



**THE FORTY-NINTH MEETING OF THE
INFORMAL PACIFIC ATC COORDINATING GROUP
(IPACG /49)**

Mita Kaigisho – Tokyo, Japan
December 3, 2024

Agenda Item 6: CNS Issues

Oceanic Data Link Network Stability

(Presented by FAA)

SUMMARY

This paper provides discussion on the stability of the oceanic data link network as experienced by the FAA in Calendar Year 2024, details safety oversight efforts regarding Communication and Satellite Service Providers underway in the North Atlantic region, as well as discussion on improving communication during planned maintenance of data link systems.

1. Introduction

- 1.1. During Calendar Year 2024 (CY24), the Federal Aviation Administration experienced multiple unplanned 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 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 third-party voice CSP. The loss of service has also meant that aircraft were no longer eligible for performance-based communication and surveillance (PBCS) services, requiring controllers to revert to other, larger separation minima. 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 of the FAA's Pacific Oceanic FIRs.
- 1.3. The bulk of data link service outages took place in Q1 of CY24. These appeared to be related to a queueing issue between Iridium and Collins/ARINC data servers. There were several changes implemented by Collins/ARINC that addressed the queueing issue, and unplanned outages/degradations related to that matter appear to have been resolved. Interruptions in data link service, although reduced from the frequency experienced in Q1, have persisted throughout CY24.
- 1.4. The FAA and other air navigation service providers (ANSPs) continue to be challenged by the lack of standardized reporting of unplanned outages and planned maintenance by CSPs/SSPs. This paper provides discussion on the impacts of degradations and outages experienced in FAA delegated airspace in CY24, as well as provides an update to work on this topic being spearheaded in the North Atlantic Region (NAT).

2. Discussion

- 2.1. The network provided by the CSPs and SSPs is a critical component of the modern oceanic air traffic environment. The PBCS separation standards enabled by rapid communication and surveillance messages have become integral to the safe and efficient service relied upon by operators. Due to the dependence upon the data link network, it is vital for lost or degraded services to be re-established as quickly as possible. Clear and structured communication between all parties is essential to support operational decision-making.
- 2.2. Table 1 summarizes the availability parameters detailed in ICAO Doc 9869, PBCS Manual for required communication performance.

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

- 2.3. Figure 1 illustrates the total count of unplanned outages impacting FAA oceanic airspace by service(s) affected in the 12-month period between 1 November 2023 and 31 October 2024. Figure 2 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.
- 2.4. Figure 2 shows that the annual safety targets for duration of unplanned outages have been exceeded for both ARINC/FANS managed service and Iridium/ARINC message delivery path in Oakland and Anchorage, as well as Inmarsat SB-S 1.0 in Oakland.

