

**Twenty Fourth Meeting of the
Informal South Pacific ATS Co-ordinating Group (ISPACG/24)**

**FANS Interoperability Team Meeting (FIT/17)
Brisbane, Australia, 9-10 March 2010**

Agenda Item 6: Progress toward the GOLD standard

GLOBAL OPERATIONAL DATA LINK DOCUMENT (GOLD)

Presented by the Federal Aviation Administration

SUMMARY

This paper provides the status on the Global Operational Data Link Document (GOLD) and invites the ISPACG to begin planning and implementation of its use.

1. INTRODUCTION

- 1.1 An ICAO-sponsored Ad Hoc Working Group is developing a global operational data link document (GOLD). The North Atlantic Systems Planning Group (NAT SPG) and Asia-Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) endorsed the work program in June and September 2008, respectively.
- 1.2 The purpose of the GOLD is to facilitate global harmonization of existing data link operations and resolve regional and/or State differences impacting seamless operations. It will include required communication performance (RCP) and surveillance specifications, based on RTCA DO-306/EUROCAE ED-122, and guidelines on post-implementation monitoring and corrective action to address issues with satellite data communication services that were coordinated in the North Atlantic and Asia-Pacific Regions. (Ref ISPACG/22 FIT/15 WP/07 and Report of ISPACG/22, paragraph 3.9.3)
- 1.3 The GOLD is intended primarily for those who are involved in planning and implementation of data link services, and day-to-day operations, and will be key to harmonizing oceanic and continental (domestic) data link operations worldwide.
- 1.4 The GOLD will effectively replace the Guidance Material for ATS Data Link Services in North Atlantic Airspace (NAT Data Link GM) and the FANS-1/A Operations Manual (FOM) for the Asia-Pacific, South American and African-Indian Ocean Regions. The GOLD also includes provisions for the aeronautical telecommunication network (ATN) implementation in the European Region.
- 1.5 This paper provides the status on the Global Operational Data Link Document (GOLD) and invites the ISPACG to:



- a) Coordinate with the North Atlantic (NAT) Region and the GOLD Ad Hoc Working Group to satisfactorily close some comments;
- b) Assess impact and establish an implementation schedule for ISPACG to transition from the FOM to the GOLD on data link operations in the South Pacific sub-region; and
- c) Agree that the GOLD Ad Hoc Working Group will continue to manage the GOLD until global configuration control mechanisms within the regions are adequately in place for processing timely changes.

2 DISCUSSION

2.1 The U.S. is coordinating efforts that have been well represented by:

- a) ICAO Headquarters and Regional Offices: Montreal, Bangkok, Paris, and Lima;
- a) Air traffic service providers (ATSPs) in the North Atlantic (NAT), Asia-Pacific (APAC), South American (SAM), African-Indian Ocean (AFI), and European (EUR) Regions;
- b) Ground system developers and manufacturers;
- c) International organizations, such as the International Federation of Airline Pilot's Associations (IFALPA), International Air Transport Association (IATA), and International Business Aviation Council (IBAC);
- d) Aircraft operators, airframe manufacturers, and avionics suppliers;
- e) Communication service providers (CSPs) and satellite companies; and
- f) Other interested parties.

2.2 The latest GOLD information is available for download on the following public web sites:

- a) FAA:
http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/enroute/oceanic/data_link/; and
- b) Airways New Zealand: <http://www.ispacg-cra.com>.

