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Agenda item [[2]](#footnote-2) 7.3

Technical Domain / Task Number 2 ………………………………

Author(s) / Submitter(s) CHINA MSA & DMU

Proposal for ARM WG1 TG 1.5.4: Develop Guidance on Marine AtoN Training and Awareness for Mariners

# Summary

Having considered the IALA ARM committee is developing a new IALA Guideline, combined with some problems and confusions of mariners in the process of using AtoN collected by CHINA MSA, we have conducted a questionnaire survey for undergraduate students of navigation technology in Dalian Maritime University. Based on the survey results, this proposal is put forward in the hope that it will be helpful to the development of the new Guideline.

## Purpose of the document

To provide a basis for supplementing part 7 of the current draft of the Guideline.

## Related documents

IALA Guideline- Guidance on Marine AtoN Training and Awareness for Mariners

# Background

At the 12th meeting of ARM committee, the plan to formulate the Guidance on Marine AtoN Training and Awareness for Mariners was proposed. This formed a preliminary framework following discussions between representatives of participating countries and relevant personnel from IALA worldwide academy.

The Guidance is divided into 9 parts consisting of background and application, aims and objectives (initial and long-term), overview of marine AtoN, training activities (theory and practical operations), information disclosure of AtoN, development of new AtoN, confusion and resolutions of mariners in their use of AtoN, abbreviations, definitions and references.

The relationship between management and use of AtoN is unity of opposites. On the one hand, administrators of AtoN hope to provide more complete navigational services as possible, restricted nevertheless by their own setting and maintenance abilities. On the other hand, mariners use AtoN to clearly mark the relevant waters. On that score, the excessive setting of AtoN hinders other operations for conducting safe navigation. Thus, the most important problem of concern and its resolution is how AtoN can be scientifically established, managed and effectively used.

This input paper is mainly focus on part7 of the new Guideline.

# Discussion

In order to gain knowledge of mariners' understanding of AtoN and what navigational services they need, and to cooperate with the preparation of the Guidance of Marine AtoN Training and Awareness for Mariners, the China Maritime Safety Administration and Dalian Maritime University jointly conducted a questionnaire survey among nautical students within the University. Most of the students who participated in the questionnaire survey were undergraduates within the specialization of navigation technology. A total of 120 questionnaires were sent out and 105 responses were received. The specific contents of the questionnaire are shown in the Appendix 1.

Through the questionnaire and analysis of the results, we find that the undergraduate students of navigation technology are not very clear about how to use AtoN. Some 48.57% of the respondents had never heard of the IALA; 68.57% of the respondents believed that it was necessary to formulate the Guidance of Marine AtoN Training and Awareness for Mariners; 42.86% of the respondents thought that the undergraduate navigation technology courses involved in AtoN were sufficient; 45.71% of the respondents thought that the content of the STCW Convention on the use requirements of mariners for AtoN should be increased, and about 11% thought that the content was insufficient.

Respondents paid more attention to the standard and specific use methods of AtoN and less attention to the relative relationship between its working principle and traffic flow; 28.57% of the respondents had never heard of AIS AtoN, mobile AtoN and new AtoNs; 54.29% of the respondents believed that the AtoN Administration should focus on the AtoN system with as complete configuration as possible. More than 54% of the respondents believed that the most confusing problem when using AtoN was the identification of their types and flash cycle; 51.43% of the respondents thought that the interference of background light was the most confusing when using light buoys; 25.71% of the respondents did not know how to identify the cardinal marks; 45.71% of the respondents believed that failure to obtain dynamic information in time became the biggest challenge when they used radio AtoN. About 75% of the respondents believed that the combination of virtual AtoN and physical AtoN is conducive to navigation safety during the channel reconstruction and expansion period. More than 77% of the respondents believed that the deployment of AtoN during the construction and operation of offshore wind farms is reasonable, which is helpful for safe navigation.

Most people thought that the published ranges and heights of lighthouses and light beacons in the Admiralty List of Lights and Fog Signals are consistent with the actual situation, and 28.57% thought that the height is accurate, but the range is insufficient. The vast majority of respondents believe that the light band on leading mark is more conducive to the identification of the central line of the channel than the guide light, but nearly 20% believe that there is no difference between the two effects or the light band and that it is not as good as the guide light. The results of the questionnaire are shown in the Appendix 2.

# proposal

1. Using the latest and most practical means to improve the efficiency of AtoN (integrated means); tracking frontier technology, introducing it into AtoN management, putting it into use and strengthening publicity.

2. After large-scale adjustment or when the entry channel is relatively stable, issuing the "layout diagram of AtoN in the entry channel of the XX port"(see Figure1) for publicity and implementation to ensure that mariners understand the AtoN distribution of a specific water area.



