

A SHORT TERM SOLUTION SET FOR FLOW MANAGEMENT

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A MET perspective of Flow Management

- Strategical:

A CTA asking: “How the weather exactly will be tonight?”

- Tactical

A CTA asking: “How the weather exactly will be in 2 hours?”

A CTA perspective of Meteorology

- Will FG raise at 5.30Z or at 6Z?
- Where and when we will have a TS today?
- Which will be the forecasted CB top?
- Cross-wind? Ceiling?



Focussing the problem

- One of the main areas of concern between MET and ATM is the lack of awareness of the ATM community about the MET capability of complying with their requirements.
- ATM is not fully satisfied with traditional ICAO Annex 3 products (SIGMET, AIRMET and so on) as they are consider too much generic, i.e. not so detailed as they would like.
- Also advanced products (information from weather radar maps, for example) have not the possibility of being immediately used during operational activity.

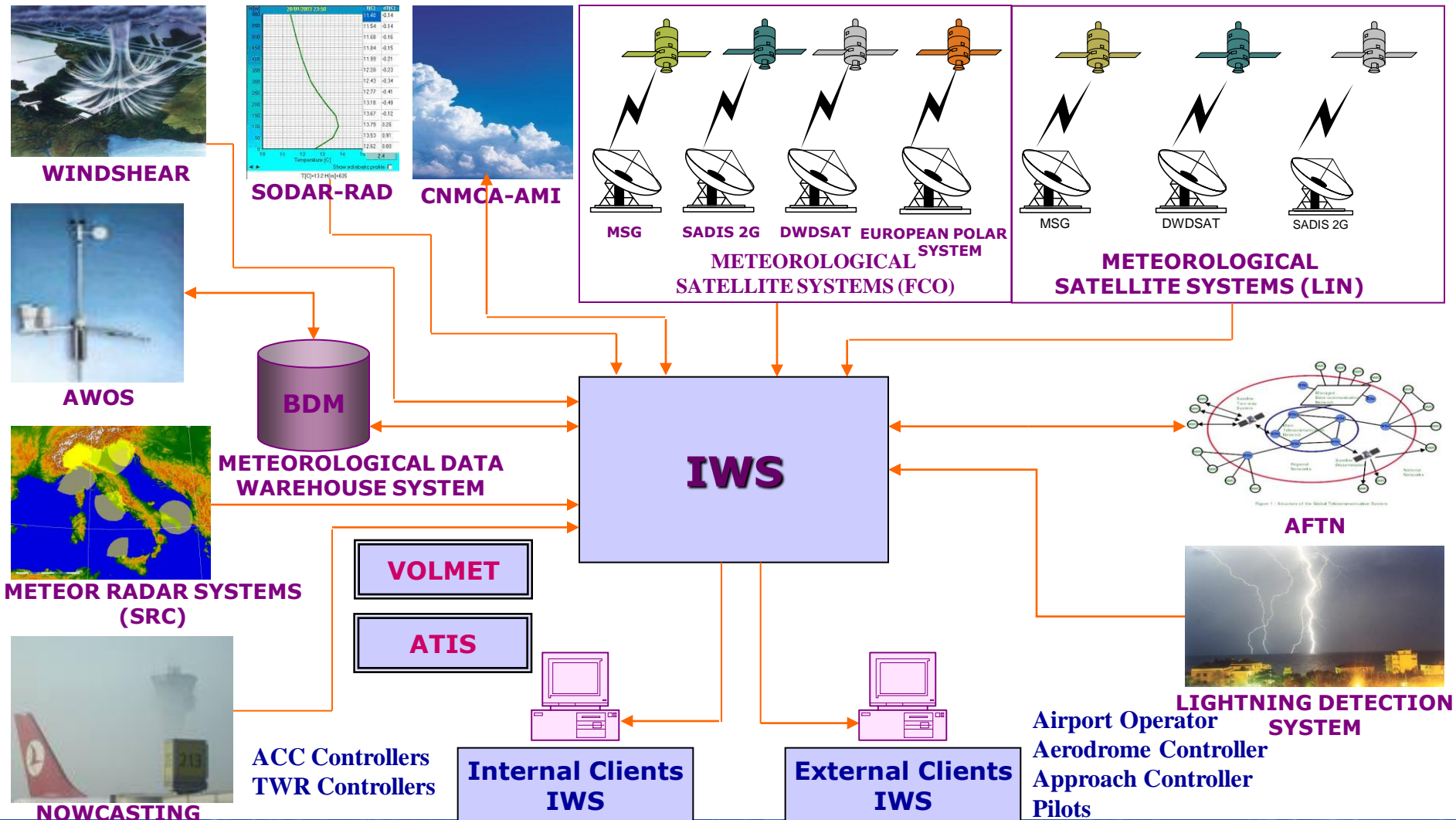
ENAV's proposed procedures

