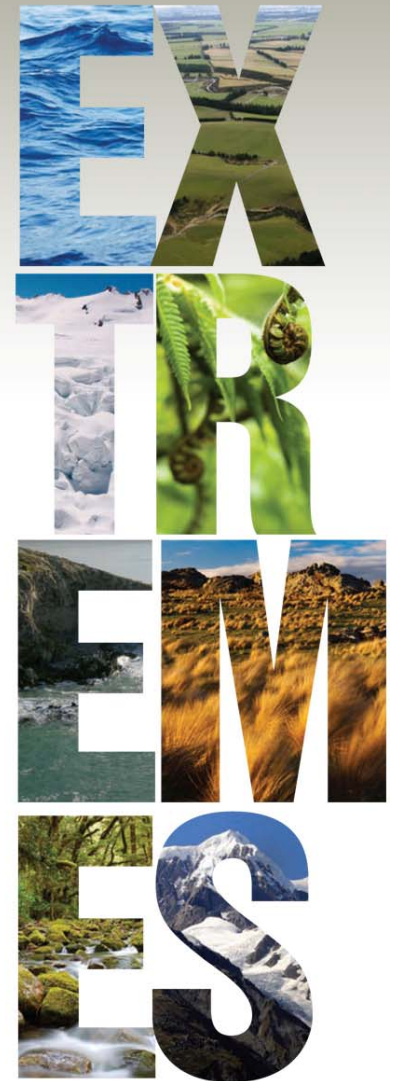


# Aviation Physiology Training (new evidence on hypoxia training and training developments in RNZAF)

Flying Officer  
Gareth Iremonger  
RNZAF

INTERNATIONAL SOCIETY OF AEROMEDICAL SERVICES  
22ND SCIENTIFIC MEETING  
**ISAS2010**



08 September - 11 September 2010  
CHRISTCHURCH | NEW ZEALAND



# Aviation Physiology Training and RNZAF Training Developments

Flying Officer Gareth Iremonger BSc MSc Hons  
Aerospace Physiologist



# Expression of Interest



The Royal New Zealand Air Force Aviation Medicine Unit offers training commercially and as such discloses this interest

The conclusions and opinions expressed in this presentation are those of the author cultivated in the freedom of expression and academic environment. They do not reflect the official position of the the Royal New Zealand Air Force

# Presentation Outline



- Hypoxia Awareness Training
- New Hypoxia Training Profiles
- Rapid Decompression Training
- Night Vision Device Training

# Hypobaric Training

- Widely used by military aviation organisations
- ASIC Air Standard
- NATO Standardisation Agreement



