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(FIT-Asia/13)

Bangkok, Thailand, 06 – 09 June 2023

Agenda Item 4: Review of ADS/CPDLC Operations and Performance

DATA LINK PERFORMANCE REPORT FOR SRI LANKA

(Presented by SRI LANKA)

SUMMARY

This paper presents data link performance of the ADS-C/CPDLC data in Colombo FIR (VCCF) for the period January to December 2022.

1. INTRODUCTION

1.1 **Tables 1 to 4** summarizes the Automatic Dependent Surveillance – Contract (ADS-C) and Controller-Pilot Data Link Communications (CPDLC) performance data according to the Required Surveillance Performance (RSP) and Required Communications Performance (RCP) criteria stipulated in ICAO Doc 4444 – Procedures for Air Navigation Services – Air Traffic Management (PANS-ATM).

1.2 Media type data (SATCOM/VHF) was not recorded separately for the year 2022. Both SATCOM and VHF data was presented as combined data.

1.3 However, Media type data (SATCOM/VHF) recorded and tabulated separately from January 2023. Measures had been taken to integrate separate media data to the system from January 2023 with the help of system manufacturer. Tabulated separate media data from January to March 2023 is presented as an additional information.

2. DISCUSSION

VCCF FIR ADS-C RSP180 Performance – Media Type, RGS and GES

2.1 **Table 1** summarizes overall ADS-C performance for downlinks sent within the VCCF FIR during 2022, where the messages sent met the RSP 180 95% criterion but marginally fall below the 99.9% criterion in the first half of the year. Media type data (SATCOM/VHF) was not available separately. Both SATCOM and VHF data were presented as combined data.

| FIR | VCCF | | | | | |
|---|--|--|-----------------------|--------------------|-------------------|-----------------------|
| Criteria | RSP180 | | | | | |
| Period | Jan-June 2022 | | | July-December 2022 | | |
| Colour Key ■ Meets Criteria ■ 99.0%-99.84% ■ Under Criteria | Message Counts | 95% % <= 90sec | 99.90% % <= 180sec | Message Counts | 95% % <= 90sec | 99.90% % <= 180sec |
| | By Media Type | | | | | |
| SATCOM + VHF | 385121 | 99.31% | 99.83% | 463887 | 99.55% | 99.91% |
| VHF | This Data is Not Available separately. | | | | | |
| HF | N/A | N/A | N/A | N/A | N/A | N/A |
| ALL | 385121 | 99.31% | 99.83% | 463887 | 99.55% | 99.91% |
| By Remote Ground Station (RGS) Ground Earth Station (GES) | | | | | | |
| Designator | Type | (only RGS/GES with message counts >100 recorded) | | | | |
| System upgrade is planned for 2023. This information will be able to provide for the year 2023. | | | | | | |

Table 1: VCCF FIR ADS-C Downlink Latency per Media Type, RGS and GES

VCCF FIR ADS-C RSP180 Performance – Aircraft Operator/Type

2.2 **Table 2** summarizes overall ADS-C performance per Aircraft Operator/Type for downlinks sent within the VCCF FIR during 2022.

