

### Training Programs of WMO RTC in RF 2013

№	Theme of a Training Course	Table of Contents of a Training Course	Terms and Place of a Training Course
<b>1. HYDROLOGICAL PROVIDING THE ECONOMIC COMPLEX</b>			
<b>1.1</b>	Methods of hydrological forecasts. Provision of consumers with forecasting data. Generation of information resources of Roshydromet using the hydrologist-forecaster workstation	The organization of service of hydrometeorological forecasts. Modern methods of hydrological forecasting. Efficiency of hydrological forecasts. Calculation and forecasting of level river regime, other characteristics of water regime. Marketing in hydrological service. Formation of information resources of Roshydromet using the hydrologist-forecaster workstation	21.01-02.02 Zheleznodorozhny
<b>1.2</b>	The specialized hydrometeorological maintenance of the enterprises and the organizations of oil branch	Strategic plans for development of oil branch. Marketing researches of requirements of the hydrometeorological information of the enterprises and the organizations of oil-and-gas branch. A condition of the specialized hydrometeorological maintenance of the enterprises and the organizations of branch. The normative and technical documents regulating use of the hydrometeorological information. The basic directions on development of new kinds of hydrometeorological production and development of address hydrometeorological service.	08.04-13.04 Zheleznodorozhny
<b>1.3</b>	Specialized hydrometeorological support the economy and issues of quality customer service	Study of methods specialized hydrometeorological services industries. Status and trends of development of specialized Hydrometeorological. Normative and technical documents regulating the use of hydrometeorological information. Fundamentals of Marketing Technologies.	17.06-22.06 Zheleznodorozhny
<b>1.4</b>	Hydrological estimation of the main characteristics of the regime of rivers and lakes at the points of hydrometeorological observations	Practical aspects of use and approbation of a new massive of the computing programs by definition of estimated meanings of an annual drain and its intra-annual distribution, peak discharges of spring high water and rain flood, summer and winter low-water discharges as well as the highest level of water of rivers and lakes and other hydrological characteristics. Consideration of a typical model of the territorial reference books/monographs. "Definition of the main estimated hydrological characteristics " (first edition).	24.06-29.06 St.-Petersburg
<b>1.5</b>	Organization of works on protection of the population	The guidance documents on antiavalanche works. Methods and techniques of precautionary descent of snow avalanches.	30.09-12.10 Nalchik

	and objects of economy from snow avalanches	Modern methods of forecasting of avalanche danger. Bases of climbing, mountain ski technique and rescue works in mountains. Problems of arranging the antiavalanche service in new conditions of management. Training at the VHI.	
<b>1.6</b>	Impacts on gradovy processes <b>NEW!</b>	Leading documents on anti hail protection (further AHP). Methods and AHP means. Safety rules of carrying out AHP	20.03-10.04 Nalchik
<b>2. HYDROMETEOROLOGICAL MONITORING OF ENVIRONMENT</b>			
<b>2.1</b>	Modern objectives of monitoring of air pollution	Normative-and-legal base of carrying out the monitoring of air pollution. The condition of network monitoring of air pollution and atmospheric precipitation chemical composition. The arrangement of observations, analysis and estimation of air pollution over the territory of the Russian Federation. Development of technology of application of air pollution data and the chemical composition of deposits. Instruments and methods of the chemical analysis of air tests and metrological provision of methods of measurement. Innovation in measurement techniques of gas and aerosol impurities. Principles of estimated and hybrid monitoring of air pollution. The forecast and real-time definition of zones of infection at technological failures. Methods of forecasting of the air pollution on a region, cities and inpidual areas of a city. Automation and processing of data on air pollution. Quality surveillance of the chemical analyses.	13.05-25.05 St.-Petersburg
<b>2.2</b>	Methods and means of control of the natural environment radioactive pollution	Observation of radioactive conditions. Installation and operation of new technical means of measurement. The order of processing and summarizing the data and informing of consumers. The principle of construction, functioning and application of the Integrated Automated System of data collection on radiative conditions. Software on the analysis and data processing about radiative conditions, data analyzing. Normative bases, principles and organization of a network of supervision behind radioactive pollution of an environment. The gamma - spectrometer analysis, qualitative and quantitative definition radionuclids. The radiochemical analysis, technique of definition Pu - 238, 239. Definition of total alfa -activity of tests, alfa, beta-spectrometr	07.10-12.10 Obninsk

