

# **RSMC Melbourne report of activities for 2011**

## **Executive Summary**

Primary activities for 2011 were dominated by the RSMC responses to the Fukushima Daiichi NPP accident of 11 March 2011. The RSMC responded to 20 requests from the IAEA between 11 March and 15 April 2011. Some ad-hoc requests for products were also received from various RA-V NMHSs during this period. Following the Fukushima accident, numerous requests for inverse modelling support were received from the Provisional Technical Secretariat (PTS) of the Comprehensive Test Ban Treaty Organization (CTBTO) throughout the year from March onwards. Other RSMC-related activities for 2011 included monthly tests conducted for scenarios over Canada, the United States and Australia and two IAEA quarterly tests for scenarios over Australia and Argentina.

### **1. Introduction**

The National Meteorological and Oceanographic Centre (NMOC) of the Australian Bureau of Meteorology is designated by the WMO as the Melbourne Regional Specialized Meteorological Centre (RSMC) with the specialization to provide atmospheric transport model products for environmental emergency response. The region of responsibility is WMO Regional Association (RA) V, which includes the countries: Australia, Brunei Darussalam, Fiji, Indonesia, Malaysia, New Zealand, Papua New Guinea, Philippines and Singapore. RSMCs Washington and Montréal also respond jointly in support of RSMC Melbourne in case of an event in WMO RA-V until a second RSMC can be designated for this region. In addition to emergency response, RSMC Melbourne contributes global inverse modelling support to the CTBTO's verification system.

### **2. Operational Contact Information**

RSMC Melbourne  
National Meteorological and Oceanographic Centre  
Bureau of Meteorology  
700 Collins Street  
MELBOURNE, Victoria 3000  
Australia

Business contact: Mr Jim Fraser  
Tel : +61 3 9669 4039  
Fax : +61 3 9662 1222  
Email : J.Fraser@bom.gov.au

Operational contact (24 hours): Shift Supervisor  
Tel : +61 3 9669 4035  
Fax : +61 3 9662 1222  
+61 3 9662 1223  
Email : [rto@bom.gov.au](mailto:rto@bom.gov.au)

### **3. Responses and information on dissemination of products**

#### **i. Fukushima Daiichi NPP accident: Modelling for the IAEA**

RSMC Melbourne responded to 20 requests for support from the IAEA between 11 March and 15 April 2011 related to the Fukushima-Daiichi nuclear reactor accident. Although RSMC Melbourne was not the Lead RSMC for this event, the IAEA requested model product support from all RSMCs. Further details on RSMC Melbourne's response can be found in the document entitled "*The RSMC Melbourne Response to the Fukushima Daiichi NPP Accident, Triggered by the Great East Japan Earthquake and Tsunami of 11 March 2011*" presented by RSMC Melbourne at the WMO CBS Coordination Group for Nuclear Emergency Response Activities meeting held in Vienna, Austria 31 October – 4 November 2011 (see Doc-5-1 of **WMO, 2011**).

#### **ii. Fukushima Daiichi NPP accident: RA-V NMHS requests**

In addition to the official IAEA requests, a number of special requests for EER products were also received from RA-V NMHSs. These were from the Philippines and Singapore - nations in relatively close proximity to Japan. In response to these requests, special runs of our dispersion model were done and the results were sent by email and fax to the requesting NMHS only.

Individual RA-V country requests for updated EER products received were

- Wed 16 March, Philippines
- Tue 29 March, Singapore
- Sat 9 Apr – Singapore
- Sun 17 Apr – Singapore
- Fri 22 Apr – Singapore
- Sat 23 Apr – Singapore
- Sun 24 Apr – Singapore

Due to the frequent update requests coming from Singapore, an automatic script was set up to routinely produce updated trajectory and dispersion charts over Japan twice a day and upload them to our password-protected general EER webpage (but not the WMO Joint EER webpages).

#### **iii. Dissemination of products**

Transport model graphical products and joint statements are posted to secure joint web pages, and faxed to relevant RSMCs and NMHSs. For examples of the graphical products, see Annex 4 of **WMO, 2008**.

In addition to the other RSMCs, the following RA-V member countries' NMHSs are in our email and fax lists:

Brunei Darussalam  
Fiji  
Indonesia  
Malaysia  
New Zealand  
Papua New Guinea  
Philippines  
Singapore

#### iv. Response to requests by CTBTO-PTS

A total of approximately 48 requests for support were received from the Provisional Technical Secretariat of the Comprehensive Test Ban Treaty Organization. Operational requests between 19 March and 22 Dec 2011. In all cases, the products were supplied to CTBTO within the allowed time limit.

#### 4. Routine operations

##### Monthly Test:

RSMCs Melbourne, Montréal and Washington generally hold a joint exercise on the second Thursday of every month. In addition, RSMC Melbourne participated in two IAEA-initiated exercises during the year, one in which RSMC Melbourne was lead with support from RSMC Montréal and RSMC Washington. The IAEA tests scheduled for April and August 2011 were cancelled due to the Fukushima Daiichi accident. The table below shows the list of tests held in 2011.