GOLD contents

2.3 Table 2-1 provides an overview of the contents of the GOLD and indicates intended uses.

Table 2-1. GOLD contents

Material Type	Reference	Description	Intended uses, remarks
Introductory material	Foreword	Purpose, scope, etc.	For all users of the document. Descriptive.
	Chapter 1	Definitions	For all users of the document. Descriptive.
	Chapter 2	Overview of data link operations	For ATSPs and operators to develop training material for personnel, as appropriate, on the fundamentals of data link operations. Descriptive.
Guidelines	Chapter 3	Administrative provisions related to data link operations	For ATSPs and airspace planners to plan for and implement data link services, including ATC automation, and interfacility agreements. For ATSPs and operators to negotiate contractual arrangements with CSPs. For operators to plan for and use the data link system.
	Chapter 4	Controller and radio operator procedures	For ATSPs and CSPs to develop procedures and training material for controllers and other personnel at ATSU's and radio facilities.
	Chapter 5	Flight crew procedures	For operators to develop procedures and training material for the flight crew and dispatchers.
	Chapter 6	Advanced data link operations	For ATSPs and operators to develop procedures and training material for personnel, as appropriate, related to advanced data link operations, such as dynamic airborne reroute procedures (DARP) and tailored arrival (TA).
	Chapter 7	State aircraft data link operations	For ATSPs and State (military) operators to develop procedures and training material for personnel, as appropriate, related to conducting military operations, such as military assumes responsibility for the separation of aircraft (MARSAs) and air-to-air refueling (AAR).
Appendices (Supporting and Additional Guidelines)	Appendix A	CPDLC message elements and standardized free text messages	For all users. Based on Doc 4444, and includes FANS 1/A and ATN B1 messages.
	Appendix B	RCP specifications	For technical operations specialists, applies to CPDLC, particularly in reduced separation environments.

Material Type	Reference	Description	Intended uses, remarks
	Appendix C	Surveillance performance specifications	For technical operations specialists, applies to ADS-C and FMC WPR, particularly in reduced separation environments.
	Appendix D	Post-implementation monitoring and corrective action	For post-implementation monitoring of the performance of the data link system, analysis, investigations, and corrective action at the State/ATSP, regional, and global levels.
	Appendix E	Regional/State-specific information	Includes differences in data link operations at the State/ATSP and regional levels.
	Appendix F	Operator/aircraft specific information	Includes differences in aircraft data link system capability and performance.

GOLD Status

- 2.4 The Ad Hoc Working Group distributed the GOLD v0.5.0, dated 3-Aug-09, for broad review and comment period that ended October 2009.
- 2.5 The APANPIRG/20 concluded in September 2009 to endorse the GOLD, upon its release to the NAT region, as a replacement for the FOM. Coordination with the South American (SAM), African-Indian Ocean (AFI), and the European (EUR) Regions will require additional time after this release. However, the GOLD is expected to be satisfactorily completed in time for NAT SPG/46 conclusions in June 2010.

Asia-Pacific Region activity on the GOLD

- 2.6 The APANPIRG/20, in Bangkok, Thailand, 7-11 September 2009, reached the following conclusions on matters related to the GOLD.

Conclusion 20/31 - State and Operator aircraft information for GOLD

That,

- a) States be urged to provide Region & State Information for inclusion in the GOLD Appendix E, by sending the completed forms(s) as provided in Annex 1 to this Report for their flight information regions (FIRs) or control areas (CTAs) by 30 October 2009; and
- b) IATA be urged to coordinate with member airlines for providing operator & aircraft information for the GOLD Appendix F by sending completed form(s) as provided in Annex 2 to this report for each variance, clarification, or addition to applicable aircraft type by 30 October 2009.

Conclusion 20/33 – Coordinate Implementation of Reduced Horizontal Separations with CSPs

That, recognizing the technical limitations in satellite data link communications capability for the provision of ADS-C and CPDLC, States intending to implement reduced horizontal separations based on RNAV 10 and RNP 4 PBN specifications in oceanic and remote area commence early coordination with Communication Service Providers (CSPs) in order to ascertain adequate data link communication/surveillance capability to support the proposed implementation. Outcomes should be recorded in a formal Service Level Agreement (SLA) between implementing States and CSPs, jointly or severally, to ensure that capabilities are available to properly support RCP 240/D specifications contained in Appendices B and C to the GOLD on an ongoing basis.

