

CGMS VIRTUAL LABORATORY FOCUS GROUP

(Submitted by WMO)

Summary and purpose of document

To inform CGMS Members on assessment by the VL Focus Group of the CGMS Virtual Laboratory for Training in Satellite Meteorology and on the status of activities within the CGMS Virtual Laboratory for Training in Satellite Meteorology

ACTION PROPOSED

- (1) CGMS Members to note the report and make comments, as appropriate.
- (2) CGMS Members to endorse and support specific recommendations of the second VL Focus Group Meeting paying particular attention to recommendations within sections that address: Servers; Tools; Virtual Resource Library; Connectivity; Future Training Event Guidelines; Electronic Workbook; Major Training Event; Co-chairs (confirmation); and Third Session of the VL Focus Group.
- (3) CGMS to confirm the roles of the VL partners as put forth in Appendix B.
- (4) CGMS to continue support of the VL and its structure and goals, outlined in Appendix A.

- Appendices:**
- A. Structure and Goals for the VL Focus Group
 - B. Expectations For “Centres of Excellence”, Satellite Operators, and WMO/CGMS
 - C. Initial Assessment of the Virtual Laboratory for Education and Training in Satellite Meteorology
 - D. Three Year VL Goal - A Global High-Profile VL Training Event.
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DISCUSSION

Background

CGMS-XXVIII

1. CGMS-XXVIII was informed of WMO discussions concerning a Virtual Laboratory (VL) for Training in Satellite Meteorology. WMO noted the importance of the coordination and overseeing needed for the VL and thus suggested that CGMS, in partnership with WMO, form an "International Satellite Data Utilization and Training Focus Group".
2. CGMS-XXVIII placed ACTION 28.14 on WMO and the CGMS Secretariat to initiate the establishment of a focus group on satellite data utilization and training within the Virtual Laboratory Framework that reported back to CGMS-XXIX on its findings and need for future activities in this area.

CGMS-XXIX

3. CGMS-XXIX reviewed and confirmed the Terms of Reference, proposed structure and goals for the CGMS Virtual Laboratory Focus Group. The structure and goals are included as Appendix A for completeness.
4. The Virtual Laboratory for Satellite Data Utilization was formally adopted by CGMS-XXIX, with continued reporting through the Virtual Laboratory Focus Group.

CGMS-XXX

5. CGMS-XXX noted that a number of important activities and milestones that were agreed by the VL Focus Group were being addressed and met.
6. CGMS-XXX was pleased to be informed of the successful application of the Virtual Laboratory for Satellite Data Utilization for the Asia Pacific Satellite Application Training Seminar (APSATS) workshop that was co-sponsored by WMO, Japan Meteorological Agency and Australia's Bureau of Meteorology.
7. CGMS-XXX requested that the VL focus group convene before CGMS-XXXI and report back on activities and status with regard to the implementation plan.

WMO Cg-XIV

8. WMO Cg-XIV noted the positive impact of the Virtual Laboratory in document 3.1.6 paragraph 3.1.6.9, a portion which follows: "...In particular, it [WMO Cg-XIV] expressed its pleasure with the now established Virtual Laboratory for Education and Training in Satellite Meteorology. The Virtual Library had already made a tremendous impact throughout WMO Regions through its six "centres of excellence". The "centres of excellence" were now co-sponsored by the satellite operators and thus provided a worldwide nucleus of RMTCs in Niger and Kenya for RA I, in China for RA II, in Costa Rica and Barbados for RA IV and in Australia for RA V. Noteworthy was a recent training event that included lectures on new R&D instruments. Congress was pleased to see the integration of the new R&D constellation into education and training activities. It also noted that the WMO Space Programme Long-term Strategy and associated Implementation Plan provided for increased utilization of the Virtual Library to the benefit of WMO Members especially for fuller exploitation of R&D data, products and services as well as those from new and existing operational meteorological satellite systems. ..."

