##### **Trends obtained from the IALA Annual Questionnaire (M3)**

##### **Prepared for ANM14 – October 2009**

The purpose of this task is to identify and, if possible, assess any trends emerging from the IALA Annual Questionnaire.

**Task History**

The fourth collection of aids to navigation and associated data through the IALA Annual Questionnaire was completed for year 2008; previous results were also collected and analyzed for years 2004, 2006 and 2007. Overall, the results of 2008 were much better than expected! The survey was completed by 24 National Authorities, which matches the results received in 2006 and doubles the number of responses received from the 2007 effort. Additionally, survey data was collected for the first time from six National Authorities who previously had not submitted survey data. This new information substantially adds to ANM committee overall understanding of the types of aids utilized world-wide. As has been reported in previous reports, however, survey results experience inconsistent year-to-year reporting which severely limits the ability to assess trend data. This is especially true since there are several countries that have an extremely large number of aids, and thereby heavily weight the results.

**Questionnaire Process**

The annual questionnaire was distributed by the IALA secretariat to ANM committee members in March 2009, requesting their information as of December 31st, 2008. The questionnaire was prepared in English, Spanish, and French languages in order to provide greater accessibility, and to promote higher response rates from all members. No substantial changes were made to the survey from previous years in order to establish consistency in the collection effort. The survey form, however, was changed to “force entry” on most fields; this was done in order to ease the burden associated with tabulation. In addition to quantitative questions concerning the number and types of ATON, respondents also provide qualitative forecast of future changes that may be expected in 3 years. Additionally, the questionnaire permits allows the National Authority to collect and report data from other aids to navigation service providers that may be present within a country, such as private organizations, provincial / regional, or port authorities. Gathering this information provides a much richer set of data in which to analyze and is a more inclusive view of the world. The notation “(A)” was used in the questionnaire to denote information from a National Authority; “(B)” designated information provided by any other Authority within the country. This same notation is used within the tables and graphs used in this report to indicate whether the information represents the National or Other Authority.

**Data** **Analysis**

All survey results received were consolidated into a single excel spreadsheet used to compile the results. This spreadsheet accompanies this report and is useful in comparing individual responses. In some cases National Authorities provided information on many port or regional authorities; this data was consolidated in order to simplify the summary process. This consolidation process does cause the lost of some qualitative results, but was considered the most feasible method for completing the analysis.

The table that follows summarizes the data reported in 2008:

|  |  |
| --- | --- |
|  | **2008 TOTALS** |
| **Aid Mix** |  |
| Floating | 104,688 |
| Fixed | 107,911 |
| **Total** | **212,599** |
| % floating | 49.24% |
| % fixed | 50.76% |
|  |  |
| **Lights** |  |
| Lighted Aids | 79,674 |
| Unlighted Aids | 132,925 |
| % Lighted | 37.48% |
| % Unlighted | 62.52% |
|  |  |
| **Sounds** |  |
| Bells & Gongs | 1,247 |
| Whistle | 359 |
| Fog horns | 6,054 |
| Total Sound | 7,660 |
|  |  |
| **Electronics** |  |
| RACONS | 1187 |
| AIS Units Installed | 69 |
|  |  |
| **Equipment** |  |
| Laser Lights | 0 |
| Blue Lights | 41 |
| % LED Lanterns | 30.70% |
| % Plastic Buoys | 33.14% |
|  |  |
| **Personnel** |  |
| District / Depot Staff | 11,593 |
| Lightkeepers | 1,528 |
| **Total** | **13,121** |

A more detailed listing is provided as Appendix A to this report.

The chart that follows shows the 2008 aid mix data by country, sorted by the total number of aids. This graphic attempts to demonstrate the world-wide distribution of the 212,599 total aids reported in the 2008 data collection. As is clearly shown, the number and mix of aids varies significantly by National Authority. The total distribution is dominated by only a few Nations. As result, the individual contributions of some are muted within summary statistics used to provide worldwide views, simply due to the magnitude of the numbers. For example, the United States reported a little more than 74,000 aids, about one-third of the total 2008 aid population. The four largest reporting Authorities (United States, Finland, Norway, and Canada) represent more than 67% of all the aids shown in this year’s data. This information should be kept in mind when viewing the tables attached to the report. Not captured within these summary statistics are the regional and national differences in aid populations that are evident when individual reports are examined.



