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GOVERNMENT OF INDIA
CIVIL AVIATION DEPARTMENT
DIRECTOR GENERAL OF CIVIL AVIATION

OPERATIONS CIRCULAR

Subject**: Operational Authorization Process for Use of Data Link Communication**

1. INTRODUCTION

This operations circular (OC) presents various methods for operators of different data link systems to meet international standards set by the International Civil Aviation Organization (ICAO) and the regional airspace authorities. There is presently no requirement in Indian Aircraft Rules 1937 to have data link communications when operating in Indian airspace. The regulations govern radio communication systems, and nothing in this OC relieves an operator from the requirement to have and use a voice communication system when operating in international airspace or Indian airspace. However, operators that choose to use a data link system (in addition to the required voice communication system) must obtain DGCA approval and amendment to the operation specifications (OpSpecs) for commercial operators or letter of authorization (LOA) for general aviation, as applicable.

2. APPLICABILITY

This OC applies to aircraft and operators operating in the commercial air transport and general aviation categories.. This OC describes the process for obtaining operational authorization for data link communication systems, acceptable methods for training and maintenance, and operational policies for use. In addition, it

describes appropriate actions in the event of an air traffic control (ATC) data link communications event.

2.1 Exceptions.

This OC does not address the use of data link communications for Aeronautical Operational Control (AOC) and certain specific Air Traffic Service (ATS) applications such as the following:

- Pre-departure Clearance (PDC);
- Digital Automatic Terminal Information Service (D-ATIS);
- Terminal Weather Information for Pilots (TWIP);
- Oceanic Clearance Delivery (OCD);
- Graphics/Text Weather Server (G/TWS); and
- Digital Delivery of Expected Taxi Clearance (DDTC).

*Note: This OC is not applicable to ADS-B which is not a data link system. It is a transponder based 1090 MHz squitter which transmits position information for surveillance only. The communication is line of sight on frequency 1090 Mhz***.**

2.2 Compliance. The data link system should comply with the following:

- Applicable International Standards and Recommended Practices (SARPS);
- Procedures for Air Navigation Services (PANS);
- Regional Supplements (Doc 7030);
- Annex 10, Aeronautical Telecommunications, Volume II to the Convention on International Civil Aviation;
- ICAO Global Operational Data Link Document (GOLD) 2nd Edition 2013; and
- RTCA DO-306, ED-122, Safety and Performance Standards for Air Traffic Data Link Services in Oceanic and Remote Airspace.

2.3 Source Documents. The following source documents were consulted:

- ICAO Global Operational Data Link Document (GOLD) 2nd Edition 2013
- FAA AC 120-70B Operational Authorization Process for Data Link Communication Systems.
- North Atlantic Minimum Navigation Performance Specification (MNPS) Airspace Operations Manual. This document is published on behalf of the North Atlantic Systems Planning Group by the European and North Atlantic Office of ICAO, and includes data link material.
- Radio Technical Commission for Aeronautics (RTCA) Inc. Documents (RTCA/DO) and European Organization for Civil Aviation Equipment (EUROCAE) documents

3. DATA LINK IMPLEMENTATION

Data link applications are being implemented in flight operations utilizing FANS-1/A (which includes CPDLC and Automatic Dependent Surveillance- Contract (ADS-C). Data link applications operate without any specific knowledge by the user as to whether a satellite, VHF, (VDL M0/A or VDL M2) or HF data link (HFDL) sub-network service is in use. However, these applications may be limited by the level of end-to-end data link service implementation in use (e.g., ACARS, FANS-1/A ARINC 622). This OC provides information for Indian operators, aircraft and data link manufacturers, various inspectors, foreign air carriers operating in Indian airspace, and other aviation organizations regarding a means acceptable to the DGCA for the use of data link systems in ATS communications. This information is intended to facilitate the operational authorization of data link systems, promote timely and comprehensive program implementation, encourage development of standard practices for the application of data link techniques, and provide an appropriate response to special data link events.

4. DEFINITIONS

Definitions unique to this OC and their application limited to use with data link systems are as follows;

Air Traffic Data Link Service. A data communication capability comprising air/ground and ground/ground data network services, specified data link message sets and protocols, aircraft equipment, ATS Facility equipment, and operational procedures intended to provide primary or supplemental ATS communications.

***Special Data Link Event*.** For the purpose of this OC, a special data link event is one or more of the following occurrences or situations related to data link:

(a) In-flight traffic conflicts or potential conflicts as determined by a flight crew

member in which use of a data link service is suspected to be contributing cause.

(b) Near mid-air collisions (NMAC) or Air Proximity situations in which the use of a data link service is suspected to be a contributing cause.

(c) Data link system performance below that of normal operation or required by the operational procedure (e.g., RCP 240).

(d) ATC operational error involving the use of data link associated with a data link procedure or operation.

(e) Other occurrences or situations in which use of a data link service is suspected to compromise continued operational safety. Loss of standard ATC separation resulting from a procedure or maneuver where a data link transaction, failure, or unmonitored error is suspected to be a factor.