CGMS-XXXI

9. CGMS-XXXI was informed that the VL Focus Group meeting had been postponed until December 2003 because of schedule and funding issues. The meeting was to be held immediately after the WMO Satellite training seminar scheduled for Barbados, 2 to 13 December 2003.

10. CGMS-XXXI was informed on progress within the VL since CGMS-XXX. Important milestones were being met: all centres were utilizing the VL; servers were in place at all sponsor centres and some centres of excellence; resource libraries were available on-line; and training tools such as VISITView and SATAID were available.

Second session of the CGMS Virtual Laboratory Focus Group

11. The second session of the CGMS Virtual Laboratory Focus Group (VL FG) met to discuss coordination and oversight requirements for the Virtual Laboratory for Education and Training in Satellite Matters (VL). It was hosted by the Caribbean Institute for Meteorology and Hydrology (CIMH) and held at the Barbados Pavilion in Bridgetown, Barbados, 15-16 December 2003. A wide range of activity has been undertaken by all VL members during the past 2½ years.

12. As instructed by CGMS, the second session of the Focus Group conducted an assessment of the VL on activities and status with regard to the implementation plan, targeting the following items: the resource library, its role, how it is structured, how it is "peer reviewed," and other pertinent matters; VISITview, its role the Virtual Laboratory construct, etc.; expectations for the RMTCs that are participating in the Virtual Laboratory, especially in the area of a review of the questionnaire to help focus their training, and as an input to WMO; coordination of training activities that could lead to a schedule of "classes" for each year; Virtual Laboratory participant roles and responsibilities; archiving of training class presentations as a future training resource; development of a web-based training resource available to WMO and others, how it is managed, and what is the corresponding role of the "centre of excellence". The complete assessment (Annex IV to the VL -2 meeting) is contained in Appendix C.

13. **Servers:** Much progress has been made on the technical side of the VL with servers established at each of the satellite operators and at three of the "centres of excellence". A goal is for all "centres of excellence" to have on-line servers.

14. **Training events:** Very successful training events have been held under the auspices of the VL with Nanjing 2000, APSATS-2002, EAMAC 2003 and Barbados 2003.

15. **Tools:** VISITView has been used to provide access to remote lecturers in the two training events held since the formation of the VL FG, and, JMA has increased the capacity of SATAID to utilize geostationary data from EUMETSAT and GOES. All sponsors and "centres of excellence" are encouraged to make similar tools available to the VL. With the Australian Bureau of Meteorology "centre of excellence", JMA has made GOES 9 data freely available to NHMSs for training purposes using the LRIT/SATAID data server. EUMETSAT and the NOAA Laboratory of CIRA have agreed to investigate the possibility of also implementing LRIT/SATAID data servers at their locations to allow access to their geostationary satellite data for training purposes.

16. **Virtual Resource Library:** The initial Virtual Resource Library (VRL) at EUMETSAT has been populated with links to more than 200 titles and a simple search engine. CIRA has taken a different, but complementary approach by adding links to information and training material alongside near real-time data on its website. All sponsors are encouraged to develop and maintain Virtual Resource Libraries for utilization by the VL and WMO Members and CGMS.

17. **Peer review:** It was agreed that each sponsor and "centre of excellence" was responsible for peer review of materials placed on its server, as well as materials presented in WMO

sponsored training events. It was also agreed that materials should be reviewed and updated on a routine basis so that sites would avoid becoming “cluttered”.

18. **Collaboration between “centres of excellence”:** There was slower progress than was hoped for on the collaboration side between the centres, however, the VL FG was encouraged by the cooperation and collaboration that had occurred. The “centre of excellence” in Niamey have linked up with the BMTC in Australia for a lecture and weather briefing for a course at Niamey in July 2003. Barbados linked up with Costa Rica for a lecture and image discussion at the Barbados training event held in December 2003. The next three years will be a good test of the potential of the VL as it moves from the formation into delivery stage.

19. **Connectivity:** All “centres of excellence” are connected to Internet, some with more bandwidth than others. The 5-year bandwidth goal of 1 MB needs to be met at all “centres of excellence”.

