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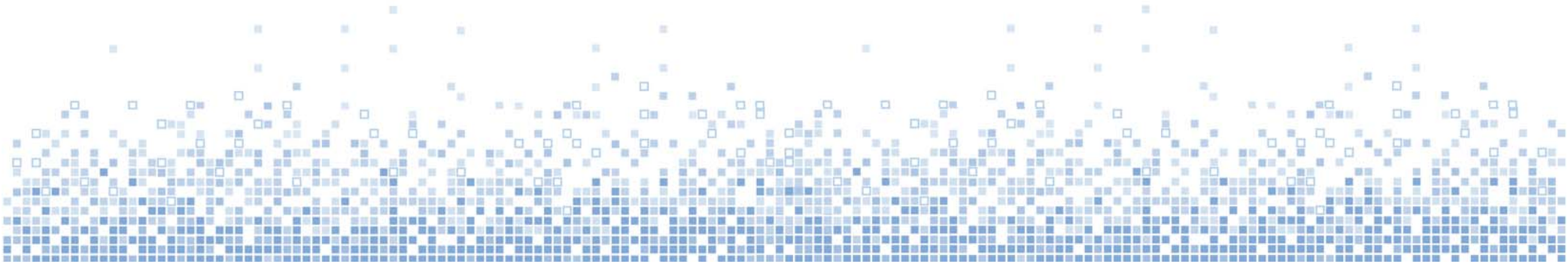
European eLoran Status

Dr Sally Basker & Dr Nick Ward

General Lighthouse Authorities of the United Kingdom and Ireland

International Loran Association, 36th Annual Convention and Technical Symposium,

14-17 October 2007, Orlando, Florida, USA



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GLA eLoran Status

Strategic Objective:

Justify the long-term provision of Loran services from a UK transmitter by March 2009 and deploy the first fully-operational GLA eLoran services in 2011

GLA Radionavigation Plan - eLoran Actions

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- Work with our international partners to ensure that eLoran remains operational within Europe and the US in the short term
- Work to identify appropriate long-term institutional arrangements for eLoran in Europe
- Be involved in the development of eLoran standards
- Work to secure long-term funding for eLoran services
- Extend the Loran trials at Rugby to March 2010
- Encourage the development of user equipment
- Continue our ongoing programme of work and publish the results
- Encourage and support the realisation of the ERNP through an EC communication and the implementation of recommendations pertaining to Loran
- Continue to seek wider support from other user segments and public sector domains to share future costs on an equitable basis

GLA R&RNAV Work Programme - eLoran Activities

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- Business case
- System engineering
  - Future European system, international standardisation, real-time differential Loran, quality-assured ASFs dissemination, coverage prediction, timing
- Service provision (Anthorn, Sylt)
- Trials
  - Prototype differential Loran, long-term trials around the UK and Ireland
- Resources
  - Good *ad-hoc* support from all three GLAs
  - R&RNAV: Part-time Director-level and Consultant, Two full-time
  - Two Ph.D
  - External support contracted as required

