KATHMANDU
NEPAL

The Prime Minister

Message

On this occasion of the thirteenth anniversary of Civil Aviation Authority of Nepal, I would like to extend my heartfelt felicitations for its tremendous contribution in the tourism and economy of Nepal. CAAN has culminated to excellence in its regularity and service as well as its forthright role in augmenting nation's pride.

The tireless effort put forth by CAAN in the context of Nepal Tourism Year 2011 stands very high among the participating sectors. The steps CAAN has taken as efforts for bringing in more tourists by improving the infrastructures and facilities together with getting connected with many of the airlines in the world are really commendable. The plans and activities CAAN has adopted for the Visit Lumbini Year 2012 are certain to lead the nation to developmental leap in the field of tourism. I am sure Gautam Buddha Airport as a regional International Airport will serve to make the Holy Birth place of the Buddha an International destination.

Today, aviation is a symbol of Nepal's spirit of adventure, progress and success. The lives of almost everyone in our country are touched by the aviation industry in one way or another. Keeping in mind that growth in today's world is directly proportional to development of aviation infrastructure in any country, Region or State, the Government is determined to help CAAN in managing and developing the airport facilities to more advancement so as to ensure growth in the Nepalese aviation sector.

I hope CAAN will manage TIA and all other airports of Nepal with global competitiveness and connect Nepal with the global aviation network.

Dr. Baburam Bhattarai
Prime Minister

Hon'ble Lokendra Bist Magar
Minister
Ministry of Tourism & Civil Aviation
Singhadurbar, Kathmandu, Nepal

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Message

On its thirteenth anniversary, I would like to congratulate Civil Aviation Authority of Nepal (CAAN) for continual service to the people of Nepal where access to all parts is still a grave topographical challenge. In this context, CAAN is the authority to have set a mark in narrowing the abysmal gap between the remote places and urban areas of Nepal. Doing this CAAN has not only contributed to assuage the plains of the people in remote areas but also paved the way for connecting the diverse cultural and ethnic hearts into a single bond of integrity. This adhesive quality demonstrated by CAAN has played part in the world forum too. Moreover, CAAN bags the credit for tangible efforts and uplifting the level of safety during Nepal Tourism year, 2011. CAAN has also proactively started its rigorous activities to ensure that Visit Lumbini Year, 2012 become an epitome of success.

The Government of Nepal (GON) is stepping ahead prioritizing the aviation industry keeping in view its necessity and the global trend of its rapid expansion. In this regard, the GON stays firm in focusing on the development and management of areas such as flight safety, security, sustainable development of air transport and technological advancement. On behalf of the Ministry, I would like to suggest CAAN to be prepared for every minute change in the aviation market and developing facilities ahead of demand.

The backbone of Nepalese tourism, CAAN remains indispensable for serving the people as well as the country as a whole. I wish CAAN to prosper high in future and be the foremost in providing service to the people and the country.

L.B.Bist Magar

Lokendra Bist Magar

Hon'ble Dilip Maharjan
State Minister
Ministry of Tourism & civil Aviation
Singhadurbar, Kathmandu, Nepal

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Message

It is a matter of an immense pleasure to learn that Civil Aviation Authority of Nepal (CAAN) is observing its thirteenth anniversary and as a part of various activities, it is publishing a special Souvenir magazine.

The importance of Civil aviation can be realized not only in intergrating the nation but also in promoting tourism which is one of the income generating sectors in a naturally rich and beautiful country like Nepal. I firmly believe that CAAN is also endowed with the responsibility of incorporating the aspirations of people which emanated from the recent historical changes in Nepal. Since the world aviation is leaping forward in a lighting speed, CAAN has to intensify its pace of technological advancement by taking proactive measures.

It is gratifying to see that CAAN is geared towards doing its best for the success of Visit Lumbini Year 2012. We believe the celebration of anniversary is also an opportunity for CAAN to reflect upon its past performance and seek for any possibility of improvement for adopting a better course of action to address and accommodate the expectations of diverse range of its stakeholders. We are well set to help in managing and developing the airport facilities to ensure world-class services to all with a firm belief that this will contribute to promote tourism in Nepal. Finally, I wish CAAN to be more progressive, productive and responsive to the growth, associated challenges of international civil aviation and in ackbowledging its role in the changed context.

Dilip Maharjan
Minister of State for Tourism and Civil Aviation

Government of Nepal

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Singhdurbar,
Kathmandu, Nepal

Message

On this auspicious occasion, I would like to extend my heartfelt congratulations Civil Aviation Authority of Nepal (CAAN) for serving the country in the aviatiion sector for thirteen years. We all know that international civil aviation nowadays is a very competitive businss. Apart from fierce competition, it has to cope with unstable oil prices, security measures as well as environmental concerns. Against all odds, CAAN has managed to make progress in global aviation market. As Nepal is one of the contracting nations of ICAO, I would like to suggest CAAN to implement the "going global" strategy for its secured future. CAAN should be more strategic, efficient and effective in working with all the stakeholders in order to build global air transportation system that is not only safer but more secure and environmentally sustainable.

I also appreciate the remarkable efforts made by CAAN during Nepal Tourism Year 2011. The infrastructural and functional development made and services provided by it stands very high among all the other participating sectors. Now Visit Lumbini Year 2012 stands as a program which CAAN seems to have given topmost priority as evident by the fact that works such as land acquisition, passengr facliity development, expansion of airport infrastructure and facilities are in progess.

As ever, CAAN has been a pace setter in regulating and promoting safe and reliable air services in various parts of the country including remote and inaccessbile areas. The Government will always remain with CAAN for all of its good efforts to uplift the socio economic status of the country and will remain ever ready in all of the works which will strengthen CAAN further.

Ganesh Raj Joshi, PhD
Secretary

International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

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Message

I am very pleased to learn that the Civil Aviation Authority of Nepal is observing its thirteenth annviersary on 31st December 2011

On behalf of the ICAO Regional Office, Bangkok, please accept our congratulations. I certainly look forward to CAAN's continued support and commitment towards strengthening international aviation security and safety standards to cherish objectives of a safe, secure and sustainable civil aviation.

Pease accept my best wishes and assurance of our cooperation at all times.

Yours sincerely,

Mokhtar A. Awan
Regional Director

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CIVIL AVIATION AUTHORITY OF NEPAL

Head Office, Babar Mahal, Kathmandu, Nepal

Commitment

On the occasion of the 13th Anniversary of Civil Aviation Authority of Nepal (CAAN), it is indeed my pleasure and privilege to extend our sincere felicitations to all stakeholders representing the organization and industry.

It is our realizations that if tourism, which is a significant source of foreign exchange and revenue in Nepal, is a mega structure, civil aviation and air transport are a factor toward supporting tourism. In this context, the infrastructure development at Gautam Buddha Airport will facilitate the transformation to Regional International Airport. Similarly works are going on for the improvement and expansion of airport and tourism related facilities to accommodate the growing requirements.

Many changes, new trends and forces are shaping civil aviation developments worldwide. On this occasion, I like to appreciate ICAO for its fore-future thought to aviation development. Embarkation on TRAINAIR Plus Programme to standardize professional training for quality assurance; addressing next generation aviation professionals to cope with predictable huge shortage of manpower; expansion of areas of cooperation for developing countries through fellowships; initiation and adoption of mechanism for facilitating technology transfer in the area of air navigation; initiation of aerodrome certification; introduction of a continuous monitoring process for global safety assurance; introduction of language proficiency requirements, etc are some of the key deliverables ICAO has created in recent times, which I believe would have far-reaching positive impact on Nepalese air transport. We are aware of the simultaneous emergence of challenges and are committed to overcome them through our own regulatory performance, as well as interaction and dialogues with the Government, States, international organizations, professional organizations, donor agencies, operators, etc.

In the assurance of the highest level of safety and security, CAAN has been putting best efforts to escalate in technology and facilities at TIA. It is going to adopt full-automation in the near future. Moreover, it is on the verge of going twenty-four hours operational for which infrastructural development is in progress. CAAN remains firm in making no compromises for ensuring the compliance of the applicable international standards and recommended practices. I believe the Special Souvenir published on our behalf offers a wealth of information and impressions with noticeable fervor on multifarious developments taking place in our sub-sector. The writers deserve our heartfelt thanks, indeed.

In the end, personally and on behalf of CAAN, I like to request all the stakeholders to cooperate and assist us in every way possible to help us become more instrumental in our future actions and enhancement of safety, security, efficiency and sustainability of civil aviation.

Ram Prasad Neupane
Director General

Chief Editor's pen

From the Chief Editor's Desk

- Yet again we are celebrating 31st December and today it is for the thirteenth time as an authority. We celebrate CAAN's anniversary with all the regular activities such as sports, blood donation, recognizing best employee, publication of a souvenir and many more. As we all know, celebrating this special event with all the same programmes every year is gradually losing enthusiasm. Now time has come to celebrate anniversaries with innovative ideas and activities which contribute for increasing productivity and effectiveness in the work of the individuals as well as the organization as a whole. Anniversaries should be observed with assessment of achievements and failures without any prejudice. This will definitely lead the organization to a greater height.
- Since past thirteen years CAAN, as a self reliant organization, has been able to build, upgrade and expand airports in every parts of the country ensuring the accessibility rights of the citizens. Similarly, CAAN has made significant contribution in the national economy by promoting tourism through its service.
- Nepal observed Nepal Tourism Year 2011 and today is the last day of this national campaign. The success or failure of the campaign will be evaluated in the coming days but we are very sure that the role of CAAN during this programme was undoubtedly paramount and strategic. And we are equally confident that we will be able to play a crucial role in making **Visit Lumbini Year 2012** a successful campaign.
- Though information technology has been widely used in international civil aviation, the use of it in CAAN is minimal. Whether in airport operation or air navigation services, the use of modern IT virtually doesn't exist and is still not in priority list either. Here it is to be noted that the domestic air operators have used it widely in ticketing service and in their internal management whereas being their regulatory body we are lagging far behind in this arena. To be competitive in the fierce competition and stand firmly in the global civil aviation industry, the use of modern technologies is necessary. Realizing this very fact, the efforts put by some diligent women staff of CAAN is praiseworthy. And it is time for us to encourage and salute them.
- I would like to thank all of the article contributors for sharing their valuable ideas. I would also like to express my sincere gratitude to all concerned who have helped for making this publication successful.
- Wish you all the happy and prosperous New Year 2012!!!

3/4/2011

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Deepak Baral
Chief Editor
CAAN Souvenir 2011

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Air Transport in Nepal: Vision, Changes and Challenges

Ram Prasad Neupane

Background

There are many broad influences that shape the air transport sub-sector of Nepal. In the wake of declaration of global principles made by the fifth worldwide air transport Conference convened at ICAO Montreal in 2003, Nepal reintroduced a comprehensive Civil Aviation Policy in 2006, which has contributed to creating a conducive and healthy competitive environment under liberalized regime, and encouraging private sector investment in air transport and manage growth, change and emerging environment in the country. Given the size and complexity of air transport industry, currently, 16 airlines (10 fixed wing and 6 rotor wing) are providing air services and 13 are running aviation sports. The aircraft fleet (31 fixed wing and 11 helicopters) comprises of 18 different types ranging from STOL to Jet Aircraft. In the domestic sector, there has been a manifold increase in air traffic, aircraft and cargo movement. It is fairly obvious that civil aviation and air transport activities have been influential in making Nepal Tourism Year 2011 a success, and with the same spirit of cooperation and support, the Civil Aviation Authority of Nepal (CAAN) will remain committed to contribute to the State's another important declaration - Visit Lumbini Year 2012 -- that cherishes to attract significant number of tourists to Nepal.

A cursory glance at the growth and expansion of travel trade and tourism over two decades of liberalization impact, Asia-Pacific region at regional

level and South Asia particularly remains the most promising space for us. In order to harness this expansive opportunity, the tourist friendly Tourism Policy and healthy air transport growth oriented Civil Aviation Policy could be further reviewed in light of new developments taking place in the areas of investment, international air route utilization, flexibility in air seats, air transport development and delivery. CAAN intends to re-strengthen Hub and Spoke system through trunk-route airports. To explore air services in the eastern and western sector, operational bases need to be rationalized. There is no denying that the country-wide air transport service expansion is attainable through cooperation of stakeholders and industry sector. It is expected that sustainable, dynamic regulatory instruments and physical facilities of the state-of-art technology complemented by productive human resources will reorder CAAN to become a model institution and backbone of Nepalese economy.

Current initiatives

Technological and operational improvement and development is an essential factor for air transport development. In this context, a team of ICAO ATM/CNS specialist conducted a study of the ATS Surveillance and Tribhuvan International Airport Approach and Landing Systems. The study report, due to conclusion, recommends CAAN to put in place MSSR Mode S, along with the replacement of existing terminal ASR/SSR. Towards ATM modernization, surveillance data processing system (SDPS) incorporating ADSB and multilateration (WAM/LAM) systems integration has also been recommended. Likewise on navigation, to facilitate safe and accurate approach over the uneven high terrain, a Satellite based augmentation system - ground based augmentation system/satellite based augmentation system (GBAS/SBAS) as a substitute to ILS has also been proposed. Simultaneously, recognizing the need of the hour, CAAN is geared to implement RNP AR under Performance Based Navigation (PBN) system designed by Airbus Sister Company Quovadis to facilitate approach at TIA. Implementation of eastern remote control air ground communication system (RCAG) has been planned to enhance VHF coverage towards the eastern sector of Nepal. Similarly, ATS message handling system (AMHS) is in the process of implementation. On the other hand, under ADB loan assistance, we are in process of installation and improvement on the CNS/ATM system, which include Voice Communication Control System (VCCS), VHF Communication, Met Equipment, New ATC Consol, and ATC Automation System. It is anticipated that with these transformations, safety would be promisingly enhanced and TIA would be more capable and efficient to contribute to safe flight operations, facilitating flexible use of operational hours by the domestic and international flights.

CAA Nepal as a regulator is planning to implement state safety programme (SSP)

which is in process of approval by the appropriate authority, and SMS for service providers, operators and such training organizations as are directly associated with operations is being implemented. As per the ICAO USOAP audit findings/recommendations, we have to revise the primary aviation legislation and specific operating regulations incorporating the provision of Chicago Convention related SARPs and Protocols. The Organization Structure of CAAN is in the process of initial internal revision as a first step and subsequently is going to be thoroughly reviewed under ADB assistance. The main objective of the three year capacity development plan, prepared under ADB's project preparatory technical assistance, aimed to address CAAN's deficiencies in the operation, staffing, and to enhance CAAN's capability to efficiently administer, manage, operate, maintain and expand civil aviation infrastructure and services in Nepal. The five major components of the capacity development plan are 1. Legal - review, revise and propose amendments to current legislation governing regulation and operation of civil aviation. 2. Planning - prepare a national plan and road map for civil aviation development of Nepal, prepare workable corporate business plan, review the opportunities for both enhancing the existing level of private sector participation and expanding private sector participation within CAAN, enhance non-aeronautical revenue generating activities and identify additional commercial opportunities. 3. Restructuring - focusing on regulation and service provision function. 4. Human resources development, 5. Computerization, 6. Management information system including financial management system. Civil Aviation Academy of Nepal is going to be a member in the ICAO TRAINAIR Plus Programme. The certification by ICAO will take place in foreseeable future. The TRAINAIR PLUS programme goal is to improve the safety and efficiency of air transport through the establishment, maintenance and monitoring of high standards of training and competency of aviation personnel on a world-wide basis and in a cost-effective manner.

Infrastructure development

CAAN is committed to strengthen its role in far reaching connectivity and accessibility. Civil aviation in fact serves as a major vehicle for economic development, poverty alleviation, social inclusion, global connection and linkages and promotion of global understanding. Some of the important airport infrastructure development works are being undertaken with priority.

Under ADB Loan assistance, the air transport capacity enhancement project includes the following works -

Component - A : Airside Infrastructure at TIA:

- Land preparation for parallel taxiway, international apron, hangar areas for Nepal Airlines, Domestic

Airlines and Nepal Army;
- 300m extension of runway;
- Pavement works of runway, taxiways and apron;
- Drainage works for runway strip, taxiway strip and apron area;
- Installation of power supply system and aeronautical lighting system,
- Installation of water supply system, sewage treatment plant and solid waste disposal system; and
- Provision of Foam Tender.

Component - B : Landside Terminal at TIA will include :
- Reconfiguration and refurbishment of existing international terminal building; and
- Construction of new domestic terminal building

Component - C : Works at Simikot and Rara Airports will include :
- Construction of terminal building with tower at both airports,
- Pavement of runway and apron, and drainage works at Rara airport
- Installation of ATC communication and meteorological equipment
- Provision of snow plough.

Similarly, another project named Gautam Buddha Airport Upgrading Component (GUAC) under the South Asia Tourism Infrastructure Development Project (STIDP) - Nepal portion, under ADB loan and grant assistance include the following works -

Airside Infrastructure
- Construction of a new runway, exit taxiway with flexible pavements,
- Construction of a new international aircraft parking apron with rigid pavements,
- Rehabilitation of the existing runway for conversion to parallel taxiway with flexible pavements,
- Water supply, Sewerage and Storm water drainage improvements,
- Diversion of Ghaghara Khola along airport boundary,
- Construction of periphery road and security chain link fencing,
- Construction of other utility roads and Airport access road, CFR access road, Fuel Farm access road and Custom and Cargo access road systems.

Landside Infrastructures
- Refurbishment and expansion of existing terminal building as a domestic terminal building,
- Construction of new international terminal building,
- Construction of new control tower/operation building, customs and cargo building and crash fire building,
- Ancillary buildings as power house, guard house, security posts and maintenance building etc.

Challenges
Challenges facing civil aviation and air

transport sub-sector are mainly constraint driven in relation to the capacity. Being a mountainous country with unique topographical situation, the development of air transport is not a choice from the point of view of economic analysts, but a social obligation. Precisely, the quality and adequacy of service covering both tourist and non-tourist social sector and sustainability of industry are some of the notable challenges of airlines. On the part of CAAN, the rapid fulfillment of the expectation and demand of the airlines, airport users and traveling public in terms of infrastructure development, modern equipment and facility are the main concern. On domestic aviation, the most glaring challenge is to cope with problems associated with non-profitability of vast number of airports. CAAN has been sparing huge expenses on the construction, upgradation, operation and management of these airports, which are located mostly in the remote and far-flung areas of the country.

The continued increase in commercial air services has resulted in capacity constraints at airports and in air space. It is an increasing challenge to the growth of air transport. The limited availability and utilization of infrastructure abruptly changing weather and climate conditions have led to serious problems on flight delays with spillover effects domestically and internationally.

The challenges in general are:

- Qualitative improvement and upgradation of airports
- Re-strengthening of safety and security oversight capability
- Adoption of modern technologies and equipment
- Diversification of income including non aeronautical revenue
- Human Resource Development focusing on production of professional manpower
- Retention of qualified inspectors and plan for recruitment and replacement addressing the problem of growing retirements in vital areas
- Maintenance of equipment by airlines
- Effective implementation of SMS
- Carrying out safety oversight functions in objective and systemic manner,
- Maintenance of professionalism in aviation business
- Adequacy and selectivity of remote-friendly aircraft equipment
- Development and adoption of domestic legislation in tandem with the provision of international Conventions, Protocols and SARPs
- Sustainability of industry as a whole.

In a country like Nepal with marginal maintenance facilities and expertise, experience has indicated the need for the continuation of the post-installation maintenance back up support from the external agencies till CAAN is self reliant in its own capacity. CAAN fully supports towards meeting appropriate technological requirements as put forth by States and

organizations of the world. However, CAAN has realized that country-specific technical assistance is more important to yield tangible benefits. In this regard, it will be appropriate for ICAO to urge States with the necessary expertise to actively devote resources for research and development for specifically addressing unique safety concerns and limitations in countries like Nepal.

Conclusion

Being a sole air navigation service provider CAAN has to take multifarious role and obligations involving construction, equipment facilitation, operation, maintenance and management of airports. To enable CAAN increasingly proactive in its endeavor and foster healthy growth of air transport without compromising safety, cooperative efforts among policy planners, civil aviation authorities, airline operators and stakeholders at national, regional and global level is indispensable. It is high time to review pertinent legislation, regulation, policies and practices in terms of the healthy and orderly growth of air transport.

In line with the spirit of international air transport policy to increase global accessibility, optimize utilization of Nepalese air space and maximize economic benefits to the nation by promoting tourism and trade, a flexible and liberal approach should be continued to foster healthy and sustained growth of air transport.

The focus of the future improvement plans and priorities are as follows:

- Enhancement of safety and security,
- Capacity enhancement of TIA (infrastructure, equipment, facilities, 24 hour operation etc.),
- Diversification of revenue sources - non-aeronautical revenue,
- Commercial utilization of land and beautification of airport surrounding areas,
- Improvement and upgradation of regional airports to facilitate regional international operation,
- Initiation for construction of second international airport and Pokhara regional international airport,
- Enhance capacity of Civil Aviation Academy,
- Upgradation of STOL airports with priority to commercially viable airports,
- Restructuring of Organization,
- Implementation of RNP-AR
- Implementation of Automatic Message Handling System,
- Upgradation of existing VOR/DME
- Establishment of eastern sector Remote Control Air-ground Communication (RCAG) System,
- Initiate action for the installation of new SSR at Bhattedanda,
- Identify appropriate site for relocation of domestic operation within Kathmandu valley,
- Air route development (Himalaya - 2)

Director General, Civil Aviation Authority of Nepal

Aviation Diplomacy In the context of Nepal

TR Manandhar

Background

Diplomacy is the art and practice of conducting negotiations between representatives of groups or states. It is the employment of tact to gain strategic advantage or to find mutually acceptable solutions to a common challenge, one set of tools being the phrasing of statement in a non-confrontational or polite manner.

Role of diplomacy may be very important when things cannot be accomplished by normal process. Recently a need of an appropriate diplomacy in Nepalese aviation field has been also genuinely felt. It is well known that Nepal is a small country in between India and China. Significant growth of air transportation with a steady increase in GDP in India and China is a great prospect for Nepal. Nepal should be able to reap the benefit of the growth and prosperity of our two giant neighbors. Aviation may be one of such fields which can produce a very positive result in our quest to transform our nation to a New Nepal.

Why Aviation Diplomacy

The Pokhara- Lucknow schedule flight as proposed by Buddha Air could not materialize in absence of a commercially viable air route for the return leg. It must be taken as an eye-opening-case by Nepal. So far we have only one entry point for international flights to Kathmandu that is via Simra or Romeo except in case of Lhasa and Paro flights. Nepal is investing substantial amount for Gautam Budhda Regional International Airport. Besides, Pokhara

Regional International Airport is also in the pipeline. On top of that, another full- fledged second international airport at Nijgadh is also a national priority project. In all of these cases, cooperation from Indian side is very much essential. If we cannot communicate our requirement to the neighbors timely and convince them properly, all the endeavors we make for building up our nation will go in vain. So, it is very essential that first we settle our actual requirements and then only put them forward through proper channel before we are too late.

Nepal can also expect a lot from China. It has been more than ten years since Nepal was after Trans Himalaya Route and Himalaya Routes for which China's cooperation is very much essential. In absence of a significant progress regarding these routes since past ten years, Nepal decided to stick only on Himalaya 2 route condoning other routes. Taking into consideration her strategic importance and having potential of bringing herself within the international air route network, Nepal must continuously be involved in establishing Himalaya 2 route. For this also continuous lobbying and proper diplomacy is very much essential.

Forms of Diplomacy

Exchange of visits

In course of communicating our requirements to concerned authority and also in the process of confidence-building, exchange of visit may be one of the effective tools to getting things done. As a part of initiating appropriate aviation diplomacy, Civil Aviation Authority of Nepal is planning to invite high officials of India and China. Besides, CAAN has also planned to invite some of the ATS officials from India and China to Nepal who are directly involved in day to day work. Moreover, this year we have planned to send few ATS Officers to India as a part of 'neighboring FIR visit and facility observation' program. This program is aimed to enhance the working relation in the grass root level.

High Level visits

Government of Nepal has now started to include airspace and air route issues as one of the agenda during high level visits of Head of the government and the Head of the state. During the China visit of Rt. Honorable President of Nepal last year, CAAN had formally requested through Ministry of Foreign Affairs for cooperation of Chinese Authority for the implementation of Himalaya 2 route and Trans Himalayan Route. During the last friendly visit of India by Rt. Honorable Prime Minister Mr. Babu Ram Bhattarai, Air Route was one of the agenda of the bilateral discussion. Ministry of Tourism and Civil Aviation had formally requested Ministry of Foreign Affairs to seek cooperation of the Chinese side for the implementation of Himalaya 2 Route (Kathmandu – Kunming/Hong Kong) during high level visits. As a part of Aviation Diplomacy CAAN should organize a meeting in presence of the Minister and the Secretary of the Ministry of Tourism and Civil Aviation inviting the Ambassadors of India and China separately. Problems of Nepalese aviation and areas of mutual cooperation should be presented in

the meetings.The Ambassadors should be requested for cooperation and initiations from their part to sort out the existing problems.

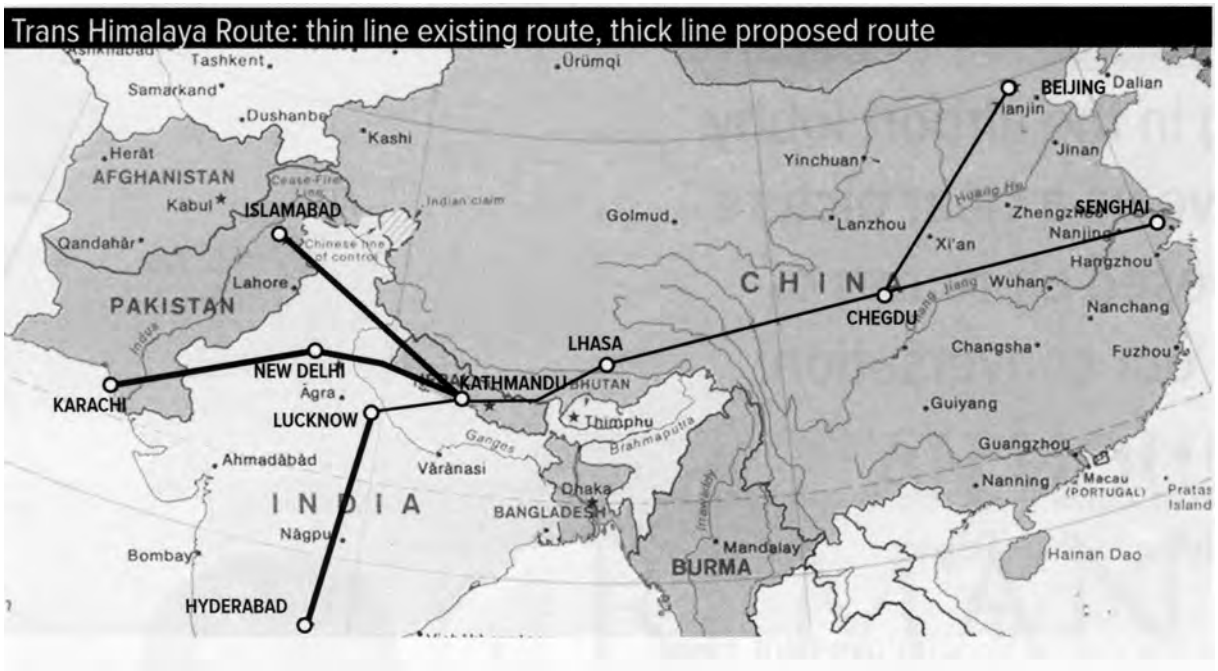
A formal request should be made to the Ministry of Foreign Affairs to instruct the respective Embassies to play a positive role in conveying and presenting Nepal's Air Route requirements.

Track- two diplomacy:

It is a specific kind of informal diplomacy, in which non-officials (academic scholars, public figures, social activists, well wishers engage in dialogue, with the aim of communicating the need, or confidence-building. In this part we can seek the help of Ex DG, Ex- ministers and political figures who are sympathetic to Nepal.

Nepal can definitely prosper in the field of aviation by adopting proper aviation diplomacy.

Deputy Director General, CAAN Head Office



SAFETY INITIATIVES BY ICAO: SOME INNOVATIVE FORUM

Er Ratish Chandra Lal Suman

Background

In this article the author attempts to elaborate the safety enhancing measures of ICAO in the past and current decade and strategies devised to fulfill the safety objective set forth. The various safety strategies adopted by ICAO have been briefly discussed shedding light primarily on RASG and HLSC. The fundamental objective of this forum will be to reinforce the core values of Global Aviation Safety Plan (GASP) and Global Aviation Safety Roadmaps (GASR).

REGIONAL AVIATION SAFETY GROUP (RASG)

ICAO has proposed to create the Regional Aviation Safety Group (RASG) covering all the regions in the world, with an objective of promoting the aviation safety in the respective regions by mobilizing the pool of expertise and the available resources. The proposed five regions covering the world are: Regional Aviation Safety Group –Asia Pacific (RASG-APAC), Regional Aviation Safety Group-Europe (RASG-EUR), Regional Aviation Safety Group-Pan America (RASG-PA), Regional Aviation Safety Group-Africa (RASG-AFI), Regional Aviation Safety Group-Middle East (RASG-MI) for their

corresponding regions.

Subsequent to the decision of the Council of ICAO on 18 March 2008, concerning increasing the effectiveness of planning and implementation regional groups (PIRGs) the Air Navigation Commission initiated a study aimed at identifying a regional mechanism to address safety issues. Resolution A36-7 resolved that the global plans (Global Air Navigation Plan and Global Aviation Safety Plan) shall provide the framework in which regional, sub-regional and national implementation plans will be developed and implemented thus ensuring harmonization and coordination of efforts aimed at improving international civil aviation safety and efficiency.

The implementation of air navigation systems follows a well established mechanism based upon the regional air navigation planning process which evolved to a more robust system with the introduction of the Global Air Navigation Plan (GANP). The GANP initiated a top-down approach in which the regions, through the planning and implementation regional groups (PIRGs), implement a regional performance framework. The Global Aviation Safety Plan (GASP) utilizes a bottom-up approach that allows groups of States to analyze gaps and implement action plans to meet specific needs by leveraging existing political and economic structures between them. This approach has the advantages of facilitating a pooling of resources, as well as supporting a dynamic exchange of information. A void exists, however, as there is no regional follow-up and coordination of the implementation of these sub-regional action plans.

PIRGs: The development of regional plans for air navigation systems is undertaken by ICAO's six PIRGs, which were established by the Council. The scope of PIRGs does not cover flight operations safety issues. The PIRG meetings are organized by regional offices and supported by Headquarters (Air Navigation Bureau). The PIRG reports are reviewed by the Commission on a regular basis and the Council, on a case-by-case basis.

COSCAP/RSOO: The cooperative development of operational safety and continuing airworthiness programmes (COSCAPs) are an agreement between Member States, executed by ICAO's Technical Co-operation Bureau by means of a Trust Fund, and are aimed at enhancing the safety and efficiency of air transport operations. The COSCAPs are limited to a few regions and within a region not all States are covered. In some subregions, Regional Safety Oversight Organizations (RSOOs) have been developed from COSCAP projects or have been established instead of COSCAPs.

DGCA meetings: Many of the regions convene regional or sub-regional meetings of Directors General of Civil Aviation (DGCA), which discuss a wide range of subjects encompassing safety, efficiency, economic,

security, environment and regulatory issues related to air transport operations. The meetings and their follow-up are carried out by the regional offices with no substantial support from Headquarters.

Regional structure: The COSCAPs and RSOOs are organized on a sub-regional basis. It may be noted that eventually some COSCAPs may evolve into RSOOs where appropriate. Considering that COSCAP/RSOO mechanisms are more focused on safety oversight issues and, as of now, do not cover all of the States of the region , it is considered necessary to establish a new regional mechanism known as Regional Aviation Safety Groups (RASGs) to address and harmonize all flight operations safety issues on an ICAO region - wide basis. Noting that in several regions there was actually a gradual evolution toward RASGs, this proposal, in effect, would facilitate ICAO to recognize groups that Contracting States had already chosen to form. The eventual recognition of RASGs by the Council would lead to the establishment of a formal reporting channel allowing ICAO to monitor the worldwide implementation of the Global Aviation Safety Plan (GASP). The RASGs are expected to build on the work already done by these existing subregional organizations. However, RASGs will facilitate the exchange of best practices, cooperation and collaboration using a top-down approach complementing the bottom-up approach of planning by sub-regions, States and industry.

Need for partnership: The GASP and GASR are built on the principle of partnership and, as such, it is essential that all relevant stakeholders are involved in the development and implementation of any activities aimed at improving safety under the focus areas. Together with ICAO, the stakeholders in the civil aviation sector are States, airlines/operators, airports, air navigation service providers, aircraft and equipment manufacturers, maintenance and repair organizations, regional organizations, international organizations, and industry representatives. ÊThe commitment of all stakeholders is fundamental for success in improving safety.

Resources: With the creation of RASGs, one officer for each of the regional offices will be required. Currently, all regional offices have a post of Flight Safety Officer in their establishment. Further support for the RASG meetings would be provided using Headquarters staff.

Coordination between PIRGs and RASGs: A concern rose related to the parallels that were being drawn between the PIRG framework and the RASGs. It was noted that while the PIRGs did touch on some safety issues, they had been developed to deal with air navigation plans at a regional and global level with ICAO playing a key leadership role. In contrast, safety continued to lie within the sovereignty of individual States. It would be helpful if States could provide input on how to determine the safety issues to be covered by the RASGs and those that should remain

with the PIRGs. Also, the need for a mechanism for coordination between PIRGs and RASGs was discussed and accordingly this aspect has been reflected in the suggested terms of reference.

Systems approach: The proposed RASGs will serve as a regional cooperative forum integrating global, regional, sub-regional, national and industry efforts in continuing to enhance aviation safety worldwide. While RASGs will initially deal with safety issues directly related to flight operations, planning should be initiated as soon as circumstances permit to adopt a systems approach so that RASGs address safety issues from an integrated perspective that includes flight operations and ATM safety. As the Commission reviews the mandate and terms of reference of PIRGs, it is expected to address in the future an integration of the safety work done by these groups. Until such time, the Secretariat will ensure that the safety issues raised by the PIRGs and RASGs are fully coordinated and that a small group of members of the PIRGs attend the RASGs meetings and vice versa.

Membership

Contracting States entitled to participate as members in a RASG meeting are: a) those with territories or dependencies located partially or wholly within the geographical area to be considered by the meeting; b) those located outside the area: 1) which have notified ICAO that aircraft on their register or aircraft operated by an operator whose principal place of business or permanent residence is located in such States, operate or expect to operate into the area; or 2) which provide facilities and services affecting the area.

Contracting States not meeting the above criteria and non-Contracting States are entitled to participate in RASG meetings as observers. The aircraft operators, international organizations, maintenance and repair organizations, regional organizations, aircraft manufactures, airport and air navigation service providers and any other allied organizations/representatives will be invited to attend RASG meetings in the capacity of observers. The members and observers will serve as partners of RASG and their joint commitment is fundamental for success in improving aviation safety worldwide. The Regional Director will serve as the Secretary of the RASG. Wherever two Regional Directors are involved, they would alternate serving as Secretary of the RASG and PIRG to balance the Secretariat responsibilities between these two regional groups.

Resources

An officer from Headquarters (ANB) will participate and provide support to the RASG meetings. The ANB officer will serve as the interface between the RASG and the Air Navigation Commission and present the reports of meetings to the Commission/Council for review and harmonization.

Work programme

The RASG will develop and implement a work programme that supports a regional performance framework for the management of safety on the basis of the Global Aviation Safety Plan (GASP) and the Global Aviation Safety Roadmap (GASR). Using the GASP and GASR, the RASG will build on the work already done by States, existing subregional organizations such as the Cooperative Development of Operational Safety and Continuing Airworthiness Programmes (COSCAPs) and Regional Safety Oversight Organizations (RSOOs) and support the establishment and operation of a performance-based safety system for the region by:

a) analyzing safety information and hazards to civil aviation at the regional level and reviewing the action plans developed within the region to address identified hazards; b) facilitating the sharing of safety information and experiences among all stakeholders; c) ensuring that all safety activities at the regional and sub-regional level are properly coordinated to avoid duplication of efforts; d) reducing duplication of efforts by encouraging collaboration, cooperation and resource sharing; e) conducting follow-up to GASP/GASR activities as required; f) coordinating with respective PIRG on safety issues; and g) providing feedback to ICAO to continually improve and ensure an up-to-date global safety framework.

HIGH LEVEL SAFETY CONFERENCE (HLSC)

ICAO has in recent past organized a high level safety conference (HLSC) with a high level participation of Directors General of civil aviation administration of contacting states with the following objectives:

Objective 1-The ICAO safety framework

The outcome sought of this objective is to set the foundation for the Conference, by providing a basic understanding of the ICAO safety framework and its evolving Internal Safety Management Process (ISMP).

Objective 2-The evolution of the States audit programme

The Conference to be presented with a report on the evolution of the safety oversight audit process by ICAO, highlighting the transition from periodic compliance audits to safety risk based continuous monitoring.

Objective 3-Managing the transition to a State Safety Programme (SSP) environment

Under this objective, an agreement to be sought from the conference for a "list" of specific activities by ICAO and States and, when applicable, Regional Safety Oversight Organizations, for ensuringÊsafeguards during the transition to an SSP environment.

Objective 4-The link between SSP and Continuous Monitoring Approach (CMA)

Under this objective, an agreement on the link between the SSP and the CMA and the endorsement of specific actions by ICAO and States, so as to strengthen the synergy

between the two and to best use the resulting information.

Objective 5-Sharing of safety information

The conference to review and agree on a proposedÊ"list" including the nature of the safety data and information to be shared, and among whom, together with the need for specific partnerships with industry.

Objective 6-The protection of sources of safety information

The conference to discuss and agree on specific interventions by ICAO and by States, and when applicable, Regional Safety Oversight Organizations, to address the political, administrative and practical aspects of the protection of sources of safety information.

Objective 7-New Safety Management Annex

The outcome sought of this objective is agreement regarding to the ICAO SSP framework as the basic contents of a new Safety Management Annex, including a declaration about the commitment to not having differences with its provisions.

Objective 8-Harmonization of rules and processes to avoid multiple certifications

The conference to be called on to make a commitment to actions to reduce the requirements for certificate holders to comply with multiple sets of similar but yet different requirements under existing multiple certification rules, thus decreasing the administrative and financial burden for certificate holders while addressing the potential safety consequences created by such burden.

Nepal registered its presence during the High Level Safety Conference organized by ICAO in Montreal in 29 March-1 April 2010 with a high level delegation. As the conference concludes with following declaration for the aviation safety, Nepal commits its full efforts in realizing the vision set by the HLSC.

1) Even though air transport is a very safe mode of transportation, there is a need to achieve a further reduction in the number of accidents and especially fatal accidents to maintain the public confidence in the safety of the global air transport system; and

2) States support an ICAO safety framework based on sound safety management principles and processes. (HLSC 2010)

In future CAA Nepal will undertake several activities that will address these two objectives so that the number of fatal accidents is significantly reduced. Again we reiterate that the safety can only be achieved with combined efforts of all stakeholders. At this point of time we urge all stakeholders to join hands to achieve the safety goal.

STATE SAFETY PROGRAM (SSP)

Annexes 1, 6, 8, 11, 13 and 14 include the requirement for States to establish a State safety programme (SSP), in order to achieve an acceptable level of safety in civil aviation. An SSP is a management system for the management of safety by the State. An SSP is defined as an integrated set of regulations and activities aimed at improving safety. It includes specific safety activities that must be performed by the State, and regulations and directives promulgated by the State to support fulfillment of its responsibilities concerning safe and efficient delivery of aviation activities in the State. The responsibilities encompassed by the SSP include, in broad terms:

a) Safety regulation
b) Accident investigation
c) Incident investigation
d) Safety assurance and
e) Safety promotion.

