

Summary of RSMC Obninsk Activities for 2018

Executive Summary

RSMC Obninsk activities for 2018 were connected with a complex of Regional Specialized Meteorological Centre (RSMC) tests, including the quarterly exercises under the guidance of IAEA and WMO, the participation in the Comprehensive Test Ban Treaty Organization (CTBTO) exercises and the ConvEx exercises on a USIE web portal.

RSMC Obninsk did not receive any emergency requests in 2018.

The following document summarizes all the RSMC Obninsk activities and changes in 2018.

The RSMC Obninsk report of activities is available on the WMO website:

<http://www.wmo.int/pages/prog/www/DPFSERA/resources.html>.

1. Introduction

RSMC Obninsk has been functioning since 1995 on a base of Federal Environmental Emergency Response Centre of Roshydromet (FEERC of Roshydromet) which is a part of "Research and Production Association "Typhoon" ("RPA "Typhoon", Obninsk).

The region of responsibility is WMO Regional Association (RA II), which encompasses Asia, jointly with RSMC Tokyo and RSMC Beijing. RSMC Obninsk performs a function of leading RSMC once every three years (according to the Memorandum concluded among RSMC Obninsk, RSMC Tokyo and RSMC Beijing).

RSMC Obninsk is a regional specialized centre of the World Meteorological Organization with specialization in the provision of atmospheric transport model products.

RSMC Obninsk operates on 24/7 basis.

In addition to emergency response, RSMC Obninsk contributes to the global CTBTO inverse modeling support.

2. Operational Contact Information

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3. Responses and information on dissemination of products

Participation in international inverse dispersion modeling events and exercises with CTBTO.

During 2018, RSMC Obninsk received requests for support from Provisional Technical Secretariat of the Comprehensive Test Ban Treaty Organization (CTBTO), both real and exercise scenarios. In all cases the products were supplied to CTBTO within the time period specified in the request. In response to a request, sensitivity fields are calculated (SRS - Source-Receptor Sensitivity fields), by implementing a reverse calculation on the time to the date required in the request.

The results obtained are stored in files of consistent formats and uploaded to the CTBTO server as archives.

The calculated sensitivity fields are stored and used in the International Data Center CTBTO.

In total, RSMC Obninsk received 9 requests in 2018:

- 1 quarter – 2 requests;
- 2 quarter – 4 requests;
- 3 quarter – 0 requests;
- 4 quarter – 3 requests;

4. Routine operations

RSMC Obninsk participated in quarterly IAEA and WMO exercises in 2018:
22.02.2018 (RA V);

15.05.2018 (RA II). The discussion of the joint statement was held during the exercise among RSMC Obninsk, Beijing and Tokyo. The final version of the statement was sent to a leading RSMC Tokyo.

21.08.2018 (RA IV and III);

20.11.2018 (RA VI and I)

The graphical products of the transport model were published on the web pages of all the RSMC following the results of each test. After the completion of the exercise, RSMC Obninsk conducted a control test of its products' availability on all the RSMC web pages.

A standard RSMC product represents a set of seven forms:

- The trajectories of pollutants at various levels for 72 hours from the emission moment
- The time integrated ground concentration of the pollutants 24, 48 and 72 hours after the emission moment
- The pollutant depositions 24, 48 and 72 hours after the emission.

All the RSMC Obninsk products were promptly posted to the mirror sites:

PCMLQ Beijing [http:// www.rsmc.nmc.cn/rsmc-bin/jntrsmc.pl](http://www.rsmc.nmc.cn/rsmc-bin/jntrsmc.pl)

PCMLQ Exeter [http:// www.rsmc.metoffice.gov.uk/cgi-bin/jntrsmc.pl](http://www.rsmc.metoffice.gov.uk/cgi-bin/jntrsmc.pl)

