Civil Aviation Authority of Nepal
Head Office: Babar Mahal, Kathmandu, Nepal
Tel.: 4262387, 4262326, 4262518, Fax: 977-1-4262516, AFTN: VNKTYAYX,
E-mail: cnsatm@mos.com.np, dgca@caanepal.org.np, Website: www.caanepal.org.np

Printed at: **Simon Printers & Traders**
Anamnagar-32, Kathmandu, Tel. 4102558, E-mail: gouprinters@gmail.com

CAAN Souvenir 2009

11th Anniversary Publication

CAAN SOUVENIR 2009

Civil Aviation Authority of Nepal

31 DECEMBER 2009

Message from
The Prime Minister

I am pleased to know that the Civil Aviation Authority of Nepal (CAAN) is celebrating its 11th Anniversary with various programmes and activities.

Civil Aviation is a key sector of the national economy of our country. Given the landlocked landscape of the country, air transport in Nepal has contributed in integrating country's remote communities into the main stream of national development. This has enormously contributed to socio-economic transformation and balanced development. Since tourism is the mainstay of the national economy, this sector has to be developed with high priority. In this regard the air transport sub-sector infrastructure should be developed simultaneously to bring enormous benefits to the country. The government is committed to playing an exemplary role in enhancing aviation safety and security as well as facilitating air travel. Since Nepal is launching the campaign of Nepal Tourism Year 2011, I would like to appeal to all the stakeholders to forge a collaborative partnership with States at all levels- sub regional, regional and global to make this national campaign a grand success.

The air transport of both passengers and cargo has witnessed a phenomenal growth in the last decade. Against the backdrop, I believe CAAN has a big role to play in regulating and promoting healthy growth of air transport industry while also ensuring increased level of quality services and facilities to benefit the traveling public domestically as well as internationally. I am confident that CAAN will remain committed forever to the sustainability of aviation sector. I would like to reiterate that the Government is committed to strengthening national policies, laws and institutions governing civil aviation with greater flexibility in the days ahead.

I wish to express best wishes to CAAN on the occasion of its Anniversary.

Madhav Kumar Nepal

Message

Minister for Tourism and Civil Aviation

I am delighted to know that 11th Anniversary of the Civil Aviation Authority of Nepal (CAAN) is being observed on this day of 31 December. Personally and on behalf of the Ministry, I would like to offer my deepest felicitations to CAAN on the occasion.

In the contest of Nepal with landlocked isolation and complex geography, tourism remains to be a structure where as civil aviation is a critical factor to contribute to tourism, which is the cornerstone of Nepalese economy. It serves as an essential prerequisite to the holistic development and a lifeline for remote and far-flung communities. It is gratifying to note that Nepal has emerged as a popular tourist destination in the world. Therefore, aviation and tourism are typically symbiotic in nature and most cooperate proactively. It is against this backdrop, that we have campaigned to accelerate tourism promotion by declaring the observance of Nepal Tourism Year 2011 with the aim to attract 1 million tourists to the country.

Moreover, against the discernible improvements in the process of peace building , conflict resolution and reconstruction in the country, safety and security management of the continuously rising air traffic and development of a more appropriate tourism strategy in foreseeable future is very likely. Pertinently, CAAN has to be more creative towards ensuring regular, affordable, reliable and efficient air transport in the country.

The Government of Nepal is committed to developing aviation infrastructure in the country. We invite the aviation partners, both government and non-government, to cooperate intensively to reiterate the significance of civil aviation. I am hopeful that the Authority will forge a collaborative partnership at governmental, local and industrial level to ensure homogeneous application of safety and operations standards of airports and travel.

Finally, I wish CAAN all success in its endeavor.

Sarat Singha Bhandari

Message

Minister of State for Tourism and Civil Aviation

I am pleased to learn that Civil Aviation Authority of Nepal (CAAN) is observing its 11th Anniversary, and as part of various activities, it is publishing a special Souvenir magazine as well as a Supplement to mark the occasion.

The instrumental role of air transport is more apparent in the context of our country, Nepal where air transport has been an indispensable vehicle to integrate Nepal with the outside world as well as the communities living in the far-flung areas within the country into the main stream of national development.

We appreciate the immense contribution made by ICAO for the development and expansion of civil aviation in Nepal. As a member State of ICAO, Nepal should not only be committed for safe and secured air transportation, but the call of the day is also for a suitable and sustainable aviation industry. Since civil aviation is a dynamic, high-tech, and above all, international in character, policies, rules, regulations as well as working methods and approaches need to be proactively and timely adopted. In this regard, the Government of Nepal has introduced a comprehensive Civil Aviation Policy 2063, and also a new elaborative tourism policy. It is expected that both of these policies would ever remain an ideal driver for creating a conducive environment for healthy and competitive development of civil aviation and tourism in the country. CAAN must take full advantage of this environment and regulate industry, provide quality services, install and update safety equipments and facilitate airports to satisfy consumer needs. Safe, healthy and efficient aviation services are essential to contribute to national economy.

At the end, I congratulate CAAN for its successful completion of 11 years in service and wish it all success in its endeavor in days head.

Shtrudhn Prasad Singh

Message

Secretary, Ministry of Tourism and Civil Aviation

Personally and on behalf of the Ministry of Tourism and Civil Aviation of the Government of Nepal it is indeed my pleasure to extend our congratulations to the Civil Aviation Authority of Nepal (CAAN) on its 11th Anniversary.

Nepal today is a transformed tourist destination - vying to offer the best in terms of a varied tourism product and accessibility. Tourism is now well recognized as a means of achieving high economic growth and realizing the social objective of providing a better quality of life. Improvements is accessibility and infrastructure, well trained human resources, diversification of the tourism product and an integrated marketing campaign under various periodic banners have helped Nepal achieve sustained growth in terms of value and volume. Nepal Tourism Year 2011 is thus set in similar vein to attract at least 1 million tourists that year.

It is gratifying to see that CAAN is geared towards coping with emerging challenges facing civil aviation sub-sector. Phenomenal traffic growth over the years of two decades, particularly after the adoption of liberal aviation policy in the early 1990s, challenges in areas of infrastructure development and regulatory provisions for safety, efficiency and sustainability of organistion and industry need to be increasingly met. In the light of liberalization trends and forces facing the world aviation arena, the government is now considering towards embarking on liberal sky policy by allowing private sectors to venture in the development of infrastructure and service management of airport operations.

In this regard it would be pertinent to mention the recent bilateral negotiations with India which has availed 30000 seats to and from 6 metropolitan cities, a historic surge over the existing 6000 air seats to and from 7 points in India both ways. Moreover, the opening of 27 points of India for utilization by both the countries heralds a significant milestone in the growth of connectivity and tourism between Nepal and India.

Finally, I urge all the stakeholders to cooperate with CAAN in its every endeavor to discharge the regulatory and service provider functions. The Government is committed to adopting appropriate policy and mechanism to facilitate CAAN is discharging its noble objectives of ensuring safe reliable, affordable and efficient air transport and operations.

In the end, I wish CAAN all success.

Nagendra Prasad Ghimire

C O N T E N T S

Face: Kangeldanda airport. **Photo:** with courtesy of Binod Gautam.
Photo edited & Design by: Suroj Maharjan.

CAAN Souvenir 2009 Publication Committee:
Co-ordinator: Mr. Ram Prasad Neupane, Dy. Director General
Consulting Editor: Mr. Saurabh Ranjan Baral
Editors: Mr. Mahesh Kumar Basnet, Mr. Deepak Baral and Mr. Sachit Pokharel
Printed by: Simon Printers & Traders, Anamanagar-32, Kathmandu, Tel: 4102558, E-mail: gouprinters@gmail.com

Civil Aviation Authority of Nepal
Head Office: Babar Mahal, Kathmandu, Nepal

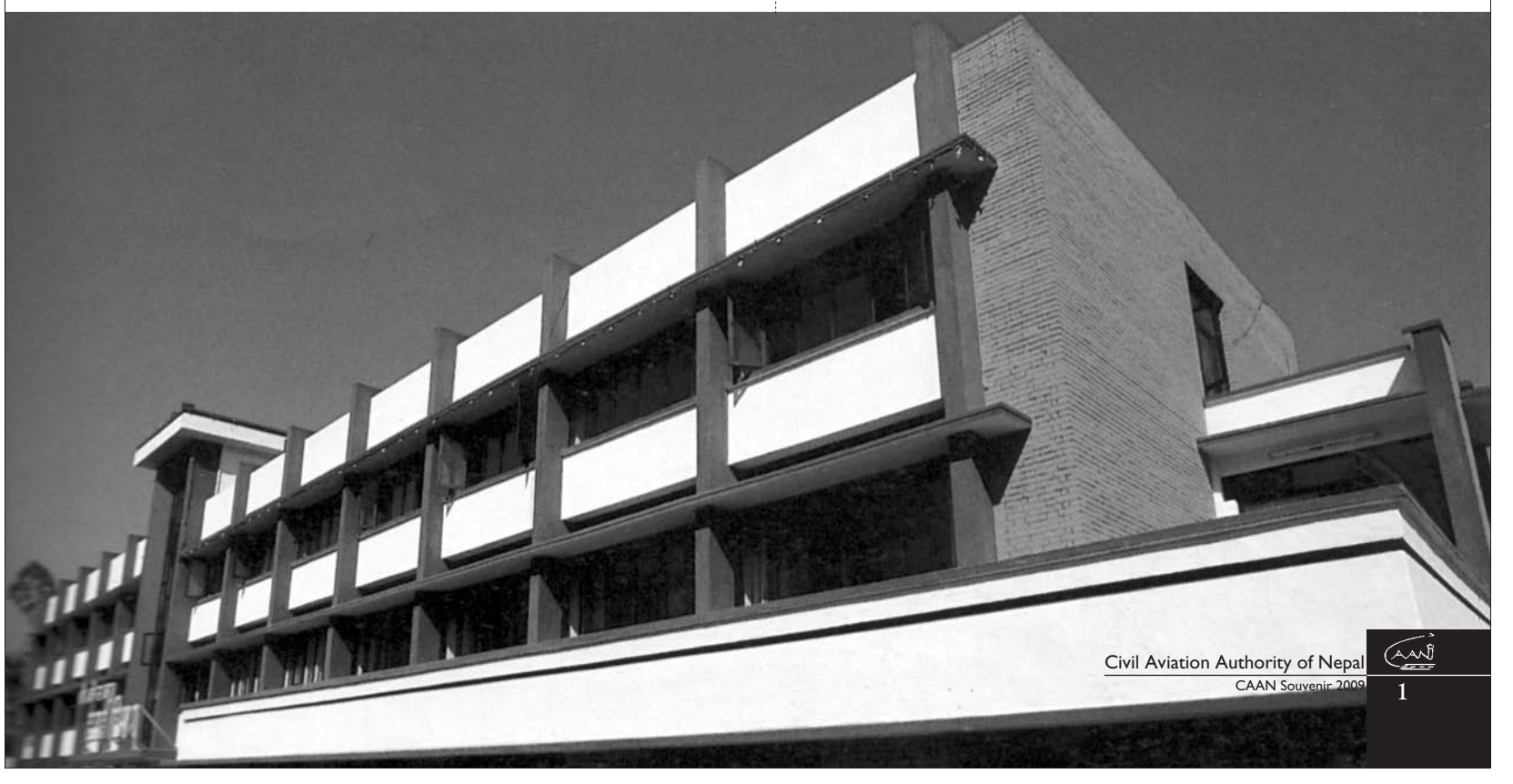
2009

Prefatorial Remarks

Keshab Raj Khanal
Director General

On the occasion of the 11th 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. This celebration, I believe, has been an important forum for the government, organizations and industry partners to not only exchange and sharing ideas but also a platform to cooperate and voice issues pertaining to safety, security and efficiency of civil aviation.

CAAN is the sole government organization looking after the civil aviation sub-sector of the country. It is committed to strengthen its role in assuring far reaching connectivity and accessibility. Given the adverse topography and land locked situation of the country, civil aviation is geared towards construction, development and improvement of the airports of Nepal. Our recent focus has been on the transformation of Gautam Buddha airport and Pokhara airport into regional international airports, construction of SIA and air services agreements with neighbouring countries along the line of liberalization and regional cooperation. However, this sub-sector is so high tech, sophisticated, liability prone and internationally influenced, that the CAAN cannot solely meet the emerging need of the infrastructure development. Hence, adequate cooperation and support from ICAO, the government at national and sub-regional level and private sectors is always called for, particularly in airport infrastructure development and adoption of modern technology.



It is our reiteration that we will remain adhered to the ICAO Standards and Requirements, which have been supportive to the growth and expansion of aviation in the country. May I recall that we also observed the ICAO Day on 7 December 2009 with the ICAO mandated theme 65 years of empowering the global community through aviation truly signifies the tie of friendship, harmony and understanding between ICAO and Nepal which has been all the more catalytic for the growth and expansion of civil aviation in Nepal. In course of being empowered for safety and efficiency of civil aviation, we would like to share our experience regarding the ICAO USOAP audit which was conducted during 5 to 14 May 2009. COSCAP-SA has provided significant assistance to CAA Nepal by providing the services of aerodrome, ANS, and operations experts in terms of preparing manuals, requirements and procedures. As directed we submitted corrective action plan taking in to account the findings made on 8 critical elements and the relevant audit protocols. CAA Nepal as regulator is planning to implement state safety programme (SSP) and SMS for service providers, operators and such training organizations as are directly associated with operations. As per the audit findings/recommendations, we have to revise the primary aviation legislation and specific operating regulations incorporating the provision of Chicago Convention and Protocols. The Organization Structure of CAAN is in the process of revision under ADB assistance for institutional capability enhancement to address the audit recommendations for the separation of service provider and regulator function. In order to fulfill the growing training requirements for technical personnel we are also in the process of preparing HR policy, training plans and programmes. In this context the cooperation of ICAO, our dedicated staff and industry partners will be very beneficial.

Despite economic downturn all over the world, it is expected that air transport will regain momentum from 2010. This will certainly reap a robust growth for this part of the world as air traffic at TIA and other domestic airports are already on the increase. Compared to first 10 month traffic throughput of 2008, this year, TIA shows 8.41%, 9.63% and 7.62% increase in aircraft, passenger and cargo movement, respectively, for the same period. On domestic, for the same period of comparison, aircraft movement has grown by 19.72% and passenger by 35.15%. Within 6 months since last June, 6 more international airlines have entered into service, taking the number of international operators operating to Kathmandu to25. Seat capacity production has also surged to 36,660 from 28,041 within the last 6 months. On domestic, the total number of AOC holders has reached 54 out of which only 25 are valid. The recent bilateral negotiations with India which has availed 30000 seats to and from 6 metropolitan cities, a historic surge over the existing weekly 6000 air seats to and from 7 points in India both ways. Moreover, the opening of 27 points of India for utilization by both the countries heralds a significant milestone in the growth of connectivity and tourism between Nepal and India. One of the most significant achievements in recent times with regard to airspace and air route management is the establishment of ATS Route L626. This Route extends from Kathmandu to Delhi via Mahendranager of Nepal and Pantanagar in India. This Route is 20 miles shorter than the existing B 345 (Bhairahawa-Lucknow--Delhi) route. It allows 291 nm utilization of the Nepalese airspace as against 100 nm that could be utilized along B 345. Nepal will have the opportunity of getting economic benefit through more utilization of airspace and maximize the revenue in the future. The operation of aircraft on L626 has been started since 19 November, 2009. Already a dozen airlines fly on this route from Kathmandu to destinations in the west. In order to extend the VHF coverage of Kathmandu Control to the entire western airspace, a remote control air ground (RCAG) station has been established which connects ACC and Nepalgunj through VSAT. Without this establishment, L626 would have not been a reality for reason of limited VHF communication coverage in the western airspace of the country. On infrastructure improvement and upgradation, it is after a hiatus of 14 years that the runway and taxiway overlay works at TIA have already been set to begin. An additional parking bay is also being expanded, which will lessen the congestion at TIA ground to some extent. Likewise, project for the development of car parking has been initiated in front of the ITB. In similar vein to facilitate the travelling public at the airport, security system is also being improved with the formation of facilitation committee.

With due regard to domestic airport improvement and upgrading, Chandragadhi airport has been blacktopped. Preparatory work has been initiated for resumption of Rajbiraj airfield. The newly built Manmaya Rai Khanidanda airport runway has also been brought to operation. Similarly, installation of simple approach and airfield lighting has been completed at Nepalgunj. Simikot airfield is also underway for upgradation with the acquisition of additional land.Getting along with the mood and spirit of the government campaign of Nepal Tourism Year 2011 to bring in 1 million tourists in the country, CAAN remains committed to make air service an effective vehicle of high economic growth supported by a wide scale tourism and accessibility. It is our confidence that sustainable, dynamic regulatory instruments and physical facilities of the state-of art technology complemented by productive human resources shall reorder CAAN to become a model institution and backbone of Nepalese economy.

In the end, I congratulate all the staff and stakeholders on this day, and thank you all for your keen interest in our activity.

I wish the day all success.

Keshab Raj Khanal
Director General

Air Transport in Liberalization Milieu- Case of Nepal

Ram prasad Neupane
Deputy Director General

Policy Dimensions and Impacts

Nepal has witnessed significant growth in air transport after the adoption of liberal aviation policy in 1992. A comprehensive Civil Aviation Policy was initially introduced in 1993 and reintroduced in 2006 to create a conducive and healthy competitive environment and encourage private sector investment in air transport and manage growth, change and emerging environment. The policy reflects the spirit of declaration of global principles made by the fifth worldwide air transport Conference convened at ICAO Montreal in 2003. Altogether 25 airlines hold valid Air Operator Certificate (AOC) and 14 airlines are providing domestic air services (7 fixed wing and 7 rotor craft). The aircraft fleet (41 fixed wing and 19 helicopters) comprises of 20 different types ranging from STOL to Jet Aircraft and 4 sports/recreational companies. In the domestic sector, there has been a manifold increase in air traffic, aircraft and cargo movement.

The air traffic growth during 1990s versus 2000s has been noticeable. On the domestic scene, in 1991, when the country was at the door step to the liberalized aviation regime, 0.216 million passengers moved in and out Tribhuvan International Airport (TIA). The number rose to more than 0.067 m passengers in 1998, the year that marked the transformation of the Government Department (DCA) into Civil Aviation Authority of Nepal (CAAN) as an autonomous entity. Given the increased trend in air traffic growth, the civil aviation sub-sector will have made a significant contribution to the campaign of Visit Nepal Year 2011, which aims to bring in 1 million tourists to Nepal. Currently there are 25 international airlines operating at TIA. In 2008, the data on international airline passenger market share at TIA indicated that Gulf Air has the highest market share followed by Qatar Airways, Nepal Airlines, Thai Airways, Indian Airlines (NACIL), Jet Airways, Biman Bangladesh, Air Arabia etc.

The Government and CAAN have granted permission to private airlines to operate scheduled international flights since 1997 and a few airlines operated flights in some selected sectors. However, they have not been successful for the continuation of services. International air service is a challenging task particularly for the operators with limited capability. It indicates that international operation requires sound technical, managerial and financial efficiency and efficacy to fulfil the international requirements.

Considering these factors, Nepal embraces the notion of liberalization in ways that best meet the objectives and mission rather than be driven by indoctrination to open the skies globally. Nepal supports the policy of progressive liberalization ensuring safety and security. As regards airport infrastructure development, out of 54 airports (6 under construction) in the country, 33 are currently in operation. The involvement of private sector in airport construction is not tangible as there are only few small airports, which are being constructed under public-private partnership (PPP).

Nepal's Status on International Legal Instruments

Nepal has been the Contracting Member States of ICAO since 1960, by ratifying the Convention on International Civil Aviation 1944 (Chicago Convention). It has ratified the Tokyo Convention 1963, The Hague Convention 1970 and The Montreal Convention 1971 relating to aviation security.

As regards Air Carriers Liability, Nepal has ratified The Warsaw Convention 1929 and The Hague Protocol 1955. Though The Warsaw Convention has been amended by

7 Protocols, only the original Convention and The Hague Protocol are applicable to Nepal. Though a separate domestic legislation have not been enacted so far to this effect, but the Treaty Act 2046 BS gives the above Convention and Protocol the effect of domestic law. As the Montreal Convention 1999 is already effective, it is high time for Nepal to ratify it considering the interest of air transport industry, its user communities and traveling public in general. As regards the ratification of Capetown Convention, the recent convening of a workshop on aircraft financing has also paved way for all stakeholders to initiate action for its ratification.

The Way Forward

In view of rapidly growing traffic, CAAN is concerned with improvement and expansion of TIA. Master Plan 2015 of the airport has been reviewed under ADB Technical Assistance. The proposed assistance includes extensive strengthening and improvement works to accomodate the 20 year traffic growth upto 2028. It will partially assist to cope up ICAO code 4E requirements. However, considering the need to cope with increased traffic we are geared to expand operational hours of TIA. Runway overlay and apron expansion are being accomplished with high priority. We are aware that despite operational constraints, we need to have a Localizer DME approach system for precision approach at TIA. It will be encouraging for international airlines to utilize TIA in various slots of operations, particularly during night, with increased safety and reliability.

Pending the existing VOR/DME and RADAR, which are more than minimum standards prescribed, to enhance more efficacy and efficiency, reliability and safety, studies on the feasibility of GPS approach, RNP approach, ILS approach, LLZ/DME approach and TLS approach at this airport have been vigorously pursued. In order to cope with mounting traffic volume at TIA, and meet future demand, we have initiated projects as per the policy to upgrade this airport to the extent of full saturation, and along side, develop and construct a second international airport and regional airports in the country.

