**Q&A and ATCO Feedback from NATS Open Demo event 8th November 2022**

**Integrated Runway Throughput & Terminal Efficiency - (Departure Operations)**

**Solution PJ.37-W3-01B**

**Questions and Answers**

**Do the ATCOs feel the eOSD tool would improve consistency among ATCOs and bring more junior ATCOs to the level of more experienced ones?​**

Providing support to ATCOs to be confident in separations they are applying would be a good step overall. Experience, confidence, training and exposure varies. Giving any ATCO more support will help. Even just using the tool as a back-up will provide a platform to provide 1-2 movements more an hour (dependant on factors such as the weather and the mix of SIDs in use).

**How did ATCOs find the inclusion of the flow restrictions in the eOSD tool and do you think making flow restrictions more granular (i.e. not just defined in minutes) will bring benefit to the operation?​**

Non-integer flow restrictions allows Airspace Capacity Managers to make a more granular assessment. Plugging that data into a tool and allowing the tool to work out the separation to have more granularity will definitely help. It allows the Departure manager to build a better sequence. For example, if there were a group of Medium departures then the ATCO can work hard to gain 45 secs, but then if there was a flow restriction of integer minutes and hence 30 seconds greater than needed, then they may lose the previously gained time.

**Do ATCOs think the 5NM target distance separations were appropriate?​**

Yes, TC (Terminal Control) ATCOs felt 5NM is appropriate.

**Where does this take into account the requirement for additional spacing downstream, Example 3.5nm starting point for something that requires 5+nm in AC (Area Control) and adjacent ANSPs?**

The 3.5nm spacing only applies to relatively early diverging Standard Instrument Departures (SIDs) (DET followed by MAXIT) not to aircraft on the same SID or similar (where a large proportion of the departure path is common) SIDs (UMLAT followed by BPK). If aircraft are on same route then it would be 5nm initial spacing.

I**s EFPS (Electronic Flight Progress Strips) from Indra or NavCanada?**

NavCanada – EFPS/EXCDS (Electronic Flight Progress Strips/Extended Computer Display System

**Failure mode query - was it possible for a controller to line up a different aircraft than expected and the eOSD would identify and correct itself?​**

The eOSD tool takes the next aircraft which lines up on the runway and hence will calculate the separation for that aircraft. The eOSD tool reads the departure order from EFPS, as long as any change in departure sequence is reflected in EFPS, the eOSD tool will re-calculate the separation for the new leader-follower pair. (Due to limitations on the simulation platform, a sim specific departure order was used, but this would not be performed operationally). Prior to Industrialisation a full safety case including Failure modes would be carried out.

**How does the system detect airborne? Ground radar?​**

An aircraft is considered airborne on movement of the aircraft electronic strip from the runway to the airborne bay. This has a limitation that the airborne time as indicated by the movement of the strip may not be exactly that of the actual take off time. (Note this is how the tool would work in the operation, however the simulator platform used the detection of the radar position updates to detect as airborne, not movement of the flight strip).

**Does the new tool consider the situation that the aircraft take-off time is longer than expected (still continue for take-off)?**

The eOSD tool will be informed of the aircraft being airborne through movement of the electronic strip from the runway bay to the airborne bay (see previous question). A prediction of the airborne time is used in the algorithm that underpins the eOSD tool, however the ATCO is required to manually account for the aircraft’s roll time.

**Why does the countdown timer not count to zero?**

The variation in runway roll time can be influenced by a number of factors. These can be difficult to integrate into a tool without making the separation times overly conservative. Using ATCO judgement on these factors make the separations both more efficient and allows the ATCO to maintain their skills. The runway roll is done as an adjustment, so the ATCO is still using their judgement. This avoids possibly the ATCO getting drawn into giving a take-off clearance when actually there are other circumstances why it is not safe to clear that aircraft for take-off at that particular point.

**Was the new algorithm linked to TBS for the mixed mode, or is it a new model?​**

Algorithm is not linked to TBS (Time Based Separation) mixed Mode, it is a new idea.

**Have you thought to put the countdown timer on the ground display?​**

We assume EFPS is the best place for it with the timer being on the follower strip of the pair. Feedback received from an ATCO stated they would want it everywhere if possible, on strip, weather display and ground system, so that it is always in the scan of the ATCO.

**Why does the tool not give a countdown to take-off clearance for the next flight, and does the controller still needs to mentally apply the roll time to each flight?​**

There are so many factors to consider when giving aircraft clearance, it is a benefit to have the tool to give guidance on countdown timer, to save cognitive effort, however, yes the ATCO still has to mentally apply a roll time.

**The Solution Technical Lead said that initial analytics showed an increase in the departure rate. By what amount​?**

Although the analysis indicates that up to 4 movements could be achieved, some of this is learning effect and the more in depth analysis is looking to isolate the benefit due to the tool from that of a learning effect. Based on ATCO feedback it is felt that the gain could be 1-2 per hour (dependant on factors such as the weather and the mix of SIDs in use).

**Did you do any runs with TEAM (Tactically Enhanced Approach Management, in effect mixed mode runway)? What was the outcome of that in terms of throughput?**

Yes we did when we were operating in Easterly Operations, however, we operated most of the time in segregated mode. The 09R runs featured arrivals (both baseline and solution for comparison) with a few landers and crossings considered to test whether the countdown timer works correctly irrespective of arrival traffic in between two departures.

**Regarding Human Factors, when there are failures of the new system, and has to be changed to manual operation, especially in busy time period, will the reduction of time implementing fully / partially manual operations without the latest tool actually raise a safety issue**?

If there are failures of the new system, then fallback procedures will be used, which will be conservative and most likely increase the time separation applied between departures and therefore should not cause a safety issue but could impact on the efficiency of the operation while the tool was not in use.

**If not every airport will use the latest tool, some of the airports will remain using the current procedure for departure, will the application of the latest tool raise the safety issue?**

No, it shouldn’t. However, a full simulation of the TMA airspace is needed which integrates traffic from other airports to understand any impact.

**How would it be envisioned working for multiple airports**?

Using the eOSD tool could deliver a few additional movements per hour from an airport. If a number of airports were to increase their capacity in this way, then there may be some sectors where the demand is in excess of capacity. This is why a TMA input has been considered, whereby non-integer flow restrictions could be fed into the eOSD tool. To date a departure manager across multiple airports is still at an early maturity, but the eOSD tool could link to this type of tool in the future.

**How many TC TMA controllers were engaged in this?**

We had several TMA ATCO participants in the concept development workshops where the SID target distance spacings were agreed and then one TMA ATCO as an expert observer during one of the sim days to provide feedback.

**End of Q&A**