When Paramedics become Designers for Helicopter Emergency Medical Services

2026 Aeromed Conference

Presented by

Jon Kerr

Northern Rescue

Specialist Air Ambulance and Rescue Helicopter Service

Located Auckland and Whangarei

- Servicing people of Northland, Auckland, and Coromandel

Provide:

- Pre-hospital clinical and critical care, Inter hospital, Search and Rescue services, 24 hours a day, 365 days a year



Northern Rescue

RESCUE

Northern Rescue proudly owns and operates Northland and Auckland Westpac Rescue Helicopters

FLIGHT STRUCTURES LTD
DESIGN, BUILD, CERTIFY

Flight Structures ltd

CAA Part 146 Design & Part 148 Manufacturing Organisation

30 Staff

Office and Manufacturing Workshop

Specialists in:

- All things Part 23 aircraft
- Emergency Medical Services (EMS)
- Agricultural Aircraft

Finish-up business



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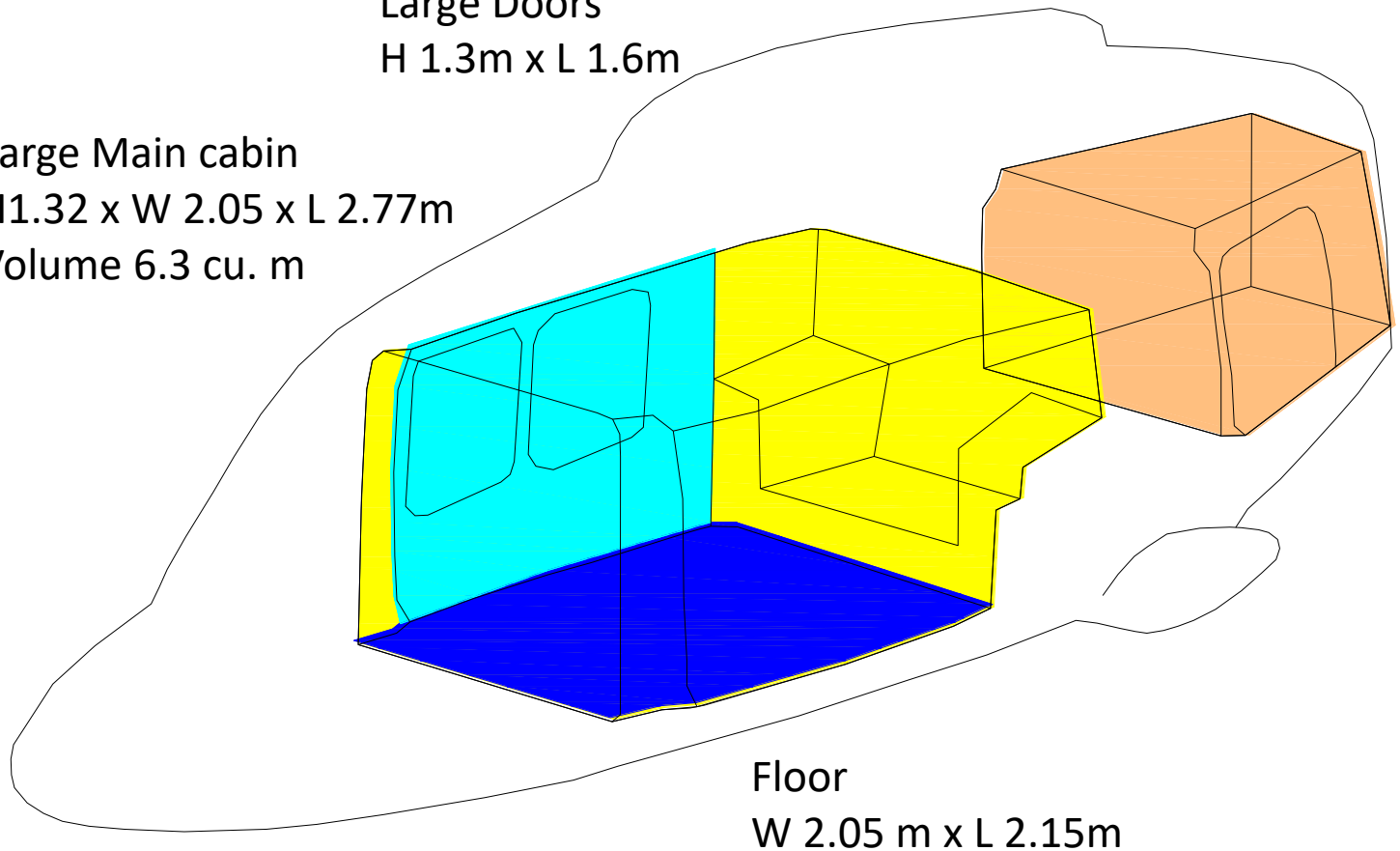
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AW169 HEMS Space