Against the constraints of TIA and enormous potential ahead in terms of tourist flow and airlines operations, action has been initiated towards the construction of a new second international airport. With a view to develop the existing Gautam Buddha Airport (Bhairahawa) into a regional International Airport, priority-wise improvement works have been put in process. This will be a Project executed under Asian Development Bank (ADB) -South Asia Subregional Economic Cooperation (SASEC). The materiality will facilitate us to see cross-border flights between Nepal and Indian cities of religious and tourist interests. Likewise, Pokhara new airport is being taken up as another regional international airport under Build Own Operate and Transfer (BOOT) scheme. These regional airports will serve as direct destinations for cross-boarder and trans-boarder flights.

It has been realized that the airlines are required to have flexibilities in the provisions of airline designations. The requirement of substantial ownership is being replaced by permission of principle places of business. However, the effective control will remain unchanged. This requirement should be reflected in the existing air services agreements. This will facilitate the potential airlines to expand services under the leasing arrangements and the required MOU as stipulated in the Article 83 bis of the Chicago Convention to ensure safety oversight responsibilities by the concerned States.

Moreover, against the backdrop of increased low cost carriers, CAAN has yet to make arrangements for low cost international airline operations. However, a new fee structure of considerable relaxation is being explored in respect of those who may be desirous of taking opportunity to operate, in lean hours, taking into account the traffic concentration during peak hours. In view of the intra-regional sentiments, it is imperative to have a more open, flexible and progressive kind of open sky policy within SAARC member States. For this, the existing bilateral air services model may be reframed in order to make air transport less cumbersome and economically efficient, thereby creating conducive environment for intra-SAARC air services. SAARC Region is the most interactive region for Nepal and since BASA forms a major component of economic regulation, attention and initiative should be focused towards ways of augmenting the bargaining capacity of the weaker economies so that the air travel could be increasingly affordable for the traveling public. A glimpse of production /utilization of air seats provided under bilateral air services agreement is presented in the table.

Route development is an important factor in liberalization to ultimately facilitate in making provisions regarding route designation and utilization during air services. Rising fuel cost, increasing air traffic congestion and increased emissions are the growing concerns of present international air transport. Initiatives taken by ICAO, Asia Pacific Region in the past to address these problems such as implementation of more efficient route structures in the region including EMARSSH Route, implementation of Reduced Vertical Separation Minima (RVSM), introduction of Air Traffic Flow Management in the Bay of Bengal for the traffic transiting through Kabul FIR are few of the remarkable examples.

For the past 6 years, Nepal has been focusing on promulgation of international routes across the Himalayas. May I now touch upon what is about establishing an air corridor across the considerable part of Nepalese airspace. In order to establish Himalayan Route for the optimum utilization of Nepalese airspace, it is Himalayan 1 and Himalayan 2. These routes have been proposed by Nepal since long. Himalayan 1 from Bangkok to Imdek of Pakistan direct via Kolkata and Nepalgunj, Nepal and Himalayan 2 from Kathmandu to Hong Kong direct via Bagdogra and Imphal. We have raised the implementation aspects of this route at many international fora, including the recent DGCA Conference.

Recently Civil Aviation Authority of Nepal and Airport Authority of India signed letter of agreement (LOA) on ATS matters and coordination procedures including establishment of new ATS route L626 Kathmadu-Mahendranagar-Pantanagar-Delhi. This route has been implemented from AIRAC date 19th November 2009 for all west bound international flights from Kathmadu.

With regard to Himalayan 2 route which is proposed as direct routing from Kunming to Kathmandu via Guwahati, Imphal will be 101 NM approx. shorter than the existing route via Bangladesh and IATA has also supported

this proposal and assured fullest cooperation in its implementation. This route if established would ultimately benefit directly to more than a dozen airlines, operating schedule flights to/from Hong Kong to Kathmandu, Delhi and several other destinations to Middle East like Sarjah, Dubai, Riyadh, Doha, Abudhabi etc.

Nepal has also proposed to extend the existing Kathmandu-Lhasa B345 Route upto Beijing and Shanghai as Trans-Himalayan Route which will be a direct and shortest route from Mainland China to Indian sub continent and vice versa.

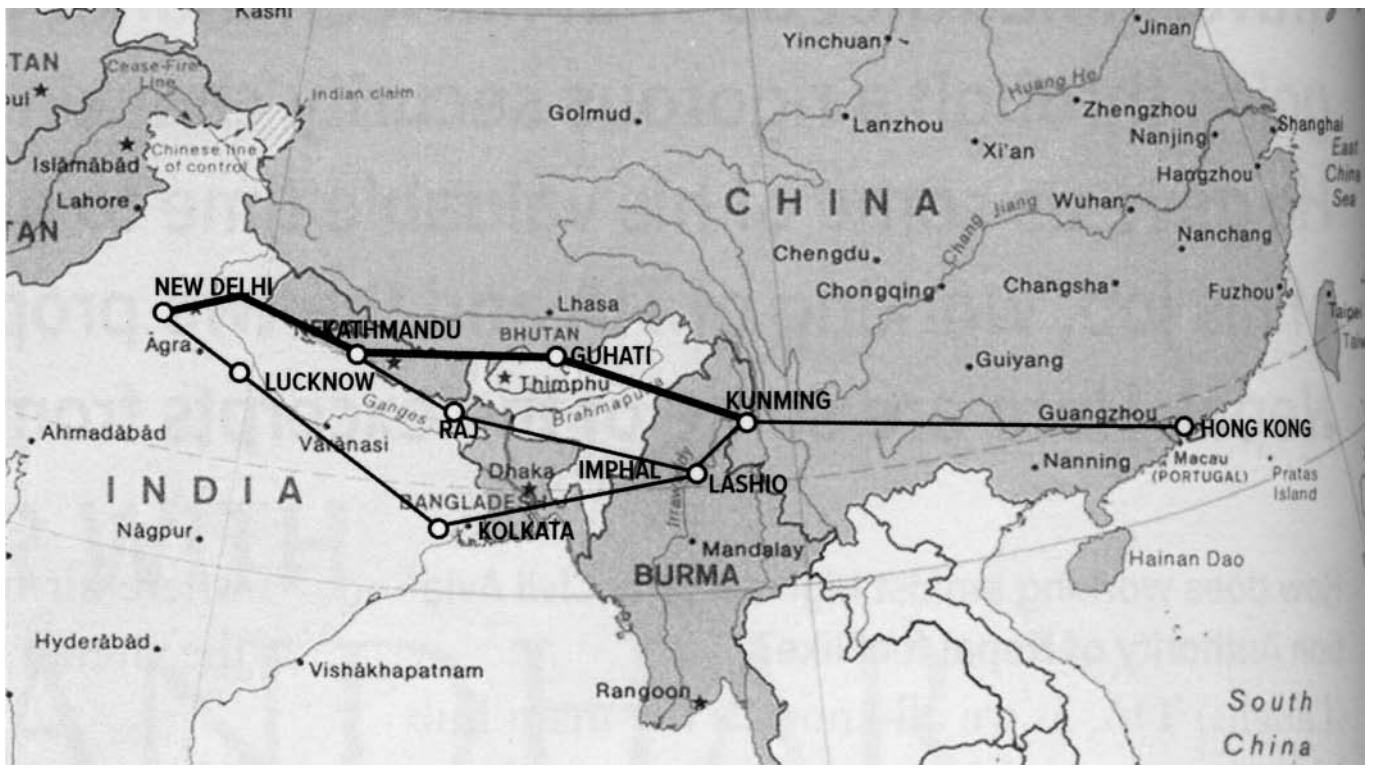
Nepal has proposed this route as follows:

- Beijing - Chengdu - Lhasa - Kathmandu - Delhi (Two Way). Or

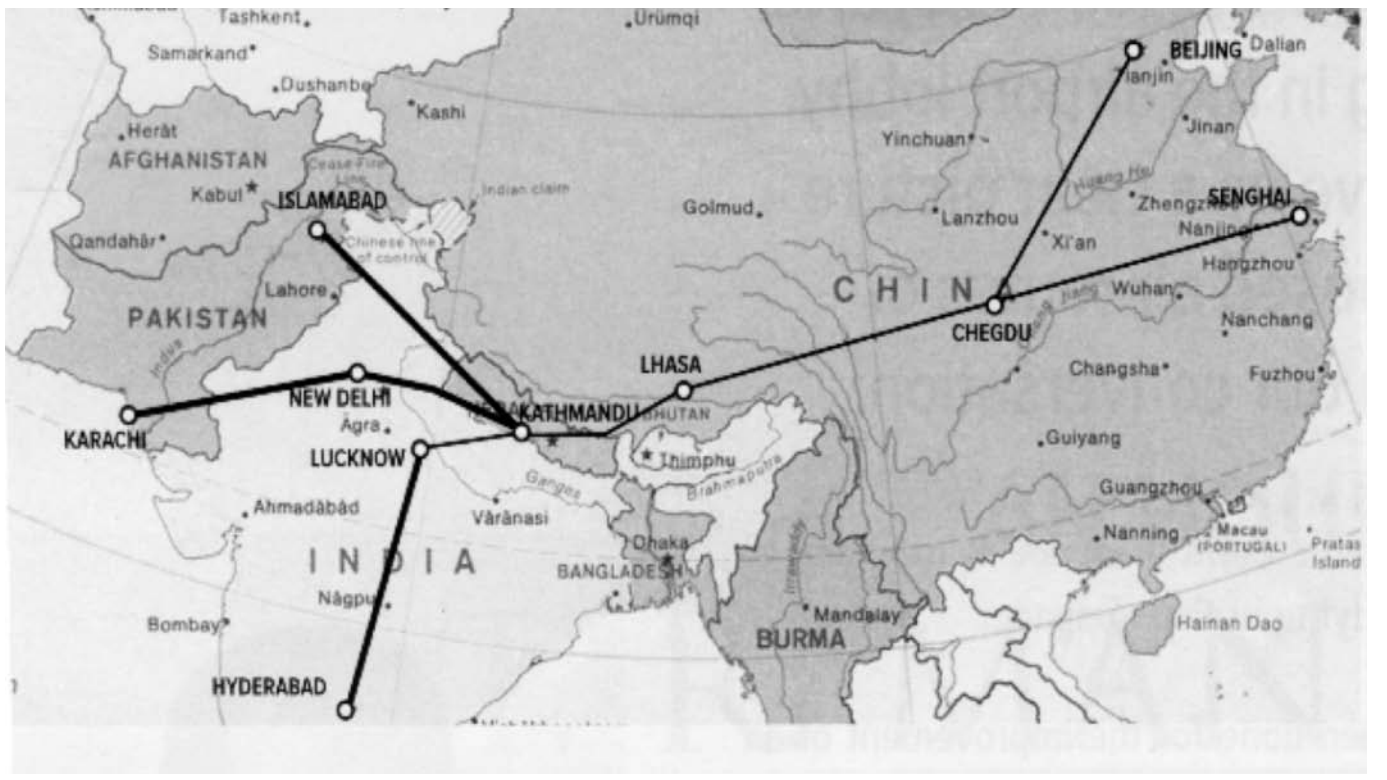
  Beijing – Lanzhou – Lhasa – Kathmandu – Delhi (Two Way)
- Shanghai - Chengdu - Lhasa - Kathmandu - Delhi (Two Way).

These routes have been identified as the shortest possible routes for the flights to/from mainland China and far east and to Middle East/Europe via Nepal and Indian sub continent.

These developments will allow the international airlines to over fly Nepalese airspace which means benefit of ecconomy on fuel and distance to the operating international airlines, and a robust revenue to Nepal. Our estimate is that the direct benefiniciary airlines will be Air India, Cathay pacific, Qatar Airways, Saudi Arabian Airlines, Nepal Airlines, Dragron Air, China Southern, Air Hong Kong among other prospective air carriers.



Himalaya Routes



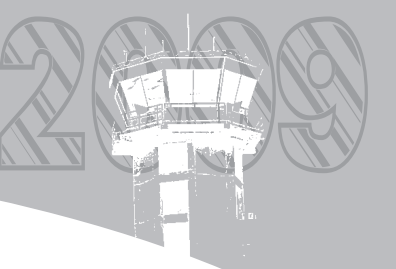
Trans Himalaya Route

Challenges

Being a land-locked and mountainous country with unique topographical situation, the development of air transport in our context is not a choice from the point of view of economic analysis 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, 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 and investment for airport infrastructure even in the absence of business case studies. In many developing countries, especially, in this part of the world, the prominent issues and constraints with regard to safety oversight are mainly adequate, qualified and well-experienced manpower. Most of the regulatory bodies find problem to retain qualified manpower because of the substantial difference in remuneration with the industry. Nepal too is not an exception.

The challenges in general include:

- Strengthening safety and security oversight capability of CAAN
- Gearing to cope with modern technological pace.
- Accelerate investment in airport infrastructure, equipment and facility.
- Promotion of public-private partnership (PPP) in operation and management.
- Exploration for generating resources-aeronautical and non aeronautical.
- Human Resource Development focusing on production of quality manpower commensurate to the changes in technology.
- Effective implementation of SMS
- Retention of qualified inspectors and plan for recruitment and replacement addressing the problem of growing retirements in vital areas.
- Maintenance of equipment by airlines.
- Carrying out safety oversight functions in objective and systemic manner,
- Maintenance of professionalism in aviation business and creating confidence of traveling public in air travel.
- Sustainability of industry as a whole.
- Private airlines are attracted towards high yield tourist sectors rather than low yield service sectors.
- Selection of appropriate aircraft equipment to cater the need of remote mountainous areas.
- Development of domestic legislation to adopt the provision of international Conventions, Protocols and SARPs.



In a country like ours with marginal maintenance facilities and expertise, experience has indicated the need for he continuation of the post-installation maintenance back up support from the external agencies till CAAN is self reliant in its own capacity.

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.

Over the last decade, multilateral regulatory regimes on the regional level among the groups of member countries have been created. These arrangements are aimed at fostering cooperation and liberalizing air transport regulation amongst member countries. The establishment of regional multilateral aviation arrangements has led to an expansion of air services within the region. However, it has also evoked concerns about their impacts on national airlines and bilateral air services regulation. Nepal also shares similar concern.

Partnership Modalities

Infrastructure, standards and requirements, systematic auditing as well as clear policies, aviation legislation and regulations are all necessary towards orderly development of air transport and enhancing safety. It is essential that the operators are conversant with their obligations and requirements to be met. Well-defined and transparent policies introduced through participatory and partnership approach forge a good kinship between the regulatory organization and air operators.

The Government of Nepal has encouraged private investment in the construction and operation of infrastructure, The Construction of Second International Airport is being explored under Build, Own, Operate and Transfer (BOOT) Concept. CAAN is in the process of involving the private sector through competitive process in the operation and management of international air cargo facility at TIA under develop, operate and manage (DOM) concept. CAAN is also initiating a policy of public-private partnership (PPP) mechanism in airport operation and management of terminal facilities. Consumers committees have been involved in the construction work of small airports under the technical supervision of CAAN.

Conclusion

Globalization, liberalization, privatization and consumerism are the drivers of regulatory reform, which should be encouraged without compromising safety standards. Liberalization of air transport and globalization of economy has gone so wide that the States, particularly those which are economically fragile, must decide on course of action and execute their obligations with great care. Regulators need to actively participate in this process by establishing rules which are non discriminatory, reflect best global practice and take account of local difference.

The Civil Aviation Authority of Nepal (CAAN) is the sole air navigation service provider with multifarious obligations involving construction, equipment facilitation, operation, maintenance and management of airports. It is responsible for regulation of airlines and safety oversight function. The growth trend with increasing number of heterogeneous aircraft is a matter of concern to the safety and regulatory authority of Nepal. To enable CAAN increasingly proactive in its endeavor and foster healthy growth of air transport without compromising safety, cooperative efforts among policy planners, regulatory authorities, airline operators and stakeholders at all level is indispensable.

The main thrust of Nepal's international air transport policy is to increase global accessibility, optimize utilization of Nepalese air space and maximize economic benefits to the nation by promoting tourism and trade. So, a flexible and liberal approach will be continued to foster healthy and sustained growth of airlines. The materialization of new international air route structure to minimize air space congestion at and around Bay of Bengal, ensure safe, economical and efficient air transport requires collaborative efforts and cooperation of all concerned authorities.

The tendency of leasing aircraft is increasing. It is high time for the authorities to review pertinent legislation, regulation, policies and practices with respect to the use of leased aircraft. Some practical solution should be sorted out for application of Article 83 bis on International Civil Aviation concerning lease, charter and interchange of aircraft.

Recent Trends in Global Air Transport

TR Manandhar
Dy. Director General, CAAN

Air transport industry is a very sensitive business. A slight change in any of its determining factors tend to affect significantly in the over all performance of the industry. Take the example of SARS in 2003, which apart from human toll estimated to have cost US$40 billion to the world's airlines and travel trade industry. In the same way, the global air transport industry was badly hit by higher fuel cost in the first half of the year 2008, the trend was amplified by the global financial crisis in the second half of the year, hitting severely the performance of the Western developed countries as well as emerging economies in the Asia and Pacific Region. The slowdown was also experienced in the Middle East Region, which nevertheless benefited from the significant increase in oil prices for most of 2008. As per ICAO report the growth rates for international passenger traffic declined from 7.9% in 2007 to around 3.4% in 2008. Total scheduled freight traffic declined by approximately 1.2% in 2008 compared to 4.7% in the previous year. The year 2008 has the slowest growth for the air transport industry since 2002

Domestic traffic declined from 6.4% in 2007 to a –1.9% in 2008. North American carriers, who account for nearly 57% of global domestic traffic, saw their traffic decline last year by 5.1% over 2007. Asia/Pacific carriers, at nearly 28% of global domestic traffic, grew by only 3.7%, achieved mainly due to growth by air carriers of China whereas the growth achieved in 2007 was by 12%. For European carriers, which account for 9% of world domestic traffic, traffic declined by 2.3%, while Latin American carriers, which account for approximately 5% of world traffic, grew by a strong 8.5%.

The scheduled air carriers of the world are estimated to have incurred an estimated operating loss of approximately US$ 9.8 billion in 2008 compared to a record US$ 19.7 billion operating profit in 2007. The significant decline in profitability was due to a slowdown in traffic growth on account of a weak global economy and fuel hedging losses for some of the major world air carriers. Oil prices were volatile and prices ranged from a high of approximately U.S. $147/barrel in July 2008 to a low of approximately U.S. $34/barrel in December 2008. Consequently, air carriers who had hedged anticipating higher fuel prices had to record significant losses in the last quarter of 2008.

As the economy improves, a moderate recovery is forecast for the year 2010 with a positive growth rate of about 3.3% and the momentum to continue in 2011 with a growth of 5.5%.

Airline industry in India

Just few years ago, India's airline industry was booming high presenting India as one of the fastest growing and most competitive aviation markets in the world. In between 2005 & 2006 alone India saw a astounding air traffic growth by 43%. This dramatic growth encouraged investment in multimillion dollor airport project and opening of new airlines. Six new carriers launched while established airlines laid on new routes and bought new jets. In the last four years, Indian carriers ordered 400 jet aircrafts worth about $37 billion.

However the situation could not continue for longer period. The global recession has hit air carriers everywhere, but a sharp decline in passenger numbers together with a very volatile oil prices had sustained Indian air carriers – more than $2.5 billion in losses this year, accounting for one-fourth of the losses for the entire global industry. Indian aviation is now struggling hard initiating various corrective measures to stay off financial collapse. Hardest hit by the economic downturn has been the national carrier.

Chinese Aviation

Domestic air traffic growth in China was by 6% in 2008. The growth was further geared up in 2009. Statistics from the Civil Aviation Administration of China showed that the domestic air transport market of China had an overwhelming growth for the 1st half of 2009 with passenger volume increased by 20.4% over same period of last year, ranking No. 1 in the world. As an important air transportation hub in China, the passenger throughput of Beijing Capital International Airport has become a vital reference index of the development of the China aviation market. From May this year, number of passenger

turnover has been up rapidly and has maintained the growth rate of 20% while numbers of landing and take-off have also been increased significantly.

For the first half of this year, the 3 major airlines with total contribution of 80% share of the domestic market of China, namely Air China, China Southern Airlines Company and China Eastern Airlines Corporation Limited all profited.

According to the CAAC's latest information, domestic passenger business has been growing step by step for the period of January through June. The speed of increase for the 1st 3 months was 15% and then grew steadily month by month to rise to 26% in May which was the highest of the year so far.

Nepalese Aviation

While over all global passenger traffic significantly declined in 2008 compared to the year 2007, in Nepal, passengers traveled by international flights which was 1.62 million in 2007 was reached to 1.83 in 2008, an increase by 12.5%. There was negative growth in Domestic passenger movement in the most part of world whereas Nepal witnessed 13.11% increase in domestic passengers which was .92 million in 2007 reaching a bit higher than one million in 2008.

Whereas most of the countries still experiencing the impact of global economic slowdown in the aviation, air traffic data available for seven months from January to July 2009 shows 6.4% growth in international passengers and 37.9 percent increase in domestic passengers compared to same period of the previous year.

