US-India Aviation Cooperation Program

Wednesday, December 03, 2008

Subject: Initial proposals for US-India Aviation Cooperation Program (ACP) Projects Commenced in 2009

This paper summarizes proposed projects for execution by the ACP commencing in 2009. The ACP's mission is to support the growth of the Indian civil aerospace sector by working directly with the Government of India to identify and execute projects that encourage collaboration between US and Indian stakeholders and provide access to US expertise, technology, and best practices. In keeping with this mission, the ACP members propose the following projects for consideration by the Ministry of Civil Aviation (MCA). These proposed projects are based on the ACP members' understanding of the needs of the Indian aviation sector and desires of the MCA, Director General of Civil Aviation (DGCA) and Airports Authority of India (AAI).

However, the projects are preliminary proposals, and there is a full expectation that some may not be viewed as appropriate while there may be other projects not mentioned that are of interest to the Indian aviation authorities. We request that these projects be reviewed and initial feedback be given to the ACP, in order that the ACP members may settle on a final grouping of projects from which to develop formal project proposals.

For reference, the 2008 ACP projects status are as follows:

1. Air Traffic Management Training Program. Estimated Completion in Q1 2009
2. Air Traffic Flow Management Seminar. Completed in October 2008.

With four more projects under review with the US TDA

- Technical Training for the Aerospace Industry.
- Pilot Capacity Assessment.
- Aircraft Maintenance Engineer Capacity Assessment.
- Air Traffic Control Officer Training Assessment.

The 2009 project proposals are summarized below in tabular form. The projects are categorized in eight domains that constitute supporting the growth of the Indian civil aviation sector.

Domain	Proposed Project
CNS/ATC/ATM Modernization	Implementation of ATC processes and procedures as identified in the ATMTP
	Study on Next-Gen technology requirement for the Indian aviation sector
Capacity Assessment/ Enhancement	Regional airspace study to determine the benefits of implementing new CNS/ATM equipment and/or procedures
	Regional airport development assessment (1 to 3 airports)
GA/BA/ Rotorcraft	Rotorcraft rulemaking, capacity assessment, airspace classification, and airspace design
Aviation Safety	Safety Programs and Safety Management System readiness assessment and development plan
Aviation Security	Airport terminal building security and check–in system
	Airport perimeters security system
CNS Implementation	GBAS assessment at major airport(s) aside from DEL and BOM
	SBAS/GBAS users and providers seminar
Training programs	DGCA Human Resources Development
MRO	Technical Training for MRO

Domain Area- CNS/ATC/ATM Modernization

Implementing ATC Processes and Procedures as Identified in the ATMTP

Based on the outcomes of the successful Air Traffic Management Training Program (ATMTP), this project would review the reports of the all four (4) phases to determine if further assistance in high-density / complex air traffic is required. The assistance could include, but is not limited to, further training for senior air traffic controllers; development and implementation of uniform procedures; analysis of terminal airspace; etc. The review of the reports would begin after the completion of Phase-IV of the ATMTP scheduled for early 2009.

Study on Next-Gen technology Requirement for Indian Aviation Sector

Applying 21st Century technology to transform Indian aviation sector by expanding capacity, enhancing safety and security, and protecting the environment is the need for future. The project would be a study of the following Next-Gen technologies from the perspective of Indian aviation sector.

a) Trajectory based and Performance based operation and support i.e. 4-D trajectories are digitally exchanged among aircraft, operators, and service providers. Use four-dimensional trajectories to analyze, predict, and manage system behavior. User preferences are accommodated as best possible.

b) Airport operation and support i.e. Network Enabled Operations (NEO), Network Enabled Infrastructure (NEI), Network Enabled Weather (NEW)

c) Safety management.

d) Environmental management. Minimize the environmental impact of aviation.

e) Layered adaptive security

f) Position Navigation and Time Services i.e. Space-Based Augmentation System (SBAS), Ground Based Augmentation System (GBAS), Airport positioning services etc.

