

RSMC Beijing report of Activities for 2012

Executive Summary

Primary activities at RSMC Beijing for 2012 consisted of communication tests and a quarterly exercise conducted by WMO and IAEA. In addition, RSMC Beijing provided atmospheric backtracking products for the Provisional Technical Secretariat (PTS) of the Comprehensive Test Ban Treaty Organization (CTBTO). Also, a report of non-nuclear activities conducted by RSMC Beijing in recent years was submitted to WMO as request.

1. Introduction

The National Meteorological Centre (NMC of China Meteorological Administration) is designated by the WMO as the Beijing Regional Specialized Meteorological Centre (RSMC) for the provision of atmospheric transport modelling in case of an environmental Emergency Response. The primary regions of responsibility are WMO Regional Associations (RA) II. RSMC Beijing performs its functions jointly with RSMC Tokyo and RSMC Obninsk when requested by the IAEA or member states of WMO Regional Association II (RA-II). In addition to emergency response, RSMC Beijing contributes global reverse modelling support to the CTBTO's verification system.

2. Operational Contact Information

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3. Responses and information on dissemination of products

i. Exercises (2012)

November 15 – RSMC Beijing participated in the ConvEx-2c exercise. The release site was Bushehr, Iran, and real-time meteorological field was considered. RSMC Beijing received IAEA faxed request for transport and dispersion modelling of radionuclide in support of the exercise. There has been good cooperation between us and other RSMCs.

ii. Dissemination of products

Transport model graphical products and joint statements are posted to secure joint web pages, and faxed to relevant RSMCs and NMHSs.

In addition to the other RSMCs, the following NMHSs are in our fax lists:

Bahrain
Bangladesh
Democratic people's republic of Korea
Hong Kong, China
India
Iran, Islamic Republic of
Iraq
Republic of Yemen
Kazakhstan
Kyrgyzstan
Macao
Mongolia
Myanmar
Oman
Pakistan
Qatar
Republic of Korea
Saudi Arabia
Sri Lanka
Tajikistan
Thailand
Turkmenistan
United Arab Emirates
Uzbekistan
Viet Nam

The failure rate of fax transmission was high. During the exercises, only 12 out of 24 fax transmissions to NMHSs were successful:

Democratic people's republic of Korea
 Hong Kong, China
 India
 Kazskstan
 Macao
 Mongolia
 Oman
 Pakistan
 Republic of Korea
 Saudi Arabia
 Thailand
 United Arab Emirates

iii. Response to requests by CTBTO-PTS

There were a total of 24 requests from the Provisional Technical Secretariat of the Comprehensive Test Ban Treaty Organization. The products were supplied to CTBTO within a few hours after the receiving of the requests.

4. Routine operations

Quarterly Tests:

RSMC Beijing participated in quarterly tests conducted by IAEA. Table 1 contains summary information on these tests. The products of the tests were uploaded to RSMC common web pages and distributed to other NMHSs when requested.

Month	Source location	Initiated by	WMO Regional Associations
May	Guam, Apra Harbour	IAEA	V ²
October	Pickering, Ontario, Canada	Delegated Authority	III/IV ²
November	Bushehr, Iran	IAEA	II ¹

Table 1: RSMC quarterly tests for 2012

Notes:

1. ConvEx-2c. The RSMCs products were uploaded to RSMC common web pages and faxed to NMHSs in WMO RA II as request.
2. The products were uploaded to RSMC common web pages.

WMO-RSMC/JRC-ENSEMBLE exercise:

RSMC Beijing took a part in WMO-RSMC/JRC-ENSEMBLE exercise. According to

the technical specification document, the products were compressed and uploaded to the specific JRC ENSEMBLE websites. The JRC ENSEMBLE system provided a platform to make good comparison and do some analysis among products of different RSMCs. It gave a wider vision on the future development of the emergency response services.

Capacity Building for Non-Nuclear Atmospheric Transport Emergency Response Activities:

In October 2012, a report, named “Capacity Building for Non-Nuclear Atmospheric Transport Emergency Response Activities”, was submitted to WMO as request. The report is about non-nuclear activities in recent years and the plans in future conducted by RSMC Beijing.

5. Significant operational or technical changes:

- The EER platform in operation was updated to be more reliable and more efficient.
- Finer meteorological fields have been applied in operation. T213L31 was replaced with another meteorological fields T639L60, which resolution is denser.

6. Operational issues and challenges:

- Some NMHSs' contact information is out of date.
- Time difference and different languages cause some inconvenience.
- The evolution of the PDF form of Environmental Emergency Response (EER) Request for WMO RSMC Support by IAEA is somewhat fast and opaque. The standardization of the request forms, especially PDF forms would of great benefits on the promotion and application of the newly-developed automated EER platform. If the automated platform could analyze the standardized request, the efficiency of emergency response would be further promoted.

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

The operational Environmental Emergency Response (EER) system, in RSMC Beijing, is currently based on the Hybrid Single-Particle Lagrangian Integrated Trajectories (HYSPLIT4) Atmospheric Transport Model, developed at the NOAA Air Resources Laboratory. HYSPLIT4 is driven by meteorological input resulting from the operational numerical weather prediction system T639L60 global model and the WRF medium model. The system is available for running on demand and produce forecast trajectories, concentrations (or exposures) and depositions for nuclear accident,

volcanic ash, smoke and other episodes. In 2010, the HYSPLIT version was updated to HYSPLIT 4.9 version.

The HYSPLIT4 is used for modeling atmospheric transport and dispersion of pollutants over medium/long-distance. The equations used in the calculation of pollutant transport and dispersion are a hybrid Lagrangian approaches. Advection and diffusion calculations are made in a Lagrangian framework using the meteorological gridded analysis and forecast fields. Air concentrations are calculated on a fixed three dimensional grid by integrating all particle masses over a pre-set averaging period. Routine calculations may consist of simple trajectories from a single source to consideration of complex emissions from several sources. Dry deposition is treated with the deposition velocity concept. Wet deposition is divided into two processes: a scavenging ratio for pollutants located within a cloud layer and a scavenging coefficient for pollutant removal in rain below a cloud layer. Radiological decay is also included when necessary.

8. Plans for 2013:

- RSMC Beijing will continue to fulfill its responsibilities as one of RSMCs in RA II to provide standard atmospheric products timely when request.
- RSMC Beijing will devote to further developing its capability for both nuclear and non-nuclear environmental emergency responses. The EER platform in operation will be updated to strengthen the reliability, and to enrich the diversity of its products.