

WORLD METEOROLOGICAL ORGANIZATION

WMO RARS IMPLEMENTATION GROUP

2nd MEETING

GENEVA, SWITZERLAND

20 - 21 May 2008

FINAL REPORT



1. INTRODUCTION AND REVIEW OF THE AGENDA

Mr Jerome Lafeuille, Chief of the WMO Space-based Observing System Division, welcomed the participants to Geneva and emphasized the importance of the RARS initiative to WMO. He recalled that the WMO SP had among its objectives to develop the use of satellite data, namely through assimilation in NWP models. In improving the timeliness of satellite sounder data, the RARS initiative has proved to be extremely valuable and has had beneficial impacts on the output of many forecasting centres.

WMO and the user community are very pleased with the momentum that has been generated for the development of the RARS network development, which has been evident with the many new HRPT stations that have been recently brought into the network and the positive feedback received at the sixteenth International TOVS Study Conference ITSC-16 just held the preceding week.

The participants adopted the agenda attached as Annex I of this report, which included a new item 5.b) Dissemination after item 5.a) Global Coverage Optimization.

The Chair also noted that the status of previously agreed actions will be discussed as part of each relevant agenda item and reviewed when wrapping up the meeting.

2. STATUS OF EARS

Mr David Lee (EUMETSAT) presented the status of EARS, covering:

- i) EARS ATOVS and AVHRR Service Status:
 - ATOVS Re-transmission Service;
 - Pilot AVHRR Re-transmission Service;
 - Pilot ASCAT Re-transmission Service.
- ii) Metop-A HRPT Status and Mitigation;
- iii) EARS ASCAT (fast extract) Service Status;
- iv) EARS Continuation (IASI Status).

During the presentation, the following points were highlighted:

- The relocation of the Athens HRPT station;
- The HRPT stations that will shortly be incorporated within EARS [Moscow, La Reunion, Muscat (Oman)];
- The investigations into the Pretoria, Marion and Gough Islands in South Africa, which concluded that these stations were not in a suitable state to be incorporated within EARS - possible projects are under discussion to improve coverage in the region;
- The CLS ARGOS and EUMETSAT discussions, possibly leading to the mutual exchange of data from their respective HRPT stations – the ultimate aim being to include the CLS ARGOS HRPT data [e.g. French Guyana, West Africa (Gabon or Senegal)] within the EARS re-transmissions;
- The NWP SAF Monitoring of the EARS ATOVS Service and the evidence that the RARS project is becoming an operational reality;
- The planned coverage evolution of the EARS network;
- The status of Metop HPRT failure investigation and the factors that need to be taken into account when turning on the redundant HRPT unit (particularly the geographic distribution of ions);
- The planning for the EARS X-band Fast Extract Service for ASCAT, utilizing the HRPT station at Svalbard and the EARS network;
- The possible extension of the EARS X-band Fast Extract Service to include ATOVS, AVHRR and IASI data.

In response to a question from the Chair, it was clarified that all EARS ATOVS data is available to the Global user community via the GTS, in addition to EUMETCast dissemination over and around Europe.

The reasons behind the two-hour delay on global data were questioned and it was clarified that this was primarily due to communication limitations and the organization of processing. In the future this delay could be reduced (e.g. through the possible introduction of an Antarctic station).

The Implementation Group expressed their appreciation to EUMETSAT for the comprehensive overview of the current status and the future planning for EARS.

3. STATUS OF THE ASIA-PACIFIC RARS

Mr David Griersmith (BoM), the Asia-Pacific RARS coordinator, presented the status of the Asia-Pacific RARS, covering:

- i) Current status of Asia-Pacific RARS:
 - Current and future station planning;
 - Coverage;
 - Timeliness;
 - Key developments;
 - NWP SAF monitoring;
 - FengYunCast and the current dissemination schedule.
- ii) Coordination and management issues:
 - Need for a systematic processing of feedback from NWP centres and the need to maintain up-to-date information about the centres currently using RARS data;
 - Websites for RARS monitoring.
- iii) Issues:
 - Formats;
 - DVB-S;
 - Communications;
 - New stations;
 - Expansion to other sensors, satellites;
 - Liaison with the user community.
- iv) Future Events.
- v) Global coverage and the areas where new stations could have the maximum benefit for NWP.
- vi) Summary of new stations.
- vii) Benefits to NWP.
- viii) Station upgrades.
- ix) RARS developments.

