

Modeling and Simulation of Fleet Operational Availability: a problem posing

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Abstract. Armed forces rely on critical and vital mission (CVM) systems to defend national sovereignty and address diverse threats. A key indicator of their operational readiness is fleet operational availability. Accurately assessing this availability is crucial for military command to evaluate capabilities objectively and understand force readiness. While the importance of this assessment is clear, effectively modeling the complex and the dynamic operating environment of CVM system fleets for precise availability estimation poses significant challenges. In this paper, we articulate this critical problem, highlighting the complexities involved in accounting for various elements and their interactions. We then present our initial thoughts on how a multi-agent system (MAS) framework could offer a robust and scalable approach to model these intricate environments. This work lays the groundwork for developing a comprehensive methodology to estimate fleet operational availability and analyze the impact of different scenarios, ultimately enhancing the operational readiness of armed forces.

Keywords: fleet, operational availability, obsolescence, multi-agent system, simulation.