| FIR | VCCF | | | | | |
|---|---|-------------------|-----------------------|--------------------|-------------------|-----------------------|
| Criteria | RSP180 | | | | | |
| Period | Jan-June 2022 | | | July-December 2022 | | |
| Colour Key ■ Meets Criteria ■ 99.0%-99.84% ■ Under Criteria | Message Counts | 95% % <= 90sec | 99.90% % <= 180sec | Message Counts | 95% % <= 90sec | 99.90% % <= 180sec |
| | By Aircraft Operator / Type (only message counts >100 recorded) | | | | | |
| ABD_B744 | | | | 410 | 96.95% | 100.00% |
| AIC_B788 | 879 | 97.49% | 98.92% | 1957 | 99.76% | 100.00% |
| ALK_A20N | 1228 | 98.54% | 99.91% | 2051 | 100.00% | 100.00% |
| ALK_A21N | 9714 | 99.13% | 99.92% | 11448 | 99.74% | 99.94% |
| ALK_A332 | 7999 | 98.40% | 99.60% | 9452 | 99.20% | 99.54% |
| ALK_A333 | 25629 | 98.94% | 99.90% | 26224 | 99.90% | 99.97% |
| ATN_B752 | | | | 456 | 98.76% | 99.50% |
| ATN_B763 | | | | 195 | 99.34% | 100.00% |
| CCA_B77W | 1218 | 98.08% | 99.67% | 1935 | 99.32% | 99.47% |
| CPA_B744 | 152 | 95.23% | 98.77% | 424 | 94.23% | 97.92% |
| ETD_A321 | | | | 215 | 100.00% | 100.00% |
| ETD_B77W | 17338 | 97.65% | 99.30% | 20469 | 99.56% | 99.55% |
| ETD_B789 | 4919 | 98.89% | 99.26% | 5976 | 99.79% | 99.27% |
| ETD_B78X | 3179 | 98.79% | 99.33% | 5317 | 99.78% | 99.13% |
| ETH_B77L | 138 | 98.27% | 99.95% | 519 | 99.53% | 99.57% |
| ETH_B789 | 204 | 100.00% | 100.00% | 922 | 99.65% | 99.89% |

| FIR | VCCF | | | | | |
|---|----------------|-------------------|-----------------------|--------------------|-------------------|-----------------------|
| Criteria | RSP180 | | | | | |
| Period | Jan-June 2022 | | | July-December 2022 | | |
| Colour Key ■ Meets Criteria ■ 99.0%-99.84% ■ Under Criteria | Message Counts | 95% % <= 90sec | 99.90% % <= 180sec | Message Counts | 95% % <= 90sec | 99.90% % <= 180sec |
| By Aircraft Operator / Type (only message counts >100 recorded) | | | | | | |
| ETH_B789 | 404 | 100.00% | 100.00% | 722 | 100.00% | 100.00% |
| GIA_A333 | 1460 | 98.76% | 99.43% | 1993 | 100.00% | 100.00% |
| GIA_A333 | 160 | 100.00% | 100.00% | 993 | 100.00% | 100.00% |
| GIA_A339 | 2871 | 97.41% | 99.78% | 4824 | 99.61% | 99.96% |
| GIA_B77W | 23178 | 98.28% | 99.37% | 27681 | 99.74% | 99.91% |
| KQA_B788 | 364 | 100.00% | 100.00% | 957 | 99.68% | 99.30% |
| LNI_A333 | 27368 | 98.72% | 99.23% | 30975 | 99.94% | 100.00% |
| LNI_A339 | 29893 | 98.44% | 99.98% | 34557 | 99.94% | 99.98% |
| MAS_B738 | 2768 | 98.60% | 99.86% | 4359 | 99.61% | 99.84% |
| MAU_A339 | | | | 591 | 100.00% | 100.00% |
| OMA_B788 | 285 | 100.00% | 100.00% | 974 | 99.85% | 100.00% |
| OMA_B789 | 2164 | 100.00% | 100.00% | 3036 | 99.67% | 100.00% |
| QTR_A332 | 1036 | 100.00% | 100.00% | 1942 | 99.73% | 99.46% |
| QTR_A333 | 2968 | 98.77% | 99.47% | 3558 | 99.78% | 99.91% |
| QTR_A359 | 7358 | 100.00% | 100.00% | 8223 | 98.57% | 99.86% |
| QTR_A35K | 352 | 100.00% | 100.00% | 1318 | 99.52% | 100.00% |
| QTR_A388 | 9315 | 100.00% | 100.00% | 11294 | 99.24% | 99.30% |
| QTR_B77L | 386 | 100.00% | 100.00% | 1343 | 99.18% | 100.00% |
| QTR_B77W | 44555 | 96.71% | 99.08% | 46453 | 97.42% | 98.86% |
| QTR_B788 | 8372 | 98.83% | 100.00% | 9697 | 99.80% | 99.91% |
| RCH_C17 | 1287 | 98.95% | 99.25% | 1926 | 99.48% | 99.79% |
| REU_B77W | | | | 330 | 100.00% | 100.00% |
| REU_B788 | | | | 2915 | 99.95% | 100.00% |
| SIA_A359 | 6733 | 100.00% | 100.00% | 7199 | 99.48% | 100.00% |
| SIA_B744 | | | | 344 | 99.54% | 99.54% |
| SVA_B744 | 2915 | 98.54% | 99.24% | 3887 | 99.56% | 99.88% |
| SVA_B77W | 23782 | 98.73% | 99.94% | 26812 | 99.75% | 99.97% |
| SVA_B789 | 8512 | 98.99% | 99.22% | 9126 | 99.93% | 99.96% |
| SVA_B78X | 8299 | 100.00% | 100.00% | 9018 | 99.98% | 100.00% |
| TGW_A20N | | | | 5680 | 98.93% | 99.68% |
| THY_A332 | 384 | 100.00% | 100.00% | 872 | 100.00% | 100.00% |
| THY_A333 | 1965 | 99.23% | 99.45% | 3575 | 100.00% | 100.00% |
| THY_B77W | 2946 | 99.18% | 99.76% | 5756 | 99.63% | 100.00% |
| THY_B789 | 1220 | 98.77% | 99.34% | 1765 | 100.00% | 100.00% |
| UAE_A388 | 34367 | 98.53% | 99.88% | 36791 | 99.81% | 99.90% |
| UAE_B77W | 17639 | 99.34% | 99.96% | 19944 | 99.70% | 99.93% |

