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Training Development Plan

Course/Project Title: Refresher Course for Aeronautical Meteorological Forecasters at RHMSS

Overview

In order to maintain »MET Service Provider« status, at the end of this year RHMSS has to perform competency assessment for its Aeronautical Meteorological Forecasters. This will be preceded by refresher course in the autumn, which will address certain issues of the five competencies endorsed by WMO: continuous analysis and monitoring of weather conditions, forecasting of aeronautical meteorological phenomena and parameters, warnings of hazardous phenomena, quality of meteorological information, communication with stakeholders and users.

There had been significant changes in work process during 2014. New technologies and procedures had been adopted and extensive verification of forecast products has been conducted since. This has led to solving difficulties and doubts continuously during work process, and revising old and writing new work manuals. A refresher course will offer a reminder of forecast techniques and algorithms and present manuals for solving assembled ambiguities.

Audience

The Primary audiences are the practicing Aeronautical Meteorology Forecasters in the Division of Weather Watch and Aeronautical Meteorology in RHMSS, and colleagues from General Forecast Division who are interested in subjects covered by the course.
Participants are expected to be familiar with forecasting techniques and procedures in RHMSS, as well as local weather patterns on the Balkans.

Learning Needs

Since RHMSS has responsibilities in providing forecasts and advisories to internal and external users, and in accordance with WMO/ICAO requirements, there is need to improve ability of AMFs in order to maintain national level competency standards.

Learning needs have been partially assessed through evaluation of manual analysis charts, verification of forecast products, analysis of timeliness and direct survey among forecasters. Interviews with the operative forecatsers are going to be conducted to confirm specific learning needs.

So far following skills are found to be critical: analyzing and interpreting various analytic and NWP guidance, forecasting techniques of hazardous phenomena, familiarity with specific terminology.

Performance/Learning Outcomes

Job competencies that will be addressed by the training:

- Analyze and monitor continuously the weather situation (utilization of satellite imagery, utilization of skew-T diagram - with an emphasis on instability);
- Forecast hazardous aeronautical phenomena and parameters;
- Ensure the quality of meteorological information and services (familiarity with quality management system at RHMSS and utilization of relevant documentation).

Desired learning outcomes of the planned event:

- Diagnose features in RGB satellite imagery;
- Infer stability trends and onset/termination of fog using skew-T diagram;
- Be able to use additional tools for front identification (ThetaE, PVA max, VCS);
- Forecast hazardous phenomena using techniques (NWP; common rules of thumb) and checklists given in Forecaster's Reference Book;
- Use additional tools in forecast of height and temperature at the level of tropopause;
- Be able to accurately interpret aeronautical meteorological codes (METAR, TAF, GAMET, SIGMET, AIRMET, AMDAR);
- Consistently apply relevant procedures and documents of QMS (job manuals: QR-A-001, QR-A-002, QR-A-003, QR-A-004; remedial procedures→to be written).

Content Scope

The refresher course will cover the following topics:

- Analysis and monitoring of weather conditions
  - Operative use of tephigram
  - Identification of fronts in synoptic analysis
  - Interpretation of selected RGB satellite imagery
- Forecasting methodes
  - Turbulence
  - Icing
  - Fog/mist/low stratus
  - Thunderstorms
  - Tropopause
- Meteorological information and services
  - Meteorological reports and information
  - Aviation specific terminology
  - QMS in RHMSS

Constraints

Organization of this training will be a challenge because primary audience consists of five forecasters working in shifts, which means that no more than three people in one day would be available for classroom sessions. There are two experienced forecastrs and three less experienced, and their learning needs differ.

Experts are available for presenting lectures, but lack teaching skills. They have agreed to help develop learning material. Production of learning material should not present a problem since archives of various products are available, but appropriate case studies should be assembled.

Main concern for successful realization of this training and following competency assessment remains forecasters' lack of enthusiasm and diminished cooperativeness that is produced by the frequent organizational changes at RHMSS and uncertain future of the aeronautical division.

Learning Solutions

Short classroom course is selected for the topics that challenge most colleagues. Asynchronous online lessons will be available for topics needed by one or two colleagues and some reading materials will be distributed regarding aviation specific terminology and changes in job manuals.

Learning Assessment

Initial assessment will be done through interviews with forecasters. Case studies and discussions will be used during classroom sessions and online sessions will include quizzes. Summative grading will not be conducted because much broader competency assessment (consisting of on-the-job observation along with practical questions) will follow.

Training Evaluation

The Kirkpatrick model will be used for the training evaluation in the following manner:

- level 1 – reaction – will be measured through a questionnaire (various aspects of this training have never been tried in RHMSS, so pace of introducing new methods should be evaluated);
- levels 2 and 3 – learning and application – will be observed through direct observation and practical questions during competency assessment;
- level 4 – results – will be measured through verification of forecast products.

Learning Activities

Every topic will be covered with theoretical (only essential knowledge) and practical part (active learning exercises). Learning activities will mainly consist of practice exercises and case studies that will be done individually because there is a small number of audiences and every forecaster works his shift alone. Since RHMSS has not developed tools for creating the simulations, this learning activity will be used only if appropriate simulations can be found on-line (this is yet to be done). Also, for some of the topics, collaborative decision making will be used.