- Being integrated inside the Italian main ATC provider, **ENAV Meteorological Service** tried to answer to some of these questions on a very practical way.
- In the strategical phase, we started giving full cooperation to our main ATC Managers (Rome and Milan ACCs and TWRs) with a continuous briefing activity, in support to the traditional MWO information, provided by ITAF.

ENAV's proposed procedures

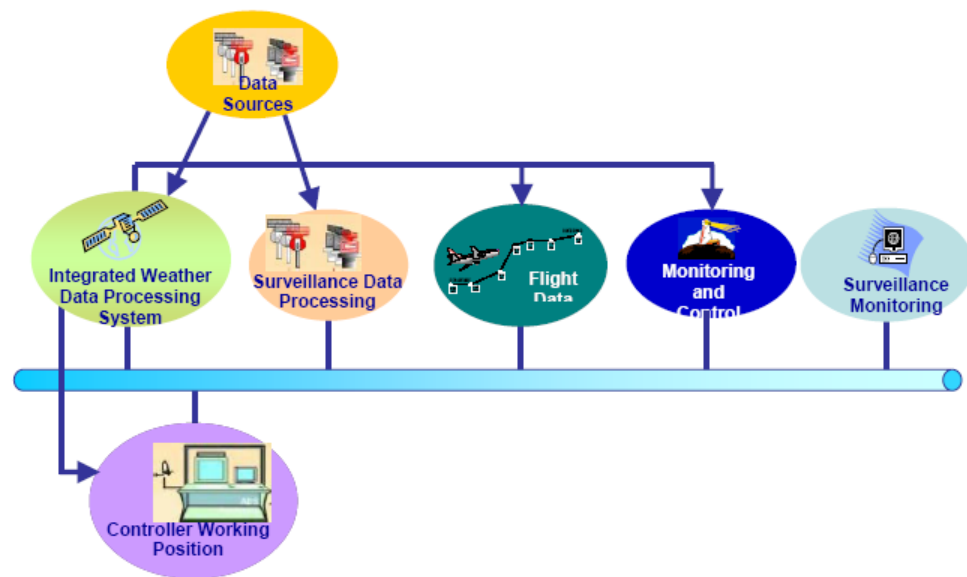
- We are now moving our MET directly into Rome and Milan ACCs Ops Rooms, side by side with the ACCs Managers, thus providing a more close contact with all ATC processes
- Our MET will also be provided with a new operational tool, especially developed for managing and integrating met data from different sources, called **IWS** (*Integrated Weather System*), with client available inside all ATC Ops Rooms.
- Next step for IWS will be a LAM implemented (*nowcasting*)

IWS - Integrated Weather System



Integrated Weather Data Processing System

- Our idea is that, in the next future, the IWS will evolve into **IWDPS**, providing integration of meteorological data directly into ATC environment.

