

## ABSTRACT

RNP is known as a performance parameter for a navigation system, where its function is to keep an aircraft within certain radius of containment. Aircraft will work with ADS-B and GNSS to transmit its data. ADS-B is a surveillance system that broadcasts aircraft data to other aircraft, ground receiver, and ATC in vicinity, with the help from satellites or ground beacons. And GNSS is the system consists of satellites to calculate aircrafts positioning with Trilateration method. The purpose of this research is to find the accuracy of RNP and how many aircrafts in the selected route are using the RNP. The data for will be gathered from *FlightRadar24* and filtered into enroute and approach phase only. The selected routes are Makassar (UPG) – Jakarta (CGK) because the route have high number of flights per week.

The dot product is the distance between the aircraft waypoints to the line between two waypoints towards destination. Anomaly flights are removed from the analysis. The calculation will be done using python programming and visualized using boxplot. The RNP threshold in each phase will be added as a limit boundary. Once the calculation is finished, boxplot is used to analyze average and deviation of the distance. The result shows that all aircraft in the selected routes are using RNP and all aircrafts fly within the RNP boundary.

*Keyword: Required Navigation Performance (RNP), Point to Line Distance, Trajectory Analysis, Boxplot, Automatic Dependent Surveillance-Broadcast (ADS-B), Global Navigation Satellite System (GNSS)*