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EUROPEAN ROTORS | THE VTOL SHOW AND SAFETY CONFERENCE

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Airbus Helicopters and Leonardo

Industry view on Restricted Icing

organised by EHA European Helicopter Association, EASA European Union Aviation Safety Agency

produced by VERTICAL AVIATION INTERNATIONAL

supported by AIRBUS, BELL, LEONARDO, SAFRAN

Flight in Restricted Icing Conditions

Concept(s) for Certification and OPS approval

HELICOPTERS

Robert Haas
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LEONARDO HELICOPTERS

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1 The Issue

HEMS mission

- Operating site - beyond a layer of cloud, (**possible freezing cond.**)
- Time limited transit through the clouds
- w/o full icing certification - NO GO
- Operators: NOLAS, REGA significant amount of cancelled missions due to icing

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2 The consequence

Patient in need of treatment / transportation

Time is critical - as usual

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Alternative route - no icing certification -

Forcing operations to lower altitudes under VFR:

- increased risk of CFIT
- mid-air collisions
- mission cancellation

Full Icing Certification
- Cost / Weight
- Reduced Power
- Light helicopters

Is there something in between?

IDEA: (refer to exposure time concept) – maintaining an acceptable level of Safety while enhancing the operability

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3 Complex decision - Go or NO Go

Did we Ignore icing conditions ?

Are we authorized to dispatch?

Did we encounter Icing conditions ?

Did we have sufficient margin to avoid icing ?

Restricted Icing:

- Proper aircraft configuration
- Defined envelope with associated mission planning

Restricted Icing as Safety Improvement

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4 The Restricted Icing Approach

…where the rotorcraft can be safely operated while not requiring the installation of an ice protection system

The corresponding envelope would be typically limited in

- negative OAT
- and/or duration
- and/or LWC (Liquid Water Content)
- and/or other relevant parameters

Reminder: Limited Icing operations are designed for over sea operation

Risk mitigation

Weather forecast
Probable areas of icing, temperature and icing severity information is available to the crew

Aircraft
- is certified for flight in Restricted Icing Conditions
- is equipped to an appropriate level (ice detection)

Crews
are trained for flight in Restricted Icing Conditions

Procedures
to ensure in-flight re-planning in case of unanticipated degradation of the environmental conditions

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5 CONOPS - Concept of Operations