(f) Use of the data link service that caused excessive crew workload.

(g) A data link service that provides reasonable information but is subsequently verified to be erroneous.

(h) An excursion of 500 feet or more from an assigned flight level/altitude, or a lateral/longitudinal deviation exceeding ATS minimum separation criteria in which use of a data link service is suspected to be a contributing cause.

***Data Link Service Academic Training*.** Training that exclusively addresses knowledge requirements (rather than skills), and is usually related to achieving satisfactory knowledge of data link service concepts, RCP types, systems, limitations, or procedures. The academic training on data link services is generally accomplished using a combination of classroom methods (stand up instruction, slide/tapes, computer-based training (CBT), tutorial, etc.), flight manual information, bulletins, or self-study.

***Data Link Service Use Training*.** This is training that addresses all of the skills related to the operational use of data link services including knowledge and skills needed to receive information provided by data link services, and appropriately accept, reject, cancel, or defer a response to that information. In addition, this training includes the knowledge and skills needed to load, store, formulate, and request information from the data link service.

***Data Link System*.** The different systems include ATN-Baseline 1, a digital system and FANS-1A, which is basically an analog based system. At the present time the digital operation is known as VDL-Mode 2 system. The analog operation is known as the VDL-Mode 0/A. The FANS 1/A system uses both digital and analog components. The data link applications are digital and binary encoded, and then

processed by the ACARS convergence function (ACF) for transmission over a character-oriented network.

5. RCP CONCEPT.

5.2 The RCP Concept.

The concept of RCP relates to the communications component of the Communication, Navigation, and Surveillance / Air Traffic System Management (CNS/ATM) framework, and complements Required Navigation Performance (RNP) and Required Surveillance Performance (RSP). In general, the requirements for operation in a defined airspace, or performance of a defined procedure, include elements of CNS functionality and performance, as well as ATM functionality and performance. The guidance provided in this OC regarding RCP is consistent with ICAO Doc 9869, Manual on RCP. RCP is a statement of the performance requirements for operational communication in support of specific ATM functions. The RCP is determined by cognizant authorities in consideration of air traffic operations, target levels of safety, separation assurance, AFS and functional hazard analysis associated with the airspace, operation or procedure. Thus, RCP is operationally derived and not based on any specific technology, or combination of technologies, that may be utilized for communications. The performance of a communications is generally accepted as comprising communication transaction time, integrity, continuity, and availability.

5.3 RCP Type.

An RCP type is a label (e.g., RCP 240) that represents the values assigned to RCP parameters for communication transaction time, continuity, availability and integrity.

- **Communication transaction time.** The maximum time for the completion of the operational communication transaction after which the initiator should revert to an alternative procedure.

- **Continuity.** The probability that an operational communication transaction can be completed within the communication transaction time**.**

- **Availability.** The probability that an operational communication transaction can be initiated when needed.

- **Integrity.** The probability of one or more undetected errors in a completed communication transaction.

5.4 RCP Type Allocation.

RCP type allocation is the process of apportioning the various RCP type values to the various parts of the system. The results of this process are RCP type allocations that are used to:

- Assess viability of different technologies to meeting operational requirements;
- Approve the provision of air traffic services supported by communication systems;
- Determine when to initiate contingency procedures;
- Design, implement and qualify communication services;
- Design, implement, qualify and approve aircraft type designs;
- Approve aircraft operators for RCP operations when required; and
- Operationally monitor, detect and resolve non-compliant performance.

5.5 Performance-Based Communications.

Performance-based communications is based on one or more RCP type(s) and their allocations, and any other functional and performance criteria for the intended operation, for example:

- Specific message set or phraseology and transaction types;
- Interactive capability of voice communication;
- Air-ground integration capability of data communication;
- Interoperability criteria for a data link system, including its sub-networks; and
- Procedures for non-compliant performance and contingency.

5.6 RCP Specifications.

An RCP specification provides the criteria for a particular RCP type, its allocations, and any other specific criteria. RCP specifications can be found in international standards and guidance material, such as RTCA DO-306/ED-122 as augmented by regional documentation.

5.7 Actual Communications Performance (ACP).

- ACP is the dynamic assessment of the actual operational performance a communication system, with human performance and technical performance included in the assessment. Human performance considers such factors as training, procedures and Human Machine Interaction (HMI). Technical performance comprises the installed elements of communication performance operating together and is used to demonstrate that the technical part of the operational communication system meets the intended function. ACP is assessed in the same terms and parameters as an RCP type, its allocations and other relevant operational criteria provided by an RCP specification.

- Initially, for aircraft type design approval and ATS provider approval, the expected communication performance is determined based on validating any assumptions and demonstrating with representative elements of the complete system that the aircraft's or ATS unit's actual performance complies with appropriate allocations provided in the RCP specification.

