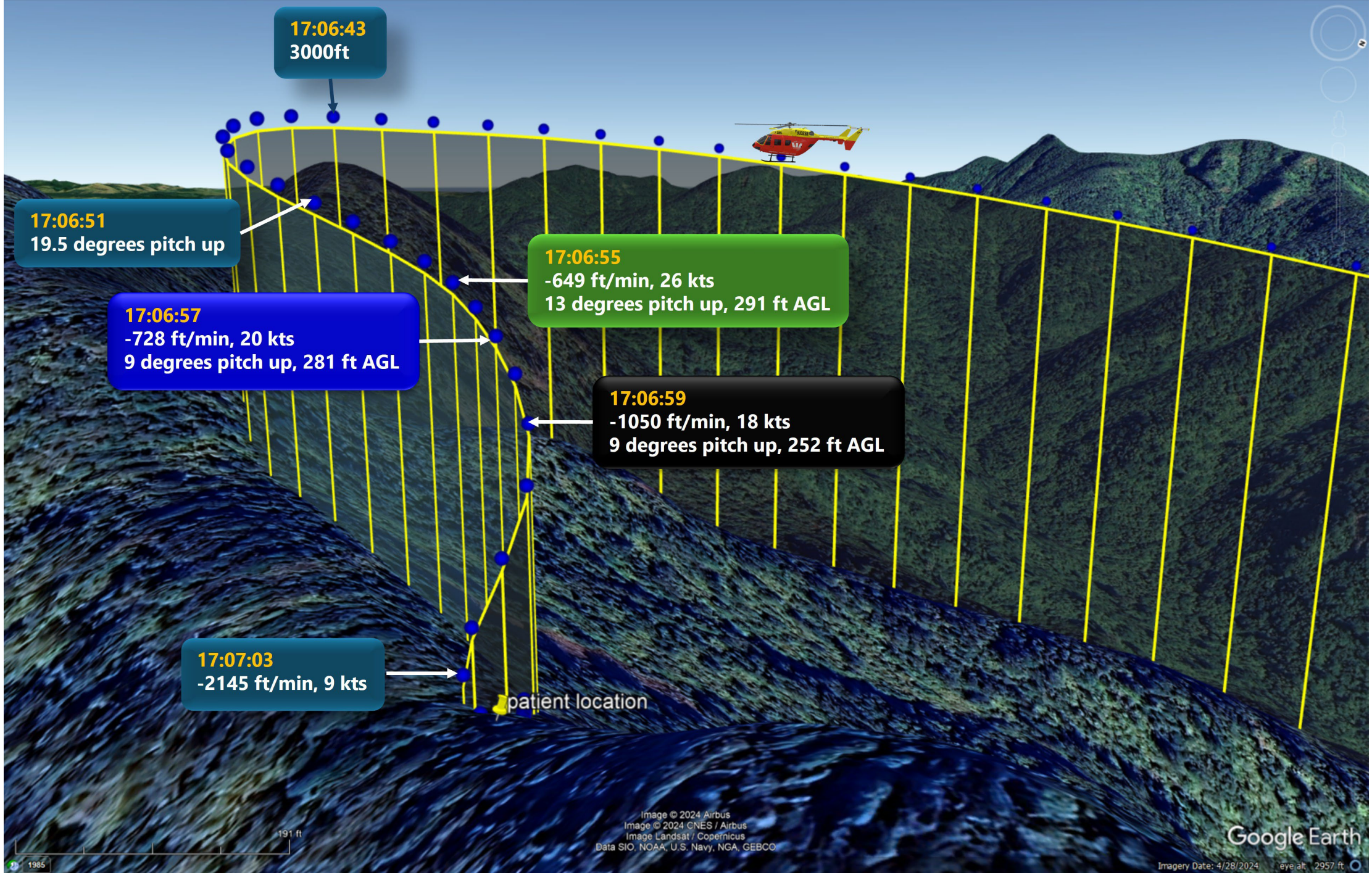
Aviation Safety- Bail before you wipe out

