INTERNATIONAL CIVIL AVIATION ORGANIZATION

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP

THIRTEENTH MEETING (APIRG/13)

(Sal, CapeVerde, 25-29 June 2001)

Agenda Item : 4.4 Review of the 5th meeting of the Met SG

GRIB and BUFR code usage, assessing the training requirement.

(Presented by the United Kingdom)

SUMMARY

It is envisaged by the two WAFCs that all SIGWX and wind/temp forecasts will be issued using BUFR and GRIB codes respectively in the future. To enable the cessation of T4 chart production it will be necessary to ensure that all users of the information are able to make full and proper use of the two codes.

1 Introduction.

The final phase of WAFS is expected to be completed by 2004 with the expectation that FAX formatted charts will not be disseminated by either of the two satellite broadcast systems (SADIS and ISCS). This will serve two purposes, firstly, there will be a huge saving in broadcast capacity which will allow the possibility of additional products. Secondly, the use of GRIB and BUFR codes as a replacement to the FAX format will allow a much greater flexibility in forecast production for the end user.

The bulk of WAFS products are currently disseminated via FAX format charts, which are very large in terms of broadcast bandwidth on the satellite. The same information is currently sent via the use of GRIB and BUFR codes on the SADIS system and GRIB is used for the gridded products on the ISCS system. The same information can be sent via the latter methods using approximately 10% of the bandwidth. This would represent both a significant cost saving, should the bandwidth be reduce, or would allow a significant increase in the number of products disseminated, should that be required in the future.

The current FAX formatted charts are very rigid in that the chart areas available are fixed. The GRIB and BUFR versions of the same information would allow the end users access to chart areas that would suit their specific needs. This is thought to be an important advantage to the end user as well as the Met provider states, who will be able to provide a more flexible and tailor-made service to their aviation customers.

The above reasons have led to the decision to cease the production of FAX formatted charts in favour of GRIB and BUFR as soon as it is sensible to do so. In order to carry this out it will be necessary to ensure that all SADIS and ISCS users have the capability of interpreting and making full use of the two codes. Plans are underway to carry out this task, this paper will describe those plans together with an assessment of further work that is required in order to be in a position to cease the production of FAX formatted charts in the near future.

2 Overall plans.

The most straightforward way to accomplish the task of ensuring that all states have the capability of using the GRIB and BUFR codes is to address the issues through the ICAO regions. A considerable amount of effort has already been put in the Asia/Pacific region. Grant Sabin (Bureau of Meteorology, Australia), has largely led this work and it has given a basic structure to work being carried out now in other ICAO regions.

Working groups have now been set up in Europe and Africa to perform the same task and it is anticipated that a similar group will be created in the Middle-East region at the forthcoming Met meeting, which will take place in April 2001. The rapporteur for the first two of the groups is the UK and it is envisaged that a similar arrangement will be acceptable in the Middle-East.

The terms of reference for the two groups already in place are identical save that they only apply within each region. They are listed below:

1. To prepare and maintain with the SADIS provider State a regional transition plan for the implementation of operational GRIB and BUFR decoding within the region. The plan should as a minimum identify:

   Those States within the region taking a SADIS service.
   The current capability of each of the identified States in regard to GRIB and BUFR decoding.
   The necessary level and form of technical assistance and training required within the region in order to enable cessation of the T4 broadcast.
   Establish the mechanism by which the region can identify when all the States within the region are prepared for the T4 broadcast to be ceased.
2. To operate and monitor the mechanism by which the region will identify when all the States within the region are prepared for the T4 broadcast to be ceased.
3. To instigate and manage with the assistance of the SADIS provider State a programme of GRIB and BUFR decoder training commensurate with the needs of the region.
4. To report on an annual basis to both the region Met group and the SADISOPSG the status of preparedness of the region for the cessation of the T4 broadcast.

A similar level of information should also be provided to the IATA METWG and to the WAFSSG.

These groups are very much in their infancy at present having only existed for around three months. However, the following section gives some suggestions as to how the above terms of reference may be carried out.

3 Suggested methodology.

The terms of reference laid out in the previous section broadly cover the assessment of need, fulfilment of need and the assessment of compliance at the end of the work. This section will concentrate on the first two aspects, which clearly need to be tackled first.

The assessment of need will be addressed in the first instance by means of a questionnaire that will be sent to all SADIS user states in Europe and Africa. It is anticipated that the questionnaire will be sent to states via the ICAO regional offices in the form of a state letter which will give approximately three months in which to return. The questionnaire will ascertain precisely which states currently operate a SADIS, to confirm records held in Bracknell. Furthermore, states will be required to give details of software that is used to retrieve and display the SADIS information which will provide details that are not currently held in Bracknell. Further questions will surround the level of current use regarding GRIB and BUFR codes and perhaps an indication of the number of airline and ATC customers that are in receipt of the WAFS data in each state.