The growth is very encouraging. However, the frustrating factor is that the National Carrier is not able to exploit the benefit of this favorable situation due the lack of adequate fleets. Though some other private parties had ventured to enter into international airlines business, this has so far not been successfully materialized. As such other foreign airlines are reaping the benefits of these favorable business environment of our country.

CAAN - Responding to Strategic Objectives of ICAO

Ratish Chandra Lal Suman
Dy. Director General, CAAN

Historical Background

Emanation of strategic principles governing aviation dates back to early 1910 when on the invitation of France, the first important conference on an International Air Law & Code was convened in Paris. This conference was attended by 18 European States. Needless to say, the technical development of aviation arising out of World War-I created a completely new situation.

For obvious reasons, the treatment of aviation matters was a subject to the Paris Peace Conference of 1919 and it was therefore entrusted to a special Aeronautical Commission. At the same time, civil air transport enterprises were created in many European States and in North America, some of which were already engaged in international operation (Paris-London, Paris-Brussels). Also in 1919, two British Airmen, Alcock and Brown, made the first West- East crossing of the North Atlantic from Newfoundland to Ireland and the "R-34", a British dirigible made a round trip flight from Scotland to New York and back .

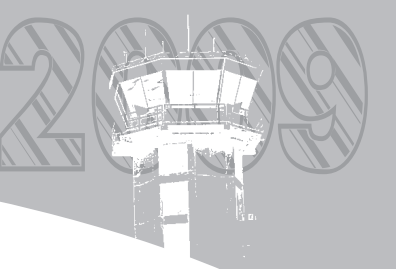
Landmark events like these paved way for turning to peaceful ends, i.e. the development of post- war civil aviation because aviation pioneers believed that aviation had to be international or not at all. This proposal was formally taken up by France and submitted to the other principal Allied Powers who received it favorably. This action then resulted in the drawing up of the international air convention, which was signed by 26 of the 32 Allied and Associated powers, represented at the Paris Peace Conference and was ultimately ratified by 38 States. This Convention Consisted of 43 articles that dealt with all :Technical, Operational and Organizational aspects of civil aviation and also foresaw the creation of an International Commission for Air Navigation (ICAN) to monitor developments in civil aviation and to propose measures to States to keep abreast of developments . To assist the Commission, it was agreed to establish a small permanent Secretariat under the direction of General Secretary. In December 1922 this Secretariat, which was located in Paris, entrusted its duties to Mr. Albert Roper from France as General Secretary. In fact, it was ICAO in Paris, on its Foundation, took over the offices of the ICAN Secretariat and remained there for its first 19 years until August 1965 (60 bis avenued'l'ena).

Foundation of ICAO

The Consequence of the studies initiated, by the US and subsequent consultations between the Major Allies was that the US government extended an invitation to 55 States of authorities to attend, in November 1944, an International Civil Aviation Conference in Chicago. Fifty- four States attended this Conference end of which a Convention on International Civil Aviation was signed by 52 States set up the permanent International Civil Aviation Organization (ICAO) as a means to secure international co-operation for highest possible degree of uniformity in regulations and standards, procedures and Organization regarding civil aviation matters.

The most important work accomplished by the Chicago Conference was in the technical field because the Conference laid the foundation for set of rules and regulations regarding air navigation as a whole which brought safety in flying a great step forward and paved the way for the application of a common air navigation system throughout the world.

Because of the inevitable delays in the ratification of the Convention, the Conference had signed an Interim Agreement, which foresaw the creation of a provisional International Organization of a technical and advisory nature with the purpose of



collaboration in the field of international civil aviation (PICAO). This Organization was in operation from August 1945 to April 1947 when the permanent ICAO came into existence. Its seat was in Montreal, Canada and in 1947 the change from PICAO to ICAO was little more than a formality. However, it also brought about the end of ICAN because, now that ICAO was formally established, the ICAN member States agreed to dissolve ICAN by naming ICAO specifically as its successor organization.

The Constitution of ICAO is the Convention on International Civil Aviation, drawn up by a conference in Chicago in November and December 1944, and to which each ICAO Contracting State is a party. According to the terms of the Convention, the Organization is made up of an Assembly, a Council of limited membership with various subordinate bodies and Secretariats. The chief Officers are the President of the Council and the Secretary General. A span of 60 years of empowering the global communities through aviation was constantly looked into against the leaps in aviation and air transport experienced by the world. It was felt by ICAO to address the global aviation by executing strategic thoughts.

Strategic Objective of ICAO set for 2005-2010

ICAO works to achieve its vision for safe, secure and sustainable development of civil aviation through cooperation amongst its member States. To implement this vision, the Organization has established the following Strategic Objectives for the period 2005-2010

A: Safety - Enhance global civil aviation safety

B: Security - Enhance global civil aviation security

C: Environmental protection- Minimize the adverse effect of global aviation on the environment.

D: Efficiency - Maintain the efficiency of aviation operations

E: Continuity - Maintain the Continuity of aviation operations

F: Rule of Law - Strengthen law governing international civil aviation

Support measures

To implement its Strategic, the Organization will take necessary steps to:

1. Operate in a transparent manner and communicate effectively both externally and internally;
2. Maintain the effectiveness and relevance of all documents and materials;
3. Identify risk management and risk mitigation strategies as required ;
4. Improve continuously the effective use of its resources;
5. Enhance the use of information and communication technology integrating it into its work processes at the earliest possible opportunity;
6. Take into account the potential impacts on the environment of its practices and operations;
7. Improve its use of diverse human resources in line with the best practices in the UN system; and
8. Operate effectively with the highest standard of legal propriety.

CAAN's Response

Safe, reliable, efficient and regular air transport services are cardinal objectives of the CAA Nepal that was incorporated in the Civil Aviation Authority Act 1996. Since its establishment, CAA Nepal has, in its own and in harmony with the strategic objectives set forth by ICAO, actively been engaged in the overall development of civil aviation sector in Nepal.

Safety

Aviation safety is undoubtedly the principal concern of all stakeholders in the civil aviation. It is of primary concern particularly to CAA Nepal as it is the regulatory agency in Nepal. Nepal is totally committed towards the global safety roadmap envisaged by ICAO. CAA Nepal, in tandem with the various regional partners like ARAST, (SARAST now ARASAT in Asian perspective) and regional groupings like COSCAPs, is formulating the safety strategy and implementing the best practices as derived from the deliberations of such forums, that prove vital in the safety enhancement efforts. The safety issues raised in such forums are adopted in our context as far as possible and applicable. On the other hand NAST-Nepal is a national turf for the safety issues to be raised and resolved that contribute towards the safety enhancements. The national safety issues are collected and resolved with available resources and time frame and the SARAST as well as ARASAT are kept informed of developments in that regard.

ICAO has envisaged the safety enhancement through the implementation of SMS in all service providers. The state safety policy has been developed and implemented. In view of the practical difficulties, CAA Nepal has its opinion of implementation of the SMS through the phased manner so that the service providers become more mature by the successive years based on the foundations of the preceding years and experience.

Security

CAA Nepal understands that safety in the sky is a result of the security in the ground. In this effect the relevant regulatory frame work has been developed consistent with the ICAO annex 17 and other associated documents. The National Aviation Security Program is the basic regulatory documents which provide the requirement and the guidance of the security agencies and the other stake holders in aviation security.

The civil Aviation Security (Management) rules, 1989 has made the Provision of National Aviation Security Committee (AVSEC) under chairmanship of the Minister for Culture, Tourism and civil Aviation. The committee is represented by high level officials of various Ministries and Organizations responsible for maintaining law and order. DGCA is the member secretary of the committee and the AVSEC Department of CAAN serves as the secretariat. The responsibility of committee includes formulation of national AVSEC Policy and Programs and coordination of AVSEC activities at the national level.

Organizations responsible for aviation security in Nepal are mainly Civil Aviation Authority of Nepal (CAAN) and Nepal Police. Responsibilities of CAAN include determination of security measures, provision

of security equipment, facilities and other physical infrastructure required for AVSEC, training, development and maintenance of security documents inclusive of Plans and programs, revision and updating of existing legislation and inspection, survey and testing. Likewise, responsibilities of Nepal Police include implementation of all security measures in its own capacity and crime detection and prevention. Other Organizations linked to AVSEC are military force deployed in case of emergency and threat, and vigilance entity deployed for intelligence purposes.

Airport Security Committees established at international and domestic airports within the country monitor the implementation of the security measures and coordinate such activities at airport level.

Airport Security Programme (ASP) is being developed. Currently, the provisions of National ASVSEC programmes are being used as guidelines in carrying out security measures at airports.

Considering the potential threat against the safety of civil aviation at national, regional and international level, Nepal has taken additional measures in strengthening AVSEC system at international airport. It includes establishment of a separate and complete sterile departure hall, secondary hold baggage screening for airlines under threat, aircraft ladder point security check, hundred percent hand search of persons and their hand baggage. In the same way, various security strengthening measures are adopted at the domestic airports.

Standard operating procedures (SOPs) of agencies engaged in aviation security and airport operation have been developed and implemented to enhance the efficiency of security system. A table exercise for airport emergency has been carried out. Threat Assessment Committee has been formed under the convenorship of secretary of Ministry of Home Affairs including the representation of huge level officials from various concerned agencies.

A joint monitoring team of CAAN, Nepal police force Nepalese Army has been formed which serves as a focal point for coordinating and monitoring security activities in their respective Organizations. Existing Airport Emergency Plan has been revised in accordance with the ICAO guidelines for Tribhuvan International Airport. The plan includes ways to respond to security and non security emergencies.

The civil Aviation Security (Management) rules, 1989has made the Provision of National Aviation Security Committee (AVSEC) under chairmanship of the Minister for Culture, Tourism and civil Aviation. The committee is represented by high level officials of various Ministries and Organizations responsible for maintaining law the guidance materials have been developed and annual security inspection schedule for the all airports has been in place and implemented so that the security lapses can be arrested before they can manifest in the serious security breaches. The security gadgets in various airports are in the process of installation and up-gradation to assist the security personnel in their efforts in security enhancements.

Aviation security audit has already been carried out by ICAO in 2006 and our security system has not been as alarming as one might think it is. We are committed to implement any recommendations that are made in the interest of aviation safety and security.

Environment protection

Given by the air traffic handled by CAA Nepal, the contribution of environment pollution is negligible in comparison with the global scenario. However it does not mean that CAA Nepal is not committed toward the global effort of minimizing the impact of the green house gas emission from the aircraft and noise pollution. Though CAA Nepal does not have its own financial and competent human resource in this regard the best efforts of the ICAO and contracting sates will always be reciprocated by recognizing their standards and certificates.

CAA Nepal has got the provision of validation of the aircraft noise certificate issued by the state of registry fulfilling the requirements of Annex 16 volume I. Similarly the regulatory frame work to include the control of emission is underway to incorporate the essence of Annex 16 part II. The provisions for the emission control will be incorporated in the suitable requirements.

Efficiency

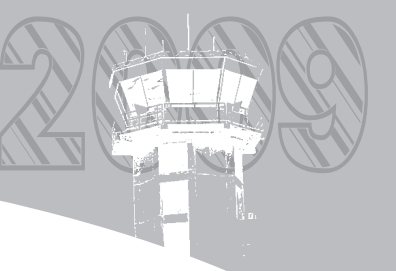
On April 1, 2009, ICAO and its states and industry partners in the global PBN Force signed a special new declaration calling for the rapid implementation of Performance based Navigation (PBN). Speaking on behalf of the group the president of council of ICAO, Mr. Robert Kobeh Gonzalez, emphasized that " PBN ... will help reduce airport and airspace congestion, converse fuel and protect the environment , reduce the impact of aircraft noise near airports, and ensure reliable, all weather operations. It will also provide operators with greater flexibility, while increasing safety and efficiency."

In order to keep with keep pace with the rapidly growing air traffic in international as well domestic scenario, CAA Nepal is always committed towards enhancing its capacity in terms of physical infrastructure, human resource and air routes. Development of new economic routes like L626and runways, terminal buildings are a few steps ahead in this direction. However it is to be regretted that despite our best efforts the traffic handling at Tribhuvan International Airport has not been significantly improved due to weather condition in the winter and lack of precision approach. A better slot management and installation of precision approach aids will ameliorate the prevailing situation whereby the traffic volumes will be efficiently handled.

As per the 36th session of ICAO assembly resolution, requiring all contracting States to have a PBN implementation plan in place by year 2009 to ensure RNAV and RNP operations according to established time frame and implementation of APV or augmented GNSS for approaches with intermediate milestone. Accordingly, the CAAN will implement PBN in near term 2010-2012 time frame as given below. Depending on the progress in accomplishment of the proposed near term plan and emerging guidelines, medium 2013-2016 and long term 2017-2025 plans shall be formulated.

Continuity

CAAN Nepal not only regulates air transport but also promotes service providers to sustain their operations by providing the industry friendly environment while also maintaining its utmost adherence to the prevailing rules



and regulations. In this regard, CAAN is concerned with:

i. Managing the transition to an State Safety Program (SSP) environment

ii. The link between SSP and Continuous Monitoring Approach (CMA)

iii. Sharing of safety information

iv. The protection of sources of safety information

In order to enhance the accessibility in the far flung remote areas of the eastern and western hills, CAAN has time and again actively lobbied with Government of Nepal to formulate the national aviation policy thereby promoting the better connectivity of the rural areas for basic amenities, the promotion of tourism and generating employment. Such policies are formulated in view of the aviation safety and environment that would otherwise prove to be detrimental if enough attention is not paid to these crucial points. Imposing an age limit and design economy life for the used imported aircraft is an example in this context.

The re-opening of the single engine aircraft in Nepal after a hiatus of one decade is one of the examples where the aviation market can be opened up with the possibility of opening of new avenues without compromising the basic norms of safety taking into consideration the design safety features and past safety records globally. The road-short remote stations can now be better connected to one another with the introduction of the reliable and proven single engine aircraft.

The allotment of the land and other amenities for the construction of hangar (or maintenance shades as an option) at TIA Kathmandu is one step ahead towards the systematic march in the direction of standard maintenance practice. Similarly the grievances of the air operators regarding the revision of the rental charge of Nepalgunj hangar are encouraging examples for the operators so that they can feel that CAAN is not there always to squeeze money, rather it is there to facilitate the healthy growth of the civil aviation in Nepal resolving all outstanding glitches.

Rule of Law- Nepal is keeping pace with the development of the latest SARPS of ICAO by updating its rules and regulations. In the event that the law has to be amended in the Act level, the Ministry will be approached for necessary preparations. In such instances, the Ministry and CAAN work in hand in hand. Nepal always respects the law governing the international civil aviation

It is also acknowledged that updating the rules and regulations in line with ICAO SARPSs and other guidance materials in CAA Nepal used to be in sluggish pace in the recent past. However, during the pre-ICAO USOAP audit as well as during the audit in May 2009, volumes of hitherto undeveloped documents were procured and developed and all the pertinent documents including the ICAO annexes, guidance materials, procedures, etc were documented and updated. At the same speed, all requirements, working manuals, handbooks, circulars, directives, database, were developed and updated, and disseminated to all concerned offices and officials. These regulatory documents have now paved way for satisfactory discharge of the duties and responsibilities associated with the safety oversight functions, as they play vital roles in up-keeping the safety oversight system vis-à-vis 8 critical elements of this system.

Safety oversight in the dangerous goods transportation was strengthened by setting up a separate unit in Aviation Safety Department. The requirements for the same was promulgated as Dangerous Goods Handling Requirements. This requirements brings together all airlines operators-domestic international, shippers, into the obligatory framework of regulations of CAA Nepal so that the dangerous goods can be transported in as safest manner as possible as per technical instructions laid down in the Requirements.

■

Nepalese Civil Aviation System under ICAO Universal Safety Oversight Audit

Sanjiv Gautam

Introduction:

"Safety is our prime concern". "We never comprise safety." "Safety always comes first." These are a few catchy lingos often heard in aviation. But who is responsible and accountable for overall safety in the industries? How safety can be enhanced and maintained at an acceptable level? Such questions are amply raised but seldom solved.

Air transportation industries are very sensitive because of ever changing technology and high cost involvement for its adaption to enhance safety and to have the uniform application throughout the world. A deficiency in the system in one corner of the globe may affect the other extreme corner in the same magnitude.

International Civil Aviation Organization (ICAO), the umbrella organization of the all nations throughout the world plays a key role for the application of minimum standards needed for the operation of international and national air transportation. Chicago Convention, the constitution of the world civil aviation clearly mentions on its first article that every state has a complete and exclusive sovereignty over the airspace above its territory. That article reflects every contracting states' obligations to maintain international standards for their respective air transportation services along with the compliance of all standards mentioned in the ICAO annexes. But who is responsible to monitor and oversee whether such system is fully implemented or not?

Recognizing the necessity of monitoring obligation, the 32nd Session of the ICAO Assembly (Assembly Resolution A32-11) resolved establishment of the ICAO Universal Safety Oversight Audit Programme (USOAP), comprising regular, mandatory, systemic and harmonized safety audit of all contracting states. Accordingly, the 35th Session of ICAO Assembly considered a proposal of the council for the continuation and expansion of USOAP as of 2005 and resolved that the programme be expanded to cover all safety related Annexes (A35-6).

Safety oversight is defined as a function by means of which States ensure the effective implementation of the safety related Standards and Recommended Practices (SARPs) and associated procedures contained in the annexes to the Convention on International Civil Aviation and related ICAO documents.

The objective of USOAP is to promote global aviation safety through auditing Contracting States, on a regular basis, to determine States' capability for safety oversight by assessing the effective implementation of critical elements of a safety oversight system and the status of States implementation of safety related ICAO Standards and Recommendations (SARPs), associated procedures, guidance materials and safety related practices

Scope:

For the effective implementation of the Safety Oversight System, States need to consider the critical elements of the safety oversight which encompass the whole spectrum of civil aviation activities, including areas such as air navigation services, aerodrome, personnel licensing, flight operation, airworthiness of aircraft, accident and incident investigation and transportation of dangerous goods by air.

The critical elements serve, essentially, as safety defense tools of a State's safety oversight system, and are required for the effective implementation of the safety related policies and associated procedures.

Critical Elements of State's safety oversight system

Source: DOC 9734 Part A

To discharge the effective implementation of safety oversight function, States shall establish comprehensive and effective civil aviation legislation in compliance with the convention on international civil aviation consistent with the size and complexity of the states civil aviation activities; provision of adequate regulation to address the national requirement which provides standard operating procedures, equipment and infrastructure in conformance with the SARPs of ICAO annexes; establishment of the Civil Aviation Authority for the safety oversight function with the required qualified technical manpower and financial resources with the provision of safety regulatory function, objectives and safety policies; minimum requirement of knowledge and experience of the technical personnel responsible for the safety oversight function and provision of appropriate training to maintain their competencies; the provision of technical guidance and tools and safety critical information to the technical personnel to perform their duties. As States become able to establish the aforesaid elements then shall implement the process and procedures to ensure that personnel and organizations performing an aviation activity meet the established requirements before exercising the privileges of a licence, certificate, and authorization to perform their aviation duties; carry out inspection and audits to ensure that licence holders continue to meet the established requirements and function at the level of competency; implementation of the process and procedures to resolve the identified deficiencies during inspection and audit which impact aviation safety.

Audit tools

Audit protocol questions are the comprehensive checklist, covering all elements of the State's safety oversight system subject to audit. Protocol questions which are used for the conduct of the on-site audit provide both the auditors and the State with a step-by-step guide to verify the status of implementation of the various elements being audited and ensures transparency, consistency and standardization. It aallows the auditors to determine if the State's requirements and practices comply with, conform with, or adhere to, the requirements of the Convention, Annex provisions, and ICAO guidance material. Audi Protocol questions which are designed considering all the areas that effects the civil aviation system includes, Primary aviation legislation and civil aviation regulations (LEG); State aviation system and safety oversight functions (ORG); Personnel licensing system (PEL); Operation of aircraft (OPS); Airworthiness of aircraft (AIR); Aircraft accident and incident investigation (AIG); Air navigation services (ANS); Aerodromes (AGA).

State Aviation Activity Questionnaire (SAAQ) which comprehends the various components of the civil aviation system established in the State and Compliance Checklists (CCs) of safety related annexes describe the implementation of SARPs contained in the Annexes and State regulation such as CAR are also the tools for the Audit.

SAAQ and CCs are required to be submitted by the states prior to the on-site audit and audit team's review. This provides the team with preliminary understanding of the civil aviation system and to determine its various function as well as status of implementation of relevant annexes provisions.

Audit Principles

Sovereignty, universality, transparency and disclosure, fairness, timeliness, systematic, consistent and objective, all inclusiveness are some important audit principles adopted by the ICAO for conducting USOAP Audit.

Respecting a sovereign State's responsibility and authority for safety oversight, all Contracting States shall be subject to a safety

oversight audit by ICAO, in accordance with the principles, processes and procedures established for conducting such audits which is fully transparent and open for examination by all concerned parties.

Providing every opportunity to monitor, comment on, and respond to, the audit process, within the established time frame, safety oversight audits is conducted by appropriately trained and qualified auditors and in accordance with widely recognized auditing principles and practices and audit final reports shall be disclosed to all contracting states to make them informed to the safety oversight capability of the other states.

ICAO safety oversight audits will be conducted in a consistent and objective manner and includes the safety-related provisions contained in all safety-related Annexes, Procedures for Air Navigation Services (PANS), guidance material and related procedures and practices and results of the audits will be produced and Contracting States' comments, action plan be submitted on a timely basis, in accordance with a predetermined schedule.