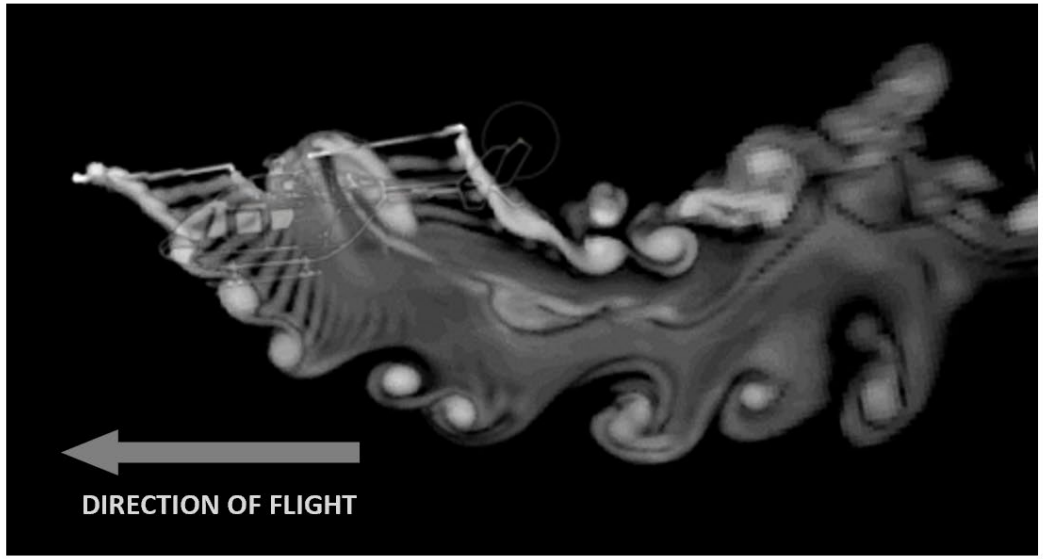
ANZSASI Seminar – Sydney
June 2026

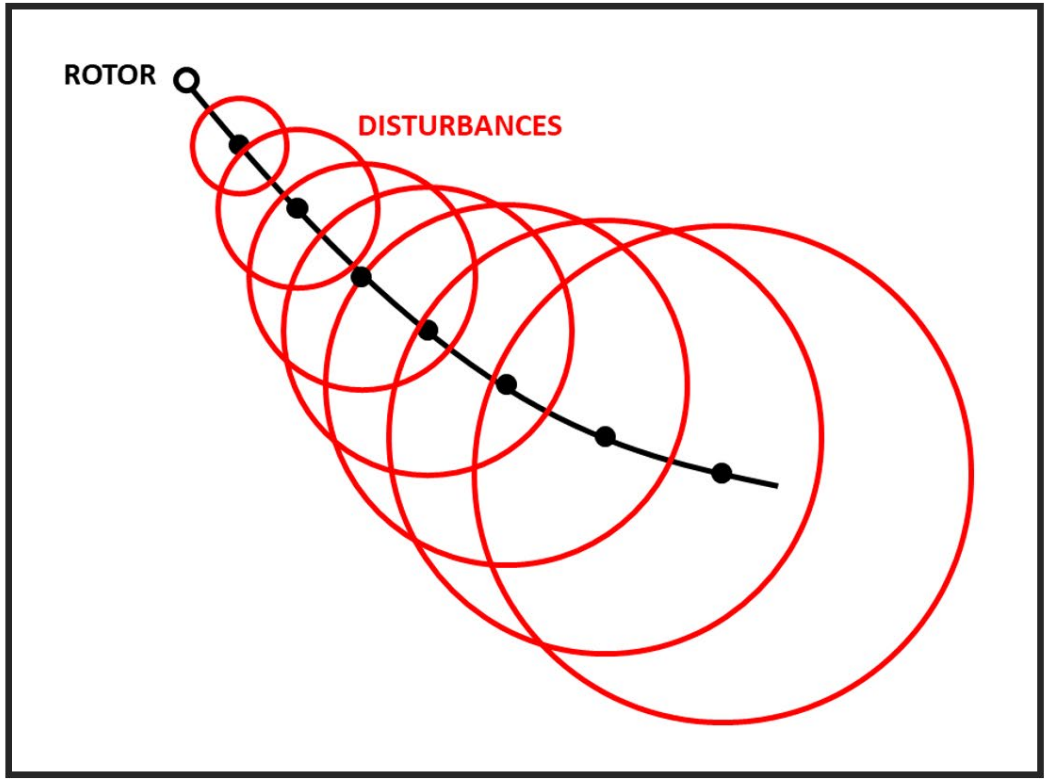
Jim Burtenshaw
Jeffrey Shearer

TE KŌMIHANA TIROTIRO AITUĀ WAKA
TAIC
Transport Accident Investigation Commission

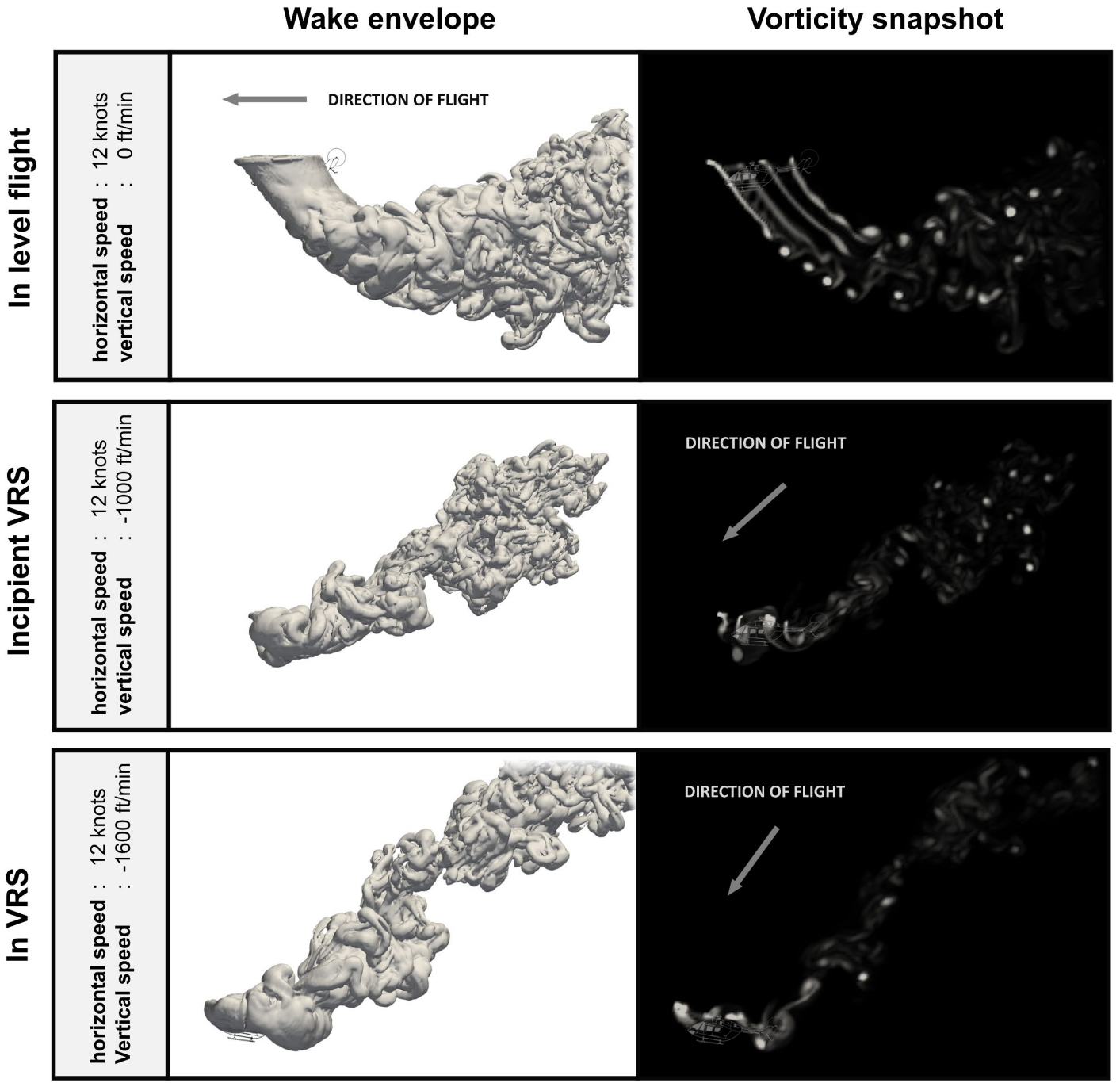

17:06:43
3000ft
17:06:51
19.5 degrees pitch up
17:06:55
-649 ft/min, 26 kts
13 degrees pitch up, 291 ft AGL
17:06:57
-728 ft/min, 20 kts
9 degrees pitch up, 281 ft AGL
17:06:59
-1050 ft/min, 18 kts
9 degrees pitch up, 252 ft AGL
17:07:03
-2145 ft/min, 9 kts
patient location
Image © 2024 Airbus
Image © 2024 CNES / Airbus
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google Earth
Imagery Date: 4/28/2024
eye alt 2957 ft