### 3. METEOROLOGICAL PROVIDING AVIATION DIVISIONS

<b>3.1</b>	Organization of aviation meteorological service	Guidance on aviation meteorological service, ICAO arranging/ methodical documents. Arrangement of AMC/AMCC activity. Technical facilities, requirements for supplying AMC/AMCC with technical facilities at airports. Workstation of KRAMS systems. Economic aspects of aviation meteorological service. Certification of airports. ICAO requirements for airports. Investigation of aviation incidents and preconditions to them	11.03-16.03 Zheleznodorozhny  07.10-12.10 Zheleznodorozhny
<b>3.2</b>	Meteorological forecasting for aviation service	Studying of new methods of short-term and super short-term aviation weather forecasting. Forms of representation and terminology of aviation weather forecasts. Use of radar/satellite data when generating the aviation forecasts. The automated methods of processing of the aviation meteorological data, including the order, methods and systems of meteorological service of the international air navigation. Aviation climatology. Training at MAMC.	25.03-06.04 Zheleznodorozhny  11.11-23.11 Zheleznodorozhny
<b>3.3</b>	Development and quality management system introduction in the field of meteorological service of aircraft	Development and introduction of quality management system in the field of meteorological service of civil and experimental aviation on the basis of ISO 9001-2008 (ISO 90001:2008) GOST P standard requirements. Management of documentation. Organization and carrying out internal audits	25.11-07.12 Zheleznodorozhny

### 4. METEOROLOGICAL PROVIDING BRANCHES OF ECONOMY

<b>4.1</b>	Processing and use of the satellite data at drawing up the hydro-meteorological forecasts	Study of modern and perspective technologies of processing and use of satellite data in real-time work. Use of space data at hydrometeorological provision of economical activity. Modern and perspective technologies of processing and use of meteorological satellite data in weather forecasts.	04.02-09.02 Zheleznodorozhny
<b>4.2</b>	Methods of short-term, medium-term and long-term weather forecasting. Forecaster workstation	The organization of service of hydrometeorological forecasts. Modern methods of hydrological forecasting. Efficiency of hydrological forecasts. Calculation and forecasting of level river regime, other characteristics of water regime. Marketing in hydrological service. Formation of information resources of Roshydromet using the hydrologist-forecaster workstation.	11.02-22.02 Zheleznodorozhny  21.10-02.11 Zheleznodorozhny

4.3	<p>Information provision of the regional authorities with prediction and emergency data.</p> <p>The order of information cooperation between Organizations of Roshydromet with Ministry of Emergency Situations of Russia</p>	<p>Providing consumers with climatic information and production taking into account possible climate changes. The description of infrastructure of the main sectors of economy and the social sphere, a formulation of requirements of these structures to climatic information. Cataloguing of main types of specialized climatic information. Methods of calculation of specialized climatic characteristics and form of submission of information on climate to various categories of consumers. Methods of calculation of climatic resources and risks. Methods of a forecast of specialized climatic characteristics taking into account modern and future climate changes in large regions. Territory division into districts on uniformity of modern climate changes. An assessment of hydrodynamic models according to specialized climatic characteristics at regional level. Creation of the optimized ensemble of hydrodynamic models for concrete regions taking into account specialized groups of users.</p>	<p>15.04-27.04 St.-Petersburg</p>
4.4	<p>Methods of the research of the ozone layer of the Earth. Instruments and methods of observation , data processing and analysis</p>	<p>The characteristic of ozone in nature and its meaning in the natural balance. The reasons of destruction of ozone and international efforts on its prevention. Current state of the ozone layer. Questions of the ozone layer monitoring, including space methods of receiving the data of the General Contents of Ozone. Ozonometric observations, observations for the General Contents of Ozone at the stations; modern techniques of observations for the General Contents of Ozone; bases of processing and analyzing of the data of the General Contents of Ozone; the equipment on manufacturing ozonometric observations; metrological principles of observations of the General Contents of Ozone; practical training.</p>	<p>17.06-29.06 St.-Petersburg</p>
4.5	<p>Economic meteorology</p>	<p>Meaning and role of economical meteorology for the activity of organizations of Roshydromet. The review of the methods of estimation of the economical efficiency of hydrometeorological service. The estimation of the impact of weather factors on various kinds of economical activity. Practical work on economical meteorology.</p>	<p>14.10 -19.10 Zheleznodorozhny</p>
4.6	<p>Use of information technologies by</p>	<p>Preparation of climatic production for various branches of economy on the basis of the</p>	<p>10.06-15.06 Zheleznodorozhny</p>