Audit Outcomes:

Uniform Implementation of International Standards, enhancement of States' capability for safety oversight, building confidence among States where each State would be aware of other States' capability for safety oversight, continuing audit ensure that standards are maintained and global aviation safety enhanced, enables State to prioritize of action to resolve the safety concern are some of the key outcome the ICAO and States are achieving and are in the process of achieving in course of Universal Safety Oversight Audit Programme implementation.

Nepalese Civil Aviation System Audit

As per the ICAO Scheduled and Memorandum of Understanding (MOU) agreed to on 12 august 2008 between Nepal and ICAO, Safety Oversight Audit of Nepal was carried out from 5 to 14 May 2009 in accordance with the Standard audit procedure laid down ICAO Doc 9735- Safety Oversight Audit Manual. Audit team member led by Mr. Mostafa Hoummady reviewed the State Aviation Activity Questionnaire(SAAQ),and Compliance Checklists CCs submitted by Nepal prior to on-site audit in order to have a preliminary knowledge of civil aviation system in Nepal and such information had been conformed to during the audit.

The USOAP Audit report has described the deficiencies found during on-site audit about the Nepalese civil aviation system with reference to safety oversight function in different critical elements. Nepalese Civil Aviation System is primarily focused in the service provision which take after the capabilities of the States in the area of safety oversight. In Nepal Civil Aviation Act 1959 and the Civil Aviation of Nepal Act 1996 are the primary legislations in Civil Aviation which has yet to address the several provisions of Chicago Convention as well as safety oversight obligations. CAA Nepal has developed different Civil Aviation Requirements in relation to ICAO annexes. Without considering the size, complexity and necessity of Nepal Civil Aviation System, there is no provision of distinct demarcation between regulator and service provision, as CAAN is both services provider and regulator in Air Navigation Services and aerodromes where safety oversight future is in inception stage.

Though CAAN established minimum qualification and experience of its regulatory staff, the required experience for appointment of such staff is short term based on experiments gained with the organization and with respect to training of regulatory staff. CAAN is still to develop its training policy and training programmes. Development of different documents and procedures for the purpose of conducting Safety Oversight functions is a must. Moreover, once they are adequately established, implementation will be more challenging in future to determine whether the concerned personnel are able to follow the procedures or not. This is more important in respect of licensing, certification, authorization and approval of different personnel. Oversight is made under the various document developed based on primary legislation and specific regulations. However there are various requirements which have not been fully implemented and CAAN has not established a system for the certification of all activities related to air navigation. CAAN has not established surveillance for the conduct of structured surveillance programme commensurate with its aviation activities in most of its aviation activities. Despite its endeavour to establish safety oversight activities in most areas, oversight activities don't address the entire scope of concerned aviation activities. Over all level of surveillance is yet to be sufficient.

With respect to the resolution of safety concerns CAAN has yet to establish the procedures for tracking of deficiencies identified during inspection of various civil aviation areas, to ensure their timely resolution. Due to the lack of an established policy surveillance programme developed in various areas is not comprehensive.

For the effective implementation of safety oversight function in various civil aviation areas, CAAN, as a regulating authority, needs to address the findings made by the ICAO audit team promptly. ICAO team has conducted the audit based on the comprehensive system approach and highlighted the deficiencies in various areas. Effective resolution of safety issues found out by the ICAO team will be the benchmark for Nepal to improve its system and enhance safety.

Conclusions:

The audit results reflect the capabilities and limitations of the civil aviation system of the states. The findings and recommendations related to each audit areas made by the audit team paves the way for States to establish their course of action for the establishment of the effective State Safety Oversight System. USOAP audit of the States is an opportunity to improve and maintain international standards set by the aviation communities.

Reference

Manual of procedures for operations inspection certification and continued surveillance Doc 8335. ICAO

Safety Oversight Manual PART A - Doc 9734 – ICAO

Safety Oversight Manual PART B - Doc 9735- ICAO

Aviation Security Awareness

(The purpose of this article is to generate awareness of security among all aviation connections vis-a-vis organization, industry and general public-*editors*)

Bharat Raj Dhakal
Director, Aviation Security

Introduction

For many years people living in the surrounding areas of the airport were allowed to enter and cross airport areas which are considered as most vulnerable in term of safety and security such as runway, taxiways and aircraft parking areas. This has become a legend, surprising and quite hard to believe if we compare the present security system with the same of the past. Security system in place at the airport at present does not allow repeating the tradition. Now it has become quite difficult to have access even to landside. This is all because of the nature and the level of threat resulting the implementation of equivalent level of counter measures. It is known to all that along with the rapid development of technology, the technique of offence has been changed in such a way that it has become a challenge to determine and implement the counter measures. Further, the development in transport and communication has brought the world into a global village with a consequence that air transport in any state can be threatened from any other corner of the world. That is why uniformity of global aviation security must be maintained in a recognized level.

Despite comparatively expensive mode of transport people choose air transport because of safety, comfort and the speed. It is therefore necessary for each of the aviation stake holders such as aircraft operators, airport operators, aviation security organizations etc to concentrate their entire activities towards maintaining these critical elements of air transport. Above all a safe environment is critically needed for the sustainability and the development of air transport for which effective implementation of aviation security measures is the basic requirement. It should always be reminded that the Aviation Security can be effective if its importance is understood and supported by the airport users and the general

public. Confidentiality of most of the counter measures are required to be strictly maintained whereas some of them are required to be known and supported by the general public. In addition to the personnel directly involved in the implementation of security measures, traveling passengers, air crew, ground staff and the airport visitors have some accountability towards aviation security. Question may arise how to make the general public aware of their aviation security responsibilities. Legal documents such as act, rule and notices published in Gazette may be some of the sources for such awareness. Signage and notices displayed in appropriate areas of the airport and displayed in paper and electronic media may the effective sources for public information.

It has been wrongly understood even by some of the airport users that aviation security is the responsibility of security organization only. Now a days airports have been developed as a village where there may be organizations to work as municipality (airport operator), service providers such as aircraft operators, airport users such as shops, restaurants, government agencies such as customs, immigration, post office, and people (passengers , visitors). In a village where maintaining law and order is the responsibility of the state but still villagers have some security responsibilities similarly though airport security organization and airport operator are mainly responsible for aviation security, airport users and tenants are also responsible for some of the airport security procedures.

Identification of Aviation Security Areas of Public Concern

In countries like ours, it has become a part of our culture to see off and receive our relatives and friends at the airport with maximum possible numbers of family members and friends. This has resulted in the presence of a remarkable crowd at the airport landside. These meeters and greeters further intend to encroach security restricted areas. This obviously creates a pressure on security personnel to manage the good order and the security of landside. Further the security of landside has some effect on the security of airside.

Secondly one of the crucial elements of aviation security of public concern is the security barriers which may be fence, walls or other mode of barriers demarcating the airside landside areas. Such barriers are created not only to prevent the entry of cattle to the airport airside areas but to prevent the unauthorized access to such areas.

A large amount of capital has been invested in creating infrastructure which includes sophisticated security equipments such as X-ray machines and other detectors and in preparing skilled manpower. The purpose of this infrastructure is mainly to prevent unauthorized entry into aircraft and airport restricted areas and security searches of person and goods to prevent the introduction of arms, explosives and other restricted articles which may be utilized in committing unlawful interference against the safety of civil aviation. Security barrier to the airside plays a vital role in maintaining the integrity of total security system and a small breakage of which may jeopardize the whole system no matter how effective are other measures and procedures. On ground reality of the role of security barriers in maintaining the integrity of total security system provided at the airport such barrier is required to be maintained in good order all the time. It is therefore necessary to make the people of surrounding areas aware of these facts.

Thirdly, it has been noticed that some of the passengers are not very much happy with the security searches of persons and their belongings. They wrongly understand that searches are being carried out with the impression that they are being suspected. It is necessary to make the people aware with the fact that in the crowd of bona fide passengers there may be the possibility of the presence of the suspect one to detect and deter of which from amongst the group of passengers, security searches is necessary.

There are numbers of articles of daily use, such as knives, scissors, blades, screw drivers, knitting needles, gels, aerosols etc passengers may carry in their baggage. Because the misutilization of such articles may endanger the safety of aircraft, crew and passengers, they are not allowed to be carried either in the possession of passengers or in their hand baggage. It is absolutely not true that all these articles themselves are problematic and all the passengers carrying such articles are to be treated as suspect, but it is a matter of concern these articles must not be in the wrong hands during flight times. This is again a matter of concern to make the people aware with the types of articles which are not allowed to carry in the person's possession and in the hand baggage but allowed to carry in the checked baggage.

Role of Air Transport in National Economy

Tourism industry is playing a crucial role in national economy ultimately enhancing the life standard of the people. Data shows that most of tourists use air transport to come to the country. In this context, development of air transport industry is absolutely necessary for the development of tourism industry. It is the task of concerned authorities to make the people aware with the fact that air transport having a significant role in enhancing their life standard requires its safety which can best be achieved by their cooperation and support.

Conclusion

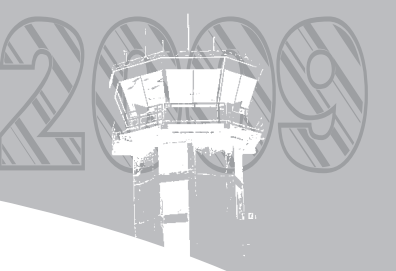
Authorities concerned are required to win the heart of the people by;

i. Giving them the impression that aviation security measures and procedures which are in place at airports are not to hurt them but to ensure the protection of lives and properties.

ii. Notifying them that Nepal being a member State of International Civil Aviation Organization – ICAO, it is bound to fulfill its international obligation in regard of Aviation Security.

iii. Making them aware that the strict compliance of aviation security of international character may help to present the good image of the Nation against international community.

To achieve the goal as stated above authorities are required to launch the awareness programmes which may comprise interaction programme with the local community, publicity in electronic and paper media, notices displayed in airport areas and in the website.



ICAO LPR Implementation: Audience and Audition

(The author assumes that readers of this article are already familiar with basic information on ICAO language proficiency requirements, particulary 6 skill areas of testing against the rating scale ranging from level 1 to level 6.)

Saurabh Ranjan Baral
Deputy Director
Curriculum Division, Civil Aviation Academy, CAAN

Problem

From a different standpoint, language proficiency requirements (LPR), a new ICAO Requirements that have to be met by all the 190 Contracting States, not only by the extended time line of 2011, 5 March, but also by any time prescribed by States in respect of any new developments in the offing in their respective fronts beyond 5 March 2011, stands out to be a Herculean task in terms of its implementation. Here, implementation is problematic due to two different situations. One of the situations has to do with the capability of training organizations to test the English language proficiency of personnel concerned. The other is about the apprehension as to how would ICAO rate the capability of test programme delivering personnel or training organizations in terms of accreditation, in the aftermath of this implementation. Speculatively, there are over one dozen aviation English language testing service providers that appear in the lime light of ICAO's concern in language proficiency requirements implementation. More are expected in forseable future because the fact – ICAO, too, accepts it – is that language testing is as unregulated an industry as any language training industry for reasons pointed out below:

- The design of language used must ensure certainty of safety of flights through unambiguous pilot- controller communication.
- The language is designed to focus a very specific set of vocabulary, expressions and speech acts.
- With regard to degree of expertise, operational efficiency rather than linguistic correctness is the criterion for assessing the proficiency.
- Communication is predominantly oral with rare occurrence of any verbal cues.
- Language training and testing is a high-stake activity as it is directly related with licensed career of the personnel
- Training cost has repercussions for industry activities in training and testing

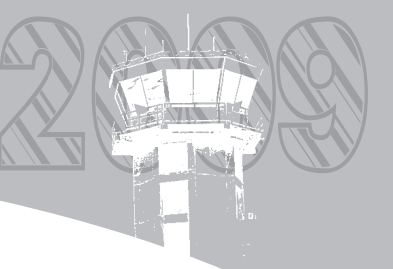
Currently, there stands no any system of accreditation, validation or specific teacher qualifications in the world of aviation. A "Guidelines for Aviation English Training Programmes" have been drawn up by the International Civil Aviation English Association (ICAEA), in cooperation with ICAO, in order to assist the aviation community in the process of selecting and contracting with aviation English training providers and to set appropriate standards of good practice for the teaching of aviation English. An agreement to co-publish the new Guidelines is also being explored by ICAO and ICAEA. In spite of its being hailed as a welcoming step, however, when it comes to administering the programme in a country like Nepal, it is essential for ICAO to intervene, and facilitate States in smooth demonstration of capability of training and test delivering organization. ICAO's manual on LPR 2004 and Testing Criteria for Global Harmonization are exhaustive enough to provide training and testing. It is a different matter that incapacitated States may seek assistance of a recognized testing organization. In sharp contrast to this, many States like Nepal are at the crossroads. Take the example of South Asian states; Pakistan, Bangladesh, Bhutan, Nepal are yet to comply with ICAO LPR Implementation. Amended plans are being submitted to ICAO, showing commitment to and assurance by States of their compliance with ICAO LPR by 2011, March 5th. An analysis of compliance status of States as published by ICAO is given below:

Response Rates To The First Survey of ICAO States Reporting on the ICAO Flight Information Exchange (FSIX) Website.		
Contracting States Contacted by ICAO	195 (190 States+5 territories)	% of 195
Round 1 (May 2008): Survey of CAAs		
Countries which did not reply to ICAO request for comliance details	55	28%
Countries which replied to ICAO	140	72%
Of those who did reply to ICAO we were unable to make contact with some because:	140	
a) No (usable) e-mail for an official contact person	4	3% (of 140)
b) Replies only in languages other than English	25	18% (of 140)
Total	**29**	**21% (of 140)**
Of the 140 replies to ICAO which we did contact		
We did not receive reply	87	78% (of 111)
We receive reply	24	21% (of 111)
Total	**111**	**79% (of 140)**
Round 2 (October 2008): Analysis of ICAO data		
Claimed compliance	53	27%
Stated non-compliance	89	46%
Not known - had not replied to ICAO	53	28%
Total	**195**	**100%**

Contextual Analysis

ICAO introduces standards for level 4 language proficiency requirements in 2003, 26 years after the Tenerife disaster, which is acknowledged to be a powerful activator for ICAO to initiate language enhancement efforts for aviation personnel, particularly, air traffic controllers, pilots and aeronautical station operators. The subsequent steps taken to assist in their effective and timely implementation has significantly altered the environment in which aviation English training is now carried out. ICAO brings out Doc 9835: Language Proficiency Requirements Implementation in 2004 followed by ICAO developed "Language Testing Criteria for Global Harmonization" in July 2008. As per the call of the State letter of ICAO, CAAN posted its implementation plan in early 2008, with compliance target of 2009. Against the grim reality of having overwhelmingly limited expertise in training and testing, CAAN has shown its willingness to fully comply by the extended time line of 2011. In APPINPIRG-20 meeting and DGCA Conference CAAN has also stressed a need of assistance in CAAN's effort to have smooth and expeditious compliance by the stipulated timeline. To recall the recent 46th DGCA Conference, held in Tokyo, Japan, Nepal urged the Conference to make arrangements for availing testing assistance to CAA Nepal in LPR Compliance given the scarcity of testers in Nepal in the existing scenario. Nepal also offered an option to ICAO, which requested ICAO to assess through COSCAP-SA, the existing training and testing capability with CAAN (in respect of the availability of linguist/testers, guiding materials, instructor qualifications, among others), and navigate CAAN in its endeavor to embark on the ELPR compliance as early as possible.

Since 2006/2007 when two personnel with tremendous aviation and English background was made available in the scene, the subject of LPR remained confined to a mere learning phase. It also remained as an independent exploration phase for the personnel. However, to respond to the call of ICAO State letter AN 12/44.6-07/68 as mandated by 36th Session of the ICAO Assembly Resolution A36-11, Implementation Plan of Nepal on ELPR was posted with ICAO website in 2007. The plan has indicated revelation of two major problems. They are: Lack of procedural documents and acute shortage of manpower. While responses from COSCAP-SA or ICAO are being awaited, Aviation English Training and Testing Procedures is being developed by CAAN to respond to the provisions in the Personnel Licensing Requirements and subsequent Procedures for Personnel Licensing requirements (PELR), enforced by CAAN under



QUOTABLE QUOTES: COMPLIANCE SLOWDOWN IS UNDERSTANDABLE

- Many airlines/ATS providers have designed their own internal test and got it approved by their national civil aviation authority.
- Even the UK , the home of the international language, does not have a formalized system of test accreditation in place.
- That level 4 is the right standard for the cockpit, tower or control center is questionable.
- ICAO level 4 is about the level of a high school student studying a foreign language twice a week for two years – equivalent to testing a teenager of 15.
- Changing work schedules of controllers and pilots make class room training and testing too cumbersome and difficult.
- If civil aviation authorities have the responsibility to accredit tests in their particular country, that still begs the question of whether they have the resources and expertise to be able to see the difference between a Mickey Mouse test and a professional test?

CAAN Act 1996, Section 34, followed by the Civil Aviation Regulations 2002, Rule 82, Schedule 3 Serial Number 27. It was only with the resilience of experts from COSCAP-SA, the longstanding and long awaited PLR and PELR both came into effect in early 2009, this year. Till then, the implementation of language proficiency requirements saw itself in gestation period, as there was an acute shortage of manpower in the skill areas of English language training and testing.

To respond to the foregoing reality, it is essential for CAAN to assign the highest priority to the development of manpower in respect of implementation of LPR. CAAN must ensure that trainers and testers are not only linguistically backed but also professionally backed with considerable exposure in Aeronautical English training and testing environment. In view of the high stake nature of language training and testing and costs involved, not only the sub-region, but Nepal should see the advantage of preparing its own manpower having English language and literature background in academia and controller experience of considerable period in the civil aviation career. CAAN has the pride of having such manpower strength within its own organization. In similar vein, COSCAP-SA can boast of having such strength and capability.

Metaphor of Collaboration

Cooperation can be likened to a launching pad, collaboration its destination. Assistance of ICAO, IATA, FAA, COSCAP-SA in the implementation of LPR in a cost efficient way may be one aspect of compliance process. More importantly, States within SA should exchange expertise in this respect. COSCAP-SA should forge a mechanism of relationship between States so that expertise could be shared amogst them. For example, States can reap benefit by taking advantage of the digital language lab established by CAA, Nepal for the purpose of English Language training and testing. Likewise, in respect of aviation English teaching, respective expertise can be harnessed. Moreover, there may be self motivated individuals and States who are good at developing adequate test procedures, requirements, program evaluation and guidance materials. So, diverse skills and knowledge can be shared amongst States through contract-in and contract-out activities. In so doing, none of the States would sustain any setback in the implementation obligations. Rather, with service import and service export, tasks for testing, training, material development, and above all, manpower production would be qualitatively standard, cost effective, cost efficient, uniform and internationally recognized. COSCAP-SA should coordinate with States under it to share their expertise as well as demonstrate their capability on Methods and Methodologies of testing; design, adoption or selection of training materials; Instructor and Tester qualification and selection; Testing Standards; and Programme Evaluation. Need of the hour for COSCAP-SA is to create a mechanism of collaboration between States. This can be done in various ways; one being recruitment and mobilization of home-based experts to advance the implementation pace in South Asia.

ICAO is the lone audience to the implementation of LPR, and States are an audition taker. The current situation with regard to fulfilling this need is widely recognized as being unsatisfactory. Meanwhile, the signs are that the language testing industry itself is gearing up to be able to assess the suitability of what is an offer. However, taking into account the need of States to take a reliable, effective and economically efficient audition before ICAO, it is more essential for ICAO, through its regional and sub-regional groups, to entertain and recognize those individuals and training organizations whose capability for implementation can be best determined and justified by means of inter-state collaboration and expertise sharing.

References:

1. Mell, Jeremy, Dr. STANDARDS FOR TEST DEVELOPMENT IN AVIATION: FROM PLACEMENT TO PROFICIENCY. ENAC, Toulouse, France
2. ICAO Journal, Vol. 64, No. 3, 2009
3. ICAO Journal, Vol. 63, No.1, 2007
4. Manual on the Implementation of Language Proficiency Requirements, ICAO Document, 2004
5. Testing Criteria for Global Harmonization, ICAO Document, 2007
6. The Scandal of Aviation English: Cover Story, Air Traffic Management, Issue1, Spring 2009
7. CAAN Souvenir 2008, Civil Aviation Authority of Nepal

ATS Route L626: Benefits in PBN Perspective

Mahesh Kumar Basnet
Deputy Director

One of the most noticeable achievements in recent times with regard to airspace and air route management is the establishment of ATS Route L626. This development is hailed as a significant niche of the Government of Nepal and the Civil Aviation Authority of Nepal (CAAN). This Route extends from Kathmandu to Delhi via Mahendranager of Nepal and Pantanagar in India. L626 allows maximum utilization of Nepalese airspace This Route is 20 miles shorter than the exiting B 345 (Bhairahawa-Lucknow–Delhi) route. It allows 291 nm utilization of the Nepalese airspace as against 100 nm that could be utilized along B 345. This has brought benefit to both India as well as Nepal. India will see reduction on traffic flow in high density airspace converging over Lucknow and Varanasi. And, Nepal will have the opportunity of getting economic benefit through more utilization of airspace and maximize the revenue in the future.