As with most state letters it is anticipated that some states will not provide the information as requested. In both Europe and Africa there are members of the team selected by the regional planning meetings who have agreed to assist in the collection of responses. It is expected that in Europe, delegates from the UK, Switzerland, Bulgaria and the Russian Federation will assist in collecting responses by either

direct contact or telephone where states do not respond to the questionnaire. A similar team consisting of the UK, ASECNA, Senegal and Kenya exists in Africa. Publicity in the WAFC London Newsletter and the annual WAFS seminar (held in Bracknell) will be used to try to ensure the maximum level of co-operation. A similar scheme is hoped for in the Middle-East although the timescales will be somewhat later.

Following the receipt of information regarding the current status across the regions it is expected that states will fall into two main categories in terms of their training requirements for GRIB and BUFR code usage. Most states will fall into the category whereby they use an "off the shelf" software package from one of the known workstation manufacturers to decode both GRIB and BUFR. The second category will contain a handful of states that have written their own software to carry out this task. The level of training and support for each of the above categories will be quite different and will be detailed below.

Category 1 (software supplied by known workstation manufacturer)

As stated previously, most states use software for data display that is supplied by known workstation manufacturers. Two main tasks are required in order to allow these states to make full and proper use of the GRIB and BUFR codes. Firstly, the software generated by the workstation manufacturer needs to be checked to ensure that it has the capability of providing a flexible display facility for these codes. Secondly, the states involved may required a little training of individuals to ensure that the software they are using is understood and that the facilities available are known about and used in the operational environment. These tasks should be straightforward.

Over recent weeks the known workstation manufacturers have been contacted with a view to an assessment being carried out of their software by the Met Office. This was a task assigned to the UK by SADISOPSG/5. A brief set of criteria have been set as a minimum requirement for WAFS data display. These criteria have been sent to the workstation manufacturers for comment and it is envisaged that an assessment will take place during the early part of 2001 on each set of software that is currently available. The results of these assessments will be placed on the SADIS web-site and may be published in the WAFC London Newsletter at a later date. Part of the assessment will require the software to be capable of giving a flexible display and decoding facility for both GRIB and BUFR. Details of this assessment are given in appendix 1 to this paper. The assessments will be carried out by the Met Office with the aim being to encourage the workstation manufacturers to provide the most straightforward and flexible decoding software.

The survey of states is also likely to establish the fact that some states will be in possession of software provided by workstation manufacturers that are no longer active in the production of such software. Once, these states have been identified a list will be provided to all current workstation manufacturers who will be asked to contact those states with a view to ensuring that they all receive suitable software. This would serve as a business opportunity to the workstation manufacturers.

For those states that have "off the shelf" software the only remaining task would be to provide simple training to ensure that operational staff are able to make full and proper use of the software that they have. To this end, it is suggested that a series of training seminars are held. The Met Office already co-sponsors a WAFC seminar on an annual basis. These seminars are held at the Met Office college in Reading which is close to Bracknell during July each year. At the seminar in 2000, a training session was held in the use of GRIB decoding software which was highly successful for those state representatives that attended. The Met Office intends to repeat the process in 2001 and in subsequent years there will be additional time given to the use of BUFR decoding software as it becomes more widely available. Further training seminars could be held within the regions as required, these could be arranged through the ICAO regions and targeted to those areas where there is the greatest need with the Met Office providing experts as appropriate. The workstation manufacturers have already agreed to provide suitable software training material for this purpose. It would be ideal for these seminars to commence during 2001 and would continue through 2002 and at least the first part of 2003.

Category 2 (States providing their own decoding software)

A handful of states will be identified through the questionnaire that are providing their own software for decoding and displaying GRIB and BUFR. It is expected that these states will number fewer than ten and will primarily lie within the European region. The training and technical assistance required by these states will be somewhat different. Basic GRIB and BUFR coding software has been created in the UK by the Met Office. This software has already been used to assist the workstation manufacturers in the preparation of their decoding software. It is envisaged that a similar level of assistance and software provision will form the core of any required training. In essence, the requirements from these states will be dealt with on an individual basis with basic software being made available from the UK along with regular communication to ensure that the states can not only provide the required software but also have trained staff with the ability to make full and proper use of that software. It is expected that this process will begin in the second half of 2001 once the states have been identified.

4 Further actions.

Two main actions seem obvious at this stage of the process. Firstly, in order to achieve full GRIB and BUFR utilisation the whole globe needs to be incorporated into the training and assessment process. This would require a successful o utcome from the forthcoming Middle-East regional Met meeting in the formation of a task force and a similar team being set up in the Americas. Secondly, throughout the course of the training process an acceptance scheme will be needed so that states can ac knowledge their capability for using these codes upon completion of any training. Some further issues will arise during this process.

It is clear that the use of these codes cannot be fully implemented until all user states have acknowledged their own capability and accepted that the codes will become the standard for future use. It is expected that some states will be unable or unwilling to send staff to attend training sessions or indeed some states may be unable or unwilling to purchase the required software. A method of dealing with such states will be required.

5 Conclusions and Recommendations.

- The meeting is invited to note the contents of this paper.