Once the model products are posted to the common web pages, an email and fax is sent in English to the relevant RSMCs, the NMHS contact points in WMO RA-V, the IAEA and WMO. The email contains login information to retrieve the RSMC products from the common web pages.

Month	Source location	Initiated by	RSMC providing joint statement
January	Gentilly, Quebec, Canada	RSMC Washington	Montréal
February	Rockingham, WA, Australia	IAEA	Melbourne
March	Manyberries, Alberta, Canada	RSMC Montréal	Washington
April	-	-	cancelled
May	-	-	cancelled
June	Lucas Heights, NSW, Australia	RSMC Melbourne	Montréal
July	Bruce, Ontario, Canada	RSMC Montréal	Washington
August	-	-	cancelled
September	Pickering, Ontario, Canada	RSMC Washington	Washington
October	Lucas Heights, NSW, Australia	RSMC Melbourne	Melbourne
November	Atucha, Argentina	IAEA	RA II RSMCs
December	Clinton, IL, USA	RSMC Washington	Washington

Table 1: RSMC monthly tests for 2011

#### 5. Lessons learned and significant operational or technical changes:

- The initial IAEA Fukushima request on 12 March highlighted an inability of our EER system to handle release start times occurring earlier than the basetime of the most recent NWP model run. Since then,

our system has been reconfigured and can now cope with releases starting up to 72 hours prior to the basetime of the most recent model run.

- Our original suite of scripts and procedures was not set up to distribute products to a single NMHS in the event of a special update request. Because of this, the initial special request from the Philippines NMS had to be faxed and emailed manually. Since then, additional logic has been added to our EER system to make this more automated.
- The increasingly long CTBTO backtracking requests eventually exceeded our 30-day historical model data disk archive. This archive has now been increased to 40 days and could be increased further if required.

## **6. Operational issues and challenges:**

- During the Fukushima event, there was some confusion over the identity of the Delegated Authority for the Philippines after their operational contact requested some changes to the Philippine recipients of the standard EER products. The Delegated Authority listed in WMO contacts webpage had actually retired several years beforehand but a replacement had not been arranged with WMO. The contact details for all member states need to be checked regularly – since then, the WMO Secretariat has sent out a circular letter to the Permanent Representatives of WMO Member States to update all contact information.
- Early during the Fukushima event there were general questions within RSMC Melbourne regarding the applicability of the standard products if we were required to issue aviation radiation SIGMETs. It was felt that some definite guidelines and training and more appropriate dispersion products need to be developed and more realistic release parameters would need to be supplied before we would be able to deal with such issues. This was discussed at the November 2011 meeting of the CBS Coordination Group on Nuclear Emergency Response Activities (CG-NERA) in Vienna but it was agreed that further work needed to be done to clarify the criteria to be used to produce the guidance.

## **7. Summary and status of the operational atmospheric transport and dispersion models**

RSMC Melbourne's operational Environmental Emergency Response (EER) system is currently based on version 4.9 of the Hybrid Single-Particle Lagrangian Integrated Trajectories (HYSPLIT), Model, developed by Roland Draxler at the NOAA Air Resources Laboratory. HYSPLIT is driven by meteorological input from the various operational numerical weather prediction systems run in the Bureau of Meteorology. The system is available for running on demand and produces forecast trajectories, concentrations (or exposures) and depositions for nuclear accident, volcanic ash, smoke and other episodes. For most initial responses to requests for nuclear EER products, input to HYSPLIT is provided by the N144L50 (approximately 80km horizontal resolution) global ACCESS-G system.

## **8. Plans for 2012:**

- An upgrade of the ACCESS NWP systems, increasing the resolution of the global ACCESS-G system from N144L50 (approximately 80km horizontal resolution) to N320L70 (approximately 40km horizontal resolution) and also increasing the horizontal resolution of the regional ACCESS-R system from 0.375° to 0.11°, is planned for the first half of 2012.
- Testing of use of raw model-level ACCESS wind fields rather than interpolated sigma-level fields.
- Involvement with the RSMC Ensemble Exercise proposed by RSMC Vienna

- The schedule of routine monthly tests for 2012 has been set up in collaboration with RSMCs Montréal and Washington. Each RSMC will select the simulated accident location and write the joint statement on a rotating basis. Quarterly tests are also scheduled with the IAEA.
- Update the contact lists of NMHSs in WMO RA-V.

## **References**

WMO, 2008: Documentation on RSMC Support for Environmental Emergency Response.

*WMO-TD/No.778*. Available online at <http://www.wmo.int/pages/prog/www/DPFSERA/td778.html>

WMO, 2011: Documentation Plan for WMO CBS Coordination Group for Nuclear Emergency Response Activities meeting held in Vienna, Austria 31 October – 4 November 2011. Available online at [http://www.wmo.int/pages/prog/www/DPFSERA/Meetings/CG-NERA\\_Vienna2011/DocPlan.html](http://www.wmo.int/pages/prog/www/DPFSERA/Meetings/CG-NERA_Vienna2011/DocPlan.html)