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Aircraft Carrier Group (CVN) Speed of Advance Project

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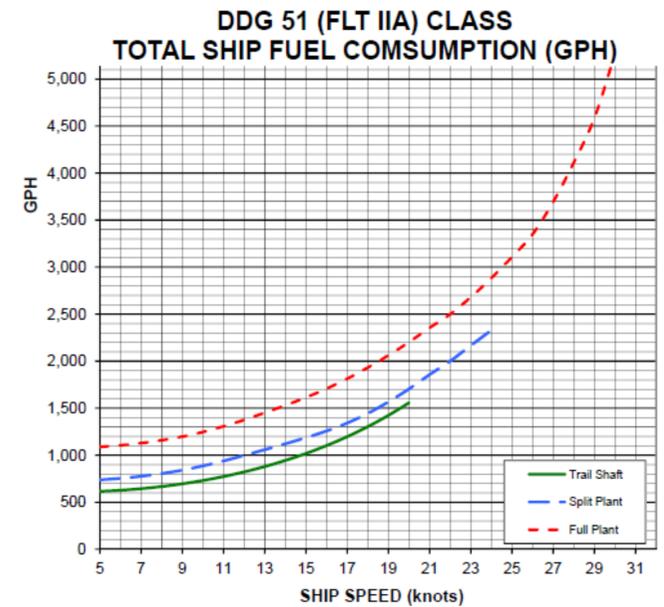
Aircraft Carrier Group (CVN) Speed of Advance Project



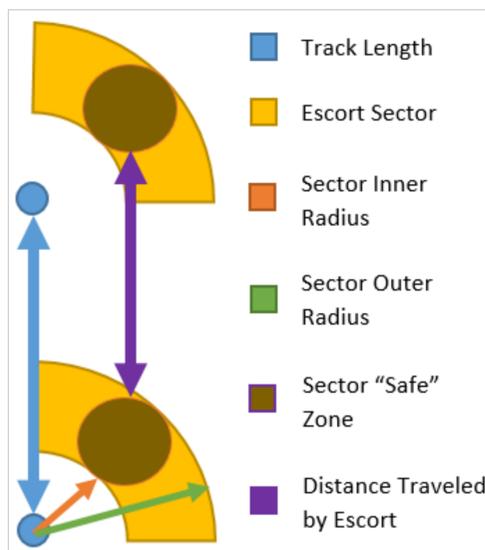
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Summary

As a means to improve the operational capability of the CVN's escorts, in this project, we study factors that could increase carrier strike groups (CSGs) efficiency conducting transits. We specifically analyze implementation of the Transit Fuel Planner (TFP) and transit speed limits. Increasing transit fuel efficiency enables additional hours on station, which could improve operational range and effectiveness. Based on our interviews with Surface Warfare Officers (SWOs), we also look into CSG operations because their input reveals the potential for substantial fuel savings in this area with minimal changes.



Engine configuration and speed are the biggest factors in a ship's fuel consumption



Escorts do not move as far as the CVN during CSG ops.

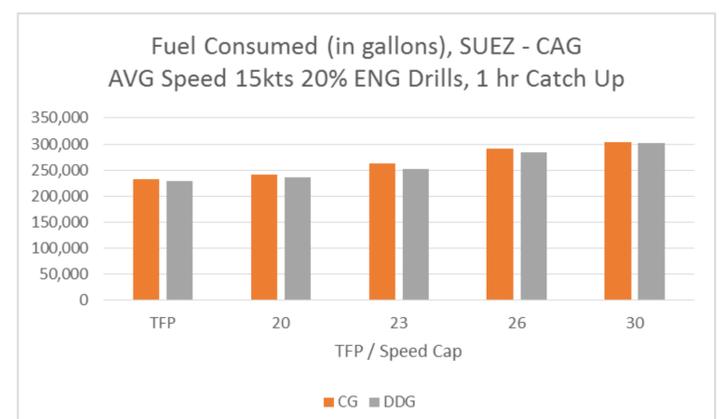
Transits and CSG Ops in FUSED

The Fuel Usage Study Extended Demonstration (FUSED) model was used to measure the effects that different transit speeds and alternative engine configurations had on CSG transit and operations. Escorts were modeled to move with the CVN during transits. During transits, the group would run drills and then rush to return to the leading edge of the Plan of Intended Movement (PIM) window. CSG operations were modeled as a CVN moving up and down a track launching aircraft while the escorts would stay within a sector window that moved with the CVN. Escort speeds could differ from the CVN speed depending on the size of the sector and track length.

Results

By using the TFP or implementing maximum speed restrictions, escorts were able to decrease their fuel consumption and increase their time on station by as much as 20%.

For escorts engaged in CSG operations, using split plant or trail shaft while moving with the carrier reduced their fuel consumption by 15-49%, with the higher fuel savings occurring in trials with larger sectors and shorter launch tracks.



In transits, using the TFP saved the most fuel, but placing a speed limit was also effective

Recommendations

We recommend limited trials of transits using the TFP to compare fuel consumption to historical values. We recommend limited trials of drills simulating CSG ops to experiment with using trail shaft and split plant configurations during operations.

The TFP is available as a standalone program or within Optimized Transit Tool Easy Reference (OTTER). We recommend the TFP within OTTER, as it includes more ship types and an interface for planning drills during a transit.



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Aircraft Carrier Group
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