	preparation of specialized climatic information and production focused on various branches of economy <b>NEW!</b>	electronic version of the scientific and applied directory «Climate of Russia» and regional climatic directories. Requirements to the initial information used for calculations of climatic characteristics, focused on various branches of economy. Preparation of specialized massifs for climatic service. Remote access to State fund archives for UGMS means of system of the automated information system of processing of regime information	
<b>5. DEVELOPMENT AND OPERATION OF MEANS IN HYDROMETEOROLOGY</b>			
5.1	Methods and facilities of agro meteorological observations. Methods of processing and control of agro meteorological data. Agro meteorological forecasting and service of the users, concerned with agro-meteorological data	Specialties of arranging the agrometeorological observations in modern conditions. The basic methods of agrometeorological observations and new means of measurement. Estimated methods of definition of agrometeorological parameters. Methods of monitoring. The program and methodology of inspection of stations/posts. Software on evaluation and transmitting of agrometeorological data. Agrometeorologist workstation. Agroclimatic processing of the results of observations. Studying of new and advanced methods of agro meteorological forecasts and interpretation of agrometeorological data. Problems of arranging the agrometeorological observations in new conditions of economy. Information provision of the system of agricultural insurance under state support. Features of organization a agrometeorological of supervision. Methods and ways of account a agrometeorological of constants. Methods of the control of humidity of ground. Technology of the automated control of humidity of ground. Development of the new program "Construction of maps of a degree of humidifying".	08.04-20.04 Obninsk
5.2	Introduction in modern climatology: applied aspects. Influence of climate on population health. <b>NEW!</b>	Climate, climate changes, their consequences and need of society for climatic information, base concepts, main problems. Influence of the extreme climatic phenomena (including waves of heat and cold, flood) on population health. Transmissivnye (i.e. transferred by carriers) diseases and influences of climate changes on their distribution. Possibilities of adaptations and problem of supervision	24.06-29.06 Moscow
5.3	Organization of activity of the state	Modern approaches to creation of a meteorological network. National and state	01.04-13.04 St.-Petersburg

	observation network and its functioning in modern conditions	observant network. Complex modernization of a meteorological network: results and prospects. The organization of functioning of the automated meteorological network. Methods and practice of the management by a network: control of a condition of points of supervision, qualities of results of supervision, inspections, introduction of electronic forms of technical documentation. Standard and legal documents of functioning of an observant network. The automated technology of obtaining meteorological and aktinometrichesky information: collecting, control, processing and accumulation	
5.4	Automated doplerovsky radar DMRL-S <b>NEW!</b>	Appointment and structure of the equipment of DMRL-page. Device and work description (hardware and software). Maintenance, organization of supervision. Standard documentation DMRL-S (RD, magazine of supervision, form, etc.). Data transmission control in Federal Hydrometereology and Environmental Monitoring Service VSS network	15-20.04 Dolgoprudny
5.5	Automated hydrological AGK. Metrological provision of hydrological measuring the level and flow rate	Complex structure. SEBA Unilog controler. Measuring instruments hydrostatic DST22 sensor, barbotazhny PS-Light sensor, radar SEBA Puls sensor, poplavkovy SurtloatII sensor. Communication subsystem. Power supply subsystem. AGK installation. Control and configuration of the modem of communication. Acoustic profilograf: types, tekhnichesy equipment and profilograf device, WinRivet II software, configuration and adjustment, carrying out measurements, processing of results. RD 52.08.767-2012 «A consumption of water on waterways. Measurement technique acoustic doplerovsky profilograf "SteamPro" and Rio Grande». Certification of techniques (methods) of measurements. Standard documentation (RD, R, MT) on checking of measuring instruments of hydrological appointment. Checking of measuring instruments. Calibrator of pressure CPH6000. Checking of measuring instruments of speed of a water stream, a water level on Federal State Budgetary Institution GGI standards	20.05-01.06 St.-Petersburg
5.6.	Metrology and its tasks in Federal Hydrometereology	Forms of metrological control and supervision, types of checkings of measuring instruments. Services and bodies of	27.05-01.06 St.-Petersburg