The Implementation Group noted with appreciation the impressive RARS developments in the Asia-Pacific region.

4. STATUS OF THE SOUTH AMERICAN RARS

4.1 Brazilian Component of the South American RARS

Mr Sergio Pereira (INPE) presented the status of the Brazilian Component of the South American RARS, covering:

- Receiving sites in Brazil, their current status and future planning;
- RARS data on GTS Washington Node;
- C-12 Sub-centre codes;
- Extension of the South American RARS to Central America (relates to **pre-existing action 3.3**).

4.2 Argentinian Component of the South American RARS

Mr Sergio Masuelli (CONAE) presented the status of the Argentinian Component of the South American RARS, covering:

- i) Description of the status of the CONAE ground stations:
 - Cordoba;
 - Marambio.
- ii) Satellites that are being acquired and the related processing.

During the subsequent discussions Mr Nigel Atkinson (UKMO/NWP SAF) confirmed that the NWP SAF was now receiving data from the Marambio HRPT station.

Argentina clarified that the Marambio station processes data to level 1c due to restrictions with communications links.

It was also noted that discussions are underway to include a station in Ecuador (Cotapaxi) which would be very beneficial from a coverage point of view.

The plans for the inclusion of stations from Chile were also discussed (including the use of Sea Space stations and the related format issues).

In reviewing the overall status in South America, the Chair welcomed the progress in both Argentina and Brazil and the important operational contribution that the South American RARS is providing to the global RARS network.

Based on the contents of the presentations from the various regions, the following new action was raised in order to capture the revised HRPT station information.

Action RARS-IG-2.1: WMO SP to update table to include new information about current and planned HRPT stations (Athens, Cotopaxi (Ecuador), correction of Tahiti location, clarify that Jincheon will take over from Seoul at the end of 2008, changes to the availability of Fortaleza, Manaus and Boa Vista) – action due date: end of June 2008.

Note: This action has been implemented via the updated HRPT station table, attached as Annex III to this report.

Review of Previous Actions

Based on the information presented, it was concluded that both Action RARS-IG-1.17 and Action 3.3 could be closed.

5.A) Global Coverage Optimization

Robert Husband (WMO Consultant) presented the paper entitled “Global Coverage Optimization” and highlighted a number of points, including:

- The need for an update to the coverage maps to reflect the correct location of Tahiti and the proposed Cotopaxi station;
- The progress towards achieving the goal of 90% global coverage and the main coverage gaps;
- The HRPT stations with appreciable coverage overlaps.

Concerning coverage, the Chair highlighted that under current plans, with the addition of Cotopaxi the network would reach about 82% of the global coverage in 2009, which is slightly

below but close to the target. The 90 % of global coverage would require further additions in the following areas:

- Central and South Africa;
- Central and South Pacific.

For the gaps over Central Africa, it was noted that the inclusion of the CLS ARGOS HRPT Station in Gabon would be particularly beneficial.

Action RARS-IG-2.2: WMOSP to write to EUMETSAT to encourage the inclusion of stations in Central (e.g. Gabon) and South Africa. Due date: end-June 2008.

For gaps in the South African region, it was noted that the inclusion of HRPT stations in Gough Island and Pretoria would significantly improve coverage.

Action RARS-IG-2.3: WMO SP to write to SAWS to encourage the involvement of Pretoria and Gough Island in the RARS network. Due date: end-June 2008.

David Griersmith informed the Group that he had contacted the US and they had indicated that there were a number of other potential HRPT Stations that could provide data to the RARS network.

Action RARS-IG-2.4: BoM to provide a list of US HRPT stations that could potentially contribute to the RARS network. Due date: end-June 2008.

In view of their beneficial effect on coverage, particularly over oceanic areas that are important for NWP, the group strongly encouraged the planned inclusion of the HRPT stations at Caracas, Cotopaxi, Fiji, Hawaii and Tahiti in the RARS network.

It was also noted that EUMETSAT is currently investigating access to McMurdo HRPT data.

Concerning coverage overlaps, it was agreed not to focus on this issue as overlaps provide an element of redundancy within the network, and can potentially help ensure the timeliness of data (in the event that one of the overlapping stations suffers from communications limitations).

Action RARS-IG-2.5: All RARS operators to identify if their stations can/will meet the RARS timeliness requirement of 30 minutes (and if not, the timeliness figure that can/will be achieved). Due date: end-August 2008.

