
Helicopter Operations Simulation (HelOS) and applications

Mr David Hammond and Mr Jamie Watson,
Maritime Operations and Tactics Analysis,
DSTO Pyrmont, NSW,
Ph: (02) 9692 1300

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 01 OCT 2003		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE Helicopter Operations Simulation (HelOS) and applications				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Defence Science and Technology Organisation, DSTO Pyrmont, NSW				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES See also ADM001929. Proceedings, Held in Sydney, Australia on July 8-10, 2003., The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 11	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Introduction

The ADF's current Amphibious capability will have reached the end of its service life by 2015

What should succeed this capability?



Desired Effect

**Minimum
Requirements**



Simultaneous Helicopter Lift

- All helicopters arrive at a destination at the same time
- Useful for delivering whole units ashore
- Tricky if less deck spots than helicopters



Launching



Loitering



Refuelling



Helicopter Operations Simulation (HelOS)

INPUTS : Number of helicopters and type, Type of Operation

Number of Deck Spots and types (refuel, launching, park)

Distance to destination

**An Object-Oriented Queuing
model**

Sends

Requests



Helicopter Object



Controller Object

Sends

Directives

OUTPUTS:

Operation Times

Fuel Consumed

Deck Crew Hours

Controller Intensity

Safety Measurement

Past uses

- HelOS has been used in future capability studies to:



- estimate the minimum number of deck spots required to launch a simultaneous lift of n airframe types

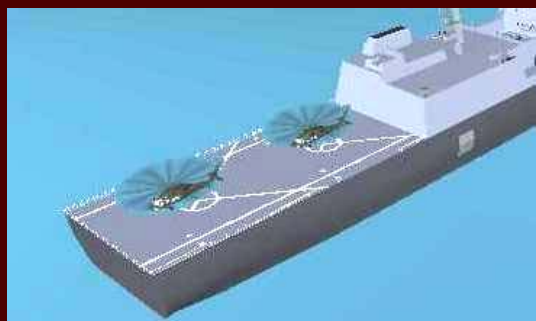


- estimate the benefits of having more than this minimum, i.e. impacts on time, safety etc

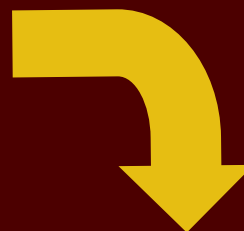
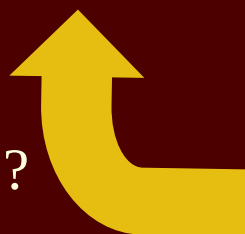


Possibilities for the future: Scheduling

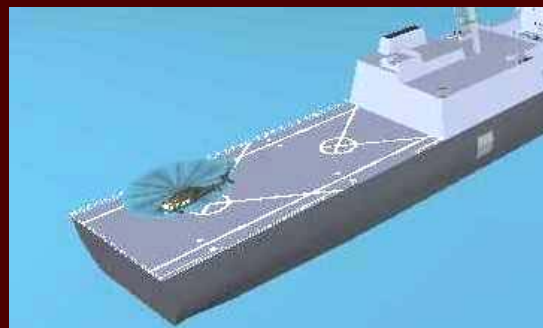
Example: Launching 3 helicopters from 2 spots



...or 1 then 2?



