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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

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SHIP OBSERVATIONS TEAM

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ASAPP-XVI

Report by the Chairperson of the ASAPP

(Submitted by Ms Sarah North, Interim Chairperson of the JCOMM ASAP Panel)

Summary and purpose of document

This document contains the report of the interim Chairperson of the ASAP Panel, Ms Sarah North, summarizing activities since the last session of the Ship Observations Team (SOT-III, Brest, France, 7-12 March 2005) and the current level of participation. It also identifies a number of overarching issues that currently affect ASAP operations.

ACTION PROPOSED

The ASAP Panel is invited to:

(a) Note and comment on the report, as appropriate;

(b) Take into account specific issues raised when discussing relevant agenda items.

DISCUSSION

1. Introduction

Following the resignation of the previous ASAPP Chairperson, Mr Jean-Louis Gaumet, at the last session of the Panel, Ms Sarah North agreed to act as the interim Chairperson until the upcoming Fourth Session of the JCOMM Ship Observations Team (SOT-IV, Geneva, Switzerland, from 16 to 21 April 2007).

Accordingly, this report contains a brief report on regarding Ms North's activities since the last ASAP Panel meeting and highlights some of the overarching issues that have arisen during this current intersessional period.

2. General Comments on status of ASAP operations since SOT-III

Unfortunately shortly after the last Panel session, it was decided to discontinue the Worldwide Recurring ASAP Project (WRAP). This decision was prompted by the fact that the host ship (***MSC Corinna***) underwent a change in its trading pattern which would have necessitated sourcing another suitable host ship. Following a review of the financial and human commitment required by the project, the Australian Bureau of Meteorology (who were funding the ASAP consumables) decided in May 2005 to cease WRAP operations and to recover the sounding equipment.

The project had provided good quality upper-air data over a period of almost four years and had required close collaboration between the National Met Services involved (i.e., the Australian Bureau of Meteorology, the United Kingdom Met Office and NOAA). Had other Met services also been able to justify financially contributing to the project, then it might have been possible to enhance it and to establish it as an ongoing programme. Nevertheless, the validity of the WRAP concept has been proven in the operational sense and should therefore be kept under review by the Panel, in case suitable opportunities arise again in the future (the new round the world Scholar Ship might for instance offer such an opportunity). However, if the project is to be resurrected then it would be essential to establish ongoing financial commitments from a greater number of participants at the outset.

The main developments during the intersessional period since the SOT-III have come from the Eumetnet ASAP Project (E-ASAP) as it progressively aims to integrate the ASAP ships contributed by its participating members into a cooperative European programme. Although progress towards integration has not happened as quickly as had been originally hoped for, nine of the sixteen ships actively participating in the programme are now effectively integrated (i.e., five ASAP units have been procured directly by the programme) and are therefore fully integrated, while four ASAP units (owned by Germany and the United Kingdom) have been managerially and operationally integrated into the programme. The programme entered its next phase at the start of 2007 when Deutscher Wetterdienst (DWD) was chosen once more as the responsible member for E-ASAP. During this next phase, which will last until 2011, it is hoped that the ASAPs operated by other participating countries (i.e., Iceland, France, Spain and Denmark) will also be progressively integrated, although this level of such integration will need to be established with each respective national operator.

The E-ASAP model of integrating units on a regional basis in order to obtain economies of scale, and aiming to harmonise operations under a central management team, is perhaps one that could be considered in other areas of the globe where vertical profiles of the atmospheric structure are needed for regional short to medium-range Numerical Weather Prediction.

Although the E-ASAP recruited ships primarily operate in the North Atlantic and Mediterranean, the programme nevertheless aims to contribute to the wider World Weather Watch by providing up to 10% of its soundings outside its direct area of interest (e.g., in the Southern Oceans). This is being achieved by upper air ascents performed by the German research ship ***FS Meteor***. In addition, the E-ASAP programme also funds radiosonde operations from the North Sea platform ***Ekofisk***, and contributes funding for consumables used by the Norwegian Ocean Weather Ship ***MIKE***.

