

**Thirty Eighth Meeting of the  
Informal South Pacific ATS Coordinating Group  
(ISPACG/38)**

**Santiago, Chile  
4-6 June 2024**

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**Agenda Item 4.2**

**Communication and Satellite Service Provider Outages and Service Degradations  
Impacting Air Traffic Operations**

**Presented by:** *FAA Air Traffic Services/Angelina Jacobson*

**SUMMARY**

*This paper provides discussion on the complexity and impacts of degradations and outages within the overall data link network and urges increased efforts towards achieving the necessary levels of availability, communication, coordination, and performance.*

**1. INTRODUCTION**

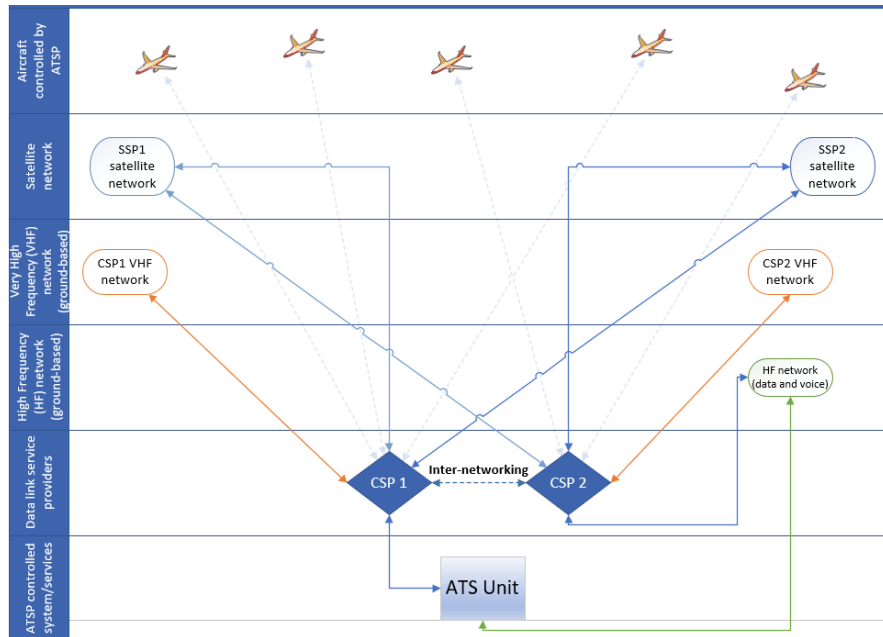
1.1. During Calendar Year 2023 (CY23) and CY24, the Federal Aviation Administration (FAA) has experienced several significant outages or service degradations by communication and/or satellite service providers (CSPs/SSPs) that have impacted oceanic air traffic services in all FAA delegated airspace.

1.2. These outages and degradations have resulted in unavailability of controller-pilot data link communication (CPDLC) and ADS-C position reporting, requiring controllers to revert to high-frequency (HF) voice communication via a third-party voice CSP. In addition, the loss of services means that aircraft are no longer eligible for performance-based communication and surveillance (PBCS) services, which requires controllers to revert to other forms of larger separation minima.

1.3. One of the challenges that the FAA and other air navigation service providers (ANSPs) have encountered with outages has been detection and standardized reporting of outages by CSPs/SSPs. This paper provides discussion on the complexity and impacts of degradations and outages within the overall data link network, recently experienced impacts in FAA oceanic airspace, and urges renewed focus and energy by ANSPs towards achieving the necessary levels of availability, communication, coordination, and performance.

**2. DISCUSSION**

2.1 The collective network provided by the CSPs and SSPs is the backbone of the Future Air Navigation System (FANS). Their data link services are relied upon to enable the exchange of communication and surveillance messages that support efficient air traffic services. Figure 1 provides a basic overview of the complexity of the various components of the network, as well as a representation of the air and ground station sub-networks users may contract with to connect to the network.