The detail route specification is that it stretches from Kathmandu to Bharatpur, Palpa, Surkhet, Mahendranagar and ONISA (Point in space in Nepal India border) in Nepal and Pantanagar Sikandarabad in India. The new route brings economy in fuel consumption as the aircraft are permitted to get high level flights, which means efficiency and hence reduces the environmental impact. One of the most tangible benefits of this route is that the aircraft on this route need not depend upon the ground based navigation aid rather they will use the on board navigation equipment. In this regard it will be pertinent to touch upon important aspects of what we are concerned with – Performance Based Navigation (PBN).

PBN comprises both area navigation (RNAV) and Required Navigation Performance (RNP). Modern aircraft are equipped with RNAV and already PBN capable. PBN simply clarifies how the navigation systems are used. While RNAV specifies the containment criteria only, Required Navigation Performance (RNP) specifies the onboard monitoring and alerting functions. RNP is more stringent than RNAV specification in that sense and is applied in approach and departure phases of flight. Civil Aviation Authorities provide the navigation specification as per the prescriptions described in PBN manual Doc. 9613.

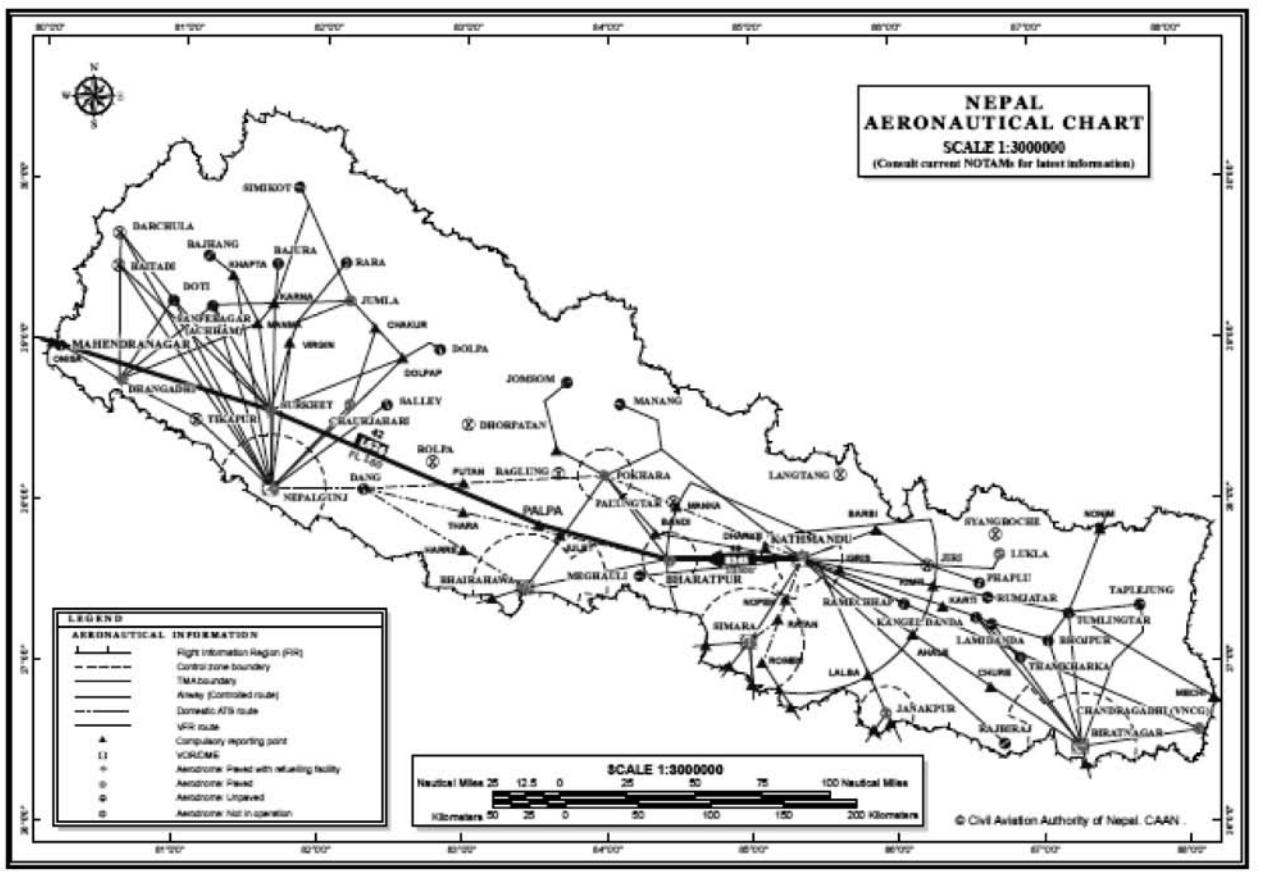
Given the worldwide use of RNP 10, the route L626 has been designated as RNP 10 route despite its having RNAV 10 specifications

RNP 10 navigation specification does not require any ground based navigation aid but it requires at least two sets of onboard long range navigation system (IRS/FMS, INS, GNSS). RNP 10 route allows the aircraft to remain within 10 nm either side of the centerline of the route 95 % of the total flying time. With the introduction of L626 Nepal has now entered into PBN era it has given tremendous opportunity to us and challenges are also likely to emerge

It is noteworthy that ICAO 36th assembly in September 2007 adopted the resolution 36/23 and urged all the contracting States to have a PBN implementation plan in place by 2009 to ensure RNAV and RNP operations as per the PBN concept described in PBN manual DOC 9613 according to established timeframes. APANPIRG established a Regional PBN Task Force though conclusion 18/52 and released an interm PBN Implementation Plan in September 2008. Utilizing the guidelines given in Asia pacific PBN implementation Plan, Civil Aviation Authority of Nepal has developed a draft PBN Implementation Plan

The PBN Plan is to provide information on the development in the field of air navigation in Nepal including GNSS based procedures

and to ensure RNAV/ RNP operations in line with the PBN concept. The ICAO mandate for the implementation of PBN procedures both in enroute and terminal area has come as a boon towards optimizing airspace utility and efficient management of terminal airspace. The implementation of PBN has been found to be an appropriate option to exploit the onboard navigation capabilities coupled with operational procedures to achieve enhanced airspace utilization through efficient, reliable, predictable and repeatable flight paths optimum solution to the traffic complexities arising out of growth.



The benefits of PBN are many fold, it can be reflected by introduction of L626 also. We can see that by implementing L626 the need of development of ground based sensor specifics routes are not required, which is cumbersome to install an operate in a mountainous country like Nepal and very costly. PBN allows more efficient use of airspace and facilitates shorter and direct routes. For pilots the very advantage is that the navigation functions are performed by the highly accurate and sophisticated on board equipment, which fairly reduces cockpit workload.

By the promulgation of L626 route, the door has been opened for east west direct long haul international fights across Nepal linking with Kathmandu. For example: Himalayan route Kathmandu to Hong-Kong direct via Guwahati, Imphal in India and Kunming in China could be established in future. Similarly, the route L626 can be further extended from Mahendranagar towards Pakistan and Afaganistan via north of Delhi. In fact, Nepal has proposed the Himalayan route in many ICAO forums which is supported by IATA.

The operation of aircraft on L626 has been started since 19 November, 2009. Already a dozen airlines fly on this route from Kathmandu to west destination barring a few, who still seem not yet prepared to fly on this route. If the concerned States like China, Myanmar and India are pursued at high government level to create better understanding and cooperation among States for the establishment of Himalaya Route direct from Kathmandu to far east that will provide great benefit to airlines and the Civil Aviation as a whole in terms of fuel economy, flying time and distance.

Conclusion

Valuable inputs form operational points of view form the pilots and controllers would be very useful to evaluate the operation of air craft on L626 in PBN perspective. Since PBN is a navigation solution for all phases of flights from departure to arrival, the input from all concerned would give the civil aviation authority to mass forward for implementation of PBN in approach and departure phases of flight.

Cost Analysis for Passenger Service Facility in TIA

A Quest for Justifiability

Shaligram Poudyal
Deputy Director, CAAN

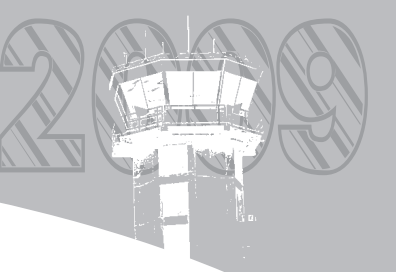
Why Passenger Service Charge?

Airports provide facilities and services to passengers. Facilities include the approach road, car parking, security arrangements, baggage trolly and terminal building. Within the terminal building there is arrangement of post office, telephone, information centre, toilets, passenger waiting area, and rest area. X-ray, Airline check-in, baggage conveyer, immigration check and customs services is arranged. Electricity, water, air conditioning, announcing and flight information display are arranged for passengers. Tea, and coffee shops, executive launges, sterile hall and boarding gates are also for passenger facility. Fund required for construction of facilities, and for furnishing and equipments installation is either to be borrowed or invested as equity by shareholders. Yearly expenses on the cost of capital, depreciation of assets, operation and maintenance are huge. To recover these costs, airports collect Passenger Service Charge (PSC) from departing passengers.

Civil Aviation Authority of Nepal (CAAN) Act 2053, clause 2(vi) has defined the "Passenger Service Facility" (PSF) and clause 10(1) (ix) has given mandate to collect PSC for providing standard service to passengers. Rules relating to service and facility charges are yet to be promolgated under the CAAN Act. Therefore CAAN is collecting PSC as specified in the Airport Charges Rules 2038 of the Government of Nepal (GoN).

ICAO's Policies on charges for airports:

International Civil Aviation Organization (ICAO) provides policy guidance for contracting states on charges for airports and air navigation services (Doc. 9082). ICAO defines charges



as a "levy that is designed and applied specifically to recover the costs of providing facilities and services for civil aviation". The policy document states that the users of airport should ultimately bear the fair share of the cost of providing the airport. Airports should maintain accounts that provide a satisfactory basis for determining and allocating the cost to be recovered. The cost to be shared is the full cost of providing the airport and its ancillary services including appropriate amount of cost of capital, and depreciation of assets as well as the cost of maintenance, operation management and administration (para 29i). Airport may produce sufficient revenues to exceed all direct and indirect costs for purpose of investing new and expanded airport infrastructure and where appropriate, to remunerate adequately to holders of airport equity. Taking the basis of ICAO's policies here we are going to calculate the cost of Passenger Service Facility (PSF) in Tribhuvan International Airport (TIA).

Assumptions and Basis of Cost Analysis:

The approved accounting procedures of CAAN do not require maintaining cost accounting. Nevertheless we can extract major costs from the yearly financial statements and re-allocate them to calculate the PSF cost. In analysing these costs we have taken following assumptions and basis of costing:

- Out of total assets (Rs. 13128.65 million) of the then Department of Civil Aviation (DCA) transferred to CAAN, assets of TIA are (7553.02 million) or 57.5%. On this basis and proportion, TIA cost is allocated from CAAN total cost,.
- The contribution of PSC in TIA revenue is about 51%. On this basis and proportion out of total TIA costs, the share of PSF is allocated. Since the PSF costs are taken in propertionate to PSC revenue contribution, non-aeronautical income is not necessary to be adjusted.
- Share of international PSC is 92% and domestic 8%. On this basis and proportion, costs on both services are to be re-allocated.
- Interest on loans except ADB loan No 1451 and Khanidanda is the burden of TIA.
- Yearly return on share capital is assumed at 10%.
- 5% depretiation (deemed building) is to be extra charged on the Work-in-Progress (WIP) assets.

Source of Data for Analysis:

A summary of data sources used to analyse the cost of PSF is given in the Table-1 below. The passenger number for the fiscal period is taken from July month to June. Let us have a look on the Table -1 below:

Table-1
PSC data sources

Particulars	F.Y. 2057/58	F.Y. 2060/61	F.Y. 2063/64	Data sources	Remarks
Share Capital	10,66.33	10,66.33	10,77.33,	Balance Sheet	Rupees in Crore
WIP Assets	2,04.43	3,75.88	3,96.59	Balance Sheet	Rupees in Crore
Interest Expenses	25.95	12.19	17.00	Income Statement	Rupees in Crore
Depreciation Expenses	1,29.08	59.88	38.77	Income Statement	Rupees in Crore
Depreciation of WIP	10.22	18.79	19.83	5% of WIP	Rupees in Crore
TIA Operating Expenses	13.90	23.00	33.63	Annual budget	Rupees in Crore
TIA Passenger Revenue	53.18	66.40	81.03	Income Statement	Rupees in Crore
Passengers out (I)	4,88,974	5,70,330	8,13,531	Corporate Directorate	
Passengers out (D)	4,54,944	4,35,075	4,50,460	Corporate Directorate	

WIP=Work-in-Progress I= International D=Domestic

As given in Table-1, interest and depreciation expenses are in decreasing trend. Operating expenses are increasing year. The international passengers are ncreasing at a high rate. But the domestic passengers growth is very much stagnant more to say negative (-1%) in this period. Interest liability is decreasing because loan installments are paid on equal principal basis which reduces the interest liability in the later period of amortization. Depreciation expenses are decreasing because of deminishing balance method. If it were a fixed installment method, a uniform depreciation cost value would arise. Additionally, athough many of the project's construction are already complete and used for services, due to unavailability of completion report these assets remained as WIP in the Balance-sheet. For example, TIA terminal building expansion was completed in 2057/58 but it was booked as WIP through out this period making depreciation under charged. To adjust this gap, we have added depreciation @ 5% (deemed building) on WIP.

Calculation of Total Cost of PSF in TIA:

On the basis of the data given in the Table-1 above, we have calculated the total cost of PSF in TIA. Let us go through the Table -2 below:

Table-2
Passanger Service Facility (PSF) Cost in TIA

Particulars	2057/58		2060/61		2063/64		
	Total Cost	For PSF	Total Cost	For PSF	Total Cost	For PSF	Remarks
Total Depreciation $CAAN_1$	1,29.08	37.86	59.88	17.56	38.77	11.37	Rupees in Crore
Depreciation WIP	10.22	3.00	18.79	5.51	19.83	5.82	Rupees in Crore
Operating expenses TIA_2	12.75	7.09	23.00	11.73	33.63	17.15	Rupees in Crore
Interest of TIA $Loan_3$	24.58	12.53	27.28	13.91	15.28	7.79	Rupees in Crore
Return on Share $Capital_4$	1,06.63	31.28	1,06.63	31.28	1,07.73	31.60	Rupees in Crore
Yearly Total PFS Cost		91.75		79.99		73.72	

1. PSC income of TIA was 51% of total income in recent fiscal year 2064/65. On this basis, out of total TIA costs. We have allocated 51% for PSF cost. By the same basis out of the 57.5% share of total CAAN depreciation expenses, 29.33% is allocated to PSF cost.
2. 51% of operating expenses.
3. 51% of the interest expenses of TIA related loan.
4. Return on share capital @10%. Out of this 29.33% is allocated PSF cost of TIA.

As shown in the Table-2 total PSF costs of TIA for the fiscal year 2057/58, 2060/6, and 2063/64 are 91.75, 79.99 and 73.72 crore rupees respectively. This indicates a decreasing cost tendency reducing PSF cost per passenger in later years.

Calculation of Per Passenger Service Facility Cost:

Total PFS cost mentioned in Table-2 is further sub-divided for International (I) and Domestic (D) sector as presented in Table-3 below. To derive per passenger cost, total cost of respective fiscal year is divided by total number of passengersas given in the Table-3 below:

Table-3
PSF Cost per Passenger in TIA (Excluding VAT)

Particulars	2057/58	2060/61	2063/64	Remarks
	cost of PSF	cost of PSF	cost of PSF	
Yearly PFS Cost (Table-2)	91.75	79.99	73.72	Rs.in crore
Total PSF (I)(92%)*	84.41	73.59	67.83	Rs.in crore (from Table-2)
No. of Departed Passengers -(I)	4,88,974	5,70,330	8,13,531	
Per Passenger Cost-(I)	1726	1290	834	In Rupees
Total PSF (D)(8%)*	7.34	6.40	5.89	Rs.in crore
No. of Departed Passengers(D)	454944	435075	450460	
Per Passenger Cost-(D)	161	147	131	In Rupees

I= International D=Domestic
- As composition of PSC revenue is 92% from international and 8% from domestic services. Cost allocation is also divided in the same ratio.

In Table-3 above, the PSF cost per passneger for the fiscal year 2057/58, 2060/61, 2063/64 is Rs. 1726, 1290 and 834 respectively for international. For domestic it is Rs. 161, 147 and 131 respectively.

Comparing Actual PSF Cost with Existing Rate of PSC:

Now we have calculated the PSF cost per passenger. As a general principal, as per ICAO guidelines, the PSC rate per passenger should be matching with PSF cost per passenger. But ICAO policies also permit states to produce sufficient revenue to exceed cost for the purpose of investing in the new or expanded airport infrastructure. Let us compare actual rate of PSC with the calculated PSF cost as given in Table-4 below.

Table-4
Comparision of PSF Cost per Passenger with PSC Rate (excluding VAT)

Fiscal Year	PSC Rate		PSF Cost (I)	Difference		Average Rate	Difference on average rate	PSF cost (D) Rs.		
	SAARC	Others		SAARC	Others			PSC Rate (D)	PSF Cost	Difference
2057/58	700	1000	1726	(1026)	(726)	880*	(846)	150	161	(11)
2060/61	700	1000	1290	(590)	(290)	880*	(410)	150	147	3
2063/64	700	1000	834	(134)	166	880*	46	150	131	19
Average for 3 years	700	1000	1283	(583)	(283)	880*	(403)	150	146	4

**Out of total departing international passengers' 40% embark to SAARC region and 60% to other countries. With this proportion, average PSC rate will be Rs. 880*

As given in Table-4 international PSC rate in SAARC regeion is much less than the cost of PSF. The loss per passenger embarking SAARC region for fiscal year 2057/58, 2060/61 and 206/64 is Rs. 1026, 590, and 134 respectively. To calculate in average PSC for SAARC region was under charged by Rs. 583 in this period. For other regions PSC rate is less by Rs. 726 for 2057/58 and by 290 for 2060/61. In 2063/64 PSC exceeded the cost by Rs. 166. In average PSC was under charged by Rs. 283 per passenger in this region. In the domestic, PSC rate is less by Rs. 11 in 2057/58. For 2060/61 and 2063/64 it is a bit more than the cost per passenger.

If we count the loss of first two years of our sample it will be Rs. 65.12 crore. In 2063/64 the gain was only Rs. 4.60 crore making a net loss of 60.52 crore for three sample years. Thus it clear gain from the year 2063/64 and after that year is not sufficient to compensate most of the under recovered cost of previous years.

Table-4 also indicates another phenomina. International passenger number is increasing and PSF cost per passneger is decreasing. For example with 488974 passengers in the fiscal year 2057/58, PSF cost was Rs. 1726. Cost decreased to Rs. 834 in 2063/64 with 813531 passengers. Airport is a capital intesive industry. It has to bear big costs on depreciation and loan interest every year. These expenses have substantial effect on PSF costing. This phenomina is clearly observable in in domestic side. In domestic although passenger growth was stable in our period of analysis, PSF cost per passenger decreased in the later year due to low total PSF cost. Nevertheless, passenger number remains a major factor to determine per passenger cost.

With the increase of passenger after some years the existing airport facility starts to be conjusted. In such situation, additional capital investment is required to expand the airport facilities. As in recent years in TIA conjestion in terminal building, parking bays and carparking lots is increasing. And additional investment in these infrastructures has been necessary.

A Snapshot Survey on PSF Standard

Recently we conducted interview with international departing passengers to get their feed back on service quality. Questions about Taxi, Trolly, Toilets, Security check, airlines check-in, immigration, tea and coffee shops, food and beverage and duty free shops were asked. Passenger's view on the whole service and facilities of TIA were also sought for.

Out of 110 passengers interviewed, 27% were satisfied with trolly facility, 36% in toilets and 64% on security check. Almost all the passengers were satisfied with the airline's check-in and immigration-check. In tea and coffee, only 18% said it was fine. No one bought goods in duty free shops.

Passenger's overal view about services and facilities of airport was expressed as follows:

"Spend more money on facilities like building"; "To put small shop in Sterile Hall"; "Trolley not sufficient"; "Immigration should be as per the international service"; "Taxi should be standard"; 'Security should be polite"; "Snacks not so cleanly handled"; "I did not use toilet because it was so dirty, I come out"; "Waiting hall should be differently managed"; "Old, sick people should get first priority"; "If the boarding gate is open, announce on the screen, boarding place & time."; "Tea, Coffee is little bit expensive"; "About signage , I could not find check-in counter"; "Lighting Departure area"; "6\ofS;L dxËf] eof] . oxfFjf6 uf}zfnf uPsf] ? %)).–lnof] " ("Taxi fare is high. He took Rs. 500 for taxing upto Gaushala")

This interview is providing several aspects of services which need improvement. This interview gives us a clue that passengers expect maintenance of international standard in TIA. As such 64% passengers were not satisfied with the level of toilet cleaning. Most of them were not satisfied with baggage trollies. Cleanliness in the snacks bar is complained. Selling price of tea, coffee is high. May be it is associated with absence of competition. Shops are not successful in attracting passenger (customers). Create environment such that passengers spend more time in the departure hall is necessary. Improvement is also necessary in security check and immigration services.

