

Effect of Training on Helicopter Ditching Survival Rates



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Presentation Outline

- Background
 - Contextual interference
 - Cognitive/Physical fidelity
 - Offshore HUET program
 - Military HUET program
- Methods
 - Helicopter ditching report analysis (2000-2009)
- Results
 - Survival comparison
- Discussion
 - Fidelity
 - Overall assessment



Contextual Interference

- Training systems that includes random presentation of task requirements and increases difficulty beyond existing capabilities.
- Also known as:
 - Stress inoculation training
 - *In vivo* flooding
 - Perturbation training
 - Error management training



Cognitive/Physical Fidelity

- **Cognitive fidelity** is the degree to which the simulation replicates the psychological factors (e.g., stress, anxiety) found in the real-world. (Allen et al., 1986)
- **Physical fidelity** is the degree to which the simulation replicates the look and feel of equipment found in the real-world.
 - Negative transfer of skills



Offshore HUET Program

- Basic Offshore Safety Introduction and Emergency Training (BOSIET)
- Six training exercises
 - Upright no exit – breath hold
 - Upright exit – breath hold
 - Upright exit – rebreather
 - Inverted no exit – breath hold
 - Inverted no exit – rebreather
 - Inverted exit – rebreather
 - **Note:** *rebreather procedure is always completed before inversion*
- Retraining every four (4) years



Offshore HUET Program

- Deploy rebreather at surface
- Average time 12.25 seconds (n = 12)



- Chen, Muller et al. (1993) indicate that 82% of helicopter ditching result in inversion shortly after landing on the water.
- Clifford (1994) reports that 57% of helicopters invert immediately after ditching.
- Taber and McCabe (2007) indicate that 85% of helicopters invert immediately after landing in the water.
- Brooks, MacDonald, Donati, and Taber (2009) indicate that 72 % of the Canadian register helicopters sank immediately after ditching.



Offshore HUET Program

- No international simulation standard
- Google search reveals 33 different levels of physical fidelity
- Trained to egress from the simulator or an actual helicopter?





Military HUET Program

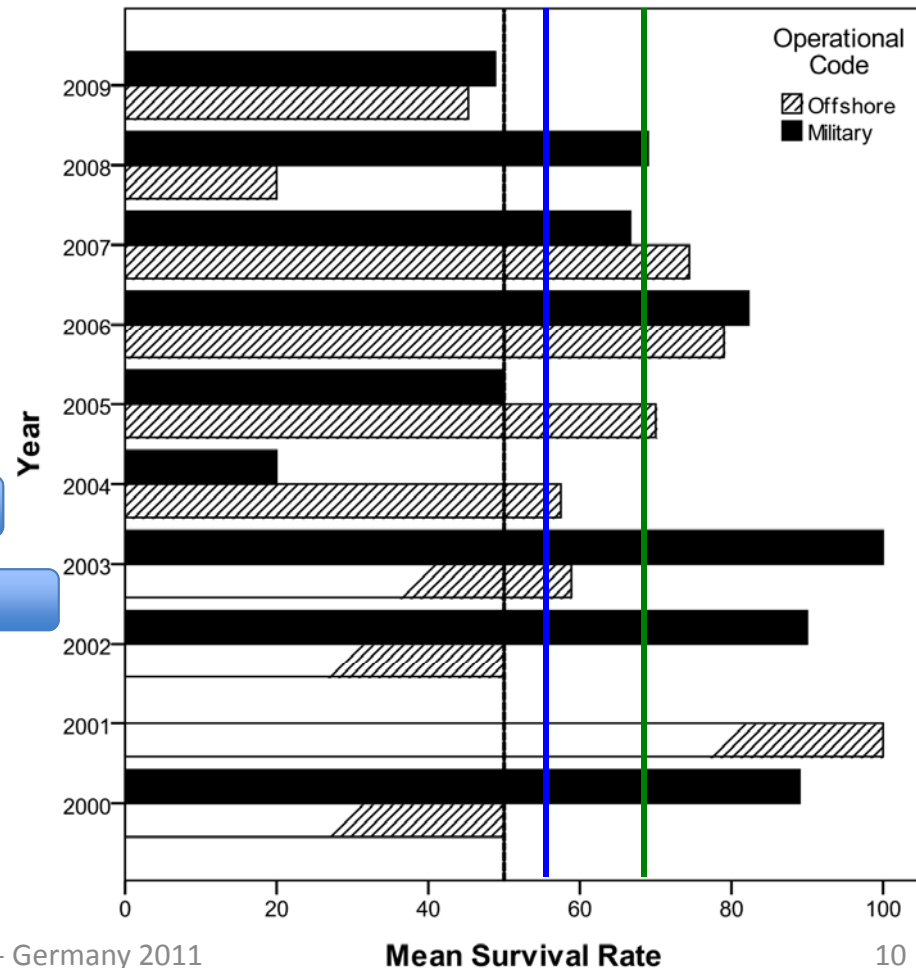
- Rotary wing Underwater Escape Training (RUET)
- Eight training exercises (min) in crew specific seat
 - Inverted no exit – breath hold
 - Inverted exit – breath hold
 - Inverted exit – breath hold – secondary crew position
 - Inverted exit – cross cabin – breath hold
 - Inverted no exit – compressed air (EBS)
 - Inverted exit – compressed air (EBS)
 - Inverted exit – compressed air (EBS) – secondary position
 - Inverted exit – cross cabin – compressed air (EBS)
- Retraining every 1 to 5 years depending on operational settings.





