



REAL COOPERATION, REAL RESULTS

COOPANS MET

Alen Sajko

Director of MET Division in Croatia Control

Member of COOPANS SESAR Programme Management



NAVIAIR



Managerial view on the MET-ATM issue

1. What is COOPANS?
2. How to integrate MET information into the decision making in ATM?
3. Why can not ATM get the needed MET information from the MET services?
4. What is the way forward?

What is COOPANS?



Clever thoughts 1

„The top-down method in cooperation between ANSPs does not work. The FAB concept is forced on top-down method, and if you fly from Munich to Milano, you will cross 3 FABs. It does not make sense!

The bottom-up method works fine. Because everybody have interest to cooperate.”

Herbert Pümpel, Montreal 2014

Bottom-up method

- Cooperation based on win-win situation
- Four pillars of possible cooperation:
 - Cross-border operational cooperation
 - Procurement
 - Research and development
 - Education

COOPANS

- COOPeration between ANS providers
- Members:
 - LFV (Sweden)
 - Naviair (Denmark)
 - IAA (Ireland)
 - Austro Control
 - Croatia Control

Austro Control and Croatia Control are the MET providers as well

COOPANS cooperation

- Based on bottom-up method
- The story started with common procurement
 - the COOPANS Topsky ATM system made by Thales
- Following cooperation in the other 3 pillars:
 - Research and development – fully through SESAR
 - Education – partly
 - Cross border cooperation - partly

COOPANS Topsky ATM system

- One of the most advanced ATM systems in Europe
- The same system in 5 ANSPs and 7 ACCs
- Constant development, regular upgrades by all members at the same time
- Following SESAR as technological and the most successful part of SES

Some COOPANS' plans for the future

- According to ATM Master Plan, increase capacity by 100% until 2030
- Maintaining the present staff level
- Better assistance tools, moving towards automatization
- Solving conflicts in timeframe of 30 minutes and more

MET issue

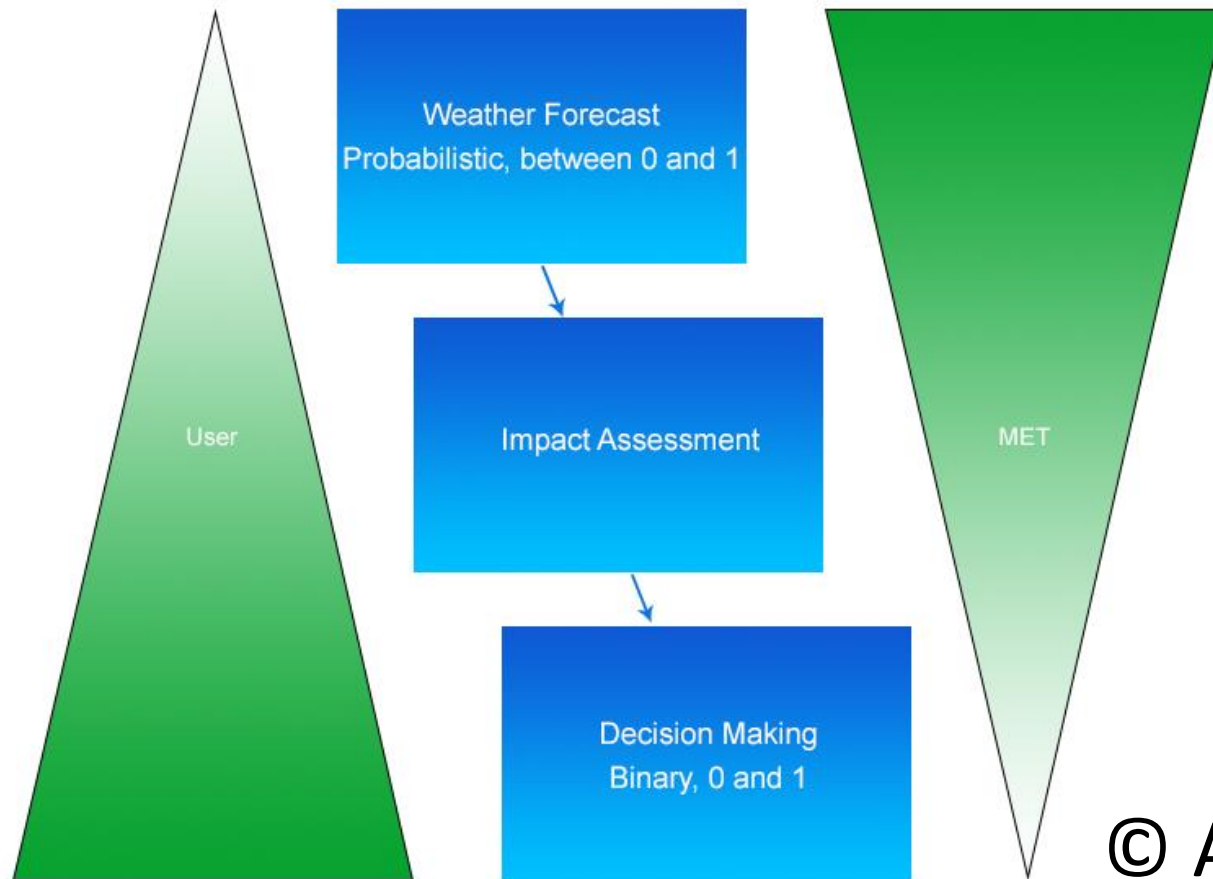
- Uncertainty and availability of MET information
- COOPANS needs harmonized MET information for the COOPANS Topsy system
- The same format and quality
- Question: What MET information are important for COOPANS partners?
- Not the same answer for Sweden and Croatia