While the main concentration of the ASAP operations therefore continues to be over the Northern Atlantic, an important contribution is also made by Japanese research ships operating primarily in the North Western Pacific areas and seas adjacent to Japan (although the research ship ***Mirai*** also occasionally operates in the Atlantic and Indian Oceans). The number of soundings reported from the Japanese has also increased significantly since 2005 (from 582 in 2005 to 938 launches in 2006). The percentage of Japanese reports getting onto the GTS continues to be generally high when compared to that of E-ASAP ships. Whilst a total of 4238 soundings messages from E-ASAP ships were inserted on the GTS in 2005 the loss rate (due to loss of sonde at launch, operator error or transmission problems) continued at unacceptably high levels. As a consequence, the initial objectives of the E-ASAP program have had to be readjusted to more realistic levels (a detailed report on the E-ASAP programme will be given under Agenda Item IV-2.1),

During the intersessional period, radiosonde soundings were also started by South African research ship ***SA Agulhas***. Although operations were temporarily interrupted by theft of the sounding equipment from this ship, it is understood that they will resume in the near future. Research ships operated by other countries may also be performing occasional soundings for particular projects, although because these do not contribute directly to the ASAP programme details are not known to the Chairperson. Nevertheless, it is suggested that closer links with research institutions are needed in future so that all upper air soundings at sea are captured and are available for consideration by the Panel.

3. Activities of the Interim ASAP Chairperson

Activities since SOT-III include the following items:

- Assisting with arrangements for recovery of the sounding/launching equipment from the WRAP ship. Return of the sounding computer to NOAA, and concluding financial arrangements for WRAP consumables and maintenance;
- Attending the first E-ASAP Technical Advisory Group (TAG) meeting held in Hamburg, Germany, from 9 to 10 November 2005;
- Chairing the second E-ASAP TAG meeting held in Hamburg, Germany on 19 March 2006 [note – a further meeting of the TAG is scheduled to take place in Geneva, Switzerland on 19 April 2006 during upcoming SOT-IV]
- Providing input into the SOT Annual Report, the ASAP brochure and the ASAP pages on the JCOMMOPS website.

4. Key Issues that have arisen during the intersessional period

There are a number of over-arching issues that have impacted on the efficiency of ASAP operations since SOT-III which are worthy of mention, including the following.

4.1 Satellite Transmission Problems

The transfer of Goonhilly Inmarsat-C LES operations to Burum LES in November 2006 had a major impact on E-ASAP data transmission, resulting initially in the loss of data and subsequently to major timeliness problems. As a consequence of these problems, which were caused by the inability of the telex nodes to handle the volume of transferred data, almost all E-ASAP ships had to switch to using backup LES Aussaguel, operated by France Telecom. Discussions have taken place with Stratos (operators of Burum and Goonhilly), and it is hoped that it will be possible to switch from out-dated telex links to email links in the near future.

4.2 Satellite Transmission Costs

The cost of upper air TEMP code data transmission via Inmarsat is extremely high when compared to a standard SHIP code transmission from VOS (often amounting to over €450/month/ship). These costs were traditionally paid by the National Meteorological Services (NMSs) that hosts the LES to which the data is transmitted. In Europe, this data was primarily sent to Goonhilly LES and

accordingly the United Kingdom Met Office, was faced with an annual cost in the order of €30,000/year. To alleviate this cost burden, an agreement was reached within the EUCOS that the Met Office should be reimbursed for cost incurred by E-ASAP Operators. This system has operated well to date, but will need to be reconsidered in the light of the recent Goonhilly problems. In addition, the E-ASAP has been testing the use of Globalstar and an alternative to Inmarsat communications, as a means of reducing transmission costs.

4.3 Metadata

The possible need for a dedicated ASAP metadata database has been discussed previous sessions of the Expert Team on Marine Climatology (ETMC) and also at the SOT-III Session, although no definite actions were agreed. Following the SOT-III, some further consideration of the possibility of extracting the information contained in Members' annual ASAP reports was considered by the SOT Chairperson in liaison with the ASAPP Chairperson. If such a repository for ASAP metadata were to be formally developed, it would bring into question the need to maintain data in the ASAP section of the SOT Annual Report. However, it would allow the metadata to be easily interrogated. Assuming there is a user requirement for the collection of ASAP metadata, then it is suggested that the JCOMMOPS might be considered a suitable host for maintaining an online ASAP metadata database. Further, it is recognised that there are already some metadata fields related to ASAPs which are already included in the WMO Pub. 47 metadata for the VOS (which it is also being proposed should be hosted by the JCOMMOPS).