By addressing these suggestions we could improve passenger's image towards airport. We will also be following the spirit of CAAN Act clause 2(vi) where stress is given to the standard service to passengers. Charging for the PSF will be more justifiable. There will be less grievances, complains, and more praises on our service.

Introduction of new technologies is also important to improve service level. For example, adoption of Common Use Terminal Equipment (CUTE) system would make passenger check-in expeditious. Desined capacity of TIA should be maximum utilizesd. As per desigh, in International Terminal Building, about 905 passengers could be processed per hour. With just 1/3rd of this capacity utilization in three shifts a day about 1.9 million passengers per year could be

smoothly handled. Arranging smooth flow of passenger and aircraft all along the operation hour needs a proper time-slot management scheme. Introducing high charge for pick hour and discounted charge for lean hour is necessary. This will motivate operators to utilize lean hour time and will also help solve congestion problem. Managing conjestion will ultimately improve passenger service standard.

Proposing New Rate of PSC:

This analysis is indicating that that prevailing rate is near about the cost. Although our analysis is based on factual data, due to non-inclusion of costs incurred by other related agency like TIA Project Directorate and Communication and Navigation Department of CAAN, this analysis inherits under-estimation of costs. Similarly, depreciation method (diminishing balance method) and loan repayment method (equal principal method) is spreading heavy costs for initial years and less costs in the later years. Therefore we like to put our analysis at 80% confidence level. Hence maximum cost of PSF could go up to Rs. 1001 for international passenger and Rs. 157 for domestic. There is a necessity of a big investment to expand facilities in near future in TIA. ICAO permits to collect charges for prefunding of projects (Doc. 9082 para 32). Until now there is no charge for x-ray and baggage conveyer. In this perspective we have given hare our proposal of new charge rates of PSC in TIA as presented in the Table-5 below:

Table-5
Proposed PSC Rate and Amount to be deposited in Pre-funding Facility Improvement Project.

Particulars	Adjusted average PSF cost	proposed average PSC rate	Existing Rate Rs.	Charge for Pre-funding	proposed Rate	Rate with VAT	Estimated Passenger Number	Annual deposite for Pre-funding
SAARC Nations	1001.00	991.15	700.00	184.96	884.96	1000.00	440000	10.0860000
Other Nations			1000.00	61.95	1061.95	1200.00	6660000	40887000
TIA Domestic	157.00	157.00	150.00	26.99	176.99	200.00	490000	13225100
							Total	135494500

**Difference of existing rate and proposed rate*

Presently PSC (I) is being collected through inclusion in the air ticket. Proposed rates of PSC (I) including VAT will be about US$ 13 for SAARC nations and US$ 16.00 for other nations (1USD=NRs 75). Rates with VAT are proposed in rounded figure just to make easy for transaction. Increased PSC amount be set aside for pre-funding TIA Improvement Project (TIAIP) fund. As calculated in Table-4, this increase will raise 13.55 crore rupees per year for the fund. Within 3 years time this fund will increase to Rs. 40.65 crore contributing about 40% financing requirement of TIAIP. Prefunding arrangement will reduce loan and interest burden of TIA.

Maching the Charges with Level of Services and Cost Recovery Principle:

Airport Council International (ACI)'s policy of charging asserts that charges should be fixed as per the level of service. CAAN Act is also stressing on the same principle. ICAO is equally in favour of safe, effecient and expeditious services. In fact fixing charge on the cost recovery basis does not ignore the quality of service. Therefore fixing of charges should consider the cost as well as service level in the airport. Now a day airports of the world are competing by maintaining high level of service. They are trying to give service beyond passenger's expection. They have established Custumers Satisfaction Department, and Cleaning Department to improve service qulity. They collect customer's feed back to monitor service level. Such a policy should also be adopted in TIA. We should also be careful that service charges are not taking the form of a tax.

Conclusion:

From the above discussion and analysis we reach in some conclusions. First of all complete accounting reports of TIA including Income statement and Balance-sheet should be prepared for each year. Main expense heads should mach with the main revenue. Secondly, getting feed-back of passengers to improve service standard should be adopted. Customer service unit and cleaning unit should be established to improve service quality. Associated entities like immigration, customs, and security offices should also try to improve service quality as per international standard. Chief of TIA should have legal responsibility and right to play effective co-ordinating role with associated agencies.

Cost of all other aeronautical charges should be calculated with related cost data. Revision of rate of charges should be done after every three year. In the context of PSC being included in the air ticket and as a general principle effective date of revised rate of charges should be fixed in advance preferably before three months. Users should feel that they are paying for value of service not that they are simply taxed.

Reference:

Civil Aviation Authority of Nepal Act 2053.
Airport Charges Rules 2038
Civil Aviation Report 2008 & 2007 CAAN
ICAO Policies on Charges for Airports and Air Navigation Services (doc. 9082), Eighth Edition 2009
Visit Nepal Year 2011, Assessing Aviation Component; -Sachit Bhakta Pokharel, CAAN Souvenir, 2008
GCA, Assets transfer report document. CAAN, Balance Sheet, Income Statement of Different Fiscal Year

Quest for security : Can we quench it ?

Birendra Kumar Singh
Under Secretary,
Ministry of Tourism & Civil Aviation

With the tremendous growth in air travel and rapid expansion of aviation, security has been the most dominating feature in the aviation arena of the present day. Security as a matter of fact, is a collective responsibility and cannot work in isolation, but needs the sole effort of all stakeholders be it the airlines, travel agents, airport authority, government agents but also of the public itself. Whenever we talk of security one thing always strikes in our mind-- the devastating act of terrorism on that fateful day of 11th September 2001 that definitely underscores the need for regular and continuous development of strategy and further upgrading the security technology thereby enhancing security to a greater height. Even amidst the doom and gloom and threat in aviation, still people have been flying, people have been marinating the glimmer of hope, that despite anything the show must go on; many more touchdowns shall still be there and there will be new and frequent travelers that will keep the global sky floating with more different and bigger aircrafts because technologies will be created to combat the ever increasing aviation threats of tomorrow and in the days to come.

Roadmaps will be made for better aviation of the future which comes thru combination of both technology and human that deploys these technologies. With the changing trends of bigger aircrafts, most flights to longer destinations with shorter span of time and

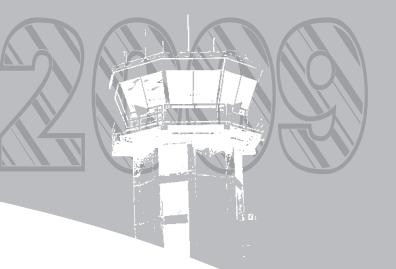
more human beings flying round the globe, future and devastating catastrophes' can be avoided through training and being more vigilant, active and above all performing ones duty with utmost care.

Annex 17 and Its Relevancy:

Annex 17, which is the main bible of aviation security, needs to be incorporated by all the contracting nations to the fullest .It is also necessary to ensure that all concerned be aware of its importance and all states must adopt the security manual containing specification and procedures to assist the contracting states in the process of implementation of this Annex. When we talk of security, threat too comes in the picture and hence diminishing threat is to upgrade security thereby providing enhanced security to the passengers, airport environs, aircraft and the public at large. So, in order to boost security system for the 21st century all must fully incorporate the latest technologies paving ways for the biometrics systems which is the latest security technologies in vogue deployed by most of the ICAO contracting nations of the world. But even these new technologies including the improved version of scanner, X-ray, biometric authentication and identification are not a panacea to solve airport security problems. However, if correctly utilized, these systems can play a pivotal role in not only upgrading the security system but also in maintaining a smooth flow of the passengers at any given airport theraeby avoiding the unnecessary inconvenience for the passengers.

Technologies Involved:

Even though security measures such as installing secured cockpits, expanding air marshal program, and increasing the effectiveness of any airport, enhances the security as well as the safety system but by all means personnel are of paramount importance. It is but necessary to give serious thoughts to install and advance technologies to make airports more secured. Installing new technologies may sound very expensive, yet if we are to combat the ever increasing threat received in the aviation arena the government should take a positive imitative to pump in the required amount of money to make the airport and its environ more secured and safe be it in Nepal or elsewhere .These days the key technology for airport security has been the biometrics which deals in the science of recognizing and authenticating individual based on the unique biological data. It is also based in any unique biological identifier and through the use of advanced information technology that can confirm individual's identification almost instantly.Thaere is a wide array of biometrics systems as: finger prints, identifiers, facial geometry, hand geometry, on-invasive rental scan and skin scanner. Other well off technologies of today used in airports as Singapore, Malaysia are: Body Scanner, Trace Detector (Vapors Tracer), Fiber Scanner (utilizing the optic mechanism), and Backscatters etc. Further, the threats' for the future in aviation can always be there and civil aviation should be able to cope and know what the future threats hold as the future threats can come in different forms: CBRN carbon, biological, radiation, nuclear, and explosives and the most terrifying idea is that carbon as a threat can even be carried in a bottle of water hence high degree of caution is to be deployed at all times. No wonder security should be considered as ''our problem" rather than 'my problem 'this way security will always be taken on a holistic basis rather than on a single basis. Again, Behavior Pattern Recognition (BPR) technique is being rolled out as a pilot project at some of the major Canadian Airports from 2010. Here facial expression and body movement of the passengers as they pass by are monitored through the terminal or as they wait for their check in. The facial recognition have become more sophisticated and capture



passenger from far distance and the people need not to stay in front to face the camera directly; but their face is captured from a long distance at any angle.

Here the use of smart cards are deployed which has all the necessary data of an individual stored with biometric information so when this smart card is pushed inside a slot for access into the restricted areas or say into the slot for cock-pit, this card gives the access to that individual of that smart card .Hence, this system is good to the fact that if this card is lost no other person can use it beside the right owner. This way, this technology recognizes and verifies the individual for any area to be accessed. Similarly: facial or hand scanner, voice identifier that use the same technology and are some of the technologies deployed for enhancing security and for the betterment of civil aviation at large. Again, these technologies not only prevent duplication, but also are designed to keep at bay the unnecessary inconvenience cause to the passengers and curtail the unnecessary delay caused by utilizing the old technologies as: the hand held metal detector, and the actual frisking of the baggage's manually.The beauty of the biometrics systems is that it ensures the actual passenger to board the aircraft and no proxy is accepted at any rate and at any given time. Likewise, the facial scanner system can identify the suspected criminal who may want to pose a threat to the civil aviation. But through this method which deploys the quick scanning of the face from thousands of face in a jiffy, can not only be a deterrent but also informs to the concerned authorities thru its database, and can be used as and when needed to spot the terrorist globally. But for the biometrics systems to be effective and of perfect use needs a globe link and full support, understanding, and deploying a global data base that can be utilize by all in full cooperation.

Deployment of the Human Resources

Installation of these advanced, new information technologies will not suffice in curtailing the safety and the security system at any given airports, but trained and motivated human resources is of vital importance so these state-of –art technologies are fully utilized for their optimum usages, or else these modern technologies are of no use if not used by well trained human resources. So to say, security and safety of civil aviation can only be achieved thru educated, trained and motivated officers. Not only that, in order to achieve heightened security and safety, government, airports, stakeholders will not only need to educate ,train, their employees, but even ensure that the public too is aware of the fact that technologies enhanced security as well as protect public and civil liberties. That is why human resources the most crucial factor in any given moment in the arena of civil aviation, needs to be up on his toes at all times. This of course comes through training, motivation, planned schedule, and above all enthusiasm. In any institution, if you want to keep the human soul alive, you should ensure that new technologies are up dated at all times and this should go hand in hand collaborating as a joint force in tandem with training, motivation and above all the security force deployed at any airport should not only be getting timely trainings so that they are up to date with the latest technologies but there are enough manpower to swap up their assigned duties to avoid fatigue and frustration, as well to ensure they are at par with the health standard as prescribed by ICAO.

Institutional Building

This is another major soft ware for effective security and safety build up. It sir necessary to ensure that each contracting state have their security measures at par with Annex 17, and ensure that attainment of aviation security objective and compliances are well met. Needless to say efficiency must be adopted for enhancing security and to avoid unnecessary delay in the name of security as Annex 9 Facilitation stipulates that though security cannot be compromised, yet delay should be avoided to create unnecessary frustration for the passengers in the name of security and for this certain things should be adopted namely:

- Better planning to optimize deployment of checked baggage's screening system
- Efficiency in the pre board passengers screening system
- Well trained screeners not only for better efficiency but to ensure that they are not fatigued by over burden of their assigned work a specialized cell needs to be established in the police force so that pre trained officers are transferred to any airports .This way once they enter any airport they at least are aware of security and its technologies and are not totally raw in their field. This is of vital importance not only to boost their working capabilities, but it also quickens and ensures better facilities combined with heightened security to the passengers at all times.

Conclusion

A comprehensive, cohesive, a national effort involving appropriate local, private sectors as well as the concerned stakeholders should join hands in providing active, updated aviation security encompassing the whole airport of the nation.

As the tragic event of Sept.11, 2001, has irrevocably changed the standards of national security around the world, Nepal cannot remain aloof in this regard and needs to pave its path accordingly ensuring better management in regards to security which can be achieved through the installation and adaptation of the new technologies. Of course it need not be stated that the budget involved may be zillions of rupees or enormous amount of foreign currency, yet in order to ensure tip top and highly attentive and updated security system it is high time that Nepal think seriously in this matter that too adoption of the biometrics and other such related gadgets- to name a few be used especially at TIA. This way it can definitely combat with the ever increasing aviation threats and upgrading security in most efficient manner thereby indorsing not only Annex 17 but even Annex9.Again, making the system work at all times needs the human resources who are not only up on their toes, but there is surplus working force (especially there are surplus serener) who can be swapped around after certain hours of their duty as stipulated in ICAO. This way they not only remain fresh energetic but above all they are always vigilant to work as fatigue is totally avoided. It is hoped that Nepal will learn from its past mistakes and will further strengthen its security systems and be able to cope in even better fashion and ensure that heightened security is provided as and when required.

WORKLOAD ANALYSIS OF AIR TRAFFIC CONTROLLERS AT TIA

Mishri Lal Mandal
Dy.Director , TIACAO

Extremely painful poverty and extreme social economic disparities as well as deprivation and despair have brought Nepal to the brink of facing queer challenges in the integration and systemic working of civil aviation components.

Aviation consequently is one such promoting high tech sector that has the potential of steering the country from poverty to prosperity through tourism, trade and high value export. In pursuit of creating preconditions for quantum leaps in our economy, Nepalese civil aviation argues over an advocates the need of a well established Air Traffic Services system and procedures and make the international airport all the more standard in terms of aviation communication and operational safety of aircraft.

Status of Nepal

There are 53 domestic airports in Nepal. Among them few are under construction and many of them are STOL fields. Presently 33 airports are in regular operation and 20 of them are in districts where there is no road connection. Tribhuvan International Airport is the only international airport in Nepal which is getting congested day by day due to increasing growth of traffic, passengers and freights.

Regional Scenario

The growth of air transportation in Asia/Pacific region has been the fastest in the world over the past 20 years. The trend is expected to continue for the next 20 years. The present growth rate in Asia/Pacific region is passengers 5.8% and freight by 8%.

TIA'S Constraints

During the recent past, attention has been drawn for the additional physical infrastructure development of TIA. However, only the construction of additional parking bays and other outside infrastructure is not sufficient to enhance the capacity of TIA. Because of the hostile terrain, geographical location and slope of the runway, TIA has its own operational constraints. So, future investment in TIA should also focus on to develop an appropriate Air Traffic Control system and procedures that can accommodate the increase

volume of traffic within the valley which is having typical weather changes round the year and almost one way approach and take-off for big jet aircraft. Presently long haul flight with bigger aircraft is very few in TIA due to geographical constraints and lack of advance avionics.

Air Traffic Control System and Procedure

Limitations on the Provisions of Air Traffic Services

1. Present ATM system has limitations that may occur at different times and places with which TIA is not far away. These limitations include but are not restricted to:

a) disparate services and procedures resulting from different systems and limited system and decision-support tools;
b) a reliance on increasingly congested voice radio communication of air-ground exchanges;
c) rigid airspace divisions and route structures that do not allow the totality of ATM resources to be used to the best effect;
d) limited collaborative planning among ATM, aerodrome operators and aircraft operators;
e) less than optimum use of scarce resources such as airspace and aerodrome airside capacity;
f) limited facilities for real-time information exchanges among ATM, aerodrome operators and aircraft operators, resulting in less than optimal responses to real-time events and changes in users' operational requirements;
g) the limited ability to maximize benefits for aircraft with advanced avionics; and
h) the long lead times involved in developing and deploying improved systems in aircraft fleets or in the ground infrastructures.

2) The limitations of the current ATM system result in inefficient aircraft operations. These inefficiencies include but are not limited to:

a) The requirement to fly circuitous departure and arrival procedures;
b) The execution of civil air traffic and airspace reserved for defense purposes;
c) Indirect fixed routes between destinations;
d) Excessive system-related ground and en-route delays;
e) The operation of aircraft at inefficient altitudes, speed and in unfavorable winds; and
f) Insufficient flexibility to permit optimum management of weather-related disruptions to airline operations.

Traffic Scenarios

Presently 25 international and 16 domestic airlines operators are given permission to operate their flights to and from TIA. Some airlines are still in pipeline to get permission. Most of the airlines operate their flights only during daytime. Therefore, congestion of traffic occurs in day period. There are over 300 movements from dawn to dusk i.e. from 6am to 6pm local time everyday. It means there are over 25 flights in an hour. If we take 30 flights in an hour for simplicity, we will have a movement of an aircraft in every two minutes. It means, in every two minutes, there is one departure or one arrival. In every two minute, a departure or an arrival indicates to a very heavy traffic. Heavy traffic means, lots of instructions and information to issue to the aircraft and other ATS units and about the same amount of information and instructions to be received from other sides as well. As a result, controllers have to speak and coordinate continuously and therefore they are saturated which brings tiredness and stress in them.

Different operators operate different types and categories of aircraft, as a result, TIA has a heterogeneous traffic of very high speed to very low speed aircraft. This variation of speed creates lots of problem in separation, safety, sequence and spacing of the traffic. Situations become worse in IMC condition, weather deterioration and foggy days.

Nature of Traffic

Traffic flow in TIA is very typical because of the typical physical feature of this airport and some connected other airports, routes and tricky weather there. Therefore, operators are unable to change their slots. They are confined to the fixed timings. For example, flights to Lukla and mountains can not be slotted differently because of the nature of the wind and weather in the typical valley, over high hostile mountains and around high Himalayas. This creates the problem of scheduling and rescheduling and distribution of air traffic in the time span.

Again, some big jet operators, like airlines operators from India do not allow their aircraft to operate after sun set because of the terrain, limited facilities at this airport and also because of their own aviation and company rules. They operate only during day period creating more congestion of air traffic & pressure to Air traffic management.

Position and Situation of ATC

Presently, there are just about 54 Air Traffic Controllers working in TIA operation. In morning and day there are hardly 22 persons in each shift and at night just about 10. About 4 among 22 and 2 among 10 go on roster leave every day. Sometimes, some are on casual leave, home leave and others in their respective shifts. To sum up Air Traffic Controllers in TIA is thought to be working more than their capacity (capacity is not yet determined). They have to work on their roaster-off days as well. They are not in a position to entertain public holidays and family functions too. There are six working positions in TIA namely Aerodrome Control Tower, Approach Control Unit, Area Control Centre, Briefing Office and two SSB positions. In control Tower, with six persons is a comfortable situation but this number is not often fulfilled. Again, among the six controllers in Tower, all are not rated ones. Hence, it decreases the efficiency of Aerodrome Control Tower. In Approach Control Unit, only four persons are allocated among which two controllers work at a time alternately. They can work comfortably in low traffic only. In case of heavy traffic, Approach Control position needs to be spitted into two sectors which require at least six persons in a shift to do so. In Area control Centre, four persons are allocated but four persons are never there. Now, there is new Letter of Agreement signed between Kathmandu ACC and Nepalgunj Tower which allocates more airspace to Kathmandu ACC. As Kathmandu ACC is a single control position, in busy period, it is very difficult for one position only to handle the traffic in whole airspace. Therefore, Kaihmandu ACC needs to be separated into two as ACC East and ACC West and more people to be allocated there. Similarly, in ATS Reporting Office, only two persons are allocated. Working with old system and procedure, they are over loaded with the work and stressed. Either the systems should be improved with advanced avionics or the number of persons should be increased to solve the work load. There is provision of two SSB for the co-ordination with the airports outside but because of the degraded facilities and lack of manpower, only one SSB is in operation for both Eastern and Western sector. To be comfortable, each morning and day shift needs 30 and night shift 15 Air Traffic Controllers as a minimum. This sums up 75 in total. Air Traffic Controllers, working in TIA are not getting regular and proper refresher trainings timely. Since long back, lacking of the proper refresher training, advance avionics and its knowledge, they are unable to increase their capacity, efficiency and performance any more. Struggling to cope with the growing high traffic and because of the high stress, they want to quit the operation and work at other places in the organization. Government of Nepal has announced the year 2011 as the "tourist year" where by more and more flights are expected to increase during the time. It is obvious that human resource is the main resource of an organization and one of the major tools to achieve its objectives. Civil Aviation Authority of Nepal (CAAN) also has a policy to fulfill its objectives by its devoted, motivated and skilled manpower. But there is no adequate number of manpower in air traffic control business and no proper steps are taken so far to develop them as mentioned in its policy. Air Traffic Controllers involved in air traffic control business are less motivated, working with old avionics system, stressed and frustrated. This is and will be a great challenge to meet the present and future manpower requirement and the requirement for Air Traffic Management in the tourism year 2011.