MET information for

1. Trajectory Management
2. Separation Management
3. Arrival Management
4. Flow and Capacity Management
5. Remote Towers

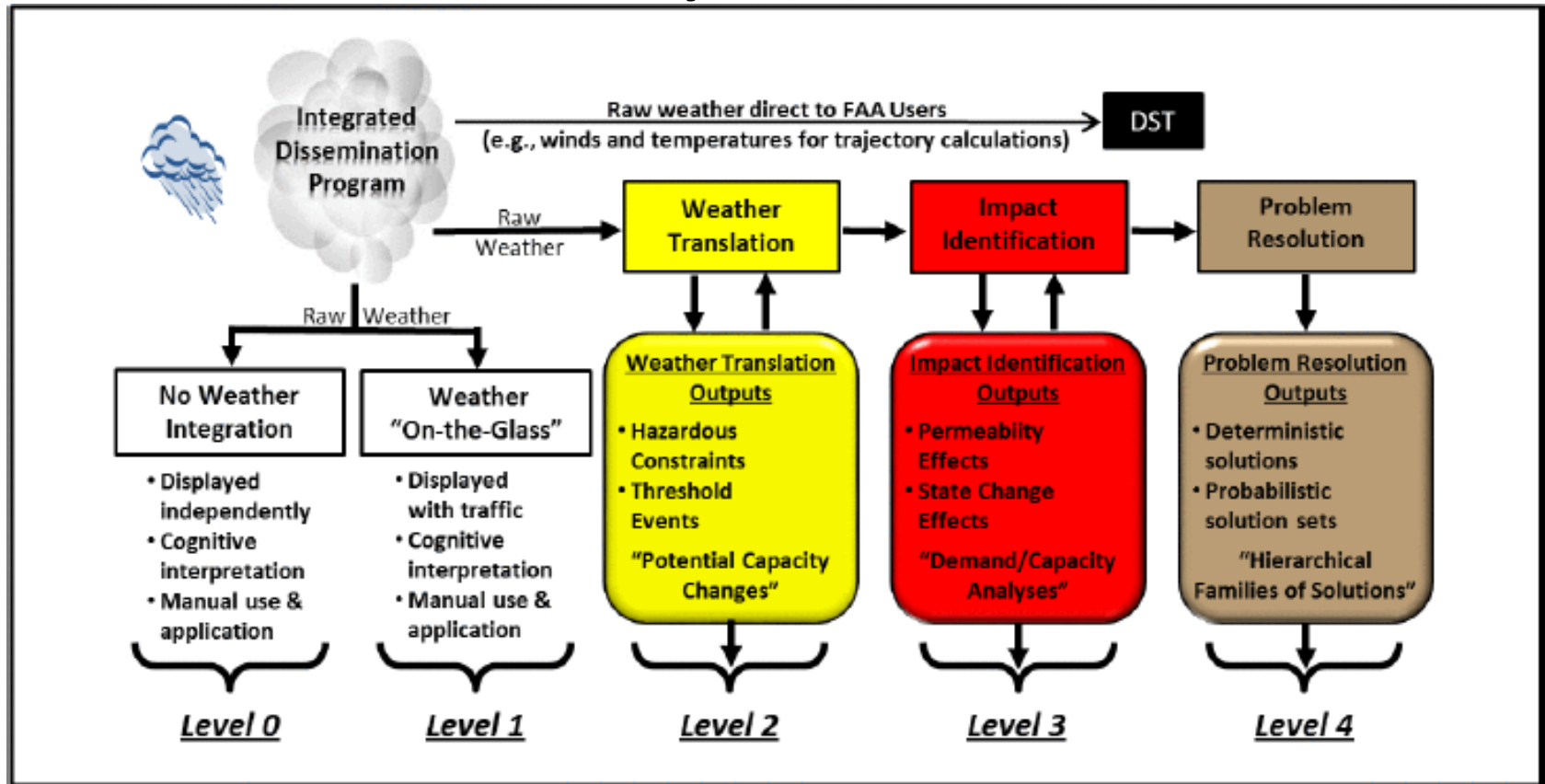
How to integrate MET information into the decision making in ATM?