# Hypobaric Training

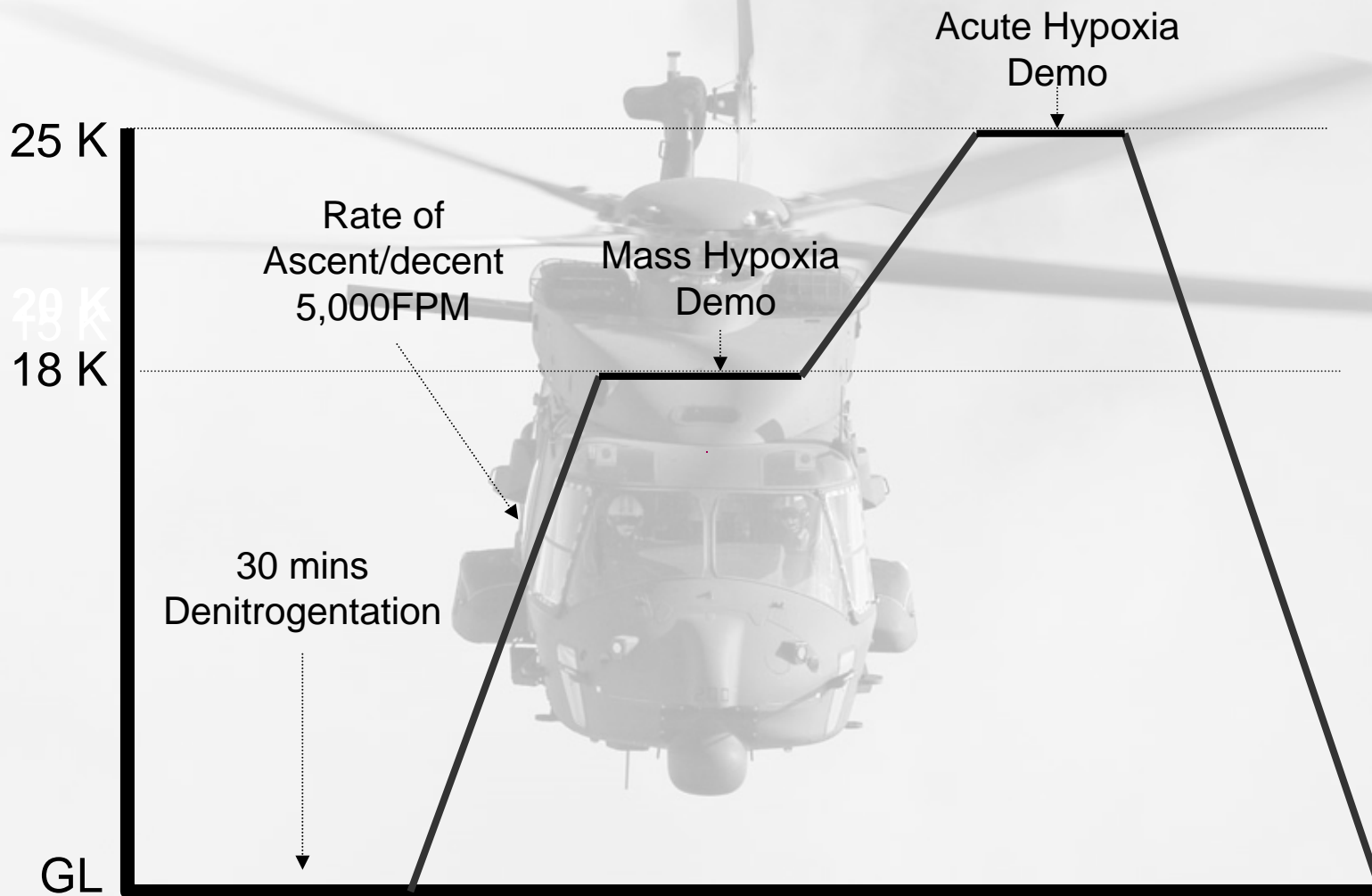


# Aims of Hypoxia Training

- Prevention of hypoxia accidents and incidents through
  - Increased appreciation of risk
  - Improved recognition of symptoms
  - Improved recognition of signs in others



# RNZAF Type 1 Hypoxia Profile



# Published Research



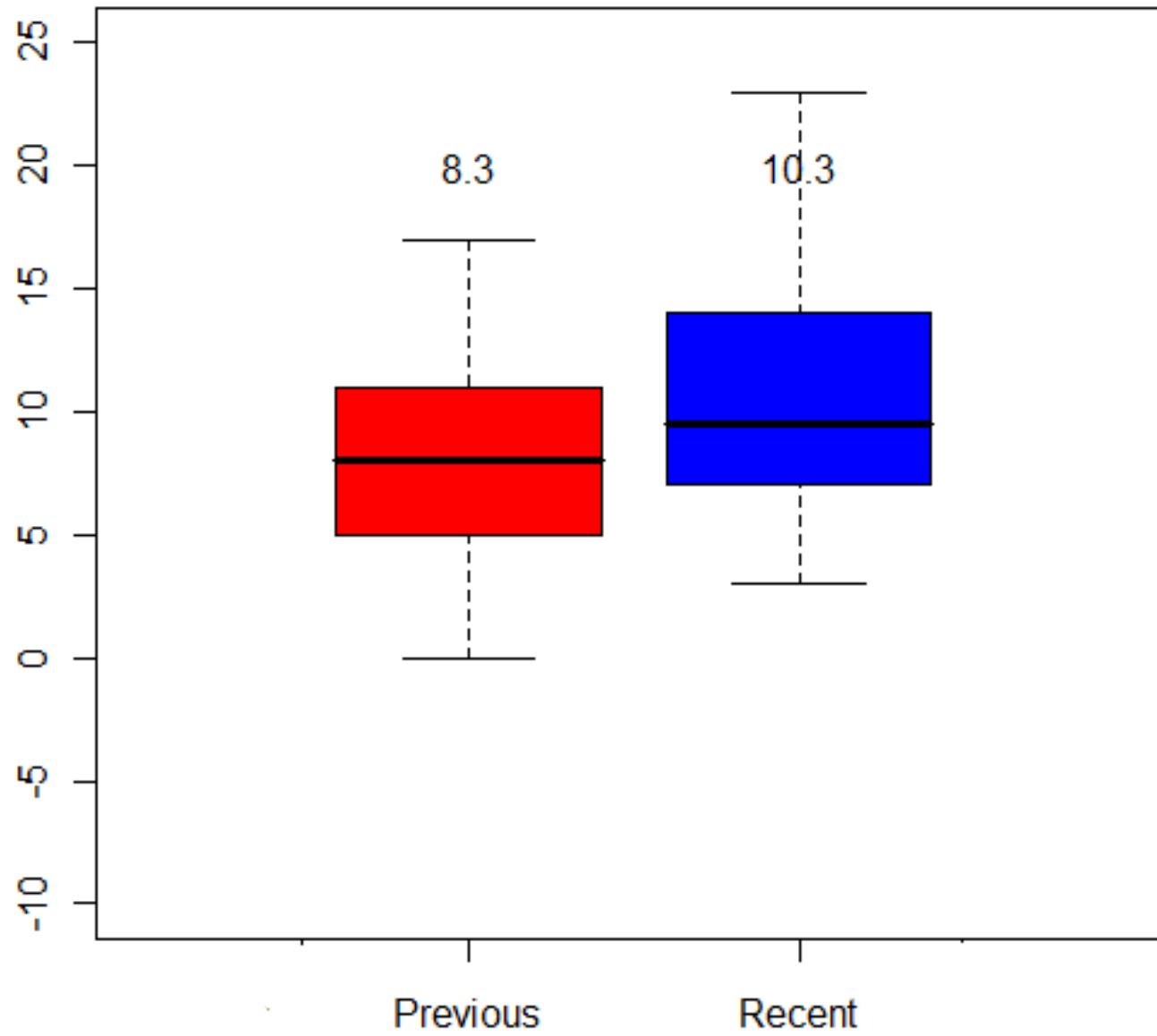
- Cable 2003; Trained aviators recognised symptoms, no comparison group
- Woodrow, Webb 2010; Correlation of hypoxia symptoms between 5 year trg
- **Smith 2008; 'Hypoxic Signature'**