Conclusion 20/74 – Adopt GOLD to replace FOM

That, upon release of the Global Operational Data Link Document (GOLD) by the Ad-Hoc GOLD Working Group in first quarter 2010, the FANS-1/A Operations Manual (FOM) be withdrawn and replaced by the GOLD as Asia/Pacific regional guidance material for use by States and airspace users as the basis for operating Automatic Dependent Surveillance – Contract (ADS-C) and Controller Pilot Data Link Communications (CPDLC), in conjunction with Annex 10 – Aeronautical Telecommunications Volume II – Communications Procedures including those with PANS status and the Procedures for Air Navigation Services – Air Traffic Management (PANS–ATM Doc 4444).

South American (SAM) and African-Indian Ocean (AFI) Region activity on the GOLD

- 2.7 The South American (SAM) and African Indian Ocean (AFI) Regions currently use the FANS 1/A Operations Manual (FOM) and requested more time to review the GOLD; their review would not begin before March 2010.

NAT ATS coordinating group activity on the GOLD

- 2.8 In follow up to NAT SPG Conclusion 44/9, NAT Implementation Management Group (IMG/34), in Brest, France, 5 – 8 May 2009, noted the progress of the GOLD. At that time, the GOLD, intended for regional use, was expected to be available for approval by the end of 2009.
- 2.9 NAT SPG/45, in Paris, France, 23 – 26 June 2009, concluded on the following:

NAT SPG Conclusion 45/19 - Global Operational Data Link Document

That the NAT Implementation Management Group (NAT IMG):

- a) review the final version of the Global Operational Data Link Document (GOLD) with the aim to replace the Guidance Material for ATS Data Link Services in North Atlantic Airspace; and
- b) provide a report to NAT SPG/46.

- 2.10 NAT Air Traffic Management Group (ATMG/34), in Lisbon, Portugal, 7-11 September 2009, agreed that:
- a) NAT ATMG would undertake a thorough review of the GOLD in order to provide an informed recommendation to NAT IMG/36. The aim of the review would be to ensure that all provisions required for NAT data link operations had been included and that, accordingly, there was no longer a need to maintain a separate NAT Data Link GM;
 - b) the member from the United States would coordinate with the Ad-Hoc Working Group on an inadvertent omission in the GOLD regarding the description of uplink messages which were not to be used in the NAT Region due mainly to safety concerns. The Group noted that a corrected version of the NAT Data Link GM (version 19.1) would be published to address this same subject; and
 - c) to forego any further changes to the NAT Data Link GM (v19.1) unless necessary to address a safety issue. This version would provide baseline content to support the final phase of the GOLD development.
- 2.11 NAT Communication, Navigation and Surveillance Group (CNSG/1), in Paris, France, 28 September – 2 October 2009, agreed that:
- a) GOLD provided adequate guidance for data link operations in the NAT;
 - b) there was minimal risk in meeting the schedule to complete the document by the end of 2009; and
 - c) upon satisfactory resolution of the comments on the GOLD, the document will be acceptable to replace the NAT Data Link GM.
- 2.12 At NAT IMG/35, Reykjavik, Iceland, 10 – 13 November 2009, the NAT IMG recalled that NAT SPG/45 had agreed that:
- a) the GOLD, when it was endorsed by NAT IMG, would replace the NAT Data Link GM and serve as the basis for data link monitoring in the NAT Region; and
 - b) a global configuration management process would be put in place by the ICAO EUR-NAT Regional Office in Paris, and in cooperation with other ICAO Regional Offices and Headquarters, whereby the document would be maintained in coordination among the concerned parties.
- 2.13 At previous meetings, it had been discussed that the NAT ATMG/35, Paris, France, 8-12 March 2010, and NAT CNSG/2, Shannon, Ireland, 22-26 March 2010 would suffice to formulate their recommendations for NAT IMG/36, in Paris, France, 18-21 May 2010. Based on favorable recommendations, the NAT IMG could proceed accordingly for NAT SPG/46, planned in Paris, France, June 2010, to conclude on endorsing the GOLD as a NAT regional document that would replace the NAT Data Link GM.