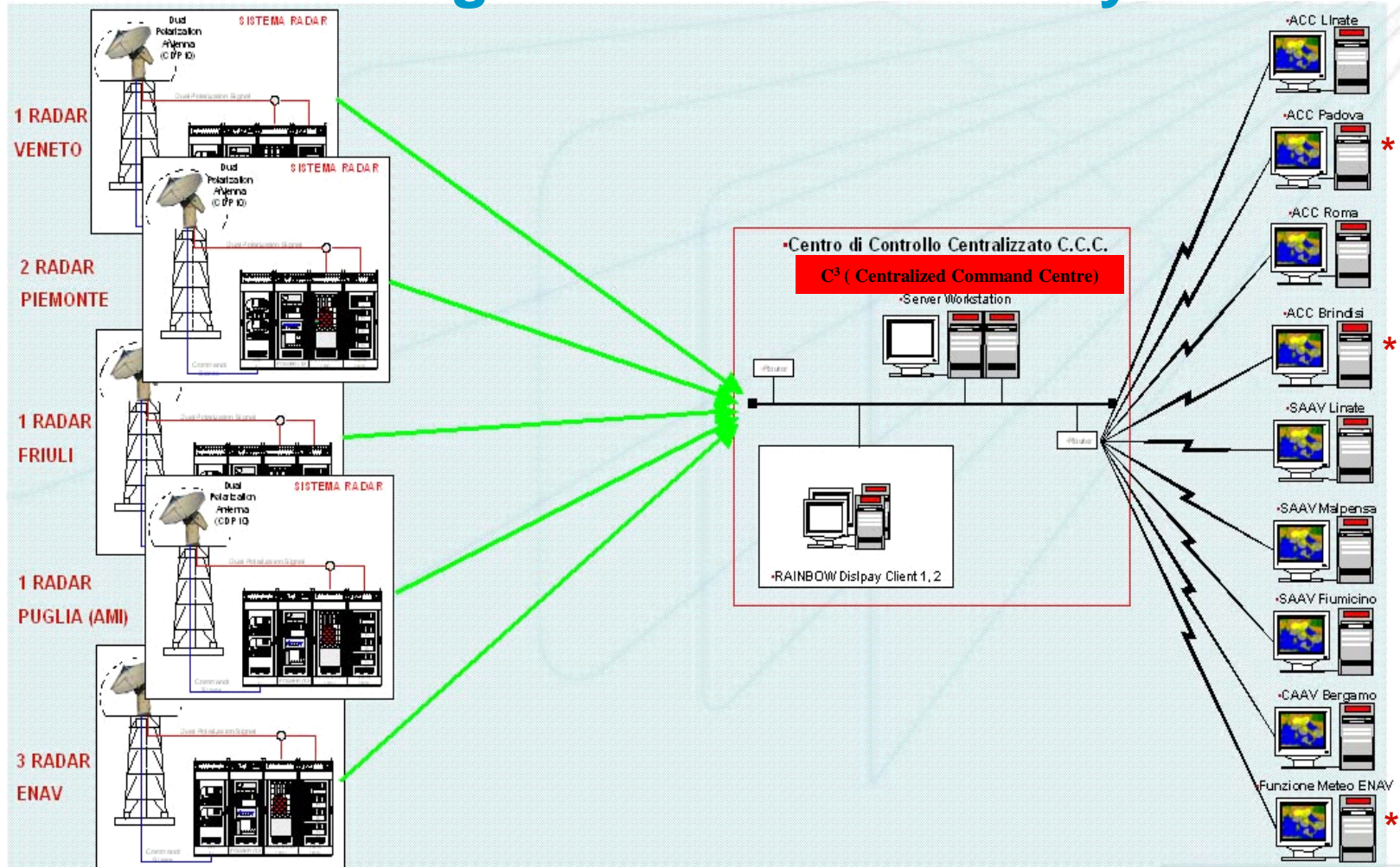


- Weather data coming from **IWDPS** shall be integrated as flight parameters in all phases of flight, providing real time update.