Action RARS-IG-2.6: Mr Nigel Atkinson (UKMO/NWP SAF) will investigate whether timeliness information could be recorded/reported by the NWP SAF. Due date: end-August 2008.

Review of Previous Actions

Following a review of the status of open actions from previous meetings, the following action dispositions were agreed:

Action RARS-IG-1.8:	closed
Action RARS-IG-1.9:	closed
Action RARS-IG-1.10:	closed
Action RARS-IG-1.11:	continuing - pending the availability of Metop HRPT [Action Text: All RARS operators to consider upgrading their reception stations to take advantage of the availability of Metop data and report at the next RARS-IG meeting].

5.B) Dissemination Issues

Kenji Tsunoda (JMA) presented the “Status of the GTS connected with the RTH Tokyo”, covering:

- Asia-Pacific RARS connectivity;
- Current status of the GTS – Region II;
- GTS Links Connected with RTH Tokyo;
- Traffic Status of the Tokyo-Washington Link;
- Traffic Status of the Tokyo-Melbourne Link;
- Traffic Status of the Tokyo-Beijing Link;
- Traffic Status of the Tokyo-Seoul Link;
- Traffic Status of the Tokyo-Hong kong Link;
- GTS Facilities in RTH Tokyo – conceptual design;
- JMA Internet Connection.

Mr David Griersmith (A-P RARS coordinator) raised the possibility of distributing AIRS, IASI, FY-3 and global RARS data using FengYunCast, emphasizing that he felt that this was the approach for the future as putting this sort of data on the GTS would be too expensive.

The Chair, noting that this was quite a general point, suggested that this could be addressed in the framework of the IGDDS Implementation Group discussions (that takes place immediately after this RARS-IG meeting).

Mr David Lee (EUMETSAT) summarized the current data exchange arrangements that are in place between EUMETSAT and CMA.

6. RARS OPERATIONS MONITORING

Mr Nigel Atkinson (UKMO/NWP-SAF) gave a presentation on the “RARS Monitoring at the UK Met Office”, covering:

- i) Monitoring:
 - Global versus local data comparisons;
 - Communications with RARS operators;
 - EARS monitoring at Meteo-France;
 - Web sites for RARS monitoring;
 - Satellite-specific issues;
 - Regions of potentially largest impact for RARS;
 - RARS stations used operationally at the UKMO.

- ii) Software:
 - Network organization;
 - Responsibilities;
 - AAPP updates;
 - Other tools;
 - BUFR encoding;
 - AAPP and platform issues.

In response to a question from the Chair, it was clarified that the NWP user community generally make use of the feedback provided by the NWP SAF to identify problems with global data.

It was noted that the NWP SAF receives data from RARS operators via FTP over the Internet which has proved to be a reliable mechanism.

A question was raised as to the feedback mechanism that NWP operators should use to provide their satellite preferences. It was agreed that this issue will be raised at the forthcoming APSDEU and NAEDEX meetings, and via the relevant subgroups of the International TOVS Working Group (ITWG).

Action RARS-IG-2.7: BoM to contact the ITWG Co-chairs to further investigate the matter with the ITWG Subgroup Chairs and to provide a synthesis paper on the feedback received from NWP Operators for the next meeting of the RARS Implementation Group. Due date: RARS-IG-3.

Action RARS-IG-2.8: BoM to establish a NWP operator email list so that the NWP user community can be informed of RARS developments. Due date: RARS-IG-3.

Following discussions, it was agreed that the grace period for installing an update of the AAPP software should be reduced from three months to one month for every update that affects the data output.

Action RARS-IG-2.9: WMO SP to update the RARS Operator Standards to reduce the grace period for updating the AAPP software from three months to one month. Due date: end-August 2008.

A discussion then ensued about regional versus local processing, and the Chair reminded the Group that, following previous discussions on this topic, the RARS Operator Standards were updated to stipulate that local processing could be up to AAPP level 1a; with the processing from AAPP level 1a to level 1c being done at the regional level (centrally) in order to optimize HIRS calibration.

David Griersmith informed the Group that he had taken the opportunity to investigate this point with NWP operators at the ITSC, and their view appeared to be that if there was a trade-off to be done between timeliness and stitching together long HIRS passes. To get better calibration, timeliness would be the most important parameter.