Representation of the main rotor wake in forward flight

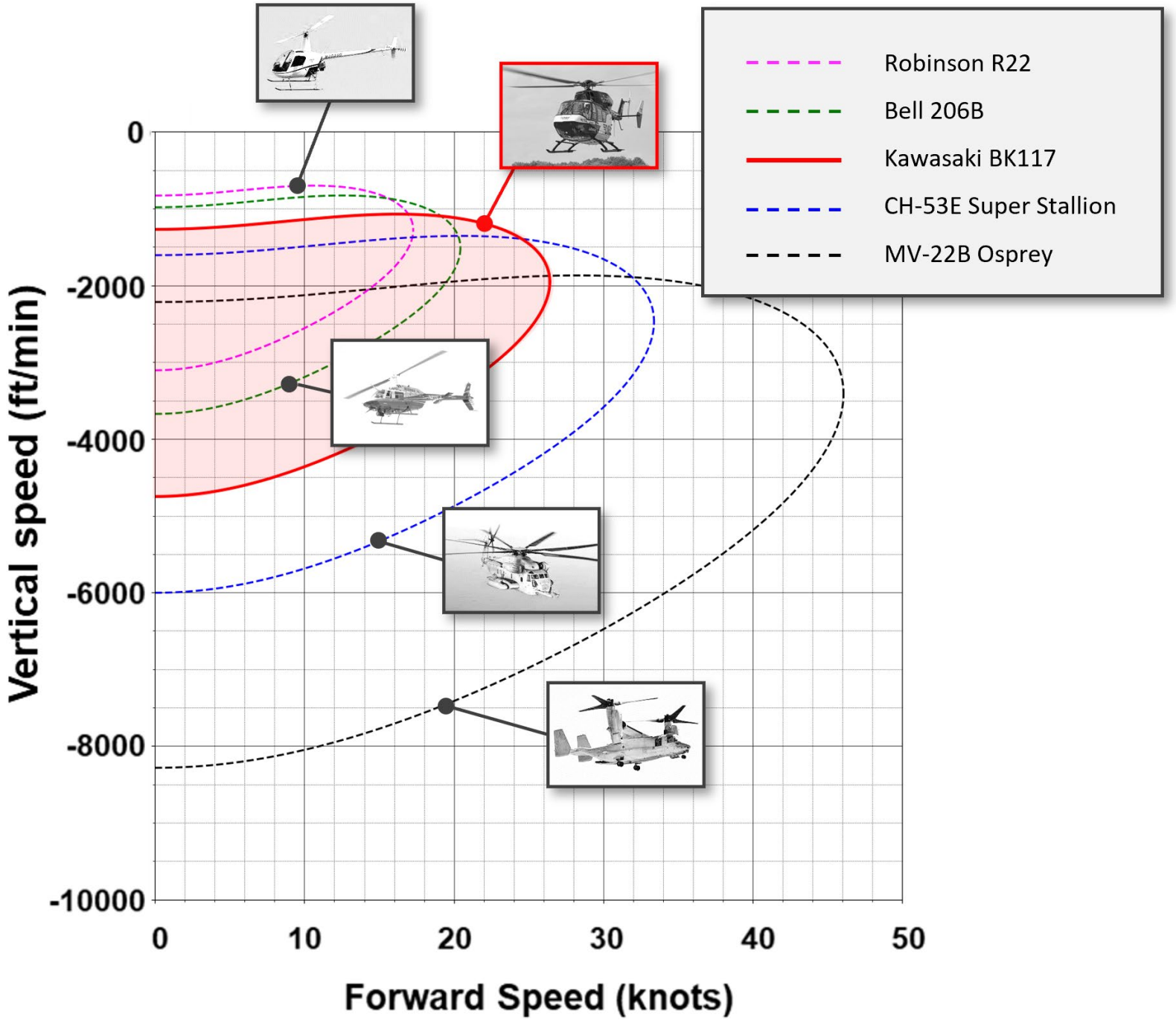




Structure of the rotor wake in level flight compared with the structure in fully developed VRS