- The results of these activities are provided as evidence of compliance, which is used to qualify for the different types of approvals.

6. AUTHORIZATION TO USE DATA LINK COMMUNICATIONS IN FLIGHT OPERATIONS.

6.1 General.

Installation of a data link communication system requires design approval of changes to the aircraft's type design by amending the TC or issuing an STC. However, approval to install a TC'd or STC'd data link communications system does not constitute authorization to use the system. Prior to using the system, the operator must request a revision to their OpSpec or a LOA to ensure that the system is used in accordance with international standards and requirements and in a manner that is acceptable to the DGCA. A revision to the OpSpec includes specific authorizations, training and maintenance programs, manuals, operational procedures, MELs, and other such areas necessary for safe and effective use of data link communications. In addition, the service must be capable of meeting international standards for a specific route. Some RCP specifications are now in place and may be implemented regionally for specific airspaces and routes. Operators intending to operate in these airspaces or routes must ensure their aircraft and operations, procedures, training and maintenance; comply with the applicable RCP specification(s) to obtain operational authorization to use the data link communication system.

6.2 Design Approval of Aircraft Data Communications Systems.

Guidelines of design approval of aircraft data link communications and applications primarily used for ATS are provided in FAA AC 20-140 (current edition) or equivalent. Evidence should be submitted that the aircraft equipment has a type design approval per AC 20-140 (current edition) or equivalent. The evidence should include the rotorcraft/aircraft flight manual (R/AFM) wording to indicate the aircraft and sub-network designators that define a specific data link capability and intended use for that aircraft operation.

6.3 Operational Authorization.

Criteria for data link operational authorization are determined by the communication requirements. When the operator establishes their contracts with the Communication Service Providers (CSP) it is imperative that they include the required criteria for the different operations such as RCP-240 and RCP-400. When the operator configures its aircraft equipage that affects performance or capability, maintenance procedures should also be in place to ensure the configuration change does not affect the intended operations.

- **Data Link Communications Authorization Criteria.** Operational authorizations are based on criteria in this OC or by reference to industry standards, and may also include criteria outlined in, training, maintenance, MMEL. Provisions for dispatch with inoperative equipment are specified by the MMEL for each aircraft type. Maintenance requirements are identified by this OC.

- **Data Link Communications Authorization Methods.** FSD, DGCA provides operational approval of data link communications training programs, checklists, operations manuals, training manuals, MELs, and other pertinent documents or document revisions applicable to the particular operator. Operators' data link communication programs are usually approved for each specific aircraft type. However, programs common to one or more types may be approved if data link communications program elements are common to different aircraft types. Maintenance programmes are approved by the Regional Office (Airworthiness) of DGCA.

- **Data link Communications Authorization Procedures.**

  - Operational authorization to use data link communications is provided by FSD, DGCA. Operators should make early contact with the FOI/FSD to permit timely DGCA response. Usually such contact is initiated at the

time preparations are being made for data link communications system selection or purchase.

- Installations, training, maintenance programs, MELs, and other data link communications program elements are reviewed and approved by the DGCA.

- Prior to issuance of a LOA or OpSpec, or the addition of an area, route, or procedure to an existing OpSpec, the operator should demonstrate that the aircraft data link system is compatible with that of the systems being used by the ATC facility when communicating with the chosen service provider(s) and has been shown to meet any performance specifications for the intended airspace or route. The results of prior interoperability demonstrations performed, as part of a design approval may suffice. Under international standards, the service provider(s) and air/ground data link communications sub-networks used in the performance demonstrations for design approval must be operationally equivalent to those in the proposed operating approval. See Appendix 2 for application checklist.

- Following, determination of aircraft eligibility to use data link services, the operator should conduct an interoperability test to demonstrate that the specific combination of data link communication system elements perform as intended (e.g., FMS ACARS interface, printers, CSP and air traffic facilities along the intended route of flight). The AW Inspector will review the test results for conformance with international standards and DGCA policy and procedures.

7. FLIGHT CREW QUALIFICATION FOR USE OF DATA LINK COMMUNICATIONS.

7.1 General.

- **Data Link Communications Qualification Issues and Objectives.** Separate qualification issues and training should be addressed depending on the system being used by the air operator, and/or other compliance air operators should address the following issues and objectives to ensure appropriate flight crew data link communications qualification:

  - Provide necessary flight crew knowledge of data link communication concepts, systems, RCP and procedures (data link communications academic training).

  - Develop necessary flight crew knowledge and skills to properly respond to data link communications clearances or advisories (Data link and RCP communication procedures training). Knowledge of

applicable RCP types and their performance requirements should be part of the training curriculum. Knowledge of applicable RCP types and their performance requirements should be part of the training curriculum.

- Assess each pilot's ability to properly use data link communications (data link communications initial evaluation).

- Identify human factor issues specific to flight crew operation and interaction with the communication software, hardware, and operating environment (e.g., head-down time, situational awareness, loss of party-line information and response time in the RCP specification).