ENAV's proposed procedures

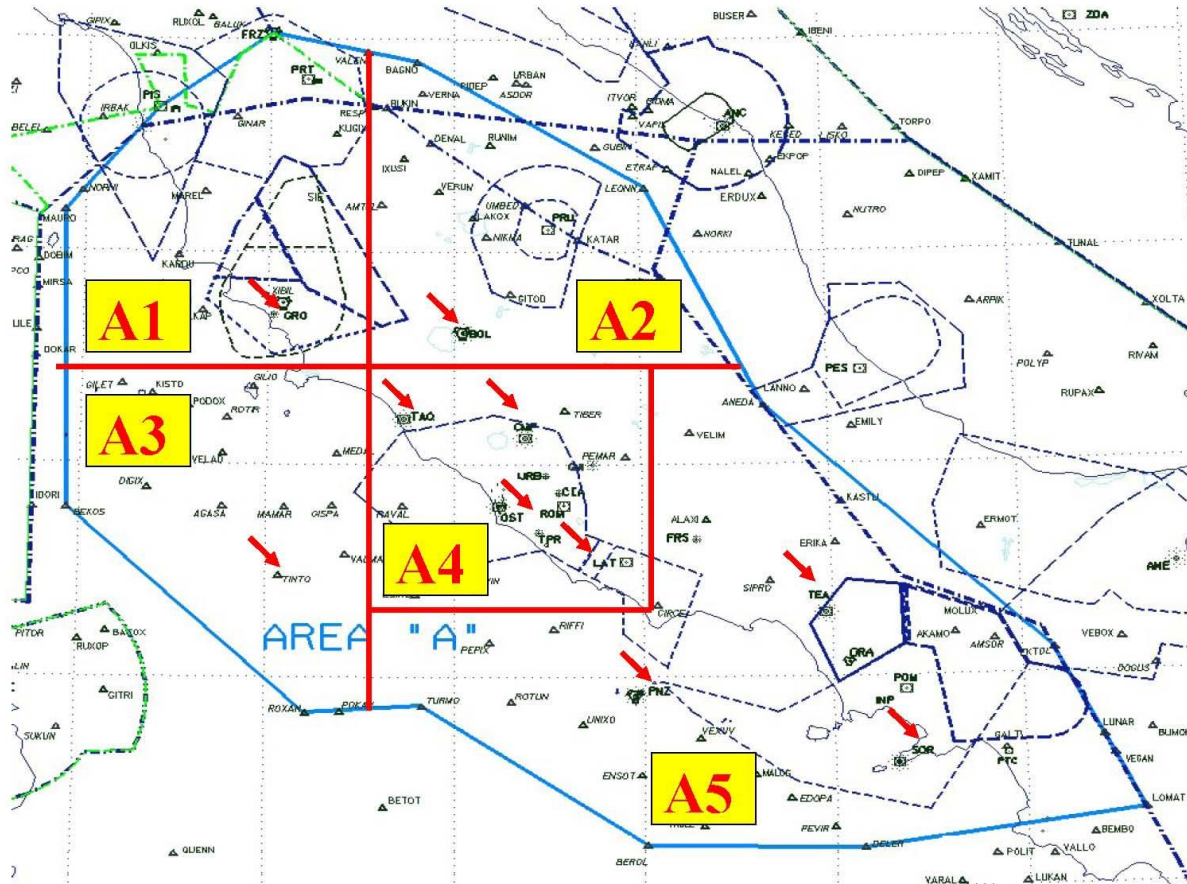
- For the tactical phase, we established specific procedures aimed at communicating the presence or forecast of adverse weather phenomena
- For convective phenomena, an extensive use of weather radar data is made. ENAV owns two Gematronik weather radars, sited in Aranova (north of Fiumicino) and Carpiano (south of Linate), which give fully coverage of the related Rome and Milan TMAs.
- Moreover, ENAV produces a synthesised image of almost the whole Italian territory, by exchanging radar data with Civil Protection Department and the main Regional Weather Services.

