International Civil Aviation Organization

Sixth Meeting of the Surveillance Implementation Coordination Group (SURICG/6)

Video Teleconference, 24 – 27 August 2021

Agenda Item 11: Next meeting & any other business

RESOLUTION OF CONFLICTING TEXT IN DOC 8071 VOL III REGARDING FLIGHT INSPECTIONS

(Presented by Singapore)

SUMMARY

This working paper highlights conflicting provisions in the Doc 8071 Vol III regarding flight inspections and provides information on the status thus far.

1 Introduction

1.1 It came to the attention of the radar engineers at the Civil Aviation Authority of Singapore that there are conflicting provisions on the frequency of flight inspections in the Vol III of Manual on testing of Radio Navigation Aids (Doc 8071) Testing of Surveillance Radar Systems (Second Edition, 2020).

1.2 A proposal was then submitted to the Surveillance Panel – Aeronautical Surveillance Working Group (SP-ASWG) on 12-16 April 2021 and subsequently to the Aeronautical Surveillance Working Group – Technical Subgroup (ASWG-TSG) on 14-15 June 2021 for considerations.

2 Discussions

2.1 In Para 2.8 – 2.10 of Appendix A of Doc 8071 Vol III – Flight Testing Methods, there is the following text:

> *2.8 Civil ATC PSR and SSR facilities, after being commissioned and set into operational service, do not require a periodic flight inspection. Instead, the radar performance parameters described in this manual shall be re-assessed at regular intervals by RTQC or by preventive/ corrective maintenance. Only in cases of specific problem investigation should it thus be necessary to perform measurement campaigns including flight checks.*
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> *2.9 Special inspections are conducted to fulfil a particular need and may be very limited in scope. The limited inspection may not require a formal written plan, but only a short report. Examples of testing events include: development of a starting baseline (as found), identification of problem areas (quantity, if possible), correction of the problem or recommendations for solutions, revision of performance, and generation of a new database.*
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> *2.10 If equipment changes/modifications to commissioned facilities change the coverage pattern, document the changes in the inspection report. The new coverage pattern will then*

become the basis for comparison during subsequent inspections. Special inspections include the following:

a) engineering support. Engineering support is performed to help engineers and air traffic personnel determine whether the radar meets equipment certification requirements. This data may be used for commissioning purposes, provided that no major equipment modifications are made prior to the commissioning inspection. Requirements for specific checks will be determined by engineering personnel and need not conform to a specific format;

b) antenna change. The checklist, Table A-1, indicates the requirements for installation of a new antenna, a new generation dual beam antenna, or an antenna with a different radiation pattern. A flight inspection is not required following an antenna pedestal or rotary joint replacement if the ground measurements of the reflector position, feedhorn alignment, and antenna tilt of the replacement pedestal are satisfactory;

c) major modifications (other than antenna change). This inspection should be confined to the parameters necessary to confirm facility performance. The radar engineer shall determine the extent of a special inspection during preparation and coordination of the plan. Depending upon the extent of the modification, an inspection using radar evaluation tools and targets of opportunity may satisfy the requirements;

d) near-miss inspections. These inspections are conducted at the request of the air traffic manager of the facility involved, and are used to determine the radar coverage in the area in which the incident occurred. The flight inspection should be conducted as soon as possible following a near-miss, duplicating the manoeuvres, altitude, and direction of the aircraft incident. The flight inspector shall use an aircraft of the same type (or reflective surface) as the smaller aircraft involved. To the extent practicable, operate the radar in the same configuration as it was at the time of the incident. Accomplish flight inspection reports concerning near-miss collisions in the same manner as after-accident reports; and

e) future requirements. New PSR and SSR systems being developed may introduce features not common to existing radar, and may require techniques and procedures substantially different from those described below. Inspection procedures for future systems will be included as they become available.

2.2 In Para 2.4-2.6 of Appendix B of Doc 8071 Vol III – Flight Inspection Procedures For SSR, there is the following text:

2.4 Commissioning flight inspections are conducted to supply engineering personnel with sufficient data to determine if the SSR meets operational requirements and/or equipment design specifications. These inspections will be extensive enough to provide required data and a basis for comparison of periodic data to detect future deterioration in the performance of the radar.

2.5 Routine flight inspections are conducted to determine that the facility performance continues to meet specifications and satisfies operational requirements. The recommended frequency for routine flight inspection is 120-day intervals, plus or minus 30 days, from the initial or annual inspection. In cases where there is a satisfactory record of performance of an equipment, an administration may extend the interval up to as much as 365 days. On the other hand, routine inspections at lesser intervals than 120 days may be needed if there are doubts about equipment performance at a given site.

2.6 Special flight inspections are conducted after major equipment modifications, for reported or suspected mal functions, after an aircraft accident to determine if facility performance could have been a contributing factor to the accident and for other reasons. Usually a routine flight inspection is sufficient to restore a facility to operation after modification; however, engineering personnel should request checks in excess of routine requirements if additional performance data is required.

2.3 Appendix A of Doc 8071 Vol III stated that flight check is required only during commissioning, unless there is specific problem investigation, or deemed necessary by the maintenance personnel. Appendix B of Doc 8071 Vol III implied that there must be flight inspections every 120 days. There two provisions are in conflict and some States might be forced to adopt the more stringent requirement. It is noted that the proposed frequency of flight inspection is more frequent than the instrumental landing system.

2.4 Following checks among the Surveillance Panel members, their ANSPs perform flight checks based on the frequencies advised in Appendix A and not those in Appendix B.

2.5 It was thus proposed that some changed be made to Appendix B of Doc 8071 Vol III, essentially removing the reference to routine flight checks. The suggested changes are shown in **Appendix A** of this paper. The text will be subjected to acceptance by the SP-ASWG during its meeting on 1-5 Nov 2021.

3 Action by the meeting

3.1 The meeting is invited to note the progress of the works done thus far on the resolution of conflicting text in Doc 8071 Vol III regarding flight inspections.

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Appendix A

INITIAL PROPOSAL 1

PROPOSED AMENDMENT TO

DOC 8071

MANUAL ON TESTING OF RADIO NAVIGATION AIDS

VOLUME III — TESTING OF SURVEILLANCE RADAR SYSTEMS

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

1. The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

a)	~~Text to be deleted is shown with a line through it~~.	text to be deleted
b)	New text to be inserted is highlighted with grey shading.	new text to be inserted
c)	~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading.	new text to replace existing text

Appendix B of Doc 8071 Vol III

2.4 Commissioning flight inspections are conducted to supply engineering personnel with sufficient data to determine if the SSR meets operational requirements and/or equipment design specifications. These inspections will be extensive enough to provide required data and a basis for comparison of periodic data to detect future deterioration in the performance of the radar.

~~2.5 Routine flight inspections are conducted to determine that the facility performance continues to meet specifications and satisfies operational requirements. The recommended frequency for routine flight inspection is 120-day intervals, plus or minus 30 days, from the initial or annual inspection. In cases where there is a satisfactory record of performance of an equipment, an administration may extend the interval up to as much as 365 days. On the other hand, routine inspections at lesser intervals than 120 days may be needed if there are doubts about equipment performance at a given site.~~

~~2.6~~2.5 Special flight inspections ~~are~~ may be conducted as part of a measurement campaign after major equipment modifications, or for specific problem investigation. ~~for reported or suspected malfunctions, after an aircraft accident to determine if facility performance could have been a contributing factor to the accident and for other reasons. Usually a routine flight inspection is sufficient to restore a facility to operation after modification; however, engineering personnel should request checks in excess of routine requirements if additional performance data is required.~~

[Subsequent paragraphs to be renumbered.]