- Maintain appropriate data link communication knowledge and skills which may include data link communications recurrent training.

- **Data Link Communications Training.** Flight crew training for first time use of data link services should be included in initial, transition, upgrade, recurrent, differences, or stand-alone qualification programs. Data link communications training could be included in specific aircraft qualification programs during transition, upgrade, or differences training (e.g., during MD-11 to B747-400 transition) or operators could conduct data link communications training in conjunction with general training (e.g., during initial "new hire" indoctrination, recurrent proficiency checks proficiency tests or line-oriented flight training. Data link communication training programs may also be developed as separate training programs (e.g., by completion of a standardized curriculum covering the general use of data link services at an operator's training centre).

- **Credit for Use of Other Programs.** Operators may receive credit for existing data link communications training programs that are already approved in a different application. For example, an operator may receive credit for programs based on previous use of data link services, such as on different routes, or for a different type of operation, or training programs conducted by another operator, training center, or manufacturer. The FOI will determine whether and how much credit an operator should receive, considering whether the training program is used in another DGCA approved application, and whether the operator has demonstrated that the training program is relevant to the new application.

- **Data Link Communications Academic Training.** The following subjects should be addressed in an approved program of data link communications academic training during the initial introduction of a crewmember to data link communication systems. For subsequent programs, only the new, revised, or emphasized items need be addressed.

  - **General Concepts of Data Link Communications Operation.** Academic

training should cover, in general terms, data link communications system theory to the extent appropriate to ensure proper operational use. Flight crews should understand basic concepts of operations involving data link services, nominal and unacceptable performance, normal and non-normal use, and other limitations.

- **Level of Capability Provided by Data Link Communications and Expected Flight crew Response.** Academic training should explain the normal, expected pilot response to data link messages including acknowledgment, acceptance, rejection, or cancellation of a data link message. Operating in the 30 nautical miles (NM) separation standard requires Global Navigation Satellite System (GNSS), with RNP-4 operational authorization. 30 NM lateral and longitudinal separations and 50 NM longitudinal separation require Direct Controller Pilot Communications (DCPC), such as CPDLC, and ADS-C. For operational implementation of reduced distance-based longitudinal separation, the airspace may require that the data communication system complies with RCP-240 and surveillance performance criteria, or other equivalent means. More information on the criteria for data link communication systems supporting reduced separations can be found in RTCA DO-306/ED-122.

- **Data Link Communications Language, Terms and System Information.** Flight crews should be familiar with data link message sets, abbreviations, conventions, contractions, terms, message addressing, facility and capability depiction on charts or in manuals, and terminology associated with applications (e.g., CPDLC and ADS-C reporting contracts).

- **ATS Communication, Coordination, and Credits for use of Data Link Communications.** Crews and dispatchers should be advised of proper flight plan classifications to use and any ATS separation criteria, procedures, or MEL credits that are based on data link communications use. Training should include procedures for transitioning to voice communication and other contingency procedures related to the operation in the event of abnormal behavior of the data link services. This would include any necessary coordination with ATC related to or following a special data link exceptional event. Ensure an acceptable transition to a new type of operation, such as procedures related to the transition to a different separation standard when data link services fail.

- **Data Link Communications Equipment Components, Controls, Displays, Auto Alerts, and Annunciations.** Procedural training should include discussion of operations, terminology, symbology, optional controls and display features. This training should also include any items particular to an air operator's implementation or the uniqueness of its aircraft capability and/or procedures. Applicable message sets, expected transmission times, failure annunciations, constraints and limitations should be addressed.

- **Interfaces and Compatibility with other Aircraft Systems.** Training

should include the management of any applicable data link air/ground, including; VHF data link, satellite communications (SATCOM) data link and HF data link. This training should also address voice integration with other cockpit systems, FMS inputs to data link, and electronic flight instrument system (EFIS) interfaces, including any items particular to an air carrier's implementation or uniqueness of its system. The priority selection of the media software by the operator needs to be addressed and trained so that the proper selection is made by maintenance, and crews report any related performance degradation resulting from media selection. The priority for ATS data link is VHF (Mode 0/A or Mode 2), SATCOM data link (Inmarsat or Iridium) and HF data link. Flight crew procedures should be established for crews to report to ATC when media switching causes system performance to degrade below that which is required for the intended operation. For example, excessive VHF/SATCOM switching and SATCOM/HFDL switching can lead to unacceptable performance, (e.g., RCP 240, required for the airspace or route). The priority for ATS data link is VHF, SATCOM data link and last HF data link.

- **Aircraft Flight Manual (AFM) Information.** AFM provisions should be addressed including information on data link communication modes of operation, normal and non-normal flight crew operating procedures, response to failure annunciations and any AFM limitations.