Crashworthy seats with
torso restraints
Crash resistant fuel cell

Large Doors
H 1.3m x L 1.6m

Large Main cabin
H1.32 x W 2.05 x L 2.77m
Volume 6.3 cu. m



Baggage compartment
H 0.85 x W 1.65 x L 1.25m
Volume 1.4 cu. m

Floor
W 2.05 m x L 2.15m

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AW169 Cabin and Baggage Area

Mock Up



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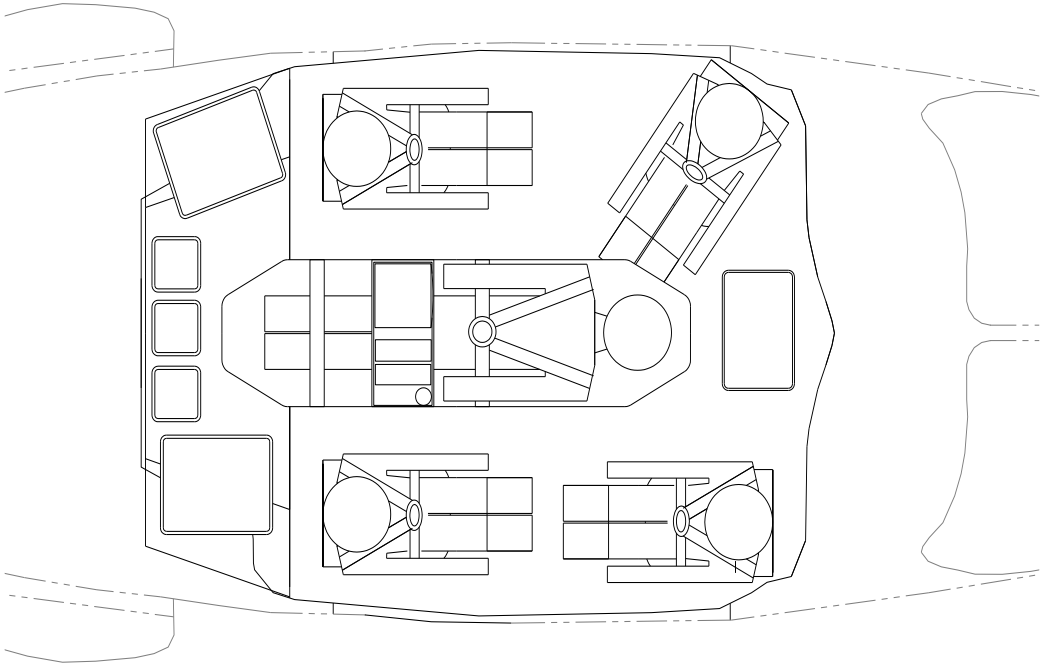
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From Paramedics

AW169 HEMS Specification

- Crew most effective in all phases of primary, inter-hospital, and SAR missions
- Common layout for all missions
- Position stretcher inflight for airway management
- Monitors viewable from any crew position
- Cater for bariatric patients
- Zero-lift loading/unloading
- Configuration change less than 60 seconds
- Oxygen bottle remote from cabin
- Comply with airworthiness requirements