PCMLQ Melbourne [http:// www.reg.bom.gov.au/cgi-bin/reg/EER/jntrsmc.pl](http://www.reg.bom.gov.au/cgi-bin/reg/EER/jntrsmc.pl)

PCMLQ Montreal [http:// www.eer.cmc.ec.gc.ca/eer-bin/jntrsmc.pl](http://www.eer.cmc.ec.gc.ca/eer-bin/jntrsmc.pl)

PCMLQ Obninsk [http:// www.feerc.ru/rsmc-bin/jntrsmc.pl](http://www.feerc.ru/rsmc-bin/jntrsmc.pl)

PCMLQ Tokyo [http:// www.eer.kishou.go.jp/cgi-bin/jntrsmc.pl](http://www.eer.kishou.go.jp/cgi-bin/jntrsmc.pl)

PCMLQ Toulouse [http:// www.meteo.fr/cmrs/rsmc2-bin/jntrsmc.pl](http://www.meteo.fr/cmrs/rsmc2-bin/jntrsmc.pl)

PCMLQ Washington [http:// www.ready.arl.noaa.gov/rsmc2-bin/jntrsmc.pl](http://www.ready.arl.noaa.gov/rsmc2-bin/jntrsmc.pl)

RSMC Obninsk also participated in ConvEx-1a, ConvEx-1b, ConvEx-2b and all the communication tests in 2018.

5. Tests of communications (Email and fax tests)

RSMC Obninsk participated in all the communication tests in 2018. RSMC Obninsk conducted a Communication test in the Asian region among 29 countries in July 2018. The requests were sent to all the NMHSs by fax and e-mail in order to verify the work of communication channels and the relevance of contact information.

The test results show:

- The contact information changed in 13 countries – 45 % of the total (Bahrain, Bangladesh, Republic of Yemen, Macau, Myanmar, Sri Lanka, Kazakhstan, Saudi Arabia, Tajikistan, Thailand, State of Kuwait)

- The e-mail requests were successful in 26 countries – 90 % of the total (Bahrain, Bangladesh, China, Hong Kong, India, Islamic Republic of Iran, Iraq, Republic of Yemen, Japan, Macao, Mongolia, Myanmar, Oman, Pakistan, State of Qatar, Republic of Korea, Kazakhstan, Kyrgyzstan, Saudi Arabia, Tajikistan, Turkmenistan, Republic of Uzbekistan, Thailand, Russian Federation, State of Kuwait);
- The fax requests were successful in 14 countries – 48 % of the total (Bahrain, DPRK, Hong Kong, India, Republic of Yemen, Japan, Macao, Mongolia, Pakistan, Kazakhstan, Tajikistan, United Arab Emirates, Republic of Uzbekistan, Russian Federation);
- All the communication channels (operative and diplomatic) were available in 26 countries – 90 % of the total (Bahrain, Bangladesh, China, Hong Kong, India, Islamic Republic of Iran, Iraq, Republic of Yemen, Japan, Macao, Mongolia, Myanmar, Oman, Pakistan, Republic of Korea, Sri Lanka, Kazakhstan, Kyrgyzstan, Saudi Arabia, Tajikistan, Turkmenistan, United Arab Emirates, Thailand, Russian Federation, State of Kuwait).

All the diplomatic and operative communication channels were checked during the test by RSMC Obninsk.

The results of the test were sent to IAEA and the colleagues in RSMC Tokyo and RSMC Beijing.

6. Lessons learned from recent experiences and significant operational and technical changes

All the requests, received in 2018, were processed within the allowed time limit.

The following requests were received during the reporting period:

- 2 requests with confirmation of the availability of operational channels and means of communication of RSMC Obninsk
- 5 training requests for the provision of conditional assistance with the provision of products of atmospheric transport models (with a conditional release of pollutants into the atmosphere);
- 9 calculation requests from CTBTO;

In some cases the requests received by fax during the exercise were of a poor quality. Moreover the requests, received from WMO and IAEA by fax, come much earlier than the e-mail requests.