g) Surveillance services i.e. Automatic Dependent Surveillance Broadcast (ADS-B)

h) Network centric infrastructure services i.e. System Wide Information Management (SWIM)

i) Weather information services

j) Data Communication i.e. Improve the capabilities communication of the over current analog voice system

k) Advanced automation of the Air Traffic Management functions

Domain Area- Capacity Assessment /enhancement

Regional Airspace Study to Determine the Benefits of Implementing New CNS / ATM Equipment and / or Procedures

Project would involve an airspace study in key regions, airport combinations, or the whole national system to better understand traffic flows under future airspace demand scenarios. The study would help determine the benefits of implementing new CNS/ATM equipment and/or procedures. It would include modeling and simulation of current and future traffic flows throughout the principal nodes in a designated airspace region and assess:

- Constraining choke points
- The benefits of implementing new CNS/ATM equipment (radars, landing systems, etc) and/or procedures (differentiated airspace corridors for General Aviation (GA) and rotary wing aircraft, RNP / PBN, etc)
- The most appropriate timeframe and value of any given technology, process, and/or procedure

Regional Airport Development Assessment (1 to 3 airports)

The promise of the domestic aviation revolution in India whether through low cost or full cost carriers can not be fulfilled unless air carriers have functioning airports that offer the same proximity and convenience as rail terminals. Airports Authority of India manages 127 airports, but India has over 450 unused airstrips with the majority of them under the state Governments. India has 41 cities with over 1 million in population but passenger carrier's service only 16 of them. Presently there are over 100 proposals for the development of metro and non metro airports pending with the AAI; most of which require further clarity. Minister Patel at a private ACP briefing at the India Aviation 2008, Hyderabad discussed the need for the development of regional airports and the lack of US presence in the process.

The project would be to review the key elements of airport development in the US and assess how they would support growth of regional airports in India. The project would include the following steps:

a) AAI would identify one to three airport development projects in select Indian regional states.

b) The ACP project team will form an India baseline by examining the projects with attention to (i) the financial model (ii) airside and city side development (iii) the qualification of airport operators (iv) evaluation of feasibility studies (v) the merits and extent of private equity participation in the PPP model (vi) the structure of the concession agreements and (vii) ancillary aviation activities possible at each site.

c) The ACP project team will compare the India baseline to US best practices by contrasting the obtained baseline data to the development, operating, and financial structure of representative US airports

d) The ACP project team will make recommendations for improvement in airport project development in India.

Domain Area: General Aviation / Business Aviation / Rotorcraft

Rotorcraft Rulemaking, Capacity Assessment, Airspace Classification, and Airspace Design

The project is based on discussions between Bell Helicopters and the DGCA in March 2008. Resulting from those meetings, the project would address the following:

1) Safety: The following training tasks will enhance safety knowledge and compliance, raising the level of safety regulatory/compliance awareness and thereby improving public perception of helicopter safety.

   a) Provide Safety Accident and Incident Investigation training, particular to helicopter operations, to government personnel (DGCA and Military). Bell also proposes to coordinate with a turbine engine manufacturer for concurrent presentation.

   b) Integrate DGCA India flight hour data into Safety database

2) Review current DGCA regulatory framework in specified areas.

   a) The present framework is a composite of ICAO, FAA, and EASA regulations. The review would provide streamlining recommendations to yield increased operational tempo which will increase demand for helicopter flights, products, and services.

   b) DGCA India presently has some 60 fixed-wing inspectors, but no dedicated helicopter trained inspectors – the proposed project would provide safety training for helicopter inspectors and standardized helicopter airport operations, training, and inspection standards.

3) Examine potential commercial helicopter operation improvements around Delhi and Mumbai International airports, and other key helicopter operational areas. The study would be conducted with the cooperation and participation of DGCA counterparts representing all divisions and departments having responsibility for establishing and implementing various aspects of regulations and standards pertaining to civil commercial helicopter operations in India. Similar to the above, increased helicopter trade will result from improved helicopter operations at high density, high traffic airports like Delhi and Mumbai airports. Presently helicopters are handled the same as fixed wing aircraft regarding approaches and takeoffs, which is not the case at high traffic U.S. airports and causes increased system inefficiencies.