**Figure 1.** Overview of typical FANS data link network configuration

- 2.2 When any segment of data link services is lost or degraded, not only are the aircraft with the lost capability impacted, but aircraft with full capability may also be impacted by less-than-optimal altitude or route changes to re-establish required separation.
- 2.3 The operational impacts of loss of service from planned or unplanned maintenance, or outages may include:
- Data link logon and message failures (ADS-C, CPDLC)
  - Losses of separation (May include cases of loss of eligibility and actual erosion below standard being applied before the outage.)
  - Increased airspace complexity due to movement of aircraft to achieve required increases in separation.
  - Delays in or inability to communicate with affected aircraft.
  - Difficulty coordinating aircraft entering/exiting FAA controlled airspace.
  - Unexpected demand for 3rd party voice provider resources (HF voice is only back up for data link)
    - Increased HF voice messaging between ATC/Pilot and Pilot/Operator dispatch
    - Delays and potential failures in delivery of HF voice position reports and ATC communications
- 2.4 Due to the dependence upon this network, it is critical for the degraded or lost services to be re-established as quickly as possible. Clear and structured communication between all parties is essential to support operational decision-making.
- 2.5 In Quarter 1 of CY24, the FAA experienced 36 degradations or outages impacting data link services affecting Oakland (ZOA), as well as 24 affecting Anchorage (ZAN), and 20 affecting New York (ZNY) oceanic airspace. Several of these outages also impacted FAA domestic CPDLC services. Appendix A provides a summary of the dates, services that were impacted and data link flights directly impacted (does not include flights that may not have lost service but experienced impacts) for each oceanic FIR.

2.6 The bulk of outages experienced in January and February 2024 appeared to be related to a queuing issue between Iridium and Collins/ARINC data servers. There were several changes implemented by Collins/ARINC that addressed the queuing issue and unplanned outages/degradations related to that matter appear to have been resolved.

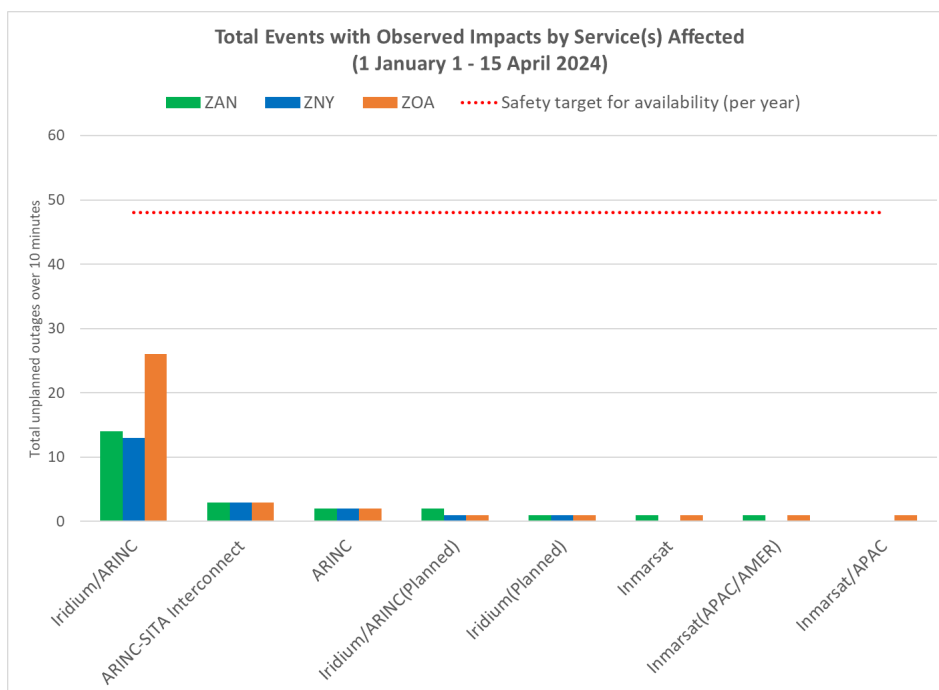
2.7 Table 1 summarizes the availability parameters detailed in ICAO Doc 9869, PBCS Manual for required communication performance (RCP) 240/ required surveillance performance (RSP) 180.