Table 2: VCCF FIR ADS-C Downlink Latency per Aircraft Operator/Type

VCCF FIR CPDLC RCP240 Performance – Media Type, RGS and GES

2.3 **Tables 3A and 3B** summarize overall CPDLC performance per Media Type messages sent within the VCCF FIR during 2022, where performance met RCP240 95% criterion but marginally fall below the 99.9% criterion. Media type data (SATCOM/VHF) was not available separately. Both SATCOM and VHF data were presented as combined data.

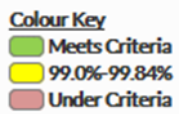
| FIR | VCCF | | | | | |
|--|--|------------------------------------|-------------|-----------------|-------------|------------|
| Criteria | RCP240 | | | | | |
| Period | Jan-Jun 2022 | | | | | |
| Colour Key  Meets Criteria 99.0%-99.84% Under Criteria | Message Counts | 95% benchmark | | 99.9% Benchmark | | 95% |
| | | ACP | ACTP | ACP | ACTP | PORT |
| | | % <= 180sec | % <= 120sec | % <= 210sec | % <= 150sec | % < 60secs |
| By Media Type | | | | | | |
| SATCOM + VHF | 20125 | 98.22% | 99.91% | 99.71% | 100% | 95.57% |
| VHF | This data is not available separately. | | | | | |
| HF | N/A | N/A | N/A | N/A | N/A | N/A |
| ALL | 20125 | 98.22% | 99.91% | 99.71% | 100% | 95.57% |
| By Remote Ground Station (RGS) Ground Earth Station (GES) | | | | | | |
| Designator | Type | (RGS/GES with message counts >100) | | | | |
| System upgrade is planned for 2023. This information will be able to provide for the year 2023. | | | | | | |

Table 3A: VCCF FIR CPDLC Performance Latency per Media Type, RGS and GES – Jan-Jun 2022.