Following further discussions it was agreed that the RARS Operator Standards should be modified to allow AAPP level 1c processing (including BUFR encoding) at the station, with the data then sent to the regional node for injection in the GTS.

If processing to level 1c is done locally, then the station sub-centre ID would nominally be coordinated by the organization responsible for the HRPT station; instead of a sub-centre ID defined/coordinated regionally. If the local station processes to level 1c, but does not do the BUFR format conversion, then the RARS regional centre will be responsible for the BUFR format conversion and for ensuring that the appropriate local centre and sub-centre information is inserted.

Action RARS-IG-2.10: WMO SP to update the RARS Operator Standards to allow local processing to AAPP level 1c. Due date: end-August 2008.

Review of Previous Actions

Following a review of the status of open actions from previous meetings, the following action dispositions were agreed:

Action RARS-IG-1.13:	complete
Action RARS-IG-1.14:	complete

During this review a follow-on action was raised.

Action RARS-IG-2.11: BoM to review their proposed website for compliance with the RARS Operator Standards, EARS and WMO websites, and to propose an update for propagation to other RARS operators. Due date: end-July 2008.

7. SOFTWARE IMPLEMENTATION ISSUES

This agenda item was addressed as part of agenda item 6.

8. RARS CODING AND FORMAT ISSUES

Robert Husband presented the paper entitled "RARS Code and Format Issues" covering:

- RARS-IG-1 Objectives;
- RARS-IG-1 Actions versus Objectives;
- Implementation Examples;
- Possible Discussion Points.

In introducing the paper, it was highlighted that its main purpose was to put into a consolidated context the actions agreed at the last Implementation Group meeting. It was also pointed out that another view of the situation is available in the paper submitted by the BoM and, in order to avoid confusion, it was proposed that the WMO paper ("RARS Code and Format Issues") should be the reference point for the discussion.

The paper was then discussed section-by-section and the following points/modifications were agreed:

- i) The data designator would be the instrument name in a word without separator (i.e. AMSUA, AMSUB, HIRS, MHS)
- ii) The <free description> component of the filename should have the form "RARS+Satellite ID+HRPT Station ID" and "Rsss" should be removed from the [_freeformat].

So a typical filename for RARS data containing AMSU-A data from NOAA-17 provided by CPTEC/INPE in Brazil from the Cachoeira Paulista HRPT station should have the form:

```
W_br-INPE-CP,AMSUA,RARS+NOAA17+cpt_C_SBBR_20110701090858_(AAPP filename)_bufr.bin
```

These modifications will require an update to section 4.1 of the paper.

- iii) The use of "CCCC" in bulletins and filenames should be consistent.
- iv) Harmonization of instrument identifiers in the bulletin heading and the filename is desirable (i.e. the value of A_1 in the bulletin heading and the <data designator> value in the filename should be harmonized). This harmonization would be subject to a decision by the RTH Focal Point, in response to a proposal from RARS Operators.
- v) Concerning the use of A_2 as the Geographic Area Indicator in the bulletin heading, a Regional Indicator or a Global Indicator ("X") could be used, depending on the most appropriate characterization of the coverage. Where meaningful, the use of regional indicators is encouraged.
- vi) Appendix D should be expanded to include centre and sub-centre ID in the BUFR message part.

Action RARS-IG-2.12: WMO SP to capture the agreements concerning RARS code and format issues in the next version of the RARS Operator Standards. Due date: end-July 2008.

In order to facilitate the use of RARS data, all RARS operators were reminded of the need to inform their respective GTS focal points about the availability of RARS bulletins so that they can be included in the catalogue of bulletins which will (a) facilitate their discovery and (b) allow them to be recognized by the RTH and forwarded to potential users. Once the bulletins have been included in the catalogue, potential users can then contact the appropriate RTH in order to receive the bulletins via the GTS.

Action RARS-IG-2.13: All RARS operators to inform their GTS focal points about the availability of RARS bulletins. Due date: end-September 2008.

During discussions on BUFR Editions, RARS operators were encouraged to move to BUFR Edition 4 as it enables a more appropriate specification of years and seconds.

Also, it was noted that bulletin counters need to be sequential, and users of the script provided with the AAPP software should be aware that the script does not take into account the possible existence of other sources of bulletins within the same centre (and so does not manage sequencing from multiple sources).