Predicted VRS onset boundaries for various conventional helicopters



ZK-HHJ trajectory superimposed on VRS onset boundary

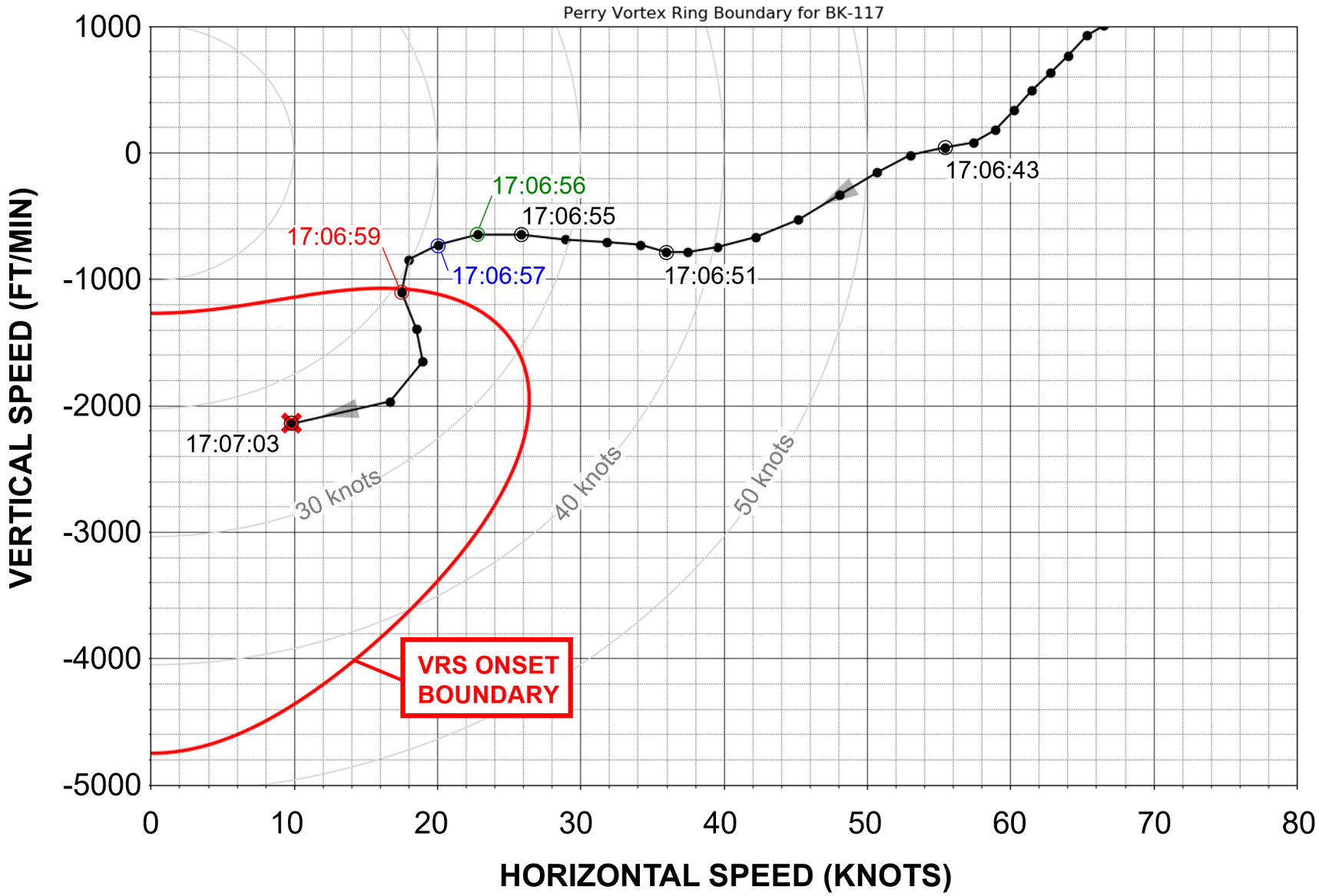
Black trajectory :

GPS trajectory (groundspeed)

Trajectory annotated with New Zealand Standard Time (UTC+12 in format hh:mm:ss)

Aircraft speed is constant along contours as shown.

ZK-HHJ TRAJECTORY RELATIVE TO BOUNDARY FOR VRS ONSET



ZK-HHJ trajectory superimposed on VRS onset boundary

Black trajectory :

GPS trajectory (groundspeed)

Blue trajectory :