- **MMEL Provisions for Systems Related to CPDLC/ADS-C Operations.** Flight crews, dispatch, and maintenance personnel must be familiar with the MEL requirements. For flights that intend to use data link, operators will adopt provisions for certain specific systems to be operational at dispatch, when required for the intended operation. MEL/dispatch deviation guide (DDG) must be amended to highlight the effect that loss of each associated system/subsystem has on data link operational capability.

i. Equipment required in current FANS-1/A-capable models is as follows:

   - VHF, SATCOM, HFDL radios, as appropriate,
   - ACARS MU/CMU,
   - Flight Management Computer (FMC) integration, and
   - Printer (if company procedures require its use).

ii. Maintenance Training. Operators are reminded of basic provisions contained in ICAO Annex 6, Paragraph 8.3: “An operator shall ensure that all maintenance personnel are instructed regarding the maintenance methods to be employed, in particular when new or unfamiliar equipment is introduced into service".

iii. Maintenance Training Requirements. Operators unsure of required maintenance procedures for data link-related equipment should contact their aircraft manufacturer field service representatives.

iv. Configuration Control. Operators should maintain their aircraft in an avionics configuration, which has been shown to provide acceptable data link performance. Data link service providers will provide operators with information on poor performance by individual aircraft.

- **Pilot & Dispatcher Training.** FANS operations have shown that system performance is extremely sensitive to the use of correct procedures. It is essential, therefore, that crews be properly trained prior to their using the CPDLC and/or ADS-C functions. Deterioration in system performance as a result of improper use of procedures can lead to noncompliance of RCP specifications and delay in realization of expected benefits of the functionality.

i. Pilot Training. An operator shall establish and maintain a ground and flight training program, approved by DGCA, which ensures that all flight crewmembers are adequately trained to perform their assigned duties

ii. Dispatcher Training. A flight operations officer/flight dispatcher should not be assigned to duty unless the officer/dispatcher has demonstrated to the operator knowledge of the communication equipment used in the airplanes.

iii. General Provision for ICAO Annex 6 Training. Operators are reminded of basic provisions contained in ICAO Annex 6.

iv. Flight crew Response. Appropriate pilot response to data link, RCP specification, and other such issues.

v. Special Data Link Event Reports. The air operator's reporting policies for flight crews regarding data link non-normal events should be as follows. The operator will send the reports to the Regional Office of DGCA which will be forwarded to DGCA HQ.

vi. Data Link Malfunction or Irregularity Reports. Data link malfunction or system irregularity reporting procedures as used by aircrews, if not otherwise addressed by routine maintenance procedures of that operator.

vii. Human Factors. Flight crew human factors are issues specific to the operating environment and operation of the installed communication system.

- **Data Link Communications Operational Use Training.** In addition to the academic training described above, appropriate operational use training (e.g., to ensure use of proper procedures and response to data link advisories) should also be given. Data link use training should expose the pilot to the typical messages expected.

i. Operational use training should include the following:

- o Receiving and interpreting messages;
- o Accepting, rejecting or canceling messages;
- o Storing and retrieving messages;
- o Loading messages into appropriate controls/displays for use (e.g., FMS, FMGCS) formulating and sending messages;
- o Loading message requests from the FMS (e.g., flight plan waypoints into data link for transmission if applicable);
- o Managing the communications systems;
- o Establishing and terminating system operation;
- o Switching use of radio frequency (RF) media (if this is a crew-controllable feature); and
- o Re-establishing system operation after loss of network log-on.

ii. Training programs should cover the proper use of data link communication controls, procedures, and limitations. Correct assessment must be done on displays, aural advisories, annunciations, timely and correct responses to data link communication failures and appropriate interaction with ATC following data link messages that are not acceptable. Recognition of data link communications system failures and data link issues unique to that air carrier or operator should be part of the curriculum. Such training may be conducted using data link communication-equipped flight training devices or simulators, or by using suitable CBT.

iii. Programs addressing data link communications that use approved simulators or training device programs based on use of DGCA-approved training devices or simulators should realistically depict relevant aspects of data link communication procedures, clearances, and pilot responses

iv. Data link communications programs may be approved which do not require using approved simulators or training devices if the proposed program meets certain criteria as described below. These programs are based on CBT adequately depicting data link communications procedures, clearances, desired pilot responses, and resulting crew interactions with aircraft FMSs. Such programs should be consistent with the following criteria:

- o Accepted DGCA/FAA/EASA and industry guidelines.
- o There should be no significant adverse training experience related to the particular data link communications system(s).
- o Differences from or compatibility with other data link communications systems (digital versus analog), that use different presentation methods, language, abbreviations etc., should be considered in the design to ensure minimum adverse human factor difficulties.
- o The program should realistically depict data link communications

scenarios.

o The training subject should be made aware of the normal delivery delays to be expected.

o Scenarios should demonstrate correct indications for messages, display annunciations, aural alerts, and require proper pilot responses.

- **Training Centre Approval.** Training centres may conduct data link communication training for an operator if accepted by FSD. The FOI will consider the following factors:

i. Provisions of paragraphs above are shown to be met, or

ii. Equivalence to a previously accepted program can be established. In this instance, circumstances, assumptions, and conditions for the program's use should also be equivalent to those applicable to the previously accepted program.