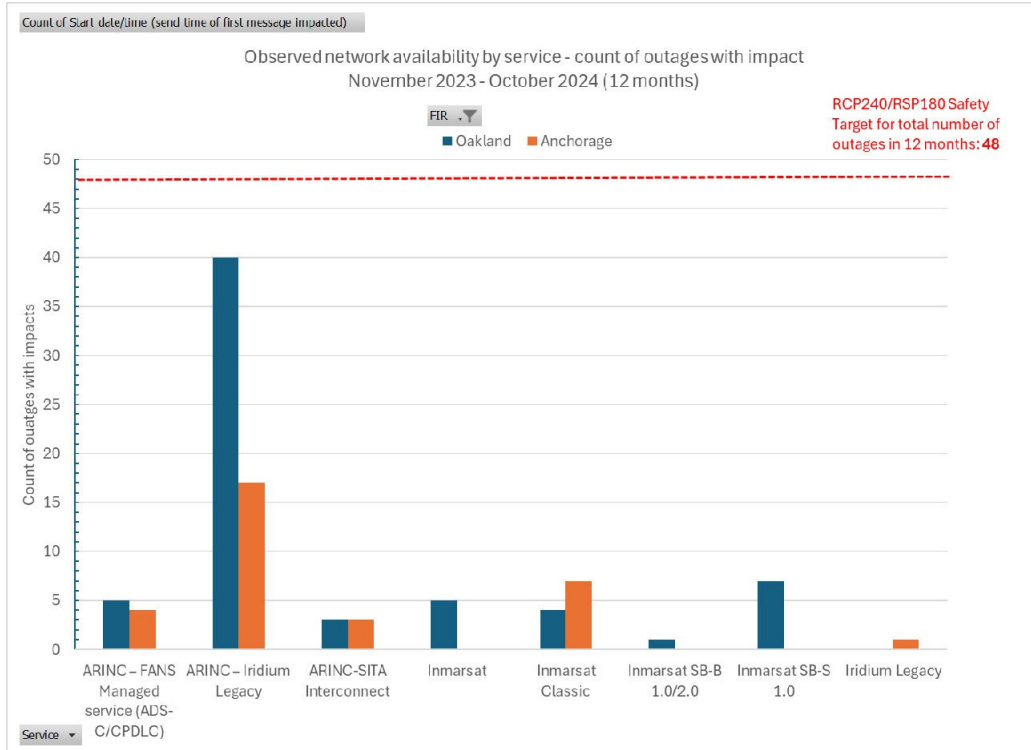


Figure 1. Total Count of Outages

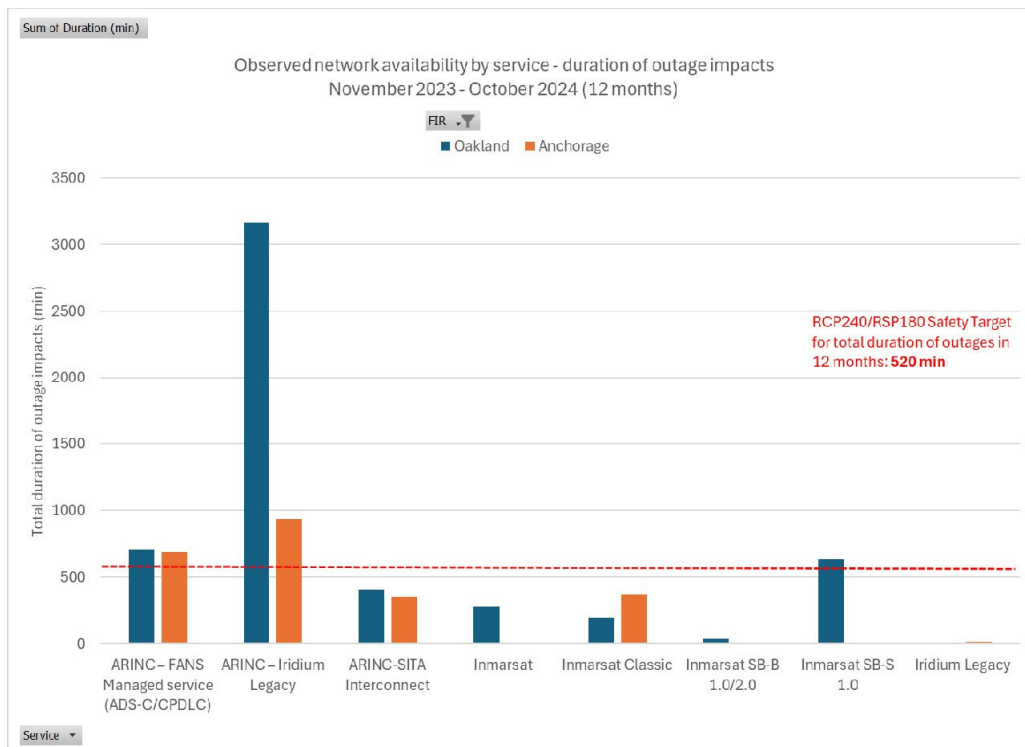


Figure 2. Total Duration of Outages

- 2.5 Unplanned outages and service degradation are not unique to the Pacific Region, as these global networks are relied upon by other ANSPs. The North Atlantic Safety Oversight Group (NAT SOG) formed a project team to understand and address shortfalls in the NAT Region, particularly those related to CSP/SSP regulatory oversight. The Oversight of Communication Service Providers and Surveillance Service Providers (OCS PT), co-led by the USA and the UK, has the objective to “determine if current oversight of Communication Service Providers (CSPs) and Surveillance Service Providers (SSPs) is sufficient for current and predicted future North Atlantic (NAT) operations.”
- 2.6 Currently, the OCS PT is endeavouring to:
- Ascertain high level content of ANSP/CSP contracts – Are they similar? – What is the overall picture of CSP/SSP delivery across the NAT and are they in line with the GOLD Manual, PBCS Global Charter and/or the EUROCONTROL CSP Generic Requirements?
 - Ascertain whether the contracts take accountability of the inter-networking elements to ensure service delivery in line with the contract? Also, are 3rd party vendors appropriately accounted for in the contracts and services provided?
 - Determine whether CSPs/SSPs should be included in Doc 007 data link mandate requirements.
 - Understand the challenges of CSPs/SSPs in delivering contractual obligations.
 - Determine whether, in addition to current actions by the NAT Technology and Interoperability Group (TIG) and the NAT Systems Planning Group (SPG), additional communication should be initiated with the upper management of these companies to ensure a common understanding in the criticality of their networks and services on enabling NAT operations. [Ref: Draft NAT SPG Conclusion 61/3]
 - Understand whether ANSP reactions and procedures to planned and unplanned degradations in network service, including communication with affected flight crews are the same and applied consistently. How are they reported? Should there be a standard taxonomy? Is an agreed upon standard needed to label these events? (When is it a loss of separation?)
 - Understand the safety impacts of unplanned CSP/SSP outages in the NAT and how this impacts the Collision Risk Estimate. Are these reported consistently across the NAT?
 - Ascertain whether crews/operators are aware of what an unplanned outage mean to their flight in terms of safety impacts and possible Air Traffic Control (ATC) actions.
 - Consider whether data link network performance, including measurements to determine acceptability of service outages should be included within the NAT Annual Safety Report and how would that be conveyed?
 - Consider whether CSP/SSP outages should be added as a Safety Key Performance Indicator (SKPIs) to the list of NATSOG SKPIs.
- 2.7 At the 17th meeting of the Joint Project Teams of the OPDLWG, the member from Iceland presented an update on the NORIA handbook and the NODAR template for service outages. (This handbook and template were previously briefed at IPACG PM/30 by the FAA. An updated draft is included as Appendix B in a separate document). An agreement on the e-mail notification template and taxonomy has been reached between Collins, SITA, Inmarsat, Iridium, and the NAT ANSPs under the supervision of the NAT Implementation Management Group (IMG). The implementation timeline for the four companies will be different.