Specification: RCP 240/D, RSP180	Application: CPDLC, ADS-C	Component: CSP
Availability parameter	<b>Safety</b>	Means of compliance
Availability — CSP (ACSP)	<b>0.999</b>	Contract/service agreement terms.
Unplanned outage duration limit (minutes).	<b>10</b>	Contract/service agreement terms.
Maximum number of unplanned outages.	<b>48</b>	Contract/service agreement terms.
Maximum accumulated unplanned outages time (minutes/year).	<b>520</b>	Contract/service agreement terms.
Unplanned outage notification delay (minutes).	<b>5</b>	Contract/service agreement terms.

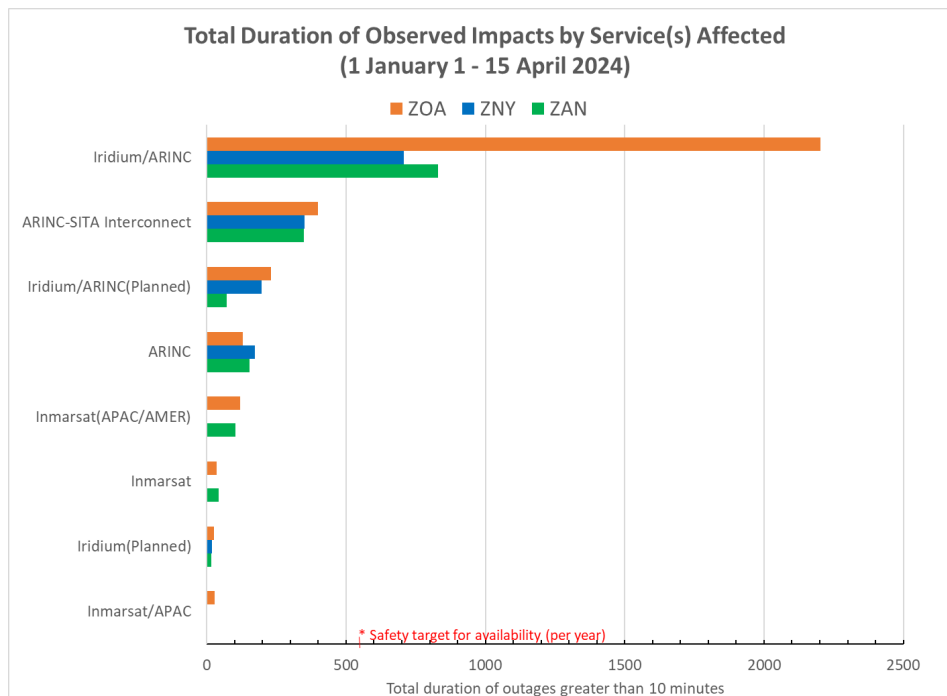
Note.— RTCA DO-306/EUROCAE ED-122 specifies a requirement to indicate loss of the service. Unplanned outage notification delay is an additional time value associated with the requirement to indicate such loss to the ANSP, per RCP-related safety requirement SR-4 for the ANSP.

**Table 1.** RCP240/RSP180 Availability criteria

2.8 Figure 2 illustrates the total count of unplanned outages impacting FAA oceanic airspace by service(s) affected in Q1 of FY24. Figure 3 illustrates the combined total duration of impact for unplanned outages greater than 10 minutes. Both figures indicate the annual safety target for comparison with the observed performance.



**Figure 2.** Total events with observed impacts by service(s) affected (1 January 1-25 March 2024)



**Figure 3.** Total duration of observed impacts by service(s) affected (1 January 1-25 March 2024)

2.9 Figure 3 shows that the annual safety targets for duration of unplanned outages greater than 10 minutes has been exceeded for the Iridium/ARINC message delivery path during the first 3 months of 2024.