- **Initial Evaluation of Data Link Communications Knowledge and Procedures.** Individual crewmember data link communications knowledge and procedures should be evaluated prior to data link communications use. Acceptable means of initial assessment include:

i. Evaluation by an authorized trainer using a simulator or training device capable of depicting data link communication exchanges.

ii. Evaluation by an authorized trainer during line operations, training.

iii. Computer-based testing in which data link communication scenarios and advisories are depicted and records acceptable pilot performance.

iv. Other alternate methods acceptable to the DGCA. Alternate methods should demonstrate the equivalent effectiveness of methods (i) through (iii).

Note: Instructors should evaluate initial data link crewmember communications for certificate holders that are authorized to use data link systems in their operations.

- **Data Link Communications Recurrent Training.** Data link communications training should be integrated as other established training programs and conducted on a recurrent basis. Recurrent training for data link communications should incorporate the recommendations of paragraph above and address any significant issues identified by line flying

experience, system changes, procedural changes, or unique characteristics.

- **Data Link Communications Recurrent Evaluation.** Recurrent data link communications checking should be incorporated as necessary, as an element of routine Proficiency Training (PT) or proficiency check programs.

- **Data Link Communications Currency (Recency of Experience).** Unless otherwise required in an OpSpec or LOA, once crews have completed initial data link communications training and as long as recurrent training is accomplished in accordance with paragraphs above the certificate holder will not be obligated to develop additional currency requirements.

- **Line Checks and Route Checks.** When data link communications-equipped aircraft are used during line or route checks, trainers should routinely incorporate proper data link communications use as a discussion item.

- **Line-Oriented Flight Training (LOFT).** LOFT programs using simulators equipped with data link communications should be enhanced by interaction with data link communications. In addition, LOFT programs should consider proper crew use of data link along with other communication methods (SATCOM voice, VHF voice, HF voice, etc.).

- **Crew Resource Management (CRM).** CRM programs should address effective teamwork in responding to data link exchanges.

- **Data Link Communications Academic Training Methods.** Appropriate methods may be suited to each operator's program. No special methods related to academic training for data link communications are identified. Typically, a combination of ground instruction, manual information, flight crew bulletins, and other such means as appropriate to address academic topics specified by paragraphs above on Data Link Communications Academic Training.

- **Characteristics of Simulated Data Link Communications Systems for Training.**

  Examples include data link communications in simulators or training devices.

i. **Acceptable Characteristics.** Training devices and simulators should have certain characteristics to be effective. This is due to the interactive nature of data link communications, the variety of exchange scenarios possible, the immediate and standardized pilot response required, and the correct display interpretation that is necessary. Thus, simulators or training devices used for data link communications training should have the following characteristics:

o The ability to functionally represent data link communication displays, controls, indications, and annunciations.
o Ability to depict selected message traffic exchange scenarios including data link communications displays and audio advisories.
o Ability to show proper data link communications reaction to depicted scenarios and advisories, crew or ATC response errors, etc.
o Ability to interactively respond to pilot inputs regarding data link communication advisories, including responses to failures or abnormal situations.

ii. **Simulator and Data Link Communications System Fidelity.** For a particular data link communication system, training may be accomplished in simulators or training devices that represent the specific aircraft, or an aircraft with similar characteristics. For the purposes of data link communications training, simulators or training devices may use simplified algorithms or abbreviated message set capability. Data link communication displays do not have to be identical, but should be functionally equivalent to the air operator's specific aircraft in use.

iii. **Training Device or Simulator Approval.** Training devices or simulators meeting DGCA criteria and approved for use by FSD. Any one or combination of the following devices or simulators that meet characteristics of paragraph above on acceptable characteristics may be used:

o Level A through D simulators,
o Level 4 through 6 flight training devices, or
o Dedicated data link communications training devices acceptable to the DGCA

8. OTHER OPERATIONAL ISSUES.

8.1 Manuals and Other Publications.

Airplane flight, operating, maintenance, general policy, or other manuals, publications, or written materials (e.g., operating bulletins) that may relate to data link communications use must be appropriately amended to describe data link communications equipment, procedures, and operational policies according to the appropriate guidance material in this OC.

8.2 MMEL/MEL.

Operators formulate necessary data link communications revisions to their MEL(s) for each particular fleet (e.g., B777, 747-400).

8.3 Aircraft with Data Link Communications System Differences.

Operators having aircraft with data link communication systems differences in displays, controls, or procedures, or operators involved with interchange operations, must account for those data link communications systems differences. This is accomplished as part of an approved differences training programme as otherwise specified in applicable reports concerning crew qualification pertaining to a particular airplane type.