# RNZAF Study

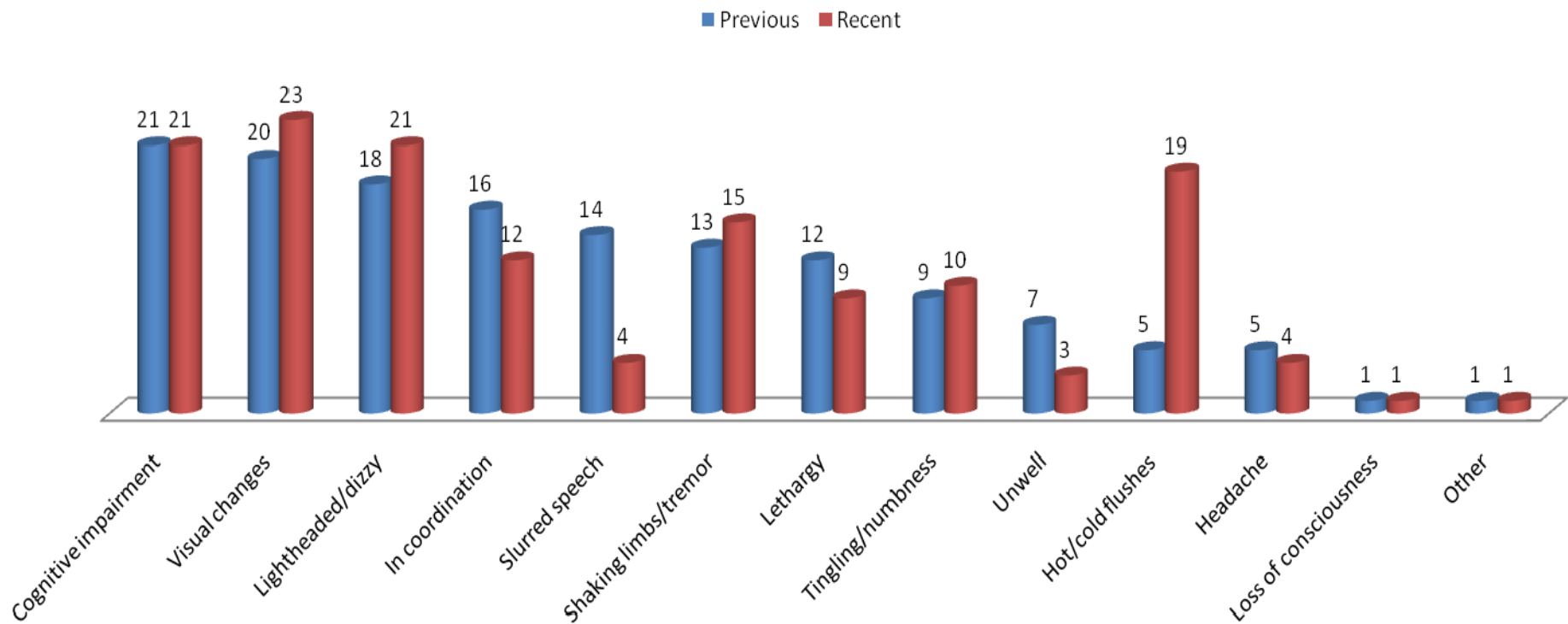


- To test whether the aircrew's memory of their 'hypoxia signature' was stable over varying durations, especially greater than 3 years
- If possible establish the pattern of change over time

