Temasek Defence Systems Institute

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3DOF-BADA Model Used To Test The Potential Runway Capacity Benefits

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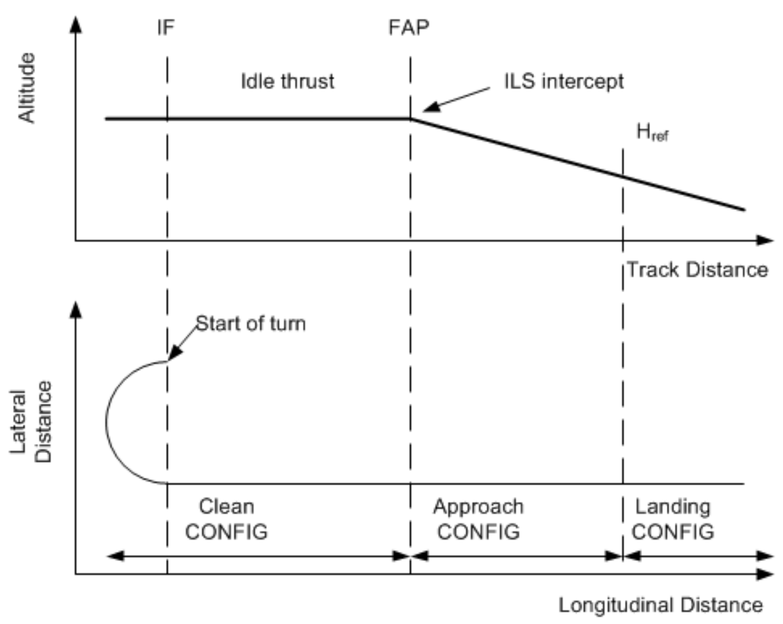
Objectives:

- Provide a methodological approach to assess improvements from TBS
  - Aircraft model and performance using BADA
  - Effect of wind on aircraft during the approach phase
- Approach path
  - Varying approach angle from 3 to 5 degrees
- Aircraft properties
  - Aircraft approach configuration
  - Aircraft TAS
  - Fuel consumption
  - IFR/VFR landing procedures



Main Research idea:

- Develop a 2DOF model and use A320 BADA performance data for the following cases:
  - Horizontal and vertical axis
  - ILS approach
  - Fixed altitude for the final approach point (FAP),
  - Varying glide path angle, head wind and tailwind

Research Results:

- 2DOF simulation model verified
- Fuel consumption and flight time reduced with an increase in glide path angle
- The simulation showed that a 3.5° glide path angle provides the best reduction in fuel per glide path angle change among the simulation cases.

Recommendations:

The glide path angle of the aircraft could be increased from the current 3° to 3.5° to obtain fuel and time savings. Further development of this project is recommended to expand to a 3DOF model to include cross winds and bank angle into consideration. In addition, the safety and operational considerations and procedures for this new landing model should be investigated.

Ref: H. L. Ho, “3DOF-BADA Model Used To Test The Potential Runway Capacity Benefits”, Cranfield University, 2015.

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