To facilitate BUFR decoding by users, EUMETSAT requested that WMO include the Table D Sequence Descriptor in BUFR for Instruments on the WMO RARS website.

Action RARS-IG-2.14: WMO SP to include the Table D Sequence Descriptor in BUFR for Instruments on the WMO RARS website. Due date: end-October 2008.

Review of Previous Actions

Following a review of the status of open actions from previous meetings, the following action dispositions were agreed:

Action RARS-IG-1.2: All RARS operators to develop proposals for the allocation of A1A2ii for the cases where T1T2 is set to "IN" in accordance with Attachment II5 of the Manual on the GTS, in cooperation with the CBS Expert Team on GTSWIS Operations and implementation – applicable to future RARS data.

Status: A convergence has emerged between RARS operators for the allocation of A₁A₂ii (for the case T₁T₂=IN) involving the use of A₁ to identify the instrument [i.e. A=AMSU-A, B=AMSU-B, H=HIRS, M=MHS, Z=IASI level 1, S=ASCAT level 1 and D=IASI level 2 (TBC)....] and for A₂ to be the geographic area designator - as per Table C3 of the Manual on the GTS.

A new action was raised to submit a corresponding proposal to ET-OI.

Action RARS-IG-2.15: WMO SP to submit proposals to the CBS Expert Team on GTS/WIS Operations and implementation for the allocation of A1A2ii for the cases where T1T2 is set to "IN" and, in parallel, inform the CGMS Task Force on Codes. Due date: end-September 2008.

Action RARS-IG-1.3: For files that only contain RARS data, a) all Coordinators to standardize the practices for filenaming by using the general filenaming convention with pflag set to "W", b) to start implementing the WMO Core Profile of the ISO Metadata standard (version 1.0 adopted by CBSExt.(06)), and to contribute

to the further development of these standards, in particular through the InterProgramme Expert Team on Metadata Implementation.

Status: Part a) of the action has been completed with the previously noted agreements on filenaming. A new action was raised to inform the ET-OI about the agreements reached on filenaming.

Part b) of the action is ongoing.

Action RARS-IG-2.16: WMO SP to inform the CBS Expert Team on GTS/WIS Operations about the agreements reached on RARS filenaming. Due date: end-September 2008.

Action RARS-IG-1.4: EUMETSAT (Simon Elliott) to propose appropriate subcategories of category 003 for ATOVS and subcategories of 012 for ASCAT, and communicate them to the Implementation Group by the end of August 2007.

Status: Completed - EUMETSAT has made a proposal which has been accepted by ET/DR&C and now has a pre-operational status (pending final publication in the manual before becoming operational).

Mr Nigel Atkinson noted that the AAPP S/W will need to be updated to reflect the new table of instrument identifiers.

Action RARS-IG-1.5: All RARS Coordinators to implement the filenaming convention with product identifiers using data designator category 003 and subcategories to be defined (see above EUMETSAT action) in Common Table C13 of the Manual on Codes.

Status: In progress. RARS operators will aim to implement the filenaming convention by the end of August 2008, with a hard deadline of the end of 2008.

Action RARS-IG-1.6: In order to identify HRPT stations in a coherent manner, all RARS Coordinators to make coordinated proposals for unambiguous subcentre identifying numbers that would be proposed for inclusion in a future update of the common Table C12 of the Manual on Codes, in coordination with the CBS Expert Team on Data Representation and Codes. Due date: end of September 2007.

Status: Ongoing. The Asia-Pacific region needs to generate a revised proposal and all RARS Operators (apart from EUMETSAT) need to coordinate their proposals with their respective focal points. New due date: end-June 2008.

Action RARS-IG-1.7: The Coordinator of the Brazilian component of the South American RARS is invited to propose a different acronym for the Manaus HRPT station by the end of September 2007.

Status: Completed - the proposed acronym is "svm".

9. & 10. WMO RARS WEBSITE AND OTHER INFORMATION ACTIONS TOWARDS THE USER COMMUNITY

Mr Robert Husband introduced the paper entitled "WMO RARS Website and Other Information Actions Towards the User Community", highlighting:

- The background to the WMO RARS website;

- Planned evolutions of the WMO RARS website.

Following a discussion it was agreed to give more prominence to how users can obtain access to RARS data.

Action RARS-IG-2.17: WMO SP to include a section on “How to access RARS data” in a prominent position within the WMO RARS website. Due date: end-October 2008.