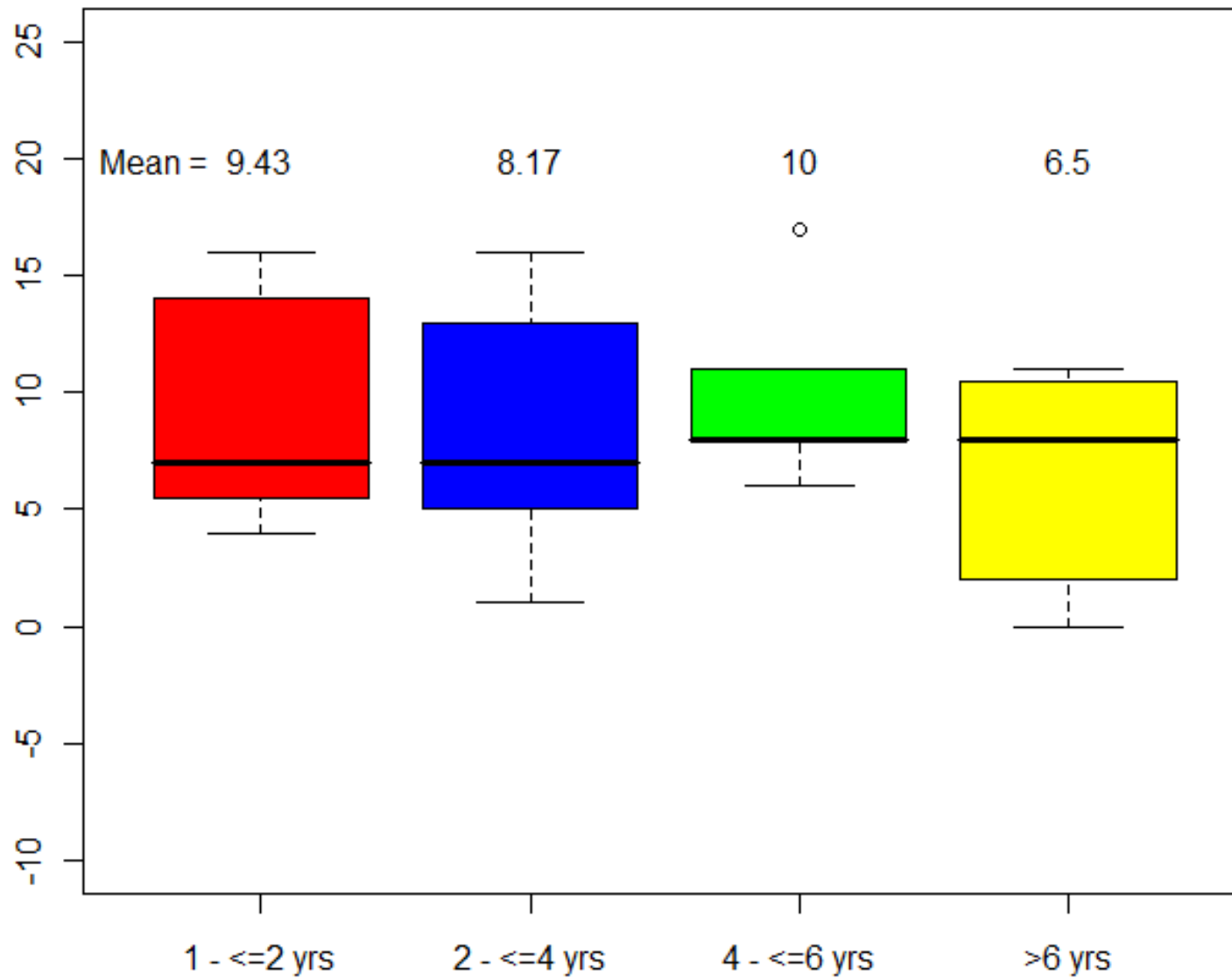
## Hypoxia Scores (Previous and Recent training)



