ADVANCES IN HELICOPTER PASSENGER TRANSPORT SUIT SYSTEMS

ALICE CANNON – DESIGN ENGINEER
ADVANCES IN PASSENGER IMMERSION SUITS

Survitec Pedigree and Heritage

Accident – Lessons Learned
Need for a better suit…
Improved fit, easier to don and doff, optimised buoyancy, integrity of wrist and neck seals
IMMERSION SUIT DEFICIENCIES
CANADA MARCH 2009

• ‘The use of improper PTSS fitting techniques may result in unacceptable levels of water ingress and a subsequent rapid loss of body temperature, following a ditching or crash at sea.’

• ‘At that time, determination of PTSS size was based on visual estimates of height and weight, hood donning ability and the passenger’s assessment of mobility.’

• ‘A properly fitted PTSS is somewhat uncomfortable; therefore, most passengers were selecting a PTSS that was comfortable, but too large.’

• ‘The water ingress was likely due in part to inadequate PTSS seals around the face (hood seals) and wrists (wrist seals) resulting from the survivor wearing a PTSS that was too big.’

Findings from Aviation Investigation Report by Transportation Safety Board of Canada (Aviation Investigation Report A09A0016)
IMMERSION SUIT DEFICIENCIES
CANADA MARCH 2009

Intimacy of the end user operating environment

Design Engineer underwent helicopter underwater escape training.

Visited oil rigs in Hibernia Oil Field

Extreme Environmental Conditions
HPTSS FEATURES

- Air Release Valves (Shoulders)
- Neoprene Hood
- Nose Clip Pocket
- Mouth Piece Retainer
- HUEBA Stowage Pocket
- Neoprene Neck Seal (Under Hood)
- Gloves
- Buddy Line
- HPTSS FEATURES
- Adjustable Waist Belt
- LPU Inflation Handle
- Adjustable Crotch Strap
- Neoprene Wrist Seal (Under Glove)
- Air Release Valves (Ankles)

Canadian Spec:
CAN/CGSB-65.17-2012
HPTSS SIZING

Survitec optimised sizing solution

Ectomorph  Mesomorph  Endomorph
HPTSS FEATURES

Seals and Gloves

Neoprene Boots

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HPTSS FEATURES

- Air Release Valves
- Donning/Doffing Zip
- Buddy Line
HPTSS FEATURES
HUEBA STOWAGE

- HUEBA (Helicopter Underwater Emergency Breathing Apparatus) stowed in an enclosed neoprene pocket
- Minimises HEUBA as potential snag
- Access to control knobs
- 2 cubic feet cylinder
- Weight supported by waist belt
- Pocket design prevents air entrapment
HPTSS FEATURES
THERMAL LINER

• PCM for thermal comfort
• 3D knit spacers inserts to the rear
• Anti-microbial liner
• Thermal requirements 0.75 tog
• Similar liner in use since 2009
HPTSS FEATURES
LIFE PRESERVER

Adjustable Waist Belt

Integral Crotch Strap/Back Strap
QUALIFICATION TESTING

- Colour of Suit System-Exterior
- Seam Integrity – Breaking Strength
- Seam Integrity – Water penetration
- Mechanical Inflation Valve
- Floatation chambers
- Tensile Strength After Ageing
- Tear Strength After Ageing
- Coat Adhesion Strength After Ageing
- Coated Fabrics – Gas Permeability
- Seam Tape – Tensile Strength
- Webbing – Tensile Strength
- Thread – Tensile Strength
- Fungus Growth
- Flame exposure
- Floatation Buoyancy / Escape Buoyancy

To name a few....
CONCLUSIONS

• Increased size role

• Improved fit

• Increased comfort

• Primary and Secondary seals

• HUEBA
  • New Transport Canada Safety Standard
  • Approximately 21 breaths at 6.4m, based on breathing rate of 10.5 bpm

The Evolution of the Survitec HPTSS – For 50+ years Survitec has been the trusted partner of choice for Design, Manufacture and Sustainment of Survival Solutions for use in the most extreme and demanding environments
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