping for the future.

Research Priority 4

Maximum energy efficiency

Research into excellence in energy and environmental performance will bring benefits to the shipping community in keeping and saving its leadership in global transport industry. It is understood that any process aimed at improving performance cannot stand on the technological leverage alone but research into management and operational aspects are also essential to reach the goal.

Research Priority 5

More secure shipping

The development of secure shipping which is based on the latest information, communication, human element and surveillance technologies, fully integrated into the overall global transport network of technology and service providers remains a vision of future ship operation. The maturity of e-maritime enabling technologies will improve vessel safety, enable continued operation using remote monitoring, remote inspection, remote maintenance services and the reduction of operational costs. It will also contribute to the pursuit of zero accidents and to minimise a vessel's environmental impact.

Research Priority 6

Safer ship operating in hostile and abnormal environment

The Arctic is warming twice as fast as the rest of the planet. The retreating ice offers access to precious minerals and new shipping routes, but also carries grave dangers and immense challenges. The prospect of mining the ocean floors comes closer as the demand for resources increases in the next few decades. Research into safer ship operating in these hostile and abnormal environment remains a major undertaking.

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LYNCEUS

People localization for safe ship evacuation during emergency

Funding scheme: Research for the benefit of specific groups (FP7, Capacities)

Project number: 286148

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CAPACITIES

Lloyd's List Awards Global | 2014

Winner Innovation Award

A real maritime industry need

Despite the huge investment in maritime technology today, there are still many deaths accounted in accidents involving ships, due to the inability of current technology localize people on-board during the evacuation procedure or in the sea.

Costa Concordia

- ✓ The ship was carrying 4252 people onboard: 3,229 passengers and 1,023 crew members
- ✓ All but 34 people were rescued
- ✓ The bodies of two people still remain unaccounted
- ✓ The evacuation of the ship was slow and chaotic, with conflicting information passed between the captain, the ship's crew and the coastguard authorities

Project objective

The Lynceus technology aims to fill this industry need by providing a **low cost and robust innovative** solution, thus maximising the probability of safe rescue and minimising loss of life.

The objective of the **Lynceus** project is to investigate and demonstrate ***ultra-low power wireless body-area-network*** technologies for enabling unobtrusive *localisation* and tracking of people for onboard and *overboard search and rescue*, as well as for *safe evacuation of ships during emergency*.

The Lynceus novel technology will be transferred into the SME-driven market segments of smoke alarm/fire detection systems, lifesaving equipment, emergency management decision support systems and assistive search and rescue equipment through the participation of SME and SME Associations.

Ship evacuation, localization, search and rescue

LYNCEUS project facts http://www.lynceus-project.eu

People localization for safe ship evacuation during emergency

Start date: April 2012
Duration:36 months
Project cost: €3.3M
Project Funding: €2.5M

Programme Area: Research for SME associations (FP7)
Consortium: 15 partners from 8 Countries

An industry pulled project

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Main research & development areas

Onboard Localisation

- Localisation of passenger and crew during Emergency
- People tracking and counting
- Wearable locator devices (Smart Life-jackets, Bracelets)
- Hybrid wired/wireless localisation system (base-stations embedded in fire detection Infrastructure)

Real-time Disaster Management

- Monitoring of disaster status
- Guide evacuation teams
- Prediction of disaster spreading
- Advanced disaster management based on ship sensor information
- Advanced evacuation management based on passenger location and behaviour

Passenger Behaviour and Health Monitoring

- Life-jacket and bracellet embedded sensors to sent information about:
  - Passenger movement
  - Passenger temperature
  - Passenger dryness or wetness
  - Passenger health parameters

Overboard Localisation

- Life-jacket active reflector patch
- Enable localisation in extreme environmental conditions and during the night
- UAV mounted radar and on-board localisation
- Assistive search and rescue operations with localisation data from UAV

LYNCEUS innovative technology

System architecture

LYNCEUS innovations (localisable life jackets)

LYNCEUS innovations (localisable activity monitoring bracelets)

Experimenting with various 3D printed bracelet designs

Localization, Heart rate and Activity Monitoring Sensors embedded in Smart Bracelet

LYNCEUS innovations (smart smoke detectors)

On-board Localization

LYNCEUS innovations (smart antennas)

Smoke detector/gateway antenna

UAV interrogator antennas (Tx, Rx)

Possible area for antenna placement on a life jacket

Active reflector life jacket embedded antenna

Life-jacked embedded antenna

LYNCEUS innovations (evacuation decision support)

LYNCEUS innovations (active reflector tag & radar)

Active Reflector Tag

Active Reflector Radar Interrogator

Unmanned Aerial Vehicle (UAV)

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Project references

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- ✓ Horizons Lloyds Register Magazine, September 2013, issue38
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- ✓ Greek Section Technical Meeting, 18 April 2013, Athens, Greece
- ✓ Hellenic Institute of Marine Technology (ELINT)
  Annual Meeting of Marine Technology, November 2012, Athens, Greece
- ✓ East-Meets-West Congress September 2012, Nicosia, Cyprus

Project video

Industry recognition

Winner of the prestigious Lloyds List Global Innovation Award 2014

Steps to commercialisation

Important Facts:

- ✓ European Commission praised Lynceus as an ‘exceptional project’
- ✓ The Research Executive Agency (REA) ranked LYNCEUS as a ‘success story’
- ✓ Lynceus appeared in major industrial publications and international conferences
- ✓ There is strong industrial interest in the project’s results
- ✓ Presented and very well received at IMO in 5/14, MSC 93 technical meeting

Steps to commercialisation

Current and Future Actions:

- ✓ Submitted LYNCEUS2 project proposal to the European Commission for raising a €7.5M grant

  Goal: to make technology market ready and perform demonstrations on large passenger ships

  16 partners
  Major Partners Involved: CARNIVAL, LLOYD'S REGISTER, AUTRONICA, LOUIS CRUISES
  Important Cypriot Participation: SIGNALGENERIX, MARINEM, DEDALOS, TALOS
  Advisory board: MALTA and CYPRUS flag states

- ✓ Technology Presentations at Samsung Heavy Industries, London UK

- ✓ Technology Demonstration to Italian Coastguard, Mediterranean Shipping Company(MSC)

- ✓ Invited presentation by the Danish Maritime Authority and the Finnish Transport Safety to present LYNCEUS at the Baltic Sea Region Maritime Safety Steering Committee

For more information

http://www.lynceus-project.eu/

http://www.lr.org/en/marine/

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Brand new Marine GTC

Southampton (UK)

Thank You!

Lloyd's Register Marine

Working together
for a safer world

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