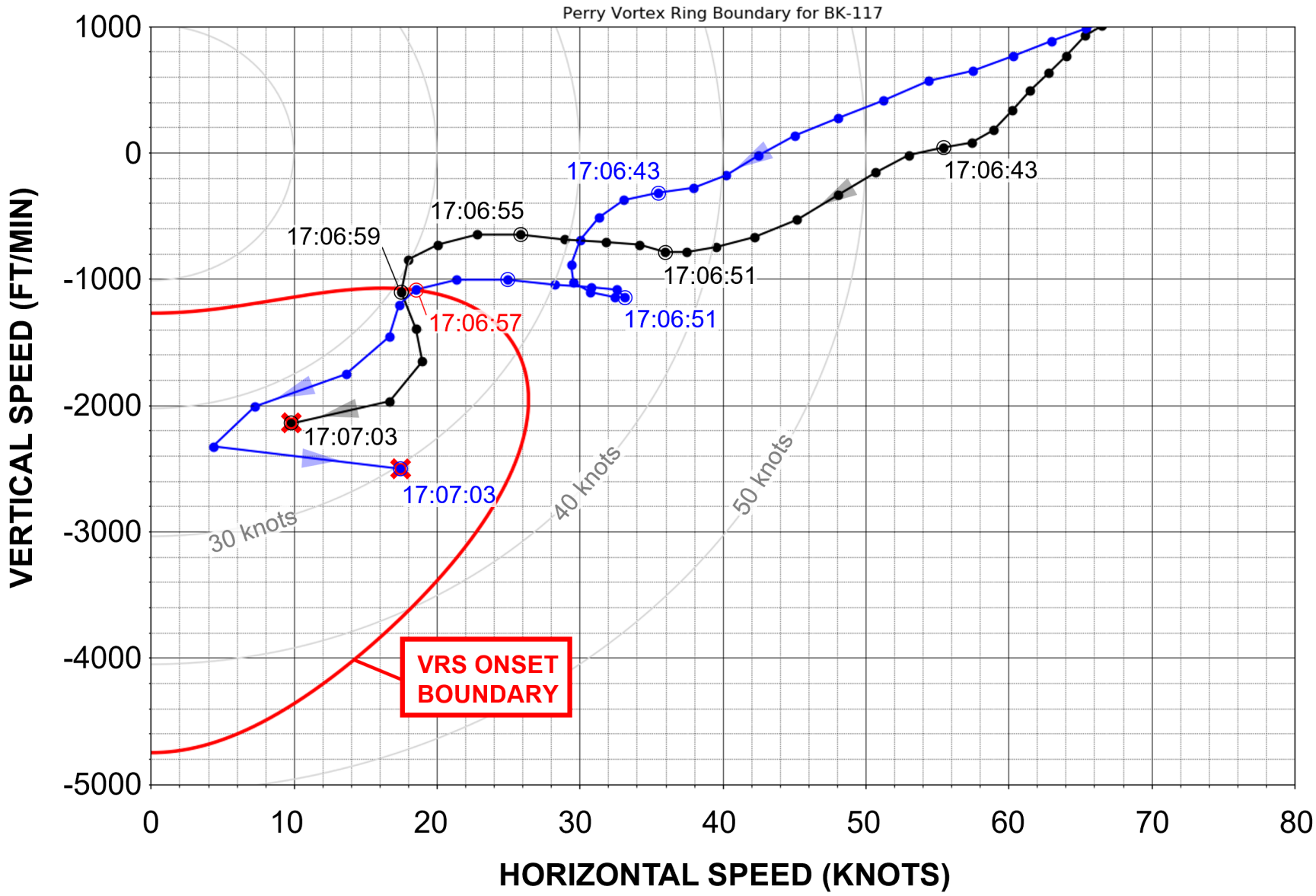
Airspeed accounting for

- 20 knot westerly wind
- 10 degrees orographic uplift

Trajectories annotated with New Zealand Standard Time (UTC+12 in format hh:mm:ss)

Aircraft speed is constant along contours as shown.