- 2.8 Figures 4 and 5 show communication from Iridium and from SITA on the same planned maintenance event. The information within each message is similar but not identical. After receiving these notifications, the FAA representative responsible for CSP contracts called SITA for clarification on this activity. Figure 6 shows the information provided to the FAA after that phone call. While the additional information is welcome, the vague description of possible impact times and the very long maintenance window are not conducive to tactical planning of air traffic service. The FAA recognizes the need for ongoing conversation with CSPs and SSPs to refine not only the provision of information, but the type of information which supports proactive air traffic planning. Absent this type of specific information, the FAA may have to rely on more restrictive, less efficient measures to assure safety such as traffic management initiatives or re-routes.

AAM
GL/Iridium-Planned Mx

This is to advise you that Iridium will be performing scheduled planned maintenance on Short Burst Data (SBD) service during the following period.
Service(s): GL/Iridium

Trouble Ticket #: 2335883

Maintenance Location: Global

Maintenance Start Time: Wednesday November 21, 2024 @ 1600z.

Maintenance End Time: Wednesday November 22, 2024 @ 0400z.

Expected Maintenance Duration: 720 minutes (12 hours)

Description of Maintenance: During the planned maintenance period, Iridium will take every step possible to minimize potential impact to service availability. Additional notification will be provided to alert you of any changes in status if an outage or degradation occur during this maintenance event.

Please ensure this message is forwarded to the appropriate technical support personnel within your organization.

If you have any further questions or concerns, please contact the Collins Aerospace Service Desk.

Service Desk / Connected Aviation Solutions (CAS)
COLLINS AEROSPACE
US & Int'l Access (AT&T) 1-800-633-6882
HDQHDXA
helpdesk@arinc.com

Figure 4. Iridium Notification of Planned Maintenance

Dear Customer,

Please take note of the planned maintenance below:

- **Type:** Planned
- **Reference ticket:** CHG0068671
- **Status:** Advanced Notice
- **Service:** AIRCOM - Iridium Legacy ACARS
- **Impacted Coverage:** Global
- **Impact to service:** Intermittent
- **Start Time:** 21-Nov-2024 16:00 UTC
- **End Time:** 22-Nov-2024 04:00 UTC
- **Duration:** 12 Hours
- **Estimated Impact:** 5 minutes

We have been notified by Iridium that they will undergo a planned maintenance during the time window indicated above. There will be brief disruption to the service during the maintenance window.

Please be advised the service will be closely monitored throughout the window

Please do not hesitate to contact us should you have any questions or concerns.

Best Regards,
SITA FOR AIRCRAFT ServiceDesk

Direct: SIN: +65 6548 2828 | North America: +1 866 247 2661
Email: ServiceDesk.Aircraft@sita.aero
URL: www.sita.aero/aircraft
SITATEX: HDQA5XS

Figure 5. SITA Notification of Planned Maintenance

AAM
GL/Iridium-Planned Mx - UPDATE

Additional information has been added to this AAM UPDATE to help clarify any service impact to be expected. Please see below.