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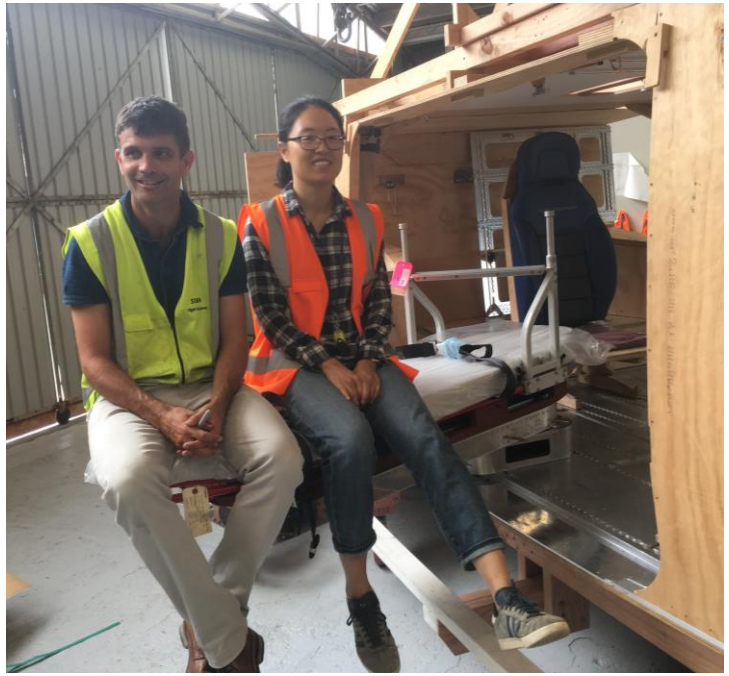
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Communication

Paramedics and Engineers







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Communication

Medical and Aviation Industries

Area	Medical	Aviation
Highly Regulated	Ministry of Health	Civil Aviation Authority
Educated Workforce	Nurses Doctors	Pilots Engineers
Expensive Equipment	$40,000 for a cardiac monitor/defibrillator	$2,200 for the mount for the cardiac monitor/defibrillator
Alpha Types	Doctors	Pilots
Safety Focus	Patients and Staff	Aircraft and Occupants

- Doctor to Pilot:
  "You are my chauffeur"
- Pilot to Doctor:
  "You are my payload"

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Communication

Medical Aviators and Engineers

Area	Medical Aviators	Engineers
Priority	Patient Care	Airworthiness
People	Paramedics Crewmen Doctors Pilots	Engineers Designers
Design Expertise	Where the defibrillator should be mounted	How the defibrillator should be mounted
Alpha Types	Doctors & Pilots	?
Safety Focus	Patients and Staff	Aircraft and Occupants

- Pilot to Engineer:
  "You work for me"
- Doctor to Engineer:
  "No, you work for me"

Engineers Designing
Stretcher Position



Feet over fuel cell to provide space forward of head



Patient height to suit crew in seated position

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Paramedics Designing
Stretcher Position





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Paramedics Designing
Loading System





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Paramedics Testing
Loading System







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Paramedics Designing
Medical Bridge





