

OPERATIONAL READINESS FOR RURAL FIREFIGHTERS - ASH & SUSTAINED OPS

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Simulation scenarios:

- Control variables we are interested in
- Consistency in assessment of key measures
- Repeatable conditions
- Compare to other research literature

Three stages in the construction of the simulation:

- *Phase One:* Data collection
- *Phase Two:* Design and development
- *Phase Three:* Trial and refinement

SIMULATION CONSTRUCTION

Phase One: Data Collection

Non-physical aspects of the firefighter task:

- Modified applied cognitive task analysis
- Selected simple tasks that can be done in the simulation
- Well-validated tasks for comparison to past and future work



SIMULATION CONSTRUCTION

Phase Two: Design and Development

Design and Development:

- Volunteer volunteers piloted
- Video footage reviewed by stakeholders, including experienced volunteer firefighters

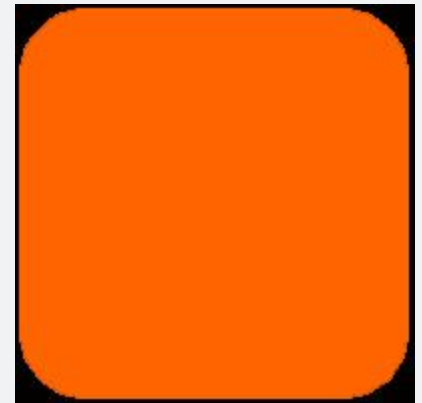
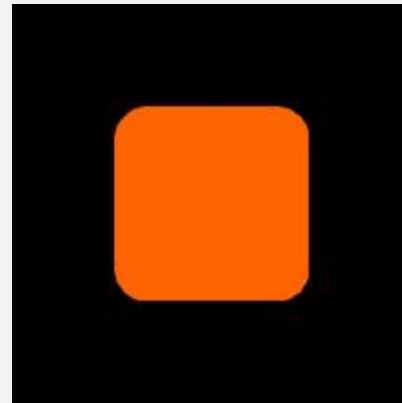
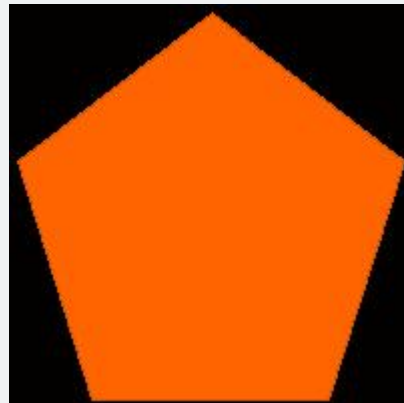
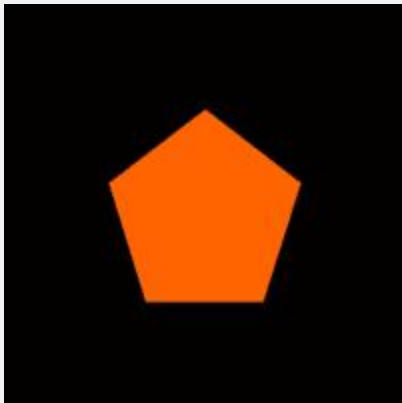


SIMULATION CONSTRUCTION

Phase Two: Design and Development

Complex Attention

- 'Go / No Go'
- Ability to suppress the intuitive response



Yellow

Non-physical test battery

- Piloted in two sites
- Volunteer firefighters participated in partial simulation involving complete test batteries
- Debriefed with researchers and Human Factors specialist for further refinement

Down the track for ASH

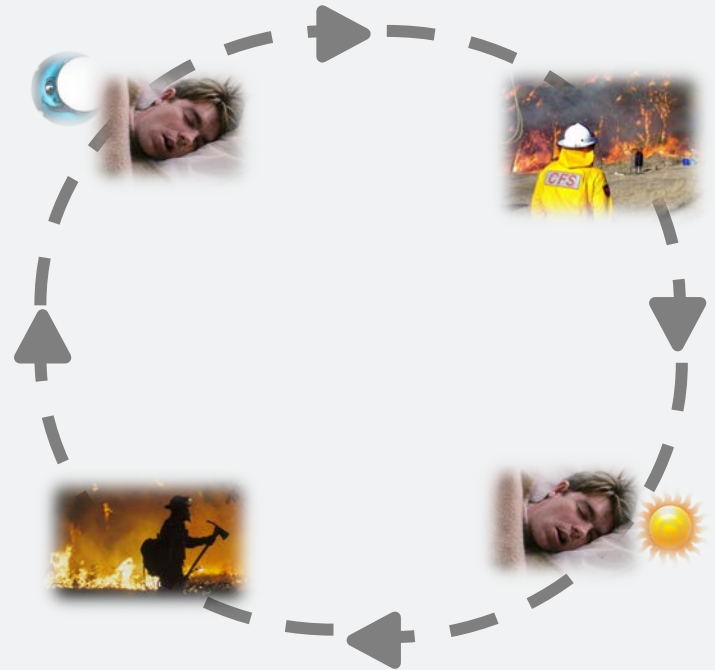
- incident management teams
- crew-based simulations
- community response teams

NON-PHYSICAL TASKS

Environmental and Occupational Challenges

Awake,
smoky, hot

Sustained
operations



1. Propose an alternative rostering strategy for managing fatigue within the context of increasing demands, and
2. Compare the fatigue implications of these novel strategies with that of existing practices

Evaluate whether traditional rostering strategies are the best option to manage fatigue given added demands or if there are alternative or complimentary strategies that might be beneficial.

SUSTAINED OPERATIONS PROJECT

Study Design

Existing data on
single
shifts/sleeps
(Lab data in
control subjects)

Test split
shifts/sleeps
(Biology of the
system using
control subjects)

Firefighters in
scenario designed
to look at
performance and
sleep impacts of
split shifts

Phase 1

Determine the sleep and performance outcomes for healthy young adults working sustained operations rosters

Laboratory protocol

Imposed sleep during sustained operations



Levels of imposed sleep restriction



Data already collected
in a separate study

Phase 2

Compare sleep and performance for fire-fighters during a standard 12-hour and a sustained operations roster

Simulation

Sustained operations



12-hour 'day shift'



12-hour 'night shift'



Phase 1 – Laboratory data

- To be collected early 2012
- Protocols well established, ethics approval obtained, new recruit to the team (post-doc), students starting in 2012

Phase 2 – Simulation of optimised schedule

- Mid-2012
- Design of simulation to be based on ASH but incorporate further stakeholder consultation
- Development of scheduling algorithm

- Instead of standard operations, i.e. replacing 12-hour shift system with a 6-hour or 8-hour shift system for specific groups (e.g. **incident management teams**)
- In conjunction with the standard operations to manage acute fatigue-risks, such as:
 - **the start-up phase of deployments**, i.e. getting personnel from home to the fireground and onto a standard shift rotation in a fit state
 - **transition personnel between day and night shifts**, i.e. managing staff transition due to mental and/or physical fatigue or physical injury
 - **the closing phase of deployments**, i.e. to ensure personnel are in a fit state prior to leaving for home

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