Remaining GOLD work

- 2.14 Until the GOLD is released to the ICAO regional offices, the Ad Hoc Working Group is coordinating to satisfactorily resolve all comments received on the GOLD to ensure the best quality and usability of its initial release to the participating regions.
- 2.15 During the broad review and comment period, the Ad Hoc Working Group had received approximately 700 comments from all representatives participating in the project.
- 2.16 The Ad Hoc Working Group closed comments via correspondence and the GOLD/3 meeting, in San Diego, CA USA, 27 January – 2 February 2010, and continues to coordinate with comment authors and points-of-contact within each of the participating regions to finalize the initial release of the GOLD to the ICAO Regional Offices.
- 2.17 Except as discussed in paragraph 2.19, some possible updates to Appendices E and F, and minor editorial formatting, the Ad Hoc Working Group has resolved all comments received on the GOLD. The GOLD v0.5.6, dated 1 March 2010, includes all resolutions and is intended for comment authors and ATS regional coordinating groups to ensure that all comments have been satisfactorily resolved.
- 2.18 Based on any feedback from comment authors and the ATS regional coordinating groups, the Ad Hoc Working Group is planning to complete the GOLD by 1 June 2010 and release it to participating ICAO Regional Offices. This date is intended to support appropriate regional coordination for NAT SPG/46 to conclude on endorsing the GOLD as a NAT Regional document that will replace the NAT Data Link GM. (refers paragraph 2.13)

Resolution to specific comments related to the NAT

- 2.19 Some unresolved comments (refers comments v50-689, v50-690, V50-691), which originated from NAT ATMG/34, suggested the addition of three standardized CPDLC uplink free text messages intended for alerting the flight crew of out-of-conformance on a route clearance, level/altitude clearance, or speed clearance. GOLD/3 concluded that further coordination with the NAT ATMG and the NAT CNSG was necessary to resolve the comments. Table 2-2 summarizes the GOLD/3 remarks to satisfactorily resolve the comments.

Note 1.— Comment references can be found in the master comment matrix provided with the GOLD document on the web sites noted in paragraph 2.2.

Note 2.— An alternative to resolution of the specific comments could be to include these free text messages as an amendment to the GOLD after its initial release.

Table 2-2. GOLD/3 considerations for new standardized free text uplink messages

Message intent/use	CPDLC uplink message	GOLD/3 remarks
(Current resolution) Instruction to notify of a navigation alert in response to receipt of any ADS-C report indicating a current or future navigation deviation and to request the flight crew to advise of intentions.	(Proposed, not agreed) <u>UM 169</u> NAVIGATION ALERT. ADS POSITION INDICATES [distance] NM [left/right] OF COURSE. ADVISE INTENTIONS.	Consider NOT including distance/direction in the uplink. Given the time for the ADS-C report to be received, processed and displayed to the controller, the response to be composed, as well as the time for the uplink to be transmitted to and read by the flight crew, any distance/direction may be in error by a significant margin and result in flight crew confusion. A more generic message is suggested, such as “NAVIGATION ALERT. ADS-C REPORT INDICATES OFF COURSE. ADVISE INTENTIONS.” (Refers comment v50-689)
(Proposed, not agreed) Instruction to notify of an alert generated from a discrepancy determined from any ADS C report. Used in combination with <u>UM 19</u> MAINTAIN [level]. <i>Note.— No equivalent to ICAO Doc 4444.</i>	(Proposed, not agreed) <u>UM 169</u> ALTITUDE ALERT. <u>UM19</u> MAINTAIN LEVEL [altitude]. <u>UM 169</u> ADS REPORT INDICATES ALTITUDE DEVIATION.	1) Move the clearance so not in the middle of the message, e.g., <u>UM 169</u> (new) ALTITUDE ALERT. ADS C REPORT INDICATES ALTITUDE DEVIATION. <u>UM 19</u> MAINTAIN LEVEL [altitude]. 2) Should the imperative be at the front or the back of the message. 3) Consider whether <u>UM 19</u> is appropriate. And if so, what level would it contain? 4) Consider maybe <u>UM 19</u> should be replaced with standard message elements, e.g., <u>UM 135</u> CONFIRM ASSIGNED LEVEL/ALTITUDE or free text ADVISE INTENTIONS. For example, the crew may be responding to a TCAS RA or a turbulence event and returning to the original level may not be optimal or safe. (Refers comment v50-690)