20. **Utilization at “centres of excellence”:** all centres are using the VL, mainly for lecturer information rather than classroom, with the exception of WMO sponsored training events, this was at least partially due to poor line speed in some cases. The VL is available for WMO and CGMS Members with a rich variety of resources.

21. The VL FG reviewed lessons learned at Nanjing 2000, APSATS–2002, EAMAC 2003 and Barbados 2003. Recommendations were developed to increase the effectiveness of the VL and in particular for the Virtual Resource Library. Each “centre of excellence” provided recommendations to increase the VL effectiveness. The VL FG also evaluated inputs from the satellite operators and special interest groups (ITWG, IPWG and IWW).

22. **Web interface:** the VL FG discussed the VL web interface and it was agreed that a common interface very similar to the one presented to CGMS-XXXI should be implemented.

23. **Feedback:** The focus group noted that establishment of a VL user tracking and feedback mechanism is an exceptionally important activity (addressed in part by the Future Training Event Guidelines below). Use of WMO guidelines for forecaster skills in use of satellite data and products, as well as using information developed through the Expert Team on Satellite Systems Utilization and Products (ET-SSUP), evaluation of the biennial questionnaire, will help guide activities undertaken within the VL. To keep abreast of user requirements for the VL (baseline being “Guidelines for the Education and Training of Personnel in meteorology and Operational Hydrology”, WMO Pub No. 258), the analysis of user responses focused on education and training to ETSSUP questionnaire will be shared with the “centres of excellence” within their region to aid them in planning future training events. Questionnaire results and other user feed-back activity that is carried out by “centres of excellence” will be reported back to VL focus group for use in reporting to CGMS and WMO.

24. **Selected successes of the VL:** Training tools, data, products, algorithms, tutorials and satellite imagery were freely available to all users. Connectivity with the three major satellite related science groups has been established. JMA has made SATAID available and NESDIS and NOAA have made RAMSDIS and VISITView available. Three major WMO training events have been conducted, Nanjing 2000, APSATS 2002 and Barbados 2003. This success has been accomplished because of hard work within the VL and support from WMO and CGMS.

25. **Standardization of certain functions:** There is a need to standardize certain functions within the lab; for example development of common VL web entry pages, learning guides for the various subjects that were taught within the lab. Certain standard activities with respect to training events should be adopted and become routine. There must be routine coordination between the “centres of excellence” and sponsor’s centres. Improve Internet connectivity and exercise the VL tools. The role of research satellite operators as CGMS sponsors of the VL was also discussed.

26. **Future Training Event Guidelines:** Based on experience from the training events cited above, the VL Focus Group agreed to the following principles for the planning and running of VL training workshops:

- ?? Planning should begin a year prior to the event;
- ?? All the course information must be included in a Learning and Action guide that conforms with the VL template:
 - o This acts to focus the participants and lecturers on the purpose of the training activity and its relationship to the course objectives and other learning activities;
- ?? Courses should include a wide range of learning activities. Those activities are designed to engage participants taking into account their culture, language and skill level:
 - o Typical activities will include traditional face to face content lectures and their accompanying consolidation workshops, online lectures, talks in non formal sessions, group discussions, poster presentations, participant presentations on how they utilise satellite data and products, real time imagery discussion and one on one sessions with lecturers. The course must cover the three facets of learning: skills, knowledge and attitude;
- ?? Sponsors must provide resource material for participants to take back to their home institution to assist them in providing training at their NMHS (see electronic workbook subsection below);
- ?? Participants should form a task group composed of the training participants, the appropriate satellite operator and the “centres of excellence” to become a self help team;
- ?? Sponsors should conduct a six month assessment after the training workshop and if necessary provide follow-up online training covering relevant workshop material;
- ?? Sponsors should report back to the other “centres of excellence” on lessons learnt from running this training event to aid in the running of future training events.