2.10 The increase in outages has raised visibility and brought higher levels of attention to the ongoing challenges with availability of the FANS data link network, as well as the with the timeliness, clarity and follow up in the notifications provided by the CSPs. The FAA is developing a new communication process to improve coordination amongst technical, operational and support personnel with responsibilities related to data link systems and services.

2.11 In addition to ongoing work with between the FAA, CSPs, SSPs, and airlines, the FAA has also participated in efforts at the ICAO North Atlantic Technical Interoperability Group (NAT TIG). In 2018, the NAT TIG created the Network Outage Detection and Reporting (NODAR) Project Team (PT) to work collectively between data link system stakeholders to improve the detection and reporting related to outages within the CSP and SSP subnetworks and systems.

2.12 In 2022, the NODAR PT was disbanded having reached the limit of what could be accomplished without further action by the CSPs and SSPs. The remaining work was rolled into the NAT TIG Work Program. While work has continued, very little progress has been made towards achieving the notifications deemed necessary by the ANSPs to support critical decision-making during data link outages and degradations caused by planned or unplanned maintenance and failures.

2.13 During the most recent NAT TIG/17 Meeting held 8-11 April, 2024 at the ICAO EURNAT Regional Office in Paris, updates on NODAR work, including a draft NODAR template and Network Outage Reporting and Impact Assessment (NORIA) Handbook were presented to the meeting in NAT TIG WP/10 (Appendix B refers). Relevant excerpts from the NAT TIG Summary of Discussions related to CSP/SSP outages are included in Appendix C.

### **3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- Note and discuss the information provided.
- Consider the NODAR template and NORIA Handbook to consider use and implementation in the South Pacific Region.

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**Appendix A.**

**Appendix A1. Outages in Oakland Oceanic FIR 1 January to 25 March 2024**

Start of Outage	End of Outage	Duration(min)	Impacted Service	Impacted Data Link-equipped Flights
2024-01-04 23:59	2024-01-05 01:13	74	ARINC	146
2024-01-14 00:00	2024-01-14 00:36	36	Iridium/ARINC	46
2024-01-15 02:27	2024-01-15 02:58	31	Iridium/ARINC	23
2024-01-19 02:25	2024-01-19 04:08	103	Iridium/ARINC	53
2024-01-21 18:08	2024-01-21 22:34	266	Iridium/ARINC	78
2024-01-22 02:23	2024-01-22 02:49	26	Iridium/ARINC	20
2024-01-26 02:29	2024-01-26 03:35	66	Iridium/ARINC	42
2024-01-29 02:21	2024-01-29 04:10	109	Iridium/ARINC	59
2024-01-31 17:25	2024-01-31 20:11	166	Iridium/ARINC	51
2024-02-02 02:18	2024-02-02 04:28	130	Iridium/ARINC	66
2024-02-04 14:25	2024-02-04 14:54	29	Iridium/ARINC	7
2024-02-05 02:24	2024-02-05 03:08	44	Iridium/ARINC	40
2024-02-06 05:12	2024-02-06 09:09	237	Iridium/ARINC	44
2024-02-07 18:00	2024-02-07 18:17	17	Iridium/ARINC	18
2024-02-08 18:15	2024-02-08 18:52	37	Iridium/ARINC	26
2024-02-08 19:15	2024-02-08 19:42	27	Iridium/ARINC	19
2024-02-09 02:24	2024-02-09 03:45	81	Iridium/ARINC	51
2024-02-12 02:24	2024-02-12 03:03	39	Iridium/ARINC	30
2024-02-12 15:25	2024-02-12 18:33	188	Iridium/ARINC	35
2024-02-13 18:32	2024-02-13 19:27	55	ARINC	149
2024-02-13 19:27	2024-02-13 20:54	87	Iridium/ARINC	48
2024-02-16 02:31	2024-02-16 03:19	48	Iridium/ARINC	40
2024-02-21	2024-02-21	290	Iridium/ARINC	53

