e-NAV10 Input paper

Agenda item 8

Task Number 6

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NT Radar and enhanced radar AtoN as an alternative means of absolute positioning

# INTRODUCTION

The results of a study carried out by the GLA on alternative positioning systems were submitted to IALA (e-NAV 9/8/6) and IMO (NAV 57/6/6). One of the options considered was an enhanced radar AtoN infrastructure, in conjunction with NT Radar. The enhancement of radar AtoN, in particular racons to provide position and identity, has been proposed in papers submitted to e-NAV 9 & 10 (e-NAV 9/8/7-9 & e-NAV 10/8/2-4). These relate to plans by DaMSA to carry out tests as part of the EfficienSea INTERREG Project in the Baltic.

This further input from the GLAs attempts to provide some context to this option, setting out some of the broader aspects that need to be considered. It is based on a work package that forms part of a new proposal under the INTERREG programme for the North Sea Region.

# SCOPE OF STUDY

The purpose of the proposed study is to establish whether NT Radar and radar AtoNs provide a realistic alternative to GNSS for absolute positioning, taking account of technical, regulatory and economic aspects.

The technical feasibility will be assessed on the basis of data from radar and racon manufacturers, drawing on technical expertise to estimate the expected performance. A plan for demonstrating performance in a ‘typical’ area will also be drawn up.

Financial aspects will be analysed using data already available from the GLA study referenced earlier, extended to cover major shipping lanes in Europe. Regulatory considerations will be set out, in terms of performance standards and carriage requirements that might be needed.

# TECHNICAL APPRAISAL

## NT Radar

* Technical features and capabilities of NT Radar will be described;
* Relevant standards and regulations will be set out;
* Likely rate of uptake by the shipping industry will be assessed, based on expert advice;
* Potential for absolute positioning using map-matching, radar AtoN, or a combination will be assessed, including an estimation of accuracy and coverage, again taking expert advice;
* The need for and approach to further regulation to implement this solution as an element of e-Navigation will be considered, including preparation of a timeline.

## Enhanced radar AtoN

* Passive reflector types: corner reflectors, octahedral, corner arrays, Luneberg lens;
* Active reflectors (Radar Target Enhancers): X Band, S Band, Dual Band, output power, power requirement, limitations (range, saturation, feedback);
* Racon types will be described, compatibility with NT Radar, added functionality (identity, position information, name), cost, power requirement.
* Existing standards will be discussed and likely developments;
* Deployment will be considered: lighthouse sites, coastlines needing enhancement, estimate of numbers required;
* Performance of radar AtoN with NT Radar will be assessed in terms of availability, continuity, accuracy, integrity, coverage. Expert advice will be taken on radar aspects.

## Financial Appraisal

* Cost of fitting NT radars to different vessel classes will be assessed, drawing on data from the previous study extended to cover major shipping routes in Europe;
* Cost of providing enhanced radar AtoN: passive, active, racons, for major shipping lanes in Europe will be estimated.

## Demonstration

* A plan will be prepared for demonstrating the potential performance of this alternative in a 'typical' area of Europe;
* Demonstrations will be carried out to verify the estimated performance;
* If results are available from the EfficienSea trials, these will also be taken into account.

## Timescale

It is planned that the study will be carried out over the period Oct-Dec 2011, with demonstrations in April-May 2012.

## Action requested

The Committee is invited to take note of this information in its discussions of options for positioning.