CAA Nepal has already prepared the draft of the SSP and it is in the final stage of approval.

SAFETY MANAGEMENT SYSTEM (SMS)

Annexes 1, 6, 8, 11, 13 and 14 establish that States shall require, as part of their SSP, that approved training organizations that are exposed to safety risks during the provision of their services, aircraft operators, approved maintenance organizations, organizations responsible for type design and/or manufacture of aircraft, air traffic services providers and certified aerodromes implement a safety management system (SMS). An SMS is a management tool for the management of safety by an organization. The Annexes also establish that the SMS shall be accepted by the State and shall, as a minimum:

a) Identify safety hazards;
b) Ensure the implementation of remedial action necessary to maintain agreed safety performance;
c) Provide for continuous monitoring and regular assessment of the safety performance; and
d) Aim at a continuous improvement of the overall performance of the safety management system.

CAA Nepal has already formulated the safety management system (SMS) requirements to be followed by the service providers. Although the SMS cannot be implemented overnight a phased manner of implementation will be considered as better practice in the Nepalese perspective.

THE ICAO GLOBAL AVIATION SAFETY PLAN and ROADMAP (GASP/GASR)

The ICAO Global Aviation safety Plan (GASP), was developed on the basis of the which was prepared by the Industry Safety Strategy Group (ISSG) working with ICAO. The GASP

can be seen as the ICAO strategy to address the focus areas and related objectives that have been defined in the Roadmap as vital to the enhancement of safety levels within global commercial aviation. The GASP also establishes coordination mechanisms to ensure that both the GASP and the Roadmap are maintained up-to-date in a coordinated way. The GASP defines 12 specific global safety initiatives designed to support the implementation of aviation safety objectives that have been accepted as vital to the enhancement of aviation safety.

In the interest of establishing a single level of aviation safety worldwide the Global Aviation Safety Roadmap was produced and developed by the Industry Safety Strategy Group (ISSG). The ISSG's members include; the International Air Transport Association (IATA), Airbus, Boeing, Airports Council International (ACI), the Civil Air Navigation Services Organization (CANSO), the Flight Safety Foundation (FSF) and the International Federation of Air Line Pilots Associations (IFALPA). There are two essential components within the Roadmap:

Part 1 - A strategic action plan for future aviation safety: Basic framework for correcting inconsistencies and areas of weakness in 12 focus areas.

Part 2 -Implementing the Global Aviation Safety Roadmap: Priorities and specific coordinated actions to be undertaken by industry in order to reduce risk and improve safety worldwide.

Implementing the Global Aviation Safety Roadmap:

The completed Global Aviation Safety Roadmap marks the first unified and coordinated accident reduction initiative developed by both governments and industry.

Theobjectives of the ICAO Global Aviation Safety Plan (GASP) are to:

a) reduce the number of accidents and fatalities worldwide irrespective of the volumes of air traffic; and

b) achieve a significant decrease in accident rates, particularly in regions where these remain high.

Fundamentals**:** In addressing these objectives, GASP concentrates on three fundamental aspects of a safety management system, as follows:

1st Fundamental	Reviewing the causal factors of aircraft accidents worldwide in order to identify specific safety issues which must be addressed to reduce accident numbers and rates. Attention will be given to the reasons for regional variations in accident rates;
2nd Fundamental	Keeping abreast of the activities of existing safety groups in order to identify safety issues which have global perspectives. In

	doing this, GASP focuses on those safety initiatives most likely to reduce accident numbers and rates; and
3rd Fundamental	Promoting safety awareness worldwide by facilitating the effective sharing and use of aviation safety data and information.

The Global Aviation Safety Plan therefore identifies those tasks and programmes likely to produce the best safety dividend in terms of reducing accident numbers and rates both on a global and regional basis. It is intended that GASP serve all parties involved in aviation safety, including acting as a planning and a tracking tool to monitor progress in the relevant areas of activity. For practical application, the objectives and fundamentals of GASP are addressed by different focus areas, or elements, each having associated tasks and programmes.

CONTINUOUS MONITORING APPROACH (CMA)

CMA is a system to monitor the safety oversight capability of a State on a continuous basis with the ability to monitor States' safety performance at the appropriate time. Additionally, CMA broadens the scope of compliance audits to incorporate safety management principles using safety risk management (SRM) and safety assurance (SA) concepts. Following are major components which allow ICAO to successfully monitor the safety oversight capabilities of Member States.

1: Collect and Validate Safety Information
2: Analyze and Measure States' Safety Oversight Capabilities
3: Identify and Prioritize Deficiencies
4: Develop and Implement Strategies

Main data sources for CMA are states, internal stakeholders and external stakeholders. Using their continuous monitoring programme (CMP), the States will provide the principle source of safety information when they complete and submit the following:

1: State Aviation Activity Questionnaire (SAAQs);
2: Electronic Filing of Differences (EFODs);
3: USOAP protocols;
4: Updated Corrective Action Plans (CAPs); and
5: State Safety Programmes (SSPs)

The information gathered from 'Collect and Validate Safety Data' is used to determine the level of effective implementation of the 8 critical elements of the safety oversight system of each State. The primary tools for making this determination are the Audit Protocols. If, at any time, ICAO has any questions or concerns about the information collected pertaining to a Member State, ICAO may generate a Mandatory Information Request (MIR) using the online framework. The MIR can be generated and sent to the Member State through the online system, requesting the State to provide either

clarification or additional information. The MIR is always linked to an audit protocol. There are numerous benefits of a USOAP – CMA including:

- → Transition from a one-time assessment activity "snap-shot" to a continuous monitoring process,
- → Collective sharing of safety data by promoting and encouraging the sharing of safety information by regional and international organizations,
- → Continuous monitoring of Member States' safety oversight capabilities,
- → Identification of safety risks,
- → Monitoring of the safety performance of Member States (at the appropriate time), and it is a
- → Real time and interactive online system (web supported).

Nepal's view point

Nepal has been actively participating in other PIRGs like APANPIRG in the area of CNS/ATM that is resolving the various issues associated with its field for better safety and efficiency. Although Nepal has been an active participant in the regional safety forums like ARAST, SARAST, apart from COSCAP-SA, -with its national body NAST-Nepal- a participation in RASG-APAC may prove a boost for the safety enhancement in Nepal.

Conclusion

A sincere analysis of aviation safety in the recent past is not encouraging rather it paints a bleak picture. Being the regulatory agency CAA Nepal must take serious stock of the situation and undertake a serious introspection. On the other hand CAA Nepal should not be left alone for the dismal state of safety where the other stakeholders like the air operators are equally accountable for the safety. With the upcoming RASG-APAC, we may optimistically expect that the root causes may be identified and corrective actions put in place. In addition, the introduction of CMA will prove a milestone in the efforts of aviation safety enhancement where all stakeholders have their view and input for the continuous improvement. It is the need of the hour to pledge all stakeholders to work in tandem to achieve the higher level of safety in Nepal.

General Manager, Tribhuvan International Airport

The challenge of accomplishing safety enhancement

Mohan Adhikari

Aviation activity faces numerous risks on daily basis. The aviation industry, as such, has quoted safety at the forefront of its priorities since its inception and is rigorously endeavoring for safety enhancement. Nepal, as a signatory to Chicago Convention since 1960, is obviously bound to comply with all the ICAO provisions. While the elimination of accidents and incidents would be desirable to everyone, the desirability or prescriptive commitment alone is not sufficient, rather performance based evidence of the implementation is essential to attain the desired achievement.

Nepal unfortunately doesn't have good safety records. Albeit, the physical geography of the country is conducive for scenic beauty, it is not aviation friendly. Particularly over 80% of the land mass being comprised of hills and mountains, the uneven terrace, gorges, the blowing of wind through these surfaces and other such meteorological factors often times create negative impacts to aircraft. While relaxation, negligence or undue compromise as essential factors obviously invite unwanted situation anywhere in the world, owing to unique situation the aviators in Nepal are apparently required to remain considerably on high alert, work with added caution and adhere strictly to the stringent requirements all the time.

In the context of recurrence of air mishaps in Nepal in recent past, the Government of Nepal, Ministry of Tourism and Civil Aviation, through a ministerial decision of B.S. 2067/5/14, constituted a five member High Level Task Force headed by Mr. Medini Prasad Sharma, the former Director General of Civil Aviation Authority of Nepal and members from various aviation communities. The TOR of the Task Force was to study the safety recommendations prescribed by various air accident investigation commissions in the past and to assess the status of their compliance and make further recommendations with action plan for the enhancement of aviation safety.

The TF was also assigned the responsibility to recommend in respect of making the right to information of the aircraft accident investigation report public, which was previously lacking.

Nearly one year later, the TF submitted its report to the then honorable Minister in the presence of concerned responsible dignitaries and media. The report, apart from other details, obviously comprised of safety analysis, findings, conclusion and some safety recommendations to the Ministry, CAAN, and the entire Aircraft Operators. Besides, couples of safety recommendations issued by past Investigation Commissions were considered vague, subjective and irrelevant to the particular accident case. It was thus difficult to ensure its compliance. Moreover, some recommendations were considered not carrying the intended meaning as well due to which for the first time, some recommendations were also issued for the guidance of the Investigation Commission to make recommendations more practical in the days ahead.

Receiving the report and addressing the gathering, the responsible dignitaries including the Minister appreciated the effort made by the TF and expressed commitment that no stone will be left unturned for the effective implementation of the report without any delay. Though the compliance of the report alone is not the panacea for all the deficiencies, yet it was believed that the effective implementation of the report would significantly contribute in the enhancement of aviation safety. However, it is being observed that even the following of safety recommendations felt of high significance, are also not paid due attention by responsible authorities.

For instance, one of the recommendations stipulates "The Ministry while keeping the data base of qualified, experienced and updated accident investigation aviation experts should also allocate necessary budget for the investigation of the accident in Nepal. The existing practices of funding by the airline operator which met the accident should be avoided to eliminate the potential conflict of interest". It was also learnt that this provision was approved by the Ministry as well. Contrary to that, the Investigation Commission formed for the investigation of ill-fated Buddha Air

accident at Kotdanda in Kathmandu valley, regrettably, could not proceed with its task as planned, due unavailability of necessary budget, thereby resulting delay in the outcome of investigation. It is a mockery that in one hand billions of State funds of a poor country like Nepal is being spent unjustifiably and on the other hand most genuine and sensitive priority need of the State and the stakeholders is hampered in the want of considerably low amount.

Apparently, the safety oversight audit of Nepal was carried out from 5 to 14 May 2009 under ICAO Universal Safety Oversight Audit Programme (USOAP). During the audit process numerous findings were observed. While agreed with the findings of the ICAO audit team, Nepal, as per the norms, also submitted a corrective action plan on 26 October 2009 and an update to the action plan on 1 February 2010 to address the shortcomings. Obviously, the State agencies being the apex body should have come out with the evidential performance that could be followed by the agencies under its umbrella.

Conversely, the study of the above TF having revealed that the progress in the execution of corrective action plan was not effective, made a recommendation to this effect "As no substantial improvement has been noted in the direction towards the compliance of corrective action plan submitted to ICAO in respect of USOAP Audit 2009, the Ministry should take immediate action on the implementation of the corrective action so as to meet the deadline committed against each corrective action plan". Notwithstanding, it is disheartening to note that deficiencies are still being observed in the fulfillment of the own submitted corrective action plan to the concerned apex International Body.

To take the instance of yet another recommendation that stipulates "A mechanism should be devised to make sure that the safety recommendations made by the accident investigation commission reach the concerned stakeholder without any delay so that they can be implemented in time. A follow up system shall be devised so that the accountable officials are bound to gear up dedicatedly for the implementation of safety recommendations and compliance status of the same can be tracked instantly by the supervising authority". Nonetheless, it is being learnt that till second week of December, even the follow up system has not been devised. On the other hand, instead of accepting the challenge of making the right to information of the aircraft accident investigation report public, unbelievingly, even the concerned stakeholders are yet to receive the safety recommendations of the TF report. These are couple of instances that depict of often times experienced weakness in our context that require due attention for rectification.

Aviation field, as general norms, is considered to keep abreast of almost all the latest

developments. The contemporary method of safety management system requires that not only the accidents and/ or serious incidents, rather aviation occurrences should also be reported, analyzed, assessed and satisfactorily treated. While the proactive and predictive methods are the ways for an organization to internally capture previously unreported incidents or safety concerns, so that they can be addressed in a proactive manner, the analysis of past accidents/serious incidents and the implementation of corrective actions to prevent the recurrence of those events through reactive method, still remains one of the three legs of the safety stool. Whereas, the proactive and predictive methods in our context are still in the initial stage and a lot is to be done , including the establishment of pervasive safety culture among all stakeholders, lack of effective implementation even in traditional reactive method as such, is undoubtedly a great concern for everyone.

It may be relevant to recall that in course of taking briefing of the Civil Aviation Authority of Nepal, newly appointed honorable Minister Lokendra Bista Magar wished for some exemplary achievement during his tenure that qualifies for long term recognition among aviation community. Addressing the employees he expressed inter-alia that "instead of probing into the past, I urge all the responsible dignitaries to fulfill your responsibilities in the days ahead with sincerity and dedication for safety enhancement and failing to do so shall compel me to stick anyone". With the elapse of about two months, hopefully, he must have understood the sensitivity of aviation and identified most of the grey areas of inaction and deficiencies with challenges ahead to rectify them.

Finally, the effort of the writer will only be felt of little significance; if this article draws the attention of the honorable Minister to kindly realize that unless deficiencies are thoroughly revealed through the inspiration of acquiring more and more information including healthy criticism, realities shall always remain in shadow. It goes without saying that the lowest standard the leader maintains is the highest standard his/her people will aspire to. Hence, simply providing prescriptive directives and, getting jumbled just in receiving unrealistic "everything is all right" briefing of poor performers and overwhelmed in entreaty behavior of near and dears will certainly not materialize the noble desires. Instead, the sole indicator to judge the true performer is the evidence of performance based tangible result that truly gears up Nepalese aviation in perfection according to international norms. Only achievement of such performance will apparently be appreciated not just by aviation community but also by entire public fulfilling your dream in reality.

Former DDG, CAAN

Accident causation model by professor James Reason and Nepalese civil aviation activities

Sanjiv Gautam

Introduction

Professor James Reason, prominent aviation experts in human factor application, has developed a simple, yet graphically powerful, model about the concept of the organizational accident which provides a means for understanding how aviation system operates successfully or floats into failure. According to this model, accidents require a number of enabling factors coming together and single-point failures are rarely consequential in the aviation system breakdown because complex systems such as aviation are extremely well-defended by layers of defences.

Equipment failures or operational errors are never the cause of breaches in safety defences, but rather the triggers. Breaches in safety defences are a delayed consequence of decisions made at the highest levels of the system, which remain inactive until their effects or damaging potential are activated by specific sets of operational circumstances. Under such specific circumstances, human failures or active failures at the operational level act as triggers of latent conditions conducive to facilitating a breach of the system's inherent safety defences.

Components of organizational accidentOrganization

The organizational processes are activities

which include: policy making, planning, communication, allocation of resources, supervision and so forth, over which any organization has a reasonable degree of direct control. As far as safety is concerned the two fundamental organizational processes are allocation of resources and efficient communication. Weaknesses in these organizational processes are the breeding grounds towards failure which may include: deficiencies in equipment design, incomplete/incorrect standard operating procedures, and training deficiencies. Inadequate hazard identification and safety risk management, whereby the safety risks of the consequences of hazards are not kept under control and normalization of deviance where the exception becomes the rule in the operational context because due to the lack of resources may be outcome of inefficient organizational process.

Workplace

Workplace conditions such as workforce stability, qualifications and experience, morale, management credibility, and traditional ergonomics factors such as lighting, heating and cooling, are the factors that directly influence the efficiency of people in aviation workplaces. If workplace conditions are not conducive in the operational context it will lead to active failures by operational personnel, which can be considered either errors or violations.

People

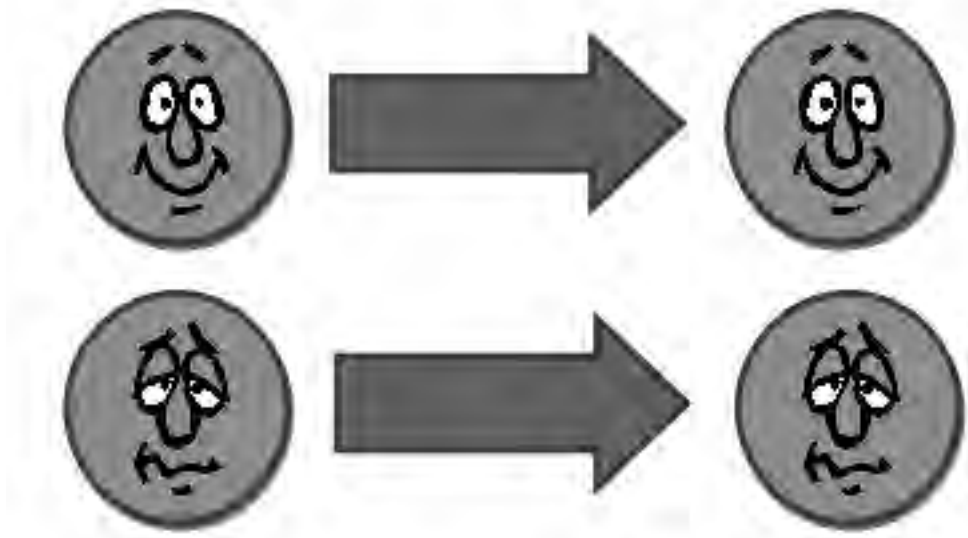
People are the main components in the production system and they can commit errors or violation during the execution of their operational activities. The difference between operational errors and violations lies in the intent. While an error is unintentional, a violation is a deliberate act. A person trying to accomplish a task, following the rules and procedures as per the training received, but failing to meet the task at hand commits an error. A person who willingly deviates from established rules and procedures while undertaking a task commits a violation. The operational personnel responsible for the actual performance of the production activities can get these done in a short span of time by adopting shortcuts that involve constant violation of the rules and procedures. Where humans and technology interact during the operational activities, operational errors are accepted as a normal component of a system, and not considered as some type of unusual behaviour. Once errors are viewed as a natural by-product of human-technology interface during operational activities, operational errors can be accepted as a normal component of any system and operational safety strategies are put into practice to control operational errors.

Defence

Defences are the resources to protect against the

risks that organizations generate during their production activities and must control. Defences in aviation can be grouped under three large headings: technology, training and regulations. Defences are usually the last safety net to content the conditions present in the system before the accident, made evident by triggering factors, as well as the consequences of lapses in human performance. Most, if not all, mitigation strategies against the safety risks of the consequences of hazards are based upon the strengthening of existing defences or the development of new ones.

From the perspective of the organizational accident, safety endeavours should monitor organizational processes in order to identify latent conditions and thus reinforce defences. Safety endeavours should also improve work-place conditions to contain active failures, because operational error or the violation is the product of all these factors that produce safety breakdowns.



Given figure illustrates the Reason model in a way that assists to understand the relationship of organizational and management factors in accident causation. Various defences are built deep into the aviation system to protect against instability in human performance or decisions. Defences are resources provided by the system to protect against the safety risks that organizations are involved in during

production activities and which must be controlled.

Nepalese context

In Nepalese aviation organizations, problems start with the decision-makers. These decision makers are subject to normal human biases and limitations, as well as to real constraints such as time, budgets, and politics. Decisions by line management may result in inadequate training, scheduling conflicts or neglect of workplace precautions. They may lead to inadequate knowledge and skills or inappropriate operating procedures. How well line management and the organization as a whole perform their functions sets the scene for error- or violation-producing conditions. Front-line operational personnel commits error or violation due to poor equipment or task design; conflicting goals (e.g. service that is on time versus safety); defective organizations (e.g. poor internal communications, proper number of manpower); or management decisions (e.g. deferral of a maintenance item, timely introduction of required equipment).

Effective management with respect to setting attainable work goals, organizing tasks and resources, managing day-to-day affairs, and communicating internally and externally is yet to be achieved in the aviation organization. On the one hand decisions made by regulatory authorities are too often the consequence of political influences and interferences, on the other hand decision made by the service providers are too often the consequences of inadequate resources and are focussed more on services. Most of the aviation organizations which are both regulatory as well as service providers do not have a training policy for their technical staff. Formal and comprehensive training programmes and training plans detailing the type of training to be provided for each technical staff position have not been developed.

Workplace conditions in Nepalese Civil Aviation are not much conducive to deliver the services as design in base line performance. An ergonomic factor, most of the time, hinders the efficiency of frontline personnel and except in few government organizations, workforce stability is not much ensured which directly affect the performance of people.

Most of the CFIT accidents are due to the error or violation made by the frontline personnel. As mentioned earlier error or violation is the motivational intention. It is widely accepted that most violations are the result of deficient or unrealistic procedures where people have developed workarounds to accomplish the task. Most stem from a genuine desire to do a good job. Seldom are they acts of negligence. If workplace condition is not user friendly, error is inevitable and in the same way if procedures are not user friendly, violation is inevitable. Analysis of previous accidents and serious incidents reveals that in the most cases main causes of accidents and serious

incidents are the situational violations and/ or routine violations of regulation and such violation may be due to time pressure or high workload and /or practicality/workability issues, deficiencies in human-technology interface design, but violation is made intending to perform the job more efficiently.

Conclusion

Nepal has witnessed number of air mishaps within its territory including the national as well as international air carriers. To prevent accident and /or incident regulatory authority as well as service providers shall monitor organizational process, identify latent condition, improve workplace conditions, contain error or violation and reinforce the existing defence or develop new defence in their respective activities. With mutual cooperation, regulatory compliance and safety performance measurement we will be able to deliver safety and service maintaining balanced approach.

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Director, CAAN Head Office

Surveillance System of TIA: A Roadmap for Improvement

Mahendra Singh Rawal

Background

A land-locked and topographically constrained country, Nepal, has a crucial role to play in the domain of air transportation for her economic development. Tribhuvan International Airport (TIA) is the stand-alone international airport in the country to contribute to national economy in general and socio-economic development of the entire country as more than 80% of foreign tourists enter Nepal by air through this airport and make access to remote and tourist destinations of the country.

The history of modern surveillance facilities started with the two fatal accidents (THAI and PIA) that had occurred on the peripheral mountain of the Kathmandu valley in 1992. These accidents triggered government of Nepal to request assistance to the Government of Japan for the development of a surveillance system and other facilities for the enhancement of aviation safety. As a result' TIA Modernization Project' was signed on 28 July 1994. Installation of surveillance system including ASR, SSR and RDPS, started in 1995 under JICA phase 1 project and brought into operation since 1997.

Installation of Primary and Secondary Radar and associated facilities brought a tremendous change in CNS/ATM to cope with the growth of air traffic at the geographically constrained airport more efficiently and safely. In other words, in spite of limited coverage due to the mountainous terrain around the airport, the existing Radar system has proved to be an

inevitable tool for TIA operational service.

Limitations of the existing Radar Systems

Operation Limitations

- Due to the location of radar antenna at the airport inside the mountainous valley, radar service at TIA is limited to only higher (flight) levels and in particular directions.
- Identification of the aircraft is often lost due to the line of sight problem which breaks the continuity of radar services.
- The ASR and SSR can only be used as terminal approach radar due to restricted coverage.
- The vector altitude in Kathmandu terminal area is very high, and that's why the vectoring services are restricted to IFR departure only.

Technical Limitations

- The existing radar system which was installed in 1997 has already completed 14 years in operation and has reached the end of its service life cycle.
- Some of the spare parts of the Radar Data Processing equipment have no redundancy.
- Frequent failures of electronic cards due to aging.
- The old software is not capable of working with new hardware which can run only in very old and obsolete sun SPARC hardware.
- Manufacturers has already stopped manufacturing spares required for primary and secondary radar and other accessories, so no support from manufacturers for the supply of spare parts.
- It is fairly obvious in light of the foregoing factors that the ASR/SSR system at TIA can't be expected to remain operational for long.

New surveillance requirement:

Kathmandu terminal area is getting congested rapidly. It has been difficult to manage the traffic in the congested terminal area safely, efficiently and economically with the existing facilities and traffic procedures. Hence, the congested Kathmandu terminal overwhelmingly needs a modernized surveillance system with better coverage and reliability.

More traffic can be accommodated in the terminal area with the use of reliable surveillance facilities, maintaining or enhancing existing level of safety. Arrival and departure schedules can be maintained at congested terminals more rapidly allowing

closer separation between arriving and departing aircraft and would also reduce the pilots and controller's work load.

Nepal has been focusing on the promulgation of international routes across Himalayas. In order to establish the Himalayan routes for the optimum utilization of Nepalese airspace there will be a requirement of new air corridor across the Nepalese airspace served with reliable and better surveillance system. Similarly, domestic congested routes like mountain flight would also be benefited significantly from the improved surveillance service provided in this area.

Emerging surveillance Technologies

Multilateration:

Multilateration or hyperbolic positioning is based on the old principle of triangulation. It is the process of locating an object band on the Time Difference of Arrival (TDO) of signal emitted from that object to there or more sensors. For ATC applications, Multilateration provides the same level of fleet coverage as traditional SSR like all aircraft or vehicles equipment with on operational Mode A, Mode C, or Mode S Transponders. Multilateration generally provides higher accuracy, greater update rate, better coverage and improved reliability as compared to traditional SSR and does so at a much lower initial cost and with lower annual maintenance cost.

Feature of Multilateration :

- The Multilateration system also acts as a real-time back up for the ADS-B surveillance network, especially in higher (en-route) elevations, but this can also be easily extended to lower levels and terminal approach.
- The essence of Multilateration is that it provides an elegant transition to ADS-B by using the same ground infrastructure, while providing early benefits through improved surveillance.
- Multilateration has the advantage of being backward compatible with existing transponders and forward compatible with ADS-B.
- Multilateration requires no additional avionic equipment as it uses replies form Mode A, C and S transponders as well as military IFF and ADS-B transponder.
- MLAT stations can be upgraded to ADS-B ground stations as the user aircraft community gradually equip with ADS-B.
- The essence of Multilateration is that it provides an elegant transition to ADS-B by using the same ground infrastructure, while providing early benefits thorough improved surveillance. So MLAT

includes with ADS-B at no additional cost.

WAM implementing countries

Austria (Innsbruck valley), Australia (Tasmania), Canada (Vancouver Harbor), Namibia, Germany (Frankfurt airport), Spain, etc.

Automatic Dependent Surveillance – Broadcast (ADS-B)

ADS-B is a replacement for (or supplement to) traditional Radar based surveillance of aircraft. ADS-B is a major change in surveillance philosophy instead of using ground based radar to interrogate aircraft and determine their position; each aircraft will use GPS to find its own position and then automatically report it.

There are three major benefits driving the transition to ADS-B.

Firstly, the GPS positions that are reported by ADS-B are more accurate than the current radar positions and are more consistent. This means that in the IFR environment closer spacing can be used than at present in the Radar environment, and this provides much needed capacity improvements in congested airspace.

Secondly, ADS-B surveillance is easier and less expensive to display than ground radar. This means that airspace which previously had no radar and only procedural separation services can now have the benefits of ATC service.

And finally, because ADS-B is a broadcast service that can be received by other aircraft as well as ATC on ground, ADS-B offers the option for an aircraft to have accurate and inexpensive traffic awareness of other nearby aircraft.

Comparison of Cooperative Surveillance Technologies

MSSR	ADS-B	MLAT/WAM
➢ Proven and mature technology ➢ Strong compatibility / interoperability ➢ SSR easily added to PSR which are still in demand ➢ Standardized system + safety cases available vs. ADS-B ➢ Avionics available and full equipage	➢ Best match with terminal and en route requirements ➢ Paradigm change ➢ Leading edge on all new applications ➢ Highly cost competitive (TCO: acquisition, installation, maintenance)	➢ Comparable technical performance to SSR (60-80 NM) ➢ Leading edge for terminal and surface surveillance ➢ Strongest interoperability/ compatibility ➢ Cost competitiveness vs. SSR for terminal area

- Expensive compared to ADS-B, close to MLAT for terminal and less expensive than MLAT for en-route
- Limited technical performance vs. other technologies-including on "traditional" applications
- Dependent system – based on unverified data provided by aircraft
- Still limited deployment – thus hindering visibility on potential issues
- Investment by Airlines / GA needed (avionics upgrade, certification)
- Offering overall limited to traditional secondary surveillance
- Deployment in progress – awaiting full feedback on technology from long-term usage

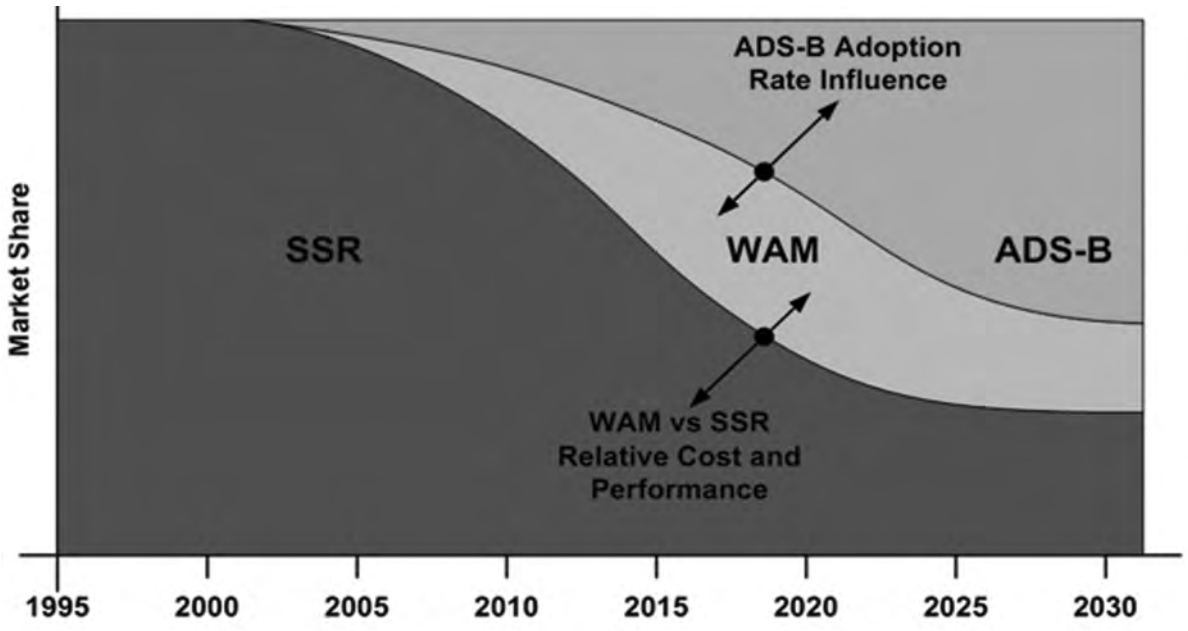
Source : THALES

ADS-B and MLAT seem promising in terms of cost competitiveness and performance

ADS-B implementing countries

Australia, USA, Indonesia, France, Germany, China, Fiji, South Africa, China etc.

Market Direction for Secondary Surveillance



Source : THALES

Proposed Road Map of Surveillance System for TIA

A. Option – One

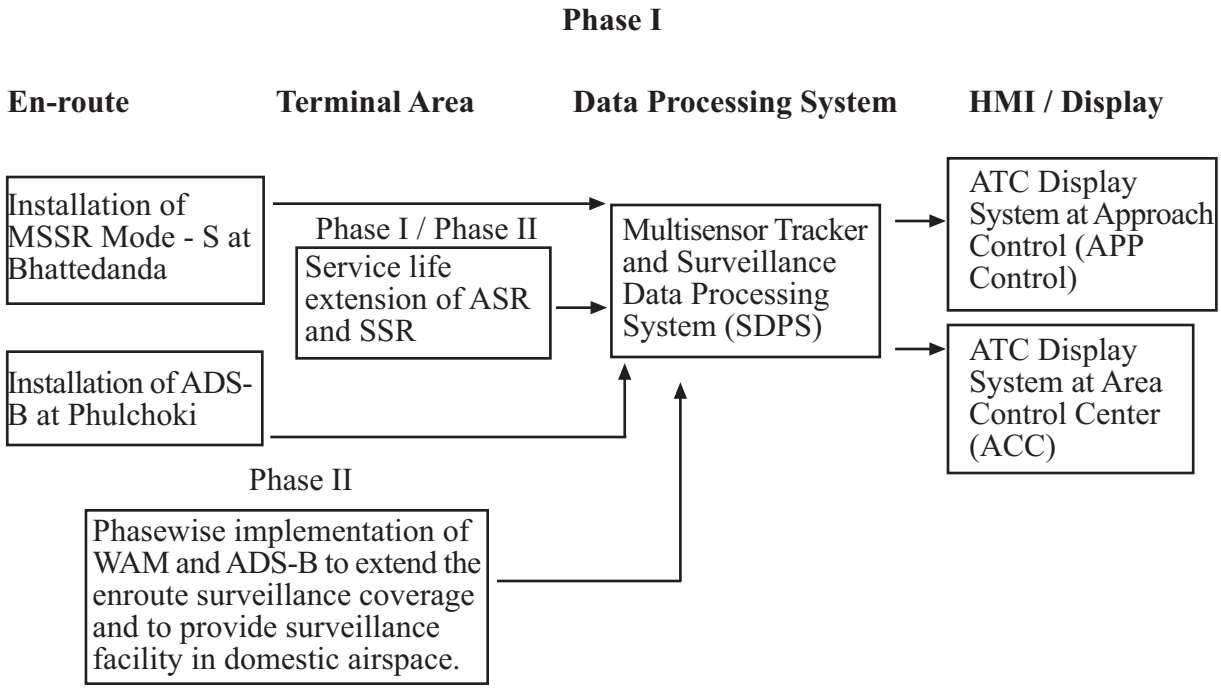
Phase – I

- Installation of MSSR – Mode S at Bhattedanda site.
- Installation of ADS-B at Phulchoki Site.
- Implementation of Multisensor Tracker and Surveillance Data Processing System (SDPS) as a replacement of existing Radar Data Processing System (RDPS).
- Implementation of user friendly Human Machine Interface (HMI) / Modern ATC display system at Approach Control and Area Control Center (ACC).

Phase -- II

- Phase-wise implementation of Wide Area Multilateration WAM) and ADS-B technology to increase the surveillance coverage of international routes and implement surveillance facility in domestic airspace.
- Service life extension of existing Primary and Secondary Radar System (ASR/SSR) at TIA with the assistance of respective manufacturing companies TOSHIBA and NEC in coordination with JICA Nepal.

Option One Roadmap



Option One: Expected Features / Benefits

Operational Features/ Benefit:

- Area Control Center (ACC) would be provided with radar surveillance facility.
- Coverage of radar (SSR) will be enhanced significantly providing coverage to major international routs, thereby enhancing airspace capacity.
- Decease in breaking of continuity of surveillance.
- Surveillance back up of ADS-B will be provided to the ADS-B equipped aircraft.
- Work load of ATCs and pilots will be deceased and airspace capacity would be increased due to enhanced surveillance from MSSR – mode S technology
- Primary Radar facility at the terminal area would be retained

Technical Features/Benefit :

- Existing ASR and SSR services at TIA could be continued with the extension of their service life cycle.
- Existing radar infrastructure like duly overhauled antenna system could be used for few more years.
- Existing spare parts of ASR and SSR would be utilized during the extended lifecycle of ASR and SSR.
- Implementation of most modern Surveillance Data Processing System would facilitate cost-effective expansion of surveillance facility in the domestic airspace in future

Economic Benefit :

- No immediate requirement for the replacement of costly terminal ASR and SSR at TIA would save the acquisition cost of new surveillance system for terminal area.
- Utilization of trained technical manpower and spare parts on the existing radar would save the operational cost of the surveillance system.

Risk factors :

- Support of manufactures may or may not be available for service life extension of ASR/SSR
- Availability of critical spare parts of ASR and SSR in future.

B. Option – Two

Phase I

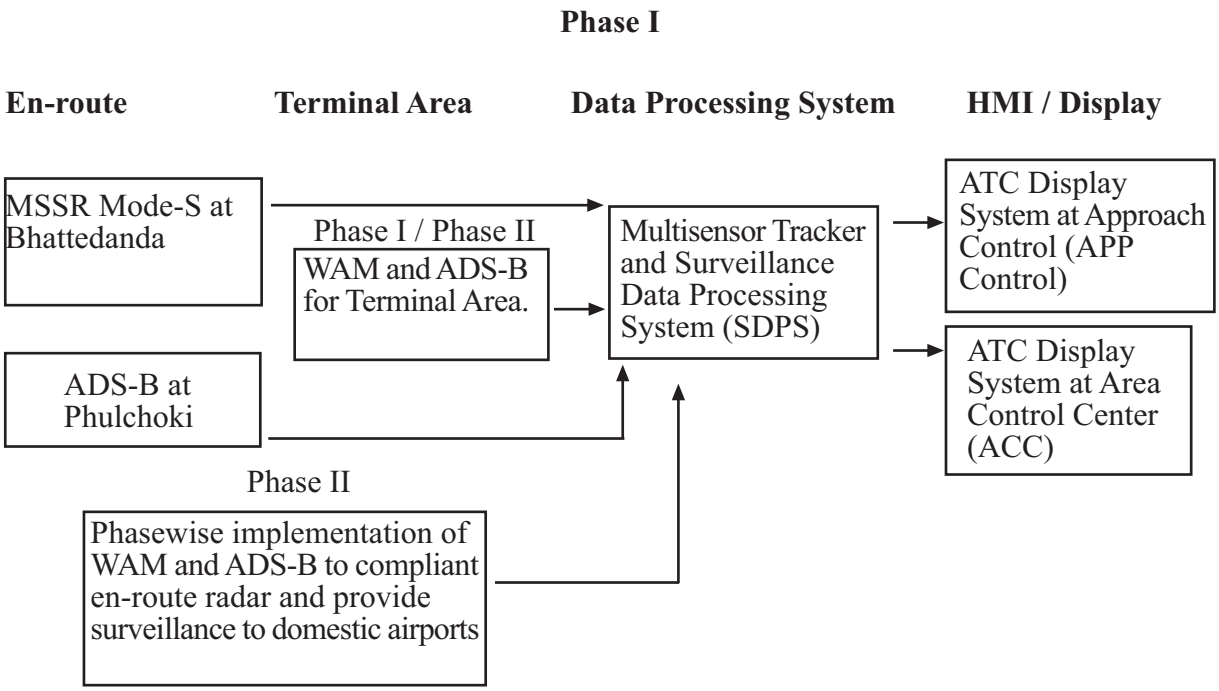
- Installation of MSSR – Mode S at Bhattedanda
- Installation of ADS-B at Phulchoki.

- Implementation of Multisensor Tracker and Surveillance Data Processing System (SDPS) as a replacement of existing very old and unreliable Radar Data Processing System (RDPS)
- Implementation of user friendly Human Machine Interface (HMI) / Modern ATC display system.

Phase II

- Phase-wise implementation of Wide Area Multilateration WAM) and ADS-B technology to increase the surveillance coverage of international routes and implement surveillance facility in domestic airspace.
- Implementation of WAM and ADS B as a replacement of existing terminal ASR/SSR.

Option Two Roadmap



Option Two: Expected Features / Benefits

Operational Features/Benefit

- Area Control Center (ACC) will be provided with radar surveillance facility.
- Coverage of radar (SSR) will be enhanced significantly providing coverage to major international routes, thereby enhancing airspace capacity.
- Decrease in breaking of continuity of surveillance.
- Surveillance back up of ADS-B will be provided to the ADS-B equipped aircraft.
- Work load of ATCs and pilots will be deceased and airspace capacity would be increased due to enhanced surveillance from MSSR – mode S technology
- Better redundancy due to multiple backup and distributed surveillance facility would be available at TMA.