Translation from weather forecast into decision making



© A. Sajko

Levels of MET data integration in ATM system



© FAA

Current levels

- Croatia Control – level 0
- Others COOPANS partner –level 0, other levels need the common COOPANS decision
- Other ANSPs – not sure, maybe DFS is most progressive in this area

Future levels

- Advanced MET information incorporated in the ATM systems
- Enabling ATM to act in the best way in challenging weather situations
- Current update of assistance tools like trajectory prediction, conflict detection and conflict resolution
- Including historical pilots behaviors (big data)

Yes, but...

- How to get advanced MET information?
- ATM still can not get MET information it needs
- The problem is obviously very complex, otherwise it would be already solved

Weather Forum

- Yesterday and today in EUROCONTROL
- Very crowded forum, everybody are interested
- My colleague Igor sent me some notes from yesterday's discussion

Notes 1 – centralized MET service

- Network Manager: We don't care who provides MET information. We just want it to be a forecast and work with it. Consolidated, optimal, best for the day!
- FAA: Changed the system in last 2 years, the Weather Service has more important role in flow management in US, centralized system, command center

Notes 2 – consolidated MET service

- NATS:
 - Satisfied with MET Office (national MET provider)
 - Highlights cross-border cooperation, to keep local knowledge
- EUROCONTROL MET expert: We need technology to make ensemble of local forecasts
- Wow, this is interesting, Croatia Control and 6 partners have just applied project eATCoN dealing with consolidated forecasts for ATM

Notes 3 – everything is... ☹️

- Flybe:
 - When airborne, the only MET information pilots have are radar and window
 - Too short range
 - Pilots are in fact almost blind regarding weather
- ECU: A lot of nice MET information, but not available to pilots
- IFATCA: Chaos with long-haul flights

Why can not ATM get the needed MET information from the MET services?

MET providers in Europe

- Is something wrong with the system of MET providers in Europe?
- **Probably YES!**
- Extremely complex system, even more complex and fragmented than the ATM system
- MET provider are:
 - National hydro-meteorological institutes
 - ANSPs
 - Armies
 - Airports
 - Others

Who provide MET services

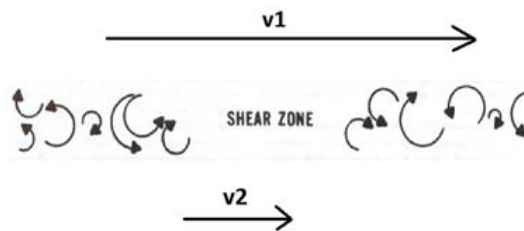
EUMETNET MEMBER	AMO AMSP					AMS AMSP					
	MWO AMSF	NMH	ATS	MIL	AIRPO	COMI	NMH	ATS	MIL	AIRPO	COMI
Austria	ATS		ATS					ATS			
Belgium	ATS		ATS					ATS			
Bulgaria	ATS		ATS					ATS			
Croatia	ATS		ATS					ATS			
Cyprus	NMHS	NMHS					NMHS				
Czech Republic	NMHS	NMHS		MIL	AIRPORT		NMHS				
Denmark	NMHS	NMHS					NMHS			AIRPORT	
Estonia	NMHS	NMHS						ATS		AIRPORT	
Finland	NMHS	NMHS					NMHS				
France	NMHS	NMHS		MIL			NMHS				
Germany	NMHS	NMHS					NMHS	ATS			
Greece	NMHS	NMHS					NMHS				
Hungary	NMHS	NMHS					NMHS	ATS			
Iceland	NMHS	NMHS					NMHS			AIRPORT	
Ireland	NMHS	NMHS					NMHS			AIRPORT	
Israel	NMHS	NMHS						ATS			COMM
Italy	MIL	NMHS		MIL			NMHS	ATS	MIL	AIRPORT	
Latvia	NMHS	NMHS						ATS			
Lithuania	NMHS	NMHS					NMHS		MIL		
Luxembourg	No resp.		ATS					ATS			
Malta	COMM					COMM					COMM
Montenegro	ATS		ATS					ATS			
Netherlands	NMHS	NMHS		MIL			NMHS		MIL		
Norway	NMHS	NMHS						ATS			
Poland	NMHS	NMHS				COMM	NMHS				COMM
Portugal	NMHS	NMHS					NMHS				
Republic of Moldova	ATS		ATS					ATS			
Romania	ATS		ATS					ATS			
Serbia	ATS		ATS					ATS			
Slovakia	NMHS	NMHS					NMHS				
Slovenia	NMHS	NMHS					NMHS				
Spain	NMHS	NMHS					NMHS				
Sweden	NMHS	NMHS		MIL				ATS	MIL	AIRPORT	
Switzerland	NMHS	NMHS					NMHS	ATS			
The former Yugoslav Republic of Macedonia	ATS		ATS					ATS			
United Kingdom of Great Britain and Northern I	NMHS	NMHS						ATS		AIRPORT	