ZK-HHJ TRAJECTORY RELATIVE TO BOUNDARY FOR VRS ONSET



ZK-HHJ trajectory superimposed on VRS onset boundary

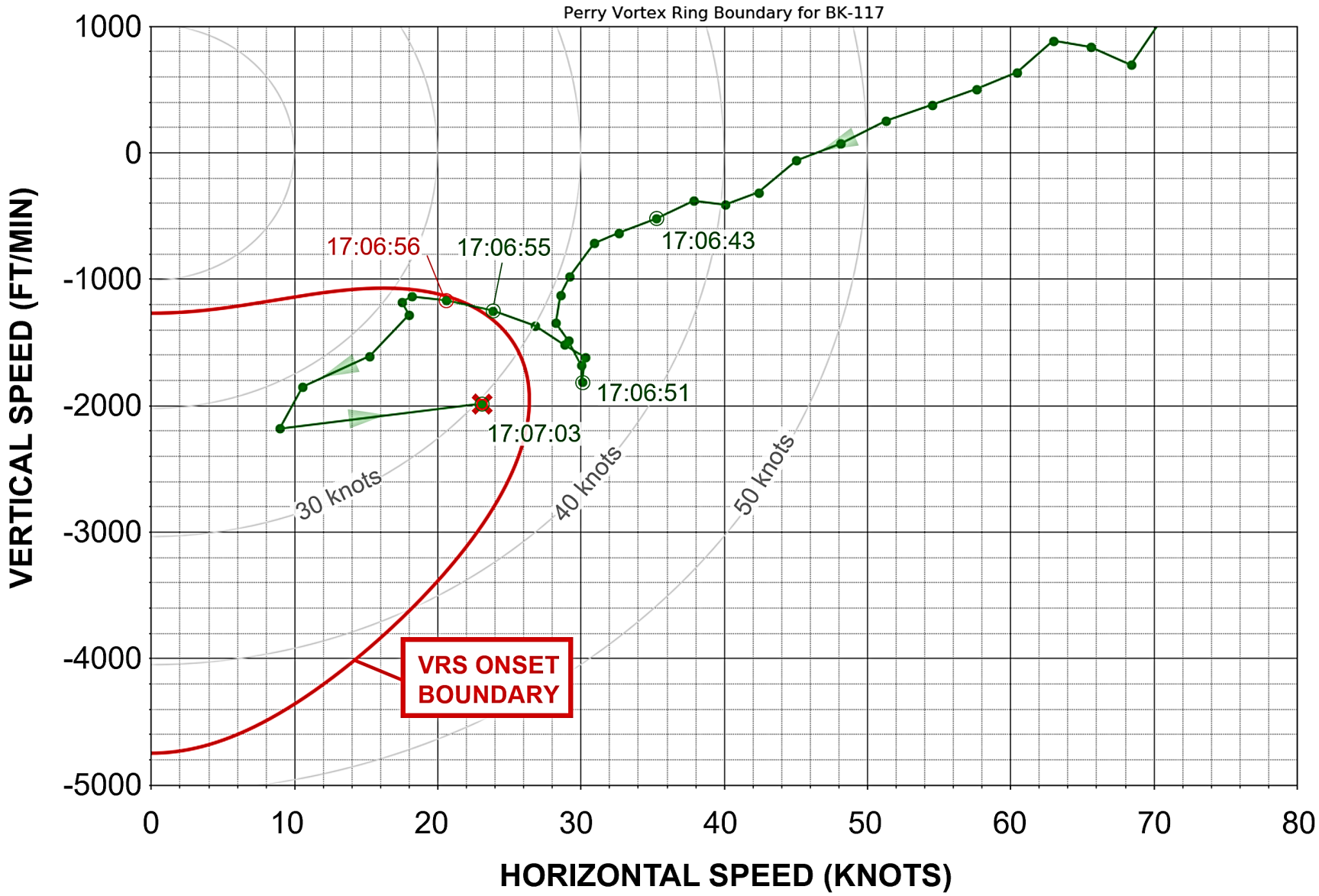
Green trajectory :