Technical Features/ Benefit

- Mixed mode surveillance facility with back up / redundancy will be available.
- Distributed surveillance system with higher reliability.
- Cost effective and improved surveillance based on upcoming next generation ATM technology.
- Scope of cost-effective future expansion to increase the surveillance coverage of international routes and domestic airspace.

Economic Features/ Benefit :

- Replacement of existing terminal ASR/SSR with more cost effective next generation technology
- Surveillance cost per flight will be remarkably reduced
- Future expansion of surveillance capacity of Kathmandu flight information region will be cost effective.

Risk Factors :

- Increased security and maintenance cost due to distributed WAM/ADS-B stations around Kathmandu hill tops.
- ADS-B surveillance may be limited due to equipage of aircraft.

The Roadmap

The surveillance road map proposed in Option One aims at installation of MSSR at Bhattedanda to enhance the surveillance coverage and extension of service life of existing ASR and SSR heads, along with the use of existing antenna system, would be the most cost effective and techno-friendly option to improve the existing surveillance capability of TIA. However, the extension of service life cycle of ASR and SSR would depend upon many factors including the availability of support from its manufactures like

TOSHIBA and NEC in terms of supply of required spare parts and necessary technical support.

If the service life extension of existing ASR and SSR cannot materialize the next choice would be the implementation of Option Two, which envisages the replacement of ASR / SSR heads by implementation of Wide Area Multilateration (WAM) systems having 5/6 ground stations around the hill tops like Phulchowki, Bhattedanda, Nagarkot, Shivapuri, Kakani, and Chandragiri, to provide surveillance coverage in Kathmandu TMA. The other component in the Option Two would be same as in the Option One which includes installation of MSSR at Bhattedanda ADS-B station at Phulchowki and implementation of Multi Tracker and Surveillance Data Processing System (SDPS) and installation of modern bright display system in the Approach Control and Area Control Center (ACC)

Conclusion

Ever increasing number of domestic and international air traffic over the past few years has been causing airspace and airport congestion resulting in excessive delays and holding of aircrafts in the air as well as on the ground. One of the solutions to improve the airspace and airport capacity without compromising the level of safety will be achieved by the improvement and expansion of surveillance capability of TIA, Kathmandu. Since the existing Radar surveillance is having number of inherent limitations of the technology including the problem posed by antenna locations, coupled by the ageing of the equipment has necessitated an immediate replacement of the existing Radar and RDPS system for futuristic and cost effective surveillance solution.

Therefore, taking it into account the developments taking place in the field of surveillance technology and TIA's immediate needs of putting in place the most appropriate cost effective surveillance technology available, the need of the hour for CAAN is to embrace the judicious mix of the technologies like MSSR, WAM and ADS-B to stride along the proposed roadmap.

Director, CAAN Head Office

Civil Aviation Authority of Nepal

established
For the provision of air navigation services and
for the development of airport and airport infrastructure
in the country.

Safety and security are our prime ***objectives.***
We facilitate air transportation services
within and outside the country.
We are committed:
-to serve the people ,
-to facilitate tourism

We are Together for Tourism

We believe:
Civil Aviation is for Tourism
Tourism is for Civil Aviation
We appeal to all our stakeholders
Please join hands with **Civil Aviation**
And

Be with us

In all our efforts to fulfill our vision and mission.

Visitor's Deck at TIA

Ramesh Man Joshi

Construction and operation of an international airport is a very expensive venture, often built at the cost of the tax-payers' money. It is a very attractive place to be for the well-wishers as well as the general people at large. People feel deep satisfaction to bid farewell and great pleasure to greet the near and dear ones at the airport. As elsewhere, International Terminal Building at TIA, Kathmandu was also constructed taking this factor into consideration by provisioning specious restaurants, visitor's deck, adequate car parks, space for concessionaires, etc.

Visitor's Deck at TIA, has always been a place of great attraction for people visiting Kathmandu. They had watched, with great fascination, the movement of "chilgadi" (Dakota) in its early days and later big jets carrying 300 people at a time, not to mention the hubbub of funny looking ground handling vehicles, fuel bowsers and hovering giant helicopters. It stayed like that till 2052 B.S. after when general public were not allowed to go to the visitor's deck for "security reasons". It has already been more than five years since the end of the political disturbances, and those security risks, as such, do not exist now. Government has even opened Narayanhiti Museum, once known as King's palace, for the general public. But Visitor's Deck at TIA still remains closed.

Visitor's Deck at TIA

Continuity of this prohibition has deprived Civil Aviation Authority of Nepal (CAAN) from earning substantial revenue, and also debarred the people from the joyful familiarization of the national infrastructure, that is, Visitor's Deck at TIA in this case.

There is no restriction for the general public to go to the visitor's deck in quite a few airports in Asia and Pacific region, such as, Tokyo, Hongkong, Bangkok, Singapore, Sydney, Melbourne, etc. Moreover, activities inside the airports are not limited to the movement of aircraft, passengers and cargo only. Airports are being transformed into a center for other mega economic activities, thereby substantially contributing to the economic growth of the nation, not to mention the great number of employments generated directly, and indirectly.

Singapore Airport authorities, in March 2005, openly invited all Singaporeans to visit Singapore Airport (Changi) to promote domestic tourism. They are so proud of the infrastructure and its activities that they feel that all Singaporeans have a right to enjoy one of the great assets of their country as much as any user or stakeholders of Changi Airport. All the tax payers deserve to see what their country is like, they say. A food for thought for the tourism promoters in Nepal.

Athens, capital of Greece, successfully conducted 2004 Olympic Games. Bravo. The whole world appreciated the great efforts the Greeks made to make it a success. Example of one such effort is that the Greeks spent US $ 2 Billion for security arrangement alone. Of course, it is a big amount by any measure. But the Greeks did not say "No" to this expenditure because their national as well as individual

pride was at stake. Monetary issues were secondary. People's strong feelings to host the games at any cost were honored by their government. The event was indeed a great success.

The big question is how deep and how wide should the net of security agencies spread in order to ensure security?

World is full of latest machinery gadgets, and modern management know-how to enhance security. Explosive detectors, metal detectors, CCTVs, and other means, such as physical frisking, indirect vigilances, dog squad, utilization of human resource from private sectors, etc. are readily available, if needed.

CAAN now levies 10% of the landing charge as Security Charge on all incoming flights at all the airports of Nepal.

TIA must be fully utilized for the benefit and enjoyment of every Nepalese citizen, whatever be the cost for security measures. Then only we will be able to say that it is "Our Airport" in real sense.

Nepal Airlines belongs to the government of Nepal. But whenever we go abroad and see NAC aircraft at the tarmac, we say "that is our Airline". Similarly, it should also be the case with Tribhuvan International Airport, "Our Airport". Earlier the better.

Former Deputy Director General
CAAN Head Office

Airspace and Air Route Planning for Gautam Buddha International Airport

Mahesh Kumar Basnet

1.Introduction

After a long fiasco and hiccups, work has been initiated to develop Gautam Buddha Airport, Bhairahawa into a main hub of regional and international level worthy of a place where Lord Buddha was born. The present airport named Gautam Buddha a few years back is situated in Lumbini zone in the Western Terai region of Nepal, just 17 Km East of Lumbini, the birthplace of Lord Gautam Buddha, and therefore has remained with a great historical, cultural and religious value from the beginning .

As per the master plan the existing airport with 1524m long Runway will be upgraded to a regional international standard. A 3000m long new runway will be built 182.5 meter south of the present runway, which will be used as taxiway capable to serve medium to long haul jet aircraft as well as to serve as alternate to the Tribhuvan international.

The present airport is very close (about 3 Km) from Indian border to the south and Indian defense restricted airspaces further south. Therefore, it needs a very careful planning and coordination with India from the beginning from the highest political level to operate international airport from Gautam Buddha Airport.

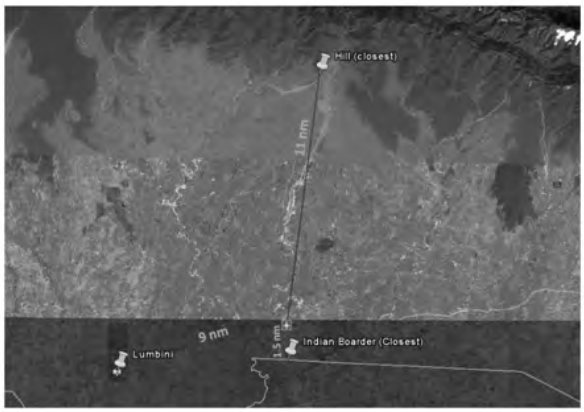
The main issue is to determine the airspace and flight procedure challenged by following factors:

i) Close proximity with Indian border and defense

restricted airspaces to the south and East

ii) Lumbini heritage site on climb out/approach area to the west

iii) High terrain to the North

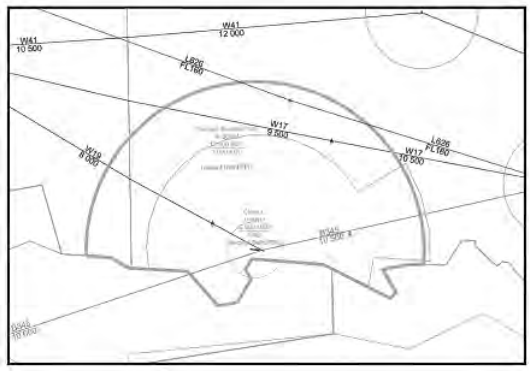


Therefore the following consideration has been felt necessary:

- Detail review of the existing air space and air routes network within the whole Nepalese FIR.
- Review existing air routes and procedures related to Gautam Buddha Airport (GBA),
- Determine the Approach Procedures-VOR/DME, ILS and RNP, Instrument Holdings, En-Route Structure, Missed Approach Procedure, SID, STARs, etc.
- Planning the airspace for GBA in considering the SIA, Pokhara and TIA
- Optimize the airspace structure by reorganizing the route network or introducing the new routes, new Terminal Control Area (TMA)
- Plan and analyze the airspace around GBA by considering the existing Indian air route structures, restricted airspaces and routes to and from Nepal
- Design new air routes and procedures within Nepalese area in context of new runway layout in GBA- in conformance with acceptable ICAO Standards.
- Design new Terminal airspace, STARs and SIDs.

2.Controlled Airspace for the Gautam Buddha International Airport

TMA Considerations with Lateral Limit 30NM from ARP (except the Delhi & Kolkata FIR) and vertically 5000ft to 13500ft with planned Navigation aids, Holding patterns, SIDs and STARs and Instrument flight procedures are to be designed.



Proposed TMA of Gautam Buddha International

3.Proposed En-route Network

With the observation of present route network to and from Nepal and location of Gautam Buddha Airport, the most suitable inbound routes could be as follows:

Inbound
ONISA – L626 – GAUTAM BUDDHA
NEPALGUNJ – W41 – W19 – GAUTAM BUDDHA
POKHARA – W41 – GAUTAM BUDDHA
LUCKNOW – G598 – NEW ENROUTE – GAUTAM BUDDHA
SIMARA – NEW ENROUTE – GAUTAM BUDDHA
KATHMANDU – B345 – GAUTAM BUDDHA

Prevailing issue:
Routes from ONISA, Lucknow and entry via Nepalgunj have to be carefully coordinated, agreed and settled with India at higher level.

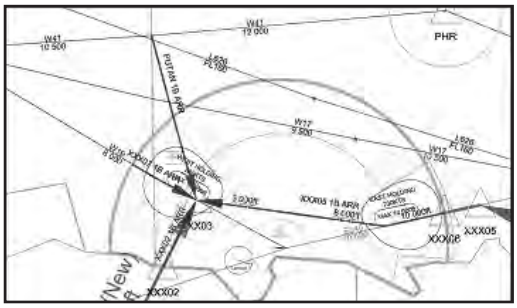
Outbound
GAUTAM BUDDHA – L626 – ONISA
GAUTAM BUDDHA – W41 – NEPALGUNJ
GAUTAM BUDDHA – W41 – POKHARA
GAUTAM BUDDHA – B345 – LUCKNOW
GAUTAM BUDDHA – W17 – NEW ENROUTE – SIMARA
GAUTAM BUDDHA – W17 – B345 – KATHMANDU

Prevailing issue:

To send the departing aircraft from GBA out of Kathmandu FIR at higher flight level via B345 needs careful coordination and agreement with India at higher level.

4.Holding Procedures

Holding procedure towards east on B345 and on W19 at 20NM clearly indicates the holding area within Nepalese airspace allowing smooth flow of arrivals and departures within Gautam Buddha TMA



Proposed Holdings, STARs and Route Network

5. STARs and SIDs

- Considering the proximity of Lumbini heritage area and Noise pollution issues, preferred Runway should be RWY28 for arrivals and RWY10 for departure other than the wind and operational considerations.
- The Stars are designed from PUTAN, New route from Lucknow, W19 and B345 for both the runways.
- The SIDs are designed to the east and west towards the Holdings as mentioned above to join the existing and proposed airways.

6.Feasibility of Instrument Approach Procedures ILS Procedures

Following considerations should be given while installing the ILS and designing the associated

procedures:

- Not to infringe Delhi FIR
- Not to penetrate Lumbini Heritage site

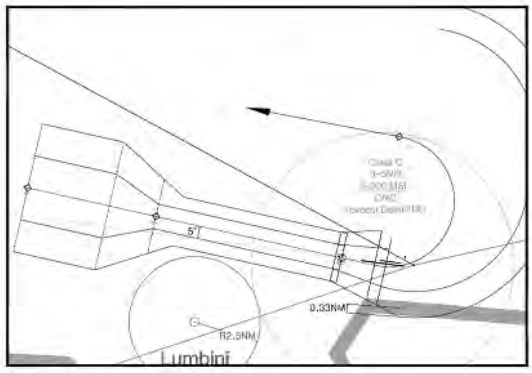
While studying the feasibility of ILS, the preliminary observation indicated that the ILS for RWY28 penetrates the Indian FIR even with 5° offset which necessitated extra land acquisition burden. On the other hand, ILS for RWY10 infringes Lumbini area and again creates extra land acquisition problem. Therefore, if ILS has to be installed, it is to be installed for RWY28 with special MOU with India.

VOR/DME approach procedure

The present VOR/DME located on the extended centerline of the present RWY has to be relocated on the offset eastern side of proposed RWY to take maximum advantage for approach and departures without infringing the Indian FIR.

RNP Approach Procedures

Because of the proximity with the Indian FIR and Lumbini Heritage, RNP approach procedures could be designed for both the RWYs as a best solution to the above constraints and back up to the VOR/DME procedures.



RNP APCH RWY10

7.Conclusion

After analyzing the detail airspace associated with the Gautam Buddha Airport, it is concluded that holdings and routes with suitable STARs and SIDs can be made within Nepalese airspace provided the limitations caused by airspace constraints are solved by agreeing with India at the Government and Aviation Authority level.

On the approach procedures, ILS is both costly and posed to various limitations and therefore, VOR/DME based procedures back up with RNAV procedures will be the best and cost effective solution for the proposed Gautam Buddha International.

Deputy Director, CAAN Head Office

Aviation and Climate Change

Sudhir Kumar Chaudhary

Introduction:

Climate Change has become the most critical environmental issue for many governments, industries, businesses and individuals. Climate Change is a complex environmental issue. Basically, a change in atmospheric concentration of Greenhouse Gases (GHGs) alters the energy balance of the climate system resulting change in climate. This happens because of anthropogenic activities like burning of fossil fuel, coal and oil for homes, factories and transportation and releases several kinds of GHGs to the atmosphere. Most common GHGs that are being released are Carbon dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Nitrogen dioxide (NO_2). Other GHGs may be Nitric Oxide (NO), Carbon monoxide (CO), Hydro-Fluoro Carbon (HFCs), Sulphur dioxide (SO_2), Sulphur hexa fluoride (SFs) etc. The increased amount of GHGs in the atmosphere eventually results in warmer temperature causing melting of ice, glaciers, rising sea level and flooding of coastal areas, shifting of seasons, fewer cold days, heavier rain, summer droughts, and an increase in storm intensity. According to Intergovernmental Panel on Climate Change (IPCC), world's surface air temperature has increased an average of 0.6 Celcius (1.1F) during the 20th century and is predicted to increase by between 1.8 and 5.8 °C by the year 2100. This may not sound like a considerable change but even one degree can affect the Earth. IPCC reports that Global GHG emission due to anthropogenic activities have grown with an increase of 70% between 1970 and 2004. And CO_2 being most important anthropogenic GHG, annual

emission has grown by about 80% between 1970 and 2004.

Contribution of Aviation to Climate

Change:

Like other GHG emission from fossil fuel combustion aircraft engines also emit GHG to atmosphere. Modern jet engine fuel is primarily kerosene. It is a fossil fuel primarily producing CO_2 and water vapour (H_2O), other major emissions are Nitric Oxid (NO), Nitrogen dioxide (NO_2) together called as Nitrogen Oxide (NOx), Sulphur dioxide (SO_2), and soot. Aircraft produce up to 4% of the annual global CO_2 emission from fossil fuel near the Earth's surface as well as higher altitude (FL250-F500). Just as a car engine that runs efficiently produces less harmful exhaust emission, the same is true for jet engine. Incomplete combustion occurs at the lower power setting used for descent or when aircraft are idling or taxiing on the ground. This incomplete combustion results in Carbon monoxide (CO) and unburned hydrocarbon emission that contribute to degrade the local air quality. The hotter the temperature inside the combustor, the more efficiently the fuel is burned. Unfortunately, this higher temperature produces increased NOx emission. This NOx

Aircraft Emission

emission increases the production of Ozone (O_3) at cruize altitudes. Aircraft emit significant amount of NOx when their engines are at hottest during take off and slightly smaller amount while cruising. Higher concentration of O_3 near the surface of the Earth has been linked to respiratory diseases. But there is benificial O_3 also. O_3 in the upper atmsphere (about 15 miles up) shields the surface of the Earth from the Sun's ultravoilet radiation. Because of the different human activity O_3 balance is being disrupted. Thining of this protective layer is the cause of increasing occurance of skin cancer.

In 1993, a sutdy of toxic emission at Chicago Midway Airport revealed that arriving and departing aircrafts release more pollutants than the industrial pollution sources in the surrounding 16 sq-mile area. A more recent study at London's Heathrow Airport showed that aircraft contributed between 16 and 35% of ground level NOx concentration. Because of the local concerns about the gases exhausted by aircraft, the expansion plan of several US airports – Atlanta, Boston, Chicago, Houston, Los Angels, New York, Philadelphia, Phoenix and Washington have

been stopped.

Aircraft emission of water vapor at high altitudes produce contrails –the cloud-like trails behind aircraft that are visible from the ground about 5 miles above the Earth's surface. At these high altitudes, contrails and cirrus cloud form. Both contrails and cirrus clouds reflect sunlight that warm the Earth's surface. At the same time, they absorb heat from ground instead of allowing it to escape. Right now this effect is small but it is growing. Although scientists are uncertain about impact of contrail, but those *contrails are implicated in the formation of cirrus clouds*
last longer than a few minutes, and gradually develop into cirrus clouds. Over the past 40 years, cloudiness seems to have increased. This continual increase in cloudiness may lead to global climate change.

Total climate effects

The IPCC has estimated that aviation is responsible for around 3.5% of the total radiative forcing by human activities. Direct CO_2 emissions are measured by radiative forcing. The IPCC has estimated that aviation's contribution could grow to 5% of the total contribution by 2050 if action is not taken to tackle these emissions, though the highest scenario is 15%. According to Fourth Assessment Report (IPCC AR4) published in 2007, the main findings related to aviation emission are:

- Due to developing scientific knowledge and more recent data estimates of the climate effects of contrails have been lowered and aircraft in 2005 are now estimated to contribute about 3.0 % of the total of the anthropogenic radiative forcing by all human activities; Ê
- Total CO_2 aviation emissions is approximately 2 % of the Global Greenhouse Emissions;
- ÊThe amount of CO_2 emissions from aviation is expected to grow around 3-4 per cent per year;Ê
- Medium-term mitigation for CO_2 emissions from the aviation sector can potentially come from improved fuel efficiency.

ICAO Programme of Action on Environmental Protection

ICAO has been playing a lead role in order to reduce or limit aircraft noise and emission from international aviation that contribute to global climate change. The urgency and importance of addressing GHGs emissions from aviation was recognized only at 36th session of the ICAO Assembly held in 2007. To achieve the goal, the Goup on International Aviation and Climate Change (GIACC) was formed in 2008, with the mandate to develop an ICAO Programme of Action. GIACC presented the proposal of Programme of Action which was accepted by the ICAO Council. A High-Level

Meeting on International Aviation and Climate Change was held in 2009 and evaluated the outcome of the GIACC. The meeting also approved a Declaration and Recommendation affirming the commitment of Member States to address aviation emission that contribute to climate change by working through ICAO. This was the first globally harmonized agreement on a goal to address its CO2 emissions.

Building up of ICAO's all those past acheivements since 36th Session of the ICAO Assembly including the Declaration and Recommendation approved by the High-Level Meeting, 37th Session of the ICAO Assembly adopted Resolution that goes one step further incorporating important key elements such as:

1. Global aspirational goals for the international aviation sector of improving 2% annual fuel efficiency up to year 2050,
2. Stabilizing its global CO2 emissions at 2020 levels,
3. Development of a global CO2 certification standard aiming for 2013,
4. Facilitation of developing and deploying sustainable alternative fuels for aviation,
5. Development of a framework for market -based measures,
6. Concrete steps to assist States to contribute to global efforts,
7. States' action plans, covering information on CO2 emissions reduction activities and assistance needs,

CAAN's Action Plans

To implement the following State's Action Plan adopted by the 37th Session of ICAO Assembly Resolution, CAAN has to establish policies and guidance on environment protection in order to reduce aircraft noise and emission from international aviation that contribute to global climate change. In Resolution A37-19, the Assembly:

1. invites States to voluntarily submit their action plans to ICAO preferably by June 2012, in order that ICAO can compile information in relation to achieving the global aspirational goals,
2. The action plans should include information on the basket of measures considered by States and information on any specific assistance needs
3. Requests the Council to provide guidance and other technical assistance for the preparation of States' action plans.

Mitigation of aviation's environmental impact

Mitigation of aviation's environmental impact can be achieved through a variety of measures, some important measures would be:

· **Use of Fuel Efficient aircraft** - Next-Generation engines are not only more fuel-efficient but also tend to be quieter. Bombardier C Series aircraft are 4 times quieter than aircraft currently in service.

· Development and deployment of sustainable alternative fuels (use of biofuels)

· **Route optimization** - An improved Air Traffic Management System with more direct routes and optimized cruising altitudes would allow airlines to reduce their emissions. In Nepal, Himalaya Route has been proposed for the last 5 years which is yet to be implemented. Satellite based approach (RNP AR) which is under implementation phase in Nepal would help reducing noise as well as emission.

· **Improved Operating Procedures** - Airlines and airports can reduce emissions and fuel burn through the use of improved operating procedures. A single-engine taxi to and from the runway and the use of a Continuous Descent Approach (CDA) which can reduce emissions significantly during the operations in and around an airport.

· Reduce the fuel burn of the aircraft

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National Aeronautics and Space Administration, NASA

Deputy Director, CAAN Head Office

Going Green the Aviation Way Adaptation to the Climatic Change.

Birendra Singh

Presently the talk of the town has been the adaptation to the climatic change and how to adapt to the ongoing climatic change both internationally and locally. Ecological together with geological change has been imparting global effects and this has made all the difference in the aviation field prompting ICAO to garner all the necessary strength for the cooperation with the member states to ensure better adaptation to the climatic change so that the sky becomes safer to fly.

Aviation, as we all know, plays different roles in different parts of the world depending upon the topography and the infrastructure of each region of a country. So in dealing with the *given environmental issues one solution may not be fit to all. Problems vary so do the* attitude while solving these problems. Hence it has been put very aptly: Think globally but act locally. This has been even truer in the aviation arena.

Civil aviation has been proactive in its efforts to reduce its negative impact on the environment, primarily through research and development as well as through fuel efficient engines and efforts to look into alternate form of fuel along with noise abated airfoils (which were very prevalent years back). Even though many solutions have been studied

and put forward for the betterment of the environment, trying to go green in aviation is one of the solutions that have been proven and that have been able to show that it is possible to further decrease the fuel consumption through a change in the existing air transport instruments. In order to mitigate the climatic change in aviation, adoption of various factors should be made viz: the application of the measures to address aircraft noise and engine emission, embracing technological improvements, better operating procedures, proper organization of air traffic ,appropriate aircraft and planning of land use; and many more have been the major contributors to the increase in efficiency by more than 70% in the area of noise abatement during flights.

In 2004 ICAO adopted 3 major important goals to:

✓ limit or reduce the number of people affected by significant aircraft noise

✓ limit or reduce the impact of aviation emission or local air quality

✓ limit or reduce the impact of aviation green house emission on the global climate.

In its pursuit to give high priority to improve the degradation of the environment, ICAO has called for all the contracting states to prepare for unified and coordinated measures. As stated, regardingS the global climatic change, the aircraft engine emission has been one of the main forces of discussion and the emission plays a pivotal impact on the atmospheric concentration of green house gases and can further contribute in the formation of cirrus clouds thereby bringing about a vast climatic change. The aircraft are estimated to contribute about 3.5 % of the total radiation. But new findings reveal that aircraft is the cause of 3.5% of the total of the anthropogenic radiation. Even though the total carbon-di-oxide emission is 2% of the global greenhouse emission, the mitigation of carbon-di-oxide emission for aviation sector can be done from improved fuel efficiency. One of the other factors contributing to the climatic change is the aircraft noise. Since the introduction of modern jet aircraft in the 60s, noise has remained the most significant cause of adverse community reaction to the operation and expansion of airport worldwide; and ICAO has made recommendations to mitigate such aircraft noise. Hence, in 2001, ICAO endorsed the concept of a "balance approach" to the aircraft noise mitigation. In order to handle this situation ICAO called upon its member states to deal with the problem of the aircraft noise. This gathering contributed in identifying the noise problem during the approach of an aircraft. Then various measures to reduce the noise were analyzed. The states came up with the major four elements viz. allowing quieter aircraft, better land use, aircraft noise abatement operational procedures, and operation restrictions. Much of ICAO's effort to address aircraft noise over the past 40 years has been aimed at reducing the noise at the very source. So the aircraft especially the

helicopters built today are required to meet the noise abatement standard adopted by the Council of ICAO contained in Annex 16, vol. I. The rules now have been very stringent than the earlier ones to ensure that only noise abated aircrafts enter into the states thereby trying to curtail the noise of an aircraft. Thus, gone are the days when aircraft as: B737, B727, B707 FK28, etc., operated widely and with great pride that produced heavy noise at the takeoff and landing at the airports (that were not only nuisance to the operators, passengers, or even to the public creating health hazards) are now on the phasing out process and most of these aircraft either have better operating phenomenon or have been completely out of production. Besides the noise abatement factor, the other approach to the betterment of environment has been the quest for suitable alternate fuel and it has shown promises of being an intrinsic part of an approach towards reducing the carbon-di-oxide and sustainable alternative factors over the short, medium and long term are being developed for the betterment of aviation .

Significant progress has been made in establishing technological goals for reducing aircraft greenhouse gas emission. The alternative fuels produced from biomass or renewed oils offer the potential to reduce greenhouse gas emission. ICAO has done a lot in its bid to do research in the alternate fuel through facilitating exchange of information on finance, providing platform for access to research and roadmaps and program, exchange of ideas and facilitate participant's ongoing efforts to develop a common definition of sustainable criteria for bio-fuels.

Even today international aviation globally has been one of the media to connect people and business across the world and has relied on the development of global solution to tackle with the ongoing challenges it encounters. ICAO is the internationally accepted body for dealing with the international aviation for the environment related issues. The debate over the climatic change is immense and many great nations are worried about it as aviation is threatened by the amount of carbon emission in the air. Developing and emerging nations are debating over the responsibility of reducing carbon emission. Their concern is the particularization of the nation responsible to reduce the emission and the targeted level to which the emission should be maintained. All such nations should act together to mitigate the effects of climatic change. No wonder improving the environmental performance of aviation sector is a challenge ICAO has taken up very seriously and in fulfilling its responsibility it has developed a range of standards, policies, and guidelines to combat the climatic change experienced today. Of course, for this global cooperation is of utmost necessity in dealing with the greenhouse gas emission in world-wide basis. Therefore newer technologies may be developed in dealing with the aircraft noise, as well as in dealing with the aircraft gas

emission that affect the atmosphere.

In conclusion we can say that even though it may be very difficult in combating and totally eradicating the environmental degradation caused by various factors including the aviation factors, we should be positive in our outlook in saying that prevention through modern technologies can play a pivotal role in reducing the effects of this problem. Even states like ours can contribute in handling the climatic change by adopting various methods as: adoption of noise abatement policy, better traffic management in the flow of the aircraft, and above all contributing and cooperating through participation in various seminars, workshops etc. thereby getting upgraded in our knowledge in climatic change and environmental degradation. Let's be positive and think positive in any way we can to have a cleaner and greener aviation of tomorrow.

He has logged more than 30 yrs experience in the field of aviation.

Former MOTCA Employee

Public Private Partnership Model of Airport Privatization

Shaligram Poudyal

Necessity of Private Participation in Airport Infrastructure

Increased traffic and cargo growth in recent decades has led to congestion and saturation at different airports of the world. To solve this problem countries require- new airports, expansion of capacity at existing airports, induction of technology for efficient handling of passenger & cargo and innovative management. Airport industry itself is capital intensive in nature. Investment has long gestation period and often involves large element of sunk cost. Huge sum of additional funds, much more than the airport authorities can generate, is necessary. To bridge the resource gap, private participation in airport infrastructure has been necessary.

Airports Evolving as Enterprise

The move towards airport privatization is relatively a recent phenomenon. It was driven by two key factors. First, due to continuous increases in passenger traffic across the world, there was an urgent need to expand existing capacity and develop new facilities. Governments were unable to undertake the investment as public financing was becoming increasingly difficult due to the other competing needs for tax revenues. Second factor was the declining level of operational efficiency and the apparent inability of government operators to run airports in a cost-effective manner. Since the privatization

of the British Airports Authority (BAA) in 1987 the worldwide movement has been to view airports as enterprise with corporatization and privatization. By 1995, some form or the other of private participation was under consideration in over fifty-four countries. This has resulted in a significant industry trend toward enterprise partnerships between public and the private sector.

Public Policies:

Governments and related international agencies are developing favorable policies to invite private participation in airport sector. The World Bank, since long, has been asserting for privatization of state owned enterprises. ICAO's policies on privatization are expressed on Airport Economics Manual (Para 2.26-2.28; 2.33-2.41; 7.63 of Doc 9562). Indian Policy on Airports 1997 has clearly mentioned about infusion of private including foreign investment (para 9-10 on financing of airports) and private sector participation (para 1-11on private sector participation). Civil Aviation Policy of Nepal 2063 (Para 4.14) is positive on private sector involvement in airport development.

Airport Privatization Models

Popular modes of airport privatizations are: Divesture (reduction of government share), Management Contract, Build Own Transfer (BOT); Build Own Lease Transfer (BOLT); Build Own Operate (BOO); Lease Develop Operate (LDO), Full Privatization (complete sale) and Public Private Partnership (PPP). In the developed countries, Management Contract and BOT form of privatization are much popular. But the public sale of BAA in 1987 was a rare and unusual case of complete privatization. Developing countries have typically opted for concession contracts, long-term leases or management contracts. In the South Asian region, especially in India and Maldives, PPP model of privatization is being favored.

The Concept of PPP Model

According to Zhang Qin PPP model is a cooperative venture between the public and private sectors, built on the expertise (and resources) of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards. In the PPP model, government retains ultimate ownership on the assets and property of Airports. Airports are not sold but handed over for a certain time period under a concession contract. Private investors and the government are owners of a Joint Venture Company (JVC). Under PPP scheme, concession contract is awarded for 25 to 50 years. The ultimate ownership of the airport is retained with the government. Here, the Government reaps dual benefits. First, some percentage of gross airport revenue is directly shared to the government. Secondly, government gets dividend on its equity in the JVC.

Indian Cases on PPP model

Case of Brown Field Airports - Delhi & Mumbai: On 3rd May 2006 the Airports at Mumbai and Delhi were

handed over to the respective JVCs under PPP agreements. Some features of the PPP agreements were as follows:

- Objectives
  - World class airport development and management
- Equity participation
  - Delhi: 74 % Pvt. Consortium 26 % Airports Authority of India (AAI)
  - Mumbai: 74% Pvt. Consortium 26% AAI
- Capital Investment for initial 7 years
  - Delhi 3286 crore, Mumbai 5676 crore
- Tasks to be performed by JVCs
  - The JVCs are to achieve a rating of 3.5 on the AETRA scale of 5 on completion of stage-I and improve to 3.75 by stage-II
- Payments to AAI
  - Upfront payment: Rs.150 crores from each JVC
- Gross Revenue Sharing to AAI for 30 years
  - Delhi: 45.99% Mumbai: 38.7%
- AAI employees' cost to be reimbursed by the JVCs

Airport's Performance:

In Airport Service Quality (ASQ) survey by Airport Council International (ACI), Delhi Airport has maintained 4th position among world's best airports in the year 2009. It has developed facilities ahead of demand. For example, 60 million passenger capacity terminal buildings are developed ahead of time. Delhi handled 26.1 million passengers in 2009/10. There are three Runways one of them capable for A380

For 2010 2nd quarter, ACI has rated Mumbai Airport's service quality as best among Indian airports. Runway of this airport is improved to comply for A380 aircraft. It handled 29.1 million passengers in the fiscal year 2010-11.

Airport Authority of India (AAI) has earned revenues over Rs 3015 crores from Delhi and Mumbai airports (1,674 crores from Delhi and Rs 1,341 crores from Mumbai) in the last four years, as part of its share.

Case of Greenfield Airports -Bangalore & Hyderabad

Contract for two new Green field airports were finalized for Bangalore (July 2004) and Hyderabad (Dec 2004) to develop on Build Own Operate and Transfer (BOOT) basis for 30 years. General feature of PPP agreement are as given below:

- Equity participation

Bangalore: 74 % Pvt. Consortium 26 % State Govt. & AAI

Hyderabad: 74 % Pvt. Consortium 26 % State Govt. & AAI

- Land Lease: **Bangalore** 4000 acres, **Hyderabad** 5490 acres
- Interest free state support Rs. 350 and Rs. 315 crore respectably for Bangalore and Hyderabad repayable after 10 years in half yearly installments
- Stamp Duty payable on land lease exempted.
- Infrastructure like water, power etc. to be provided at site
- Commercial flights from existing Bangalore and Hyderabad airport will close.

Airport's Performance:

These new airports started operation from the year 2008. Bangalore International Airport (BIA) received the IATA Platinum Certification as the first 100% Bar Coded Boarding Passes (BCBP) compliant airport in India. BIA has bagged 'Best Airport India Award from "Skytrax World Airport Award" in Copenhagen, Denmark in 2011 March. This airport handled 11.59 million passengers in the fiscal year 2010-11.

Rajiv Gandhi International Airport (RGIA) Hyderabad has been worlds best in 5-15 million passenger categories airports in the year 2009 in ASQ survey of ACI. RGIA got International Quality Management standard ISO 9001:2008, Environment Management Standard ISO – 14001:2004 and Occupational Health and Safety Management standard BS OHSAS 18001:2007. It has developed A-380 compatible runway and has best facility in cargo. This airport handled 7.63 million passengers in the fiscal year 2010-11.

Other Countries:

Three airports of Cambodia are managed jointly by France's group VINCI with 70% share and Muhibbah Masteron Cambodia, a Malaysian-Cambodian joint venture with 30%.

Privatization of airports in China has transformed some airports from loss making entities reliant on large public subsidies into profitable, customer-orientated businesses. Mostly, China's privatization is on PPP model to develop non-aeronautical aspect especially for landside, Terminal and Ground Handling businesses. Recently, Male International Airport has been awarded a concession for 25 years under PPP model.

What for Nepal?

Brown Field TIA's Context: Civil Aviation Authority of Nepal (CAAN) manages Tribhuvan International Airport (TIA) the only internal airport of Nepal. We are facing traffic congestion problem. Ground facilities like international parking bays and domestic parking apron areas are limited. Terminal buildings are also getting congested. Baggage mishandling complaints are frequent. Weaknesses on the side behavior service orientation are raised by customers time and again. Lack of professionalism and customer orientation from the agencies like security and immigration are the other sides of the problem. Improvement in 4Ts (Taxi, Toilet, Trolley, Telephone) are always sought for. Very low level of non-aeronautical revenues, under-utilization of commercially important assets and facilities and high overhead expenses are yet other parts of the problem.

While other international airports are dedicated to give exciting experience beyond expectation to their customers, we are just struggling to come out from the family of hated airports. Periodically changing political leadership, their popular slogans and soft promises of the bureaucrats melt down in a short span of time. Getting ISO management certification is far away for TIA. In short we have not been able to show world class competitiveness in TIA management.

A professional management team with full mandate will be able to deliver solution of these problems. This means opening up the door to private participation with appropriate policies.

Green Field Nijgadh's Context: Possibility of private participation in the proposed green field project of Second International Airport (SIA) seems to be high. Airport site has sufficient land (8000 hectares) availability bring forward Airport City or Aerotropolis concept. Birgunj, the commercial gateway on the south, Kathmandu, the capital on the north (72 km) and the airport site itself in the middle of the Republic puts it in the most appropriate location possible for Nepal. In future with the growth of transit trade between China and India, new economic activities could be growing in this area. In case, international air traffic is concentrated from TIA to SIA, it will get more than 6 million passengers per annum by 2028. In the final phase, SIA will have the capacity to handle up to 60 million passengers annually. Construction of fast track link from Nijgadh to Kathmandu, declaring the airport area as Special Economic Zone, government guarantee for the supply of electricity, water and other utilities will be the basic requirements for the viability of this airport. The internal rate of return in this project is expected to be low, (around 10%), some amount of state support may be necessary to fill the viability gap. SIA is a must for Nepal. There is strong possibility of attracting private foreign investment. This will save billions of Rupees of tax revenue of the government. Therefore, transparent policies and procedures towards private investment supported by political consensus are the demand of time to attract private foreign capital and materialize the SIA project.

Conclusion:

It is certainly possible for Nepal to provide world class airport service and to develop facilities ahead of demand. Key to the success is with the right policies and political commitment. If we are not going to accept any form of privatization, in the first stage, CAAN's regulatory and operator function should be separated. CAAN should keep hold of regulatory and the Air Traffic Management (ATM) function. A separate holding company should be established to manage TIA. The organization should be restructured introducing cleaning department and customer service department. Its key staff should come from management faculty. Such a step may be helpful to develop corporate culture and managerial professionalism. Even such improvement may not be sufficient to bring TIA in the family of the world class airports. Because, governments perform less well than the private sector, the ultimate solution will be some form of private participation. And PPP may be one of the choices.

Lastly let us quote N. Chandrababu Naidu, the former Chief Minister of Indian state of Andra Pradesh and the pioneer of PPP policy of India. He says "At the time nobody had experience in the public private partnership or PPP model, and the bureaucracy was not interested in private investment, I had to

fight to anything create this policy. I had 34 meetings – not one, not two but 34 – with the Prime Minister. I faced different objections at each meeting but I kept up the pressure and finally they accepted. After so much resistance and arguments then, now you find Bangalore, Delhi and Mumbai airports have gone for privatization. ….once you do that you just watch out for the development. It starts to happen." Expecting similar endeavor to come from dedicated politicians, let us hope that our statecraft will also be successful to devise an appropriate mechanism to develop and manage TIA and SIA with global competitiveness.