EUMETNET

- Organization of European national hydro-meteorological institutes
- Trying to be single MET voice in Europe
- Unsuccessful
- No common way forward, no vision
- Top-down method, it doesn't work
- But the only European MET organization we have today

Challenges in MET world

- MET influenced by IT revolution - extremely high speed (mobile phone applications)
- MET providers work under ICAO rules - system of international agreements necessary for the aviation to function at all - extremely slow system
- Under two velocities all the time - shear zone and turbulence in the MET business detected!



- My forecast: 99% probability this wind shear and turbulence will be more intensive in the future

Why can not ATM get the needed MET information from the MET services?

- The task is not easy
- Centralized or consolidated approach
- Communicating confidence - understanding forecast confidence can improve decision making
- Everybody want automatic systems giving the adverse weather zones – is it even possible today – do we still need forecaster in the loop or not?
- Problems:
 - Initialization and dissipation
 - Climate changes
- MET services are not consolidated and not proactive enough

What is the way forward?

COOPANS

- In Wave 2 of SESAR 2020 - strong focus on the MET issue
- COOPANS will cooperate with its national MET providers on the bottom-up method
- COOPANS MET initiative – how to harmonize MET information for the COOPANS Topsky system
- ATM works at national level and the best available MET information are at national level
- TBO-MET project is very interesting for COOPANS – the right way forward

MET-ATM projects at national levels

- A lot of ongoing or planned projects on national levels
- Everybody is trying to do something
- Non-regulated MET information for decision making in ATM
- Regulations (PCP and CP) about new regulated MET information unclear

Example

31

Weather Impact Assessment on Controller Workload and Staffing Solutions at RTC Arlanda



Study how bad weather conditions (e.g. **snow**, fog, low visibility) influence controllers workload—**weather related impact assessment**



Input:

- ✓ Statistical weather data (snow, fog, low visibility)
- ✓ Statistical traffic data
- ✓ Staffing solutions at individual tower

Output:

- ✓ "Red spots" - quantify the correlation between adverse weather and workload problems in ATM

European ATM

- Not sure
- A lot of MET information sources based on centralized systems
- Not sure about the quality of those information
- For some of them I'm sure they are ... ☹️
- Very strong entry of industry into this part of MET business

Almost finished!



Conclusions

- Both MET and ATM experts need to work together to solve the problem of MET information for ATM
- MET has to be proactive, not just to wait for requirements
- ATM has to be aware of abilities and limitations of the MET services – confidence of MET information

Clever thoughts 2

„Because of climate changes and limited airspace, the MET is today more and more important in aviation, again after fifties and piston engines.”

Herbert Pümpel, World ATM Congress, Madrid 2018

Not so much clever, but thoughts

„Today ATM guys need FORECASTS or PREDICTIONS (not only weather forecast, but trajectory predictions etc.) in their systems.

MET guys can help them, of course, because we have been fighting with the prediction of future (and sound stupid) more than 80 years! Now we are waiting for you, guys! ” 😊

Alen Sajko, in every-day discussion with controllers in Croatia Control

Questions?