Figure1. *layout diagram of AtoN in the entry channel of the port issued by the Navigation Service Centres of the China Maritime Safety Administration*

3. Paying close attention to the influence of background lights on AtoN lights. If necessary, measures should be taken to enhance the identification effect of AtoN lights.

4. Strengthening the publicity of AtoN management, so as to increase the popularity AtoN knowledge; setting up AtoN in accordance with established navigational practices and procedures.

5. Strengthening training, and adding more content related to AtoN during crew competency examinations in combination with the requirements of the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW Convention).

At present, the only requirements of the STCW Convention for mariners are to use those AtoN which the OOW knows and understands their use. How this is to be assessed needs refinement in terms of the relevant requirements. At the IALA level, more detailed technical guidelines can be formulated to guide mariners to better use the AtoN system.

# Action requested of the Committee

The ARM Committee is invited to consider the proposals in part 4, and take action as appropriate.

Appendix 1

**Questionnaires on the Guidance of Marine AtoN**

**Training andAwareness for Mariners**

**Introduction:**

**Dear students,**

The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) is drafting a new guidance: Guidance on Marine AtoN Training and Awareness for Mariners. A questionnaire is designed and distributing among all nautical students of Navigation College in Dalian Maritime University (DMU) with the purpose of surveying the necessity of Aids to Navigation (AtoN) knowledge and how to use AtoN up to the level of BSc nautical students.

Thank you for your great support and participation.

**Questions:**

1. Do you know about the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)?
2. Yes, I do.
3. Probably, but I do not exactly know what it is.
4. I only heard of that.
5. No, I do not.
6. Do you think it is necessary for IALA to formulate the Guidance on Marine AtoN Training and Awareness for Mariners?
7. Extremely essential.
8. Necessary.
9. Unnecessary.
10. Absolutely unessential.
11. Do you think the course related to Aids to Navigation (AtoN) in the specialization of nautical studies and maritime administration is sufficient?
12. Sufficient.
13. Just okay.
14. Not sufficient.
15. Too few.
16. Do you think the requirements of STCW Convention on mariners' understanding and use of AtoN are sufficient?
17. Sufficient.
18. Just okay.
19. Not sufficient.
20. Too few.
21. What do you think the mariners should know most about AtoN?
22. Standard (IALA Maritime Buoyage System).
23. Optical principle (range, vertical divergence angle).
24. Relationship between AtoN and traffic flow.
25. Specific use method.
26. Do you know new types of AtoN, such as AIS AtoN, Mobile AtoN...?
27. Yes, I do.
28. Probably, but I do not know exactly what it is.
29. I only heard of that.
30. No, I do not.
31. What are the most important services you want the AtoN administration to provide for Mariners?
32. Configure the AtoN system as complete as possible.
33. Publicize and implement the latest technical standards of AtoN.
34. Popularize the use of AtoN.
35. Timely release the dynamic information of AtoN.
36. What do you think is the most confusing thing in the current use of AtoN?
37. Type identification.
38. Flash rhythm recognition, background light interference.
39. Position accuracy.
40. Use of new navigation aids (AIS AtoN and Mobile AtoN)
41. What do you think is the biggest confusion of mariners when using light buoys?
42. Background light interference, range.
43. Flash cycle identification.
44. Buoy position accuracy.
45. Type judgment.
46. Can you clearly confirm the cardinal marks (four kinds in east, west, north, south)?
47. Yes, I can.
48. I know the color, but I can not tell the flash cycle.
49. I can confirm, but don not know how to use it.
50. No, I cannot.
51. What do you think is the biggest challenge for you to use radio aids (differential positioning system, AIS AtoN, Radar transponder)?
52. Unable to obtain dynamic information in time.
53. Unable to ensure normal display in bridge.
54. Unable to understand the specific coverage.
55. Unable to confirm information accurately.
56. Do you think it is helpful for navigation to use virtual AtoN and physical AtoN in the temporary adjustment of AtoN in the channel reconstruction and expansion project?
57. Sufficient.
58. Just okay.
59. Not sufficient.
60. Too few.
61. Do you think setting AtoN during the construction and operation of offshore wind farms is helpful for safe navigation?
62. Sufficient.
63. Just okay.
64. Not sufficient.
65. Too few.
66. Do you think the published range and height of Lighthouse and light beacons on the Admiralty List of Lights and Fog Signal are consistent with the actual situation?
67. Consistent.
68. Height is accurate, but range is not.
69. Range is accurate, but height is not.
70. Both range and height are not consistent.
71. Do you think it is beneficial to identify the axis of channel or fairway by changing the leading light for port arrival (light source) to light band (line light source)?
72. Very beneficial.
73. Just okay.
74. There is no difference between the two effects.
75. The light band is not as good as the traditional guide light.
76. If there are other suggestions, please fill in:

Appendix 2

Results of the questionnaire

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. To be left open if uncertain [↑](#footnote-ref-2)