Interpretation Challenge(s) of Meteorological Information
A universal / Global Safety Concern

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CONTENTS

A LOOK Backwards

| Weather is ranked 3rd with 12% of aviation accidents after pilot and technical errors.
| Without change during fifty years, this position points to the weather and Meteorological information impacts on the overall aviation safety.

What's the reason and what can we Learn of this?

ONE COMMON FACTOR REMAINS

{ INTERPRETATION of Meteorological DATA }

How do we pick the high-hanging fruit of "Effective Interpretation"?

INTERPRETATION of Meteorological Information

With weather considered one of the most critical factors for flight safety, the interpretation of weather reports became a fundamental skill, required and expected from every MET aviation user.

Learning how to read various aviation meteorological information from reports and weather charts is fundamental for pilot training.

Meteorological Information Services

Meteorological Information Services are presented as:

- Observations (METAR, MET-Reports, SPECI, AIREP, SPECIAL AIREP, Display systems….)
- Forecasts and Warnings (TAF, Airdrome warning, SIGMET, AIRMET, GAMET, information for Low-level flights.
- Climatological and historical meteorological records.
- Dissemination of meteorological data in different media (paper, display devices, web portal)

Meteorological Information Formats Require Special Learning

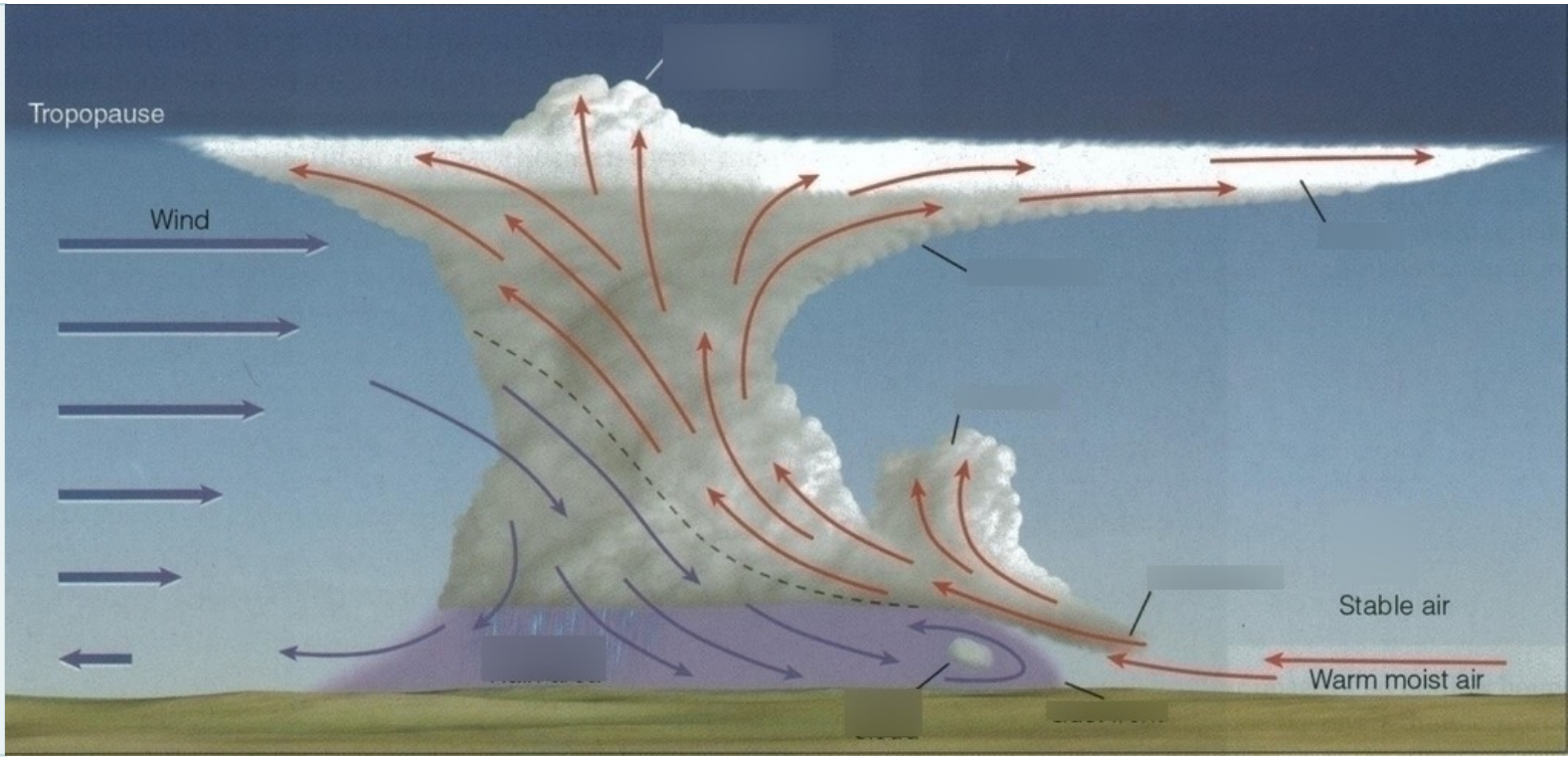
Meteorological information is coded under the following Standard Message formats:

- TAC : Traditional Alphanumerical Code
- IWXXML: ICAO meteorological information exchange model
- GRIB code form: Upper-air gridded information supplied by (WAFCs) for pre-flight and in-flight replanning
- BUFR code : Significant weather information charts supplied by WAFCs for pre-flight and in-flight replanning

Introducing the MET Interpretation Escalator

Understanding Meteorological information Requires End-User Training

- Precise knowledge of Height References.
- Sizing an Area of applicability
- Understanding of Specific. Meteorological Phenomenon association with hazard(s).
- Codes and abbreviations used in OPMETs METAR, METAR AUTO, SPECI ,TAF.



ICAO Future Progress and enhancements

Meteorological information services: | Observation, | Forecasts and warnings | Climatological and historical meteorological products | Dissemination of meteorological product	**AMET-B0** **Completed**	Meteorological information in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.
	AMET1B1 **In progress**	Meteorological information in support of automated decision processes or aids and performance based requirements, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support.
	AMET-B2 **Planned**	Integrated meteorological information service in the SWIM environment in support of enhanced operational ground and air decision-making processes, particularly in the planning phase and near-term.
	AMET-B3 **Planned**	Integrated high resolution meteorological information in support of enhanced operational ground and air decision-making processes, for all flight phases and corresponding air traffic control operations, allowing gate-to-gate seamless operations.

Case Sample (International)

On 02,08, 2005; an Airbus A340 landed at destination in daylight during a thunderstorm and failed to stop before reaching the end of the runway.