05:08	09:58			
2024-02-25 11:42	2024-02-25 12:09	27	Inmarsat/APAC	22
2024-03-05 16:58	2024-03-05 17:17	19	Iridium/ARINC	12
2024-03-06 17:27	2024-03-06 17:53	26	Iridium(Planned)	27
2024-03-11 02:36	2024-03-11 03:13	37	Iridium/ARINC	42
2024-03-13 14:11	2024-03-13 18:01	230	Iridium/ARINC(Planned)	41
2024-03-19 03:25	2024-03-19 04:00	35	Inmarsat	50
2024-03-21 11:45	2024-03-21 13:45	120	Inmarsat(APAC/AMER)	91
2024-03-27 17:29	2024-03-27 18:00	31	Iridium/ARINC	38
2024-04-03 16:50	2024-04-03 17:30	40	Iridium/ARINC	24
2024-04-12 15:26	2024-04-12 18:18	172	ARINC-SITA Interconnect(?)	100*
2024-04-14 15:54	2024-04-14 18:55	181	ARINC-SITA Interconnect	197
2024-04-15 14:06	2024-04-15 14:53	47	ARINC-SITA Interconnect	35
2024-04-15 19:12	2024-04-15 19:30	18	Iridium/ARINC	18

\*Outage on 12 April 2024 Low impact to Air Traffic - mostly resulted in delayed logons for inbound flights

#### Appendix A2. Outages in Anchorage Oceanic FIR 1 January to 25 March 2024

Start of Outage	End of Outage	Duration(Min)	Impacted Service	Impacted Data Link-equipped Flights
2024-01-05 00:01	2024-01-05 01:13	72	ARINC	55
2024-01-19 02:25	2024-01-19 04:08	103	Iridium/ARINC	6
2024-01-26 02:29	2024-01-26 03:27	58	Iridium/ARINC	6
2024-02-02 02:21	2024-02-02 02:55	34	Iridium/ARINC	6
2024-02-04 14:47	2024-02-04 15:04	17	Iridium/ARINC	5
2024-02-05 02:39	2024-02-05 03:02	23	Iridium/ARINC	4

2024-02-06 06:21	2024-02-06 08:55	154	Iridium/ARINC	3
2024-02-09 02:28	2024-02-09 03:49	81	Iridium/ARINC	4
2024-02-12 02:33	2024-02-12 03:02	29	Iridium/ARINC	5
2024-02-12 18:02	2024-02-12 18:27	25	Iridium/ARINC	5
2024-02-13 18:38	2024-02-13 20:00	82	ARINC	23
2024-02-16 02:36	2024-02-16 03:15	39	Iridium/ARINC	5
2024-02-21 05:13	2024-02-21 07:52	159	Iridium/ARINC	6
2024-02-21 08:59	2024-02-21 09:58	59	Iridium/ARINC	3
2024-03-06 17:36	2024-03-06 17:53	17	Iridium(Planned)	4
2024-03-11 02:33	2024-03-11 03:04	31	Iridium/ARINC	10
2024-03-13 15:02	2024-03-13 16:00	58	Irdium/ARINC(Planned)	4
2024-03-13 17:15	2024-03-13 17:29	14	Irdium/ARINC(Planned)	4
2024-03-19 03:25	2024-03-19 04:03	42	Inmarsat	14
2024-03-21 11:36	2024-03-21 13:19	103	Inmarsat(APAC/AMER)	41
2024-03-27 17:35	2024-03-27 17:54	19	Iridium/ARINC	3
2024-04-12 15:31	2024-04-12 18:12	161	ARINC-SITA Interconnect(?)	35*
2024-04-14 16:09	2024-04-14 18:56	167	ARINC-SITA Interconnect	38
2024-04-15 14:29	2024-04-15 14:50	21	ARINC-SITA Interconnect	14

\*Outage on 12 April 2024 Low impact to Air Traffic - mostly resulted in delayed logons for inbound flights