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Current Status in Europe

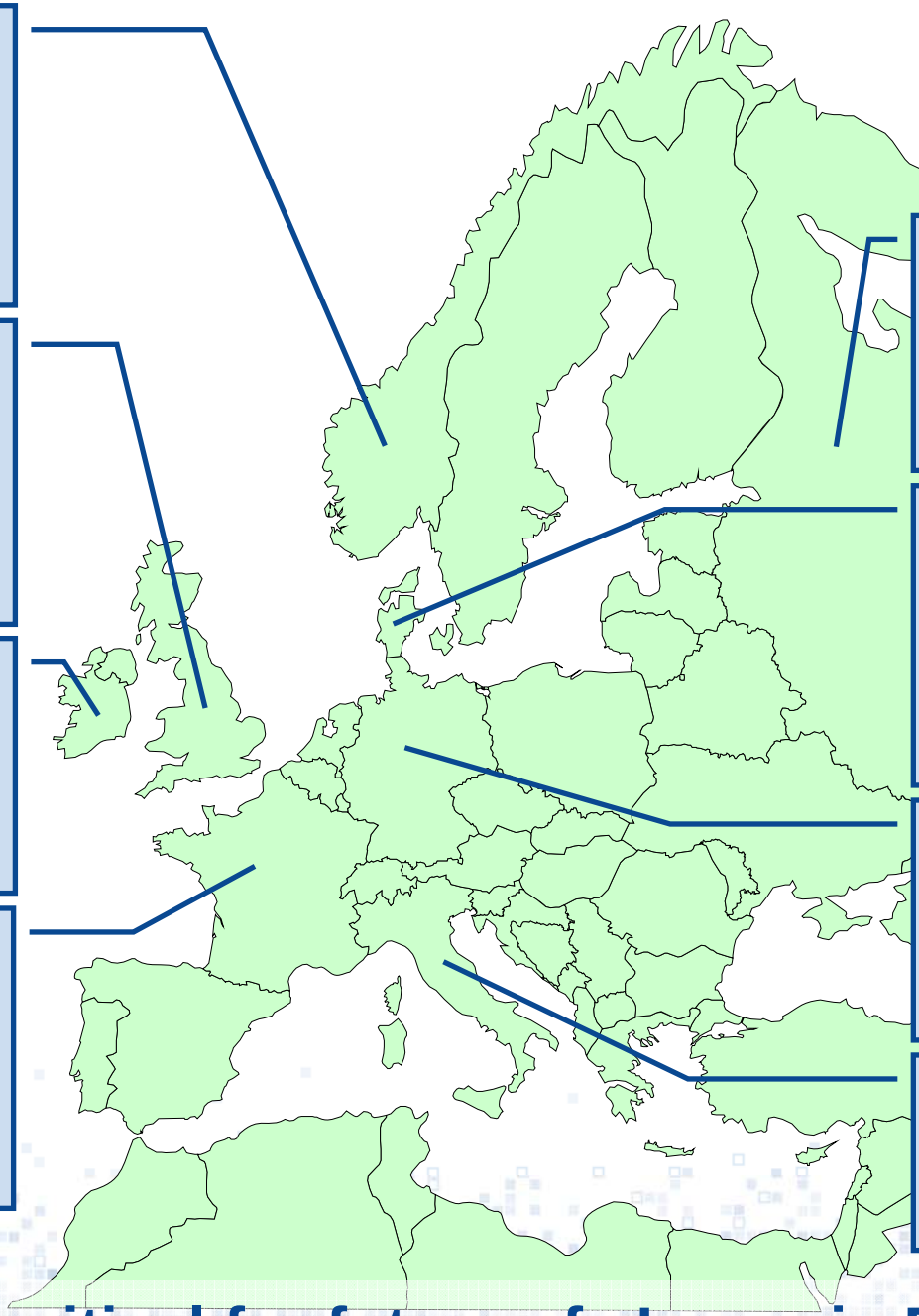
Source: Report of IALA *ad hoc* meeting on eLoran.
Haugesund, Norway, 24/25 September 2007

Norway
- Operating 4Tx to the end of 2009
- Funding decision in 2008

United Kingdom
- 15-year service at Anthorn with break at 2010 for new Tx
- Funding Sylt

Republic of Ireland
- Maintaining an open mind
- CIL (GLA) supportive

France
- Operating Brest CCN
- 2 Tx operational until 2020
- Funding Ejde



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Russia
- Modernising Chayka
- Plans for new chains and stations

Denmark
- Loran not needed due to reliance on satnav
- Ejde Tx operational and funded by France

Germany
- Sylt available while paid by a third party
- Sylt funded by UK

Italy
- Both Tx being decomissioned

ERNP critical for future of eLoran in Europe

Other European States

- Finland
  - Following the eLoran discussions. Concerned about its viability in archipelagos with poor ground conductivity and large seasonal variations
  - Need for a GPS backup fully supported – needs to be shown that eLoran is the answer
- Netherlands
  - Some appreciation of GPS vulnerability issues, particularly for timing
- Sweden
  - Takes a similar position to Finland

European eLoran Forum - Copenhagen, 26 September

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- Purpose - to support the successful introduction, operation and provision of eLoran services in Europe as part of a European Radio Navigation Plan
- Membership –countries/administrations that are operating, financing or hosting Loran infrastructure
  - Denmark, Faroes, France, Germany, Ireland, Netherlands, Norway, United Kingdom
- Next meeting: 7 November 2007

European eLoran Forum - Objectives

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- To secure participating government funding to operate current stations for four years by April 2008
- To secure eLoran as a core component of the European Commission's ERNP by June 2008
- To establish a consultation process with users linked to the ENC-GNSS conference at Toulouse in April 2008 and the ILA/NAV08 conference at London in November 2008
- To develop a plan addressing the institutional, regulatory and commercial environment to transition from eLoran experiments to fully operational eLoran services in Europe by November 2008

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Prospects for a European Radionavigation Plan