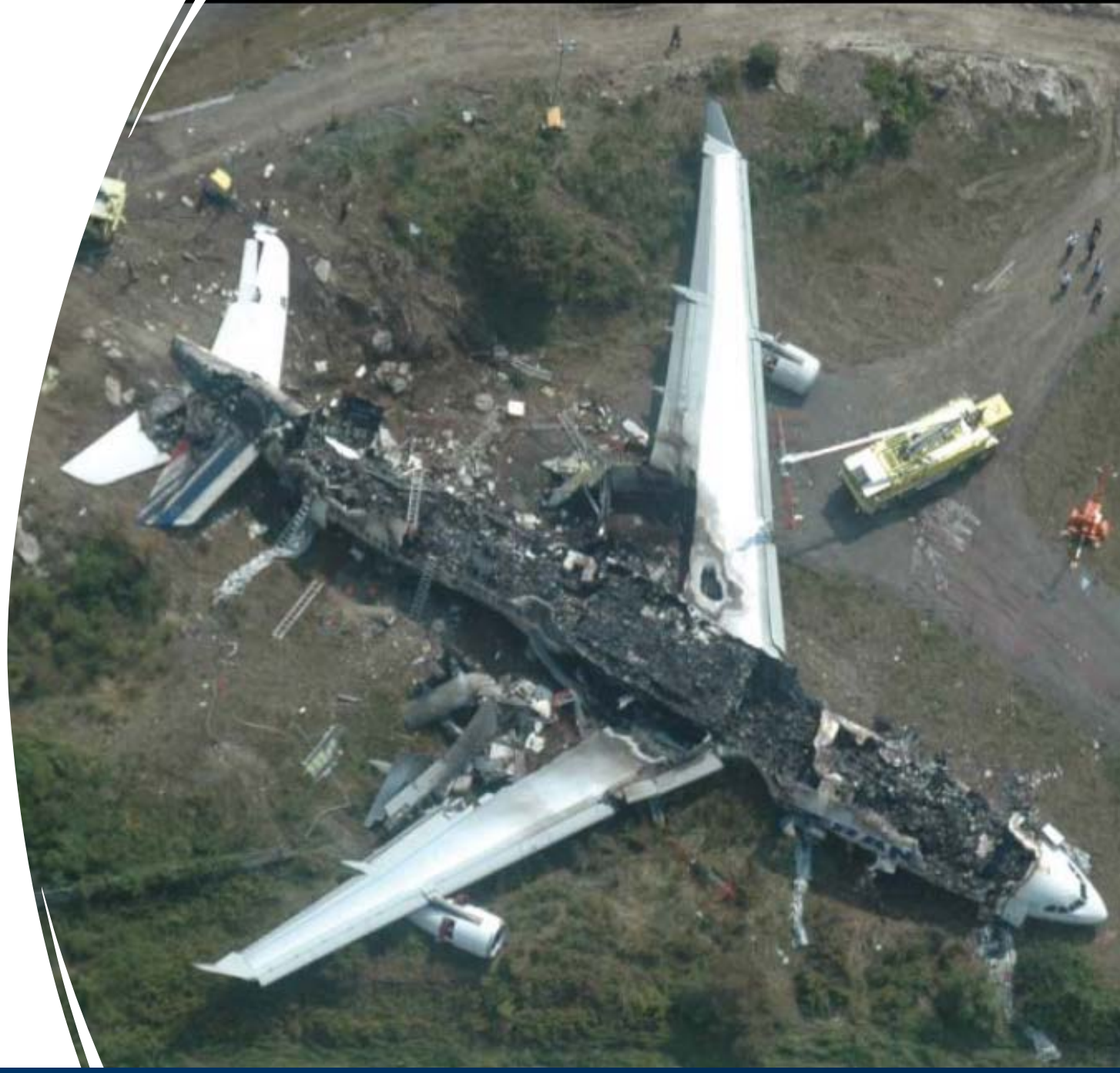
TSB Canada weather-related Findings :

| Flight risk in close proximity to convective weather in terminal environment

| Limited pilot assimilation, comprehension, and reaction to meteorological data hazards created by a rapidly changing nature of a thunderstorm.

TSB Recommended:

The Department of Transport (TC) establish clear standards limiting approaches and landings in convective weather for all air transport operators at Canadian airports.



Case Sample (National)

Probable Cause

The unexpected 13 ft AGL roll, immediately after the airplane rotation, was caused by a visible dust devil undetected on the start of the take-off roll by the flight crew.

Contributing Factors

- The lack of dust devil airplane and ground detection devices.
- No warning of the dust devil was given by the tower control.

The Aviation Investigation Bureau Recommends the following:

Safety Recommendation AIB-030623-911-SR-01 the operator to initiate a refresher campaign to review difficult weather phenomena for all KSA airports where known peculiar weather conditions for each locality requires attention.

Safety Recommendation AIB-030623-911-SR-02 Saudi flight to develop a special optimized Line Oriented Flight Training (LOFT) introducing lessons learned from this experience.

Safety Recommendation AIB-030623-911-SR-03 Saudi Air Navigation Services (SANS) to emphasize for air traffic controllers and AFIS operators to provide information for landing or taking-off traffic on any observed dust devil on the vicinity of their runway.

Safety Recommendation AIB-030623-911-SR-04 Request the National Center for Meteorology (NCM) to conduct an in-depth study in coordination with GACA, SANS, Airports and any related entity on the occurrence of dust devils in the vicinity of KSA airports, seasonality, times and most effective detection equipment for effected airports. Results of the study are vital for updating Aeronautical Information Publications (AIP) and to consider in airport upgrade plans.

Meteorology is still in a “Crystal Ball”

Understanding…is outside crystal ball, the challenge is:

- Improving the science;
- Training the end-user how to INTERPRET,
- Delivering the information
- Response in terms of Risk Management

“In almost all-weather related occurrences, the needed Met information is available hidden in the information pile”.

BE SAFE