

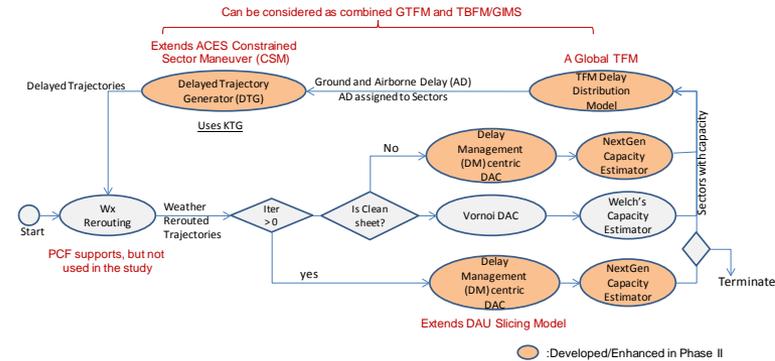
ACES-based Testbed and Bayesian Game-theoretic Framework for Dynamic Airspace Configuration

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Identification and Significance of Innovation

IAI developed a Planning Cycle Framework (PCF) to study integrated DAC-TFM Concept. The PCF is integrated with ACES and can be used to study how Global Traffic Flow Management (GTFM) concepts and Dynamic Airspace Configuration (DAC) concepts interact to determine maximum capacity airspace and assign flight specific ground and airborne delays to manage the traffic demand in meeting the capacity. In this effort, a flight specific sector-level ATC feasible and airline preferred TFM Delay Distribution Model (DDM) was developed for GTFM and Delay Management centric DAC model was developed to evaluate and enable convergence to a DAC-TFM solution during a planning cycle.

Expected TRL Range at the end of Contract (1-9): TRL2/3



Example of Planning Cycle Workflow configured using PCF to study DAC-TFM Concept

Technical Objectives and Work Plan

1. Develop a framework to study integrated DAC-TFM concept
2. Develop DAC and TFM models for integrated DAC-TFM concept
3. Demonstrate using ACES simulation testbed how DAC-TFM solution converge

Task 1: A Planning Cycle Framework (PCF) implemented and integrated into ACES

Task 2: A Global TFM model that uses DAC constrained airspace in delay assignment

Task 3: A DAC model that uses ATC workload for meeting TFM restrictions in airspace partitioning

Task 4: Evaluate and analyze integrated DAC-TFM concept using PCF

NASA Applications

1) The software provides a simulation capability to perform and study DAC and TFM planning concepts, 2) The Global TFM with DDM can be used with DAC concepts to generate ATC feasible delay maneuvers – an important contribution, 3) The principles of the incremental DAC model with Delay Management centric workload computation can be used to modify other DAC concepts/models

Non-NASA Applications

Some parts of PCF can be reused for general planning cycle based simulation models

Firm Contacts

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