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Deputy Director, CAAN Head Office

Aviation organizations require information Flow as much as aircraft require fuel

Shishil Chitrakar

INFORMATION

ATM community depends extensively on the provision of timely, relevant, accurate, accredited and quality-assured information to collaborate and make decision. Sharing information on a systematic way will allow the ATM community to conduct its business and operations in a safe and efficient manner.

SAFETY

Safety is the highest priority in ATM and a comprehensive process for safety management is implemented that enables the ATM community to achieve efficient and effective outcomes.

collection and evaluation of Safety Data

Data for use in safety monitoring programmers should be collected from as wide a range of sources as possible, as the safety-related consequences of particular procedures or systems may not be realized until an incident has occurred .The appropriate ATS authority should establish a formal incident reporting system for ATS personnel to facilitate the collection of information on actual or potential safety hazards or deficiencies related to the provision of ATS, including route structure, procedures, communications, navigation and surveillance system and other safety significant systems and equipments as well as controller workload.

Safety-related reports concerning the operation of air traffic services, including air traffic incident reports, shall be systematically reviewed by the appropriate ATS authority in order to detect any adverse trend in the number and types of incidents which occur. Reports concerning the serviceability of ATS facilities and systems, such as failure of system and equipment or failure and degradation of communication, surveillance and other safety significant system and equipment, shall be systematically reviewed by the appropriate ATS authority in order to detect any trend in the operation of such systems which may have an adverse effect on safety.

THE NEED FOR SAFETY MANAGEMENT

Traditionally, the need for safety management has been justified based on a predicted industry growth and the potential for an increase in accidents as a consequence of such growth. While accident reduction will always remainthe main priority of aviation, there are more compelling reasons than statistical projections underlying the transition to a safety management environment in international civil aviation worldwide.

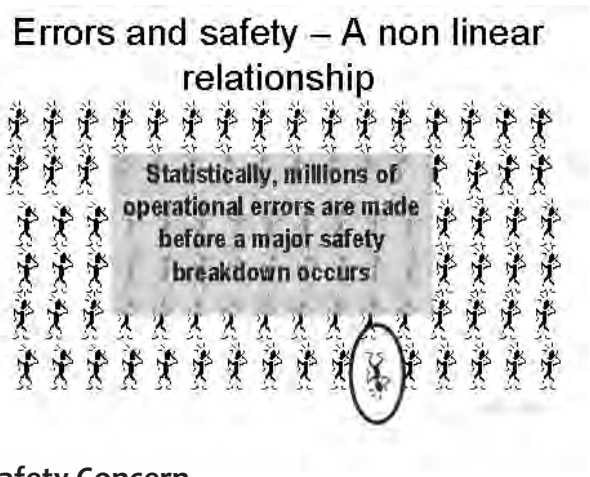
Aviation is arguably the safest mode of mass transportation and one of the safest socio-technical production systems in the history of humankind. This achievement acquires particular relevance when considering the youth of the aviation industry, which is measured in decades, as compared to other industries having long history. It is a tribute to the aviation safety community and its unrelenting endeavors that in a mere century aviation has progressed, from a safety perspective, from a fragile system to the first ultra-safe system in the history of transportation.

In the first era, which spans from the pioneering days of the early 1900s until approximately the late 1960s where aviation could be characterized as a fragile system from a safety reliability standpoint. Safety breakdowns, although certainly not daily occurrences, were not infrequent. It was then only logical that safety understanding and prevention strategies were mainly derived from accident investigation. There was really no system to speak of; rather the industry functioned because individuals literally took it upon themselves to move it forward. The safety focus was on individuals and the individual management of safety risks, which in turn built upon the foundations provided by intensive training programmers. During the second era, from the early 1970s until the mid-1990s (the human era), aviation became not only a system, but a safe system. The frequency of safety breakdowns diminished significantly, and a more all-encompassing understanding of safety, which went beyond individuals to look into the broader system, was progressively developed.

This naturally led to a search for safety lessons beyond those generated by accident investigation, and thus the emphasis shifted to the investigation of incidents. This shift to a broader perspective of safety and

incident investigation was accompanied by a mass introduction of technology (as the only way to achieve increased system production demands) and an ensuing multiple-fold increase in safety regulations.

From the mid-1990s to the present day (the organizational era), aviation entered its third safety reliability era, becoming an ultra-safe system (i.e. a system that experiences less than one catastrophic safety breakdown every one million production cycles). From a global perspective and notwithstanding regional spikes, accidents became infrequent to the extent of becoming exceptional events, or anomalies in the system. Serious incidents also became fewer and further apart. In concert with this reduction in occurrences, the shift towards a broad systemic safety perspective that had started to emerge during the previous era consolidated itself. Fundamental in this consolidation was the adoption of a business-like approach to the management of safety, based upon the routine collection and analysis of daily operational data. This business-like approach to safety underlies the rationale of safety management systems. In the simplest terms, SMS is the application of business management practices to the management of safety. The application of business management practices to aviation safety, with its underlying routine collection and analysis of operational data, has as its objective the development of the safety space. Within that safety space, the organization can freely roam while delivering its services, with the assurance that it is within a space of maximum resistance to the safety risks with the consequences of hazards which exist in the context in which it must operate to deliver its services.



Safety Concern

Safety is a matter related to everybody. No single person, unit can achieve safety without coordinated and integrated effort from every concerned unit. "Some of the best lessons we ever learn are the ones we learn from our mistakes and failures
.The error of the past is the wisdom and success of the future."

ATS SAFETY MANAGEMENT

States shall ensure that the level of air traffic services (ATS) and communications, navigation and surveillance, as well as the ATS procedures applicable to the airspace or aerodrome concerned, are appropriate and adequate for maintaining an acceptable level of safety in the provision of ATS.

The requirements in respect of services, systems and procedures applicable to airspaces and aerodromes should be

established on the basis of a regional air navigation agreement in order to facilitate the harmonization of ATS in adjacent airspaces. To ensure that safety in the provision of ATS is maintained, the appropriate ATS authority shall implement safety management systems (SMS) for the air traffic services under its jurisdiction. Where appropriate, ATS SMS should be established on the basis of a regional air navigation agreement

ATS Evaluation

Standardization of procedures and methods is essential in a service which has international obligations and which uses procedures involving more than one unit. The degree of standardization achieved is directly related to the proficiency with which individuals perform their duties. This in turn determines the efficiency of the service given to the users and to the traveling public. Regardless of the scope of the evaluation certain common objectives are involved. ATS evaluation normally includes all or part of the following provisions:

a)assessing the service provided to the users for standardization, quality, adequacy, efficiency and effectiveness;
b)ensuring that operating procedures conform to national standards;
c)assessing and making recommendations concerning operational requirements;
d)identifying any potentially unsafe procedures or operating practices so that immediate corrective action can be taken;
e) detecting problem areas or deficiencies and determining probable causes and recommended corrective measures;
f) examining the effectiveness of intra-unit and inter unit communication and co-ordination;
g) examining personnel utilization, position workload and unit establishments to ensure compatibility

ATS Planning

Safe and adequate ATS system should result from sound planning techniques. All relevant operational factors must be taken into account and close meaningful co-ordination between planners and users is essential. To ensure that an ATS system functions properly it must cover the following main factors:

a)a navigation aid system which provides for both air navigation and **ATS requirements;**
b)communications both point-to-point and air-ground;
c)specialist equipment for use by ATS personnel; '
d)adequately trained and qualified controllers;
e)provision of flight data permitting controllers to constitute a picture of the existing and expected traffic situation;
f)provision of information on the status of air navigation facilities and services, both air and ground derived, including meteorological information.

The system must have sufficient capability and flexibility to accommodate traffic peaks and reasonable expansion possibilities to cover forecast traffic increases during a period at least equal to the lifetime of the facility.

Facilities must be available for controller training and there must be a unit management structure which ensures adequate constant supervision and standardization of operating methods. In ensuring that all operational factors are taken into account at the planning stage, planners will be faced with many conflicting considerations and it is in this area particularly that the judgment and experience of interested aviation activity groups can contribute to a **balanced and logical proposal**.

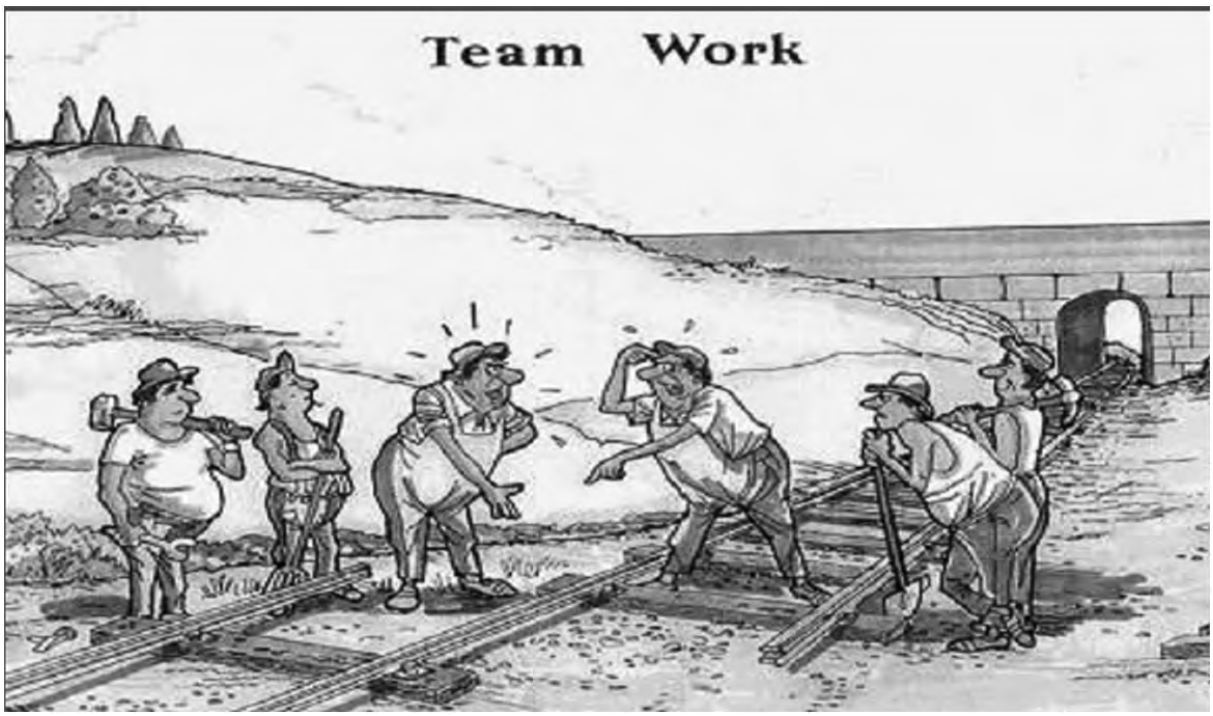
Conclusion

Correct and up to date information is essential from planning stage to implementation phase. Information collection, sharing and analysis are highly essential for safe operation of Air Transportation and must be used as fundamental tools for Safety Management System of Organization. Thus we can say Aviation organizations require information Flow as much as aircraft require fuel .

Be Happy !

REF:
Annex 6
ATS Planning Manual
PANS ATM DOC 4444
Safety Management manual (Doc 9859)

Deputy Director, TIACAO



Implementation of RNP AR at Tribhuvan International Airport

Suwarn Raj Upadhyay

1.Background

Tribhuvan International airport (TIA) being situated inside the beautiful Kathmandu valley is well known in the aviation community for its challenging surrounding terrain, both for Air Traffic Controllers and Pilots. Proximity of natural obstacles around the vicinity restricts the application of precision approach system like ILS, MLS, etc. Feasibility studies of possibility of precision approach for TIA by JICA, Air Services Australia and Airways International New Zealand in the past revealed that the ILS with 15° off-track and 3.5° glide slope or 5° off-track and 4.1° glide slope is only possible resulting the non-feasibility of precision approach at TIA.

Several initiatives such as the publication of a new VOR/DME approach procedure have been undertaken to facilitate the airport access by reducing the excessive step down procedures on the approach path but these efforts have reached the limits of conventional navigation. Hence, the application of Performance Based Navigation specification especially the RNP AR has been sought as one of the most suitable alternatives to the limiting conventional procedure.

By taking the full benefit of aircraft capabilities primarily the GNSS equipage, RNP allows an aircraft to fly accurate, predictable and repeatable trajectories without relying on ground-based navigation systems. The flexibility in airspace and air-route structuring

which is the beauty of PBN especially the RNP AR application that allows the aircraft to circumnavigate the terrains, congested areas and noise sensitive areas in the final approach segment. This benefit has been currently grasped by Civil Aviation Authority of Nepal (CAAN) by adopting the concept of RNP AR Approach into the TIA operation which precludes the current practice of overflying the controlling rugged terrain while commencing the conventional approach.

2.What is RNP AR APCH?

RNP AR APCH is the most sophisticated PBN navigation specification which requires special authorization for aircraft and aircrew to execute the approach. The RNP AR APCH criteria apply only to those aircraft and operators complying with specified additional certification, approval and training requirements. Thus, implementation of RNP AR procedures extends beyond the procedure design and includes the authorization and approval processes- both airworthiness and operational. It precludes the necessity of ground-based navigation aids.

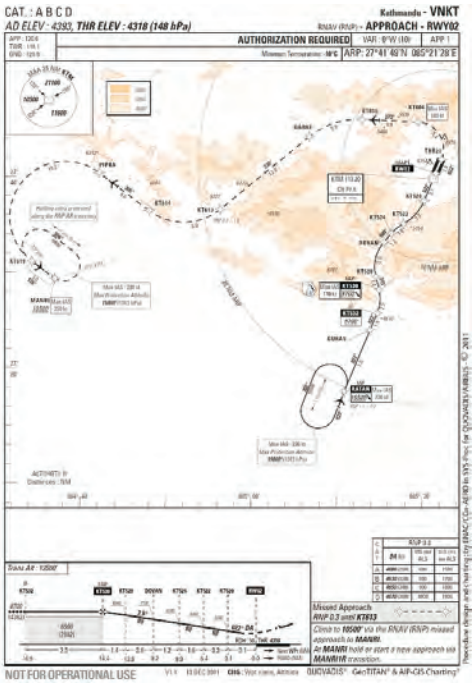
Navigation Aid Infrastructure required in RNP AR APCH procedures is GNSS with ABAS like RAIM and AAIM which provides the lateral navigation guidance to the aircraft. These procedures published only when the significant operational advantages can be achieved by improving the safety of the operation. RNP AR APCH operations are considered very close to the precision approaches and are classified as approach with vertical guidance (APVs). This type of operation requires a positive vertical navigation guidance system (VNAV) for Final Approach Segment (FAS) by utilizing the barometric vertical navigation system (BARO-VNAV).

3.Benefits of RNP AR Approach over conventional VOR/DME procedure

a.General Benefits:

- Infrastructure Aspects:
  - No ground infrastructures are required. Hence, no financial burden.
  - Satellite based navigation and on-board equipments are sufficient for aircraft navigation.

- Operational Aspects:
  - Low visibility operation
  - Reduction in diversions and go-around
  - Reduction in ATC complexities
  - Reduction in congestion
  - Increases the efficiency of operation
  - Continuous descent profile of 3° is attainable
  - Much like Precision Approach
  - More payload out of terrain/obstacle challenged airports
  - Enhanced safety



⇨ Procedural Aspects:

- ➢Routes can be designed as per necessity
- ➢Reduces route complexities
- ➢Stabilized approach
- ➢Flexibility and Maneuverability, can beautifully along the Arc, called as RF leg
- ➢Lateral & vertical guided approaches

⇨ Environmental Aspects:

- ➢Fuel saving
- ➢Noise abatement
- ➢Carbon emission reduction

b. Specific Benefits with regard to TIA

⇨ Low visibility operation is possible by lowering the visibility minima. Visibility minima can go as low as 900m for CAT C operations with the decision height 340ft.

⇨ Go-around tendencies could be reduced due to the stabilized approach with lower minima. The procedure proposed by QUOVADIS QUOVADIS is a subsidiary of Airbus. after the final discussion with CAAN has the Final Approach Segment (FAS) with shallow glide path angle of 2.58° allowing the stabilized approach until landing.

⇨ As there is no step down fixes and procedures and as it is the stabilized approach, engine thrust remains optimum during the approach manoeuvre thereby increases the fuel saving and ultimately reduces the carbon emission.

⇨ Flexibility in approach procedure design is possible. In the approach procedure, lots of RF (radius to fix or arc) legs are prevalent right from the STARs up to the Missed Approach Holding MANRI. Such RF legs enable aircraft to circumnavigate the hurdling terrain in a very efficient manner with the help of aircraft automatics. Terrain in between the 8 to 9 DME has been the limitation of existing conventional VOR/DME RWY02 Approach procedure which has been avoided by the proposed RNP AR APCH procedure.

⇨ TIA will have much like precision approach procedure, i.e. RNP AR with lateral and vertical guidance which will certainly increase the reliability of the operation of the airport as well.

CFIT type of occurrences will be reduced because of the non-existence of step down fixes, stabilized approach and Onboard Performance Monitoring and Alert (OPMA) functionality of the RNP AR Navigation Specification.

4.Why RNP AR? Why not RNP APCH and other PBN Specifications?

Different PBN NAVSPECS require different protection area depending on their RNAV or RNP value. However, the value ranges from 10 as maximum up to as low as 0.1 which is nothing but the lateral navigation tolerance in Nautical mile.

As for as the approach of TIA concerned, RNP AR APCH has got the preference over the RNP APCH and other PBN specifications because of the following reasons:

- RNP AR APCH does not require buffer protection area while the other PBN Specifications including the RNP APCH requires it. Hence, the segment width of RNP AR APCH is narrower. Almost every solution is available with RNP AR especially relating to the flight path. Therefore, this approach is technically feasible even in the narrower valley like Kathmandu.
- The beauty of RNP AR APCH is the possibility of RF leg in the FAS which is not possible in the case of RNP APCH and others. This RF leg allows aircraft to circumnavigate avoiding the terrain even in the FAS. In case of proposed TIA RNP AR APCH, it allows aircraft to fly in the arc path along the mountain gorge by eluding the high terrain in between 8 and 9 DME from Kathmandu VOR/DME.

5.What are the mandatory equipages and aircraft capabilities?

As the RNP AR APCH operations requires very low navigation tolerance limits and very small protection area, the onboard system must have the path construction, display and adherence capabilities. It must have the Navigation Display/Control Display Unit capable to display the deviation of the aircraft both vertically with a resolution of 10 ft or less and laterally with a resolution of 0.01 NM or less. It must have the means to annunciate failures of any component of RNP, including the navigation sensors and such annunciation must be displayed in the primary view of the pilot.

Besides the above mentioned capabilities, the aircraft should have the following sets of equipment onboard to perform the RNP AR APCH and associated missed approach operations:

- Dual GNSS sensors
- Dual FMS
- Dual Auto Pilots
- One IRU
- Dual Navigation Display
- An operable enhanced ground proximity warning
- ystem (EGPWS/TAWS)

6.Chronology of CAAN Activities to implement RNP AR Approach for TIA

The Civil Aviation Authority of Nepal (CAAN) is implementing Required Navigation Performance with Authorization Required (RNP-AR) operations at Tribhuvan International Airport in the near future with the support of QUOVADIS.

This RNP-AR project is the result of an initiative between the CAAN and QUOVADIS with the support of COSCAP and ICAO FPP as well as Qatar Airways to further improve the safety of the operations at Kathmandu.

31 March-1 April 2011 A workshop with prime focus on RNP AR approach for TIA was conducted in Kathnmandu with the facilitation of COSCAP and ICAO FPP in which QUOVDIS personated the viability of RNP AR Approach.

Workshop was attended by 65 representatives including almost all the 29 air operators flying to/from Kathmandu. The survey in the 15 operators have RNP AR APCH capability and 7 operators can be readily upgraded for it. About 68% aircraft fleet are found capable of flying RNP AR APCH.

13-17 July 2011 FUGRO GEOID SAS, a French data survey company recognized by DGAC France, contracted by QUOVADIS performed an obstacles survey around Tribhuvan International Airport for the implementation of the RNP AR procedure.

2-3 August 2011 A kick off meeting was held in CAAN for the conceptual procedure design for RNP AR APCH at Tribhuvan International Airport. In this meeting, QUOVADIS presented the initial design of RNP AR STARs and Approach for Runway 02.Vigorous discussion was held about the procedure presented. The meeting agreed on the RNP AR procedure final design to be produced by the end of December 2011.

5-6 December 2011 CAAN, Quovadis and associated airlines again met in Kathmandu for RNP AR Detail Design Review Meeting. The meeting agreed on the procedures with RNP AR STARS fromSouth, West and East, and Approach from South.

7 December 2011 As a process to validate the procedure, CAAN officials, QUOVADIS and Qatar Civil Aviation Authority Representative attended the Simulator Session of Kathmandu RNP AR APCH on Qatar Airways' Simulator at Doha.
.The procedure was found appropriate as per its design during the simulator session. No significant deviation – vertical and lateral was observed and no GPWS warning was monitored. Procedure was checked in both normal and emergency scenario and found appropriate in both the scenario.

12-14 Dec 2011 ATM Expert from QUOVADIS conducted one day PBN training for ATCs focusing on RNP AR APCH procedure and ATC role. The training was interactive, informative and useful for ATCs. 'Pros' and 'Cons' of the procedure were discussed during the training in perspective of Air Traffic Controlling including the phraseology.

As per the MOU between CAAN and QUOVADIS, the

final procedure will be delivered to CAAN by the end of December 2011 and demonstration flight by Qatar Airways will be performed by the end of January 2012.

CAAN will update the AIP Nepal with the necessary data and the RNP AR Approach procedure will be published as AIP Supplement on AIRAC date cycle January/February 2012. Most probably the procedure will come in effect by April 2012.

7.Challenges ahead

⇨ Regulatory provisions for both operational approval and procedure authorization

⇨ Difficulties in transition from conventional environment to PBN environment due to lack of sufficient infrastructures especially the on-board infrastructures when we talk of RNP AR operation.

⇨ Training and expertise constraint in different fields (ATCs, Pilots, Engineers, etc)

⇨ RNP operations may require changes to the ATC system interfaces and display.

⇨ Mixed navigation (conventional and RNP) may introduce complexity in the ATC operation.

⇨ Exploration of the lateral separation points from the RNP AR STARs, Holdings- RATAN and MANRI and Missed Approach track

8.Recommendations

⇨ Necessary trainings should be provided in the field of Flight Operational Approval, Air Traffic Control, Procedure Design and Quality assurance. In-house training shall be conducted for the Air Traffic Controllers to deliver the knowledge of PBN technology focusing on RNP AR.

⇨ Provisions for Regulations and Oversight functions should be developed.

⇨ Provision of Clear and Concise Roadmap to transition from Conventional to PBN environment shall be established.

⇨ In-house capability shall be built for the maintenance of the RNP AR procedure in the long run.

⇨ Lateral separation points of Holdings and STARs shall be identified for the smooth aircraft operations within Kathmandu TMA.

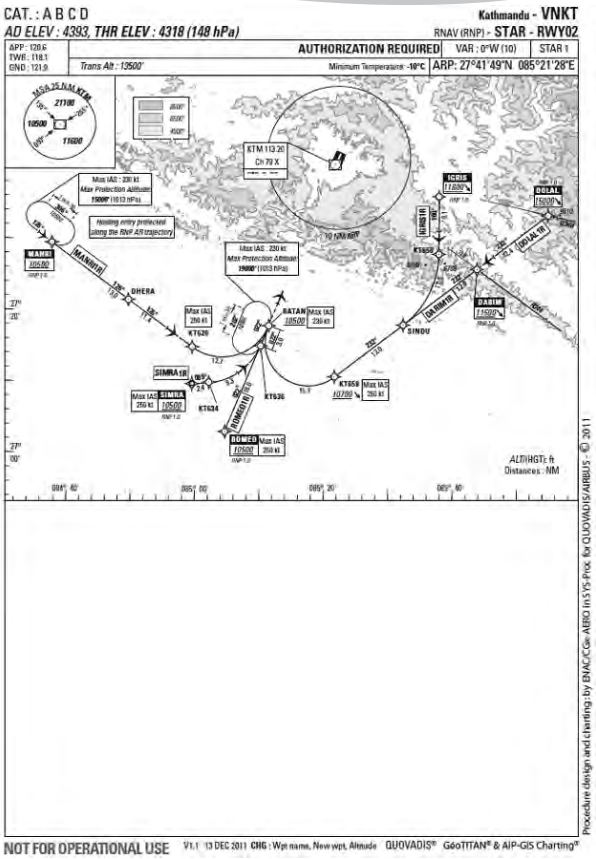
⇨ Radar Map shall be updated to address the RNP AR trajectories.

9.Conclusion

The implementation of RNP AR operations at TIA will not only beneficial for airline

operators by reducing the operational costs rather it is equally beneficial to CAAN as well, as it is going to enhance the safety and reliability of flight operation into the only international airport itself. Finally, the benefits fall on passengers' domain as they are the ultimate user of the approach. Hence, with the development of all the necessary measures, RNP AR will be the safest and best alternative to the conventional approach that could allow TIA to experience the essence of APV approaches (much like precision approaches) without the huge investment on ground-based infrastructure.

Manager, CAAN Head Office



The issue of Regulation and Deregulation of the Airlines Industry

Narayan Prasad Giri

The issue of just how much government intervention is necessary in a free enterprise system is an ongoing battle between proponents of laissez-faire ("leave it alone") to proponents who argue that continual and intense government monitoring is necessary to protect the consumer.

Deregulation is the removal or simplification of government rules and regulations that constrain the operation of market forces. Deregulation does not mean elimination of laws against fraud or property rights but eliminating or reducing government control of how business is done, thereby moving toward a more laissez-faire, free market. It is different from liberalization, where more players enter in the market, but continues the regulation and guarantee of consumer rights and maximum and minimum prices. An example of Deregulation would be Financial Deregulation. Liberalization refers to a relaxation of previous government restrictions, usually in areas of social or economic policy. In some contexts this process or concept is often, but not always, referred to as deregulation. Deregulation is different from liberalization because a liberalized market, while often having fewer and simpler regulations, can also have regulations to increase efficiency and protect

consumers' rights, one example being anti-monopoly legislation. However, the terms are often used interchangeably within deregulated/liberalized industries.

parallel development with deregulation has been organized, with ongoing programs to review regulatory initiatives so as to minimize, simplify, and make more cost effective regulations. Such efforts may bring momentum and liveliness in the industry by the regulatory flexibility legislation. The stated rationale for deregulation is often that fewer and simpler regulations will lead to a raised level of competitiveness resulting in higher productivity, more efficiency and lower prices. It is one of influential measures of worldwide business regulations that has inspired mostly deregulation.

One can distinguish between deregulation and privatization. Privatization can be seen as taking state-owned service providers into the private sector. This can result in making the privatized enterprise more subject to market forces than was the state-owned entity. But the degree to which there is freedom to operate in the market and the extent of competitiveness in the market for the goods and services of the privatized entity or entities may depend on other measures taken in addition to privatization.

Deregulation allows the economy to grow on its own terms. A free market economy puts power in the hands of purchasers.

History

While viewing at the history of deregulation, many industries in the United States became regulated by the federal government in the late 19th and early 20th century. Entry to some markets was restricted to stimulate and protect the initial investment of private companies into infrastructure to provide public services, such as water, electric and communications utilities. With entry of competitors highly restricted, monopoly situations were created, necessitating price and economic controls to protect the public. Other forms of regulation were motivated by what was seen as corporate abuse of the public interest by businesses already extant, such as occurred with the railroads following the era of the so-called robber barons. In the first instance, as markets matured to where several providers could be financially viable offering similar services, prices determined by competition were seen as more desirable than those set by regulatory process.

One problem that encouraged deregulation was the way in which the regulated industries often controlled the government regulatory agencies, using them to serve the industries' interests. Even where regulatory bodies started out functioning independently, a process known as regulatory capture often saw industry interests come to dominate those of the consumer. A similar pattern has been observed with

the deregulation process itself, often effectively controlled by the regulated industries through lobbying the legislative process. Such political forces, however, exist in many other forms for other special interest groups.

Deregulation gained momentum in the 1970s, influenced by research at the University of Chicago and the theories of Ludwig von Mises, Friedrich von Hayek, and Milton Friedman, among others. Two leading 'think tanks' in Washington, the Brookings Institution and the American Enterprise Institute, were active in holding seminars and publishing studies advocating deregulatory initiatives throughout the 1970s and 1980s. Alfred E. Kahn played an unusual role in both publishing as an academic and participating in the Carter Administration's efforts to deregulate transportation.

Controversy

The deregulation movement of the late 20th century had substantial economic effects and engendered substantial controversy. As preceding sections of this article indicate, the movement was based on intellectual perspectives which prescribed substantial scope for market forces, and opposing perspectives have been in play in national and international discourse.

The movement toward greater reliance on market forces has been closely related to the growth of economic and institutional globalization between about 1950 and 2010.

There are a significant number of risks associated with economic liberalisation and deregulation, which many see the need to secure against with regulation that does not distort markets and allows them to continue to be competitive, or perhaps even more so. Much as the state plays an important role through issues such as property rights, appropriate regulation is argued by some to be "crucial to realise the benefits of service liberalisation". Regulation can play an important role in, but not exclusive to, the following situations:

- creating a level playing field and ensuring competition (e.g. ensuring new energy providers have competitive access to the national grid);
- maintaining quality standards for services (e.g. by specifying qualification requirements for service providers);
- protecting consumers (e.g. from fraud);
- ensuring sufficient provision of information (e.g. about the features of competing services);
- preventing environmental degradation (e.g. arising from high levels of tourist development);
- guaranteeing wide access to services (e.g. ensuring poorer areas where profit margins are lower are also provided with electricity and health services); and
- preventing financial instability and protecting consumer savings from excessive risk-taking by financial institutions.

These issues can cause high levels of market distortions and barriers to entry. For instance, regulation ensuring that specific qualifications are needed to provide a service can be problematic for foreign firms wishing to invest, when those qualifications are provided only by domestic institutions. Thus, regulation must be carefully implemented and respond to any issues that develop to ensure that liberalisation delivers the expected benefits, for instance by creating mutual recognition agreements (MRAs) of qualifications or cross-border harmonisation of rules. Regulation often involves a complex balancing act between market and social objectives and it is argued policy space is required to ensure regulation can constantly be adjusted and adapted to changing market and social realities.

Deregulating Airlines

In 1976, the airline industry was deregulated. Until that time, the U.S. airline industry was governed by the Civil Aeronautics Board (CAB). Each carrier's routes and prices were set by this government organization. The U.S. airline industry operated with a somewhat imprecise relationship between costs and revenues. Airfares were set by route in consultation with the airlines flying them according to a standard cost-plus formula. Many of the less frequently traveled routes were subsidized by the higher fares charged on the major routes. This arbitrary methodology reduced or eliminated the need to compete based on operational efficiency and consumer satisfaction. The system virtually guaranteed airline costs would be covered. Once price guarantees were lifted, there was a significant re-positioning of and restructuring within the entire industry as the airlines needed to become more efficient in order to compete.

The Airline Deregulation Act, 1976 opened up the U.S. airline business to free market principles, which spurred a dramatically larger, more accessible and, some say, a more affordable industry. On the positive side, deregulation opened the market to many competitors and low-cost airlines often with less frills than existed under regulation. On the negative side, many carriers disappeared through mergers, acquisitions and bankruptcy. But in reality, that is the essence of the free market economy. The strong survive and the weak perish as in the animal kingdom.

According to the General Accounting Office (GAO), airline fares decreased by 21% from 1990 to 1998. Average airfares declined and quality of service improved at 168 of the 171 airports examined generally because of competing service from a low-fare carrier. ÊConsumers today can buy air travel today for one-half the purchasing power of a 1968 dollar, and about one-third of a 1950 dollar. I can personally remember paying $800-$900 for a round trip ticket between Los Angeles and New York in the 1970s -1980s, wherein I can fly on one of the no-frill airlines today for a fare as low as $99.

The Consequence of Deregulation

Even the partial freeing of the air travel sector has had overwhelmingly positive results. Air travel has dramatically increased and prices have fallen. After deregulation, airlines reconfigured their routes and equipment, making possible improvements in capacity utilization. These efficiency effects democratized air travel, making it more accessible to the general public.

Since passenger deregulation in 1978, airline prices have fallen by 44.9 percent in real terms according to the Air Transport Association. Capacity utilization ("load factors") increased, allowing fare reduction. Passengers save $19.4 billion dollars per year from airline deregulation. The real benefits of airline deregulation are being felt today as never before, with Low Cost Carriers (LCCs) increasingly gaining market share.

The rigid fares of the regulatory era have given way to today's competitive price market. After deregulation, the airlines created highly complex pricing models that include the service quality/price sensitivity of various air travelers and offer differential fare/service quality packages designed for each. The new LCCs, however, have far simpler price structures—the product of consumers' (especially business travelers') demand for low prices, increased price transparency from online Web sites, and decreased reliance on travel agencies. As prices have decreased, air travel has exploded. The total number of passengers that fly annually has more than doubled since 1978. Travelers now have more convenient travel options with greater flight frequency and more nonstop flights. Fewer passengers must change airlines to make a connection, resulting in better travel coordination and higher customer satisfaction. Because of the effect of deregulation on the airline industry, air traffic has increased tremendously. Consequently, it has posed challenge to the Air Traffic Controllers (ATCs). This requires updating and modernizing the Air Traffic Control system and managing slot system so as to develop efficiency and competency, especially in the congested airports.

The analysis of fares and service after adoption of deregulation provides evidence that consumers have benefited from lower fares after the airlines were deregulated. Since deregulation, competition has generally increased, traffic has expanded, and fares have declined. As predicted by the framers of deregulation, airline markets have become more competitive and fares have fallen since deregulation. For consumers, airfares have fallen in real terms since 1980 while service has generally improved.

We can summarize the effects of deregulation as under:

1. Hub and Spoke-widespread development of Hub-Spoke Network
2. New Carriers
3. Increased Competition
4. Discount Fares
5. Growth in Air Travel

6. Frequent Flyer Programs
7. Computer Reservation System (CRS)
8. Code sharing

Few things were left for regulation after the deregulation commenced. They may be summarized as under:

The regulation of traffic rights as to the bilateral, consequently liberal sky policy and open sky policy agreements were followed liberalizing international aviation markets and increasing importance of global airline alliances in one hand; exchanging traffic rights, without any limitation on routes, the number of carriers or capacity; and provide liberal regimes for pricing, charters, cooperative marketing agreements and other commercial opportunities on the other.

It can be safely said that deregulation, with the exception of a few isolated incidences, lowers costs, improves service, and opens the industries to more efficient competitors.

Air transportation regulation appeared to favor incumbent carriers, those in passenger transport more than in air-cargo. It suppressed new entrants. Deregulation has permitted such carriers to flourish, leading to greatly lowered prices for air-passenger travel and to more timely delivery modes for air-cargo.

Air carriers are no longer in the same straightjacket that they were in during the days of economic regulation. But deregulation has not moved the air transportation industry quickly into a new equilibrium configuration. Instead, deregulation has enabled a plethora of creative destruction. Consumers have gained enormously from lower fares. Innovation has been rampant. New industries and firms have been born and reconfigured. Operations have been redesigned. Deregulation has enabled a dynamic, not a static, marketplace.

Looking into the legislation

When we look into the Nepalese system of legislation for the regulation of airline industry we have Ministry Of Tourism and Civil Aviation (MOTCA) representing government which has the authority to regulate airlines for license to establish and operate airline industry in Nepal as to the Civil Aviation Act 2015. The Act also confers authority to the government to frame the rules for granting permission for the airport construction and prescribe fees thereof compensation necessary for the cost of the public property, the aircraft search-rescue and investigation, protection of environment, above all the safety and security of the aircraft and passenger.

There are government regulations: Civil Aviation Rules 2046 and Civil Aviation Regulation 2024 for aviation security and aircraft accident investigation. In terms of air fare Civil Aviation Authority Nepal (CAAN) has been conferred authority by the CAAN Act 2053 to recommend to the government and thereby government fixes upper and lower limit the airlines

find the rate remaining within. In this case airlines have some type of autonomy resembling somehow to the deregulation. CAAN also looks after primarily the aviation safety matters with regard to airline operation as to the Act 2053. Airlines operating certificate is provided by CAAN. It oversees all safety matters of the airlines. Unlike Nepal US has three different bodies in terms of the regulation of airline operation. There is FAA which oversees air navigation, safety, and airport investment; the Department of Homeland Security, which oversees passenger security; DOT which oversees international agreements and has a mandate to protect consumers from unfair and deceptive practices in air transportation and its sale.

Complete deregulation may create some type of situation which causes weaker to be the loser. Many of the cases indicate that regulation somewhere in the industry is necessary for the protection of public welfare, life and property of the people and protection of the industry as well. Therefore, some regulation is necessary to protect the weaker party. For instance, the framers of the US legislation recognized that this approach could cause some airlines to fail and could lead to some communities losing some levels of service. As a result, the act created the Essential Air Service (EAS) program which subsidizes air service to small communities. The act also established the Employee Protection Program (EPP).

When we talk of Nepalese airlines business, many of the private airlines have mushroomed, some of them are well grown up like Buddha and YETY; whereas the public air carrier i.e. Nepal Airlines Corporation (NAC) established on Ist July 1958 with some prerogatives as to its Act 2019, is about to sink down. The reason may be the lack of deregulation in case of NAC because some of the private airlines enjoying some type of liberalization seem to be establishing in the market. As compared to them, NAC is not in a good position; though some of the analysts say that one of the reasons may be the political interference. Some type of deregulation equally applicable to all the airlines companies may avail of the opportunity commensurating with the liberalization as enjoyed by other private airlines companies may let NAC to improve and rescue from so-called political interference. This may require dissolving the NAC Act 2019 and managing the necessary provisions under the Aviation Umbrella Act so as to establish it as the dynamic company. It is necessary to rescue NAC from such difficulties and let it stand on its own foot being able to survive in the environment of lawful competition so as to move ahead in the age of globalization.

Conclusion

Matters as mentioned above deliver a type of insight on the issue of deregulation of ainlines industry that it is a product of free economy bringing competition in the market to provide free environment for standing on

one's own foot to stay in the business where incapable may decline and efficient one may grow up. This is why some type of regulation in the business along with the deregulation may be required to protect the industry and the public interest. This may be fruitful for the overall industry development. This may be materialized through the efficient legislation which may reflect the achievements of good governance including both the interests of public welfare and the fruits of free economy so that it may be able to lead the industry to flourish.

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Fifth Generation CRM Threat and Error Management

Govinda Poudel

Evolution of CRM

History of CRM is traced back to the workshop arranged by National Aeronautics and Space Administration (NASA) in 1979 on research into the causes of air transport accident.

First generation CRM program was initiated by United Airlines in 1981 with a focus on human factor aspect known to contribute to aviation accident. The focus was also largely on psychological testing and general management concepts, leadership and managerial effectiveness. In addition to classroom training, some programs also were included such as full mission simulator training (line oriented flight training), where crew practice interpersonal skills.

Second generation CRM training was initiated by NASA organizing a workshop of airlines. The conclusion of the working group at the workshop was that CRM training to be viewed as separate component of the pilot-training.

A new generation of CRM training course was beginning to emerge with focus on cockpit group dynamics and adopted a change in the name from cockpit to crew resource management dealing with more specific aviation concept relating to flight

operations and team oriented aspects such as team building, briefing strategies, situation awareness and stress management etc.