ERNP Study Aide Memoire

- Source: Helios Technology, 2004

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- On vulnerability
  - The stability and robustness … would be improved by the availability of Galileo, EGNOS and Loran-C services. Critical infrastructure applications should implement diverse services to mitigate vulnerability and ensure continuity of service
  - eLoran is the only real stand-alone alternative to satellite radio-navigation services for many market sectors (including maritime, land and timing)
- On the economic rationale
  - EGNOS and Galileo have the potential to deliver 78% of the policy benefits
  - Loran-C/Eurofix have the potential to deliver 22% of the policy benefits for 4% of the cost
- Recommendations
  - The EU should work with Member and associated States and appropriate international organisations in order to secure both transport and wider socio-economic benefits delivered by Loran-C

Current Status

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- France and UK met with the European Commission at the end of August
- Objective is to publish an ERNP by June 2008 comprising an 8-page Communication and technical annexes
  - Based substantially on the 2004 Helios Study with updates to address changes since 2004
  - Initial draft being prepared by the General Lighthouse Authorities
- Meeting of ERNP Expert Group on 12 December, Brussels

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Maritime Developments

- IALA e-NAV Seminar, July 2007
- IMO NAV 53, July 2007
- IALA ad hoc Meeting on eLoran, September 2007

IALA e-NAV Seminar, July 2007

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- Independent and fully redundant position fixing and timing systems are vital for the implementation of e-navigation. Enhanced Loran (eLoran), a terrestrial radionavigation system, is an independent and dissimilar system to GNSS that is capable of meeting the positioning, navigational and timing requirements for e-navigation
- Marine Inertial Navigational Systems (INS) cannot be considered as a primary back up system to GNSS. It can assist in accurate navigation, but for a limited period of time.

Source: Conclusions and Recommendations of the IALA Seminar

IMO NAV 53
- e-Navigation Working Group Report

- The group considered the information provided by the United Kingdom (NAV 53/13/2) and IALA (NAV 53/13/5) on the need to provide a backup to the Global Navigation Satellite Systems (GNSS) because of the vulnerabilities of GNSS. The group agreed that there was a need to provide an internationally agreed alternative system for complementing the existing satellite navigation, positioning and timing services to support e-Navigation and recognized that potential backup systems could be made available. However, it was still premature to identify any specific system before the users' requirements for e-Navigation had been finalized. Accordingly the group invited the Sub-Committee to endorse this view.

Source: Report of the Working Group on the Development of an e-Navigation Strategy. IMO NAV 53/WP4

IALA *ad hoc* eLoran Meeting - Haugesund, Norway, September 2007

- Purpose
  - To confirm the current status of Loran and identify transition options to eLoran
- Present
  - Canada, Denmark, Finland, France, Germany, IALA, Ireland, Korea, Norway, Russia, UK, USA
- Apologies
  - China, European Commission, India, Japan, Netherlands, Saudi Arabia, Spain, Sweden, Turkey

Source: Report of IALA *ad hoc* meeting on eLoran. Haugesund, Norway, 24/25 September 2007

IALA *ad hoc* eLoran Meeting - Conclusions

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- The “IALA List of Radionavigation Services 1996” needs to be updated as a matter of urgency. Improved coverage prediction methods and specifications for new reference parameters need to be developed
- Proof of concept trials have demonstrated that eLoran will meet the IMO performance requirement for navigation in restricted waters
- Any new eLoran system which performs to the minimum operational performance standards must be free of intellectual property rights. This applies to both service providers and receiver equipment.
- There is no market for stand-alone eLoran receivers in the maritime world. eLoran receiving capability should be part of any integrated user equipment

IALA *ad hoc* eLoran Meeting - Recommendations

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- A concept for a world-wide maritime radionavigation plan should be developed, leading to a multi-modal plan
- The definition of eLoran, as provided by ILA (LOC1-05-01 refers) was noted by the group. This definition should be considered as a working definition of eLoran.
- The action plan for the standardisation of the eLoran, as presented at the meeting, should be supported.

IALA *ad hoc* eLoran Meeting - Notable Actions

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- IALA to update the IALA List of Radionavigation Services
- The IALA e-NAV Committee to note the IPR and system compatibility issues
- IALA Secretariat to forward the report of this meeting to the International Loran Association (ILA) for the October 2007 meeting
- GLAs, France and USCG requested to forward the results of their trials on the capability of eLoran to meet 10m positioning accuracy
- The IALA e-NAV Committee is requested to commence work on an action plan for the standardisation of eLoran
- Russia is requested to forward the results of their standardisation efforts to IALA

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Thank You!