Comparison of Survival Rates (2000-2009)

Group	Offshore	Military
Total Ditchings	82	28
Number Onboard	402	166
Fatalities	169	56
Overall Survival (%)		
>50% Survival	63.4	71.4
Inverted	35/48 (73%)	7/8 (87.5%)
Immediately	32/48 (67%)	7/8 (87.5%)



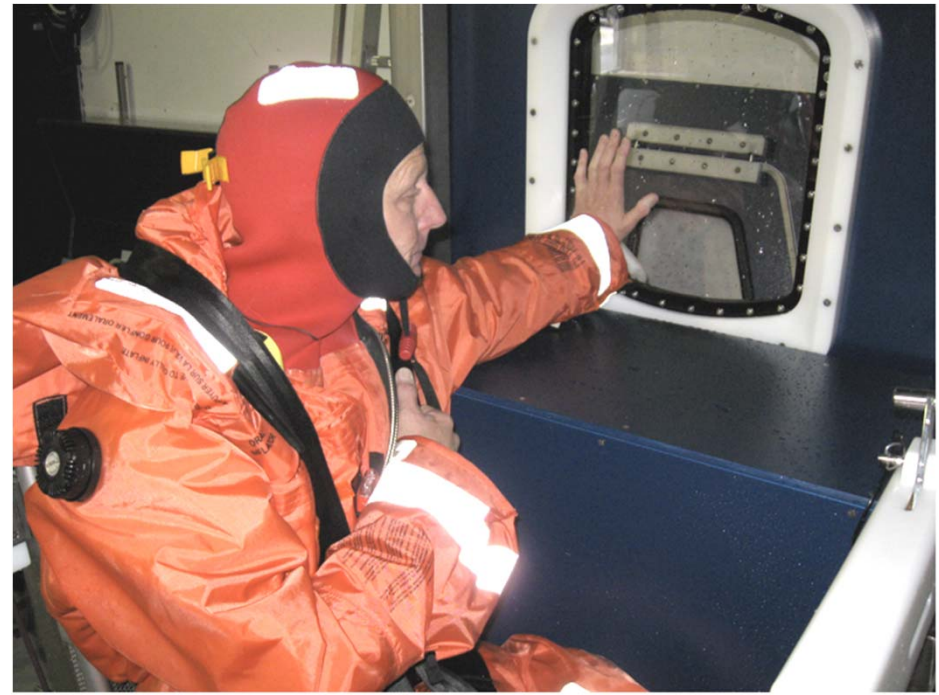








S92 Aux Tank Cabin Exit (actual)



S92 Aux Tank Cabin Exit (simulated)



Discussion

- Contextual interference during training
- Basic Offshore Safety Introduction and Emergency Training (BOSIET)
- Military-based Rotary wing Underwater Escape Training (RUET)
- Physical fidelity
- Cognitive fidelity
- Future research



Questions ?