4.4 High-resolution data

BUFR code templates to match the vertical frequency of the alphanumeric TEMP code have been developed within the WMO, and a further template to facilitate the collection of high-resolution data in real-time is being progressed within the EUCOS. However, the costs involved in transmitting BUFR data via satellite is a determining factor in deciding the level of data (and metadata) that can be sent. Furthermore, manufacturers of sounding equipment will need to ensure that their systems can accept the high-resolution BUFR template.

The extent to which delayed-mode high-resolution data (usually collected by visiting Port Meteorological Officers (PMOs)) is being evaluated for quality is not clear, although it is known that this is not currently happening for the E-ASAP high-resolution data due to resource issues. The need to do QEv of this high-resolution data was evidenced when problems with the DigiCORA III software arose in early 2005. The problem was identified by Vaisala, and was caused by the inclusion of the ships velocity vector in the winds calculated for data from RS80 or RS90 radiosondes (as ships can be moving in the region of 10 m/s during the flight this represented a serious problem). Although the onboard software was relatively quickly corrected for affected ships, there was also the need to correct the archive datasets, through a correction program.

4.5 Soundings close to land

The risks of damage, or injury to third parties, caused by radiosondes falling over land has been considered in the E-ASAP TAG, following concerns expressed over ascents performed while transiting the St. Lawrence seaway in Canada. This risk can be reduced by using integrated parachutes for balloons >500g, while smaller 350g balloons would need the purchase and attachment of a separate parachute when doing ascents in coastal waters or when doing test launches in port. Insurance premiums to cover for such risks are extremely high, particularly in North America, and as a consequence, the E-ASAP launches are no longer performed by participating ships when sailing close to land (< 75 nm) unless they are willing to accept the insurance risk.

4.6 Shipping trends & PMO Involvement

The nature of shipping is highly dynamic, and since the SOT-III, there have been some major mergers between the shipping companies that are used for hosting ASAP systems. Although this has resulted in significant changes to the trading patterns of many of the container ships involved it has, fortunately, not greatly affected the ships that host ASAP units. However, as new ships come on stream, this often results in older ships transferring to different routes or being sold on to other

companies and this could easily happen at any time, without any real warning. Therefore, it is almost impossible for programmes such as the E-ASAP to predict when such changes are likely to occur, and there are inevitable delays involved in sourcing new host ships and transferring the ASAP equipment. Furthermore, it is extremely difficult for the ASAP operators to have the flexibility to respond to such changes, as ASAP observations are specialised in nature and not all Port Meteorological Officers will have the necessary skills to service them. Therefore, it is suggested that there is a need to extend the training of PMO's in major container ports to encompass routine ASAP operations.

A further problem arises when trying to source potential new ASAP ships as modern container ships are designed with a minimum of superstructure or deck space where an ASAP container can be sighted. This highlights the need to establish close links with the major container shipping companies, and to encourage new ships to be designed and classed with possible future weather observing capacity in mind. It also suggests that the time is right to start reconsidering the design of ASAP units and launching systems, so that they can be more easily accommodated onboard and transferred to other ships when necessary.

5. Conclusion

Global ASAP performance has been slightly disappointing since the SOT-III and, following the loss of the WRAP ship, operations are now primarily focused on the North Atlantic and Western Pacific.

The capital costs involved in establishing an ASAP unit, and the ongoing costs of consumables, are extremely high when compared to other marine observing networks and are difficult to justify, especially given the high radiosonde failure rates. Although the ASAP data has been shown to be of comparable quality to that from land radiosonde stations, increased satellite and AMDAR data over oceans will also place a question mark over future plans to enhance the ASAP operations. Whilst more targeted observations in sensitive areas where storms are originating should be encouraged, this is always likely to be hampered by the variable nature of shipping movements.

The ASAP nevertheless continues to be an important component of the World Weather Watch, and it is hoped that other countries can be persuaded to initiate, or resume, their ASAP activities.

The SOT-IV meeting is invited to consider the above mentioned items, and to elect a suitable new Chairperson to further progress the aims of the ASAP Panel.

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