4) Review and propose Emergency Medical Service (EMS) landing and take-off sites and flight routes, to include key, designated hospitals. India presently has no EMS infrastructure – the potential trade in this economic sector is significant, extending beyond helicopters into air ambulance equipment, EMS services, equipment, and infrastructure.

The specific objective of these studies is to safely increase the volume of helicopter operations in India through enhanced helicopter operations, more trained personnel, and establishment of non-existent services like EMS. This project will benefit India by providing real-world, executable helicopter operational solutions that help to alleviate some of India's transportation infrastructure shortfalls.

ACP partner companies have completed a similar study with Republic of China in 1997.

Domain Area- Aviation Safety

Safety Programs and Safety Management System (SMS) Readiness Assessment and Development Plan

ICAO requires member states to implement SMS in their Air Traffic Services, Aerodromes and with their aircraft operators and maintenance organizations by November, 2009. [The original deadline was January 2009; however, an extension has been voted in and was awaiting final approval as per my latest information].

The project would assist in the development of standards and guidance for an SMS program in India. It is recommended that the standards and guidance to be developed jointly with government and industry as has been done in the US. The project would involve ACP participation with Indian stakeholders to develop the Indian SMS. The ACP participation would help bring in experiences from the US process of developing SMS in industry/government groups both throughout various Government agencies (FAA, NASA, Department of Defense, Transportation, Commerce, etc) as well as within the FAA.

It benefits include:

- Increase inherent level of safety and efficiency in aircraft operations, aerodromes, air traffic, repair and manufacture
- Compliance with ICAO 2009 SMS requirement and anticipated IATA requirement
- Carriers become a more attractive prospective code share/alliance partners
    - increased travel opportunities for residents
    - increased business for Indian industries
- Improve repair and manufacturing facilities ability to attract international customers
    - increase need for skilled labor
- If desired, ability to share oversight responsibilities with operator/agency
    - reduce demand on government resources

Domain Area- Aviation Security

Airport terminal Building Security and Check–in System

The protection of civil aviation security passengers from persons with criminal intent imposes enormous challenges for responsible government officials, as well as airline and airport managers. The AAI / Bureau of Civil Aviation Security (BCAS) is responsible for the physical security of the airports, and air carriers are responsible for the screening of passengers and their belongings as well as cargo, mail, food, and fuel. Not only must boarding passengers and their belongings be screened, but terminal managers must consider the possibility of persons attempting to bring weapons, explosives or incendiaries into the non-sterile areas of the airport.

ACP study project will review existing airport terminal security policies, regulations and procedures. In concert with airport specific risk assessments, the study will provide plans and recommendations for additions, deletions or changes to existing policies to improve the general level of protection of civil aviation within India. If implemented, the proposed plans will provide qualified people, equipment, standards and procedures to meet the objectives of the BCAS-India. The plan will include but not be limited to:

- An airport-specific risk analysis that will review threat vectors (both internal and external) and vulnerabilities;
- A proposed list of countermeasures (behavioral and sensor-based) to be adopted;
- A review of airport construction guidelines and parking procedures to minimize blast impact;
- A review of checked baggage screening procedures to maximize probabilities of detection of threat-level explosives with minimal false positives;
- A review of checkpoint passenger (including behavioral assessment) and cabin baggage screening procedures to maximize probabilities of detection of weapons, explosives and incendiaries with minimal false positives;
- A review of existing checkpoint screening procedures against ICAO and government /industry best practices to maximize effectiveness and efficiency to reduce waiting times;
- Recommendations for use and placement of state-of-the-art screening equipment and procedures;
- Recommendations for training of personnel and periodic testing of security systems to ensure operator and equipment effectiveness;
- An implementation plan for the adoption of suggested actions, including funding requirements; and
- An assessment of the social, economic and political issues that may impede successful implementation of the proposed program with recommendations for overcoming such obstacles.