| FIR | | VCCF | | | | |
|---|--|---------------|-------------|------------------------------------|-------------|----------|
| Criteria | | RCP240 | | | | |
| Period | | Jul-Dec 2022 | | | | |
| | Message Counts | 95% benchmark | | 99.9% Benchmark | | 95% |
| | | ACP | ACTP | ACP | ACTP | PORT |
| | | % < =180sec | % < =120sec | % < =210sec | % < =150sec | %<60secs |
| By Media Type | | | | | | |
| SATCOM | 25443 | 98.57% | 99.94% | 99.49% | 99.96% | 95.31% |
| VHF | This data is not available separately. | | | | | |
| HF | | | | | | |
| ALL | 25443 | 98.57% | 99.94% | 99.49% | 99.96% | 95.31% |
| By Remote Ground Station (RGS) Ground Earth Station (GES) | | | | | | |
| Designator | Type | Designator | Type | (RGS/GES with message counts >100) | | |
| System upgrade is planned for 2023. This information will be able to provide for the year 2023. | | | | | | |

Table 3B: VCCF FIR CPDLC Performance Latency per Media Type, RGS and GES – Jul-Dec 2022.

VCCF FIR CPDLC RCP240 Performance – Aircraft Operator/Type

2.4 **Tables 4A and 4B** summarize overall CPDLC performance per Aircraft Operator/Type for messages sent within the VCCF FIR during 2022.

| FIR | | VCCF | | | | |
|---|----------------|---------------|-------------|-----------------|-------------|----------|
| Criteria | | RCP240 | | | | |
| Period | | Jan-Jun 2022 | | | | |
| | Message Counts | 95% benchmark | | 99.9% Benchmark | | 95% |
| | | ACP | ACTP | ACP | ACTP | PORT |
| | | % < =180sec | % < =120sec | % < =210sec | % < =150sec | %<60secs |
| By Aircraft Operator / Type (only message counts >100 recorded) | | | | | | |
| ALK_A21N | 448 | 97.58% | 99.23% | 99.40% | 100.00% | 94.09% |
| ALK_A332 | 353 | 97.99% | 99.45% | 99.27% | 100.00% | 94.23% |
| ALK_A333 | 985 | 97.54% | 99.12% | 99.91% | 100.00% | 95.11% |
| ETD_B77W | 915 | 96.83% | 98.99% | 99.45% | 99.95% | 95.14% |
| GIA_B77W | 954 | 97.11% | 100.00% | 99.45% | 100.00% | 93.88% |

| FIR | VCCF | | | | | |
|---|----------------|-----------------------|------------------------|-----------------------|------------------------|------------------|
| Criteria | RCP240 | | | | | |
| Period | Jan-Jun 2022 | | | | | |
| <div style="border: 1px solid black; padding: 2px;"> Colour Key Meets Criteria 99.0%-99.84% Under Criteria </div> | Message Counts | 95% benchmark | | 99.9% Benchmark | | 95% |
| | | ACP % < =180sec | ACTP % <= 120sec | ACP % <= 210sec | ACTP % <= 150sec | PORT %<60secs |
| By Aircraft Operator / Type (only message counts >100 recorded) | | | | | | |
| LNI_A333 | 1458 | 97.99% | 99.25% | 99.38% | 100.00% | 96.87% |
| LNI_A339 | 1653 | 97.12% | 99.78% | 99.28% | 100.00% | 96.78% |
| MAS_B738 | 314 | 98.88% | 98.89% | 99.67% | 99.65% | 94.98% |
| QTR_A359 | 273 | 97.45% | 99.66% | 99.21% | 100.00% | 95.05% |
| QTR_A388 | 456 | 97.81% | 100.00% | 99.34% | 100.00% | 95.33% |
| QTR_B77W | 1548 | 98.11% | 99.48% | 99.67% | 99.90% | 93.27% |
| QTR_B788 | 298 | 98.99% | 100.00% | 99.64% | 100.00% | 96.78% |
| SIA_A359 | 371 | 97.73% | 100.00% | 99.48% | 100.00% | 95.96% |
| SVA_B77W | 1174 | 95.46% | 100.00% | 99.66% | 100.00% | 94.66% |
| SVA_B789 | 369 | 98.23% | 100.00% | 99.38% | 100.00% | 95.06% |
| SVA_B78X | 453 | 98.99% | 100.00% | 99.23% | 100.00% | 96.41% |
| TGW_A20N | 247 | 98.89% | 100.00% | 99.49% | 100.00% | 94.24% |
| THY_B77W | 324 | 97.37% | 100.00% | 99.51% | 100.00% | 96.89% |
| UAE_A388 | 1305 | 98.73% | 99.57% | 99.69% | 99.92% | 95.28% |
| UAE_B77W | 796 | 97.12% | 100.00% | 99.67% | 100.00% | 95.08% |