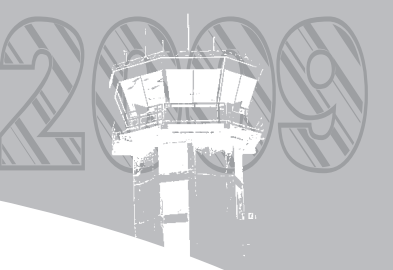
Remedies/suggestions

All limitations and constraints that may occur at different times and places can not be avoided or eliminated. Here are some remedies or suggestions that may help Air Traffic Services and Air Traffic management but are not restricted to:

1) Production of adequate number of Air Traffic Controllers, their proper trainings and motivation may help in adjustment and retaining of man power in this field.
2) Communication, navigation and surveillance system should be improved and advanced avionics should be introduced. An automation system may fulfill the demand of increasing manpower and improve the capability of ATS system.
3) Splitting of approach and ACC into two sectors may solve the problem of congested radio voice communication.
4) Flexible use of airspace may also be helpful in the improvement of Air Traffic Services.
5) Optimum use of airspace and airport air side capacity should be exercised.
6) A wide scale collaboration planning among ATM, aerodrome operators and aircraft operators should be done.
7) System and decision support tools should be increased.
8) Short lead times involved developing and deploying improved systems in aircraft fleets or in the ground infrastructure may help.
9) Straight departure and arrival routes should be established as far as possible.
10) Direct fixed routes should be established between destinations.
11) Excessive system related ground and en-route delays should be decreased.
12) Operation of aircraft at suitable altitude with suitable speed and in favorable wind should be emphasized.

Conclusion

There should be a sufficient number of Air Traffic Controllers working in TIA operation. They should be well trained, skilled, refreshed and motivated. Implementation of advance avionics and automated systems may reduce the workload of Air Traffic Controllers and improve Air Traffic Services system. Present CNS/ATM system should be reviewed, revised and improved in time. Splitting of control airspaces and their flexible use may simplify and reduce the workload and stress of air traffic controllers. Besides this, improvement in infrastructure and airspace management is an urgent need to cope with the present requirement and the requirement of tourism year 2011 in near future.



Model of Strategy CAAN should adopt

Deepak Baral
Dy. Director, CAAN

Civil Aviation Authority of Nepal was established in 1998 to provide safe, secured, reliable and economical air service to both national and international air transportation. CAAN was expected to function as a self-governing, self reliant government entity to deliver the following services in efficient and effective manner.

- Regulation of civil aviation
- Aeronautical navigation service
- Aerodrome service
- Air service to the travelling public

A decade has already passed and it is high time for us to evaluate whether the transformation of the erstwhile Department of Civil Aviation into CAAN is justifiable. The magnitude of benefit to the nation from air transportation also needs to be evaluated. And, how far have we been able to catch up with the pace of global aviation trend too remains to be assessed.

If we go through the preamble of CAAN Act 1997, we get a clear impression that CAAN was overloaded with the task of performing the role of both the regulator as well as service provider. Had there been sufficient seriousness and homework during its inception, CAAN would have surprisingly advanced.

CAAN enjoys the monopoly in terms of its being the sole authority of the State to look after the civil aviation sub-sector of the country particularly in areas of airport operations and air navigation services of the country. In addition, there is no viable alternative mode of transport other than air service. Heavy investment on infrastructure development in aspects of equipments and technical services for a decade or so against low return on investment seems to have impeded CAAN to grow financially sound, while assuring safety and efficiency of air transport. Besides, too many hierarchical levels of management, profusely held meetings attended by too many people, rarely exhaustive interdepartmental interactions, Poor delegation of authority, and mushrooming of politically aligned trade unions have made CAAN less effective in competently delivering safe, secured efficient, standard service in civil aviation and airport operation. Very of late, CAAN has submitted the following strategies to be adopted by CAAN to the National Planning Commission:

a) Develop a healthy, safe and competitive air service by attracting private investors to venture in airlines operation, airport construction, operation and management.

b) Enhance flight safety through the adoption of Safety Management System (SMS) with the simultaneous use of state of art technology as developed and practiced in the international arena.

c) The Civil Aviation Authority of Nepal will be strengthened to increase its institutional capability. Private airline companies will be encouraged to contribute to tourism and economic development through the expansion of domestic and international air services.

d) With the effective involvement in the ICAO audits, strengthen safety, regulatory and monitoring activities.

e) Optimize the utilization of Nepali airspace by international flights through development and restructuring appropriate North-South and East-West air routes.

f) Increase revenue by proper utilization of available assets, facilities, air space and other potential sources.

g) Upgrade and strengthen Tribhuvan International Airport and other domestic airports to meet required standards.

Aviation today faces significant challenges from globalization, advanced information technology and economic alliances. Aviation business is getting done in a global market place. Change in airport business is occurring at an unprecedented pace. Technology has made time and distance less and less relevant. Economic groupings of airport and airlines business make market penetration difficult. There was a time when revenue generation was not the primary task of airport management. Now it is a requirement to survive. Airport managers must be looking ahead, anticipating change, and developing strategy to proactively and successfully navigate through the turbulence

created by change. CAAN needs a long –term horizon to cope with all these emerging challenges.

Strategic planning tells where an organisation is heading to over the period of time (Let's say five years from now) and how it is going to get there. It also can tell if the organisation got there or not.

Strategic planning provides CAAN with a purpose and direction. How CAAN is going to reach somewhere if it does not know where it is going? We need to know what we can sell or do in the airport or what can we do with huge landmass that CAAN possess. CAAN also needs to know who target customers are, what satisfy them, and whom it has to compete with. A good strategy will bring balance between revenue, developments as well as safety initiatives. Without strategic planning, CAAN business endeavours simply drift and are always reacting to the pressure of internal and external environment. Like a good pilot always flight plan well in advance before takeoff to reach destination safely and comfortably ,CAAN must do strategic planning to realise its vision before a strong wind or other phenomena forces it into a complete disaster.

Now the question arise what models and approaches should be used in CAAN's Strategy?

There are variety of models and approaches used in Corporate Strategy. The way that a strategy is developed depends on the nature of an organisation, size, expertise of planners and leadership. Among the all above, one should not forget the nature of work of CAAN as a facilitator, regulator as well as service provider of aeronautical services of the country while developing its corporate strategy.

There are a variety of Strategic planning models, including goal–based and issue based. Goals-based planning is probably the most common and starts with focus on the organization's mission (and vision and\or values), goals to work toward the mission, strategies to achieve the goals, and action planning. Issues-based strategic planning often starts by examining issues facing the organization, Strategies to address those issues, and action plans. Perhaps, the goal based planning scoped to five years is the model CAAN should start with.

CAAN has to develop and implement strategy in three levels–Corporate, Business and Functional.

A Corporate level strategy is concerned with long- term direction and scope. This strategy is related with fixing vision, mission, value, strategy etc.

Business level strategy defines business portfolio. It classifies business units. For example, CAAN operates as regulator as well as services provider. As an aerodrome service provider, CAAN has its own products, customer groups and market areas which might be different from as a regulator. The third level of strategy is functional which follows from business level strategy. It deals with strategy for each function such as flight operations, airside operations, terminal operations, finance and human resources of an airport operation. It supports the business level strategy and involves tactical decisions to achieve strategic advantage.

A frequent criticism about the Nepalese bureaucracy is that it produces wide range of documents but that end up collecting dust on a shelf. For execution and not to have same destiny with the valuable information illustrated in the CAAN's corporate strategy, commitment from the top management must be sought for. This commitment must be demonstrated through behaviour, investment, communication and accountability.

Strategic planning is likened to a precision approach on which all CAAN activities can be executed and aligned so that even if the vision is missed it would keep CAAN in safer holding and still enabling it to adjust for successive attempt to meet the goal.

Last but not the least, strategic planning means challenging the status quo, working in controlled environment, inviting new partner, developing and implementing new procedures, hiring different people in key positions, cutting down or splitting the size, and putting new system in place in order to deliver on the strategy.

Quality management system and Audit in feild of ATS

Shishil Chitrakar
Dy. Director

As part of safety management In ATS, ICAO require stats to ensure that the level of ATS and communication, navigation and surveillance applicable to an airspace or aerodrome are appropriate and adequate for maintaining an acceptable level of safety. To ensure that safety in the provision of ATS authority shall implement formal and systematic safety management programs for ATS under its jurisdiction. One of the requirements is regular conduct of safety audit of ATS by personnel by qualified through training, experiences and expertise.

Quality Management

There has been much confusion about the term "quality" and what is quality control, Quality assurance, Quality Management and another terms related to Quality.

In simple terms Quality means meeting requirements: and Quality management denotes the co-coordinated activities to direct and control an organization with regard to quality. Notes from safety Audit of ATS(Singapore)

Effective Quality Management does not focus just on control and providing assurance to customer .It is about the effectives management of everything that effects quality, for the benefit of the customer and the organizational itself. It is an overall system for ensuring that quality requirements are met and for continual improvement of process, efficiency, and effectiveness.

Quality Management System

The Quality management system achieve through various activities such as,

- Control Of Documents
- Control Of Records
- Internal Audit
- Control Of Non- conformity
- Corrective Action Plan
- Preventive Action Plan

In 2001 October, ICAO set a new standard for state to: establish safety management programs to ensure: AIR Traffic Services and Communication/Navigation/Surveillance system are maintained at safe level.

Objectives of Audit:

- To ascertain compliances with ICAO standards and Recommended Practices.
- To ensure adherences with prescribed standards and procedures in provision of air traffic services.
- To determine the effectiveness of safety planning in ATC operations
- To highlights commendable findings (where appropriate)

Scope of Safety Audit of ATS:

Now it is better to understand what is meaning of audit and its activities.

Audit means an in-depth review of the activities of on organization to verify conformance to regulations and standards.

Audit activities means those activities and procedures, through which information is obtained to verify the Auditee's conformances to applicable regulations and standards. Such activities may include, but are not limited to: interviews, observations, inspections and the review of files and documents. Manual of Regulatory Audits, 1st Edition September 1998

In this regard the meaning of Audit and green Audit given in Oxford dictionary also better to consider.

Audit

an official examination of business and financial records to see that they are true and correct, an official examination of the quality or standard of something.

Green audit

an official examination of the effect of a company's business on the environment.

The audit activities must deal various work related to ATS, now it is better to know something about human factor .

Transfer of information

The objectives of ATC are to prevent collisions between aircraft and avoid and other potential hazard by means which nevertheless promote efficiency of flight. How theses are achieved depends on many functions.

- The characteristic of each aircraft and its equipment;
- The nature and degree of control over the traffic that is exercised;
- Applicable rules, principles and procedure;
- The means for exercising control over traffic;
- The knowledge, skill, and experience of the pilot;
- The knowledge, skill, and experience of the controller;
- The quantity, density, and mix of air traffic;
- The information available ion each aircraft;

Environmental factors, including ground equipped, terrain and weather

Training:

The objective of air traffic controller training is to ensure that controller training is to ensure that controller posses the required knowledge, skill and experiences to perform their duties safely and efficiently, and to meet national and international standards for ATC. A controller must be able to understand and assign priorities to the relevant information, to plan, ahead, to make timely and appropriate decisions, to implement them and to ensure compliance with them.

Training is matter of learning, understanding and remembering. It relates what the controller already knows to the information that the system provides about current and pending traffic. It relates the information which the system presents automatically to the controller to the information which the controller must remember unaided, and it provides guidance on how human memory can be strength and made more reliable. Tanning also relates the principles for learning and displaying ATC information to the capabilities and limitations of human information processing and understanding. The aim is to make the best use of human strength and capabilities and to overcome or circumvent inadequacies or limitations or limitations, partially in relation to knowledge, skill information processing, understanding, memory, and workload.

The proficient controller needs to know and understand.

- How ATC is conducted;
- The meaning of all presented information;
- The task to be complied;
- The applicable rules, procedures and instruction;
- The forms and method of communication within system;
- How and when to use each tool provided within the workspace;
- Human Factors considerations applicable to ATC;
- The way is which responsibility for an aircraft is accepted and handed over from one controller to next;
- The ways in which the work various controller harmonizes so that they support rather than impede each other;
- What changes or signs could denote system degradations or failure;
- Aircraft performance characteristics and preferred maneuvering;
- Other influences in flight and routes, such as weather, restricted airspace, noise abatement etc.

A General Human Factors View

- ATC has to take account of the basic cognitive capabilities of People, how they think, how they decide, how they understand and how they remember. Jobs and task must be designed within theses capabilities and training must be devised to maximize them. People need to be able to use their cognitive capabilities well and sensibly, in which they recognize as worthwhile and not demanding.
- The conditions of employment of controllers vary. There is a need to periodically review and make recommendations about the total hours of work, rostering and shift patterns, and the maximum permissible period of continuous work with no rest break.
- ATC is dynamic and expanding. The future rate of expansion is difficult to predict, being subject to factors totally beyond the direct influences of ATC, such as global and national economic conditions, the availability and cost of fuel, and the traveling public's perception of how safe it is to fly. Nevertheless, all projects expect air traffic to increase so substantially in the longer term that most exiting ATC systems will have to be replaced extended of further developed because they were never designed to handle so much traffic. CIR 241 human Factor digest human Factor IN ATC

Conclusion

Safety is everybody concern and ATS safety is must for safe operation of Air transport.Safety is a situation where risk is reduced to and maintained at or below an acceptable level. Since the elimination of serious and accidents is not possible and no human endeavor or human-made system can be free from risk and error, thus safety auditing is a just measure of an organization's safety performance. And ultimately the principles of Audit is " Audi tee is innocent until proven guilty" and not blame personnel but to improve the system. Hence the CAAN should achieve quality management of Organization through start the Safety of Audit of ATS as soon as practicable.

Reference

Notes from safety Audit of ATS (Singapore)

Manual of Regulatory Audits, 1st Edition September 1998

CIR 241 human Factor digests human Factor IN ATC

*Dy. Director, ATC Training & Rating Division, TIACAO

Just Culture In Incident Reporting As Accident Prevention Solution

Pratap Babu Tiwari
Deputy Director, CAAN

Summary

With the global aviation activities forecast to continue to rise, there is concern that traditional methods for reducing risks to an acceptable level may be insufficient. New method for understanding and managing safety is therefore evolving. One of the ways of reducing and preventing aircraft accidents is to establish incident reporting systems. The identification of errors, hazards, incidents,and serious incidents is a fundamental element of any safety management system. Yet, international surveys have revealed that many air traffic incidents go unreported because those involved are feared of management disciplinary action.

The unrestricted flow and exchange of information is vital to improving safety. Criminalization obstructs this flow. One key area to achieve an effective safety management system is to cultivate a level of "Just culture" within a non-punitive environment, by service provider, regulator and investigator.

Introduction

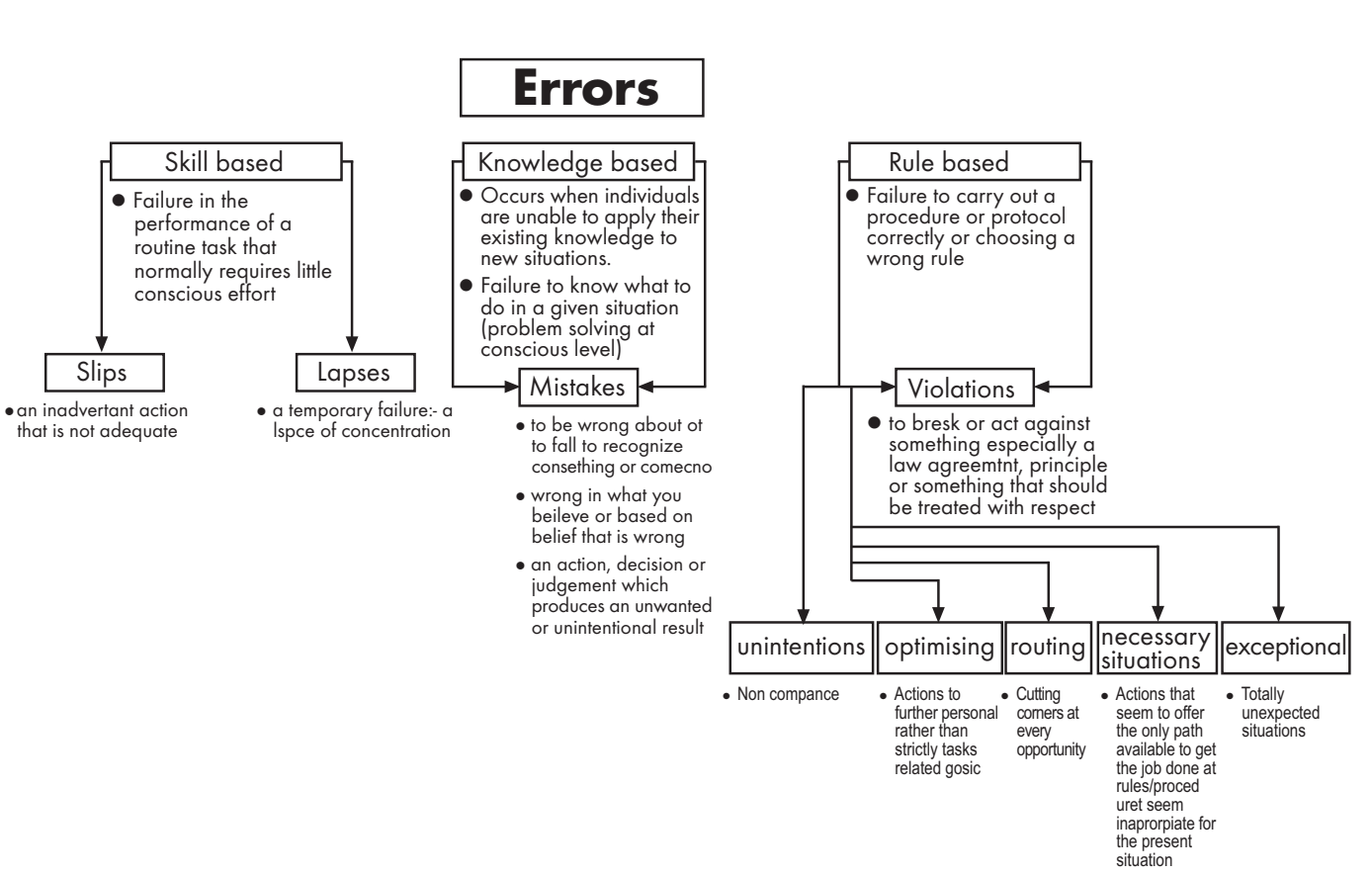
Incident is an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation. The primary focus of reporting systems is to prevent accidents and in order to be effective, users of these systems must have complete confidence that they will not face retribution as a result of disclosure. Properly collected and analysed aviation safety information can be a powerful tool and will be of great benefit to achieve its objective of accident prevention.

A non-punitive culture starts at the top of an organization and is a function of the organisational culture at large; it is a culture that needs to be adopted and practiced by the organisation as a whole. A good reporting culture is one in which personnel have sufficient trust in the system that they are willing to report their errors, thereby providing a valuable contribution to safety.

Just culture in dealing with culpability

Just culture in aviation is defined as a culture in which front line operators are not punished for actions or decisions that are commensurate with their experiences and training, but also a culture in which violations and willful destructive acts by front line operator or others are not tolerated. So, it is an atmosphere of trust in which people are encouraged (even rewarded) for providing essential information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior. In some of the countries, sabotage, substance abuse, reckless violation or gross negligence are regarded as willful acts or deliberate acts and are brought under criminal prosecution, whereas, system induced violation and errors, Omissions, slips, lapses, and mistakes are categorized as honest mistakes or non-intentional acts and are treated as non-punitive.

A Just Culture supports learning from unsafe acts. The first goal of any manager is to improve safety and production. Any safety related event, especially human or organisational errors, must first be considered as a valuable opportunity to improve operations through experience, feedback and lessons learnt.



Sample of Error Classification within 'Just Culture' Environment

This system has been successfully established in a number of aviation organisations and the benefits have been shown to improve safety, as it,

- builds trust between management and staff;
- motivates staff and promotes the need for open reporting;
- provides feedback to both staff and the aviation industry as a whole;
- provides information on "trends" that otherwise may not be noticed;
- improves the overall flow of safety data.

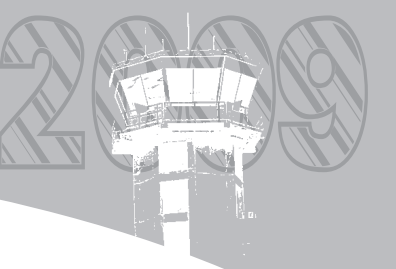
Criminal prosecution is counter-productive to improving aviation safety. The effect of legal prosecutions is that if pilots and controllers perceive they will be held personally liable for any safety related events in their work, they will stop reporting such events. This means legal prosecutions achieve the exact opposite of what they are aiming to achieve – they don't help to improve aviation safety. However, we must still have a mechanism for holding people accountable even in a blame-free atmosphere.

In many states, however, the introduction of legal protection for voluntary occurrence reporting is controversial, as it is argued that there are other professions that would then require similar protection from the law, creating the need for a major review of national penal codes. The answer is that just-culture protection should only apply where safety management is paramount. Aviation safety performance improvement in countries that have adopted just-culture reporting testifies to its effectiveness. Even a mandatory reporting system has been found effective in some countries. It is found successful because they have implemented safety management system and have adopted just culture reporting in the organisation.