So far, following activities have been planned:

Goals (learning outcomes)	Learning Activities
Diagnose features in RGB satellite imagery	Practice exercise: Analysis of today's weather situation using the Airmass RGB
	Practice exercise: Identifying main conveyor belts on today's WV 6.2 imagery
	Practice exercise: Analysis of today's weather situation by the Day Microphysics, Fog and Dust RGB
	Case studies: Analysis of a winter situation (fog and low stratus) and a summer situation (deep convection)
Infer stability trends and onset/termination of fog using skew-T diagram	Case study: Fog
	Collaborative Decision Making: Fog
	Case study: Thunderstorm
	Collaborative Decision Making: Thunderstorm
Be able to use additional tools for front identification	Case study: various tools for front identification
Forecast hazardous phenomena using techniques (NWP; common rules of thumb) and checklists given in Forecaster's Reference Book	Problem-based Learning: Applying checklist for turbulence
	PBL: Applying checklist for icing
	PBL: Applying checklist for fog/mist/low stratus
	PBL: Applying checklist for thunderstorms
Use additional tools in forecast of height and temperature at the level of tropopause	PBL: Applying checklist for tropopause
Be able to accurately interpret aeronautical meteorological codes (METAR, TAF, GAMET, SIGMET, AIRMET, AMDAR)	Practice exercise: Reading various aeronautical reports
	Discussion: Aligning your forecast to forecast/warning issued by another Office
Consistently apply relevant procedures and documents of QMS	Practical exercise: Completing a workflow task using Alfresco software

The main tasks for the trainers are to prepare and present theoretical background for each topic, and to design a learning activity (find an on-line resources for the simulations, build the case studies, design the practical exercises). Also, during the training event, trainers will deliver some presentations and provide support and feedback during exercises.

Learners are expected to read the Forecaster's Reference Book before the training event, and other reading materials provided during the event. They should actively participate in learning activities and seek guidance and feedback from the trainers.

Resources

Human Resources

All the staff involved in the training development and delivery are RHMSS's employees. So far these have been assigned:

- Project leader: Head of Division for Weather Watch and Aeronautical Meteorology
- Project manager: Chief of Group for International Standards and Practices in Aeronautical Meteorology
- Content experts: Senior Aeronautical Forecasters

Content Resources

Existing resources that will be used in this course include:

- MetOffice AMF Course Notes
- the modules from "Review of Aeronautical Meteorology" course (MetEd)
- satellite imagery interpretation guides and training materials from the training library (EUMETSAT)
- ePort (EUMeTrain)

Senior Aeronautical Forecasters are expected to collaborate on production of the Forecaster's Reference Book, and give advice on the case studies and practice exercises that remain to be developed.

Learning Resources and Tools

For each learning activity, use of the methodology for developing the active learning sessions (TDF table, LAM, the guidance for planning, preparing and design of the presentations) is highly recommended.

The training material development will be executed by a text editor (e.g. MS Word) and a presentation software (e.g. MS PowerPoint). Some of the material should be printed.

The Moodle platform needs to be implemented in RHMSS. It will be needed for the delivery of the online part of the course and repositing the course material. Every forecaster will need access to the computer. For the classroom phase a projector and 2-3 laptops will be necessary.

Milestones and Schedule

Task	Completition date	Notes
Project Plan completed (reviewed and revised)	end of June 2015	
Learning needs assessed	end of June 2015	learning needs already assessed, but interviws with forecasters need to be done
Learning outcomes reviewed and approved	July 2015	

Scheduling of all human, technical, and facility resources	September 2015	
Content outline developed	August 2015	
Learning resources developed or adapted	end of October 2015	also Forecaster's Reference Book and Contingency Manual need to be developed !!!
Training delivered (begin date/end date)	mid-November 2015	
Training evaluation complete – Kirkpatric level 1 – Kirkpatric level 2 – Kirkpatric level 3 – Kirkpatric level 4	 ·end of November 2015 ·end of November 2015 ·end of December 2015 ·mid-January 2016	 measuring to what degree offered knowledge is understood and evaluating the participants' level of engagement in the training activities ·competency assessment scheduled for early December

Questionnaire for the Training Evaluation

Course Title:	Date:
Place:	
Instructors:	

Please evaluate various aspects of the training. We would also appreciate additional comments and observations.
Meaning of the colours:

strongly disagree	disagree	agree	strongly agree

Learning Outcomes

Learning outcomes are clearly stated.				
Learning outcomes are relevant to your job.				

Course content

Course content is relevant to your job.				
Learning materials are useful.				
Learning materials are clear and accurate.				
Acquired knowledge and skills are useful.				

Organizational aspects				
Audio and visual aids were used appropriately.				
Space was adequate (light, temperature etc.)				
Course scedule was adequate (activities, breaks, length of the training event etc.)				
Duration of each activity matched complexity of the addressed topic.				

Instructor team				
Explained each topic in clear manner.				
Used time effectively.				
Used methods consistent with the learning outcomes.				
Engaged participants in learning activities.				
Gave clear answers to the questions.				

Rate overall quality of the course.
Overall quality

very poor	poor	good	excellent

Please share additional comments about this training event. (What did you like most? What did you like least? What would you change and how?)