	and Environmental Monitoring Service system	metrological control and supervision. Main objectives of meteorological services: accreditation of metrological services on the right of checking of measuring instruments; a quality manual of meteorological services, akkreditirovanny on the right of checking of measuring instruments. Physical sizes and their measurements, types and methods, errors. Testing schemes and their types, interesting intervals. Measuring instruments and their errors. Methods of checking of measuring instruments, standards, auxiliaries. Checking of measuring instruments of hydrometeorologists-chesky appointment, standard documentation on checking of measuring instruments of guide-rometeorologichesky appointment. Standards, testing equipment. Checking of the equipment arrived within the Project by means of MAPL	
5.7	The use of mobile equipment topogeodesic hydrological laboratory to perform work on the hydrological stations	Normative and recommendatory documents in a scope of the topogeodeziche-sky equipment. Training to work with the Tachometer at a prolozheniye of a takheometriche-sky course and topographical shooting of the adjacent territory of a hydrological post. Training to work with levels. Prolozheniye of a nivelirny course of 2 km in compliance with requirements «Instructions on leveling of I, II, III and IV classes» (GNTA)-03-010-02) according to requirements of the IV class. Training to work with GPS/G1 ONASS the geodetic equipment of Topcon of the model GR3, GMS-2	17.06-29.06 St.-Petersburg
5.8	Methods of collection and processing of climate data. Use of CLiWare system	Methods of collecting and processing of climatic information. The automated CLiWare system as a control facility climatic data. MeteoXML language. Database. Administration. Input of hydrometeorological information in system. Operative data of meteorological observations. Constant data. Obtaining climatic characteristics. Subsystem of the description of information resources	17.06-22.06 Zheleznodorozhny
5.9	Automated means of primary processing and updating of information resources by the current agrometeorological information from stations/posts	Functions of the workstation of the agrometeorological observer. The general review of the automated means. Input of data to a PC from the logs of observations. Data processing and reception of the tables with agrometeorological data. Data processing and reception of real-time daily and decade telegrams. Processing and reception of moveable files for data accumulation and	09.09-14.09 Zheleznodorozhny

		reception of the agrometeorological annual. Additional capabilities of the agrometeorological observer workstation.	
<b>5.10</b>	Automation of data collection control and processing of hydrological observations. System "RIVER - MODE"	Technology of the regime of hydrological data processing on a PC using "RIVER REGIME" system. The passport of a hydrological post. Preparation of the data of hydrological observations to be inserted into a PC. The syntactic and semantic control of hydrological observation data. Monthly processing of hydrological data. Archiving of data. Annual processing of hydrological data. Development and approach to the "RIVER-SROK", "RIVER-SUTK" archives. Development of "RIVER-EDS" file. Compilation of the EDS tables. Graphic representation of hydrological observation data. Reception of the MDC tables. Use of real-time hydrological data. Historical database of main hydrological characteristics. The automated updating of a database by the current hydrological observation data.	16.09-21.09 Zheleznodorozhny
<b>5.11</b>	Digital stations of reception and data processing of an artificial satellite of new generation: polarly - orbital series "METEOR - M", MetOp, geostationary "(ELEKTRO-L)"	Studying and practical development of technologies of reception and data processing of formats LRPT, LRIT and HRIT. Modern computer technologies and methods of processing of satellite images.	23.09-28.09 Zheleznodorozhny