Third generation CRM was started in the early 1990s. The training began to reflect organizational, cultural, and integrated CRM with technical training and focusing on specific skills and behaviors that pilots could use to function more effectively. In this generation of CRM flight deck automation was also included. A new concept of joint CRM training was introduced on which cabin crew, flight dispatcher and maintenance personnel were included.

Fourth generation CRM has included the advance qualification program (AQP) by Federal Aviation Administration in 1990, requiring to provide crew training both on CRM and LOFT (Line Oriented Flight Training).CRM helps to solve the problems associated with human error as it is an integral part of all flight training.

Fifth generation CRM training has dealt on error management in recognition of the fact that it is impossible to eliminate human error. It is agreed that human and error can not be separated; it can be reduced but cannot be eliminated. Human error induces the hazards which are the contributors to accidents.

Error is defined as "an action or inaction by an operational person that leads to deviations from organizational or the operational person's intension or expectations."

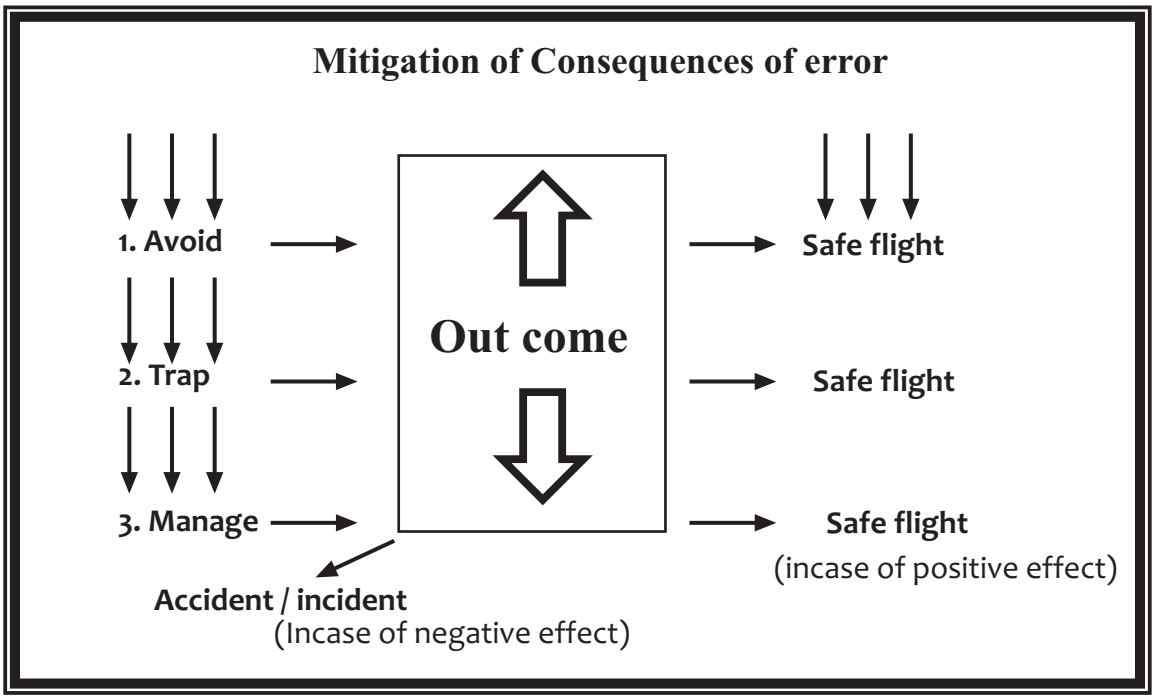
Error management is defined as "the process of detecting and responding to error with counter measures that reduce or eliminate the consequences of error and mitigate the probability of future errors or undesired aircraft states."

Underlying the fifth generation of CRM is the premise that human error seems to be everywhere and every time. Moreover, it is inevitable and a source of information. If error is inevitable, CRM can be seen as a set of error countermeasures with the following units of defense.

1. Avoidance of error by thorough planning
2. Trapping incipient error with continual cross checking and vigilance and reducing consequences of error through improved checklist management, task prioritization and decision making strategy.
3. Mitigating the consequences.

Fifth generation CRM has aimed to present errors as normal occurrence and develops strategies, develops a more team oriented concept to manage the error by breaking the error chain.

Corrective action to minimize the error can be shown as below.



- There are many threats in the aviation world in all areas, which cannot be completely removed.
- We need to develop strategies to manage, to protect against the threats and reduce the frequency and severity of human errors.
- Threats are external situations that must be managed by the cockpit crew during normal everyday flights.

The fundamental purpose of CRM training is to improve flight safety through the effective use of error management strategies in individual as well as systematic areas of influence. It also helps to review actual airlines accidents and incidents in order to solve the problems resulting out of dilemmas.

The action taken by participating aircrew should be analyzed through the use of feed back system which will enhance crew members' awareness of their surrounding environment, make them recognize and deal with similar problem and help them to solve situation that might occur to them. Hence it is only reasonable to focus CRM as threat and error management (TEM) training. It must be continuously enforced and it must become an inseparable part of the organization-culture. The objective of fifth generation CRM is the integration of TEM into CRM.

The TEM perspective proposes that threats and errors are present all the time in the operational environment within which crews

operate the flight. Threats are factors that originate outside the influence of the flight crew which must be managed by them. Therefore threats are external to the flight deck. They increase the complexity of the operational environment and thus have the potential to foster flight crew error. The latent threat those are tangible and observable to the crews are

1. Adverse weather, icing, wind-shear etc.
2. Difficult ATC clearance, language, late changes etc.
3. Aircraft malfunction in operative components etc
4. Cabin distraction, ground and ramp problem / maintenance etc.

The total elimination of threats would only be possible by not flying at all. What is important is that crews recognize threats and can apply counter measures to avoid or mitigate their effect on flight safety.

Some of the mitigating elements to error are
1. Use of SOP, checklists, memory items etc.
2. Following the operating procedures and execute correctly without deviating from the standard.
3. Proper communication with ATC.
4. Proper decision making, maintaining situational awareness.
5. Effective training and continuous evaluation.

Latent threats are those threats which are not readily observable by the crew. It may pertain to culture, professional level, organizational policy and procedures etc which can lead to an undesired aircraft state. While the geneses of threats are outside the influence of the crew, it is important that training is design to provide flight crew with the tools to recognize unique prevalent threats, to their specific airlines operations. Flight crews that are well equipped in terms of recognizing threats evolve as more successful in managing the potential errors, and threats that might generate during flight operations.

What is error?

Error is an action or inaction that leads to deviation from organizational or professional intention or expectations, which tend to reduce the margin of Safety and increase the probability of accident or incidents.

□ Generally people do not commit error intentionally.

□ All the time we shall anticipate occasions when human error can occur.

□ We shall focus on correcting the factors that contribute to human error.

□ Any act may be unsafe when it is

associated with hazard or the same act may not become unsafe, if it is not associated with hazard.

Example

1. There is nothing inherently unsafe in not wearing / having a life jacket. If the aircraft is not flying over water.
2. It becomes an unsafe act when the aircraft is flying over water and a person gets near deep water without wearing / having a life jacket.

Action Error

Type of action:-
During any action a person can commit error beginning from one or other of the following.

□ Beginning of error or causes of the error are as follows.

1. Slip
2. Lapses
3. Mistakes
4. Violations

1. Slip

Slip is an attention failure, caused mainly by
i. Distraction
ii. Preoccupation.

2. Lapses

A lapse is a memory failure caused mainly by Poor recall procedures which may be Rules and / or skills such as,

® Missed action / omission
® Failed to do something
® Lapses of memory and / or attention;
® Missed / incorrect read backs
® Slip and lapse are "unsafe acts" caused by unintentional actions.

3. Mistakes

1. Somebody does something believing it to be correct, when it was, in fact wrong.
2. An error of judgment / wrong selection – mistakes are (i) rule based and (ii) knowledge based.

□ Faulty plan
□ Intentional / unintentional

a) Rules based mistakes,
✓ Wrong rules
✓ Right rules – wrong time
✓ Right rules – poor application

b) Knowledge based mistakes,
✓ Inadequate knowledge or data
✓ Insufficient time
✓ Poor problem solving
✓ Poor decision making

4. **Violation**

1. Somebody does something knowing it to be against the rules
2. Deliberately failing to follow procedures.

□ Deliberate

- Illegal action

The findings of aircraft accidents in Nepal issued by the investigation-commissions are associated with probable causes as CFIT, pilot error due to lack of proper decision making and situational awareness. Other important issues are temptation of the crew to complete the flight even not in normal condition. The reason behind it is human nature to show superior or better than other pilot(s) or to impress the management. Similarly, exceeding of limitation, which may be human as well as time, weather and environment including terrain due to overconfidence of the pilot. Therefore fifth generation CRM can help the pilot to recognize threats and apply counter measures to avoid or mitigate the effect on flight safety. It is high time for the authority and the airlines of Nepal to arrange a CRM training program accommodating the elements as suggested by fifth generation CRM which helps the pilot to recognize the threats and to apply counter measures to avoid or mitigate the threat.

Senior Manager, Yeti Airlines

TIA is not yet congested!!

Sachit Bhakta Pokharel

Congestion of Tribhuvan International Airport (TIA) has become a chitchat topic these days among aviation people. Is TIA really becoming congested? It seems crowded but not to the extent that TIA cannot handle. There are 27 international and 12 domestic airlines operating their air services from this airport. Yes there are only 9 international aircraft parking aprons and sometimes it is congested but one should look for the reason behind this. Most of the airlines have got favourable slot for parking as they want. The chain effect of that slot timing goes up to car parks. It is ridiculous to say that 30 international flights can make TIA congested when it has 9 international parking bays and operates 18 and half hours a day. Basically, if we assign one and half hours turnaround time for each international aircraft, we can accommodate more than a hundred aircrafts a day on the parking bays. TIA has a single runway of 3050m long for different types of fleet from DHC6 to Boeing 777 and each flight is counted a single flight every day, no matter whether it is 16 seated Twin Otter or 319 seated Boeing 777 aircraft. They are treated equally as one single traffic as per the prevailing rules of the air. In 2010 TIA handled 19417 international

Air Traffic Trend in Tribhuvan International Airport

Year	International	Growth (%)	Domestic	Growth (%)	Total	Growth (%)	2006 vs 2010	
2006	11057		61291		72348		**International**	**Domestic**
2007	11899	7.62%	65443	6.77%	77342	6.90%		
2008	14276	19.98%	69286	5.87%	83562	8.04%		
2009	14228	-0.34%	6995	8 0.97%	84186	0.75%		
2010	19417	**36.47%**	79875	**14.18%**	99292	**17.94%**	**75.61%**	**30.32%**

flights/ 236558 passengers and 79877 domestic flights/ 1554701 passengers. It shows that flight-passengers ratio in international flights is 1:125 whereas in domestic flights it is only 1:19. The current international terminal is able to handle 1,350 Per Hour Passenger (PHP) with adequate level of service and it is good enough to handle such volume of passenger if managed efficiently.

It means that the reason for airports being congested is the domestic air traffic and the frequencies being used. If we try to reduce the number of flights from domestic operation, we need to use big fleet instead of small ones. Alternate of TIA were explored several times and infrastructures in airports were added to deal with congestion. Gradually, because of increasing urbanisation of Kathmandu, TIA is moving towards the centre of the city. Kathmandu is administrative and business centre of country therefore people want to move to Kathmandu. If we start to build a second international airport today, it may take another 10/15 years to get ready for flights. It will probably commence flights on 2022/2027. It is a fact that TIA is the only international gateway for the next decade. Therefore it is unavoidable that priority should be on international operation rather than in expansion of domestic operation.

Most of the domestic airlines want to have their operating base at TIA and the reason is obvious from airline business point of view. About 100 of mountain (view) flights are operated early in the morning from TIA and if schedule time is shifted due to bad weather, it hampers other flights. These flights originate from and make final landing at TIA. Hence, a single flight makes TIA busy twice early in the morning and it impacts international flights. Similarly, most of the international flights are concentrated during midday. It might be the reason of connecting flight to their hub, unpredictable weather of Kathmandu or the strict operating policy of the airlines.

It is important to systematically manage the annually increasing figure of the airlines, aircraft and passengers arriving from many parts of the world at TIA. It is an inevitable truth that a major fraction of national economy is based on remittance and till date the country's job market is too small to accommodate all unemployed people & those who work abroad. Their movement raises the number of air passengers, thus airlines are increasing their flight in terms of size and number of fleet. Similarly, government has been launching different types of national activities as Visit Nepal Year, Nepal Tourism Year, Lumbini Year etc. to increase the tourist flow into the country. All these activities increases the number of air travellers and ultimately air traffic.

Approach path of TIA has always been a concern for the airmen and aviation authority, airlines and other concerned agencies. They have continuously been exploring the advancement of the approach procedures and new technology to deal with this. Now, it seems that adoption of Performance Based Navigation System could simplify some portion of existing abrupt approach. The achievement of procedures may attract new airlines to the country

opening new gateway for the air travellers.

Again talking about domestic flights, previously there were few airports that could operate in all weather and had all size of fleets. But time has changed and most of the airports located in the south of the country have been developed and strengthened. They can handle medium size of aircrafts for the domestic air operation. Hence, it is time to talk about operating moderate type of aircraft on domestic trunk-route operation. It is already carried out by the major domestic airlines by using their Jet Stream, ATR types of bigger propeller aircraft. Thus, if airlines operate big aircraft in TIA and use their small aircraft from regional hub to the remote destination, it will loosen the congestion at TIA. Ultimately, TIA will face the less small aircraft congestion.

Air Traffic Controllers working at TIA have repeatedly raised the issue of on on various platforms and it is unavoidable. Likewise airlines frequently have been complaining about aircraft holding longer in the air and on the ground as well. Such issues are directly concerned to the safety of the air traffic and cannot be compromised at any cost. Hence the voice of controllers and airmen should be immediately addressed to keep away from any unwanted disasters.

CAAN is solely an autonomous organisation and any business like organisation cannot ignore beneficial venture. It generates income of more than 90 percent from TIA. TIA earns more from international operation than from domestic air operation. It has obligation of operating social airports, repay the loan taken on former DCA and for the development of new airports. It is a fact that to get such resources CAAN needs to emphasize on international air operation.

To have TIA remain uncongested the following should be done on short term, medium term and long term basis. It can be done in consensus with air operators. Bureaucratic and political commitment is equally necessary to implement these steps.

Short term:

Operating base of the domestic airlines should be shifted from the TIA to other hub airports. Mountain flights and maintenance check from the TIA should be minimized and it should be partially shifted to Pokhara and Biratnagar airports. It increases the touristic as well as economic activities of those places. TIACAO can offer international flights during that time. Operation of moderate size fleets on domestic trunk route can minimize the frequency of small aircrafts at TIA and it reduces air/ground congestion. Government has started to operate 24 hours city transport services in Kathmandu; hence it is easy for air passengers to get into airport easily. So, domestic airlines can use their trunk route operation in off peak hours. CAAN has been strengthening its domestic hub airports by well equipped night

operation facilities.

Medium term:

Slot management of TIA is quite essential on issuance of permission to every new airline or flight. Prevailing slot distribution should be redistributed. Ramechhap airport should be developed as cargo base for Tenzing-Hilary, Phaplu and Syangboche airports. Thus the domestic cargo handling can be minimized. Limited number flights for STOL should be operated from TIA as it will reduce the congestion and increase the activities on other airports eg. Biratnagar, Nepalgunj, Bhairhawa. Most of the flights for STOL airfield operating from TIA should be operated from nearby airports such as Ramechhap, Jiri. On ADB's Loan Assistance, the runway of TIA is going to be extended towards south and a type of approach light on northern side will be added. It will definitely help ATS/Airmen for simultaneous runway operation. A rapid exit taxiway is to be constructed to clear the runway after landing on shortest time.

Long term:

It seems that a fully independent military airport is needed for military exercise and it should be built separately or be managed with airports which are not in public uses. Private sector can be involved to explore and build an alternate domestic airport nearby TIA under the Public Private Partnership as the provision made by Aviation Policy 2063. Ultimately, a full phased Second International Airport should be built to distribute the international air traffic.

Manager, CAAN Head Office

SLOT Management in TIA

Raj Bahadur Maharjan

A slot allocated under the scheme permits a specified aircraft movement at a specified time, on a specified day. All commercial, charter and private aircraft require a "slot" to land or takeoff at Tribhuvan International Airport, Kathmandu.

As only one aircraft can land or depart from a runway at a time, and because aircraft must be separated by a specified time to avoid collisions, every airport has its own capacity; so it can handle certain number of aircraft per hour. This capacity depends on many factors, such as the number ofÊÊavailable, number of parking bay available, layout of taxi tracks, availability of air traffic control, and current or anticipated . Especially, weather can cause large variations in capacity because strong winds may limit the number of runways available, and poor visibility may necessitate increases in separation between aircraft. Air traffic control can also be limiting, there are only a certain number of aircraft an air traffic control unit can safely handle. Staff shortages, radar maintenance or equipment faults can lower the capacity of a unit. This can affect airport, air traffic control as well as en-route.

When an air traffic control unit that will control a flight reaches its highest capacity, arriving aircraft are directed towards where they circle until it is their turn to land. Because aircraft flying in circles is an inefficient and costly way of delaying aircraft, it is preferable to keep them on the ground at their place of

departure, called at. This way, the delay can be waited out on the ground with engines off, saving considerable amounts of fuel. Obviously, careful calculation of en route time for each flight (and the effect of current wind upon it) and traffic flow as a whole is needed which is highly dependent on.

Each airport and air traffic control sector has a published maximum capacity. When capacity exceeds, measures are taken to reduce the traffic. This is termed regulation. The aim is to utilize capacity effectively, keeping the average delay as low as possible, while ensuring capacity is not exceeded.

Calculated Take-Off Time (CTOT), is also known as *slot time* or simply *slot*. The *slot* is actually a period of time within which take-off has to take place; in Europe it is defined between -5 and + 10 minutes from CTOT. The aircraft is required to be at the runway, ready for departure at its CTOT, the leeway is forÊÊto integrate the aircraft into the other traffic.

For the purposes of airport coordination, airports are categorized by the responsible authorities according to the following levels of congestion:

a) **Level 1**: airports where the capacity of the airport infrastructure is generally adequate to meet the demands of airport users at all times.

b) **Level 2**: airports where there is potential for congestion during some periods of the day, week, or season which can be resolved by voluntary cooperation between airlines. A facilitator is appointed to facilitate the planned operations of airlines using or planning to use the airport.

c) **Level 3**: airports where capacity providers have failed to develop sufficient infrastructure, or where governments have imposed conditions that make it impossible to meet demand. A coordinator is appointed to allocate slots to airlines and other aircraft operators using or planning to use the airport as a means of managing available capacity.

Why have a Slot Management ?

The management of airport slots is required at some airports where the available airport infrastructure is insufficient to meet the demand of airlines and other aircraft operators.

1) To minimize the Aircraft parking bay problem,

2) To ensure that the peak hour movements can be managed in a non- discriminatory and efficient manner.

3) Without a planning mechanism for runway and apron movements at the airport, congestion would increase, imposing a significant cost on airline operators (e.g. increased holding patterns), airline passengers (e.g. delayed arrival or departure), the airport operator (e.g. inefficient use of the infrastructure) and the community.

4) The Slot Management scheme is delivering for airport:
   - less clustering of flights in airline's schedules;
   - greater predictability for investment;
   - reduced time spent by Airservices;
   - less fuel wastage leading to savings in costs and reduced emissions; and
   -airlines rescheduling movements to improve the balance of arrivals and departures at certain peak times.

5) Airport management and the airlines to take ownership of the problem of slot management, and the solutions.

Tribhuvan International Airport (TIA) has constraints in different sectors. It has hostile terrain all around, congested airspace, typical single runway and taxiway layout, limited bays, congested terminal and limited facilities in terminal building. Besides these facts, almost all the airlines (schedule operator) intend to operate their flights during day time only. Therefore it is very difficult to allocate slots, approve schedules and give permission to charter and private flights. It remains a matter of great discussion in TIA slot management committee. The members of slot advisory committee have been doing their best to advise to allocate slot by analyzing different related components.

The formation of TIA slot management committee is as follows:

1. General Manager TIACAO - Co-ordinator
2. Director, Flight Operation Department, TIACAO - Member
3. Director, Airport operation and facilities department, TIACAO - Member
4. Deputy Director, ATS/SAR Division, TIACAO - Member
5. Deputy Director, GFS Division, TIACAO - Member
6. Chief Station Manager, Nepal Airlines corporation - Member
7. Chairman, Airlines Operator Committee, Nepal (AOC-N) - Member
8. Representative, Airlines Operator Association of Nepal (AOAN) - Member
9. Manager, Flight Schedule and Permission Section, CAAN HQ - Member
10. Manager, Flight Permission Section, TIACAO - Member secretary

The committee has a limited authority, It recommends the slot time and ultimate decision will be made by Civil Aviation Authority Of Nepal (CAAN), Head quarter.

Reference: IATA Publication, Sydney Airport Demand Management, Visit report of Hongkong and Dacca Airport.

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Manager, TIACAO

Nepal's Path to Tourism Development

Sunil Sharma

Introduction

International tourist arrivals have shown positive trend both in 2010 and 2011. International tourism grew by almost 5% in the first half of 2011 totaling a new record of 440 million arrivals. Growth in advanced economies (+4.3%) has maintained strength and is closing the gap with emerging economies (+4.8%), which have been driving international tourism growth in recent years. At the projected pace of growth, it will reach the 1 billion mark by 2012, up from 940 million in 2010. By 2030, the number is anticipated to reach 1.8 billion meaning that in two decades' time, 5 million people will cross international borders for leisure, business or other purposes such as visiting friends and family every day, besides the four times as many tourists traveling domestically.

There will also be much change beyond the numbers. Future arrivals will be spread more widely across the globe; the share of international tourism to emerging economies will surpass that to advanced ones, and many of the new arrivals will be to destinations in Asia, Latin America, Central and Eastern Europe, Africa and the Middle East. According to the United Nations World Tourism Organisation, the growth of international tourist arrivals will be propelled by Asia and the Pacific region. The current forecast for the arrival growth rate for 2011 is between 5-6 percent. Hence, every country in the region is working hard to get lion's share of international tourist arrivals and Nepal is not left far behind. The currently favourable

political situation in Nepal has provided a strong base for the development of the tourism industry.

Tourism in Nepal is a priority sector and mainstay of Nepal's economy, generating US$ 329 million tourism revenue in 2010 and attracting over half a million foreign visitors (509,956 in 2009 and 602,867 in 2010). The last eleven months (Jan-Nov, 2011) have seen consistent healthy growth of international tourist arrivals to Nepal at an average of +21.5%. With 58,156 visitors in the month of November 2011, the total number of visitors between January and November 2011 has reached to 501,264, the ever highest number in tourism history of Nepal.

Nepal Tourism Year 2011 Campaign

The year 2011 saw people of all walks of life united to celebrate the national campaign, Nepal Tourism Year 2011 (NTY2011) under the themes: *Together for Tourism - Tourism for Prosperity and Prosperity for Stability*. This campaign was formally inaugurated on January 14 in the capital city of Nepal, Kathmandu, by Rt. Hon'ble President of Nepal amidst the audience of 35,000 with big fanfare in the presence of all major political parties of Nepal, Tourism Ministers and representatives from 13 Asian countries, Secretary General of United Nations World Tourism Organization, Dr. Taleb Rifai, Foreign diplomats in Nepal, more than 50 international media, high ranking officials, artists, sportsmen and women and people from different professions. The inauguration was quickly followed by Asian Tourism Ministers' Conclave where Dr. Rifai's expressed tourism's capacity to strengthen the economy and a major factor for binding a society. Prior to inauguration, NTY 2011 was formally launched on February 26, 2010 by the then Prime Minister Madhav Kumar amidst the fanfare. He launched the formal beginning of NTY-2011 by lighting a peace lamp brought from Lumbini at the Army Pavilion in Tundikhel, Kathmandu, Nepal. The main highlight of the launching was that the leaders of 19 political parties reiterated their commitment to refrain from any strike that could affect the tourism year. Likewise, representatives from tourism and trade association showed their commitment by pledging to make the campaign a big success and avoid any kind of strike in 2011 to maintain peace and security.

The NTY 2011 campaign has given clear message to the world: Nepal has embarked on peaceful and stable situation and tourism sector has been one of the vehicles of economic transformation in the nation. Therefore, the objectives are set accordingly: establish Nepal as a choice of premier holiday destination with a definite brand image; improve and extend tourism related infrastructures in existing and new tourism sites; enhance the capacity of service renders; build community capacity in the new areas to cater the need of the tourists; and promote domestic tourism for sustainability of the industry. The quantified targets are: one

million annual international arrivals; dispersal of at least 40% of the international tourists into emerging and new tourist areas; encourage additional investment on tourism infrastructures; and develop mechanism to record domestic tourism activities. The coordination for infrastructure enhancement and development, product improvement and expansion, domestic as well as international publicity, enhancement of community capability and up-gradation of service quality and others have been most important agenda for the NTY 2011 campaign.

Most of the critiques have tied the success and failure of NTY 2011 solely on quantified target of one million tourists. The NTY 2011 campaign was launched to reestablish Nepal as a premier holiday destination in the international tourism map. Further, the campaign has clearly stated the dispersal of tourists to new destinations in Nepal to spread the benefits of tourism to the people across the country indicating the tourism industry's exigency to organize a tourism promotion campaign having wider impact. In other words, the campaign envisioned regional development through tourism supported by well-developed network of infrastructure. The NTY 2011 campaign is instrumental to look for new tourism products.

New Tourism Products

The Great Himalaya Trail

Hardcore trekkers have new reason to visit Nepal, with the launching of the 1,700 km trail called the Great Himalaya Trail (GHT). According to the GHT official website, the GHT is one of the longest and highest walking trails in the world. Winding beneath the world's highest peaks and visiting some of the most remote communities on earth, it passes through lush green valleys, arid high plateaus and incredible landscapes. The GHT has 10 sections comprising a network of upper and lower routes, each offering something different, be it adventure and exploration, authentic cultural experiences, or simply spectacular Himalayan nature. In other word, the GHT is a network of existing treks and trails which together form one of the longest and highest walking trails in the world. Lonely Planet has chosen the GHT as one of the world's best long walks for 2011. It states "the GHT spans the , passing rhododendron forests, high-altitude lakes, 8,000m peaks and the remote communities that call them home – providing vital income and support. Do the lot in 160 days, or choose one of ten tantalising sections".

The trail goes through the Kanchenjunga region in the east linking the Makalu and Everest regions en route to showcasing the rich ethnic and geographical tapestry of Nepal. One can view the splendid snowcovered peaks of Lhotse, Everest and Makalu range. The spectacle enchants every viewer. Further to the west of the Everest region is Rolwaling Valley

and in between these two valleys is Tashi Labsta pass which is a real challenge for climbers.

Thereafter the trails arc across the Langtang region and onto the Manasalu region, offering unimpeded views of the Himalayas to the north. After this slog, it's on to the Annapurnas range and after crisscrossing it there's Dolpo, famous for its pristine landscape and Shey Phoksundo Lake. This remote and sparsely vegetated region is part of the Tibetan Plateau. The trail then moves further uphill to the western region encapsulating Rara Lake; a rarely trekked area noted for its rich biological diversity. Finally, the trail winds up at Humla in the far west of Nepal along the upper reaches of Karnali River.

One should remember that there are many passes in between the GHT connecting different valleys and spectacular regions and some of these passes are well over 5,000 metres. The undulating mountains look as they have been stitched together and they are punctuated by occasional passes and interspersed by verdant valleys. Undoubtedly, the GHT is the ultimate physical and mental test for even the most hardcore adventure traveler. In short, there are many unexplored areas in Nepal to be explored, with a cornucopia of creatures and a quilt of exotic cultures.

Namje, New Trekking Trails and Home-Stay

CNN under the category of '12 best places you've never heard of 'has listed Nepal's Namje giving good promotion to Nepal. Namje is situated in Eastern part of Nepal with the majority of Magar people. The Nepal Tourism Board (NTB) in association with Trekking Agencies Association of Nepal also launched four new trekking trails - Nagi-Narchyang trail from Myagdi to Parbat district, Dhorpatan trail in Myagdi to Baglung district, Panchpokhari trail in Sindhupalchowk district and trekking trails in the lower Solukhumbu.

Tourism can sustain if local people have say in it and tourism benefits are shared among the people. Tourism provides opportunities to people to participate in tourism-related business. In order to get benefit out from tourism, Home-stay programme has been initiated in different part of Nepal. For example, tourism awareness has helped community to start home-stay in Bhada Home-stay at Urma VDC, Kailali district run by Tharu community; Home-stay run by Shiva Community in Bardia district; Chitlang Home-stay, etc. Here the Shiva community is worth mentioning as it has devised an innovative method to deal with dangers of wildlife. The Shiva community learnt that soothing green mint leaves and the daisy-like white chamomile flowers drove mega herbivores like rhinos away with just their smell. Also, the two plants were found to be high-valued cash crops. For their efforts, BBC World Challenge 2011 has short-listed the Shiva Community Forest's project as one of the top 12 projects from around the world that

demonstrate enterprise and innovation at the grassroots level and help in social and environmental benefits. Thus, Home-stay has given opportunities in engaging people economically and socially in the development process. However, it requires capacity-building programmes to provide skills, technical know-how, and venture capital fund to start and operate Home-stay or small-scale tourism enterprises.

Conclusion

Tourism development has been an integral component of economic development strategies of Nepal, as it is main source of foreign exchange earnings, creating new jobs, increasing tax revenues and therefore tourism has been considered as an engine for macro-economic growth. Nepal has an impressive tourism product (nature-based products, mountains, trekking etc.), with incredible opportunities for growth, yet it faces a magnitude of challenges. Nepal has some structural handicaps that hinder the development of a tourism industry for mountain development and poverty reduction. Key structural handicaps include: limited infrastructure development, lack of integrated development, weak market linkages, and low supply side capacities. Steps have been initiated in various ways to address the structural handicaps. Building on the lessons learned from tourism development activities, policy and institutional mechanisms need to be put in place, to encourage local participation in the design, implementation and management of tourism projects and local use of tourism resources. Tourism can generate major opportunities for Nepal, if the destination is managed properly through strong institutional linkages; provision of training, marketing, credit; technical and financial support for local entrepreneurs; improve access to services and infrastructure; and development of community income through tourism-based activities.

Research, Planning & Monitoring Dept., NTB

Development of New CNS/ATM Concepts and Scope of GNSS Augmentation System

Birendra Joshi

General:

In 1940s ICAO established international standards for air navigation systems in order to ensure safety, regularity and efficiency of air transportation. And, in 1991, ICAO announced the concept of new CNS/ATM systems and recommended States to carry out development of the sub systems and proposed the standards due to numerous problems caused by service limitations and considerable drawbacks of the conventional systems. These conventional systems have limitations and problems like line of sight propagation, difficulties in implementation in different parts of the world, lack of digital air ground data interchange systems and necessity of much budget for installation and maintenance.

Conventional systems consist of:

- Communication: VHF radio for short range, HF radio for long range

- Navigation: Ground based systems such as VOR, DME, NDB and ILS

- Surveillance: ASR, SSR (Mode A/C) and position report by radio

Hence, ICAO developed concepts of the New CNS/ATM Systems as shown in the table

Table (1)

ICAO Concept of New Communications	
Present	**New**
? Short range mobile communication ? -VHF radio voice	Short range mobile communication -VDL mode 1,2,3,4 and Mode S
? Long range mobile communication ? -HF radio voice	Long range mobile communication -HF data link, AMSS
? Fixed communication -Not integrated networks (AFTN, Direct speech line)	?Fixed communication -AMHS, AIDC
	? ATN (Aeronautical Telecom Network) -AMHS, AIDC, VDL, Mode S, AMSS

Table (2)

ICAO Concept of New Navigation	
Present	**New**
? Short range and landing navigation - VOR, DME, NDB, INS	? GNSS - Positioning Satellite System
? Long range navigation - Loran, INS	: GPS, GLONASS, GALILEO - Augmentation System
	: ABAS, GBAS, SBAS, GRAS - GNSS receiver

New CNS/ATM Systems:

The new CNS/ATM systems have distinct features. It has a combination of satellite and ground-based systems providing a global coverage.

- It provides seamlessness and easier integration and interfacing.
- It employs air to ground data link and digital technologies.

Global Navigation Satellite System (GNSS)

Satellite-based positioning is the determination of position of observing sites on land or at sea, in the air and in the space by means of artificial satellites. The immediate predecessor of today's modern positioning systems is Navy Navigation Satellite System (NNSS), also called Transit system. This system was conceived

in the late 1950s and developed in 1960s by US military, primarily, to determine the coordinates and time of vessels at sea and for military applications on land. The civilian use of this satellite system was eventually authorized, and the system became used worldwide both for navigation and surveying. However, the NNSS had two major shortcomings i.e., large time gaps between two satellite passes and low navigation accuracy. The navigation system with time and ranging (NAVSATR) Global Positioning System (GPS) was developed by US military to overcome the shortcomings of the NNSS. In contrast to these systems, GPS answer the questions "what time, what position, and what velocity is it?" quickly, accurately, and inexpensively anywhere on the globe at any time. Presently there are four types of GNSS: (i) GPS (Global Positioning System), (ii) GLONASS (Global Navigation Satellite System), (iii) Galileo, and (iv) Compass/Beidou. They are either already operational, or under construction. The GLONASS is the Russian counterpart to American GPS and is operated by Russian military. Galileo is the European contribution to the future GNSS. A Chinese system called Compass, which is the evolution of the first-generation regional system Beidou, is presently under development stage. GPS has been developed by the US Department of Defense (DoD), and is operated by the US Air Force (USAF). The first satellite was launched in February 1978.

GPS Satellites Constellation:

Fig. 1 ? Number of Satellites- 29 satellites on 20,000km orbits ? Function- provide accurate position, time information all over the world ? Position errors-P code: 7m-Civil code: 10-20m

Various generations of GPS satellites are Block I, II, IIA, IIR, IIR-M and currently IIF. The ground-segment of GPS consists of six stations (worldwide), and one at Cape Canaveral of USA. GPS is fully operational, currently even with 30 satellites, instead of the nominal twenty four. GPS is in full operation since more than one decade. Therefore, it is natural that on the one hand further technological advances occurred and on the other hand demand for even better performance with respect to applicability

and accuracy arose. The need for improvement was driven from both the military and civil interests and requests. Beyond these arguments also competition is an issue since systems of other countries like the European Galileo or the Chinese Compass/Beidou system showed clearer contours, features, and developmental time schedules. On January 25, 1999, the GPS modernization program was announced officially, aiming at the objectives to satisfy the requirements mentioned. The modernization affects the space and the control segment and, specifically, the GPS signals. According to GPS modernization plan, a block IIF satellite was launched in May 2010, and GPS block III satellites are scheduled from 2013 onwards. The GLONASS has been built to the order of the Russian Ministry of Defense. The first satellite was launched in October 1982. Since fall 2003, 2nd generation satellites (GLONASS-M) are being launched. The first 3rd generation satellites (GLONASS-K) were launched on February 26, 2011. The ground-segment of GLONASS consists of 12 stations in Russia and Africa. GLONASS is currently operational (27 satellites, of which 23 are active, and 4 are temporarily switched off). Current plans mention 30 satellites in 2011. The Galileo system is being developed by the European Commission (EC) and the European Space Agency (ESA). Once operational, with 30 satellites, expected in 2014, the system shall be operated and maintained by the Galileo Concessionaire. A first prototype satellite was launched in Dec. 2005 (GIOVE-A). The ground-segment of Galileo will consist of a worldwide network with about 40 stations. The Compass system is being developed by the Chinese government. As a precursor the Beidou system is used. The Compass system is expected to be operational by 2012. Compass will consist of 27 middle earth orbits (**MEO**) satellites, supplemented by 5 geo-stationary satellites, and 3 inclined geo-synchronous satellites, positioned above South-East Asia (total 35 Compass/Beidou satellites). The first MEO-satellite was launched in April 2007. The Quasi-Zenith Satellite System (**QZSS**), developed by Japan, provides a regional satellite navigation service in East Asia and Oceania. QZSS was designed to provide position service in urban canyons and mountainous environments. The first QZSS satellite was launched on September 27, 2010.

GNSS Augmentation System:

In order to improve the accuracy and integrity of GPS stand alone, the differential GPS (DGPS) technique was developed in the early 1980s. The concept of DGPS is based on using the correlation in ranging errors between a reference station receiver and DGPS user receivers to eliminate co-existing ranging errors in the user ranging measurement. Usually DGPS applications require a surveyed location for the reference station. This reference station estimates the slowly varying measurement errors and forms a ranging correction for each satellite in view. The

correction data is broadcasted to all DGPS users in an operational service radius centered at the reference station. This differential correction greatly improves accuracy for all DGPS users within the service radius. However, there are some limitations to DGPS. As the reference station is geographically separated from the user, these corrections are not the exact corrections for users' ranging errors. The differences between reference ranging corrections and user ranging errors are called differential ranging errors. The **Ground Based Augmentation System (GBAS) is an example of utilizing the DGPS concept**. The **GBAS is an aircraft precision landing system with the objective of replacing the current Instrument Landing System (ILS)**. The Federal Aviation Administration (**FAA**) developed the GBAS system under name of Local Area Augmentation System (LAAS). Another example of DGPS concept is Satellite based augmentation system (**SBAS**) which is wide-area augmentation system (**WAAS**), the European Geostationary Navigation Overlay Service (**EGNOS**), the Japanese Multifunctional Transport Satellite (**MTSAT**) space-based augmentation system (**MSAS**), or the India's GPS and Geo-augmented Navigation **(GAGAN)**. The WAAS has been developed by FAA. The WAAS signal was made available for non-safety-of-life applications in 2000. The initial operational capability (**IOC**) started in July 2003. The WAAS currently relies on the service of three leased geostationary satellites positioned at 98° W, 107° W, and 133° W latitude. There are 38 wide-area reference stations throughout North America (in Canada, Mexico and US, including Alaska and Hawaii) and Puerto Rico. On June 18, 1996, a formal agreement between the members of the European Tripartite Group was the kickoff of EGNOS. First experimental signals have been emitted starting in 2000. The IOC has been declared in July 2005. The GNSS signals are processed at 34 receiver integrity monitoring stations. Japan's space-based augmentation system (**MSAS**) is payload of the **MTSAT**. MTSAT are owned and operated, respectively, by Meteorological Agency and the Japanese Ministry of Land, Infrastructure, and Transport. The 1st geostationary satellite was launched on February 26, 2005. The 2nd followed on February 18, 2006. The Indian Space Research Organization in collaboration with the Airports Authority of India implements India's SBAS GAGAN. The first geostationary satellite of India was to be launched in May, 2011 and located at 83° E latitude.

ICAO has recommended for the use of **GNSS** as well as the current navigation aids. This system is based on GPS, GLONASS and the augmentation systems to provide better performance. For the standardization of the system, ICAO provided the technical standards for GPS, GLONASS, SBAS and GBAS, and advised each country to develop and to utilize the system. ICAO SARPs on GNSS was adopted by the ICAO Council under the provision of Convention (6th Edition, July, 2006). There have been numerous researches

to guarantee the required navigation performance of the **CNS/ATM** sub-systems (GBAS, SBAS etc.) mainly in the accuracy or integrity aspect. GNSS is expected to support all phases of flight and aerodrome surface operations; however, present **SARP**s provide for en-route, terminal, approach and landing operations down to **CAT**- **I** precision approach.