### Appendix A3. Outages in New York Oceanic FIR 1 January to 25 March 2024

Start of Outage	End of Outage	Duration(Min)	Impacted Service	Impacted Data Link-equipped Flights
2024-01-05 00:00	2024-01-05 01:14	74	ARINC	66
2024-01-26 02:34	2024-01-26 03:23	49	Iridium/ARINC	6
2024-01-29 02:25	2024-01-29 03:00	35	Iridium/ARINC	3



2024-01-29 03:14	2024-01-29 03:43	29	Iridium/ARINC	3
2024-01-31 17:25	2024-01-31 20:11	166	Iridium/ARINC	21
2024-02-06 05:11	2024-02-06 06:33	82	Iridium/ARINC	10
2024-02-08 18:14	2024-02-08 18:37	23	Iridium/ARINC	7
2024-02-08 19:00	2024-02-08 19:11	11	Iridium/ARINC	5
2024-02-12 15:17	2024-02-12 17:50	153	Iridium/ARINC	12
2024-02-13 18:36	2024-02-13 20:14	98	ARINC	62
2024-02-13 20:36	2024-02-13 20:54	18	Iridium/ARINC	5
2024-02-21 05:17	2024-02-21 06:13	56	Iridium/ARINC	4
2024-03-05 17:00	2024-03-05 17:16	16	Iridium/ARINC	7
2024-03-06 17:35	2024-03-06 17:53	18	Iridium(Planned)	17
2024-03-13 14:02	2024-03-13 17:18	196	Iridium/ARINC(Planned)	10
2024-03-27 17:06	2024-03-27 17:57	51	Iridium/ARINC	8
2024-04-12 16:22	2024-04-12 18:21	119	ARINC-SITA Interconnect(?)	42*
2024-04-14 16:09	2024-04-14 19:06	177	ARINC-SITA Interconnect	105
2024-04-14 14:01	2024-04-14 14:56	55	ARINC-SITA Interconnect	56
2024-04-15 19:12	2024-04-15 19:30	18	Iridium/ARINC	4

\*Outage on 12 April 2024 Low impact to Air Traffic - mostly resulted in delayed logons for inbound flights

## Appendix C. Relevant Excerpts from the NAT TIG Summary of Discussions Related to CSP/SSP Outages and NODAR

### ***Datalink outages***

3.10 USA presented a paper that discussed the complexity and impacts of degradations and outages within the overall data link network, and underlined the need for increased efforts towards achieving the necessary levels of communication, coordination and performance.

3.11 It was recalled that since the completion of the tasks of the NODAR PT, very little progress was made towards achieving the notifications deemed necessary by the air traffic service providers (ATSPs) to support critical decision-making during data link outages and degradations caused by planned or unplanned maintenance and failures.

3.12 The Group reviewed the availability parameters detailed in ICAO Doc 9869 (PBCS Manual) for required communication performance (RCP) 240/ required surveillance performance (RSP) 180 and noted that, in some cases, they were not met in terms of number of observed outages and duration of unplanned outages. It was noted that the mentioned availability requirements were not included in the operators' contracts with the CSPs.

3.13 The Group noted an overview of data link outages presented by Iceland, UK and USA:

- Iceland: since NAT TIG/16: total of 566 minutes CPDLC issue.
- UK: between 16 October 2023 and 25 March 2024, 4 SITA events, 6 ARINC events and 4 NATS technical events and 3 events resulted by other sources.
- USA: between 1 January and 25 March 2024, the FAA has experienced 14 degradations or outages impacting data link services in New York (ZNY) oceanic airspace, as well as 30 affecting Oakland (ZOA), and 20 affecting Anchorage (ZAN).

3.14 The Group discussed the various impacts of the lost or degraded data link services resulting from outages. Of note was the increase in the number of outages that are impacting service delivery, specifically on the application of reduced separations. The Group was especially concerned about the anticipated traffic increases during the upcoming summer period should this trend in unplanned outages continue which in turn impacts airspace capacity. IATA and IFALPA mentioned the added pressure of the Summer Olympics in Paris which will place further demands on airlines for on time departures and arrivals.