Table 4A: VCCF FIR CPDLC Performance Latency per Aircraft Operator/Type – Jan-Jun 2022

| FIR | VCCF | | | | | |
|--|----------------|-----------------------|------------------------|-----------------------|------------------------|------------------|
| Criteria | RCP240 | | | | | |
| Period | Jul - Dec 2022 | | | | | |
| <div style="border: 1px solid black; padding: 2px;"> Colour Key Meets Criteria 99.0%-99.84% Under Criteria </div> | Message Counts | 95% benchmark | | 99.9% Benchmark | | 95% |
| | | ACP % < =180sec | ACTP % <= 120sec | ACP % <= 210sec | ACTP % <= 150sec | PORT %<60secs |
| ALK_A21N | 642 | 98.75% | 100.00% | 99.18% | 100.00% | 93.98% |
| ALK_A332 | 456 | 98.59% | 100.00% | 99.24% | 100.00% | 95.58% |
| ALK_A333 | 1185 | 98.61% | 100.00% | 99.56% | 100.00% | 95.32% |
| ETD_B77W | 1015 | 98.69% | 100.00% | 99.37% | 100.00% | 92.14% |
| ETD_B789 | 431 | 98.68% | 100.00% | 99.64% | 100.00% | 93.80% |
| ETD_B78X | 306 | 98.51% | 100.00% | 99.21% | 100.00% | 95.91% |
| GIA_A339 | 326 | 98.67% | 100.00% | 99.47% | 100.00% | 95.61% |
| GIA_B77W | 1353 | 98.66% | 100.00% | 99.17% | 100.00% | 92.98% |
| LNI_A333 | 1764 | 98.78% | 100.00% | 99.56% | 100.00% | 95.01% |
| LNI_A339 | 1970 | 98.57% | 100.00% | 99.23% | 100.00% | 96.60% |
| MAS_B738 | 402 | 98.87% | 100.00% | 99.12% | 100.00% | 96.77% |
| QTR_A359 | 486 | 97.41% | 99.45% | 99.16% | 99.87% | 95.22% |
| QTR_A388 | 571 | 99.58% | 100.00% | 99.11% | 100.00% | 95.67% |
| QTR_B77W | 1944 | 95.41% | 99.16% | 98.67% | 99.81% | 93.46% |
| QTR_B788 | 494 | 98.74% | 100.00% | 99.75% | 100.00% | 95.21% |
| SIA_A359 | 552 | 98.72% | 100.00% | 99.73% | 100.00% | 95.72% |
| SVA_B744 | 199 | 98.65% | 99.04% | 99.86% | 99.53% | 95.18% |
| SVA_B77W | 1487 | 98.45% | 100.00% | 99.64% | 100.00% | 93.22% |
| SVA_B789 | 565 | 96.79% | 100.00% | 99.20% | 100.00% | 96.24% |
| SVA_B78X | 490 | 98.51% | 100.00% | 99.45% | 100.00% | 98.09% |
| TGW_A20N | 297 | 98.61% | 100.00% | 99.11% | 100.00% | 94.64% |
| THY_B77W | 424 | 98.86% | 100.00% | 99.35% | 100.00% | 97.01% |
| UAE_A388 | 1494 | 98.57% | 100.00% | 99.67% | 100.00% | 95.42% |
| UAE_B77W | 897 | 98.72% | 100.00% | 99.11% | 100.00% | 93.97% |

Table 4B: VCCF FIR CPDLC Performance Latency per Aircraft Operator/Type – July-December 2022

2.5 Few airline operators failed to meet the required performance for PORT 95% criterion. Measures have been taken by the ANSP to notify the airline operators through the CAASL (Civil Aviation Authority of Sri Lanka) to take corrective actions as appropriate.