Refernces:

1. GNSS, ICAO-KOICA Joint Training doc/ Rep. of Korea
2. ICAO SARPs of GNSS/Standards Ch.3, 3.7 of ICAO Annex 10, Vol. I

Manager, TIACAO

Challenges of Aviation Security

Nabin Prasad Acharya

As we know, the aviation industries are playing a major role in world economic activities and remaining on of the fastest growing sectors of the world economy. In our context , Aviation industries are playing a vital role for the economic and tourism development and still air transport is being a major means of transportation for the remote hilly region . In Nepal, when the formal beginning of aviation was started in 1949, at that moment Aviation security was really a new subject. With the chronological development of civil aviation, aviation security has been a concern for us.

For the security of general people and property, on the preamble of Chicago Convention, it is mentioned that "International Civil Aviation can greatly help to create and preserve friendship and understanding amongst the nations and people of the world, yet its abuse can become a **Threat** to general security.

As per definition; Aviation security is a combination of measures and human and materials resources intended to safeguard international civil aviation against acts of unlawful interference. So the primary objective of Aviation security is to safeguard aviation (passengers, crew, ground staff, and assets) and the general public against acts of unlawful interference within the

confinement of an aerodrome or during flight. This scope also involves the protection of aircrafts, air navigation infrastructure and facilities serving the aviation.

Terrorism has no geographical limits and has existed since decades. It will never really stop being in scene throughout global human struggles.

Threat to civil aviation creates uncertainty and affects safety, security and regularity of air transportation.

Before the unbelievable devastating terrorist attack of September 11, 2001 Security threat to aviation industries were limited to

1. Act of Unlawful Seizure
2. Act of attempted seizure
3. Sabotage of aircraft /airport
4. Act of in -flight attack
5. Act of facility attack
6. Act against the safety of civil Aviation

In the following years of terrorist attack of 9/11, the emerging challenges of aviation security are pointing out with

1. Attacks aimed at causing human casualties on a large scale ;
2. Attacks against a symbolic target in a geographical location
3. Readiness for suicide committers
4. Increased use of media to publicize the attack and frighten general people , generate support
5. Use of Aircraft as weapons of mass destruction
6. Use of Liquids , Aerosols,(Aerosol spray) and Gels
7. Use of Dangerous Goods
8. Cyber and electronic attacks

In this scenario, after the event of 9/11, ICAO passed Assembly Resolution A 33-1, Declaration on misuse of civil aircraft as weapons of destruction and other terrorist acts involving civil aviation, A 33-2 Consolidated statement of continuing ICAO policies related to the safeguarding of international civil aviation against acts of unlawful interference, As a party to the Chicago Convention, Nepal has fully supported the ICAO Assembly Resolution.

Aircraft hijacking case in Nepal:

In the Aviation history of Nepal, the first hijacking case (also known as the Biratnagar plane hijack) was on June 10, 1973, when three members of the Nepali Congress party hijacked Royal Nepal Airlines Twin Otter aircraft bound to Kathmandu from Biratnagar. Within five minutes of take-off, they forced the pilot to land the plane at Forbesganj, Bihar, in India and robbed 3 million Rupees that belonged to the Nepalese government.

The second hijacking case was that I have still remembered, it was on Friday, December 24, 1999, I was in duty as a young Air Traffic Controller in Area Control Centre Kathmandu. The Indian Airlines

flight IAC 814 ,Airbus A300 with 176 passenger en-route from TIA Kathmandu to Delhi departed from Kathmandu at around 17:00 local time ,the aircraft was supposed to report Bhairahawa (BHW) at 17:25 but we did not receive the reply from aircraft , later on around at 17:30 local time we received the information from Venares hotline that the aircraft had been hijacked ,on receiving this information we were strangely afraid because it was unexpected for us . We informed this emergency message to our chief and after some minutes this message had been changed to head line news all over the world. After the touch down of the aircraft in Amritsar, Lahore and Dubai, the hijackers forced the aircraft to land in Kandahar Afghanistan. The hijacking lasted for seven days and ended after India released three militants.

Besides these two cases, our aviation security is facing the challenge of fake information, like bomb threat, except this we have no other hijacking case related with people and property.

In Nepal , The challenges in Aviation Security are:

1. Traffic volume increase
2. Fast technology development
3. Threat evaluation
4. Implementation cost
5. Application of controls

ICAO- the global forum of civil aviation is playing a leading role and uniting all contacting states through security related Standards and Recommended Practices and states ensure effective implementation of their national security with requirements in compliance with the SARPs.

ICAO Security Convention

1. The Tokyo Convention, 1963 - Convention on offence
and certain other acts committed on board aircraft.
2. The Hague Convention, 1970- Convention for the suppression of unlawful seizure of aircraft (hijacking convention).
3. The Montreal Convention, 1971 – Convention for the suppression of unlawful acts against the safety of civil aviation (sabotage convention).
4. Montreal Protocol, Montreal, 1988 - Protocol supplementary to the Montreal convention for the suppression of Unlawful acts of violence at airports serving international civil aviation
5. Montreal Convention ,1991 – Convention on the marking of plastics explosives for the purpose of detection

Nepal has already ratified the Tokyo Convention, 1963, The Hague Convention 1970, and Montreal Convention 1971.

ICAO security program:

1. ICAO Security Manual (Doc 8973/5)
2. Annex 17 –Adopted in 1974, 7th ed,2002
3. Aviation Security panel- Experts nominated by 15 states and 4 international

organizations.

International agencies involved in Aviation security are;

1. ICAO
2. ACI (Airports Council International)
3. IATA (International Air Transport Association)
4. INTERPOL (International Criminal Police Organization
5. WCO (World Customs Organization)
6. IFALPA (International Federation of Airline pilots' Associations)
7. UPU (Universal Postal Union)

Aviation security related legal documents Of Nepal

1. Civil Aviation Act ,2015 (Amendment 2053)
2. Civil Aviation Rules , 2019 (Amendment 2058)
3. Aviation Security (management) Rules , 2064
4. National Aviation Security Program.

Conclusion:

People, Equipment and Policies are the main 3 pillars of Aviation Security, in our scenario, to strengthen aviation security we need comprehensive legal foundation and effective implementation of advanced technologies. We should have most reliable and advanced aviation security system to cope the emerging challenges.

Reference;

KOICA-ICAO fellowship Program Annex 17 Aviation journals, CAAN documents

Manager, TIACAO

Circadian Effect to Controllers

Murari Prasad Paudel

Due to the rotation of earth, there are 24 hours in a day. Day is the time to work and night is the time to rest or sleep. **B**esides that there is certain time for eating and of course for toilets. Our body reacts according to its own biological clock. This is called circadian rhythm. It is natural and biological process. What happens if we work at night and sleep at day, similarly if we postpone or make early schedule for eating and toilets? If we go against body's natural process, this rhythm will be broken directly affecting human body. So it is called circadian effect.

Air Traffic Controllers work 24 hours a day as they need to work in a shift. Rotating in a shift, they must go through irregular natural body's process. They sleep sometimes at day and sometimes at night; similarly they go to toilets sometimes at morning and sometimes at midday, and same is the way of their feeding. Not to forget that all social activities will take place at day. If we suppose, controllers are human beings, and they have social and family life then how can they manage all of those being an active controllers?

A circadian rhythm is roughly 24 hour cycle in the physiological process of living beings, including plants, animal, fungi and cyanobacteria in a strict sense, circadian rhythms are endogenously generated, although they can be modulated by external cues such as sunlight and temperature. Circadian rhythms are important in

determining the sleeping and feeding of all animals, including human beings.

There are clear patterns of brain wave activities, hormone production cell regeneration and other biological activities linked to this daily cycle. The human body works according to a natural 24 hours sleep/wake cycle also referred to as a circadian rhythm, which controls body temperature, sleep/wake timing, and the way our organs and body system work together. Past research has shown that irregular sleep patterns and shift work take a toll on even the healthiest person over an extended period.

It is true; of course, we can adjust our time schedule with the help of alarm clock but our biological clock takes longer to adjust. That's because our internal clock is very tightly wound to many physiological behavios.

Shift work disrupts the body's natural circadian rhythm, which plays an important role in regulating levels of hormones. That affects not only how long or well people sleep in the short term, but it can also lead to health problems down the line, including cancer. A 2010 of female shift workers found that those who worked overnight were 50% more likely to receive a breast cancer diagnosis than those who worked during the day. There is very solid evidence showing that shift work disrupts circadian rhythms, and that has an effect on tumor genesis, heart disease and other conditions.

The effect of shift work is so well known that in 2007, the International Agency for Research on Cancer, the cancer arm of the World Health Organization, overnight shift work to its list of probable carcinogens. And in several countries, such as Sweden and Denmark, people who have worked the night shift for 20 years or longer are compensated better in retirement than other shift workers. Denmark also was the first country to pay government compensation to women who develop breast cancer after long spells of working at night.

Melatonin is a hormone, which is found in humans. Melatonin plays an essential part in regulating the circadian cycle. Melatonin is made via the pineal gland, a pea sized gland located in the brain center. Melatonin is also known as the hormone of darkness. The reason for this is Production of melatonin via our pineal gland is permitted by darkness as well as inhibited by light. The discharge of melatonin and its level in our blood comes to a peak during the middle of the night and steadily decreases throughout the latter half of night.

Studies have shown that late night shift work may be considered a cancer-causing agent. Melatonin is an anti-oxidant and suppressant of tumor development that is produced at night. When someone works in artificial light, they generally have lower melatonin and may be more likely to develop cancer. Melatonin supplements are useful in that they may simulate the Melatonin production at different times that does not occur during regular sleeping hours for people who work night shifts.

A of involving a total of 643 cancer patients using

melatonin found a reduced incidence of death. Another clinical trial is due to be completed in 2012. Melatonin levels at night are reduced to 50% by exposure to a low-level incandescent bulb for only 39 minutes, and it has been suspected that women with the brightest bedrooms have an increased risk for breast cancer. Reduced melatonin production has been proposed as a likely factor in the significantly higher rates in night workers.

What is Melatonin?

A naturally occurring hormone (derived from serotonin) that is both endocrine (enters the bloodstream from a pineal gland) and paracrine (signaling cell phenomenon, as from the retina when light is low, when the signal is "time to sleep").

Melatonin, besides being a sleep hormone, is a very powerful antioxidant, anti-aging agent, immune-regulator, anti-depressant and sexual dysfunction regulator. However, our body produces a hormone called melatonin, and for a variety of reasons, we may not be getting enough of it. Our sleep problem may be due to this. People who work at night, and have their melatonin blocked by evening bright lights have a significant higher incidence of cancer than day workers.

The amount of melatonin we produce is determined by how dark or light our surroundings are. Our eyes have specialized light-sensitive receptors that relay this message to a cluster of nerves in the brain called the suprachiasmatic nucleus, or SCN. The SCN sets our internal biological clock, also called our circadian rhythm, which regulates a variety of body functions including sleep.

Question for the compensation?

If you assign a person to work breaking their natural cycle or rhythms, and let him/her have lot of risk regarding her/his health; definitely you should pay for that. Let's think about both working at day and working at night. These two are quite different and are not comparable. Another aspect, just to work at night to finish a plain job and to work at night with a lot of alertness, activeness without leaving a position and without any error are utterly different. If studies show this; why not to compensate them?

Everybody knows that controllers sacrifice their social life, due to the nature of their job. Whenever we consider their alertness, activeness, readiness, stresses, requirement to be always up-to-date with procedures, manual and changes, we become clear that this job can't ever be compared with other jobs. Working in an environment of radio magnetic wave, frequently breakage in circadian rhythm and inviting a lot of diseases including cancer are the factors which urge the concerned authority to decide how a controller should be compensated.

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Time Health land
Taiwan Health, heath magazine
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Manager, TIACAO

Importance of HRM for an Organization

Manju Paudyal

Human resource is the backbone of an organization. An organization is nothing without human resources. If we remove the employees from different department not much would remain in an organization. But how did these people come to be employees in their organization? How were they found and selected? Why do they come to work on regular basis? How do they know what to do on their job? How does management know if the employees are performing adequately? If they are not, what can be done about it? Are the employees prepared for work? What are the qualities inherent in each of them that can contribute to the benefit of the organization? These all are the factors related to the human resource management.

Vision, Mission and **Strategy** are the driving force for any organization and human resource is always in its center of operation for the achievement of the goal of an organization set under the it's mission. The vision, mission and strategy of the Civil Aviation Organization are as follows:

Vision:
"Utilizing air services as an effective means of achieving high economic growth through wide scale tourism promotion and accessibility."

Mission:
"Ensuring safe, secured, efficient, standard and quality service in civil aviation and airport operations."

Strategy:
"Airport-marketing, facilitating, diversifying revenue

sources, monitoring, organizational performance and HRD training."

If we imagine an organization as hardware, the human resource is its software without which there can be no organizational function. The more competent is the HR, the more efficient will be the organizational performance. Nepal Government has declared Civil Aviation Authority of Nepal as an autonomous body as incorporated in CAAN Act. Being an autonomous body, CAAN is mandated to provide non-profit services for the people. Similarly, CAAN has self-sustained in its operation through collecting revenues from the airlines. In this situation, proper human resource planning has been a crucial process for CAAN in order to carry out its responsibility.

HR recruitment follows the standard set of processes for the selection of appropriate manpower and work assignment as per their quality. Even after recruitment, they are monitored for their regular work assignment and their regular performance. Based on their accountability, they either get reward or punishment according to their performance evaluation. In general, CAAN trains HR for long term service delivery.

Management is the process of efficiently getting activities completed with and through other people. The management process includes the planning organizing, leading and controlling activities that takes place to accomplish objectives.

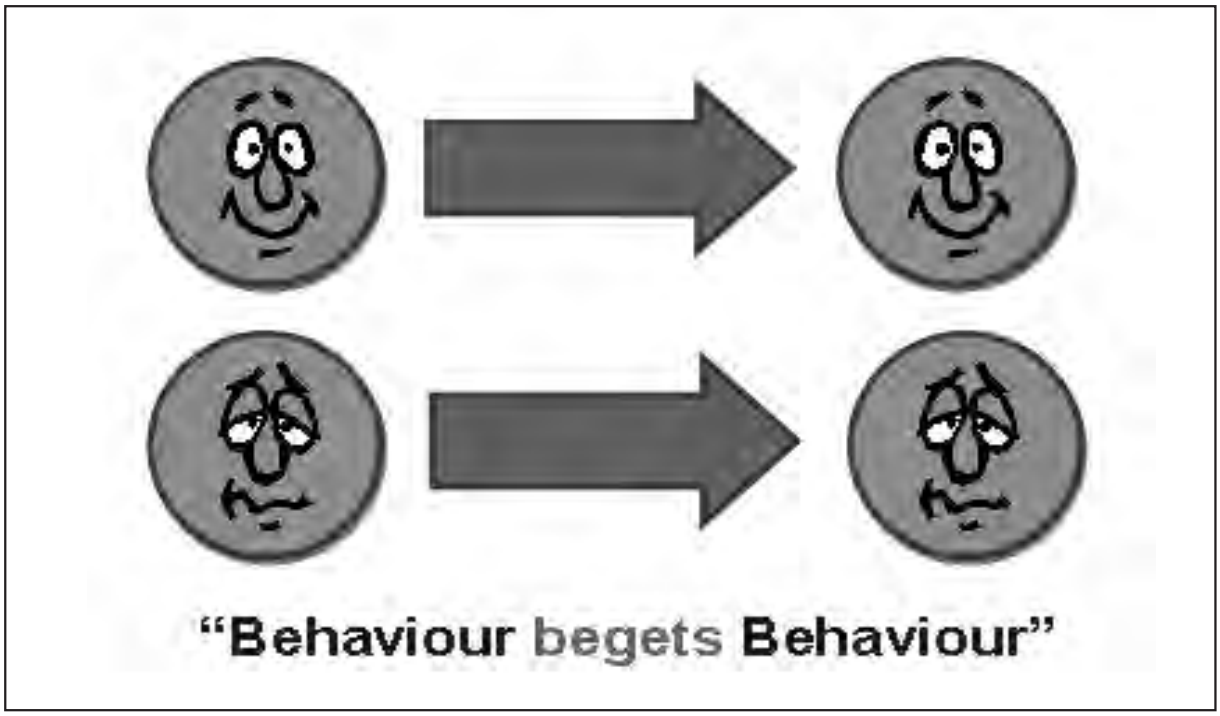
Human resources management is concerned with the "people" dimension in management. Since every organization is made up of people and functions by utilizing their services, developing their skills, motivating them to high level of performance and ensuring that they continue to maintain their commitment to the organization are essential to achieving organizational objectives.

To make an organization successful, the knowledge, skills and capabilities of individuals and proper training to enhance their capabilities are the core essentials by which HRD is accomplished and nurtured. Training alone can improve the existing capabilities of human resources and help to acquire new skills needed for growth in different sectors of the organization. The functional areas of human resource are divided into nine fields:

- Training and development
- Organization and development
- Organization/job design
- Human resource planning
- Personnel research and information systems
- Compensation/benefits
- Employee assistance
- Union /Labor relation

As a multi disciplinary organization, CAAN has different work forces like Engineers, Air traffic controllers, Fire-men, Administrators, Accountants etc. The question here arising is how much they are motivated to

accomplish their job responsibility and how much accountable they are resulting in greater client satisfaction in air transport system in Nepal.



on their given duties and responsibilities. If any gap exists in their motivation, accountability and responsive actions, the causes contributing to create the gap needs to be diagnosed by HR planner in the organization with proper analysis. The main function of the organization is to make the human resource willing to work with full job satisfaction. Moreover, the organization should ensure the optimum utilization of intellectual, technical and creative capacity of available human resources for the maximum organizational output,

In Summary, HRD is a process by which employees of an organization receive support in a planned way to acquire capabilities required to perform various tasks as individuals thus helping to develop organizational culture.

Manager, CAAN Head Office

Need of effective Coordination for air safety as well as national sovereignty

Ritcha sharma

The main objective of Air Traffic Controlling is 'safety' to achieve which Air Traffic Controllers arduously follow the rules and regulations set by ICAO and the local provisions as maintained by CAAN. To carry out such a responsible duty, such procedures which result in ease to the controllers are needed. One of the key factors needed to ease the job of air traffic controllers is effective coordination. Coordination should be both inter organization and intra organization.

Inter organization coordination includes coordination among various Air Traffic Control Units within the organization like Aerodrome Control Tower, Approach Control Unit, Area Control Center, Air Traffic Services Reporting Office, Terminal Duty Office, and other domestic airports etc. Intra organization coordination includes that among Air Traffic Services Authority, Aircraft Operating Agency, Air Traffic Control Units of Adjacent Flight Information Regions (FIRs), and Military Authority etc.

Talking about the coordination within the organization, safe and continuous traffic flow can be realized only through effective coordination. It is done by maintaining constant communication among the ATC

units responsible for the safe conduct of flights during any phase of a flight. For instance, the flight plan submitted by the operator at the ATS reporting office should be sent to all other units. During the progress of the flight from start up to the transfer of control to the adjacent FIR units, inter organization coordination takes effect by informing all necessary details of the flight, other traffics that may affect the flight and the transfer of control and transfer of communication conditions by the existing control unit to the next control unit.

Only through proper flow of information regarding each and every flight, safety can be maintained. Communication gap within the control units is the main hazard which may result in confusion to the controller and thus affect safety. Coordination can sort out such regular circumstances which may become a problem if neglected. Therefore, only via effective coordination, the flow of traffic can be managed and the main objective of Air Traffic Controlling can be ensured.

Similarly, intra organization coordination with operators including the military authority and Air Traffic Control Units of adjacent FIRs is quite essential both for flight safety as well as maintaining national sovereignty.

Prior to conducting any flight subject to receiving Air Traffic Services, operator is bound to submit flight plans at the ATS reporting Office. All flight plans thus submitted are then forwarded to all units which are responsible for providing ATS service to those flights. If this procedure is not followed, it certainly affects the controller's traffic planning consequently affecting safety.

The ATS units should also consider the requirement of the operators and provide them with information that may be useful in carrying out their responsibility. Annex 11 (Air Traffic Services), in this regard, says," Air traffic services units, in carrying out their objectives, shall have due regard for the requirement of the operators consequent on their obligations as specified in Annex 6, and, if so required by the operators, shall make available to them or their designated representatives such information as may be available to enable them or their designated representatives to carry out their responsibilities." (Annex 11, 2.15.1)

In case of military authority no separate airspace or air traffic control unit has been allocated for military flights in Nepal. Military flights are treated as civil flights with regards to the rules and regulations guiding these flights. This means, following of the same civil rules of flight by military authority is a must. Annex 11 urges these authorities to follow all coordination procedures. Annex 11 says," Air Traffic services authorities shall establish and maintain close cooperation with military authorities responsible for activities that may affect flights of civil aircraft." (Annex 11, 2.16.1)

Military flights, should, therefore be initiated only after submission of flight plan and should follow every rule as done by all other civil flights.

Coordination with ATC units of adjacent FIRs is similar to the inter organization coordination except for the fact that here the information flow is between the ATC units of two different countries and it should be done remaining within the letters of agreement between these units. Besides the provision for regular scheduled and chartered flights, countries have provisions regarding unauthorized flights entering their airspace. For protecting our airspace from such unauthorized entrants, civil and military authorities should go hand in hand and maintain mutual coordination.

There are provisions for punishing the intruder and encroacher of Nepalese airspace in Civil Aviation Act 2015 (fourth amendment 2053). But the act is mum about the policy of protecting our airspace.

Civil Aviation Authority of Nepal grants permission to all the regular scheduled flights and chartered flights, hospital, military, ferry and other flights intending to operate in our territory by issuing a permission number which is the key to enter our airspace. Unlike in other countries such as India, Nepal does not have provision for informing the military unit to check illegal entrants. In India, every scheduled flight has to obtain Air Defense Clearance (ADC) number issued by the military unit and Flight Information Center (FIC) number issued by the Air Traffic Services (ATS) unit. The ATS unit supplies the military unit with all the information of flight plans submitted to them by the operator. The military unit then issues ADC number without which no aircraft can enter their airspace. This reveals how the ATS unit and the military authority have been coordinating with each other in protecting national airspace. Annex 11, regarding this matter, urges, "Arrangements shall be made to permit information relevant to the safe and expeditious conduct of flights of civil aircraft to be promptly exchanged between air traffic services units and appropriate military authority." (Annex 11- 2.16.3).

It's high time for the military authority to establish military unit under aviation wing. The ATS authority should provide the military unit all the information regarding the flights that will enter our airspace. Military unit should also issue permission number along with the permission from CAAN. This can certainly check encroachment of Nepalese airspace and thus protect our national sovereignty.

Proper coordination is thus the main way through which we can ensure flight safety, and also protect our airspace. It is an indispensable part of safety procedures.

Asst. Manager, TIACAO

UNIDROIT Research - A sweet Memory

Buddhi Sagar Lamichhane

Background

I am very keen to write some words on good memory of UNIDROIT research programme that was conducted from November 3 to 30, 2010 in it's headquarter 28 Via Panisperna, 00184 Roma (Italy). The Scholarship for the research was provided by International Institute for the Unification of Private Law (UNIDROIT) and sponsored by US foundation for International Uniform Law. The research was focused on the Convention on International Interest in Mobile Equipment, Cape Town 2001.

What is UNIDROIT

The International Institute for the Unification of Private Law (Unidroit) is an independent intergovernmental Organisation with its seat in the Villa Aldobrandini (28 Via Panisperna) in Rome. Its purpose is to study needs and methods for modernising, harmonising and co-ordinating private and in particular commercial law between States and groups of States. UNIDROIT was originally set up in 1926 as an auxiliary organ of the League of Nations but after following the demise of the League of Nations, the Institute was re-established in 1940 on the basis of a multilateral agreement.

At present there are 63 member states of Unidroit and the member states are drawn from the five continents and represent a variety of different legal, economic and political systems as well as different

cultural backgrounds. The member states are: Argentina, Australia, Austria, Belgium, Bolivia, Brazil, Bulgaria, Canada, Egypt, Estonia, Finland, France, Germany, Greece, Holy See, Hungary, India,Indonesia, Iran, Iraq, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Mexico, The Netherlands, Nicaragua, Nigeria, Norway, Pakistan, Paraguay, Poland, Portugal, Republic of Korea, Republic of Serbia, Romania, Russian Federation, San Marino, Saudi Arabia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Tunisia, Turkey, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay and Venezuela. Nepal is not its member and as per my information there is no any relation of Nepal with the UNIDROIT till this date. This is the signal that Nepal is still in premature stage of Private International Law development.

UNIDROIT is working towards the legal harmonization of private international law throughout the world. So to achieve this objective UNIDROIT has policy of providing legal cooperation to the states in need and research scholarship and internship to the young and dedicated scholars interested in the field from all over the world. In providing assistance Special attention is given to the particular needs of developing countries and countries in economic transition.

Cape Town Convention and Aircraft Protocol

The Convention on International Interests in Mobile Equipment, Cape Town 2001 and its associated Aircraft Protocol 2001 are International treaty and were concluded at Cape Town, South Africa on 16 November 2001 in a Diplomatic Conference under the joint auspices of the International Institute for the Unification of Private Law (UNIDROIT) and the International Civil Aviation Organization (ICAO). The Conference was attended by representatives from 68 States and 14 international organizations. The final treaty document was signed by representatives of 20 States on the occasion of the signing ceremony. The Convention and Aircraft Protocol entered into force on 1 March 2006. In less than ten years the Convention has been ratified by 40 States and the Protocol by 34 States and many states are in pipe line.

The Cape Town Convention and Aircraft Protocol are the complex set of Instruments of private international law ever made. It not only addresses the finance issue but it also addresses many other issues of law like property law, secured transaction law, insolvency law, international air law etc. It has various stakeholders like Aircraft and Engine manufacturers, financiers, lessors, airlines, governments, passengers and others. It is the product of tough conflicts of different legal systems of the world. It has introduced a common set of rules which can be accepted and interpreted by all legal systems of the world uniformly. So it took many years to be developed in the final shape. So it has a significant importance in

the field of private international law.

The primary purpose of the convention as applied by the aircraft protocol is to facilitate the extension and reduce the cost of aviation credit. It will do so by establishing substantive, commercially oriented international rules regulating the key elements of secured transactions and leasing of aircraft equipment.

Research environment

UNIDROIT is itself a research institute and has developed a world class research environment in its premises. The library is full of different legal books, journals, periodicals and other reference materials which are essential tools of legal research. In my view the library is suitable for any kind of research in the private international law area. It not only conducts research but promotes research throughout the world to achieve the goal of harmonization of private law. The environment inside is very adaptable for any researcher and the cooperation of the institute's staff is of highly appreciable. UNIDROIT is not an academic institution like University, so the research in UNIDROIT should be conducted on personal basis. The institute does not provide research supervisor but provides any technical and logistic support as per the terms set prior to acceptance of research request. UNIDROIT promotes individual researchers to pursue their study based on their needs and support with required facilities.

I am highly impressed with the research and study environment of UNIDROIT. During my stay I got all assistance as needed.

Cape Town Forum

The significant achievement of UNIDROIT stay was to participate in the Cape Town Treaty Forum, which was held on 9-10 November 2010 at Rome. It was organized by Aviation Working Group in association with the UNIDROIT. About 100 governments, airlines, and industry representatives from Europe, Middle East and Africa has attended the forum. The theme of the Forum was "Aircraft Protocol-Assessing and advancing Ratification". For me it was the first international forum and more remarkable in the sense that I represented Nepal incidentally. Practically I feel the forum was another learning opportunity to me regarding the Cape Town system. All the information's disclosed in the forum were very useful. The forum resulted into another opportunity to establish formal contact with different personalities from different geography and level of industries.

City of Rome

During school days when I studied history of the world I felt very curious about the Rome civilization and its system of development. Now that I had travelled Rome and become eyewitness

of the Roma Civilization, culture and History, I found that the history which we studied was true. The human civilization started from Rome and the legal history too was developed from Rome. When I travelled around the city of Rome I found that Rome city is a living museum of human civilization and history. Everywhere we can see the well preserved historical monuments and places. It is a great lesson to the future generations that we should preserve the past for the proper guidance to the future. I feel all the other countries should learn from the Roman experience about the protection of History.

What I learnt

Basically being confined with the Cape Town convention I would like to forward some points as reference of my research findings. Like other Conventions it is not simple to understand and to implement also. There is no provision of reservations in the Convention and Protocol but declarations system is complex. Without making appropriate declarations, it is better not to ratify the Convention and Protocol at all. In my understanding before initiating the process of Ratification or accession every country should be aware of the following points:

Regarding the domestic Sphere-

a) Whether the legal system is blended with the basic principle of asset based financing and leasing (transparent priority principle, prompt enforcement principle, bankruptcy law enforcement principle)
b) Whether the court system is applying the principle of asset based financing while considering the cases
c) Whether the national Civil Aviation Industry is seeking for the international financing to acquire new aircraft equipment for the continuation of its disruptive service.
d) To achieve expected economic benefit implementation legislation is essential

Regarding the Convention System-

a) The Convention is comprised with two tire system
b) Convention consists of basic provisions while the associated protocols consists of operating provisions
c) There is no provision of reservation but the system of declaration is very complex, so before the deposition of declaration a comprehensive and critical review is required
d) Without appropriate declaration there is less chance of economic significance of the convention system.
e) There are different categories of

declarations, so based on their significance states should take appropriate steps regarding their adoption.

f) States should give more attention on the language used in the declaration before submitting to the depositary of the convention. The experience shows that the language used in the convention also plays significant role to achieve the proposed benefit of the convention.

g) The notion of the convention is to advance the financial interest of the related parties of aviation industry but not to advance the political interest of the country. So before lodging the instrument of ratification or accession each state should think more aptly on the point that how they can achieve maximum economic benefit.

Asst. Manager, CAAN Head Office

Women in one of the world's most challenging jobs

Suneeta Shiwakoti "Bhardwaj"

The word "fireman" is synonymous to 'firefighter' and fire fighting as a job used to be predominantly occupied by male participants. With time has changed the overall concept of relating a particular job with a specific gender. Similar is the case of 'firefighting'. It is not solely a male domain anymore. Women also work as firefighters these days throughout the world. Now, as more and more women are joining the ranks, "firefighter" has become the preferred term used equally for both the genders. Women who work in the fire department are called firefighters.

Throughout the history, we have seen our once narrowly defined gender roles progressively expand. Today, women serve in the armed forces, work as surgeons and participate in the highest levels of government service. Similarly, men are stay-at –home dads, have careers in nursing and are even self-defined feminists. The world is changing its definition of roles according to the gender these days. Yet every day, women and men are typecast according to their gender in rather conservative ways. Just like every other career, trade, or profession women have made inroads into this traditionally male territory.

Female firefighters have been putting out flames for almost 200 years, while continuing

to burn down boundaries of gender discrimination, harassment and criticisms. While firefighting remains a predominately male profession, female fire fighters make sure that their efforts are noticed and their voices are heard. **Molly Williams** was the first known female firefighter who was a slave in New York City and became a member of Oceanus Engine Company in 1815. She was known to be just as hard-working as the male firefighters and her firefighting efforts remain an important part of women's history and have been paving the way for female fire fighters worldwide till the date.

Well we all have heard these stereotypes- men are "strong," women are "weak," men should act "manly" and women should act "girly". We all are grown up in these social norms and beliefs, themes and thinking, rules and regularities. In the long run of time from Molly Williams in 1815 till now everything has changed globally. In the context of one of the developing Asian countries like Nepal, first of all it was a great challenge to have chosen firefighting as a career. In addition, being one of the pioneer ladies in this field will always remain as a great achievement. Civil Aviation Authority of Nepal, Civil Aviation Academy conducted the first Basic Aerodrome Firemanship Training (RFF CAAN-2-001 dated from 19th March 2003 to 10th July 2003) and this training included two women namely Rati Dhungana Thapa, and me (Suneeta Shiwakoti Bhardwaj) who were the first to get trained as women firefighters of Nepal and coming up to this date there are four women firefighters altogether in Nepal. I think that the number of women firefighters is very much disappointing for the development of women firefighter's career in Nepal.

In fact the training was not only an opportunity to prove ourselves as upcoming future women firefighters but also a challenge to successfully complete it. The training demanded the determination to adjust and adapt to each and every aspect of it in relation to male counterparts. As this field is dominantly led by male, women fire fighters have to encounter often the negative and discriminatory behaviors occurring most commonly on a fire ground.

A good firefighter must be honest and dependable. Team play is a necessary function of the fire fighting as is respect for co-workers and members of the public. Good communication skills and common sense are traits appreciated in a firefighter. Firefighters need to be emotionally stable and sense of humor is appreciated in this job as it is in any other. Flexibility and open-minded is also needed. No one person can have all of these attributes, and if they did, as a group their strengths would be redundant and their weakness magnified. Each person, male or female, can offer some of these traits and contribute to the team and make it strong. Women are known to be more faithful, loyal, hardworking and reliable than

male so they can make the team more bonded, progressive and goal oriented. Firefighting is a career choice with a lot of job satisfaction because putting your life on the line for others can be very rewarding indeed.

Since women have only recently begun to be formally considered firefighters, there have been many difficult adjustments for the fire service, management and women firefighters themselves and we are going to discuss these difficulties in following paragraphs.

One major problem or we can say hurdle to entrance into firefighting for women is the lack of facilities and this problem is not only for the developing country like Nepal it is also the major problem in developed countries. According to the job nature days and nights are spent in the fire station, and over decades operating with an all-male staff, many fire stations developed a "fraternity house". The immediate problem of sleeping quarters and bathing areas had to be solved before women could participate fully in firefighting as an occupation and as a culture. Communal showers and open bunk hall were designed for men only and women firefighters often faced these difficulties. Today, although most stations are now designed to accommodate firefighters of both genders, some female firefighters still face issues related to their gender.

Moreover, the greatest difficulty experienced by most women in the fire service is ill-fitting protective gear. Not only are women usually smaller than men, they are also shaped differently, so gear designed for men often will not fit correctly. In firefighting, properly fitted uniforms and equipment are not merely a matter of appearance or comfort. Bunker coats which do not fit result in burns, breathing masks which do not seal lead to smoke inhalation, and helmets which slip can block vision during an emergency.

In an environment where uncovered skin can be almost instantly covered in full thickness burns, it is essential that protective gear or protective wear fit properly. The improper fittings of protective clothing also may result in low performance level of women firefighters during firefighting procedure as well as in training period. We, as pioneer ladies in this field, have also faced the similar problems relating our protective clothing, boots, and helmets and breathing masks. Due to the lack of required facilities we had to manage with the similar protective gears used by male and made for them during our training period and the condition has remained the same till now.

The most sensitive issue or more we can say the challenge that has to be faced in daily activities by women fire fighters is the underrepresentation of women in firefighting. And it has become an alarming inequity that needs to be immediately addressed.

Firefighting is a physically and emotionally demanding job which includes dragging and

pulling heavy lengths of hose, climbing ladders or lugging equipment up steep inclines, handling different water pressures while firefighting and also needs to work on ladders carrying the power saws. Therefore an adequate level of strength, fitness and endurance is mandatory for the role. Due to the biological or sexual differences between male and female; women obviously are having more problems while performing these tasks. So, rather than discriminating them they should be socially and mentally boosted up for their work.

To reduce all the barriers and bring women's employment to its potential will require more universal application of best practices adopted by these pioneering departments. In particular, it will require changing the underlying workplace culture form one of exclusion to gender inclusiveness. Inclusion is a substantially more ambitious goal than merely increasing the number of women employees. However, it is essential if increases in those numbers are to be meaningful and self-sustaining.

Senior Fire Officer
CAAN Head Office

Rescue Operation in Aviation Fire

Narayan Bahadur Rawat

Introduction

The main objective of the Fire Fighting and rescue service is to save life and properties in the event of accident and incident basically at the aircraft, electronic equipments and high rise buildings fires etc. After completion of the fire fighting activities, every fire fighter must be thoroughly prepared for any potential rescue situation. Rescue activities can happen in the natural elements, structural collapse, elevation differences or any other condition not considered to be an extrication accident and incident. The vast majorities of rescue operations conducted by fire fighters are on the aircraft, equipments and structural fires hazardous environments. Thousands of people die in every year in the word due to aircraft accident and incident fires and other hazardous acts. Therefore, a fire fighter must be familiar in many more searche-and-rescue works so that they can accomplish their activities in the actual time. During the rescue operation or activities, rescuers should always use the body system with teams of two or more. Rescue personnel should always carry breathing apparatus, forcible entry tools, charge hose and life lines whenever they enter a structural building, facilitation and aircraft fuselage. When rescue personnel searching within the closed room, they should move systematically from room to room with crawling position by hands and knees. Rescuers should start their searching work back towards the entrance door. It is

important for rescue personnel to search all areas such as bathrooms, under beds, behind furniture, any areas where men and women may hide. During the search, low visibilities can happen inside the room due to smoke, heat and flame so rescuer should be attention carefully of the entire areas taking with search electrical devises or equipments. Rescue team should be maintained radio contact with their commander and periodically report the progress as per official procedures.

In most cases, the best method of searching is for one member to stay at the door while another member searches the room. There is a double-safety system in aviation fire service i.e. first of all their own safety and secondly the safety of their occupants or victims of fire. While searching for victims in a fire, rescuer must always consider their own safety first.

The following are recommended by National Fire Protection Association (NFPA) to search and rescue personnel as safety guidelines for better performance:-

1. Do not enter an aircraft and building in which the fire has progressed to the point where victims are not likely to be found.
2. Attempt entry only after ventilation is accomplished when back draft Conditions exit.
3. Wear full personal protective equipments including Self-Contained Breathing Apparatus (SCBA) and audible devices.
4. Work in teams of two or more and stay in constant contact with each other so that all members of the team are responsible for themselves and each other.
5. Maintain contact with a wall when visibility is obscured. Working together, search team members can extend their reach by using ropes or straps.
6. Have a charged hose line at hand whenever possible when working on the fires because it may be used as a guide for fire fighters and rescuers.
7. Inform the group commander immediately of any search areas that could not be searched due to obstruct conditions.
8. Report promptly to the commander once the search is complete; also report the progress of the fire and the condition of the building, structures and aircraft etc.

National Fire Protection association has suggested different types of rescue methods in aviation fire service and structural fire.
Such methods are as follows:-

1.Cradle-in-arms: - This method can be used for carrying children or adults with very small body structure.

2.Seat lift carry: - This method can be used with a conscious or an unconscious victim and is performed by two rescuers.

3.Two or three person: - This method is an effective way to lift a victim who is lying down.

4.Extremities carry: - This method is used on either a conscious or an unconscious victim

and requires two rescuers.

5.Chair Carry: - Be sure that the chair used is sturdy and do not use folding chair.

6.Incline Drag:- This method is used by one rescuer to move a victim down a stairway and is very useful for moving an unconscious victim.

7.Blanket Drag:- This method is implemented by one rescuer using a blanket.

8.Two hand seats, three hand seats and four hand seats methods are used as per situation.

The Fire Fighting and Rescue Service also use different types of rescue tools and equipments. Such tools and equipments are as follows:-

1.Emergency Power:-

Unfortunately, many incidents occur in poor lighting condition and windowless structures. Firefighter must know how to properly and safely operate the emergency power and lighting equipment. Generator and inverter as emergency power are the most common power source used for rescue activities. It is extremely useful when electrical power is needed in the emergency site.

2.Lighting Equipments :-

Portable and fixed light as lighting equipment are used in areas where emergency operation is being launched by rescue personnel. Fixed light are not able to illuminate because of adequate obstruction or when additional lighting is necessary. In the most cases, portable lights usually provide the ease of carrying.

Civil Aviation Authority of Nepal (CAAN), Aviation Fire Service provides fire fighting and rescue operation facilities for saving life and properties of people as per International Civil Aviation Organization guideline. CAAN could not manage the proper rescue tools and equipments according to the ICAO standard. Universal Safety Oversight audit Program (USOAP) has given some suggestion (findings) about rescue tools and techniques such as skillful manpower, rescue vehicles, rescue equipments etc. Now, Aviation Fire fighting facilities are provided within the six Civil Aviation Offices. They are, TIA- category-8, Nepalgunj Biratnagar, Bhairahawa, Pokhara and Simara- category-5, but rescue facility is very difficult to properly manage in case of emergencies. ICAO documents, requirements, manual and Directives have recommended that rescue operation is as important as fire fighting activities.