27. **Electronic workbook:** The VL FG also discussed a potential development that would place all training materials, tools and presentations delivered during a training event onto a VL electronic training workbook (a small powerful laptop PC). It was envisioned that in the future such VL electronic training workbooks could be configured for use as a primary tool during the training event and return with the participant to his/her country for further education and training activities.

28. **Major training event:** The VL FG then developed an action plan for approval by CGMS taking into consideration the WMO Space Programme Long-Term Strategy. As part of the action plan, the VL Focus Group considered promotional activities that could expand the usage of the Virtual Laboratory within the wider WMO Members’ user base. As a three-year goal, the VL Focus Group agreed to convene a major high-profile VL global training event in the two to three year timeframe. Such a VL global training event would address all the points raised by the VL Focus Group in its discussion on ways to increase the effectiveness of the VL described in Agenda Item 6. A description of the global high-profile VL training event is contained in Annex VI including several related action items. The VL Focus Group also agreed in order to convene the high profile VL global training event that several important areas need to be further elaborated on as contained in Annex VI. Annex VI to the VL-2 report is contained in Appendix D.

29. **Roles and Responsibilities of VL partners:** The broad roles and responsibilities of the VL participants that were outlined at the first Focus Group meeting are being met on a best effort basis. The learning that occurred since the first VL Focus Group helped the second VL Focus Group Meeting define exciting new pathways forward, as well as further elaborate activities that a VL participant should undertake. Thus, the roles and responsibilities for “centres of excellence”, satellite operators, and WMO and CGMS were further clarified and are presented in Appendix B.

30. **Terms of Reference:** The session reviewed the current Terms of Reference in light of new activities that should be included. The second session agreed that the present Terms of Reference adequately covered the present and planned VL activities and thus suggested that no changes were required. The present Terms of Reference are contained in Appendix A.

31. **Co-chairs:** the VL Focus Group re-elected Mr Jeff Wilson and elected Dr James Purdom as VL Focus Group Co-Chairmen.

32. **Thanks to the outgoing co-chair:** The VL Focus Group thanked the outgoing Co-Chairman, Mr Richard Francis, for his outstanding contributions to the VL.

33. **Third session of the VL focus group:** The third session of the VL Focus Group should occur in three years time and conduct a comprehensive review of the VL as originally outlined as the first session of the VL Focus Group.

Activity within the VL since CGMS-XXXI

WMO Satellite training program in Barbados, 2-13 December 2003

34. Barbados 2003 was sponsored by the Caribbean Institute for Meteorology and Hydrology, CIMH, one of WMO's six "centres of excellence" for education and training for satellite meteorology. The VL achieved another major milestone in continuing its pre-eminence in meeting the WMO Space Programme's training objectives.

35. The first day of the event marked the beginning of a long line of firsts, foremost being the complete removal of the language barrier, often common to regional training events, by a seminar simultaneously conducted for participants in Barbados, as well as at the RMTTC in Costa Rica (another first) through the use of VISITView. The Barbados participant received several hour long lectures from the RMTTC in Costa Rica that utilized live Internet audio and VISITView. Since several of the Barbados participants had Spanish as their mother tongue, lectures alternated between English and Spanish.

36. The Virtual Laboratory, its training material, resources and personnel were central to the success of the workshop. The participants benefited from presentations by world-renowned lecturers, both live and using Internet and VISITView, that covered a variety of topics on satellite meteorology.

37. Instruction included how to use various VL tools:

- ?? The capabilities of the JMA software package SATAID and its applicability to the data streams available in RA III and IV;
- ?? An indepth description of VISITView and how to establish the necessary links to take advantage of its true power;
- ?? Use of RAMSDIS OnLine as a primary tool for daily map discussions.
- ?? The use of RAMSDIS for fire detection and cloud type identification.

38. As in APSATS 2002, a research space agency participated in the training event. ESA provided a lecture and materials relevant to its satellite missions and in particular ENVISAT.

39. Another in the list of firsts - tropical storms Odette and Peter broke a 100-year record for two storms in the month of December and RAMSDIS Online was there to provide near real-time imagery to the participants and some extremely interesting map discussions.