TC Holder

Aircraft Certification
Certification Review Item / Special Condition

Deliverable:
- Flight Manual Supplement
- Flight Crew Training

Certification

EASA

Feedback

Aircraft Operator

Weather Forecast (reliable, precise, available

Infrastructure: IFR, low level, transition to VFR

Mission Profile

CONOPS Document

Standard Operating Procedure

Safety Risk Assessment

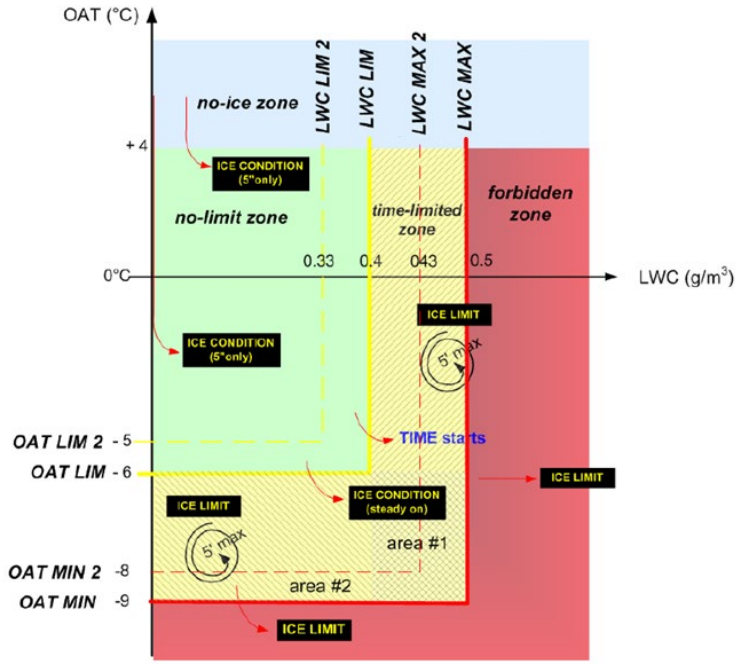
OPS Approval

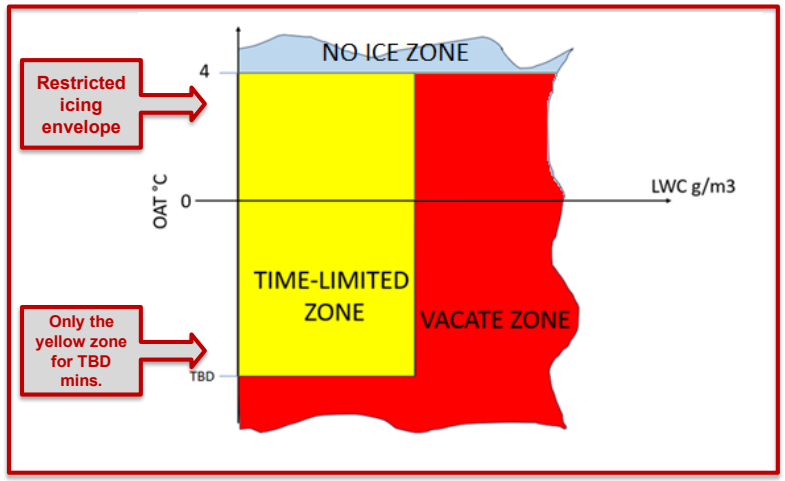
National Aviation Authority

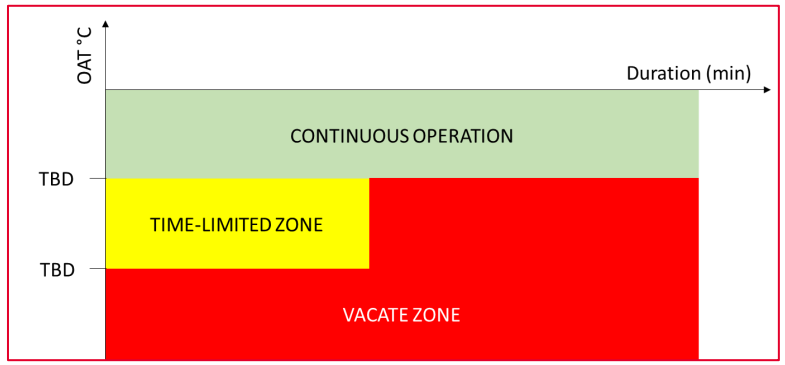
6 Flight Test Results

where the rotorcraft can be safely operated while not requiring the installation of an ice protection system

EASA already approved limited IPS envelope







The corresponding envelope is typically limited in negative OAT, defined icing severity, duration (minimum 5 min) and/or other relevant parameters always available to the crew.

A Restricted Icing clearance shall be demonstrated to allow safe operation.

6 Flight Test Results

The clearance may typically be limited in terms of some or all of the following:

- Altitude,
- OAT,
- Aircraft Mass,
- Icing severity (Liquid Water Content)
- Airspeed,
- Power required,
- Maneuver limitations e.g. maximum bank angle,
- Ice accretion limits on unprotected areas of the airframe (e.g. horizontal stabilizer) when correlated with ice accretion on any part of the airframe directly observable by the operating crew,
- Duration,
- Any cockpit displayed parameter requiring the crew to leave icing conditions

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6 Flight Test Results

AIRCRAFT MINIMUM CONFIGURATION

1. Ice detection
    a. Ice detectors subsystem
    b. SLD (Supercooled Large Droplets) visual cue
2. Ice protection
    a. Protected windshields
    b. Engine intakes passive/active IPS
    c. Air Data Probes Protection
3. Controller + cockpit controls & messages


SLD icing encounter

6 Flight Test Results

Some HISS or natural icing test points with cold blades:

- Continuous Maximum Icing conditions
- Warm/medium temperatures
- Several minutes of immersions

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7 Extension of scope of operation - Outlook

1

Regulatory Work

EASA Stakeholder Advisory Board - (SAB)
Activity Group AG008 WPI009
OUTPUT: CONOPS & Generic CRI

2

Certification Project:

Flight Manual Supplement
+ Crew Training

3

Operation:

Limited to HEMS (experienced Crews)
Specific geographical areas
+ Environment / Infrastructure

2026

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Thank you

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