Every Civil Aviation Office must provide properly managed rescue facilities in every airport for safety of life of the passengers and their journey. Aircraft movement is rapidly growing in the every airport. From Safety and security point of view, CAAN management should extend their fire fighting and rescue operation service to all the airports with skillful manpower. Aviation Fire is a hi-tech service in the aviation field so that its nature of work is very difficult and quite costly in accidents and incidents. More than 80 percent of emergencies occur within the airport boundary. Therefore fire service

should be ever ready to control any accident and incident.

Conclusion:

In Nepal, rescue operation service has been provided in different Civil Aviation Offices as per International Civil Aviation Organization (ICAO) standard but its internal infrastructure is not properly update with the nature of work. So many problems can occur but these problems must be tackled proved its manpower, tools and techniques, apparatus, modality to save of lives and properties of passengers and whole Civil Aviation Staffs in the aircrafts accident/incident or structures collapse. Due to minimal manpower in the rescue operation, it importance would not be arise in the service. CAAN management must be appreciating it reality in the civil aviation scenario.

Senior Fire Officer , CAA

Budgetary Control System :CAAN Perspective

Chandrakant Pandit

Background

In the context of legally organized body, a budget is an estimation of income and expenditure for future-period. In broad sense, it is a statement of anticipated revenues and expenditures with detailed plans, programs and policies of various actions to be carried out for next financial year. It is the process of expressing future plan of action in quantitative and financial terms. The budget is formulated for a specific period; this period is broadly specified for long term and short term. Long term budget is prepared for longer period i.e. three years, five years, ten years or more. Similarly short term budget is prepared for a short period; normally i.e. one year or less than one year.

For autonomous entity like Civil Aviation Authority of Nepal (CAAN), budget is considered as the fiscal plan of action which shows how the various sources of revenues (aeronautical and non-aeronautical) are collected and how it is utilized from the commercial or business aspect as well as social responsibility aspect. So the budgetary document of the CAAN is a source of information of past activities and current decisions on future prospects. It is an effective managerial tool for planning, implementing, monitoring and evaluating

(M&E) and controlling overall activities of the CAAN.

Prerequisites

The budgetary process is a planning process or resources allocation process which is prepared based on the organizational objectives. Generally, the following aspects are considered while formulating the budgetary procedures:

(a) Setting organizational goals and priorities
(b) Linking goals and priorities to actions
(c) Managing resources (pre-assumption of fund)
(d) Allocating and Controlling the use of resources
(e) Keeping the budgeting process manageable
(f) Promoting efficiency and effectiveness
(g) Fulfilling the social responsibilities
(h) Monitoring the performance of budget centers
(i) Evaluating actual outcome with pre-assumed goals
(j) Getting Feedback for modifying budget in the coming year

Besides above mentioned procedures, budget preparation is a two way process of making decisions on the size and consumption of revenues and expenditures. It would be unrealistic to take decision on total size of expenditures without considering the availability of revenues. If the prospective revenues are greater than the cost of maintaining existing programs, there is usually a scope for additional expenditures. If the prospective revenues are however less than the cost of maintaining existing program, there is a need for curtailing the planned expenses.

Budgetary system is a planning of collection and allocation of resources and is also an outcome of priority setting process of the organizational goals. It can only be successful when the organization runs an efficient budgetary control system. When the budget is implemented only within its approved programs and within its pre-specified period, it is called budgetary control. So the budgetary control is a prerequisite of the organization. It is a tool, which guides the management to take corrective action and measures to carry out its plan of action. Principally, the major objectives of budgetary control system are; to express the plan of action of the organization and its goal in a clear and specific manner; to establish clear responsibilities of different budget centers of the organization for attainment of its goal; to evaluate and control the performance of budget centers of the organization; to provide guidance for execution in the future actions on the basis of past experience.

On the basis of approach, budgeting is categorized as follows-

1. Traditional Budgeting Approach

· Line Item Budgeting:

- Incremental Budgeting:
- Objective Budgeting:
- Surplus Budgeting
- Deficit Budgeting
- Balanced Budgeting

2. Modern Budgeting Approach
- Program Budgeting
- Performance Budgeting
- Zero Based Budgeting
- Planning, Programming Budgeting System (PPBS)

In the context of CAAN, budget is basically prepared on the foundation of previous fiscal year's actual revenue collection and actual expenditure as well as the estimation of current year's revenue and expenditures. CAAN mostly adopts the incremental budgeting system. Revenue income budget is prepared on the basis of aeronautical revenue income and non-aeronautical revenue income. Similarly, expenditure budget is classified in the following three heads:

- Development Capital Expenditure Budget or Capital Expenditure
- Replacement Capital Expenditure Budget or Administrative capital Expenditure
- Operational Expenditure budget or Revenue Expenditure Generally,

The budgetary control system has the following key elements;

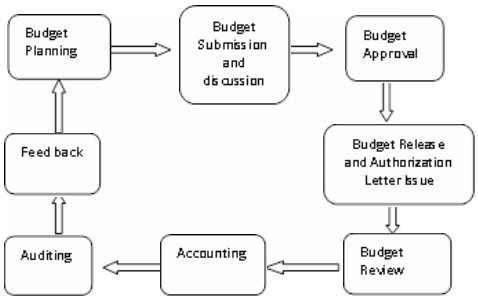
1. Regular monitoring of budget whether it is utilized properly on periodic basis or not.
2. Proper justification on any budget variations when unexpected or unusual accident or incident happens and it must be approved by authority.
3. Prior approval compulsory for modification and revision of action plan.

Budget Cycle

The stage and period between one budget and the next budget is called budget cycle. It is repeatedly circulated process of year to year. For each defined stage, an organization has its timeframe within which the specific stage has to be completed. The preparation of the budget begins from the budget planning and ends with the closing of fiscal year. Generally the next year budget is prepared based upon the utilization and trend of last year's actual performance and current year's targeted performance. But for profit making organization, the budget is prepared based upon the revenue target, marketing strategy and investment plan - basically in new areas. The budget cycle includes the stages like budget estimation, budget, budget approval, budget release, accounting, reporting, auditing and feedback. The practice of budget preparation and budgetary control system has not become much popular in the case of CAAN. It has neither got the expert manpower of this area, nor taken any initiation to groom up some manpower for this purpose. However, CAAN has been preparing annual budget in ad-hoc basic by the initiation of some sincere non-professional employees of various fields.

Now, the time has come that CAAN must develop its own expertise in budgeting and budgetary control system. From the aspect of budgetary control system, the budget cycle of CAAN includes various stages like budget planning, budget submission, budget discussion in various levels, budget approval, budget release and authorization letter issue, program execution, monitoring and evaluation, budget review, accounting, auditing (internal and external) and feedback.

The following picture shows the various stages of budget cycle of CAAN.



Challenges

The objective of budgetary control system can be fulfilled only when the prerequisites of budgets and its control procedures are well established. Although, there are some practical challenges which prevents from realization of the objective of budgetary control system and its benefits in large scales. The following are some of the challenges in the context of CAAN-

- Budgeting without business plan.
- Lack of expertise in formulation of budget.
- Lack of approved formal policy for budgeting and budgetary control.
- Lack of linkage of approved budget and action plans.
- Absence of proper monitoring and evaluation process.
- Heavy expenses in eleventh hour of the fiscal year.
- No use of budget preparation software.
- Lack of linkage of budget and accounting software.
- No proper discussion at the time of budgeting about the feedbacks of internal and external auditing.

Remedies and Conclusion

Budget should be prepared on the realistic basis considering all the possible changes in the near future. There must be rigid restriction in the revisions of budget. The frequent revision of budget carries the meaning of less attention of its committee members in the process of budget formulation. Thus, a formal and approved budgetary control system should be adopted to make the budget more realistic and applicable. Budgetary progress or target should be compared not only in the volume of its expenditure, but also physical development of implemented projects and its quality assurance. Good accounting and internal auditing software must be used to reduce the present manual working styles. For the execution of software, the staffs of related fields must be trained well to meet this requirement. So a good budgetary control system establishes best working environment

of budgeting. It also helps in allocating and utilizing the resources as well as monitoring and evaluating the operational activities of the organization. CAAN has been launching some positive practices of budgeting from its establishment. However, there are so many lapses to be improved to adopt the full phase of budgetary control system. Now, CAAN must take proper decision to establish a permanent unit for budget preparation and budgetary control system without making delay for the betterment of budget-related overall activities.

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Asst. Manager, CAAN Head Office

Sustainability of Air Transportation in the context of Nepal.

Bibek Adhikari

The sustainability of Air transportation system is considered along a global trajectory of growing effects and the diminishing impacts of this on society and environmental conditions due to continuous growth. In doing so, the situation of users of the system (or passengers), air transport operators (airports, air traffic control) and airlines, aerospace manufacture, local and national community's policy makers and public are examined.

Sustainability is directly related to economic, social and environmental sectors along with the blend of technological perspectives. Economic growth is vital for technological advancement and the investment required for improving the social services all along the globe. Socially, people should be included in discussions and decisions that have impact on their communities. Environmentally, production and consumption should advance in a way that does not diminish the world's natural resources, now and for the future generation to come, which is of course the main jest of sustainable development. According to Brunt land commission Sustainable mobility can be defined in this context " as the ability to meet society's need to move freely ,gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values, today and in the future (word business council for sustainable development)" .

Sustainable development in air transport is directly

relevant to global economy. Air transportation has valuable and peculiar contribution to the society and nation as a whole. Moreover, it provides efficient and affordable access to local or global markets. It helps to improve living standards and fasten economic growth. It alleviates poverty and reduces environmental degradation. Thus, sustainability is directly associated with the welfare of the society from its grass root level.

Air transport is one of the world's fastest growing industries. This fact is evidenced by the demand for air travel that increased three fold from 1980 to 2000 and that is expected to double by 2020. Air transportation is vital and essential to modern life. No one can imagine a world without air travel. This is all because of its time saving, economic benefit and safety. Life can not be as easy without air transport in today's world. In every walk of our life air transport plays a vital role.

Every coin has two sides. Basically air transport also has pros and cons. Noise and air pollution from emissions such as nitrogen oxide is very hazardous which ultimately leads to climate change, fuel consumption and related emission. One of the prime reasons for global warming is due to the emissions from aircrafts. But people are paying deaf ear to the situation. They are concerned only for road transport and their emission. For the sustainability this problem must be addressed.

Air transport is essential for world's business and tourism. It creates jobs and facilitates the expansion of world trade by opening up new market opportunities. It attracts business to locations in developed and developing countries like Nepal, there by satisfying the mobility requirements of people. It moves products and services quickly over long distances bringing economic advantage to communities.

It forms a unique global transport network linking people, countries and cultures safely and efficiently. So socially air transport plays a bridging role in between countries of diversities. Today air transport is increasingly accessible to greater number of people who can now afford to travel by Air for leisure and business purposes. Additionally, it can reduce or contain its environmental impact by continually improving fuel consumption, reducing noise and introducing more sustainable technologies.

In context of Nepal if the government forms effective rules and regulations and implements them in practice, air transport can realise sustainable development. Furthermore, management of the airport is also significant. The safety related issues must be addressed. If this can be done then only air transport will be sustainable. That is needed for present as well as for future.

Pentagon Int'l Collage

पर्यटन विकासका लागि सुधारको खोजी

गजेन्द्र बुढाथोकी

नेपाल अन्तर्राष्ट्रिय स्तरमै आकर्षक पर्यटकीय गन्तव्य भएको कुरामा कुनै दुईमत हुन सक्दैन । सन् १९५० को दशकमा केही सीमित विदेशी आरोहीहरूका लागि हिमाल आरोहरणबाट सुरु भएको नेपालको पर्यटन उद्योग सन् ६० र ७० को दशकपछि भने हिप्पीहरूको स्वर्गका रूपमा परिचित भयो । पश्चिमा पुँजीवादबाट विरक्तिएका युवाहरू शान्ति र प्रेमको खोजीमा भौतारिँदै हिड्ने क्रममा काठमाडौंलाई अन्तिम गन्तव्य (The last Destination) मानेर नेपाल आउन थाले । यहाँ उपलब्ध हुने सस्तो गाँजा र शान्तिपूर्ण माहोलले झोछेँका गल्लीहरूदेखि स्वयम्भूका डाँडासम्म हिप्पीहरू झुम्मिन्थे । 'टप टेन्ज' वेबसाइटले ६० र ७० को दशकको उत्कृष्ठ १० हिप्पी गन्तव्यमा नेपाललाई पहिलो नम्बरमा राखेको छ । सस्तो मूल्यको आवास र यहाँको स्वर्गीय आलौकिक सुन्दरतासँग पश्चिमाहरू क्रमैसँग आकर्षित हुने क्रम बढ्दै गयो । सन् १९९०को परिवर्तनपछि नेपालमा औपचारिक रूपमा गाँजाको किनबेच र सेवन प्रतिबन्धित भएपछि काठमाडौंको 'फ्रिक स्ट्रिट'ले अझै पनि पुराना दिनहरूको स्मरण गराउँछन्, त्यसपछि सुरु भयो, पर्वतरोहण र पदयात्रा पर्यटनको युग । हिप्पी युगले यहाँको वातावरणलाई परिचित बनाएपछि हिमालभित्र लुकेको हिमाली स्वर्ग अर्थात् स्वर्ग (सांग्रीला)का रूपमा नेपालको पर्यटनले अन्तर्राष्ट्रिय पहिचान पाउँदै गयो । बेलायती लेखक जेम्स हिल्टनको व्याख्याभित्र पर्ने सांग्रीलाअन्तर्गत उत्तरी भारतदेखि तिब्बत, नेपाल र भुटानका हिमाली उपत्यकाहरू पर्छन । हिमाली उपत्यकाहरूका मौलिक संस्कृति र पहिचान अझै जीवित छ, यसको भेद त्यति नै गहिरो छ जति योभित्र पस्न सक्यो । संस्कृति उत्खन्नको यही भोकले सांग्रीलालाई गन्तब्य बनाउने पर्यटकहरू कति भारत हुँदै नेपाल र भुटान छिर्छन, कति नेपाल हुँदै तिब्बत ।

यसरी स्वतस्फूर्त रूपमा विकासित र प्रबर्द्धित हुँदै आएको नेपालको पर्यटकीय इतिहासलाई अब नयाँ मोड दिनुपर्ने बेला भइसकेको छ । नेपालका गन्तव्यको सबल र कमजोर पक्षबारे अब मूल्यांकन

गर्नैपर्छ । देशको पर्यटन काठमाडौं (नगरकोट र धुलिखेल), पोखरा, चितवन, सगरमाथा, अन्नपूर्ण संरक्षण क्षेत्रसहितका सीमित क्षेत्रबाट बाहिर जान सक्नुपर्छ । अब यो समयमा प्राथमिक गन्तब्यबाट सहायक गन्तब्यमा तान्नका लागि प्याकेज कार्यक्रमहरुको विकास गर्नु जरुरी भइसकेको छ । विगतको लामोसमयसम्म राजनीतिक अस्थिरता, लगातारको बन्द, हड्ताल र चक्काजाम, कमजोर पर्यटकीय पूर्वाधार, नेपाल पर्यटन बोर्ड, पर्यटन मन्त्रालयलगायतका निकायका कमजोर भूमिकाजस्ता कारणले पर्यटक आवागमनमा प्रभाव पारी नै रह्यो । नेपाललाई अन्तर्राष्ट्रिय क्षेत्रमा ब्रान्डिङ र प्रबर्द्धन गर्ने मामिलामा हामी सँधै नै चुकी रह्यौं । नेपालमा गुणस्तरीय र खर्चालू पर्यटक ल्याउनका लागि न त सरकारले न निजी क्षेत्रले नै सक्रिय भूमिका खेल्न सक्यो । यहाँ पनि एकले अर्कोलाई दोष देखाएर पन्छने प्रवृत्ति हाबी भयो ।

सुरक्षाजन्य कारणले मात्र नभई व्यवहार र बेथितिले पनि नेपालको पर्यटकीय छवि सकारात्मक बन्न नसकेको तथ्यलाई अब गम्भीरतापूर्वक मनन गर्नैपर्छ । मुलुकका लागि अतिथि बनेर भित्रिएको एउटा पर्यटक एयरपोर्ट बाहिर निस्केपछि बीसौं वर्ष थोत्रा एयरपोर्ट ट्याक्सी, ट्याक्सी ड्राइभरहरूको तानातान त्यसको विकल्पमा एयरपोर्ट बसको अभावले उसलाई पिरोल्छ । धन्न थोत्रा ट्रलीको अध्याय भने यतिखेर केही हदसम्म टलेको छ ।

विमानस्थलबाटै कसैगरी उम्किएको पर्यटक देशकै राजधानीको अस्तव्यस्त चाल देखेर विरक्तिन थाल्छ । काठमाडौंको फोहोरबाट वाक्क भएको ऊ पर्यटकीय क्षेत्रमा घुम्दा सडकभर माग्ने, सडक व्यापारीको वाक्कलाग्दो चालबाट झनै निराश हुनपुग्छ । सीमित पर्यटकीय क्षेत्रमा पर्यटन प्रहरी त छन् तर उनीहरूको सेवाबारे पर्यटक अनभिज्ञ छन । जानेर होस या नजानेर पर्यटन प्रहरीको प्रभावकारिता बढाउन सकिएको छैन । पर्यटकीय क्षेत्रमा पर्यटक हैरान पार्ने माग्ने र सडक व्यापारीको नियन्त्रणदेखि पर्यटक लुटिँदा-चोरिदासमेत पर्यटन प्रहरी सक्रिय नभएको गुनासो बेलाबेलामा सुन्ने गरिएको छ । पदयात्रामा गएका पर्यटकहरू हराइरहेका छन् । त्यसैले पर्यटन प्रहरीको सेवामा पुनरावलोकन गर्ने समय भइसकेको छ । बीचमा नेपाल पर्यटन बोर्डले पर्यटकको सन्तुष्टीबारे मूल्यांकनसमेत सुरु गरेको थियो, त्यतिखेर यसबारे उल्लेख्य सुझाव दिइएको तथ्य सार्वजनिक भएको थियो । सुझाव लिने तर त्यसको कार्यान्वयन भने नहुने संस्कार अझ रहँदै आएको छ । नेपाल आएर फर्केको पर्यटकले राम्रो-नराम्रो जेजस्तो टिप्पणी गरे पनि देशको पर्यटन उद्योगको विकासमा त्यो प्रतिक्रियाले योगदान पुऱ्याउँछ भन्ने तथ्यलाई यतिखेर विर्सन मिल्दैन । नेपाललाई उत्तम पर्यटकीय गन्तब्य बनाउँछु भनेर मात्र हुँदैन, त्यसका लागि सबै पक्ष सबल हुनुपर्छ । पर्यटकीय पूर्वाधार भनेको होटल, रिसोर्टका राम्रा कोठा, यात्राका लागि वातानुकूलित गाडी, अथवा हिड्नका लागि राम्रो बाटो, उचित स्वागत सत्कार मात्र होइन । एक पटक नेपाल आएपछि फेरि पनि दोहोऱ्याएर आउँ भन्ने वातावरण सिर्जना गर्ने सबै पक्ष हो । जसमा शान्ति-सुरक्षा, निर्वाध आवागमन पहिलो सर्त हुनजान्छ ।

नेपालमा १० लाख पर्यटक भित्र्याउने लक्ष्यसाथ नेपाल पर्यटन वर्ष २०११ मनाइयो, सन् २०१२ लाई लुम्बिनी भ्रमण वर्ष घोषणा गरेर सोही अनुपातमा पर्यटक भित्र्याउने लक्ष्य सार्वजनिक गरिएको छ । ह्वात्तै पर्यटक बढाउनु मात्र काफी छैन । एकै पटक ओइरने ठूलो संख्याका पर्यटक धान्नका लागि यहाँको पर्यटन उद्योग सक्षम छ या छैन ? छैन भने क्षमता विस्तारका लागि के गर्न सकिन्छ भन्ने विषयमा पनि गम्भीर पुनरावलोकन गर्नुपर्छ । यसका लागि यहाँको पर्यटकीय पूर्वाधारमा आमूल सुधार गर्नुपर्ने

देखिन्छ । जसमा सडक सञ्जालदेखि सम्भाव्य पर्यटकीय गन्तव्यहरूमा भौतिक पूर्वाधारको सुधारसम्म जोडिन्छ जसका लागि ठूलो अनुपातमा लगानी बढाउनु पर्ने हुनजान्छ । उपयुक्त लगानी नीति नहुँदा बैंकिङ क्षेत्रले चाहेर पनि लगानी विस्तार गर्न सकेका छैनन । एकल कर्जा सीमाजस्ता प्रावधानले गर्दा र केही ठूला कर्जामा देखिएको समस्याले गर्दा पर्यटन उद्योगका ठूला परियोजनामा सहवित्तीयकरण लगानी करिब करिब रोकिएको अवस्था छ । यस्ता गाठों नफुकाइकन निजी क्षेत्रबाट थप लगानी विस्तार हुन सक्दैन । सरकारको एक्लो प्रयासले मात्र धेरै ठूला उपलब्धीहरू हासिल हुन सक्दैनन भन्ने कुरा प्रमाणित नै भइसकेको छ । नेपालको पर्यटन उद्योग अहिले जहाँ पुगेको छ, त्यसमा निजी क्षेत्रको प्रमुख भूमिका रहेको कुरामा कुनै दुईमत हुन सक्दैन । अब सरकारले सार्वजनिक-निजी-सामुदायिक अवधारणामा हात नहाली नेपालको पर्यटन उद्योगले ठूलो फड्को मार्ने सक्दैन । नेपालको परम्परागत पर्यटन बजारीकरण अवधारणामा परिवर्तनको खाँचो छ । अहिलेको तीव्र र उच्च प्रतिपर्ध्धा अवस्थामा कमजोर क्षमताबाट एकल रुपमा खर्चालु पर्यटक तान्न सक्ने सम्भावना भने कमै छ । नेपाललाई जति अन्तर्राष्ट्रिय बजारमा प्रबर्द्धन गर्न सक्यो, त्यति नै बढी पर्यटक आउँछन् भन्ने तथ्यलाई सम्बद्ध सरोकारवाला पक्षहरूले मनन गर्नैपर्छ । एकातिर पर्यटनलाई राष्ट्रिय प्राथमिकताप्राप्त क्षेत्र घोषणा गर्ने अर्कातिर यसका लागि आवश्यक बजेट विनियोजनमा कन्जुस्याईं गर्ने वा विनियोजित बजेट विभिन्न नाम र बहानामा खर्च नगरी अन्यत्र सार्ने संस्कारले यो क्षेत्रको विकास हुनै सक्दैन । अहिलेको अवस्थामा पर्यटकलाई आकर्षित गर्नका लागि विभिन्न आकर्षण र प्याकेजहरू विस्तार गर्न आवश्यक छ, यसका लागि क्षेत्रीय गन्तव्यहरुसँग नेपाललाई आवद्ध गर्ने क्रम सुरु गरिनुपर्छ । केही वर्षअघि एसियाली विकास बैंकको एक आयोजना सासेक अवधारणाअन्तर्गत बुद्धिस्ट सर्किटको अवधारणा ल्याइयो । नेपालदेखि श्रीलंकासम्मका बुद्धसँग सम्बन्धित क्षेत्रहरूलाई समेटेर ल्याइएको यो बुद्धिस्ट सर्किटलाई प्याकेजका रूपमा प्रबर्द्धन गर्न सकिएको छैन । भारतले बुद्धसँग सम्बन्धित क्षेत्रहरुसम्म घुम्ने गरी आफ्नो मुलुकभित्र रेल्वे सेवा पनि सुरु गरिसकेको छ, तर दुर्भाग्य गौतमबुद्धको जन्मथलो लुम्बिनीनजिकसम्म आइपुग्ने यो सेवाबाट नेपालले केही पनि लाभ उठाउन सकेको छैन । साँचो अर्थमा भन्ने हो भने कहिल्यै पनि संयुक्त बजार प्रबर्द्धन सिर्जनशील हुन सकिएनन् । नेपाल विश्व पर्यटन बजारमा साहसिक पर्यटनका लागि प्रख्यात रहँदै आए पनि यसको बजारीकरण छिमेकी मुलुकका वा विकसित मुलुकका टुर अपरेटरहरूले गरिरहेको यथार्थ हाम्रासामु छ । डिज्नी ल्यान्डभित्र निर्मित सगरमाथाको प्रतिरूपमा चलाइएको कोस्टर राइडसँग नेपालको सगरमाथा र यहाँको पर्यटकीय सूचना राख्न न त नेपाल सरकारले पहल गर्‍यो, न स्वदेशी पर्यटन व्यवसायीले, न गैरआवासीय नेपालीले नै नेपालको पर्यटन प्रबर्द्धनका लागि विदेशस्थित नेपाली दूतावास र अन्य कुटनैतिक नियोगले जुन रूपमा प्रभावकारी भूमिका खेल्नु पर्ने थियो, त्यो हुन नसकेको छलंङ्ग भइसकेको छ । दूतावासहरूमा पर्यटन प्रबर्द्धनका लागि विशेष रूपमा प्रशिक्षित जनशक्ति र बेलाबेलामा नेपाल साँझजस्ता कार्यक्रम आयोजना गर्न पर्याप्त बजेटको अभाव हुने गरेको कुरा बेलाबखत सम्बन्धित राजदूतहरूले सार्वजनिक गर्ने गरेका छन् । ख्यातिप्राप्त अन्तर्राष्ट्रिय सञ्चारमाध्यमहरूबाट प्रचार प्रसार गर्नुपर्ने त छँदैछ, भएका संयन्त्रहरूको पनि सही ढंगले परिचालन हुन सकिरहेको छैन । नेपाल पर्यटन वर्ष-२०११ का क्रममा दर्जनौं व्यक्तिहरूलाई सद्भावनादूतका रूपमा नियुक्त त गरिएको थियो तर उनीहरूलाई सही ढंगले परिचालन नै गर्न सकिएन ।

अब हामीले नेपालका पर्यटकीय उत्पादनलाई फरक ढंगले विकास

र बजारीकरणको नीति लिनु पर्ने बेला भएको छ । यस्तो विविधिकरणका लागि अब नेपाली संस्कृति अध्ययनका लागि गन्तव्य पहिचान गरी त्यसको विकासका लागि समुदायसमेतको सहभागितामा कार्यक्रमहरू अघि बढाउनु पर्छ भने यस सिलसिलामा ग्रामीण पर्यटनमा हासिल उपलब्धीलाई अझ विस्तार गर्नुपर्छ । नेपालको पर्यटन उद्योगको प्रमुख चुनौती भनेको पर्यटकहरूको बसाई अवधि र उनीहरूको खर्च गर्ने क्षमतामा विस्तार नै हो । पर्यटन मन्त्रालयको एक तथ्यांकअनुसार नेपालमा पर्यटकको औसत बसाई अवधि साढे ११ दिन छ । १९९८ को भ्रमण वर्षपछि पर्यटकको संख्या बढे पनि खर्चालू र गुणस्तरीय पर्यटकको संख्या बढ्न सकेको छैन । पर्यटकको आवश्यकता र चाहनाअनुसारको उत्पादन तथा सेवा विस्तारमा ध्यान दिन नसकिएकै कारण खर्चालू पर्यटक बढ्न नसकेको तथ्यलाई अब पनि बिर्सने हो भने नेपालको पर्यटन प्रबर्द्धनमा जतिसुकै प्रयत्न गरे पनि अर्थहीन नै हुन पुग्छन ।

अर्को कमजोर पाटो भनेको हवाई सञ्जाल विस्तार नै हो । दुर्भाग्यवस देशको एकमात्र राष्ट्रिय ध्वजावाहक पनि यतिखेर जहाजविहीन अवस्थामा छ । यो निकाय लामो समयदेखि अत्याधिक राजनीतिककरण र भ्रष्टाचारको शिकार भइरहेको छ । अन्तर्राष्ट्रिय उडानका लागि नेपाल वायुसेवा निगमसँग जहाज त छैन नै, भएका जहाजहरू पनि कुनै पनि बहानामा ल्यान्डिङ हुने वित्तीकै त्यसका पाटपुर्जा चोरिने रोग देखापरेको छ । नयाँ-नयाँ जहाजहरू थपेर राष्ट्रिय वायुसेवालाई सबल र सक्षम बनाउनु पर्नेमा भएका जहाजहरू पनि क्रमैसँग खिया लाग्दै गए । जहाज किन्ने प्रक्रिया चरम राजनीति, भ्रष्टाचार तथा कमिशनको खेलको जन्जालमा जेलिँदै गयो । वायुसेवा निगममा कहिले कुर्सीको झगडा त कहिले अख्तियार र लेखा समितिको हस्तक्षेप देखियो । निगमका क्षमतावान पाइलटहरू विना काम बेरोजगार हुन बाध्य भए, कति त पलायन नै भए । निजी क्षेत्रका वायुसेवा सञ्चालकहरू पनि अन्तर्राष्ट्रिय उडानका लागि सक्षम भएनन्, न उनीहरूलाई सक्षम बनाउनमा नै चासो दिइयो । अन्तर्राष्ट्रिय उडानका लागि दिइएका निवेदनहरू पनि थाँतीमा राखियो । फलाना देशसँग हाम्रो वायुसेवा सम्झौता छँदैछ भनेर अरुको आशमा आकास हेरेर बस्ने प्रवृत्ति तालुकवाला मन्त्री तथा सरकारी अधिकारीहरूमा हाबी भयो । नेपालसँग हवाई सम्झौता भएका कतिपय देशले अहिलेसम्म नेपालमा एउटा पनि जहाज पठाएका छैनन्, न त जहाज उडाई रहेका देशहरूबाटै प्राप्त सिट क्षमता उपयोग गर्न सकिएको छ । वायुसेवा निगमसँगै उडान सेवामा प्रवेश गरेको थाइ एयरवेजले व्यापक उन्नति गरिसक्दा हाम्रो वायुसेवा निगम भने दिनप्रतिदिन रुग्ण बन्दै गइरहेको छ । भन्न त थाइल्यान्ड र नेपालको अवस्थितिका कारणले गर्दा यी दुई वायुसेवाहरूबीच तुलना नै गर्न मिल्दैन भनेर एकथरि विश्लेषकहरूले भन्ने गरेका छन्, तर सत्यचाहिँ के हो भने वायुसेवा निगमलाई कहिल्यै उन्नतिको बाटोमा लान नदिइएको, यसलाई सत्ता र शक्तिमा रहेका समूहहरूले आफ्नो स्वार्थपूर्ति गर्ने दुहुनो गाईमात्र भएका कारण यसले उन्नति गर्न नसकेको हो । अर्कातर्फ नेपालको निजी क्षेत्र पनि हवाई आकासमा त्यति व्यावसायिक रूपमा सफल हुन सकेन । एभरेष्ट एयरदेखि नेकोन एयरसम्मका कम्पनीहरू नाफामा चल्दाचल्दै आश्चर्यजनक रूपमा बन्द हुन पुगे भने अर्कातिर विश्वको उड्डयन आकासबाटै विस्थापन भइसकेको फोकरजस्तो जहाज ल्याएर जोखिम मोल्न खोज्ने कस्मिक एयर आफ्नो उद्देश्यमा विफल भयो । बुद्ध, यतिजस्ता वायुसेवा कम्पनीहरूले यतिखेर सफलता हासिल गरिरहेको देखिए पनि उनीहरू अन्तर्राष्ट्रिय उडानमा जान सकिरहेका छैनन, यसका पछाडि आर्थिक र प्राविधिक दुवै कारणहरू छन् ।

यसरी हेर्दा नेपाली हवाई आकास अन्तर्राष्ट्रिय वायुसेवा कम्पनीहरूको भरमा चलिरहेको छ । अरुको वायुसेवाका भरमा चलिरहेको नेपाली पर्यटन उद्योगले त्यसबाट लाभ पाउन नसक्नु स्वभाविक नै हो । नेपालको निजी क्षेत्रले अन्तर्राष्ट्रिय साझेदारी खोज्ने जोखिम हालसम्म मोल्न नसक्नु नै यहाँको उड्डन क्षेत्रको सबैभन्दा ठूलो कमजोरी हो ।

नेपालको हवाई आकासलाई पूर्ण सुरक्षित र भरपर्दो छ भनेर विश्वास बढाउनु पर्ने अर्को खाँचो छ, किनभने नेपालको हवाई आकासमा भएका केही दुर्घटनाहरूसँगै लुक्ला विमानस्थललाई विश्वकै जोखिमयुक्त विमानस्थलमा राखिएको, सीएनएनको आइ-रिपोर्टजस्ता कार्यक्रममा काठमाडौंको विमानस्थललाई विश्वकै हेला गर्न लायकको विमानस्थलको सूचीमा राखिएकोजस्ता कारणले नेपालप्रतिको विश्वासमा धक्का परेको छ । नेपालमा हालसम्म हवाई सुरक्षासम्बन्धी एउटा अपवादको चुक (ईन्डियन एयरलाइन्सको अपहरणको घटना)बाहेक अर्को कुनै चुक नभएता पनि उड्डयन सुरक्षाका सवालमा भने सुधार गर्नुपर्ने धेरै विषयहरू छन्। जसमा वायुसेवाहरूको नियमित अनुगमनदेखि उपकरणहरूको आधुनिकीकरण र परिवर्तनसम्मका मुद्दाहरू जोडिएका छन् । यो पनि नेपालको पर्यटन क्षेत्रको मुख्य मुद्दा हो । यदि पर्यटन क्षेत्रलाई नेपाली अर्थतन्त्रको मेरुदण्डका रूपमा मान्ने हो भने नारा र भाषणमा मात्र होइन, व्यावहारिक रूपमा यस्ता कमजोरीहरूको सुधारतर्फ ठोस नीतिगत पहल हुनु अत्यावश्यक छ ।

नेपाली पर्यटन एक झलक

कुल गार्हस्थ उत्पादनमा प्रत्यक्ष योगदान
सन् २०११: रु ३७ अर्ब ३० करोड (२.८ प्रतिशत)
वार्षिक औसत वृद्धिदर: ४.८ प्रतिशत
सन् २०२१: रु ५९ अर्ब ४ करोड (३.२प्रतिशत)
कुल गार्हस्थ उत्पादनमा कुल योगदान
सन् २०११: रु ८९ अर्ब २० करोड (६.७ प्रतिशत) सन् २०२१: रु १ खर्ब ५५ अर्ब ९० करोड (७.९प्रतिशत)

प्रत्यक्ष रोजगारी

सन् २०११: २ लाख ९३ हजार (कूल रोजगारीको २.४ प्रतिशत)
वार्षिक औसत वृद्धिदर: ३.९ प्रतिशत
सन् २०२१: ४ लाख २९ हजार (कूल रोजगारीको ५.७ प्रतिशत)
कुल रोजगारी सिर्जना (प्रत्यक्ष र अप्रत्यक्ष)
सन् २०११: ७ लाख २६ हजार (कूल रोजगारीको ५.९ प्रतिशत)
वार्षिक औसत वृद्धिदर: ४.१ प्रतिशत
सन् २०२१: १० लाख ८७ हजार (कूल रोजगारीको ६.८ प्रतिशत)
स्रोत: वर्ल्ड ट्राभल एन्ड टुरिज्म काउन्सिल

नेपाल पर्यटन अनुमान र प्रक्षेपण

	2011			2021		
	NPRbn [1]	% of total	Growth [2]	NPRbn [1]	% of total	Growth [3]
Direct contribution to GDP	37.3	2.8	3.1	59.4	3.2	4.8
Total contribution to GDP	89.2	6.7	4.1	144.9	7.8	5.0
Direct contribution to employment [4]	293	2.4	1.8	429	2.7	3.9
Total contribution to employment [4]	726	5.9	2.8	1,087	6.8	4.1
Visitor exports	32.8	25.8	0.0	55.6	26.8	5.4
Domestic spending	26.1	2.0	6.5	37.3	2.0	3.6
Leisure spending	44.7	3.4	1.4	72.2	3.9	4.9
Business spending	15.2	1.1	7.4	22.0	1.2	3.8
Capital investment	11.2	3.9	5.7	20.0	5.0	6.0

[1]2011 constant prices & exchange rates; [2]2011 real growth adjusted for inflation (%); [3]2011-2021 annualised real growth adjusted for inflation (%); [4]'000 jobs

Data Souce: World Travel & Tourism Council

सम्पादन संयोजक, राष्ट्रिय आर्थिक दैनिक कारोबार

प्राधिकरणमा जनशक्ति व्यवस्थापन

सुनिल मूल

१.पृष्ठभूमि :

कुनै पनि निकाय तथा संगठित संस्थाको लागि आवश्यक कर्मचारीहरूको छनौट, नियुक्ति, भर्ना, सरुवा एवम् तत्सम्बन्धीको काम गर्ने प्रक्रियालाई कर्मचारी व्यवस्थापन नामकरण गर्ने गरिएको पाइन्छ। यसको अलावा कर्मचारीलाई आफ्नो कार्य सम्पादनको सिलसिलामा सहज र कार्यप्रतिको ज्ञानमा अभिवृद्धि गर्न दिइने तालिम, अध्ययन, बिदा सुविधालगायत पदोन्नति, अवकासजस्ता कार्य प्रदान र अवकासपछि जीवनयापनका लागि आर्थिक सुविधा उपलब्ध गराइने जस्ता कार्यहरूलाई समेत कर्मचारी व्यवस्थापन भित्र समेटिएको हुन्छ। कुनै पनि संस्थामा रहेका कर्मचारी यदि दक्ष भएनन् भने त्यस संस्थाबाट प्रदान गरिने सेवासुविधामा गुणस्तरीयता हुन सक्तैन। यिनै कुराहरूलाई मनन् गरी प्रत्येक संस्थाले कर्मचारी व्यवस्थापनको क्षेत्रमा विषेश ध्यान पुऱ्याउने गरेको हुन्छ। कुनै पनि सस्था सञ्चालनका लागि भौतिक, आर्थिक एवम् मानव स्रोतको आवश्यकता पर्दछ। अन्य सम्पूर्ण श्रोतहरू मानवबाट परिचालित हुने हुनाले संस्था सञ्चालनमा अन्य स्रोतहरूलाई साधनको रूपमा र मानव स्रोतलाई साध्यको रूपमा लिइने गरिन्छ। यस प्रकारको संस्था सञ्चालनको साध्यको रूपमा रहेको मानव स्रोतको व्यवस्थापन सम्बन्धमा नेपाल नागरिक उड्डयन प्राधिकरणको विद्यमान व्यवस्था र यसमा गर्नुपर्ने सुधारहरूमा केन्द्रित रही यो आलेख तयार गरिएको छ।

२. नियुक्ति व्यवस्था

तोकिएका पदहरूको लागि तोकिएको योग्यता, सीप, दक्षता एवम् प्रतिभा भएका उम्मेदबारहरूबीच प्रतिस्पर्धा गराई तीमध्येबाट छनौट गरी सम्बन्धित सेवा समूहमा प्रवेश गराइने कार्यलाई भर्ना छनौट अथवा नियुक्ति भनिन्छ।