This is to advise you that Iridium will be performing scheduled planned maintenance on Short Burst Data (SBD) service during the following period.

Service(s): GL/Iridium

Trouble Ticket #: 2335883

Maintenance Location: Global

Maintenance Start Time: **Wednesday-Thursday** November 21, 2024 @ 1600z.

Maintenance End Time: **Wednesday-Friday** November 22, 2024 @ 0400z.

Expected Maintenance Duration: 720 minutes (12 hours)

Description of Maintenance: During the planned maintenance period, Iridium will take every step possible to minimize potential impact to service availability. Additional notification will be provided to alert you of any changes in status if an outage or degradation occur during this maintenance event.

UPDATED INFORMATION:

Iridium will use the following procedure for this maintenance:

- At start of the maintenance event, SBD service will be on the standby/redundant equipment which will result in no impact to service.
- A cutover over to the new hardware will result in a brief disruption to SBD ACARS message traffic, both Air to Ground and Ground to Air directions.
- Subsequent network and hardware upgrades will result in brief disruptions to SBD ACARS message traffic, both Air to Ground and Ground to Air directions throughout the maintenance window.
- All total disruptions are expected to be less than 5 minutes cumulatively throughout the maintenance window.

Figure 6. Iridium Update on Planned Maintenance

3. Action by the meeting

3.1. The meeting is requested to:

- Consider the goals of the OCS-PT as they pertain to safety oversight of the oceanic data link network.
- Encourage timely implementation of the NODAR template by CSPs and SSPs.
- Support the collaborative refinement of information sharing regarding service outages, degradations, and planned maintenance such that it supports proactive air traffic management planning.

Appendix A.

Data Link Outages Observed in Oakland, January – October 2024

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 05:08	2024-02-21 09:58	290	Iridium/ARINC	53
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
2024-05-14 22:16	2024-05-15 03:52	336	AMER SB-S 1.Q(?)	12
2024-05-16 20:05	2024-05-16 20:49	44	Iridium/ARINC	44
2024-06-10 21:35	2024-06-10 21:52	18	ARINC	17
2024-06-17 19:07	2024-06-17 19:24	17	Iridium/ARINC	31
2024-07-31 01:58	2024-07-31 03:51	114	Inmarsat	107
2024-07-31 06:11	2024-07-31 06:50	40	Inmarsat	52
2024-07-31 11:31	2024-07-31 12:45	75	Inmarsat	85
2024-07-31 13:23	2024-07-31 13:49	26	Inmarsat	5
2024-08-01 11:04	2024-08-01 11:25	21	Inmarsat	68
2024-08-02 02:30	2024-08-02 03:18	48	Iridium/ARINC	22
2024-08-05 02:30	2024-08-05 03:30	60	Iridium/ARINC	32
2024-08-06 16:20	2024-08-06 17:37	77	Iridium/ARINC	28
2024-08-23 02:57	2024-08-23 03:19	22	Iridium/ARINC	20
2024-09-26 16:32	2024-09-26 17:26	54	Iridium/ARINC	20
2024-10-02 00:45	2024-10-02 01:00	15	Inmarsat/APAC	23
2024-10-03 18:08	2024-10-03 18:45	37	Inmarsat SB-B 1.0/2.0	19
2024-10-05 05:54	2024-10-05 06:23	49	Inmarsat SB-B 1.0	7
2024-10-05 16:16	2024-10-05 16:30	24	Inmarsat SB-B 1.0	7
2024-10-05 17:00	2024-10-05 17:29	49	Inmarsat SB-B 1.0	8
2024-10-05 23:00	2024-10-05 23:18	30	Inmarsat SB-B 1.0	6
2024-10-05 23:50	2024-10-06 00:08	31	Inmarsat SB-B 1.0	6
2024-10-06 00:33	2024-10-06 01:39	112	Inmarsat SB-B 1.0	7
2024-10-07 14:54	2024-10-07 15:27	56	ARINC	113
2024-10-11 02:41	2024-10-11 03:24	73	Iridium/ARINC	38

Data Link Outages Observed in Anchorage, January – October 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
2024-07-31 01:55	2024-07-31 02:42	48	Inmarsat	33
2024-07-31 02:46	2024-07-31 04:05	49	Inmarsat	30
2024-07-31 06:06	2024-07-31 06:45	40	Inmarsat	39
2024-07-31 11:31	2024-07-31 12:38	67	Inmarsat	33
2024-08-01 11:04	2024-08-01 11:25	21	Inmarsat	21
2024-10-07 14:56	2024-10-07 15:22	26	ARINC	37