THE FORTY-THIRD MEETING OF THE INFORMAL PACIFIC ATC CO-ORDINATING GROUP (IPACG/42)

(Tokyo, Japan 27-28 September 2017)

Agenda Item 5: Communications/Navigation/Surveillance (CNS) Issues

ISSUES OF SIGNIFICANCE RELATED TO LARGE REMOTELY PILOTED AIRCRAFT SYSTEMS (RPAS)

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Presented by Federal Aviation Administration

SUMMARY

This Information Paper highlights the five elements of significance identified in ATMOPS/WG/4-WP011.

1. DISCUSSION

1.1 **Communication lag between Air Traffic Control (ATC)/Pilot in Command (PIC)/Vehicle (Latency)**: Latency is such that air traffic personal must accommodate for up to 20 second comm lag. This latency creates communications overlap with other aircraft on the same frequency and complicates the surety of ATC directions --particularly in time critical situations. (As a note) Currently, the RTCA and FAA have established a National Voice Switch (NVS) workgroup. The team is formulating the infrastructure and regulatory policy for a UAS communication system utilizing VOIP technology. The VOIP system will eliminate communication latency and UAS/ATC communications will be received and transmitted in the same manner as manned aircraft.

1.2 **Lost link procedures effectively relayed and known to ATC**: Lost link procedures are often very complicated and result in several potential flight plan routes (contingencies) depending on when and where the RPAS loses link. Many of these Lost Link Procedures (LLP) are buried in lengthy and cumbersome Certificates of Waiver or Authorizations, (COAs), which ATC personnel can't directly access, and if they do, finding the appropriate LLP is time consuming. PICs generally don't have sufficient warning of lost link/lost communication prior to establishing back-up communication to inform ATC of the LLP being taken by the RPAS. An RPAS squawking the lost link beacon code simultaneously with the execution of the LLP does not provide ATC sufficient time to move other traffic to provide appropriate separation with the RPAS, therefore ATC tends to segregate the RPAS from other traffic. Whereas, manned aircraft fly their flight plan following radio failure, which provides immediate predicatable action of the aircraft to ATC.

1.3 **Reroutes due to incorrect filings or mission changes**: Some situations require immediate relay over SATCOM links. With the combined impact of communication latency issues and the difficulty of amending active Flight Plan data with long amendments and coordinating any issues with adjacent ATC personnel, these tasks prove extremely difficult.

1.4 **Reliability of Command and Control (C2) link**: Reliability of stable and predictable link between the operator, RPAS, satellite or ground station, needs to mimic that of manned aircraft communications. The C2 links must be robust enough to eliminate the potential of lost link events to an extremely rare off nominal event.

1.5 **RPAS inability to replicate "see and avoid"** – Detect and Avoid (DAA): US Code of Federal Regulations (CFR) 91.113, (yield right of way) requirement of manned aircraft cannot, absent of new technologies, be replicated by the RPAS operator. This failure to meet the requirements, places ATC at a disadvantage when performing normal traffic when responsible for RPAS.

1.6 **Climb/descent rates can differ significantly from typical manned aircraft**: Often climb and descent for large RPAS are pre-programmed and thus not easily responsive to an ATC request for expeditious ATC clearance. Again, the disparity of these vehicles, compared to nominal aircraft operations, requires ATC to treat these aircraft differently, which impacts workload.

1.7 **Current large RPAS were not designed for US National Airspace System (NAS) integration**: Large RPAS were mostly designed for military applications – airspace, etc. Hence, large RPAS remain, essentially, segregated from manned aircraft due to differences in aircraft performance, systems performance, command and control, and reliability. These platforms now in the NAS can be dealt with since their numbers are limited. The next generation of RPAS must meet the normal expectations of manned aircraft in the NAS, particularly when these vehicles are utilized by commercial entities. Performance and design initiatives by manufacturers of RPAS in the US should be mandated so as to require RPAS conform to all requirements similarly imposed on manned aircraft.

2. ACTION BY THE MEETING

2.1 The meeting is invited to:

a) Note and review the contents of this working paper.

b) Note the information presented in the attached "Remotely Piloted Aircraft System" presentation.