Meteorological Central Radar System

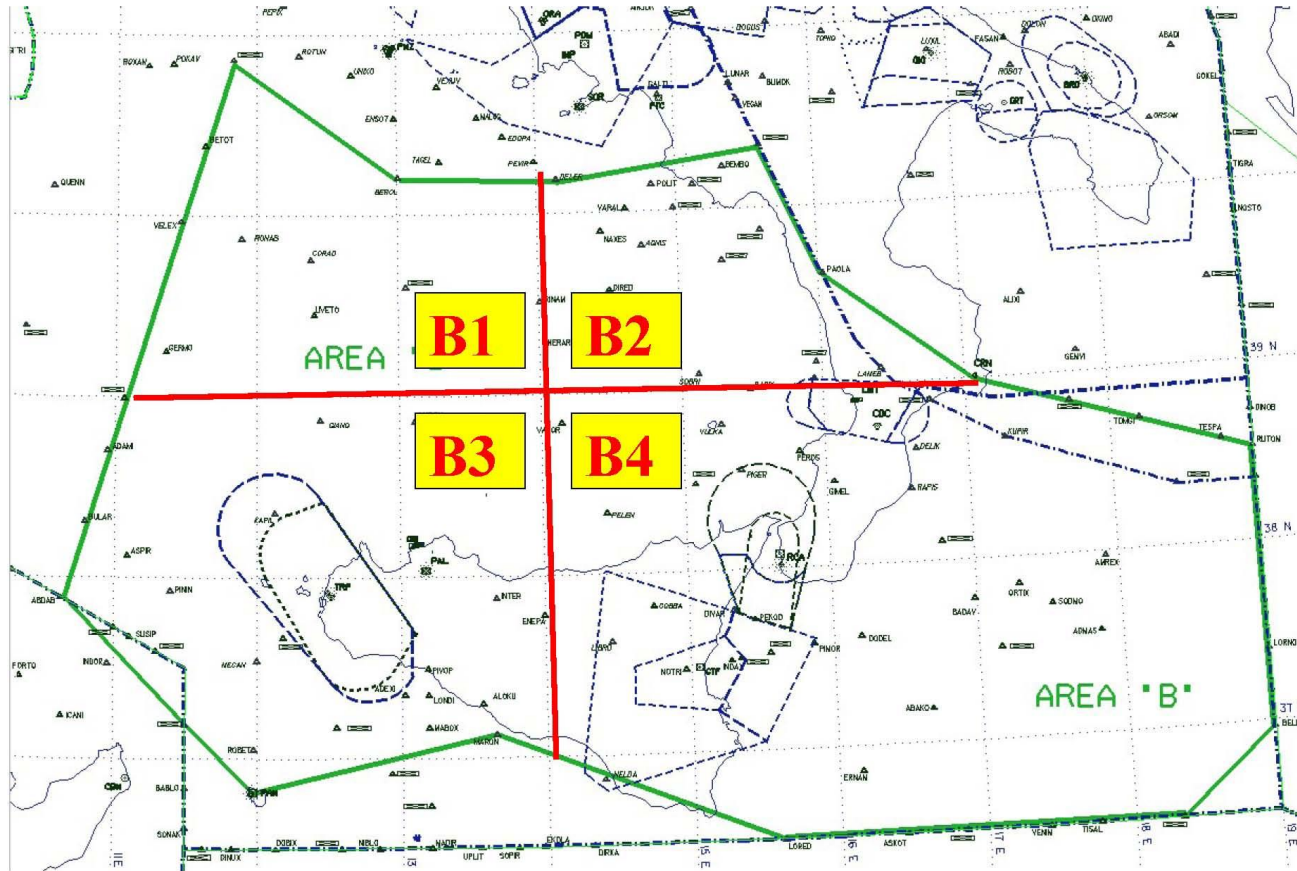


Operational procedures between METs and ACCs

- Forecasts of convective phenomena are reported using a reference map, which gives a partition of the TMA in sectors having the same climatological characterization.
- Within each sector some "major points" (airports or radio aids) are defined and used to localized the reported phenomena and (if possible) the expected flight level affected.
- Data coming from the synthesised radar images are used for less critical forecasts outside the TMAs (Sardinia and Sicily areas)



Rome TMA area divided in 5 sectors. Inside each sector are marked with red arrows from one to four “major points”, used as a reference for reporting forecast of convective phenomena.



Sicily area divided in four sectors, without internal reference.
Forecast of convective phenomena is reported just in term of sector interested.

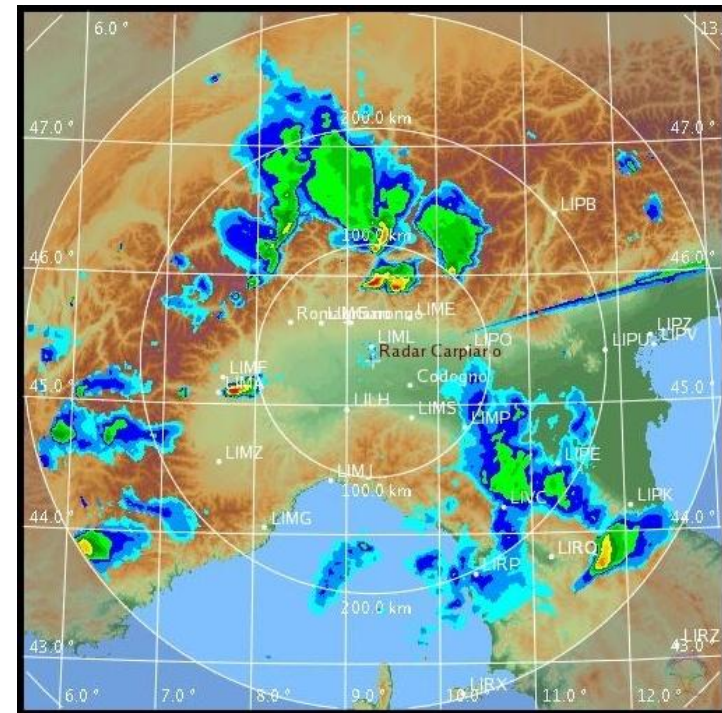
Probabilistic assessment in Milan TMA forecasts

- Milan TMA forecast also includes a probabilistic assessment in terms of occurrence, calculated according to the following rules:
 - 40% probability that corresponds to the contextual inclusion of the phenomenon in a "TAF" forecast type, represented by a change group type TEMPO, preceded by a PROB40 probability indicator.
 - 60% probability that corresponds to the contextual inclusion of the phenomenon in a "TAF" forecast type, represented by a change group type TEMPO, without any probability indicator.
 - 80% probability that corresponds to the simultaneous inclusion of the phenomenon in the main body of a "TAF" forecast or in a change group type BECMG or FM, and/or in a forecast TREND type and/or in a Aerodrome Warning.