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Monitors

Rotatable and Removeable







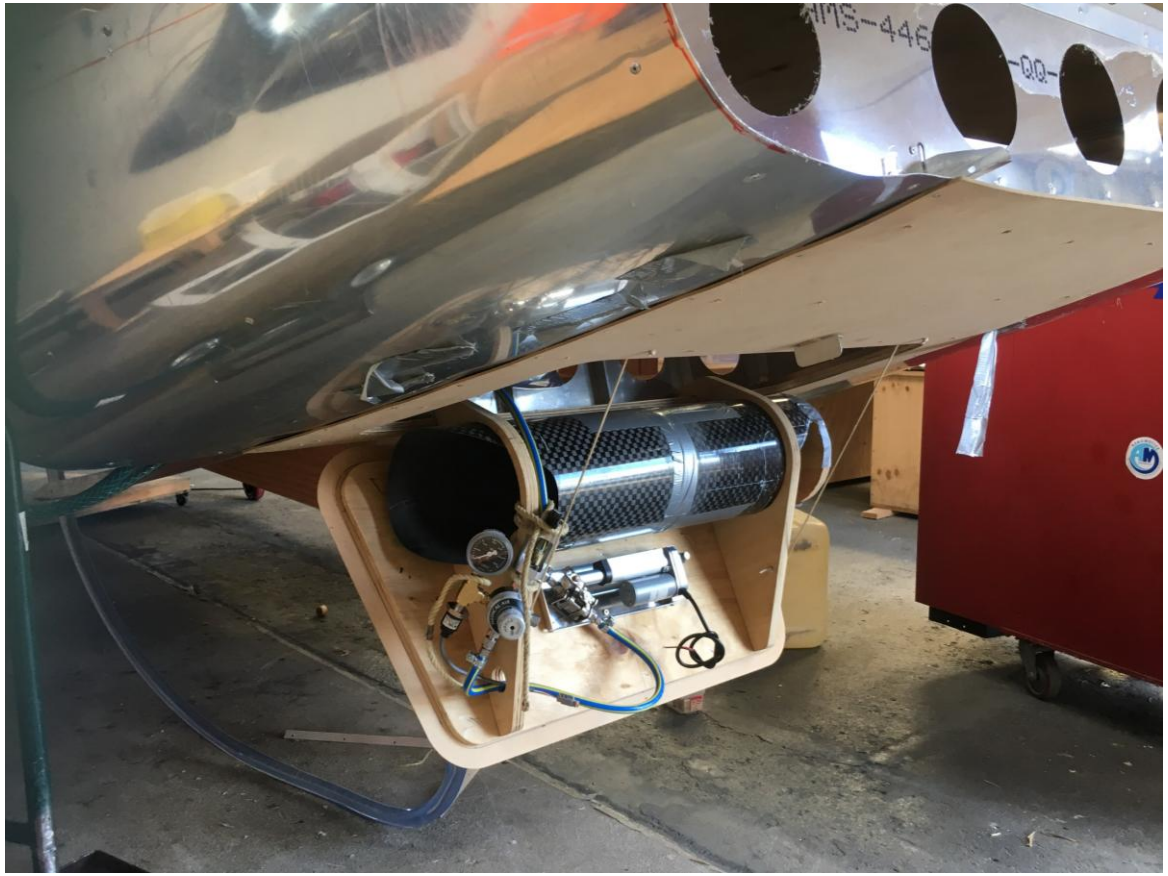
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Oxygen Bottle

Remote from Cabin





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Oxygen Bottle

Remote from Cabin



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WHERE DO GOOD IDEAS COME FROM?

Who knows the idea is good?





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Paramedics Designing
Hoist Stretcher Loading System