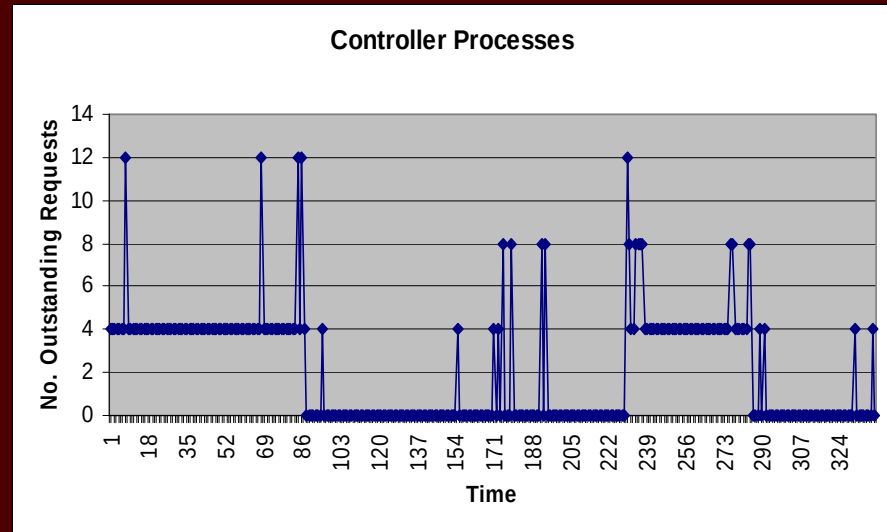
Should you
launch 2 then 1...



**Different schedules affect the work load,
fuel consumption and safety of operation**

Possibilities for the future: C2 issues

- Monitoring the controller activity could offer insight into C2 levels during an operation

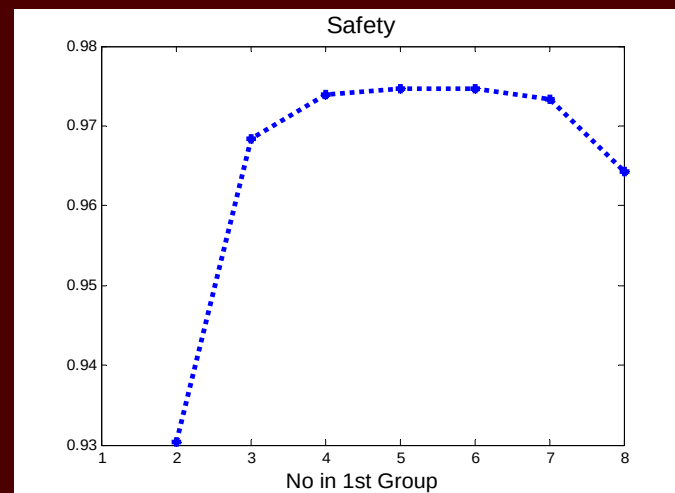
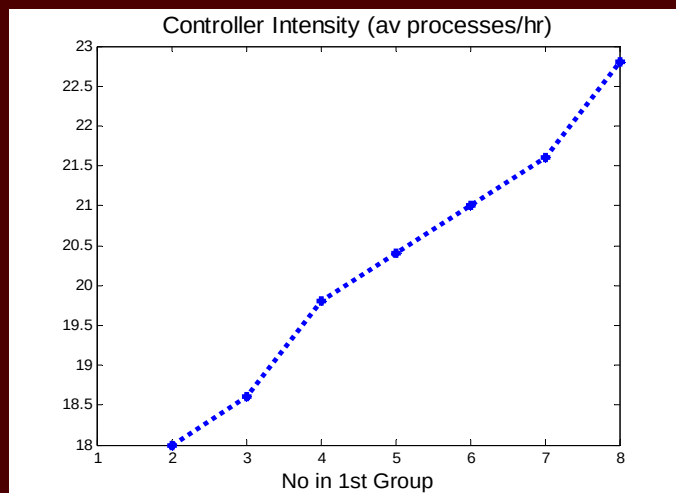


Example of HelOS output

- Trials required (possibly human-in-the-loop) to see how such results map to reality

Possibilities for the future: Developing SOPs

- Using outputs from HelOS, trade offs that occur by altering the operation can be analysed
- Such work could feed the development of ‘optimal’ Standard Operating Procedures



HelOS outputs

At the moment...

- HelOS being shifted from analysis tool to an operators tool
- Integration into Littoral Battlespace Tool Set (LBaTS)
- Research into inclusion of optimisation (ILP)
- Discussions being held to use HelOS for planning ops during EX CROC 03





Summary

- HelOS is an object oriented modelling tool which simulates amphibious helicopter operations
- Useful for analysis of
 - Platform requirements
 - Scheduling and C2 issues
 - SOP development
- Useful for operators as a planning tool



QUESTIONS?