**Fig 1a Frequency of symptoms experienced  
(Previous and Recent training)**



## Previous Hypoxia Scores by time since previous training



# Conclusions



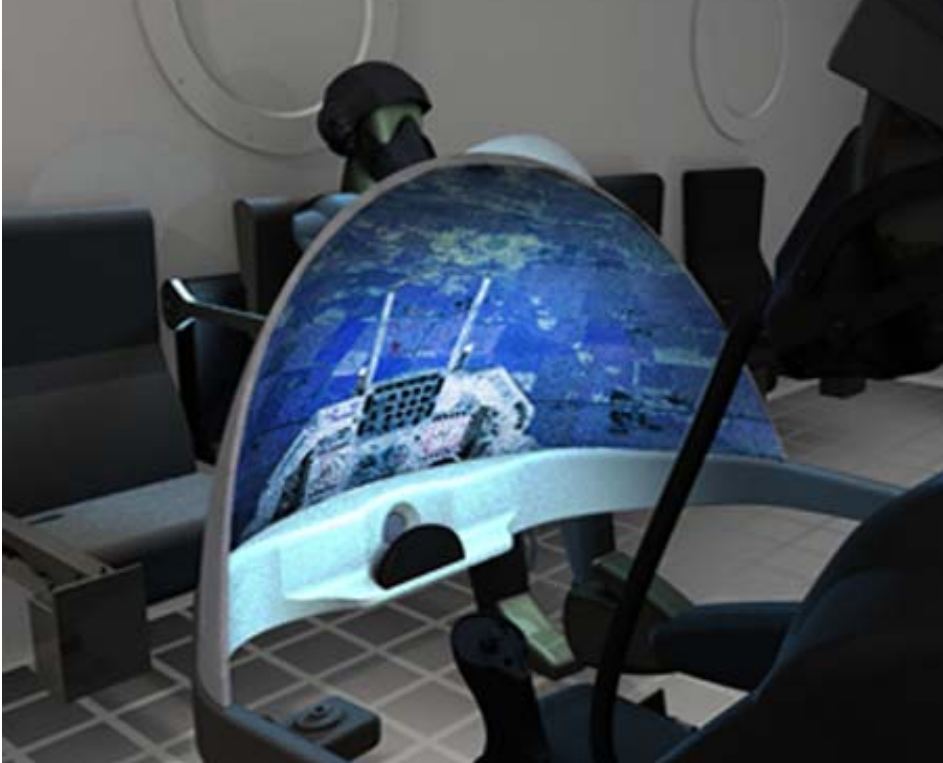
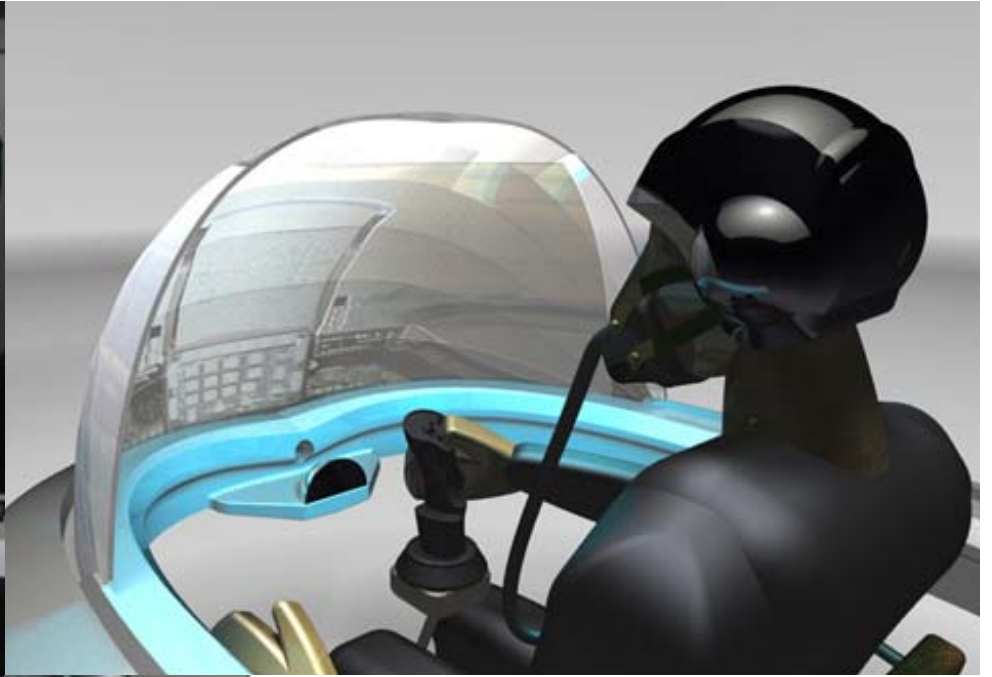
- ‘Hypoxia signature’ replicated
- Symptom replication is reliable enough to confer training benefit for periods exceeding 5 years
- Pattern of change over time not clearly established
- There was no difference in the frequency of most hypoxia symptoms

# Unanswered Questions



- What is the optimal frequency of refresher training?
- Is hypoxia awareness training the best way of mitigating the risk?
- Is the training operationally significant?







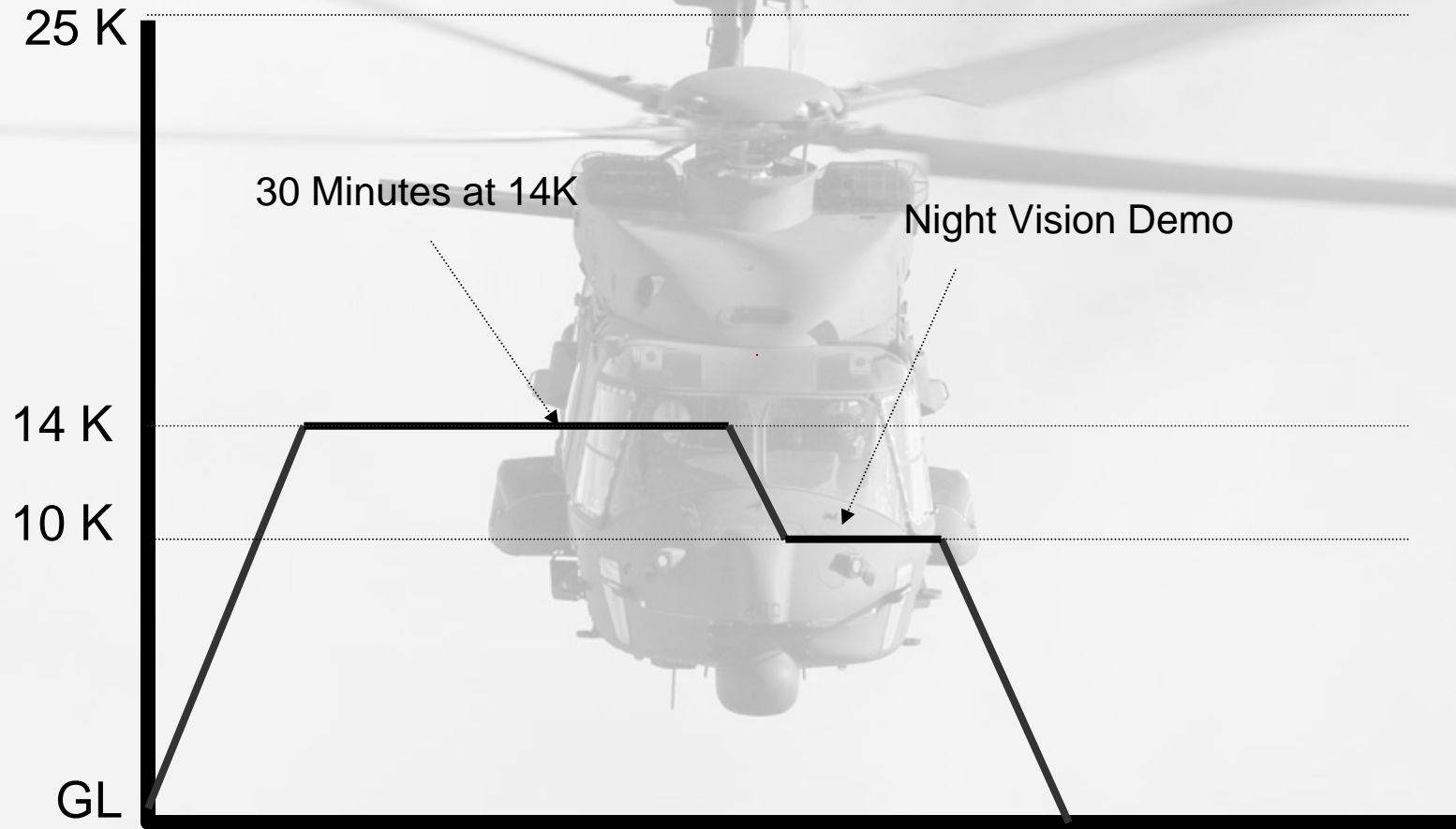
# Low Altitude Hypoxia Training Rotary Wing Operators