40. All the Barbados participants were trained in how to obtain the free VISITView software as well as how to establish similar dual location lectures.

41. As with the previous two VL training events, CIMH will be providing each participant with all the lectures on CD ROM to enable each "trainer" to pass on the expertise gained in Barbados to colleagues in their own NMHS.

42. Barbados 2003 was an excellent satellite data and products training course. It relied heavily on resources and training material from the Virtual Laboratory, the crown jewel of the WMO Space Programs' training activities, and demonstrated the potential of remote teaching using software such as VISITView.

Establishment of a Caribbean Focus Group

43. The participants in the WMO Satellite training program in Barbados were so buoyed by the new capabilities presented with the training that they established a new Caribbean Focus Group to perpetuate and build a new and stronger dialogue amongst trainers and forecasters in the region, another first for the VL.

44. Since the Barbados training event the Caribbean Focus Group has met on a monthly basis in a virtual laboratory environment using VISITView

45. Example of utilization: copy of email from 17 March Caribbean Focus Group session

Thanks to everyone that joined us in the March 17 VISITview exercise for the WMO VL Task Team. The next session is scheduled for April 7 at 20:00 UTC. We will look at the features over the Caribbean Sea, Central America, and over the Eastern Pacific near Peru as we gain more experience with VISITview.

The participants in the March 17 session included: Bernie Connell (CIRA with Audio); Scott Lindstrom (CIMSS with Audio), Horace Burton (Barbados with Audio); Julio Perez (Cuba); Clara Oria Rojas (Peru with Audio), Ricardo Raposo (Brazil); two students from Costa Rica; and Tony Mostek (NWS COMET with audio).

We were able to Chat via Yahoo messenger, and seven of us had microphones/headphones and could talk during the exercise.

We were able to share several loops (vis, IR window and Water Vapour) using the collaboration site for GOES-East at: <http://www.ssec.wisc.edu/visit/east.html>

Most of the participants were able to annotate/draw on the images and everyone was able to see the annotations.

To prepare for the next session on April 7 at 20:00 UTC, try the "VISITview controls" Web page to help you learn about and get experience with the menu controls. This page is located at: <http://www.ssec.wisc.edu/visitview/usage.html>

Please go through the instructions on this page. Once you are ready, you can try the VISITview controls by going to the collaboration weather satellite site at: <http://www.ssec.wisc.edu/visit/satcollab.html>

Note: Use "wmovl" for the VISITview select group window.

Remember, headphones and a microphone are needed to talk with YAHOO messenger. I will send out additional information before April 7 as we prepare for the next satellite weather briefing.

Thanks/muchas gracias/merci
Tony

Excitement and success !!!

**STRUCTURE AND GOALS
FOR THE
CGMS VIRTUAL LABORATORY FOCUS GROUP**

Management structure

Co-chaired by one satellite operator and one representative from the “centres of excellence”. Served by the WMO Satellite Activities Office as the Secretariat. Membership should include:

- ?? representatives of science teams as appropriate;
- ?? remaining satellite operators and “centres of excellence”;
- ?? other interested parties as appropriate.

VL Strategic Goals

- (1) To provide high quality and up-to-date training resources on current and future meteorological and other environmental satellite systems, data, products and applications;
- (2) To enable the “centres of excellence” to facilitate and foster research and the development of socio-economic applications at the local level by the NMHS through the provision of effective training and links to relevant science groups.

VL Immediate Goal

- (1) To implement a baseline VL and to foster its logical growth.

VL Connectivity Goal

- (1) To assure links between the 6 “centres of excellence” (and supporting satellite operators) with a **minimum** data rate of 56 kbs, to support communication (email, voice), the exchange of software and limited image data sets (e.g., case studies and some near real-time data sets);
- (2) “Centres of excellence” to consider means to increase link capacity to a minimum of T-1 within 5 years;
- (3) A preferred method in the short-term would be the direct insertion of data from a ground receiving station into the Virtual Laboratory servers. As an alternative, the Internet can be used to route data and products to the VL servers.