Probabilistic assessment in Milan TMA forecasts

- A probability index for a reported phenomenon outside an airport site will have to be made with reference to the drafting of an hypothetical TAF or Aerodrome Warning.
- This probability indexes is thus assigned by the Meteorologists as a consequence of their general analysis, making the ACC forecasts strictly related to the routine emissions of TAF 9H, TAF24H and Aerodrome Warning for pertaining airports
- Since now, however, the probability index is leading, in Milan ACC Managers' opinion, to an improvement of the operational ATM performances through a better planning of air traffic flows in adverse meteorological conditions.

- Observed radar data are also transferred to the ATC Managers using a new kind of weather radar report (first operational issue in March 2009), called **TAD (Thunderstorm Area Detection)**.
- TAD provides the following elements:
 - ICAO code station and sequence number
 - validity
 - echo intensity and extension
 - associated phenomena (present weather)
 - echo position and top of clouds
 - movement and intensity forecast
 - remark



TAD examples

Tad

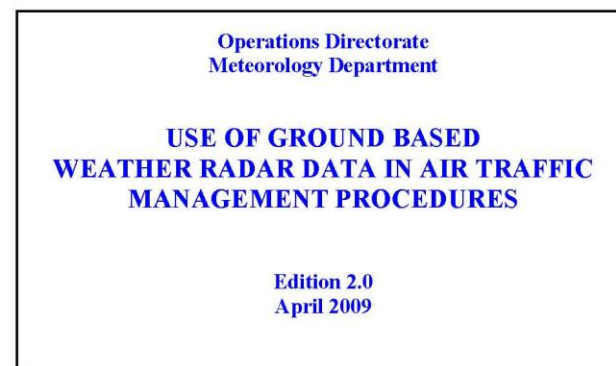
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120102 LIRF MET RADAR 01 VALID 120200/120500Z ECNIL=  
112307 LIRF MET RADAR 16 VALID 112300/120200Z ECNIL=  
112101 LIRF MET RADAR 15 VALID 112100/112300Z HVY ISOL ECHOES RAD 010KM  
TSRA OVER PONZA TOP 7000M WKN=  
111942 LIRF MET RADAR 14 VALID 112010/112100Z MOD CNS ECHOES LINE WID 010KM  
FM 11.63E 41.68N TO 12.61E 41.33N TOP 5000M MOV S 10KT WKN=  
111938 LIRF MET RADAR 14 VALID 112010/112100Z MOD CNS ECHOES LINE WID 010KM  
FM 11.63E 41.68N TO 12.61E 41.33N TOP 5000M MOV S 10KT WKN=  
111859 LIRF MET RADAR 13 VALID 111900/112000Z MOD/HVY CNS ECHOES LINE WID  
010KM TSRA FM 11.63E 42.04N TO 12.71E 41.36N TOP 6000M MOV S 15KT  
WKN=  
111657 LIRF MET RADAR 12 VALID 111700/111900Z OCNL ECHOES AREA RAD 030KM  
MOD/HVY TS 12.66 E 42.23 N TOP 6000M MOV S WKN=  
111515 LIRF MET RADAR 11 VALID 111500/111700Z SCT ECHOES LINE MOD WID 020KM  
FM 12.16E 42.79N TO 14.04E 41.48N TOP 7000M STNR INTST NC=  
111238 LIRF MET RADAR 10 VALID 111300/111500Z BKN ECHOES LINE WID 020KM FM  
43DEG 55MIN E 12DEG 54MIN N TO 42DEG 57MIN E 13DEG 88MIN N TOP 7000M  
INTST NC=  
111058 LIRF MET RADAR 09 VALID 111100/111400Z ECNIL=  
110853 LIRF MET RADAR 08 VALID 110900/111100Z ECNIL=
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More...

- More details about our MET-ACC operational procedures are given in a specific document, available here or via email at:

(Marco Tadini email here)

- More details about TAD code form and all information related to the new report are given in the **AIC A13/2008**, published by ENAV S.p.A. on 4th December 2008.





ANY QUESTION?

THANKS FOR YOUR ATTENTION



Marta Lohini