# The Rationale for Change



- Traditional hypoxia training
  - Poor match with rotary environment
  - DCS risk
  - Takes longer
  - Pre and post run restrictions

# RNZAF Type 3 Hypoxia Profile



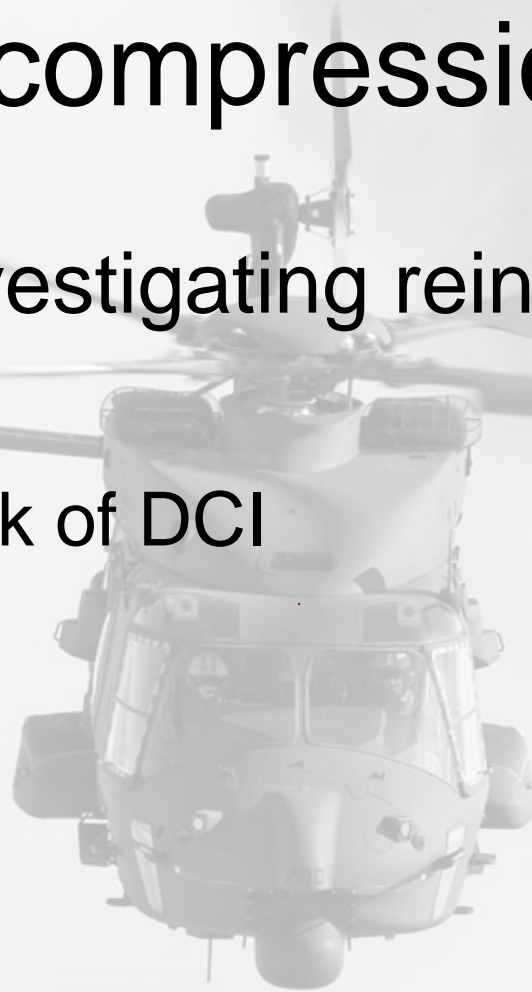
# Experience to Date



- Data re aircrew acceptance from trials
- Safety Considerations
- Planned improvements
  - Visual demonstration at 14K
  - Use of NVG for monitoring