VIRTUAL RESOURCE LIBRARY (VRL) GOALS

- (1) To establish a list of usable training resources (includes image data sets, s/w, tools);
- (2) To implement a structure for the depository of training resources which will allow easy access by the “centres of excellence” trainers;
- (3) To populate this structure with a core set of material from the training resources list;
- (4) To consider a more general access to the resource library by students (forecasters);
- (5) To consider the provision of additional (enhanced) material from the resource library to all 6 “centres of excellence”.

VL UTILIZATION GOALS

- (1) To establish a VL user tracking and feed-back mechanism, from the outset, (for analysis, refinement, reporting to VL management, and to assess overall usefulness);
- (2) To keep abreast of user requirements for the VL (baseline being WMO Pub No. 258). Assume: analysis of user responses focused on education and training to questionnaires within their region and other user feed-back is carried out by "centres of excellence" and results are reported to VL management;
- (3) To train meteorological students to an operational level of expertise as well as to allow daily weather discussions during training events, near real-time data and products are a strong requirement. Near real-time data are needed to train forecasters on the effective use of new satellite reception and processing systems. Depending on the application, the need for near real-time data availability may not be as stringent.

Long-Term Evaluation of the VL

- (1) After five years, conduct a comprehensive review of the VL.

Typical activities to be undertaken to meet the goals

- ?? Consolidate documentation of the range of skills/competencies for operational meteorologists and specialists;
- ?? Examine which online (Web-based learning), Computer Aided Learning. CDs and hard copy learning materials are currently available for use in the Virtual Laboratory. This activity will include contacting groups such as ASMET, COMET, CIRA, EuroMET, BMTC and CIMSS who have complementary projects under way and relevant science groups (such as the EUMETSAT SAFs, the TOVS Working Group, the Winds Working Group and the proposed quantitative precipitation working group);
- ?? Negotiate with the copyright holders of the training material rights to either link to their material and/or to acquire the rights to use their material at the designated centres of satellite training expertise (this includes the centres making the material available to on- and off-site users);
- ?? Working with groups such as ASMET, COMET or EuroMET, design and test possible user interfaces, educational approaches for delivering the material, and examine methods for online tracking of student participation;
- ?? On a trial basis, evaluate the proposed Virtual Laboratory material in conjunction with one of the WMO satellite training workshops for more user feedback;
- ?? Incorporate user feedback into the educational approach and review the content of the Virtual Laboratory;
- ?? Move to a wider implementation of the material;
- ?? Undertake a periodic review of the Virtual Laboratory sites in conjunction with reviews of the skills and competencies of the operational meteorologists and specialists;
- ?? Prepare sample data sets for the various data streams now being provided or planned for in the near future. The data sets would be used within the VL concept;
- ?? Provide for continuous monitoring of user requirements for Education and Training as well as the effectiveness of the Virtual Laboratory

EXPECTATIONS FOR “CENTRES OF EXCELLENCE”, SATELLITE OPERATORS, AND WMO/CGMS

Expectations from the “centres of excellence”

Whilst recognizing that each “centre of excellence” has different administrative and financial structures, relationships with the sponsoring satellite operator and links with neighbouring NHMSs, the VL FG recommended the following:

- ?? Nominate a focal point and an alternate within the CoE as the primary contact for all VL business:
 - o Preferably this person should have some authority to make decisions regarding the use of the VL within the CoE;
- ?? Run international training events that conform with the VL guides for organising and running training events;
- ?? Maintain an up to date list of priority training needs for that region:
 - o Links to SSUP ET coordination;
- ?? Develop and maintain proficiency in providing online training using tools such as VISITView;
- ?? Maintain regular contact with the other members of the VL Focus Group:
 - o Co-chair responsibility to coordinate sessions;
- ?? Provide the Co-Chairs (or designated people) a brief annual report at the end of August each year, relevant to the VL, outlining the training activities for the past 12 months, anticipated training activities for the next twelve months, priority training needs for the region for the next 12 months and their ability to meet the training needs, and other information they feel is relevant to the VL:
 - o Co-chairs responsibilities to report to constituent bodies after receipt of information.

