

Eagle Claw Model with SIPmath 3.0 Libraries

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Operation Eagle Claw was a failed special operations mission designed to rescue 52 Americans who had been taken hostage by Iranian revolutionaries in Tehran in November 1979. The Naval Postgraduate School uses it as a case study in Flaw-of-Average based decision modeling as described in the presentation available [here](#).

In the September 2019 PHALANX article on Operational Readiness Rollup by Dohoney, McLemore and Savage we described an earlier [spreadsheet simulation](#) of Eagle Claw based on modeling aircraft failures as Bernoulli random variables.

The Model

The model described here explores a different approach. It uses continuous distributions of flight hours before failure for each of twelve helicopter, stored as JSON objects in a SIPMath 3.0 library. In addition, the user may choose between three potential missions, each with a distribution of hours for completion, which are stored in a separate 3.0 library.

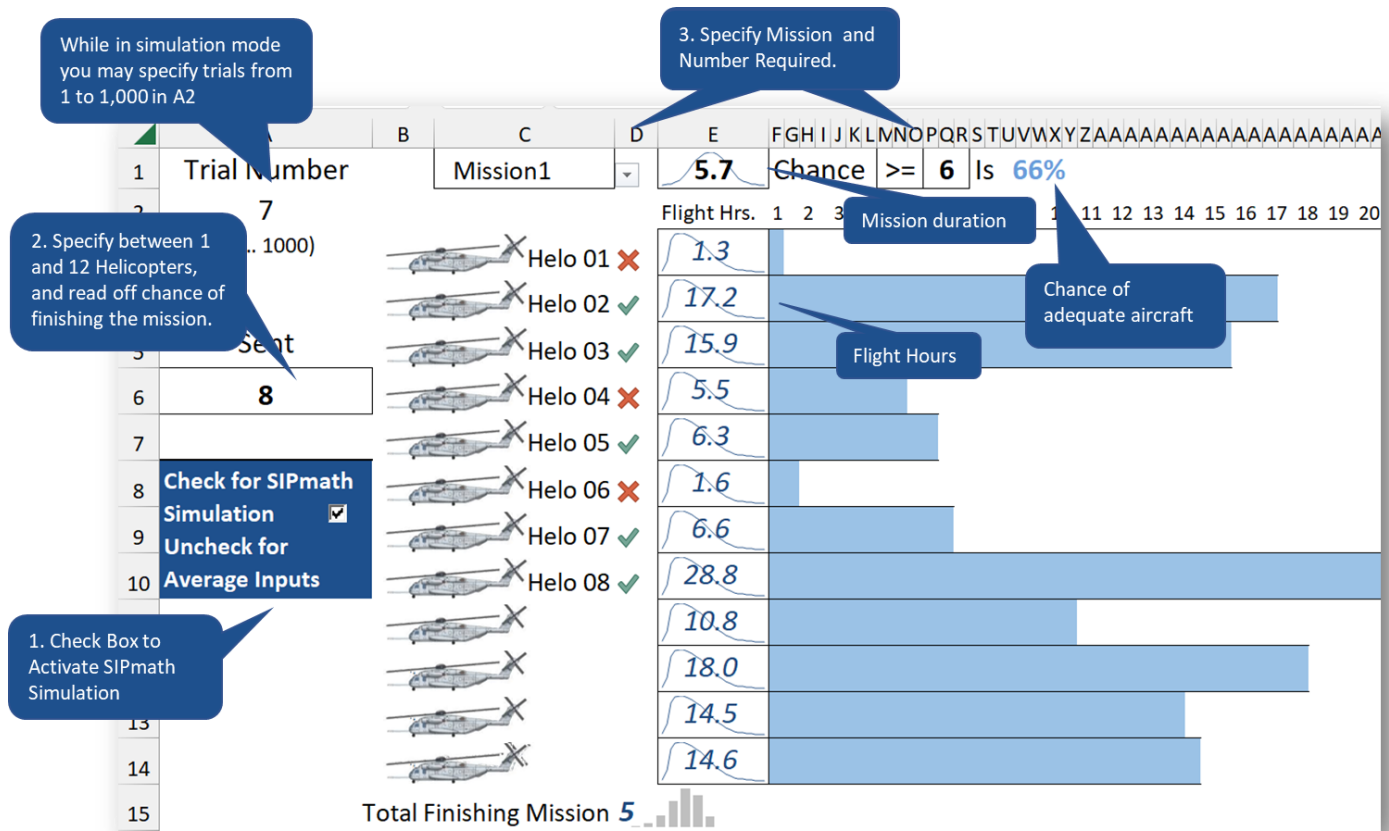
Like all SIPmath models, interactive simulation is accomplished using the Excel Data Table without the use of macros. This makes them particularly useful in the context of DOD, in which it may not be convenient to install specialized software in the field.

The model has two modes controlled with a simulation check box.

When unchecked, the model uses the average values of inputs from the SIP libraries for the flight hours of all 12 aircraft and durations of the three missions.

	A	B	C	D	E	FGH	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1			Mission1		5.5	Chance	>=	6	Is	100%													
2						Flight Hrs. 1 2 3 4 5 6 7 8 9 10																	
3			Helo 01	✓	10.0																		
4			Helo 02	✓	10.0																		
5	Sent		Helo 03	✓	10.0																		
6	8		Helo 04	✓	10.0																		
7			Helo 05	✓	10.0																		
8	<input checked="" type="checkbox"/>		Helo 06	✓	10.0																		
9	<input type="checkbox"/>		Helo 07	✓	10.0																		
10	<input type="checkbox"/>		Helo 08	✓	10.0																		
11					10.0																		
12					10.0																		
13					10.0																		
14					10.0																		
15			Total Finishing Mission		8																		

When checked, the interactive simulation is activated, and performs 1,000 trials per key stroke as you change the number of aircraft required and the number sent. In this mode, the cells containing flight hours and mission duration display a single trial, which may be specified in cell A2. The chance of having adequate aircraft at the top of the screen is based on all 1,000 trials.



The SIPmath 3.0 Libraries

The libraries read into this model are

HeloFHBF12Lib.SIPmath

and

Missions.SIPmath

Free Excel Simulation and Documentation available at

ProbabilityManagement.org and the [Military Operations Research Society](http://MilitaryOperationsResearchSociety.org)



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