जनशक्ति भनेको संस्थाको निम्ति मानव पुँजी हो । संस्थाको कार्य प्रकृतिअनुसार विभिन्न प्रकारका प्रविधिहरू जडान गरिएका हुन्छन्, ती साधनहरूको सञ्चालन मानवले मात्र सञ्चालित हुने हुँदा संस्थाभित्र मौजुदा भौतिक सामाग्रीहरू साधनको रूपमा रहने र साध्यको रूपमा मानव रहने हुन्छ । यस प्रकारका विविध साधनहरू सञ्चालन गरी संस्थाबाट पुऱ्याइनु पर्ने सेवा-सुविधा असीमित रहेको हुन्छ । असीमित सेवा, सीमित जनशक्तिबाट सञ्चालन गर्नुपर्ने बाध्यता संस्थाको रहेको हुन्छ भने कतिपय संस्थाहरूमा अधिक जनशक्तिका कारणसमेत सेवामा प्रतिकूलता आइरहेको हुन्छ । अतः संस्थाबाट पुऱ्याउनुपर्ने सेवा अनुकूलको जनशक्ति संख्या र तोकिएको कार्य बहन गर्न सक्ने दक्ष, लगनशील र ईमान्दार जनशक्तिको भर्ना छनोट अथवा नियुक्तिले संस्थाको कार्य सम्पादनमा गुणस्तर अभिवृद्धि हुन जान्छ । यस प्रकारको भर्ना छनोट तथा नियुक्तिका लागि वैज्ञानिक योजनाको आधारमा तयार गरिनु पर्ने हुन्छ । होडबाजी र लहड, करकाप र दबाबमा यो कार्य हुन गएमा संस्थाले सोचेअनुरूपको आकांक्षा परिपूर्ति गर्न सक्दैन । यसबाट संस्थागत उत्पादनमुखि परिणामको बदला अनुत्पादक जनशक्ति बढ्न गई संस्था ह्रासोन्मुख हुन पुग्दछ । संस्थामा सेवा प्रवेश गराइनु भनेको मानवको जीवनको सुरक्षादेखि संस्थाको दिगो विकाससम्मको भूमिका रहेको हुन्छ । यही तथ्यलाई हरेक संस्थाले कार्यरत जनशक्तिहरूको सेवा सुविधाहरूको स्पष्ट व्यवस्था नियमबाटै किटान गरिएको हुन्छ ।

नागरिक उड्डयन प्राधिकरण सेवा उत्पादन गर्ने सार्वजनिक संस्था हो । नागरिक उड्डयन सेवाअन्तर्गत रही प्रशासन र प्राविधिक दुई भागमा कर्मचारीहरूको सेवा तह १ देखि ५ सम्म सहायकस्तर र तह ६ देखि १२ सम्मको अधिकृत तह विभाजन गरिएको छ । प्राधिकरणको संगठनात्मक संरचना तथा दरबन्दी पदपूर्ति समितिले स्वीकृत गरेबमोजिम सेवाको निमित्त आवश्यक पदको सिर्जना गरिन्छ । उक्त सेवाहरूको पदपूर्ति खुला, आन्तरिक प्रतियोगितात्मक तथा कार्य क्षमताको मूल्यांकनद्वारा निर्धारित प्रतिशतअनुरूप पदपूर्ति गरिन्छ । खुला प्रतियोगिताद्वारा पूर्ति गर्ने निर्धारित प्रतिशतको पद मध्येबाट ४५ प्रतिशत पदमा महिला, आदिवासी/जनजाति, मधेसी, दलित, अपांग र पिछडिएको क्षेत्रलाई क्रमशः ३३, २७, २२, ९, ५ र ४ प्रतिशतले समावेस हुन पाउने व्यवस्था प्राधिकरण कर्मचारीहरूको सेवाका सर्त-सुविधासम्बन्धी नियमावलीले व्यवस्था गरेको छ । नियमावलीले खुला तथा आन्तरिक प्रतियोगिताद्वारा लिइने परीक्षाको हकमा तोकिएको योग्यता भएका उम्मेदबारहरूको लिखित, अन्तवार्ता र पदपूर्ति समितिले तोकेको अन्य तरिकाको माध्यमले सफल भएका उम्मेदवारलाई पदपूर्ति समितिको सिफारिसमा अधिकृतस्तरको पदमा सञ्चालक समितिले र सहायकस्तरको हकमा महानिर्देशकले नियुक्ति गर्न सकिने उल्लेख गरेको छ । नियमावलीले व्यवस्था गरेको खुला प्रतियोगितात्मक परीक्षा आंशिक प्राविधिक सेवातर्फका केही पदहरूको विज्ञापन भई सोअनुरूप पदपूर्ति गर्न सकेको छ भने प्रशासनिकतर्फ सामान्य प्रशासन तथा आर्थिक प्रशासनतर्फको खुला पदपूर्ति गर्न सकेको छैन । यसरी प्रशासनिक पदहरूको समयमा पदपूर्ति नहुँदा प्राधिकरणको प्राविधिक विषयवस्तुलाई प्रशासनिक संयन्त्रले डोऱ्याउनुपर्ने कार्यमा प्रतिकूलता उत्पन्न हुँदै गएको देखिन्छ । संस्थाले राखेको लक्ष्यलाई साकार पार्न दक्ष एवम् क्षमतावान जनशक्तिहरूको बाहुल्य हुनु जरुरी हुने भएकोले पूर्ति गर्न बाँकी पदहरूको खुला प्रतिस्पर्धात्मक परीक्षाको माध्यमबाट लिने प्रकृयालाई तीव्र तुल्याइनु पर्दछ ।

३. तालिम व्यवस्था

जुनसुकै संस्थामा त्यस संस्थाबाट प्रवाह हुने काम कारबाहीहरू गुणस्तरीय ढंगबाट परिचालन हुन त्यहाँ कार्यरत जनशक्तिहरूको

उल्लेख्यनीय भूमिका रहेको हुन्छ। दिन-प्रतिदिनको नवीनतम विकासक्रमसँगै काम कारबाहीहरू पूरा गरी छिटोछरितो ढंगबाट सेवा प्रदान गर्नुपर्ने परिस्थितिमा नयाँ प्रविधिहरूलाई आत्मसात गरी समयसँगै जान नसकिएमा काममा चुस्तता आउन सक्दैन। बदलिँदो समयसँगै काम कारबाहीहरूमा सोहीअनुरूप परिवर्तन हुन संस्थामा कार्यरत जनशक्तिहरू यससँग सम्बन्धित कार्यहरूमा प्रशिक्षित हुनु आवश्यक हुन्छ। यस्तो तालिम नयाँ नियुक्ति हुने जनशक्तिहरूको निमित्त अझै महत्वपूर्ण रहेको हुन्छ। नयाँ जनशक्तिलाई कार्यसँग परिचित गराउनको लागि पूर्वसेवाकालीन तालिमका साथसाथै कार्यरत जनशक्तिहरूको पेशागत ज्ञान, सीप तथा दक्षता अभिवृद्धि गर्न विभिन्न किसिमका सेवाकालीन तालिमहरूको जरुरत हुने हुन्छ। सेवाकालीन तालिमले संस्थामा कार्यरत जनशक्तिको उत्प्रेरणामा विकास हुन पुग्दछ। यसले जनशक्तिबाट सम्पादन हुने कार्यविवरणमा प्रगति हुनुका साथै वृत्ति विकास समेतमा सहयोग पुग्न जान्छ। यसबाट समग्रमा पेशागत कार्य क्षमतामा अभिवृद्धि हुनाका साथै संस्थाको सर्वाङ्गिण विकासमा उल्लेख्यनीय योगदान हुन पुग्दछ। यस तथ्यलाई मनन् गरी हरेक संस्थामा कार्यरत जनशक्तिहरूको क्षमता अभिवृद्धि गर्न तालिम, प्रशिक्षणहरूको व्यवस्था गरिएको हुन्छ। तालिमको उपर्युक्त महत्वलाई ध्यानमा राखी संस्थाले तालिमसम्बन्धी ठोस नीति तथा कार्यक्रम बनाई प्रत्येक वर्षहरूमा कार्यान्वयन गर्ने गर्दछ।

प्राधिकरणमा यस प्रकारको वृत्ति विकासका लागि हरेक वर्ष स्वदेशी तथा विदेशी तालिमहरूको निमित्त उल्लेख्य रकम खर्च हुने गरेको छ। यस प्रकारको तालिम प्रदान गर्नका लागि मानव संसाधन विभागको अग्रसरतामा कर्मचारी छनोट गर्न मनोनयन कमिटीको सिफारिसमा स्वदेशी तथा विदेशी तालिमका लागि कर्मचारीहरूको महानिर्देशकस्तरीय निर्णयको आधारमा कर्मचारीहरूको वृत्ति विकासमा योगदान पुऱ्याउँदै आएको छ।

४. सरुवा व्यवस्था

कुनै पनि कर्मचारीलाई नयाँ काम सिक्ने तीव्र ईच्छा हुने भएकाले एउटै प्रकृतिको काममा लामो समयसम्म नराखी ठोस सरुवा नीतिको आधारमा समय समयमा सरुवा गरी संस्थाको विभिन्न कार्यको सम्बन्धमा अनुभव तथा ज्ञान हासिल गर्ने अवसर प्रदान गर्नु पर्दछ। यसबाट संस्थाको विविध कार्य एवम् क्रियाकलापको सम्बन्धमा कर्मचारी परिचित हुन गई कार्यसम्पादन क्षमता अभिवृद्धि भई संस्थाको उद्देश्य हासिल गर्ने कार्यमा महत्वपूर्ण सहयोग पुग्ने धारणा व्यवस्थापनसम्बन्धी विद्वानहरूको रहेको पाइन्छ।

१५ वर्षभन्दा बढी अवधि प्राधिकरणको सेवा गरिसकेका कर्मचारीलाई उसको शैक्षिक योग्यता, अनुभव, तालिम, कार्यक्षमता आदिको आधारमा विज्ञ कर्मचारीको रूपमा उपयुक्त विभाग तथा कार्यालयहरूमा सरुवा एवम् पदस्थापना गरी त्यसपछि लामो समयसम्म निजको कार्यक्षमताको अधिकतम उपयोग गर्ने गराउने अवसर प्रदान गरिनु पर्दछ।

प्राधिकरणमा कार्यरत कर्मचारीहरूको सरुवा गर्ने अधिकार महानिर्देशकलाई हुने कर्मचारी नियमावलीमा व्यवस्था रहेको छ। नियमावलीमा भएको व्यवस्थाअनुसार एक कार्यालयबाट अर्को कार्यालयमा सरुवा भएका कर्मचारी सरुवा भएको कार्यालयमा हाजिर नभई सामान्यतया अर्को कार्यालयमा सरुवा गर्ने छैन र कुनै पदको लागि अवधि तोकी सरुवा गरेकोमा बाहेक कुनै पदमा बहाल रहेको कर्मचारीलाई सामान्यतया दुई वर्ष पूरा भएपछि मात्र सरुवा गरिने उल्लेख रहेको छ। यस प्रकारको व्यवस्थामा सामान्यतया भन्ने वाक्यांशले बाध्यता गर्न सक्दैन। कर्मचारीहरू आफ्नो हितअनुकूल र खासगरि पदोन्नतिका लागि भौगोलिक क्षेत्रको अंक प्राप्तिका निम्ति त्यस्ता

क्षेत्रमा सरुवाका लागि होडबाजी नै गर्ने प्रचलन प्राधिकरणमा विकसित हुँदै गएको छ। कार्यालयको स्तरोन्नति गर्ने दिशातर्फको लक्ष्यभन्दा व्यक्तिगत स्वार्थपूर्तिका लागि सरुवाको माग गर्नेहरूको बाहुल्य रहेको देखिन्छ। कर्मचारीको भावनाविपरीत गरिएको सरुवामा प्राधिकरणले बाध्य पार्न समेत सकिरहेको अवस्था छैन । वायुसेवा उडानको निमित्त तयार हुँदाहुँदै त्यस्ता क्षेत्रमा कर्मचारीको उपस्थितिसमेत हुन नसकी हवाई यातायात सेवाको सञ्चालन समेतमा व्यवधान आइरहेको यदाकदा देखिएको छ। सरुवा गर्दा कर्मचारीको मनोभावना समेतलाई ध्यानमा राखी गर्नु पर्नेमा सो हुन नसकेका कारण कर्मचारीमा सरुवा समेतको गुनासो रहेको पाईन्छ। कार्यालयको काम भन्दा आफ्नो स्वार्थमा वढि केन्द्रित रहि सरुवा माग गर्ने प्रचलन वढि रहेको अवस्थामा कार्यालयको स्तरोन्नतीका साथै कार्यालयले गर्ने आय आर्जनसँग आवद्ध गरिनु पर्दछ। भौगोलिक क्षेत्रमा काम गरेबापत पाउने अंकको बदला त्यस क्षेत्रवाट आय गर्ने कार्यालयको आम्दानी तथा बेरुजुसँग आवद्ध तुल्याइनु पर्दछ ।

५. अध्ययन व्यवस्था

प्राधिकरणमा कार्यरत कर्मचारीहरूलाई शैक्षिक उपाधि हासिल गर्ने अध्ययनको सिलसिलामा गरिने मनोनयन समितिको स्वीकृतिमा र स्वदेश तथा विदेश तालिम तथा सेमिनारमा भाग लिन जान मनोनयन गर्ने अधिकार प्राधिकरण कर्मचारीहरूको सेवाका सर्त तथा सुविधासम्बन्धी नियमावलीले महानिर्देशकलाई तोकेको छ। नियमावलीले अध्ययन तथा तालिममा मनोनयन गर्दा अध्ययन तथा तालिमको विषयसँग सम्बन्धित सेवा समूह र उपसमूह भित्रका कर्मचारीहरूमध्येबाट जेष्ठता र कार्य दक्षता समेतको आधारमा मनोनयन गरिने उल्लेख रहेको छ। त्यस्तै अध्ययन तथा तालिममा कर्मचारीको मनोनयन गर्दा पहिले अध्ययन तथा तालिम लिने मौका नपाएका तथा विषयवस्तु हेरी उपयुक्त कर्मचारीलाई प्राथमिकता दिइने समेतको व्यवस्था नियमावलीले गरेको छ। नियमावलीले व्यवस्था गरे बमोजिमको शैक्षिक उपाधि हासिल गर्ने अध्ययनको सिलसिलामा गरिने मनोनयन कार्य हालसम्म कार्यान्वयनमा ल्याउन सकिएको छैन। प्राधिकरणवाट प्रदान गरिने सेवामा उच्च गुणस्तरयुक्त हुनुपर्ने हुन्छ। यसका लागि कर्मचारी समयसापेक्ष रूपमा दक्ष हुनु जरुरी हुन्छ ।

६. बढुवा व्यवस्था

कुनै कर्मचारीलाई साविकको भन्दा माथिल्लो पदको तलब-भत्ता अन्य सुविधा र दर्जा प्रदान गर्नुलाई बढुवा भनिन्छ। स्वस्थ बढुवा प्रणालीबाट कर्मचारीको हौसला वृद्धि गर्नुका साथै संस्थामा कर्मचारीहरूबीच स्वस्थ प्रतिस्पर्धाको भावना सिर्जना भई कार्य सम्पादनको उत्पादकत्वमा वृद्धि ल्याई संस्थाको उद्देश्य प्राप्तिमा ठोस सहयोग पुऱ्याउने कार्य गर्दछ । प्राधिकरण कर्मचारी नियमावलीअनुसार कार्य क्षमताको मूल्यांकन तथा आन्तरिक प्रतियोगितात्मक सिफारिस गर्ने उल्लेख रहेको छ। प्राधिकरण, कर्मचारी सेवाका सर्त तथा सुविधा सम्बन्धि नियमावलीले गरेको कार्य क्षमताको मूल्यांकनको आधारमा हुने बढुवा कार्यान्वयनमा कर्मचारीको कार्य क्षमताको मूल्यांकन गर्ने आधार र सोबापत पाउने अधिकतम अंक तालिकामा देखाइएको छ ।

७. विदा व्यवस्था

नागरिक उड्डयन सेवा अत्यावश्यक सार्वजनिक सेवा भएकोले हप्ताको सातै दिन सञ्चालन गर्नुपर्ने हुन्छ। कर्मचारीलाई सामान्यतया हप्ताको एक दिन साप्ताहिक विदा दिइएता पनि आवश्यक भएमा विदाको दिनमा पनि कामका लगाउन सकिने नियमावलीले व्यवस्था गरेको छ। सार्वजनिक विदाको सम्बन्धमा नेपाल सरकारले गरेको व्यवस्था अनुरूप हुने व्यवस्था रहेको छ। मानिस सामाजिक प्राणी भएकोले आ-आफ्नो रितिरिबाजअनुसारका सामाजिक कार्यहरूमा

जेष्ठता	शैक्षिक	तालिम	भौगोलिक क्षेत्रमा काम गरेबापत प्रति वष	कार्य सम्पादन मूल्यांकन
हाल बहाल रहेको तहमा काम गरेको प्रत्येक वर्षको निमित्त दुई दशमलव पाँच अंकका दरले बढीमा ३० अंक	प्रथम श्रेणी ११.५ द्वितीय श्रेणी ११ तृतीय श्रेणी १०.५	थम श्रेणी ३ द्वितीय श्रेणी २.५ तृतीय श्रेणी २	(क) वर्ग २ (ख) वर्ग १.७५ (ग) वर्ग १.५० (ख) वर्ग १.२५	(क) सुपरीवेक्षण २५ (ख) पुनरावलोकन १० (ग) पुनरावलोकन समिति ५

सहभागी हुन कर्मचारीहरूलाई विदाको आवश्यकता पर्ने भएको हुँदा यस प्रयोजनका लागि वर्षमा केही दिन भैपरी आउने विदा दिने चलन रहेको छ । कर्मचारीले आफ्नो परिवारको रेखदेख, भरणपोषण र अन्य घरायसी कार्यमा समेत सहभागी भई पारिवारिक जिम्मेवारीसमेत बहन गर्नको लागि उनिहरूलाई केही दिन थप विदाको आवश्यकता पर्ने भएको हुँदा यसका लागि घरविदा दिने प्रचलन रहेको पाइन्छ । कर्मचारी अस्वस्थ हुँदा उपचारका निमित्त विरामी विदा दिने चलन रहेको छ । यसैगरी परिवारको सदस्यको मृत्यु हुँदा क्रिया विदा, प्रसूति हुँदा प्रसूति विदा, अध्ययनका लागि अध्ययन विदा, सार्वजनिक विदाको दिनमा काम लगाइए सोको सट्टा विदा, अन्य अवस्थामा विशेष तथा असाधारण विदा दिइने गरिन्छ । संस्थाको कार्य प्रकृति हेरी विभिन्न संस्थाहरूमा विभिन्न अन्य प्रकारका विदाहरू समेतको व्यवस्था गरिएको हुन्छ । प्राधिकरणमा कर्मचारीहरूले पाउने विदाको उपरोक्त व्यवस्थाहरूबमोजिम कर्मचारी सेवाका सर्तसम्बन्धी नियमावलीले व्यवस्था गरेको छ । यस प्रकारका विदाहरूमा एक वर्षभित्र सञ्चित हुन सक्ने र नसक्ने गरी तोकिएको छ । संचित हुने विदाहरूको रकम खाइपाइ आएको तलबबराबर भुक्तानी पाउने हुन्छ भने सञ्चित नहुँने विदाको उपभोगमात्र गर्न सकिनेको व्यवस्था रहेको छ । घरविदाको सम्बन्धमा हरेक वर्ष ३० दिन पाइने व्यवस्थामा कुल १८० दिनसम्म सञ्चित गर्न सकिने सोभन्दा बढीको हरेक वर्ष ३० दिन बराबरको

विदा	प्रत्येकवर्ष	सञ्चित	भुक्तानी
भैपरी आउने पर्व विदा	१२ दिन	नहुने	नहुने
घर विदा	३० दिन	१८० दिन	हुने
विरामी विदा	१२ दिन	हुने	हुने
प्रसूति विदा	६० दिन (२ पटकसम्म)	नहुने	नहुन
किरिया विदा	१५ दिन	नहुने	नहुने

साधारण विदा	५ वर्ष सेवा अवधि पूरा भएकाले एक पटकमा १ वर्षमा नबढाई दिन सकिने/यस विदामा रहँदा अन्य कुनै प्रकारको विदा पाक्ने छैन र सेवा अवधिमा गणना नगरिनुका साथै तलब/भत्तासमेत पाउने छैन ।
दुर्घटना तथा अशक्त विदा	प्राधिकरणको कामको सिलसिलामा कुनै कर्मचारी दुर्घटना परी घाइते वा अङ्गभङ्ग भई काम गर्न सक्षम नभएको अवस्थामा औषधोपचारको लागी मेडिकल वोर्डको सिफारिसमा वढिमा १८० दिन सम्मको पुरा तलव भत्ता सहितको दुर्घटना तथा अशक्त विदा दिईने । यस्तो विदा नीजको कुनैपनि संचित विदाबाट कट्टा नहुने ।
अध्ययन विदा	तलब सहितको पटक-पटक गरी बढीमा ३ वर्षको ।
सट्टा विदा	काममा लगाइएको सट्टा विदा सोही वर्षमा लिइसक्नु पर्ने/विदा उपभोग गर्न नपाएमा सो बापत पारिश्रमिक बढीमा खाइपाइ आएको ४५ दिनसम्मको तलबबराबरको भुक्तानी हुने ।

उपभोग नगरिएको घरविदाबापतको रकम भुक्तानी गरिने व्यवस्था रहेको छ । घरविदा उपभोग नगरी सोबापत रकम भुक्तानी पाउने कारण प्रायसः कर्मचारीहरू विदा खर्च गर्न नचाहने तथा आफ्नो व्यक्तिगत कामको लागि अनेक बहाना बनाएर बनाबटी काज स्वीकृत गराई काजमा जाने र सो बापत दैनिक भ्रमण खर्च रकम खर्च हुने गरि संस्थाको आर्थिक व्ययभार बढाउने गर्ने गरेको पाइन्छ । यस्ता विकृतिहरूबाट प्राधिकरणसमेत अछुतो रहन सकेको छैन । यस प्रकारको समस्यालाई समाधान गर्न नोकरी अवधिमा खर्च नगरेको विरामी विदाको पूरै, घर विदा २५० दिनसम्म सञ्चित गर्न पाउने र नोकरीबाट अवकास हुँदा मात्र उक्त विदाको रकम पाउने व्यवस्था गरी प्रत्येक वर्ष घरविदा बापतको रकम भुक्तानी गरिने व्यवस्था खारेज हुनु पर्दछ । यस प्रकारको व्यवस्थाले कर्मचारीहरूलाई लामो विदा आवश्यक भएमा उपभोग गर्न पाउने, उपभोग हुन नसकेमा अवकास हुँदा उक्त रकम पाउने हुन्छ भने संस्थालाई पनि बर्सेनि यस सम्बन्धमा भइरहेको खर्च रकम उत्पादकीय क्षेत्रमा लगानी गर्न सकिने र अनावश्यक दैनिक भ्रमण खर्चको उल्लेख्य रकम बचत हुन जाने हुन्छ ।

८. अवकास व्यवस्था

जुनसुकै संस्थामा जसरी भर्ना, छनोट वा नियुक्ति गर्ने गरिन्छ त्यसरी नै संस्थाबाट निश्चित उमेर वा अन्य कारणबाट सेवाको अवकास हुने व्यवस्था गरिएको हुन्छ । हरेक संस्थामा कर्मचारीहरूको उमेरअनुसार, नोकरी वर्षलाई आधार मानेर अनिवार्य अवकासको व्यवस्था गरिएको हुन्छ भने संस्थाहरूले कर्मचारीहरूको अनिवार्य अवकासको उमेर घटाउने, अवकास हुने नोकरी वर्ष किटान गर्ने, स्वेच्छिक अवकास योजना लागू गर्ने जस्ता व्यवस्थाहरू गरिएको हुन्छ । प्राधिकरणमा स्वेच्छिक अवकास योजनाको व्यवस्था रहेता पनि हालसम्म त्यसलाई कार्यान्वनमा ल्याउन सकिएको छैन । यस प्रकारको स्वेच्छिक अवकास योजनाले संस्थाले चाहेजस्तो कर्मचारीले

अवकास प्राप्त नगर्ने र संस्थाको निमित्त अति नै आवश्यक कर्मचारी धेरैले अवकास प्राप्त गर्ने कारण यस किसिमको व्यवस्था संस्थागत रूपले सफल हुन नसकेको स्थिति विद्यमान छ । प्राधिकरणमा पनि यसको कार्यान्वयन भएमा उत्पादनशील कर्मचारीहरू बाहिरिने संख्यामा बढी हुने र अनुत्पादक कर्मचारीहरू मात्र संस्थामा बहाल रहने स्थितिको अवस्थाले आगामी दिनमा संस्थाले गर्ने काम कारबाहीमा प्रत्यक्ष असर पुग्ने हुन्छ । उमेरको हदबाट मात्र अवकास हुने वर्तमान व्यवस्थामा विगतमा व्यवस्था रहेका ३० वर्ष नोकरी अवधि पुगेका वा कर्मचारीको उमेर र नोकरी वर्ष जोड्दा ८० पुगेमा अर्निवार्य अवकास हुने व्यवस्था लागू हुनु पर्दछ । प्राधिकरणको सेवामा बहाल रहेका कर्मचारीको उमेर ५८ वर्ष पुगेपछि अनिवार्य अवकास २० वर्ष वा सोभन्दा बढी सेवा गरेका कर्मचारीले स्वेच्छाले सेवाबाट अवकास लिन चाहेमा सोको लिखित जानकारी दिन सकिने कर्मचारी सेवाका सर्तसम्बन्धी नियमावलीमा व्यवस्था गरेको छ ।

९. निष्कर्ष

देशमा लोकतन्त्र बहालीपश्चात् खुला बजारमुखी अर्थतन्त्रले क्रमशः विकसित हुँदै जान थालेको अवस्थामा आर्थिक उदारीकरणमा समेत सकारात्मक परिवर्तनका संकेतहरु देखा पर्दे आएका छन् । मुलुकको यस स्थितिमा हवाई क्षेत्रमा पनि तदनुरुपको परिवर्तनहरु देखापर्दे जानु स्वभाविक हो । नेपालले अंगालेको उदार आकास नीतिका कारण असंख्य वायुसेवा कम्पनिहरूको स्थापना हुँदै जानु यसको उदाहरण हो । जसकोकारण परम्परागत काममा मात्र सीमित रहेको नागरिक उड्डयन प्राधिकरणको काँधमा थप गहन जिम्मेवारी बढ्दै गएको छ भने अर्कोतर्फ प्राधिकरणलाई समयानुकूल आधुनिकीकरण गर्दै जानुपर्ने स्थिति समेत रहेको छ ।

यस स्थितिमा प्राधिकरणलाई वायुसेवाहरूको सवल नेतृत्व प्रदान गर्न सक्ने गरी समयानुकूल सुधार गर्न सकेको खण्डमा मात्र समग्र नेपालको हवाई क्षेत्रले महत्वपूर्ण उपलब्धी हासिल गर्न सक्ने कुरामा द्विमत छैन । तसर्थ, प्राधिकरणको सुधार केवल चाहना मात्र नभएर वर्तमानको आवश्यकता पनि हो । प्राधिकरणलाई आधुनिक रूपमा विकास गर्न यसका समग्र पक्षको सुधार हुनु पर्दछ । यस्तो सुधार कार्यले परम्परागत ऐन-कानुनमा परिमार्जन भई अधिकारसम्पन्न स्वायत्त संस्थाको रूपमा परिणत हुनु हो ।

संगठनको ढाँचा जतिसुकै वैज्ञानिक तथा समयसाक्षेप भएता पनि यदि संगठनभित्र क्रियाशील जनशक्ति दक्ष तथा पेशेवर भएनन् भने संस्थाले परिलक्षित गरेका उद्देश्य हासिल गर्न सकिँदैन । अतः जनशक्ति व्यवस्थापन र विकासलाई प्राधिकरण आधुनिकीकरणको मुख्य आधार बनाइनु पर्दछ । प्राधिकरणभित्र कार्यरत जनशक्तिलाई कसरी दक्ष, पेशेवर तथा समयानुकूल आधुनिक प्रविधिसँग काम गर्न सक्ने सबल सक्षम तथा गतिशील जनशक्तिको पुञ्जको रूपमा निर्माण गर्न सकिन्छ सो सम्बन्धमा ठोस नीति तय गरिनु पर्दछ । यसका लागी जनशक्ति विकास र व्यवस्थापनसम्बन्धी २० वर्षे मार्गचित्र तय गरिनु उपयुक्त हुनेछ । यसले गर्दा आगामी ५, १०, १५, र २० वर्ष भित्र कति नयाँ जनशक्ति, कसरी, कुन समयमा, के कति संख्यामा संस्थाभित्र नियुक्ति गरिने हो ? उक्त समयावधिभित्र कति जनशक्तिले स्वतः अवकास पाउँछन् ? कुन-कुन समयावधिभित्र कति पटक कस्तो प्रकारको तालिम पाउँछन ? सो सम्बन्धमा स्पष्ट वैज्ञानिक नीति तय हुन गई २० वर्षे जनशक्ति विकास र व्यवस्थापनसम्बन्धी मार्गचित्र अनुरुप संस्थागत कार्यान्वयनले निश्चित उद्देश्य परिपूर्तिमा टेवा पुग्ने कुरामा विश्वस्त हुन सकिन्छ ।

वरिष्ठ लेखा अधिकृत, नेपाल नागरिक उड्डयन प्राधिकरण, प्रधान कार्यालय ।

'Dreams coming true'

Our long awaited event – 51st IFATCA World Conference

Pratap Babu Tiwari

It was 2004. Nepal Air Traffic Controllers' Association (NATCA) organized 21ST International Federation of Air Traffic Controllers' Association (IFATCA) Regional Meeting in Kathmandu. It is historic for me to recall the event as it was connected with a jerk of time—somehow unpleasant but true—that while the preparation works were in climax, there was a massive protest in the streets in various cities of Nepal against the mass slaughtering of twelve innocent Nepalese in Iraq by the terrorists. Because of the unrest, Nepal Government had imposed indefinite curfew in Kathmandu and this message was widely covered by international news channels-- including BBC and CNN as well. Above that, the country itself was under the havoc of insurgency. Besides, the internal political situation of the country was not stable; something like insecurity and uncertainty for the honorable foreigner guests was looming large. As a result, the then Executive Vice President of IFATCA sent me an e-mail -- indicating that he is going to announce the cancelation of meeting in Kathmandu, shortly. We requested him not to cancel the meeting and try to convince him that the demonstration was just a natural wave of peoples' sentiment and nothing hazardous for the international delegates of the conference. We continuously briefed him about the ongoing situations of the city and informed that the curfew had been relaxing day by day. To cope the situation, we called a series of meetings with our management; requested to Ministry of Tourism and Civil Aviation and Nepal Tourism Board to do something positive -

- assuring safety for the IFATCA delegates and other concern visitors. Nevertheless, they did not want to take any risk; lastly, seeing no other options, we issued letter proposing to reschedule the convention date around the date of World Buddhist Summit in Nepal in the first week of December 2004. The Vice President convinced to reschedule the date if only majority of member associations would vote in favor of this proposal. Alternatively, he proposed to organize this conference in Hong Kong being Nepal as the host-- which we rejected out rightly. We made several telephone calls to all member associations and requested them to vote for the venue in Kathmandu. Ultimately, majority of the member associations voted in favor of us -- although remaining a few members kept themselves unspoken. Finally, the meeting convened in Kathmandu, from 1 to 4 December 2004, with a success, supported from various organizations and well-wishers. The great prize was that the meeting was concluded without any unpleasant incidents in the country. The supports and acknowledgements we received and the experience we gained from this world-conference urged us as the inspiring spirit to conduct IFATCA World Conference in Nepal.

The mission for our dream to conduct IFATCA World Conference in Nepal was started from the 47th IFATCA World Conference in Istanbul, Turkey, in 2008 where we proposed our intention to host 50th IFATCA World

Conference in Nepal in 2011-- which is also published in concern IFATCA report. In the world conference in Dubrovnik in 2009, our bid to host 50th IFATCA World Conference in Nepal in 2011 underwent voting; unfortunately we lost it by marginal votes. However, we just could not give up our immense desire of hosting this world-conference. We bid again for the same in the 49th Annual conference in Puntacana, Dominican Republic. Delegates raised bunch of queries: like security situation, , airfare and air connections, registration fee, hotel room rates, power cut etc. We tried to satisfy their queries. Although some delegates from the developed countries were still in doubt whether Nepal, a third world country, can host that scale of world conference or not, however, with the help of our friends from other few developed countries -- considering perhaps our wish and deliberated attempts -- the situation compelled all members to vote in favor of NATCA: and the venue for the fifty-first IFATCA World Conference was

unanimously selected Kathmandu. Later, IFATCA Conference Executive made an inspection visit to satisfy himself whether or not the infrastructures for the conference – as like conditions our hotels, supportive agencies like state government, civil aviation authority, airlines and other stakeholders of aviation and tourism -- are adequate . In Amman of Jordan, during the 50th Annual Conference in 2011, the Conference Executive report was presented and working paper from NATCA was also presented and discussed. Finally, Nepal was confirmed as the host for the 51st IFATCA Annual Conference. We shared ecstatic moment with all friends; ultimately we became able to win the race : the dream comes true.

The International Federation of Air Traffic Controllers' Associations (IFATCA) is a non-political, non-industrial organization with a membership of over 50,000 air traffic controllers representing from 137 countries' member associations, including NATCA. IFATCA was founded in 1961 whereas NATCA has been affiliated with IFATCA since 1992. IFATCA enjoys a worldwide reputation amongst all partners in Air Traffic Management with representation in many areas including ICAO and Euro control working groups. IFATCA 's commitment to enhancing safety and efficiency of air transport is widely recognized. The objectives of the Federation are-

- To promote safety, efficiency, and regularity in international air navigation.
- To assist and advise in the development of safe and orderly systems of air traffic control and new procedures and facilities.
- To promote and uphold a high standard of knowledge and professional efficiency among air traffic controllers.
- To closely co-operate with international and national aviation authorities and institutions concerned with air navigation.
- To sponsor and support the passage of legislation and regulations which will increase and protect the safety of air navigation.
- To strive for a world-wide Federation of Air Traffic Controllers' Associations.

The conference is going to be organized from 12th to 16th of March, 2012 at Yak and Yeti hotel in Kathmandu. The Conference and Technical Exhibition 2012 is expected to attract over 500 delegates from 137 countries' member associations all over the world, expert speakers and high ranking officials of government and Civil Aviation Authority (CAA), CEO and Operations Directors of major commercial airlines, honorable guests from various International organizations such as ICAO, FAA, IFALPA, IATA, IFATSEA, CANSO, ITF and Aviation vendors (IFATCA Corporate members) etc.

Aviation activities are usually getting publicity and becoming a catching-matter of media's attraction only if there is any accident. The usual questions in

such situation were the person involved in the accident -- who was the pilot, who was the ATC on duty—but less importance is given for the actual causes of accidents and the role of the front line operators, situational constraints, condition of the system using, procedures, trainings, organization safety cultures, oversight system are ignored. To this direction, the significance of the conference is that, it makes review as well as formulate new IFATCA policies relating to safety concerns. This conference will focus its discussions on a number of burning issues -- like Safety Management System (SMS), English Language Proficiency (ELP), transition from present to future systems (performance based system), human factor issues, shortage of human resource in ATC, need of expertise and knowledge other administrative, technical and\ or professional matters of the federation : most importantly, safety of flight operation and air traffic control, intensively.

One of the aims of this conference is to ensure the profession of the air traffic controllers. It is well publicised throughout the world that air traffic control receives wide public interest. Considering the aviation space that occupied the present world, the conference would not only highlights the concern professionalism of ATCs but also holds a greater significance for promoting tourism. Further, it will revealed the beauty of this Himalayan country to the outer world to support the government strategy for promoting convention tourism. It is a pleasant note for us that despite our constraint resource we dare to convene this mega- event with the objective of "**Developing professionalism by organizing the mega international event and to promote tourism**". In relation of its international standers , we believe, the conference will hold a special significance with the essence of considerable discussions for safe and reliable air transportation -- on which the success of travel, trade and tourism depends.

Basically, we hope, the event offers a good opportunity for the participants to gain rare knowledge and exposure to Nepal's aviation environment that is challenged by operational, topographical and technological constraints. It would be a proper forum to discuss aviation issues and formulate common policies to open a common sphere of aviation where we could join with each other and cooperate with each other to address our common concerns. Taking into this matter, the theme of the conference has been set as -- ***"One Voice, One Capability, One Sky"*** -- keeping in view that IFATCA is the only professional organization representing the voice of 50,00 air traffic controllers around the world and working under the one sky. This is the reason why '***One voice, One Sky*** ' has been the slogan of IFATCA since 1961. Further more, to strengthen the slogan above, we have added a clause further, '***One Capability*** ' for the harmonization and cooperation in the actions of IFATCA, as ICAO has been giving stress for the same. It is

essential for the consistent development in aviation in the region and the world to have a one capability. It is also a coincident our theme resemblance to' ICAO Day theme' for this year 'Assistance and Cooperation for globally Sustainable Air Transport'. It is evident that demand of air travel along with the adoption of a more customer-driven service and system has become the pressing issues for every aviation organizations. To cope with this challenge, every ATS Providers/Organizations should be self-sustainable and efficient in its services without compromising the given international standards – keeping the regional balance and harmony intact. However, it seems to be more challenging for many member countries to implement aviation standards set by ICAO due to disparity in resources availability, lack of expertise and knowledge. In this perspective, these issues will only be materialized once the capability is harmonized. For this, assistance and cooperation in terms of financial, technical and human resource is very essential from every sectors and expert organizations like IFATCA.

Fiveday-long conference starts with opening ceremony, opening plenary, opening of technical exhibition and breakout sessions of three committees on the first day. Sessions will be divided into three Committees: Committee A- Administrative, Committee B- Technical and Operational and Committee C- Professional and Legal. There will be the technical exhibition related to ATC System from various international vendors and other Aviation related booths from domestic as well as international fronts. All three sessions will continue separately but combined on second and third days along with technical exhibition that will continue up to the third day of the conference. On the fourth day of the conference, there will be IFATCA Panel discussion and that will be a combined session. On last day, there will be the separate four regional meetings : 1. European region, 2. Africa and Middle East, 3. America and 4. Asia Pacific Region. The meetings will followed by the final plenary and closing ceremony.

The Organizing Committee for the conference has already been formed and duties and responsibilities has also been assigned as: Public/Media Relation,. Publication, Event Management, Transport and Hotel, Logistic, Technical Support, Hospitality, Finance control, Visa, Ticketing and Registration, Marketing and Secretariat sub-committees. Similarly, an Advisory Board has also been formed under Chairmanship of Honorable Minister for Tourism and Civil Aviation. Other members of the committee are as follows: Secretary, Ministry of Tourism and Civil Aviation; Director General, Civil Aviation Authority of Nepal ; Chief Executive Officer Nepal Tourism Board; Chairman/Managing Director, Nepal Airlines Corporation; General Manager, TIA Civil Aviation Office; President, Hotel Association of Nepal; President, Airline Operators' Association of Nepal; President, Nepal Airline Pilots' Association; President,

Board of Airline Representatives in Nepal; President, Nepal Association of Travel and Tour Agents ; President, Authorized Trade Union, Civil Aviation Authority of Nepal and Member secretary as President, Nepal Air Traffic Controllers' Association. The organizing committee is planning to open this conference either from the President of Government of Nepal or from the Prime Minister.

Our long awaited mega conference and the mega event in aviation industry 'IFATCA Conference' is being held for the first time in South Asia region and it is also expected to be the biggest conference ever held in Nepal in terms of foreign delegates participation. The Organizing Committee is sincerely dedicated in making this mega event a success by meeting all expectations of the participants. However, it is also sure that this event will not be successful without the support from the Government of Nepal, Civil Aviation Authority, and other stakeholders of aviation and tourism industry. Considering this fact, I would like to request all to take it as your own and join hands to make this super- event a grand success.

President, NATCA