8.4 Issues Unique to a Particular Operator.

Operators should address any data link communications issues that may be unique to their particular route environment, aircraft, procedures, or data link communication displays and control features. Examples include the following:

- Examples of "Route Environment" Issues. Operators should describe any peculiarities associated with a particular route that may involve either end-user application issues or communications performance issues. For example, On North Atlantic routes, it is necessary for data link oceanic clearance message verification to include the track message serial number in the response. A particular route may be subject to propagation disturbances (e.g., with HF radio or HF data link at particular locations, time of day, season, or sunspot cycles).

- Example of a "Procedural" Issue. Operators should describe any data link precautions that may be appropriate when operating in states where data link communications policies are uncertain. As an example, certain modes of direct controller-pilot data link communication may not be supported in certain states. In those cases, carriers should conform to the laws and regulations that govern the airspace being used and use only authorized communications equipment and methods. This guidance should be reflected in company flight operations manuals.

- Example of a "Unique Data Link Communications System" Issue. Operators should describe any differences in particular data link communications systems, or their versions, that may have operational impact.

9. MAINTENANCE.

9.1 General.

Maintenance procedures for data link communications are approved or accepted as part of an operator's initial maintenance manual approval or as a revision to that manual. To obtain DGCA authorization, an operator must demonstrate that their data link communications maintenance procedures are consistent with the data link communications systems manufacturer's maintenance procedures and/or aircraft manufacturer's maintenance procedures for data link communications.

9.2 Maintenance Training.

Operators should provide adequate data link communication maintenance training to ensure that their maintenance personnel or contract maintenance personnel at facilities not staffed by the operator are able to properly implement data link communications-related maintenance programs. This includes, but is not limited to, installation, modification, correction of reported system discrepancies, and use of test equipment, procedures, MEL relief, and "return to service" authorizations. The training procedures should address testing data link communications on the ground in such a way that correctly evaluates data link communications functions while not introducing hazards with respect to simulated message traffic with an air traffic facility.

9.3 Data Link Communications System Software Updates.

Operators should assure that appropriate data link communication software updates are incorporated when necessary and that both air and ground systems are able to identify and properly respond to the installed level of data link communication capability.

9.4 Data Link Communications "Return to Service" Policies.

Data link communications "return to service" policies should be established to ensure proper data link communication functions when an aircraft is returned to service after a data link communication failure or maintenance action.

10. DATA LINK COMMUNICATIONS OPERATIONAL USE.

10.1 General.

Operationally, those skills addressed and the guidance provided in the data link communications training paragraph above should be followed and implemented by each operator electing to use data link communications.

10.2 Pilot Responsibilities.

Data link communications are intended to serve as either a primary or supplementary communication means as designated for the operations being conducted. For data link communications to work as designed, prompt and correct initiation response to data link advisories is important. Flight crews using data link communications should respond in accordance with the following guidelines:

- Prompt initiation of messages where needed.
- Prompt response to messages where appropriate (e.g., RCP-240).

- Appropriate crew coordination so that each crewmember receives pertinent information needed.

- Appropriate retention of messages (archive) requiring later action (printer copies of oceanic clearances etc.).

- Appropriate resolution of message uncertainty.

- Appropriate use of data link and voice, respectively, where circumstances or operations dictate (e.g., voice for backup or clarification of non-normal situations).

- If an ATC data link clearance contradicts a voice clearance, comply with the voice clearance.

10.3 Data Link Communications Good Operating Practices.

The following data link communications "good operating practices" have been identified:

- To preclude unnecessary communication and possible interference with ground facilities, data link communications should be used only in conjunction with facilities specified for the route or procedure to be flown. An example would be as follows: data link communications with other than designated ground facilities should be accomplished only as necessary to support flight plan or flight operations requirements.

- Free text data link messages should use standard aeronautical terminology, accepted abbreviations, and be written in English.

- When appropriate, verify data link communication functions prior to departure.

10.4 Operator Responsibilities.

Operators have the following general responsibilities regarding data link communications:

- Verify data link communications functionality for each environment to be used and when new or modified components or software are introduced.

- Assure follow up and evaluation of exceptional data link events.

- Periodically assess data link communications training, checking, and maintenance programs to ensure their correctness, pertinence, timeliness, and effectiveness.

10.5 ATC Responsibilities.

The operator can expect ATC to adhere to the following procedures.

- Ensure that controllers do not knowingly issue data link instructions that are contrary to voice instructions when data link is being used.
- Be aware of pertinent data link communication program changes.
- Train ATC specialists about data link expected flight crew responses to data link advisories.
- When requested by the flight crew, provide clarification or confirmation of data link messages and assist in returning to the assigned clearance, if appropriate. Issue additional clearance instructions when necessary.
- Advise pertinent DGCA offices via data link communications questionnaires about airspace or airports where data link communication problems occur. This facilitates initiation of corrective actions related to data link communication enhancements, procedures, and airspace adjustments.
- Advise DGCA of other hazardous conditions, situations, or events which may be related to data link communications.