Expectations from the Satellite Operators

- ?? Nominate a focal point and alternate for VL business:
 - o Preferably this person should have some authority to make decisions about VL matters within the satellite operator and some delegation to assist the CoEs on a case by case basis;
- ?? Make near real time data, products and/or selected case study data available for education and training purposes to CoE's in the correct data formats for use with the agreed VL tool sets;
- ?? Maintain regular contact with the CoE(s) that the satellite operator is sponsoring, focusing in particular, but not solely on communications and data access issues. As appropriate, provide an alerting role for the CoE(s) on new training resources and material generated within or for the satellite operator;
- ?? Maintain regular contact with the other VL satellite operators on data access and format issues and other matters as appropriate;
- ?? Provide the Co-Chairs (or designated people) a brief annual report at the end of August each year, relevant to the VL, outlining the activities that the satellite operator has undertaken in the past 12 months for their sponsored CoE(s) and the VL in general, and plans relevant to the CoE and the VL for the next 12 months;
- ?? Assist the CoE(s) to overcome resource constraints on VL related matters through advice, championing with other funding bodies and direct assistance as appropriate.

Expectations from WMO and CGMS

- ?? Provide long term guidance and advice, and where appropriate, direction regarding global and regional priorities;
- ?? Represent the VL partners at appropriate policy and resource fora;
- ?? Assist with resource issues.

INITIAL ASSESSMENT OF THE VIRTUAL LABORATORY FOR EDUCATION AND TRAINING IN SATELLITE METEOROLOGY

The resource library, its role, how it is structured, how it is “peer reviewed”, and other pertinent matters;

The initial goals were met. Its role was to provide access to training and educational material, software and expertise on how to utilize data, and case studies and near real-time data. It served as an entry point or portal for a user searching for information or resource material for satellite education and training. It was globally distributed with servers located at all operational satellite operators and some of the “centres of excellence”. However, there was no structured peer review. In its current state each contributor peer reviews its own site.

VISITView, its role within the Virtual Laboratory construct, etc;

VISITView was a powerful communications and collaboration tool and its use within the Virtual Lab was expected to continue to grow. The importance of the VISITView tool can't be over-emphasized. VISITView provided the ability to incorporate remote lecturers and experts into face-to-face training events (allowing more effective use of funds) and hence to enable distance education sessions. One of the Co-Chairs had recently been involved in a training event that had used VISITView to provide follow-up training to the course participants and to encourage them to consolidate and use the course material. It was recommended that future satellite training events also incorporate follow-up sessions using VISITView to reinforce the training that occurs during the face-to-face sessions.

Other tools within the VRL included analysis tools such as SATAID, RAMSDIS and Envi Freelook. These analysis tools along with VISITView were probably one of the strongest parts of the VL at this stage. Whilst tool developments were being funded outside of the VL framework, the developers were very aware of the interest and use of their tools within the VL and had been extremely co-operative in incorporating suggestions and requests into the tool development. Use of common tools within the satellite operators, “centres of excellence” and neighbouring NHMSs has allowed more sharing of resources and expertise.

Expectations for the RMTCs that are participating in the Virtual Laboratory specially in the area of a review of the questionnaire to help focus their training, and as an input to WMO;

Focus Group members agreed that the “centres of excellence” should see the responses to the Questionnaire for their regions. The “centres of excellence” should themselves also provide a response to the Questionnaire to WMO Space Programme Office. The “centres of excellence” have agreed to encourage WMO Members to respond to the Questionnaire through whatever mechanisms are appropriate. WMO Space Programme Office should advise “centres of excellence” of responses to the Questionnaire using the VL list server.