# Rapid Decompression Training

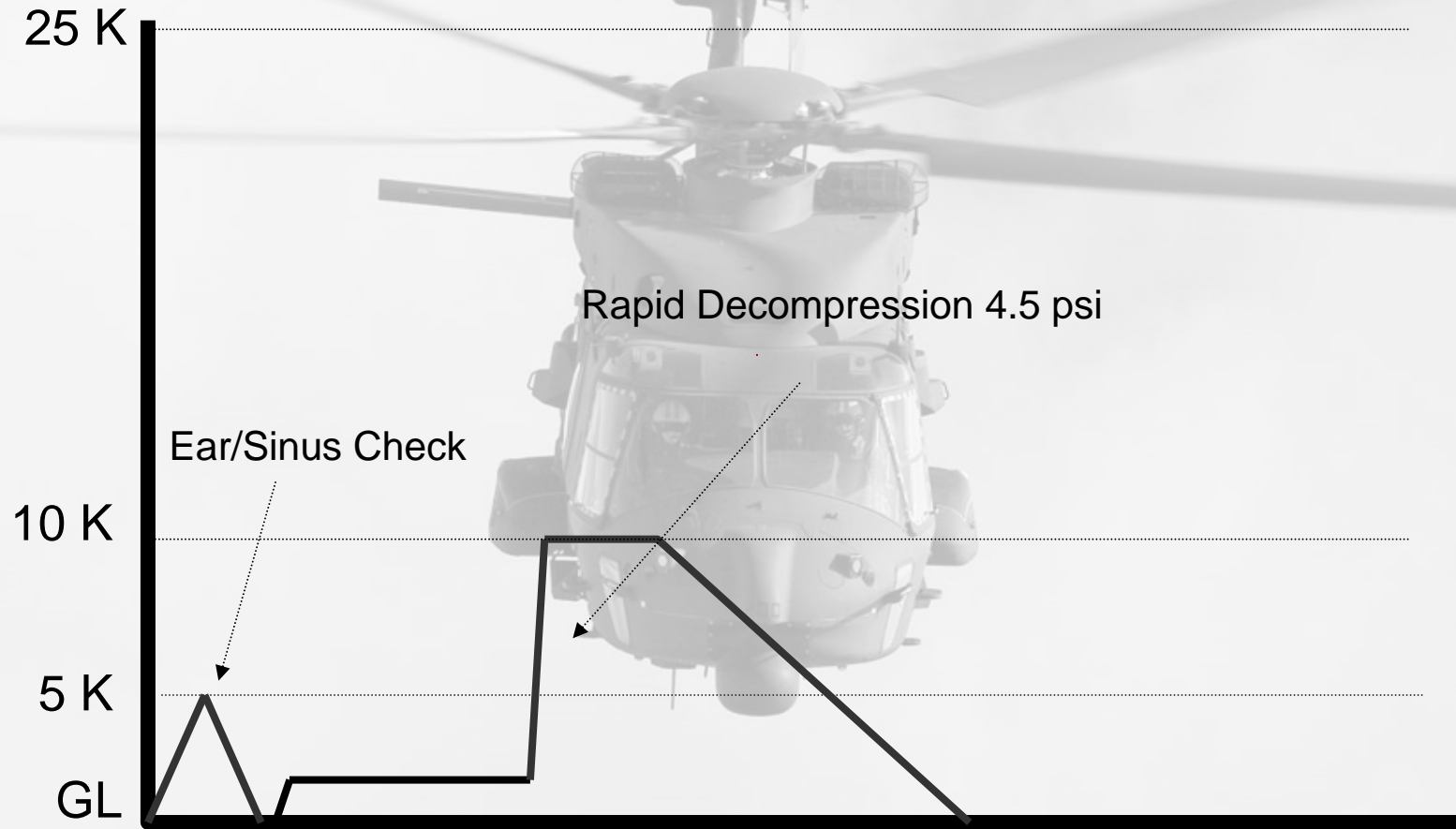
- Currently investigating reintroduction
- New profiles
  - Lowered risk of DCI



# RNZAF Rapid Decompression Profile



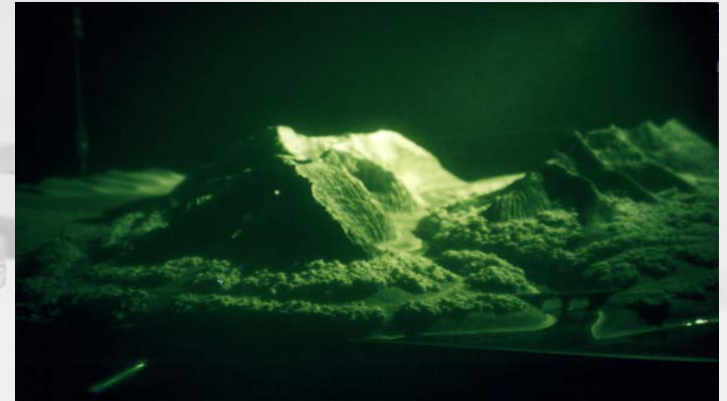
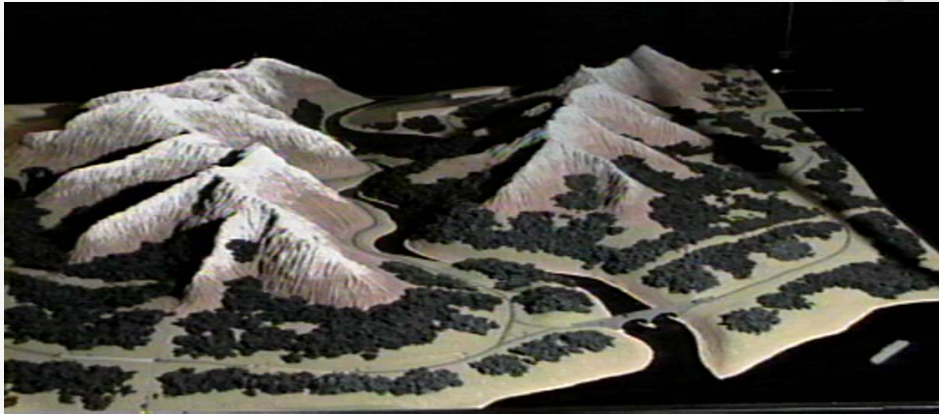
# RNZAF Rapid Decompression Profile