Review of Previous Actions

Following a review of the status of open actions from previous meetings, the following action dispositions were agreed:

Action 1.1: closed

Action 1.12: ongoing [Action Text: The WMO SP to inform the various Regional Associations of the increased availability of RARS data and seek feedback from NWP operators, via the Regional Rapporteurs on Space Matters].

Action 1.15: closed

Action 1.16: closed

Action 1.18: closed

11. APPLICABILITY OF THE RARS CONCEPT TO FUTURE SOUNDING MISSIONS

The Chair introduced the paper entitled “Applicability of the RARS Concept to Future Sounding Missions”. This paper contains the conclusions of discussions held within the Working Group on International Issues and Future Systems at the 16th TOVS Study Conference.

The Working Group considered the potential expansions of the RARS objectives to other sounding data beyond ATOVS.

As the applicability of the concept to IASI relies on the reactivation of the Metop HRPT capability, this issue was not addressed in detail by the Working Group.

It was noted that there will be a sounding capability on the FY-3 series. FY-3A, to be launched very soon (actually launched on 27 May 2008) and FY-3B to be launched in 2009 will be experimental satellites and the FY-3 programme is expected to be fully operational within around two years. This could be a candidate for the extension of the RARS concept, on the assumption that a suitable processing package is available.

Concerning NPOESS data, the Working Group noted that, once the SafetyNet is fully implemented, there should be no need for NPOESS data to be carried on the RARS network. However, it was confirmed by the USA that the SafetyNet would not be in place for NPP and would only be gradually implemented until the launch of NPOESS-C2. So for NPP/NPOESS-C1, the RARS concept is fully relevant as a gap-filling measure until the SafetyNet implementation is completed. For technical reasons it was noted that Metop data cannot be incorporated in the SafetyNet.

The main conclusions and recommendations of the Working Group were:

- i) The valuable contribution of the RARS network to NWP was recognized;
- ii) On the assumption that an FY-3 data processing package becomes available, the feasibility of including such data in the RARS network should be investigated;
- iii) The inclusion of NPP and NPOESS sounder data (CrIS and ATMS) within the RARS network should be investigated, as an intermediate measure, until the full SafetyNet is implemented.

A discussion then ensued about the bandwidth implications of including NPP and NPOESS sounder data. The ATMS data volume should not raise major issues; but CrIS is a hyperspectral instrument, like IASI, for which there has to be a prior selection of the channels to be retransmitted.

In order to prepare for discussions and recommendations at the forthcoming Direct Readout Conference, it was agreed that RARS operators should identify which of their HRPT stations have an X-band reception capability and would have the potential to contribute to a RARS extension to NPP/NPOESS.

Action RARS-IG-2.18: RARS operators to indicate (a) which of their stations have an X-band reception capability (and which are planned to be upgraded by the time of the launch of NPP) and (b) whether they would be willing to consider an extension of the RARS concept to NPP/NPOESS data. Due date: end-September 2008.

Action RARS-IG-2.19: WMO to investigate with IPO potential technical support and cooperation that could be provided to the RARS community in the period leading up to the full implementation of the SafetyNet. Due date: end-September 2008.

EUMETSAT then reminded the group of their tentative plans for the extension of the EARS X-band Fast Extract Service to include ATOVS, AVHRR and IASI data, and also their plans for cooperating with CMA on the development of the software processing package for FY-3.

12. SUMMARY OF ACTIONS AND PRIORITY SETTING

The Implementation Group then reviewed all the actions raised during the meeting and assigned due dates (as reflected in this report).

13. CONCLUSIONS

In conclusion the Chair was pleased to note the tremendous developments that have taken place in the RARS network, which now has a fully global dimension. In addition, the excellent progress made during the meeting on code and format harmonization means that the RARS data will be readily available to the global NWP user community in a consistent and coherent form.

The Chair thanked all the participants for their contributions to the success of the meeting, and particularly highlighted the importance of having a representative from the NWP SAF at the meeting, which greatly facilitated the speedy resolution of some of the open issues.

The close contact with users (via the participation of RARS operators in the ITSC) was also noted as a welcome and important development.

In view of the rapid pace of developments in the evolution of the RARS network, it was felt that the next meeting of the RARS Implementation Group should take place in the first week of March 2009.