11. DATA LINK EVENT REPORTING.

11.1 General.

Operators and manufacturers are encouraged to develop procedures to ensure effective identification, tracking, and follow up of data link-related events, as appropriate. Such procedures should focus on providing useful information to:

- Properly assess the importance of data link events.
- Follow up on information related to specific data link events as necessary.
- Keep the industry and DGCA informed on the performance of data link in Indian airspace and international operations.

11.2 Pilot Reports.

- “Data Link-Specific" Reports. Pilots should make the following reports for unusual

data link events, as necessary:

- Upon query from ATC, or after an inadvertent deviation from an ATC clearance, make radio communications as appropriate to report the event.

- Reports, as specified by the operator, concerning data link anomalies, procedural difficulties, or system failures typically are made by pilots through one or more of the following methods:

  i. Pilot/observer questionnaire,
  ii. Logbook entry,
  iii. ACARS, etc, and
  iv. Other record used by that operator (such as a "Captain's Report"). An example of a typical reporting form for data link event information is shown in Appendix 1.

- Other Reports Incidental to Data Link.

  - Near Mid-Air Collision, Air Proximity Reports. Flight crews should continue to submit Air Proximity reports in accordance with existing policies and procedures. (Crews should be aware that there is no requirement to submit an Air Proximity report solely due to a data link event).

  - Air Safety Reporting System Reports. reports may be filed at the discretion of the flight crew.

  - Operator/Maintenance Department Reports. Operator maintenance department personnel should make data link-related reports as necessary. Submit reports of frequent or systematic data link problems that may relate to system performance, manufacturers, and/or data link vendors to the Regional Office (Airworthiness Inspector), as appropriate.

  - Data Link Manufacturer Reports. Data link avionics manufacturers report problems found with specific data link systems in accordance with established Service Difficulty Report (SDR) procedures.

12. FOREIGN AIR CARRIERS.

12.1 General.

Foreign air carriers may use data link communications when operating in Indian airspace. Foreign air carriers are not required to install and use data link communications for any aircraft or operations even though separation services may be provided by a Indian ATC facility (e.g., in oceanic airspace), unless separation standards or a desired flight plan classification are based on its use.

12.2 Data link Communications Approval for Foreign Air Carriers.

DGCA does not approve data link communications installations, training programs, MELs, or maintenance programs for foreign operators operating non-Indian registered aircraft. Such authorizations are addressed as specified by the State of the Operator.

(Capt Ajay Singh)
Chief Flight Operations Inspector
For Director General of Civil Aviation

SAMPLE DATA LINK EVENT REPORTING INFORMATION

Date_____ Time_____

Operator/Flight #_____ Origination_____ Destination_____

Submitted to: ATC Inquiry_____ Other_____

Phase of Flight_____ Position_____ Altitude_____

(Optional for Aircrew:)
Name_____ Phone (W)_____ Phone (H)_____

Describe Event:

APPLICATION AND TRAINING GUIDANCE

1. The operator's application to obtain authorization to use data link must address and contain the following subjects including those identified in this operations circular (OC). The applicable OC 16 of 2014 paragraphs are referenced below.

a) List of Source Documents Used:

- For generic data link Operations (e.g., aircraft/avionics manufacturer documents)
- For area of operations specific policy/procedures. See "d)" below

b) Description. Description of aircraft data link systems including certification documents and current configuration (e.g., current avionics load).

c) General Information.

d) Area(s) of Operations/Routes Where Operator Intends to Use Data Link.

- List of areas and/or routes where operator intends to conduct data link operations.
- List of air traffic centers/service providers with which operator intends to communicate via data link.
- List policy/procedures source documents applicable to each area(s) of operations, such as:
  - Operations manuals for specific areas of operations (e.g., Future Air Navigation System (FANS) Operations Manual (FOM) for operation in Asia Pacific FIR's).
  - State Aeronautical Information Publications (AIP).
  - State Notices to Airmen (NOTAM).
  - DGCA chart supplements.

e) Flight crew Qualification Programs.

- Manuals and Other Publications.
- MMEL/MEL.
- Issues Unique to a Particular Operator.
- Maintenance Programs.

2. Content of Flight crew Qualification Programs.

a) Academic Training Subjects.

- General Concepts of Digital and Analog Communications.
- Expected Flight crew Response.
- ATS Coordination.
- Aircraft Digital or Analog Communication Equipment Components, Displays, Alerts. Sources:

  - Aircraft manufacturer documents,
  - Interface with other aircraft systems,
  - Aircraft Flight Manual (AFM) information,
  - Minimum equipment list (MEL) provisions,
  - Data Link Events Reports,
  - Data Link Malfunction or Irregularity Reports, and
  - Human Factors-Lessons learned.

b) Operational Use Training:

- General requirement,
- Simulators,
- Computer-Based Training (CBT),
- Policy on Initial Pilot Evaluation, and

- Recurrent Training and Evaluation.

c) Currency (Recency of Experience).

d) Line Checks and Route Checks.

e) Line-Oriented Flight Training (LOFT).