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Paramedics Flight Testing

Hoist Stretcher Loading System



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Ross



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Ross Testing

Head Path Obstructions











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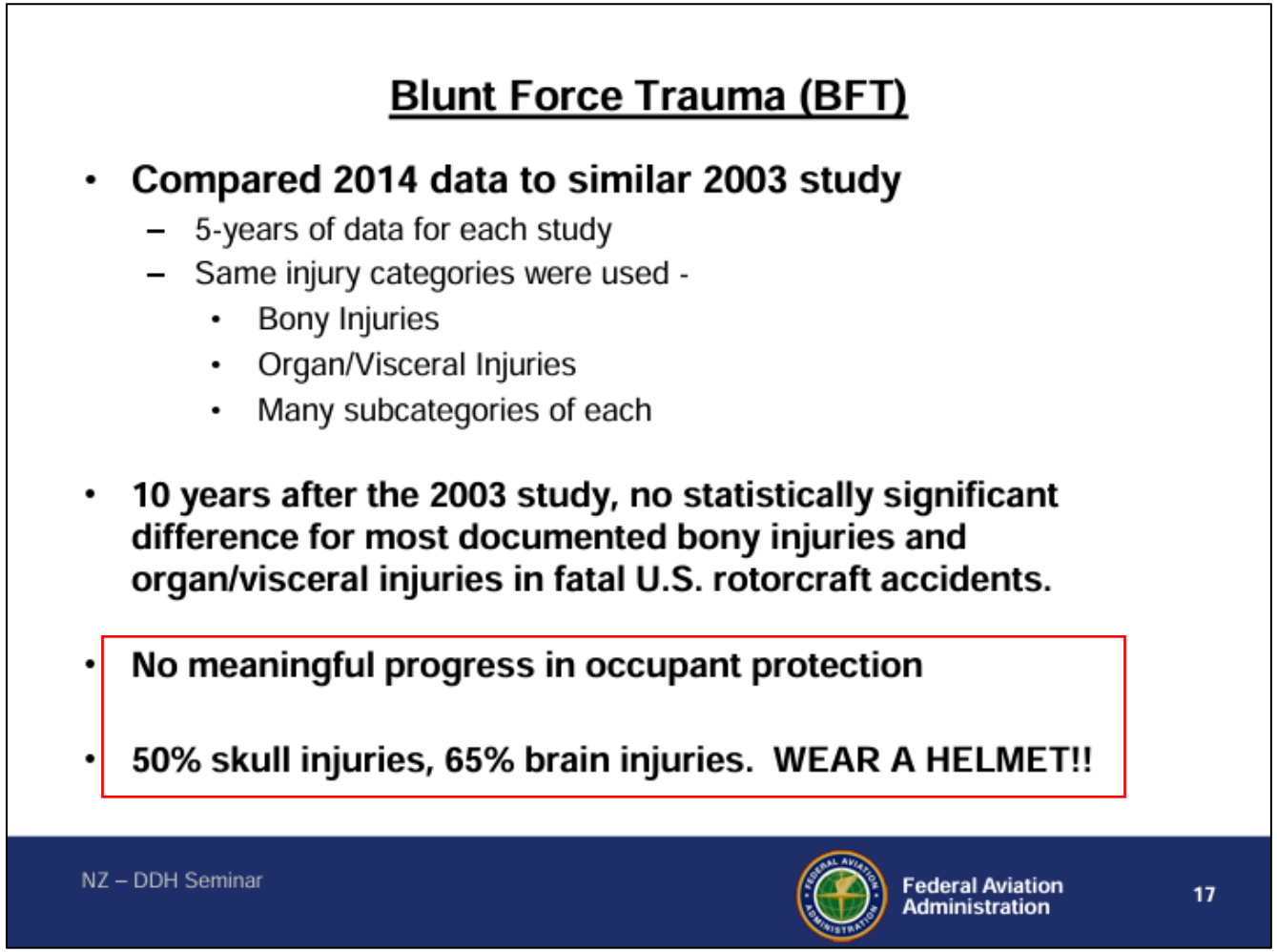
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Safety Effect of New Regulations

FAA Study



Blunt Force Trauma (BFT)

- **Compared 2014 data to similar 2003 study**
  - 5-years of data for each study
  - Same injury categories were used -
    - Bony Injuries
    - Organ/Visceral Injuries
    - Many subcategories of each
- **10 years after the 2003 study, no statistically significant difference for most documented bony injuries and organ/visceral injuries in fatal U.S. rotorcraft accidents.**
- **No meaningful progress in occupant protection**
- **50% skull injuries, 65% brain injuries. WEAR A HELMET!!**

NZ – DDH Seminar

Federal Aviation Administration

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Bariatric Stretcher

Physics vs Regulation





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Transport Nurses Designing
Incubator Position





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NICU
Flight Nurse

Thanks for coming





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