Additional Information

ADDITIONAL DATA LINK PERFORMANCE DATA FOR JAN – MAR 2023

VCCF FIR ADS-C RSP180 Performance – Media Type, RGS and GES for JAN – MAR 2023

2.6 This section covers the RSP measurement for ADS messages sent within VCCF FIR for the period of January 2023 to March 2023. RGS and GES separate media data is presented for the period.

2.7 **Table 5** summarizes overall ADS-C performance downlinks sent within the VCCF FIR during January to March 2023.




| FIR | | VCCF | | |
|---|-----------------------|--|------------------------|---------|
| Criteria | | RSP180 | | |
| Period | | Jan-March 2023 | | |
| Colour Key  Meets Criteria  99.0%-99.84%  Under Criteria | Message Counts | 95% | 99.90% | |
| | | % < = 90sec | % < = 180sec | |
| By Media Type | | | | |
| SATCOM | 152951 | 98.61% | 99.57% | |
| VHF | 40680 | 99.93% | 99.97% | |
| HF | N/A | N/A | N/A | |
| ALL | 193631 | 99.27% | 99.77% | |
| By Remote Ground Station (RGS) Ground Earth Station (GES) | | | | |
| Designator | Type | (only RGS/GES with message counts >100 recorded) | | |
| CMB-F1 | VHF | 38578 | 99.87% | 99.92% |
| MAA-F1 | VHF | 256 | 100.00% | 100.00% |
| MLE-F1 | VHF | 2102 | 99.91% | 100.00% |
| APK1 | SAT | 124012 | 99.30% | 99.72% |
| APK2 | SAT | 25331 | 99.18% | 99.57% |
| EUA1 | SAT | 3108 | 97.35% | 99.41% |

Table 5: VCCF FIR ADS-C Downlink Latency per Media Type, RGS and GES for the period January to March 2023

VCCF FIR CPDLC RCP240 Performance – Media Type, RGS and GES for JAN – MAR 2023

2.8 **Tables 6** summarize overall CPDLC performance per Media Type, messages sent within the VCCF FIR during January to March 2023. Media type data (SATCOM/VHF) was available separately for the period. Both SATCOM and VHF data were presented as separate data.

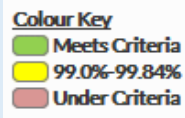
| FIR | | VCCF | | | | |
|---|----------------|------------------------------------|---------------------|--------------------|---------------------|--------|
| Criteria | | RCP240 | | | | |
| Period | | Jan - March 2023 | | | | |
|  | Message Counts | 95% benchmark | | 99.9% Benchmark | | |
| | | ACP % <= 180sec | ACTP % <= 120sec | ACP % <= 210sec | ACTP % <= 150sec | |
| By Media Type | | | | | | |
| SATCOM | 8142 | 98.44% | 98.92% | 99.32% | 99.56% | |
| VHF | 2196 | 98.82% | 99.27% | 99.61% | 99.90% | |
| HF | - | - | - | - | - | |
| ALL | 10338 | 98.60% | 99.10% | 99.47% | 99.70% | |
| By Remote Ground Station (RGS) Ground Earth Station (GES) | | | | | | |
| Designator | Type | (RGS/GES with message counts >100) | | | | |
| CMB-F1 | VHF | 2187 | 98.78% | 99.23% | 99.29% | 99.87% |
| MLE-F1 | VHF | 136 | 98.87% | 99.31% | 99.93% | 99.93% |
| APK1 | SAT | 6263 | 98.76% | 99.12% | 99.54% | 99.76% |
| APK2 | SAT | 1357 | 98.63% | 98.97% | 99.32% | 99.67% |
| EUA1 | SAT | 289 | 97.94% | 98.67% | 99.12% | 99.24% |

Table 6: VCCF FIR CPDLC Performance Latency per Media Type, RGS and GES – January to March 2023.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

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