Coordination of training activities that could lead to a schedule of “classes” each year;

As already mentioned in the agenda item 5 discussions the Focus Group identified the need to enhance coordination and collaboration between “centres of excellence”. As an outcome of the Barbados training event, a task group of the participants, satellite operator and two “centres of excellence” has been formed to initiate and coordinate a series of ongoing contacts. “centres of excellence” have used VISITView and other VL resources to provide training activities as part of the WMO Satellite training events and other training activities.

Virtual Laboratory participant roles and responsibilities;

The broad roles and responsibilities of the VL participants were clearly outlined at the first Focus Group meeting and were being met on a best effort basis. The learning that had occurred during the first two years of the VL Focus Group had helped define exciting new pathways forward as well

as further elaborating activities that a VL participant should undertake. As the goals for the next period are agreed the association of activities with their responsible VL participant shall be embodied in the plan.

Archiving of training class presentations as a future training resource;

Training resources and material from the Nanjing and Melbourne training events have been made available to VL members and were available via the VRL. Training resources from the Barbados event should be added when they become available. In general terms, and in the interest of enhancing communications between participants, training class presentations will be distributed and also made available via the VRL as soon as practical.

Development of a web-based training resource available to WMO, how it is managed, and what is the corresponding role of the Centre of Excellence

The VISITView tool for generating web based training material was available online, as were a large number of VISITView lessons. Most “centres of excellence” have utilized VISITView within their training activities. It was reported that VISITView is freely available to any WMO Member and should be used by the Barbados task group. There were still challenges to be met including VISITView sessions on how to utilize the various components of the VL.

THREE YEAR VL GOAL

A GLOBAL HIGH-PROFILE VL TRAINING EVENT

A major high level goal – a global high profile VL training event, 2-3 year timeframe with interim events testing the overall concept and its components. All “centres of excellence” and their regional NMHSs, satellite operators, focussed science groups and a globally distributed set of lecturers linked into a common training event. “Roll around the globe with the trainers” to link two or three of the “centres of excellence” at any one time.

Benefits:

- ?? “Centres of excellence” would all achieve a comparable skill level;
- ?? Leverages E&T events, not just a WMO event, and extra-budgetary resources to maximize the impact;
- ?? The same set of expert lecturers that make presentations to an event at one “centre of excellence” could make the same presentations to all “centres of excellence”;
- ?? This would add the linking of NMHSs with their regional “centre of excellence” into the global event. Training would reach into the NMHSs at the same time as the global event;
- ?? Preparing for the event and the event itself would exercise the VL addressing all proposed ways to increase VL effectiveness as discussed at the second session of the VL FG.

Action item:

Appoint a focal point (Mr Wilson as VL FG Co Chair) to coordinate the global high profile VL training event and it was anticipated that the focal point would convene an *ad hoc* working group to assist.

Action item:

Focal point to identify financial resources required to implement the event.

Action item:

CGMS VL Rapporteur to inform and seek agreement from CGMS-XXXII of the event and associated need for financial resources.

Action item:

WMO Space Programme Office to inform the 2004 Consultative Meeting of the event and associated need for financial resources.

Important areas requiring further elaboration by the focal point.

- ?? VRL
 - o Case studies and lectures able to be downloaded, as well as found via the search engine;
 - o Sat operators to provide online access to digital data for the standard VL tools (SATAID, RAMSDIS);
 - o Improve search capabilities on the VRL;
 - o Standardise meta data to allow more effective searching;
 - o Provide a brief description of the material on the VRL that is available only on request;
 - o Peer review mechanism.

- ?? Institute routine coordination between “centres of excellence” and sat ops (at least 3 monthly) – Co – Chairs;
- ?? Collaborate on series of training related projects (3 monthly for those who can);
- ?? Common VL interface on the web pages (Mr Wilson to email to group);
- ?? “What’s new and FAQ” to be added to the VL website s;
- ?? Sat Operators to install the RAMSDIS-Online type system and tailor to meet their needs and those of the “centres of excellence” (CIRA to provide code);

Have EUMETSAT investigate and report back on the feasibility of using EUMETCast to disseminate training material (by end of 2004)