# Future NVG Training



# Physical Terrain Board

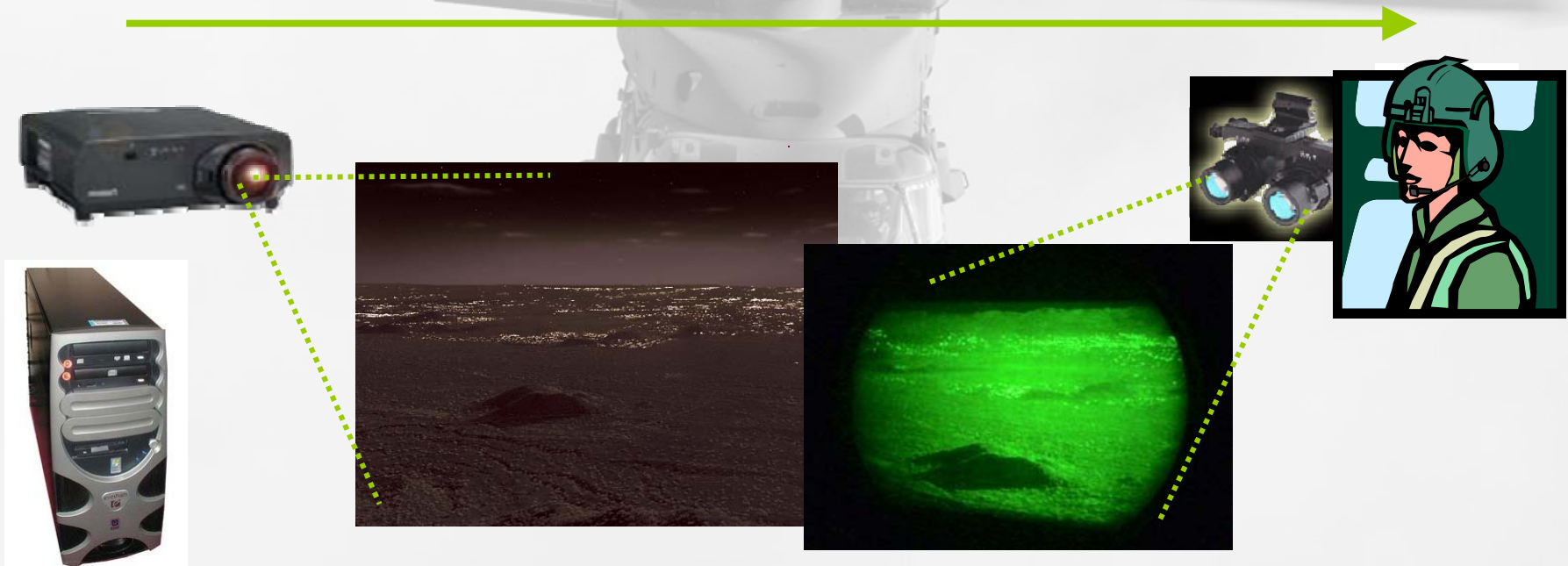


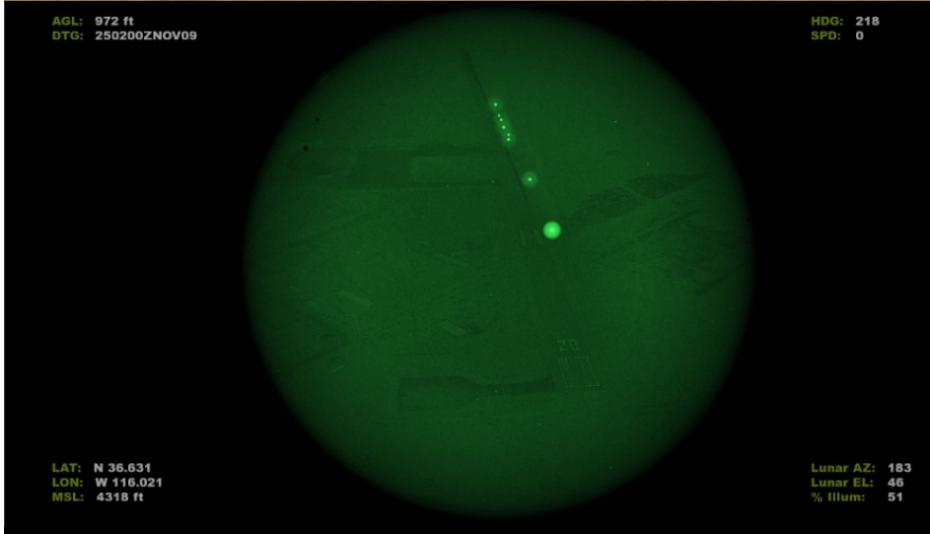
- Static, limitations, large foot-print, must have dedicated room.



# VTB Concept: Sensor Stimulation

- The Virtual Terrain Board is a Night Vision Goggle Sensor Stimulation system to replace physical terrain board instruction.







# QUESTIONS

For more information please contact:

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# Hypoxia Training Alternatives

- Reduced Oxygen Breathing Device (ROBD)
- Combined Altitude and Depleted Oxygen (CADO)



# High Contrast, High Illumination Scene



# High Contrast, Low Illumination Scene