The interaction with the representatives of the WMO, CTBTO and IAEA was held at a high level throughout 2018. All the channels were used for communication.

The major number of failures was caused by the technical errors in the fax and e-mail transmission, and the changes of the NMHS contact information in the Asian region. The information is fully reflected in the results of communication tests.

7. Operational issues and challenges

The following problems in communication between RSMC Obninsk and other centres occurred during the reporting period:

- The temporary mutual lack of communication with Canadian colleagues via the SSH protocol in May 2018, connected with a RSMC Montreal provider. The problem was solved in June 2018;
- The restriction of access rights for data transfer via FTP in RSMC Toulouse November 2018 (The Regional Association of the WMO - Region VI and I Europe and Africa). The problem was solved in November 2018;
- The temporary lack of connection with Japanese colleagues via the FTP protocol in November 2018, connected with the Obninsk RSMC IP-filtering by RSMC Tokyo. The problem was solved in December 2018;
- The temporary lack of communication with Canadian colleagues via the SSH protocol in November 2018, connected with the Obninsk RSMC IP-filtering by RSMC Montreal. The problem was solved in December 2018;
- The failures of fax and e-mail sending to some countries of the Regional Association of the WMO (RA II, Asia), connected with a contacts' change in these countries;

The interaction of all the regional specialized meteorological centers was operational and well-coordinated throughout the reporting period.

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

At present, the following models of regional and global atmospheric transport are used:

- The trajectory model generates a map with a set of 3-D trajectories of air masses starting at specified heights above ground level;
- The STADIUM (Stochastic Atmospheric Diffusion Model) is used for modeling atmospheric transport and dispersion of pollutants (radioactive or chemical) over medium and long ranges of distances. The STADIUM is based on Lagrangian approach with turbulent dispersion simulated by a random walk technique (Monte-Carlo method). Such an approach allows applying modern parameterizations for turbulent dispersion and deposition processes. Deposition including both wet and dry deposition is computed using a deposition velocity for the dry component of the removal process and in-cloud and below-cloud removal rates for the wet deposition. The model allows considering the essential features associated with instability and non-uniformity of the atmospheric boundary layer, spatial heterogeneity of the underlying surface.

The STADIUM provides a set of spatial-temporal fields of air concentration and deposition (dry and wet) of pollutants.

9. Plans for 2019 год

Obninsk RSMC will continue to work with all RSMCs during training, emergency situations and everyday activities through the established channels of communication:

fax, e-mail, phone, SSH and FTP connections (in case of publishing information on RSMC web pages).

Obninsk RSMC is planning to make all the calculations using the software updated in 2018 (software and hardware complex that provides the solution of problems of operational analysis and forecast of the spread of pollutants in the environment).

Obninsk RSMC is going to participate in ConvEx-2b, ConvEx-2e, ConvEx-2d, ConvEx-1a, ConvEx-2a, ConvEx-1b, ConvEx-2g exercises, and in quarterly exercises with WMO, IAEA and CTBTO.

The improvement of communication quality with WMO, IAEA and NMHS in PA II is also a purpose.

References:

- Manual on the Global Data-processing and Forecasting System (WMO-No. 485)
- Documentation On RSMC Support For Environmental Emergency Support (WMO-TD/No.778). Available online at <http://www.wmo.int/pages/prog/www/DPFSERA/td778.html>
- Joint Radiation Emergency Management Plan of the International Organizations (EPR-JPLAN)
- MEETING OF THE CBS EXPERT TEAM ON EMERGENCY RESPONSE ACTIVITIES (ET-ERA) Buenos Aires, Argentina, 30 November to 4 December 2015
- «Agreement between the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization and the World Meteorological Organization»
- MEETING OF THE CBS EXPERT TEAM ON EMERGENCY RESPONSE ACTIVITIES (ET-ERA) Vienna, Austria, 01-05 October 2018