Message intent/use	CPDLC uplink message	GOLD/3 remarks
<p>(Proposed, not agreed)</p> <p>Instruction to notify of an alert generated from a discrepancy determined from any ADS C report. Used in combination with UM 106 MAINTAIN [speed].</p> <p><i>Note.— No equivalent to ICAO Doc 4444.</i></p>	<p>(Proposed, not agreed)</p> <p><u>UM 169</u> SPEED ALERT.</p> <p><u>UM 106</u> MAINTAIN [speed].</p> <p><u>UM 169</u> ADS REPORT INDICATES MACH DEVIATION.</p>	<p>1) Move the clearance so not in the middle of the message, e.g., <u>UM 169</u> SPEED ALERT. ADS C REPORT INDICATES MACH DEVIATION. <u>UM 106</u> MAINTAIN [speed].</p> <p>2) Should the imperative be at the front or the back of the message.</p> <p>3) Consider whether <u>UM 106</u> is appropriate. And if so, what speed would it contain?</p> <p>4) Consider maybe <u>UM 106</u> should be replaced with standard message elements, e.g., <u>UM 136</u> CONFIRM ASSIGNED SPEED, or free text ADVISE INTENTIONS.</p> <p>(Refers comment v50-691)</p>

Regional change process for the GOLD

- 2.20 After the Ad Hoc Working Group releases the GOLD to the ICAO Bangkok and Paris Offices for regional use, the GOLD will be maintained as a Regional document in each of the regions, e.g., multiple instances.
- 2.21 The FOREWORD of the GOLD provides a change process that has been coordinated with ICAO Montreal, Paris, and Bangkok offices. The change process is described as follows:

8. Changes to the document

This document is maintained as a regional document in coordination with all ICAO planning and implementation regional groups (PIRGs) providing data link services within their region. Each participating PIRG establishes a mechanism for submitting and administering change proposals.

Change proposals (CPs) can be submitted by any stakeholder participating in data link operations. The stakeholder should submit a Change Proposal to their ICAO regional office (see Appendix E). The ICAO regional office will coordinate the change proposal within its own region, other regions, and ICAO HQ, to determine the acceptability of the change proposal. Once the ICAO regional office has completed coordination and the participating PIRGs accept the change proposal, the change is concluded by each of the PIRGs.

- 2.22 Change proposals (CPs) will be submitted to an ICAO regional office. The ICAO regional office will coordinate with other participating regions. Participating Regions will need to accept the change proposal before the GOLD can be amended by any region.

- 2.23 GOLD/3 recognized that Appendices E and F contain factual information that is specific to the regions/States and operators/aircraft and hence they would not be required to follow the same change process as other parts of the GOLD. Therefore, the Ad-Hoc Working Group will consider other arrangements under which Appendices E & F are not subject to the regional GOLD amendment process described above, and would be maintained preferably electronically through an on-line website, such as <http://www.ispacg-cra.com>, for continuous update by States and airspace users in the future.
- 2.24 In view of the foreseen need for continued change to the GOLD document in the initial phase of implementation, it was agreed to recommend that the Ad Hoc Working Group retain the authority to manage the document until global configuration control mechanisms within the regions are adequately in place for processing timely changes.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to:
- a) Note the information in this paper;
 - b) Coordinate with the North Atlantic (NAT) Region and the GOLD Ad Hoc Working Group to satisfactorily close comments as discussed in paragraph 2.19; and
 - c) Assess and identify operational or technical impact of transitioning from the FOM to the GOLD on data link operations in the South Pacific sub-region;
 - d) Establish an implementation schedule for ISPACG to implement GOLD guidelines; and
 - e) Agree that the GOLD Ad Hoc Working Group will continue to manage the GOLD until global configuration control mechanisms within the regions are adequately in place for processing timely changes.