Airport Perimeters Security System Analysis and Recommendations

Persons with criminal intent will usually enter an air transportation system at its weakest point. Large airports face significant security challenges due to the sheer length of their perimeter which, on average, may extend 15 miles in length. ACP proposes a project that would provide analyses and recommendations for improving physical security around designated airports within India. The analyses will include airport-specific risk assessments based on threat vectors (both internal and external) and vulnerabilities based on past incidents worldwide, as well as subject matter expert estimation of future criminal capabilities and intent.

Recommendations will include, but are not limited to the following:

- An enumeration of suggested airport perimeter protection policies and regulations;
- Specific physical and/or electronic countermeasures to be adopted;
- Airport worker and staff vetting policies and procedures;
- Comparison of ICAO minimum requirements vs. industry and government best practices;
- Personnel and funding resources necessary to implement the recommended course(s) of action;
- An airport-specific action plan for implementation of recommended actions; and
- An assessment of social, economic and political factors which may impact the successful execution of the selected course(s) of action, and recommendations for overcoming such obstacles.

Domain Area - CNS Implementation

GBAS Assessment at Major Airport(s) aside from Delhi and Mumbai airports

GBAS will offer cost-effective approach navigation for India's growing airport network, more fuel efficient and capacity enhancing approach procedures for the large hubs, and precision approach capability to terrain-challenged airports. Initial GBAS technology evaluations are in process at Delhi and Mumbai. In parallel, the potential benefits from GBAS at other airports should be considered, especially in light of the significant expansion and up-gradation on-going in India's airport infrastructure.

This project will look at existing and planned operations at India's tier 1 and 2 (and select other) airports, precision approach capabilities, optimum runway configurations, and atmospheric (wind and visibility) impacts on capacity and efficiency. The analysis will result in a prioritized list of airports most able to benefit from GBAS capability including an assessment of the type and quantity of benefits at each airport.

SBAS/GBAS users and providers seminar

Based on the success of the recent Air Traffic Flow Management (ATFM) seminar, a Satellite Based Augmentation System (SBAS) /Ground Based Augmentation System (GBAS) seminar would build upon the efforts of the India Government to deploy the GPS Aided Geo Augmentation Navigation (GAGAN) System by 2011. The seminar would allow the U.S. government and U.S. industry (commercial and general aviation) to provide best practices and lessons learned from the introduction of the Wide Area Augmentation System (WAAS) to the U.S. user community. The seminar would compliment current U.S. efforts to support India's certification of GAGAN and making system operational and also India's efforts to deploy GBAS atleast major airports.

Domain Area - Training

DGCA Human Resources Development

In April 2008, the DGCA requested the FAA support a 10-year Human Resources Development project focusing on on-the-job training for inspectors in the following fields:

a. Airworthiness Control & Oversight
b. Aircraft & Components Certification
c. Accident Investigation & Prevention
d. Aerodrome Certification & Surveillance
e. Air Traffic Control Officer Licensing
f. AOC Administration, Flight Clearance Procedures
g. Cabin Safety & Surveillance

To ensure the DGCA participants receive a full and enriching experience, the proposal would provide for both government and industry experiences as well as classroom training as needed. The ACP proposes the DGCA provide one class of fourteen (14) participants three (3) times a year over a five (5) year period resulting in the training of 210 inspectors. Training would be provided at ACP member academies (FAA Academy; DOT Academy; University continuing education courses; ACP member training) with OJT provided at FAA /USG field facilities as well as ACP member facilities regulated/overseen by FAA.

Domain Area: MRO

Technical Training for MRO

It shall be much along the same manner as the 2008 Technical Training for the Aerospace Industry project. The 2008 project is geared towards manufacturing activities and will be given to manufacturing companies and DGCA, where as the proposed project will be focused inspection, checks, repairs, maintenance, standards to be followed and airworthiness of aircraft and their components and shall be given to airlines and MROs. Some fundamental technologies may be repeated in this session as well to the new audience.