**RARS IMPLEMENTATION GROUP
Second Meeting
AGENDA**

Day 1: Tuesday, 20 May 2008 (Start: 9h00)

- 1. Introduction and Review of the Agenda**
- 2. Status of EARS**
- 3. Status of the Asia-Pacific RARS**
- 4. Status of the South American RARS**
(Related actions: RARS-IG-1.17 and pre-existing Action 3.3)

Coffee break

- 5.A Global Coverage Optimization**
 - **Potential Extension of the Coverage Towards Africa**
(Related actions: RARS-IG-1.8, RARS-IG-1.9, RARS-IG-1.10, RARS-IG-1.11)
- 5.B Dissemination**
- 6. RARS Operations Monitoring**
(Related Actions: RARS-IG-1.13 and RARS-IG-1.14)
- 7. Software Implementation Issues**

Lunch break

- 8. RARS Coding and Format Issues**
(Related actions: RARS-IG-1.2, RARS-IG-1.3, RARS-IG-1.4, RARS-IG-1.5, RARS-IG-1.6 and RARS-IG-1.7)
- 9. WMO RARS Website**
(Related Actions RARS-IG-1.15, RARS-IG-1.16 and RARS-IG-1.18)
- 10. Other Information Actions Towards the User Community**
(Related Actions: RARS-IG-1.1, RARS-IG-1.12)

Day 2: Wednesday, 21 May 2008, morning only (Start: 9h00)

- 11. Applicability of the RARS Concept to Future Sounding Missions**
- 12. Summary of Actions and Priority setting**
- 13. Conclusions**

**RARS IMPLEMENTATION GROUP
SECOND MEETING**

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HRPT STATION STATUS AND ANTICIPATED EVOLUTION

■ ATOVS/NOAA reception ■ ATOVS/Metop reception

Region	Processing Centre	HRPT Station Name	Latitude	Longitude	2008				2009				2010			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Asia Pacific (A-P RARS)	Tokyo	Kiyose	35.77° N	139.53° E	■	■	■	■	■	■	■	■	■	■	■	■
		Syowa	69° S	39.58° E	■	■	■	■	■	■	■	■	■	■	■	■
		Seoul	37.48° N	126.92° E	■	■	■	■								
		Jincheon	36.99° N	127.43° E					■	■	■	■	■	■	■	■
		Beijing	39.93° N	118.28° E	■	■	■	■	■	■	■	■	■	■	■	■
		Guangzhou	23.13° N	113.3° E	■	■	■	■	■	■	■	■	■	■	■	■
		Urumuqi	43.78° N	87.6° E	■	■	■	■	■	■	■	■	■	■	■	■
	Melbourne	Melbourne Crib Point 1	37.88° S	144.96° E	■	■	■	■	■	■	■	■	■	■	■	■
		Darwin	12.46° S	130.84° E	■	■	■	■	■	■	■	■	■	■	■	■
		Perth	31.95° S	115.89° E	■	■	■	■	■	■	■	■	■	■	■	■
		Singapore	1.3° N	103.83° E	■	■	■	■	■	■	■	■	■	■	■	■
		Vladivostock	43.0° N	131.54° E					■	■	■	■	■	■	■	■
		Honolulu	21° N	157.5° W					■	■	■	■	■	■	■	■
		Guam	13.47° N	144.78° E					■	■	■	■	■	■	■	■
		New Zealand	41.3° S	174.5° E	■	■	■	■	■	■	■	■	■	■	■	■
		Hong Kong	22.3° N	114° E	■	■	■	■	■	■	■	■	■	■	■	■
		Casey	66.26° S	110.53° E					■	■	■	■	■	■	■	■
		Davis	68.58° S	77.97° E					■	■	■	■	■	■	■	■
		Fiji	17.7° S	177.6° E					■	■	■	■	■	■	■	■
		Townsville	19.28° S	147.05° E	■	■	■	■	■	■	■	■	■	■	■	■
Noumea	22.27° S	166.45° E									■	■	■	■		
Tahiti/Papeete	17.56° S	149.61° W									■	■	■	■		

