

Paper information

Title: *Modeling the forest with the trees: a Case Study on Multi-Resolution Modeling in the Asset Management domain*

Abstract: In the asset management field, simulation models support decision-making in many ways. Detailed models can study a particular aspect of an asset in-depth, such as its reliability network. Aggregated models can give insight in the 'big picture' by modeling multiple interdependent systems such as the failure behavior of an asset, crew maintenance, and spare parts supply. As both detailed and aggregated models have their own strengths and weaknesses, this research investigates the usefulness of working with asset models at different levels of detail. For the case highlighted here, an aggregated SD model is derived from a model with a detailed specification of the management of a maritime asset. With a higher runspeed and less analytical constraints, the aggregated SD model enabled the exploration of many uncertainties. Uncertainties can be internal to the asset (e.g., failure properties) or relate to the environment in which the asset is operating (e.g., weather impact or required usage). With exploration, the aggregated SD model provided a thorough understanding of the system's dynamics and gave insight in effective leverage points in the system. The detailed model provided a strong basis for the development of the aggregated SD model and remained important for further investigation of high-level findings.

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