Shown below are the primary results and observations of the 2008 data:

Sound Signals:

* 7,660 fog horns, whistles, bells and gongs reported in use
* Use primarily concentrated in North America (United States, Canada)

Electronic Aids to Navigation and Vessel Traffic Services:

* DGPS - 267 stations operated by 17 organisations.
* LORAN – 48 stations operated by 9 organisations.
* AIS:
  + 418 Aids to Navigation stations
  + 53 Units installed on buoys
  + 16 Units installed on fixed aids
* RACON – 1,187 in service, with 29% installed on buoys.
* VTS – 150 centers operated by 17 organisations
* 24 Ship Reporting System operated by 8 organisations

Equipment:

* No laser lights reported in service
* 31% of lighted aids use LEDs
* 33% of floating aids are plastic

Personnel:

* 11,593 District or Depot Aids to Navigation personnel
* 1,528 Lightkeepers
* 88% Lighthouses are automated / remote controlled

Management:

* 16 of 31 organizations use **performance indicators**
* 11 of 31 organizations use **risk management tools**
* 16 of 31 organizations use **quality management** practices ISO or other certified
* 12 of 21 national organisations reported using **external contractors** to place or serve a portion of the aids. The range is extreme from 100% in some locations to just 1% in others.
* 15 of 21 national organisations **charge fees**.
* 10 of 31 organisations also responsible for **Pilotage**
* 12 of 31 organisations also responsible for **Hydrographic Services**
* 3 of 31 organisations also responsible for **Aquaculture**
* 3 of 31 organisations also responsible for **Offshore Petroleum**
* 6 of 31 organisations also responsible for **Sea Dumping**

**Future Trends and Expectations**

The questionnaire asked respondents to qualitatively assess where changes were expected within the next 3 years for each question. Shown below are the areas in which the most significant changes are expected by National Authorities:

* Overall the total aid population and mix are not expect to remain stable
* Overall expect a trend of reducing the number of major size buoys, while increasing medium and small sized
* Overall expect an overall decrease in the number of sound signals
* No Authorities expect to utilize laser lights
* More than half the Authorities expect to increase both the number of plastic buoys and LEDs installed
* Overall expect an increase in the number of DGPS stations
* The majority of Authorities expect to increase the use of AIS; more than half expect to increase the number of transponders installed on fixed or floating aids
* Overall expect an slight decrease in the number of ATON personnel

**Discussion**

The 2008 data only provides a snap-shot report in time for the organisations that provide the information. As a result it is difficult, if not impossible, to assess trend data in a meaningful way since the data set has different reporting sources each year. For example, comparing the total number of worldwide aids collected in the earlier 2007 report against the data collected in this report shows an increase of 34% in the total number of aids reported, which we know simply is not the case and is merely the outcome of inconsistent reporting.

A single baseline of data was completed in 2007 by including responses from early surveys. In those cases where an organisation responded both in 2006 and 2007, the 2007 data was used. While it would be ideal to obtain a response each year, it is believed to be a valid assumption that the overall system is stable, and that only small, incremental changes occur each year. The 2008 data was then added to this baseline by using the same process, previously described. Based upon this preliminary data, the view of the worldwide aids to navigation system can be seen:



The total number of aids reported in the 2007 combined report was 222,607. Thus, it can be seen that building a common baseline report does provide stability, as shown 226,458 is a 2% increase over the previous year totals. The increase in the total aid population is easily explained by the six National Authorities who had not previously participated in this survey.

The results of combined 2004-2008 questionnaire are presented in Appendix B at the end of this report.

**Conclusion**:

The collection of data through the annual questionnaire may eventually prove to be useful for identifying trends. The value of the information will be enhanced through greater National member participation in completing the annual questionnaire. Combining multi-year data allows a greater understanding the numbers and types of aids and system utilized throughout the world. This methodology will also facilitate the greater understanding of trends that are occurring. By sharing this info and analysing the data with some degree of reserves, members can compare the provision of their aid to navigation services with others.

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**APPENDIX A – SUMMARY OF 2008 IALA QUESTIONAIRE**



**APPENDIX A (Cont)**



**APPENDIX B – AIDS TO NAVIGATION BASELINE 2004 -2008**



**APPENDIX B (Cont)**