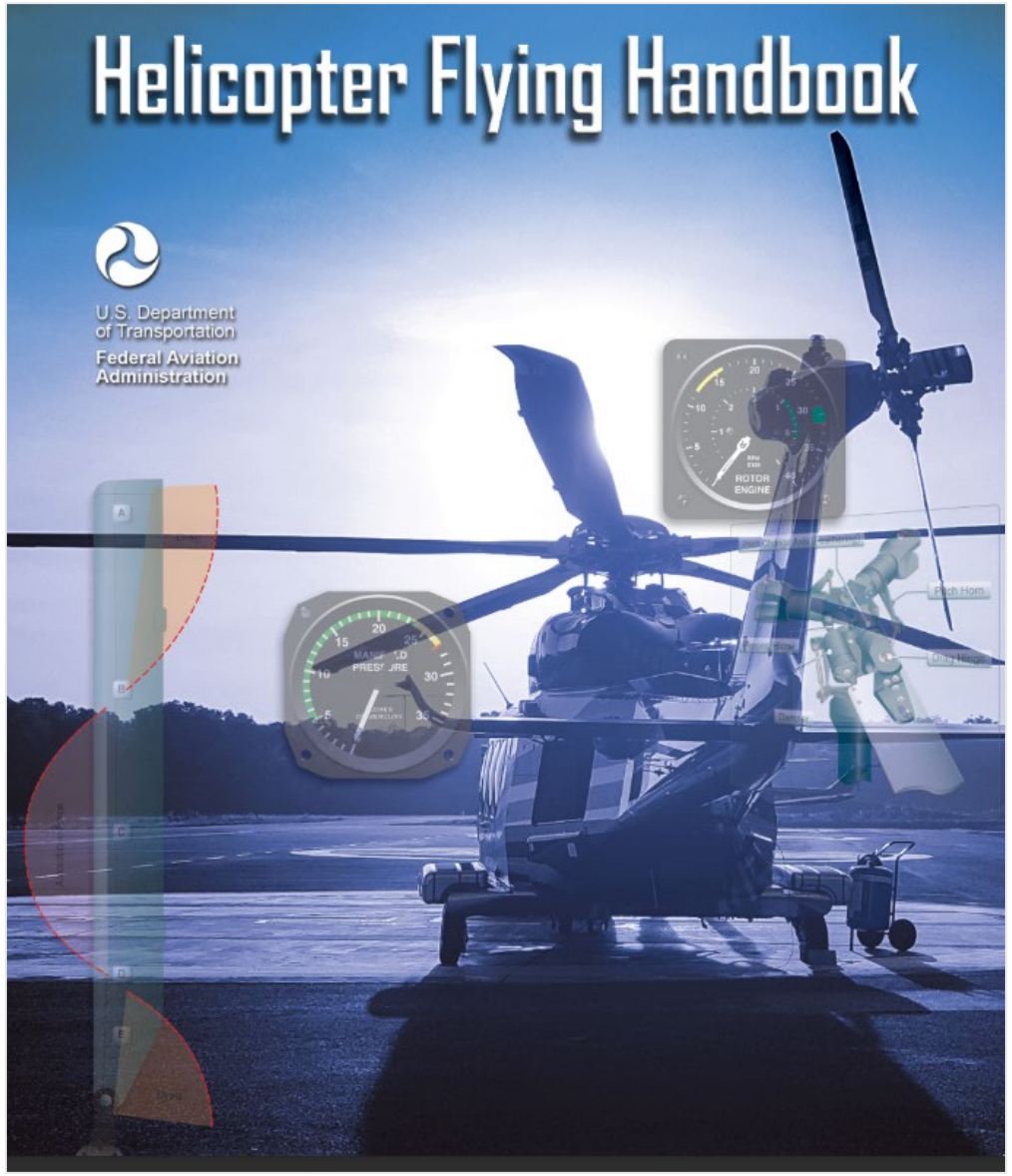
Airspeed accounting for

- 20 knot westerly wind
- 10 degrees orographic uplift
- aircraft pitch attitude

Trajectory annotated with New Zealand Standard Time (UTC+12 in format hh:mm:ss)

Aircraft speed is constant along contours as shown.





BK117 B-2
APPROVED ROTORCRAFT FLIGHT MANUAL

Valid for Model: **MBB-BK117 B-2 and MBB-BK117 B-2D**

Registration Mark: _____

Serial No.: _____

Year of Manufacture: _____

IT IS THE OPERATOR'S RESPONSIBILITY TO MAINTAIN THIS MANUAL IN A CURRENT STATUS IN ACCORDANCE WITH THE LIST OF EFFECTIVE PAGES.

This manual is part of the above designated helicopter. It includes the material to be furnished to the pilot as required by FAR Part 29.

The "Airworthiness Limitations" section of the Rotorcraft Maintenance Manual shall be complied with.

THIS MANUAL MUST BE CARRIED IN THE HELICOPTER AT ALL TIMES.

Original Issue - January 17, 1992

Approved by:

Luftfahrt-Bundesamt
Braunschweig

Published by:

EUROCOPTER DEUTSCHLAND GmbH

TAIC Safety Recommendation

On 26 February 2025, the Commission recommended to the Director of Civil Aviation at the Civil Aviation Authority of New Zealand that they promote, through the appropriate International Civil Aviation Organization (ICAO) forum, the need for additional information to be included in all rotorcraft flight manuals, to assist pilots in avoiding Vortex Ring State. (004/25)

On 26 February 2025, the Commission recommended that Kawasaki Heavy Industries revise the Kawasaki BK117 B-2 Flight Manual to include specific data for Vortex Ring State to assist pilots in avoiding this phenomenon. (001/25)

EFFECTIVITY *This cover sheet shall not be used for French registered helicopters*

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TITLE
Rev. 6

0 - 1

TAIC Safety Recommendation

On 26 February 2025, the Commission recommended to the Director of Civil Aviation at the Civil Aviation Authority of New Zealand that they promote, through the appropriate International Civil Aviation Organization (ICAO) forum, consideration for the requirement and implementation for Vortex Ring State alerting systems to be installed in new helicopters. (002/25)

What does this mean for your future investigations

- VRS can contribute to helicopter accidents, and known VRS recovery methods don't always work
- Failed safety barriers can indicate the need for new safety barriers
- Considering data from different sources can reveal new ideas
- Transfer your knowledge to those that can make a difference

Transport Accident Investigation Commission

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Questions?

www.taic.org.nz