Region	Processing Centre	HRPT Station Name	Latitude	Longitude	2008				2009				2010			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Europe and North-America (EARS)	Darmstadt	Athens	38.0° N	23.44° E												
		Edmonton	53.33° N	113.5° W												
		Gander	48.94° N	54.57° W												
		Gilmore Creek	64.97°N	147.40° W												
		Kangerlussuaq	66.98° N	50.67° W												
		Lannion	48.7°N	3.5° W												
		Maspalomas	27.78°N	15.63°W												
		Monterey	36.35° N	121.55° W												
		Svalbard	78.13° N	15.23° E												
		Wallops Island	37.8°N	75.3° W												
		Oman	23.61° N	58.54° E												
		Moscow (TBC)	55.75° N	37.62° E												
		Novosibirsk	54.8° N	83.13° E												
		Khabarovsk	48.47° N	135.35° E												
		La Reunion (TBC)	20.88 ° S	55.50 ° E												

LIST OF ACTIONS

- Action RARS-IG-2.1:** WMO SP to update table to include new information about current and planned HRPT stations (Athens, Cotopaxi (Ecuador), correction of Tahiti location, clarify that Jincheon will take over from Seoul at the end of 2008, changes to the availability of Fortaleza, Manaus and Boa Vista). Due date: end-June 2008.
- Action RARS-IG-2.2:** WMOSP to write to EUMETSAT to encourage the inclusion of stations in Central (e.g. Gabon) and South Africa. Due date: end-June 2008.
- Action RARS-IG-2.3:** WMO SP to write to SAWS to encourage the involvement of Pretoria and Gough Island in the RARS network. Due date: end-June 2008.
- Action RARS-IG-2.4:** BoM to provide a list of US HRPT stations that could potentially contribute to the RARS network. Due date: end-June 2008.
- Action RARS-IG-2.5:** All RARS operators to identify if their stations can/will meet the RARS timeliness requirement of 30 minutes (and if not, the timeliness figure that can/will be achieved). Due date: end-August 2008.
- Action RARS-IG-2.6:** Mr Nigel Atkinson (UKMO/NWP SAF) will investigate whether timeliness information could be recorded/reported by the NWP SAF. Due date: end-August 2008.
- Action RARS-IG-2.7:** BoM to contact the ITWG Co-chairs to further investigate the matter with the ITWG Subgroup Chairs and to provide a synthesis paper on the feedback received from NWP Operators for the next meeting of the RARS Implementation Group. Due date: RARS-IG-3.
- Action RARS-IG-2.8:** BoM to establish a NWP operator email list so that the NWP user community can be informed of RARS developments. Due date: RARS-IG-3.
- Action RARS-IG-2.9:** WMO SP to update the RARS Operator Standards to reduce the grace period for updating the AAPP software from three months to one month. Due date: end-August 2008.
- Action RARS-IG-2.10:** WMO SP to update the RARS Operator Standards to allow local processing to AAPP level 1c. Due date: end-August 2008.
- Action RARS-IG-2.11:** BoM to review their proposed website for compliance with the RARS Operator Standards, EARS and WMO websites, and to propose an update for propagation to other RARS operators. Due date: end-July 2008.
- Action RARS-IG-2.12:** WMO SP to capture the agreements concerning RARS code and format issues in the next version of the RARS Operator Standards. Due date: end-July 2008.
- Action RARS-IG-2.13:** All RARS operators to inform their GTS focal points about the availability of RARS bulletins. Due date: end-September 2008.

- Action RARS-IG-2.14:** WMO SP to include the Table D Sequence Descriptor in BUFR for Instruments on the WMO RARS website. Due date: end-October 2008.
- Action RARS-IG-2.15:** WMO SP to submit proposals to the CBS Expert Team on GTS/WIS Operations and implementation for the allocation of A1A2ii for the cases where T1T2 is set to "IN" and, in parallel, inform the CGMS Task Force on Codes. Due date: end-September 2008.
- Action RARS-IG-2.16:** WMO SP to inform the CBS Expert Team on GTS/WIS Operations about the agreements reached on RARS filenaming. Due date: end-September 2008.
- Action RARS-IG-2.17:** WMO SP to include a section on "How to access RARS data" in a prominent position within the WMO RARS website. Due date: end-October 2008.
- Action RARS-IG-2.18:** RARS operators to indicate (a) which of their stations have an X-band reception capability (and which are planned to be upgraded by the time of the launch of NPP) and (b) whether they would be willing to consider an extension of the RARS concept to NPP/NPOESS data. Due date: end-September 2008.
- Action RARS-IG-2.19:** WMO to investigate with IPO potential technical support and cooperation that could be provided to the RARS community in the period leading up to the full implementation of the SafetyNet. Due date: end-September 2008.