3.15 The Group discussed possible ways of improving the process of coordination and notification of the outages and agreed that clear and structured communication between all parties is essential to support operational decision-making. In addition, due to the dependence upon this network, it is critical for the degraded or lost services to be re-established as quickly as possible.

3.16 Concerning regulatory aspects, it was recalled that the NAT SOG, in line with the NAT Vision item 4-4, established the NAT SOG Oversight of CSPs and SSPs Project Team (OCS PT), with the objective to determine if current oversight of CSPs and SSPs is sufficient for current and predicted future NAT operations. The OCS PT composition should include members of NAT SOG, NAT TIG, IATA, IFATCA and IFALPA. Therefore, NAT TIG members were encouraged to participate in the OCS PT.

3.17 As a result of the discussions, the Group invited ANSPs to form a team of the NAT TIG analysts in order to continue developing the process for determining outage impacts and measuring against the RCP240/RSP180 availability requirements.

### **Update on NODAR template implementation**

3.30 The Group noted latest coordination made with the CSPs/SSPs on the implementation of NODAR template. It was noted that the Rapporteur organised teleconferences with the CSPs/SSPs and the ANSPs that provided updates to the NODAR template. The Group reiterated that the NODAR template and taxonomy is a long-term solution that Inmarsat, Iridium, SITA and Collins would gradually work towards aligning with it. The Group reviewed and endorsed the NODAR template and taxonomy, as provided at Appendix E, as the baseline for the NAT for network outage reporting and notification, pending NAT IMG approval. It was agreed that any future proposal for amendment to the template should be formally submitted to the NAT TIG for review. Therefore, the following was agreed:

Draft NAT IMG Decision 64/NATTIG17/x – NODAR template and taxonomy

That, the NODAR template and taxonomy at Appendix E is endorsed.

3.31 The Group noted that the table of ACARS path identifiers included in the NODAR template document (Appendix E) would need to be kept up to date, because it is the key that ANSPs use, in combination with the e-mail notification, to determine the impact of the planned maintenance or outage. The Group agreed that the NAT TIG should assume the responsibility for maintaining the table until a permanent solution is found.

3.32 The Group was further presented with a draft Network Outage Reporting and Impact Assessment (NORIA) Handbook for the NAT ANSPs. It was proposed that the NAT guidance handbook should be promoted to become a global document, possibly under the umbrella of the ICAO Operational Data Link Working Group (OPDLWG). In this regard, Bjarni Stefansson will write a working paper for the upcoming OPDLWG meeting in June with information on the NODAR status and seeking input on possible global applicability of the NODAR template and methodology.

3.33 The Group reviewed a draft Network Outage Reporting and Impact Assessment (NORIA) Handbook presented by the Rapporteur, as at Appendix F. The document will be under further review by the NAT TIG.

3.34 In addition, the Group agreed on the following tasks remained for the NAT TIG:

- a) Monitor the progress of implementation by the CSPs and SSPs of the agreed template and common taxonomy.
- b) Maintain the table of ACARS path identifiers. In this regard, the Group agreed to add a new item to the action item R-06 for the CSPs and SSPs: "Provide any amendments to the table of ACARS path/location identifiers".
- c) Continue developing the NORIA handbook and consider the best solution for developing it into a globally applicable document.
- d) Identify whether any other documentation needs to be updated or developed because of the agreed template, taxonomy and table of ACARS path identifiers.

3.35 The Group noted that, with the approval of the notification template and taxonomy and ongoing development of the NORIA handbook, it was expected that the CSPs and SSPs would start working towards full implementation of the template.

3.36 It was noted that the NODAR template is not intended by the CSPs to be used for passing notifications to one another, and in fact there is currently no service level agreement between SITA and Collins to provide notifications to one another during outages. The Group expressed concerns about the risks associated with not receiving notifications about an outage affecting potentially half



or more of the aircraft under the responsibility of the ATSP. It was remarked that the issue could be discussed in the new NAT SOG OCS PT.