Concerns about information misuse

One of the major problems with systematically collecting and analysing large quantities of information is that information can be a very powerful tool; and like any powerful tool, it can be used properly with great benefit, or it can be used improperly and cause considerable harm. There are various ways in which such information can be misused:

Job sanctions by employers and/or penalties imposed by government regulators based upon the information, Public disclosure of the information, Criminal sanctions based on the information, Misuse of the information in civil litigation



Dealing with various approaches of incident reporting

The ICAO position

The ICAO annex 13 on aircraft accident and incident investigation has stated that:

- State to establish a mandatory incident reporting system to facilitate collection of information on actual or potential safety deficiencies and recommends establishing a voluntary incident reporting system, but it requires that where such a system is established, it shall be non-punitive and afford protection to the sources of the information.
- The State conducting the investigation of an accident or incident, shall not make the following records available for purposes other than accident or incident investigation, unless the appropriate authority for the administration of justice in that State determines that their disclosure outweighs the adverse domestic and international impact such action may have on that or any future investigations.
- The sole objective of the investigation is to draw lessons that could prevent future accidents and that the safety recommendations are not designed to apportion blame or liability.

IFATCA's opinion on incident reporting

International Federation of Air Traffic Controllers' Association (IFATCA) is of the opinion that ,

1. It shall not encourage MAs to join Incident Reporting Systems unless legislation exists that adequately protects all persons involved in the reporting, collection and/or analysis of safety-related information in aviation .
2. If a voluntary reporting system is established it shall be based on the following principles-

a) In accordance and in cooperation with the pilots, air traffic controllers and ATC Organisation.

b) The whole procedure shall be confidential, which shall be a guaranteed by law.

c) Guaranteed immunity for those involved, executed by an independent body.

Some Best Practices in the world

The Danish System

In 2001, a new law was passed by the Danish Parliament, mandating the establishment of a compulsory, strictly non-punitive, and strictly confidential system for the reporting of aviation incidents.

The reporting system is mandatory in the sense that air traffic personnel are obliged to submit reports of events, and it is strictly non-punitive in the sense that they are ensured indemnity against prosecution or disciplinary actions for any event they have reported.

Furthermore the reporting system is strictly confidential in the sense that the reporter's identity may not be revealed outside the agency dealing with occurrence reports. Reporters of incidents are ensured immunity against any penal and disciplinary measure related to an incident if they submit a report within 72 hours of its occurrence and if it does not involve an accident or does not involve deliberate sabotage or negligence due to substance abuse (e.g., alcohol). Moreover, punitive measures are stipulated against any breach of the guaranteed confidentiality.

The UK CAA System

The Mandatory Occurrecne Reporting (MOR) Scheme has been in existence in UK law since 1976. The MOR Scheme contributes to the improvement of air safety by ensuring that relevant information on safety is reported to the CAA. That data is stored, protected and disseminated to assist others in improving flight safety. The sole objective of the MOR Scheme is the prevention of accidents and incidents and not to attribute blame or liability. The name of the reporter is never placed on the MOR database. Without prejudice to the proper discharge of its responsibilities in this regard, the CAA will not disclose the name of the person submitting the report or of a person to whom it relates unless required to do so by law or unless, in either case, the person concerned authorises disclosure. Should any flight safety follow-up action arising from a report be necessary, the CAA will take all reasonable steps to avoid disclosing the identity of the reporter or of those individuals involved in the reportable occurrence.

Confidential reports can be submitted when the reporter considers that it is essential that his/her identity not be revealed. However, reporters must accept that effective investigation may be inhibited; nevertheless, the CAA would rather have a confidential report than no report at all.

It is not CAA policy to institute proceedings in respect of unpremeditated or inadvertent breaches of the law that come to its attention only.

The CAA has a duty to vary, revoke or suspend a licence as appropriate if it ceases to be satisfied that the holder of the licence is competent, medically fit and a fit person to exercise the privileges of the licence. If an occurrence report suggests that the licence holder does not satisfy these requirements, the CAA will take appropriate licensing action. For example, if the report indicates that the licence holder requires further training, the CAA may suspend his or her licence until he or she has undergone such training. Although the CAA recognises that, in practice, licensing action may be regarded as having a punitive effect; there can be no question of action being taken by the CAA on a licence as a punitive measure.

Alaska Airlines System

The Alaska Airlines Error Reporting System (ERS) is a non-punitive reporting program which allows employees to report to management operational errors or close calls that occur in the workplace.

Generally, no disciplinary action will be taken against any employee following their participation in an error investigation, including those individuals who may have breached standard operating procedures. Disciplinary action will be limited to the following narrow circumstances: An employee's actions involve intentional (willful) disregard of safety toward their customers, employees, or the Company and its property; an employee commits a series of errors that demonstrates a general lack of care, judgment and professionalism, fails to promptly report incidents, and fails to honestly participate in reporting all details in

an investigation covered under this policy and the employee's actions involve criminal activity, substance abuse, controlled substances, alcohol, falsification, or misrepresentation.

British Airways approach

British Airways gave assurances that they would also not "shoot the messenger" in order to get information from pilots, mechanics, and others. Many other airlines around the world are concluding that they must do the same in order to obtain information they need to be proactive about safety.

FAA Legislative framework

In 1996 the FAA obtained legislation, Public Law, which requires it to protect voluntarily, provided aviation safety information from public disclosure. This will not deprive the public of any information to which it would otherwise have access, because the agency would not otherwise receive the information; but on the other hand, there is a significant public benefit for the FAA to have the information because the FAA can use it to help prevent accidents and incidents. Significantly, the thinking on this issue has changed dramatically in recent years because the potential benefits of proactive information programs are increasing more rapidly than the risks of such programs.

Incident reporting in our perspective

CAAN has adopted voluntarily incident reporting system. However, incident reporting in some of cases has not been seen from the appreciative eye. Just culture reporting in non-punitive environment is still to be adopted by our organization. This might be the reason that incidents are rarely reported by the pilots and air traffic controllers.

Conclusion.

A reporting system capable to collect all useful data is found to be very important experiences all over the world show that a mandatory reporting system within a punitive environment doesn't succeed. On the contrary, best results are obtained in those countries where reporting system is both "blame free" and "voluntary".

A lack of reported events is not indicative of a safe operation, and likewise, anincrease in reported events is not indicative of a decrease in safety. In-depth investigation on the incident, regular interaction on the safety lapses, dissemination of lesson learnt and adopting the appropriate corrective measures to mitigate the recurrence of the events in the future are essential to make the best use of collected incident data.

Recommendations

To make incident reporting system effective and productive ,

1. A clear need of legislative support for no punitive reporting and assurances of confidentiality (protecting of safety information from public disclosure) along with the notion of the just culture (a clear de-lineation between acceptable and unacceptable behaviour) has to be incorporated by the authority in its national law, acts and regulation wherever required and should be translated into action in a real sense.
2. Apart from this, the effectiveness of a reporting system depends on the existence of an organization positive reporting culture, which encourages the submission of reports. The basic features of which the organization has to adopt are:

- The reporting system is simple and user-friendly.
- Management encourages the reporting of safety occurrences.
- The treatment of staff who submit reports is seen to be just (i.e. unintentional errors should not suffer retribution or disciplinary action)
- Each occurrence report received is investigated.
- Feedback is provided to the originator of the report.
- Staff sees that the submission of reports results in corrective action to prevent recurrence.
- Confidentiality is maintained, in so far as possible, in relation to disclosure of information concerning individuals.
- Lessons learned are disseminated to all staff to enable them to learn from other's errors.

3. An in-house independent (and trusted) investigation team for the correction of the errors, and non-intentional acts and A national level independent accident investigation committee for the investigation of accidents have to be formed to achieve the objective of ICAO Annex 13 on accident investigation.

References:

Accident prevention through non-punitive reporting, A position statement of

IFALPA (web site reference).

ESARR Advisory material/guidance document on Just culture principle. ..

FAA ATO SMSM

Just culture in Safety reporting, IFATCA WP, 2004.

ICAO Annex 13 on aircraft accident and incident investigation.

IFATCA Mannual

Airspace restructuring within Nepalese FIR

Ashok Kumar Subedi
Manager, CAAN

"Oh! From Nepal! You have airports!!!" A veteran AIS expert remarked when I introduced myself during an informal meeting on the second floor of terminal-2 of Changi Airport one of the best airports in the world. The remark was sensible. Yes, the beautiful mountainous country has some real airports fulfilling the needs of all people. We have airport at a low altitude like Biratnagar (236 ft AMSL) to a high altitude airport like Syangboche (12297 ft AMSL). One can feel a spellbinding breath taking moment during landing and take-off at airports like Manang and Dolpa. These and many other airports really test the temperament and skills of a pilot. During a lab session of PANS-OPS training, a trainee from Australia was hesitating to increase the gradient of an approach from a standard of 5.24% to 6% sharp in contrast to our real approach scenario at TIA having a gradient of up to 11.5%. So, we have all sorts of airports, and according to a senior pilot, if a pilot masters flying in Nepal, he or she can fly in any part of the world without much difficulty.

If we count the number, out of a total of 50 aerodromes (may be a lot compared with the size of country) we have thirty operating, sixteen abandoned and four under construction. Among them, air traffic control service is provided at eight airports and AFIS is provided in rest of them. In some airports, AFIS is provided under open sky with a portable VHF/HF. These portable sets are carried daily from a distance and the manpower is stationed according to the demand. Some aerodromes have instrument flight procedures, and some have night landing facility as well (Biratnagar, Bhairahawa, Nepalgunj). Contrary to some basic principles, some controlled aerodromes (with CTR) do not have instrument flight procedures, neither they justify for controlled service having low traffic and very basic nav-aid facilities. On the other hand, some emerging aerodromes having high traffic are provided with AFIS.

Airspace restructuring

There are three domestic ATS routes (W19, W41, and W17), six airways (R344, G348, R325, B345, G336, and G598), and one RNAV route (L626; RNP-10) within Nepalese FIR. We also have some RNAV routes (based on GPS) that are yet to be implemented in airspace.

Additional domestic routes shall be established for better transaction of flights between two airports for domestic operation (for example, Simara-Biratnagar; Janakpur-Biratnagar; Bharatpur-Simara etc.). GPS routes are the best option as we don't need ground based facilities which justify the present situation, as NDBs are supposed to be decommissioned (some have already been). Paradoxically, the authenticity of all domestic routes (W41, W17, and W19) which converge at 'DNG' is questionable after the nav-aid has been decommissioned. The location of 'DNG' was strategically at a proper place considering the convergence of ATS routes and for navigational guidance to the western of the airspace. So, either new nav-aid should be re installed or 'fix' shall be re-defined with 'NGJ' VOR/DME.

New route economy

During recent bilateral talks between CAAN and AAI, it was agreed that for flights between regional hub airports of Nepal and some designated airports of India, direct routing shall be established. As some of the direct routing passes through restricted area of Indian airspace, India has agreed to discuss the matter with concerned authority and inform accordingly. But, following routes were agreed principally (detail drawing and coordination process is under way), which will pave a way for flight operation between two countries.

S.No	Route	From / To	Route Details	TCP (For ATS purpose only)	Remarks
1.	New Route	BIRATNAGAR - PATNA	(BRT-JKP-PPT)	**'JALES'** (FIR boundary) 26° 38' 10" N 085° 51' 51"E	BIDIRECTIONAL At or below FL150
2.	New Route	POKHARA - PATNA	PHR-BHP-SMR-G336-PPT "	**'BIRGA'** (FIR boundary) 26° 53' 55" N 085° 00' 30"E	BIDIRECTIONAL At or below FL150
3.	New Route	POKHARA - GAYA	PHR-BHP-SMR-G336-PPT-GGC	**'BIRGA'** (FIR boundary) 26° 53' 55" N 085° 00' 30"E	BIDIRECTIONAL At or below FL150
4.	New Route	BHAIRAHAWA - VARANASI (Extending upto GAYA)	BWA-B345-LLK-R460-BBN*	**'LUMBI'** (FIR boundary) 27° 25' 39" N 083° 11' 03"E	BIDIRECTIONAL At or below FL150

**For inbound, direct routing from APIPU has been considered*

Furthermore, route from Nepalgunj or Dhangadhi to Lucknow shall be considered for connection from western part of Nepal.

Over fly market

Nepal has to tap overflying market for long term benefit. For this, routes connecting from east to west via Nepal should be developed. Newly promulgated route L626 can play a vital role in this regard and it shall be extended towards eastern part also. Strong lobbying with stake holders is required for harnessing overflying market. New route connecting 'SMR' and 'TTR' shall also be established for direct routing from west to east for international inbound over flying aircraft.

Establishment of new control zones

To provide an efficient air traffic management, airports having high traffic and conducive geography, should be provided with air traffic control service either by establishing CTR or ATZ. The demanding airports at present are Surkhet and Chandragadhi, even though no IFR procedures have been established in these airports. Best option for this might be establishment of ATZ (5 NM radius up to a height of 2000') and declare the aerodrome as controlled. Additionally, some established CTRs are of a huge dimension extending to 30 NM and up to a height of 10300' from ground level. This has generated some confusion for providing SVFR operation and traffic management. Generally, CTRs in some countries are established within a radius of 10 NM and up to a height of 2500' from ground level. But, in our context, we have to protect the airspace of instrument flight procedures at some airports. For this, we can limit the CTR up to a certain level and establish control area atop.

GPS approaches

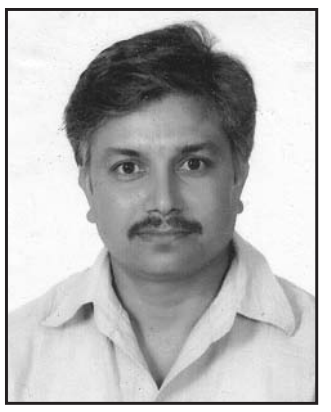
Despite considerable progress seen in the design and implementation of GPS based instrument flight procedures for different airports, for reasons of cumbersome procedural works, CAAN has to gear up towards their promulgation. Besides, overall procedures detailing the requirement of on-board equipment, training, data coding shall be done for promulgation of these procedures. Manpower in the field of procedure designing shall be prepared for future.

CAAN does not have any data, file record or detail drawing of IFR procedures of most of the aerodromes. Recently, when the holding procedure of Nepalgunj was re-checked, it was fond that beneath the holding altitude of 3000', there was an obstacle of 3700'. Luckily, no aircraft had ever made holding over there at 3000'. Detail obstacle analysis of some of the procedures for safe and efficient flight operation should be done. All procedures should be re-checked and verified in line with the latest amendments of PANS-OPS and other relevant ICAO documents. Detail drawings of all procedures shall be kept in record for future reference. As CAAN has acquired all digitized version of topo sheets from survey department, obstacle analysis and drawing from GIS/ auto-cad software is simplified easy and accurate paving way for effective and practically viable instrument flight procedure designing if we train the manpower accordingly.

Conclusion

Despite topographical constraints, Nepalese airspace should be re-designed for safe, efficient, and economic flight operation. All instrument flight procedures shall be rechecked, verified, and documented to keep in line with the recent amendments in ICAO documents. Strategic training programmes should be pursued with high priority taking into account the lessons learnt from the past accidents/incidents which were directly or indirectly connected with procedural glitches.

Airport Transformation Through Partnership



Sachit Bhakta Pokharel
Asst. Manager, CAAN

Privatization in Changing Context

The buzzword of Privatization may not have the same meaning in all geographical, cultural, and above all, political contexts. The process of transferring the responsibility for delivering services that were previously delivered by a government, to a nongovernment entity is often termed as privatization. In the quest to restructure, reengineer, and reinvent, governments have engaged the private sectors using many models, including the use of vouchers, franchises, asset sales, joint public/private equity developments, and contracting out services to private firms. According to the Oxford Advanced Learner Dictionary the term "Privatize" has been expressed as "to sell a business or an industry so that it is no longer owned by the government".

Although the privatization in modern terms dates back to 1950s it is long rooted in Grecian history. In major governmental functions such as tax collection, army supplies, religious sacrifices and construction were handed over to the private sectors. In modern times, British Steel Industry was privatized in 1950s, and the world also witnessed the selling of majority venture of Volkswagen to small investors in public sharing in1961 in Germany. In the 1970s General Pinochet implemented a significant privatization program in Chile. However, it was in the 1980s under the leaderships of Margaret Thatcher in the UK and Ronald Reagan in the USA, that privatization gained worldwide momentum. Airport privatization started in Canada from July 1992, with the transfer of the operating rights of Vancouver International Airport Authority to the newly constituted not-

for-profit corporation.

In our context, when the series of review studies on public enterprise performance carried in the Fifth Plan period (1975-80) presented a bleak picture, in the Sixth Plan the word "selling" has come into sight regarding the public enterprises. Privatization in Nepal started from the Seventh Plan. The most common types of privatization are contracting out public services to the private sector and selling off government-owned enterprises in their entirety. During the period of 17 years from 1992, 30 public enterprises were management contracted out, share floated, sold, dissolved and liquidated. There are 36 public enterprises in existence in Nepal. There are 7 public enterprises in industrial sector, 6 in trading sector, 7 in service sector, 5 in social sector, 3 in public service and 8 in financial sector. Among them, 17 are in profit and 19 are facing loss.

Transformation in Aviation Context

Aviation in terms of service dispensing has not yet been addressed in respect of privatization though government has opened sky for private entrepreneurship by adopting Liberal Sky Policy -1992 which has simultaneously allowed private sectors to venture domestic airline operations. The newly adopted Aviation Policy-2006 has one objective to develop healthy and competitive air services by attracting and encouraging native and foreign private investors in the operation of airlines, construction, operation, and management of airports and development, expansion and operation of the services and facilities related with air transport. It indicates two possibilities. One is total contract out to private sectors and the other is distribution of partnerships. It is a good indication that the government has of late shown interest to embark on infrastructure development and service management through privatization. In most of the developing nations when managerial and financial performance decreases, operational efficiency also degrades and of course productivity is gradually reduced. Then only the need for public participation is realized in public enterprises. Hence the public enterprises are taken into the process of privatization to encourage increased efficiency, to maximize revenue to the government, to reduce political interference from the government and to increase the confidence of private sector.

Statistics shows that most of the public enterprises in Nepal are not in a profitable position. It is noticeable that most of the public enterprises need to increase their operational efficiency on supply of basic human needs such as: reliability of domestic as well as international flights, inadequacy of electricity supply, insufficiency of food supply in remote, regular fuel crises, scarce drinking water supply etc. But some of the enterprises have apparent outstanding performance on communication and financial sector. So, it has been realized that transforming of government entity into autonomous public enterprises can perform well and compete in the market.

Government transforms its entities into the public enterprises to make it independent and autonomous. Large amount of taxes and revenue are routine source of government from various public enterprises. Besides that, flexible and perforated regulations of public enterprises allow independence to government to recruit favourable person in the post s of Chairman, Board of Directors and General Managers. It also invites public criticism of political patronage, appointments and interference in the management of public enterprises. Public enterprises need 3 to 5 years to show the results through implementation of strategic plan thus international agencies appoint Chief Executive Officer for that execution period and the CEO should be allowed to complete his/her tenure of 3 years in order to implement the plan completely and show the real performance of the organisation.

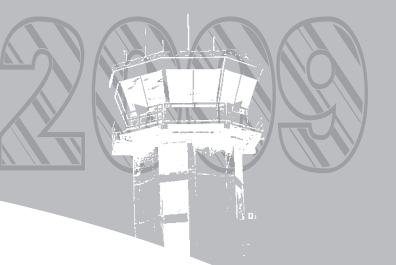
Public enterprises can be reconstituted in different ways, initially supplies and civil works can be carried by contracting out. Similarly, technical and management contract are the most common accepted ways of reconstituting the enterprises. In Asian region, most of the hotels operate under management contract arrangements, as they can more easily obtain economies of scale, a global reservation systems, brand recognition etc. Management contracts have been used to a wide extent in the airline industry, and when foreign government action restricts other entry

Policy Provisions:

Government has encouraged the private sectors to the activities such as research and technology transfer. In addition to involvement of private participation in infrastructure development such as hangar and aircraft repair and maintenance service in TIA as well as at other domestic airports. The private sector will also be encouraged to identify and expand possibilities of non-aeronautical income sources, by upgrading the passenger facilities, while developing and expanding airport hotels, duty free shops, confectionary shops, flight kitchens, golf clubs, business and entertainment centers.

The policy also offers an opportunity for national and foreign private sectors to invest in developing air transport structures such as airports and infrastructures like roads, railways, terminal buildings, communication and escorting inside the airport area, and operating other industries and organizations under Build-Operate-Transfer (BOT), Operate-Transfer (OT), Build-Own-Operate-Transfer (BOOT) basis or any other appropriate schemes. It is for the first time that the government through its comprehensive policies has clearly opened door for foreign investment in aircraft operation, training, repair and maintenance and passenger service provider industries. Furthermore, policy has clearly mentioned the investment opportunity for foreign investors in operation of international airlines -up to 80%, in domestic airlines-up to 49%, flying school-up to 95%, and repair and maintenance institutions-up to 95% , in addition to the immigration facilities.

Policy also encourages participation of the private sector in building and development of domestic regional hub airports which have long-term importance in regional balance and air transport development under the modality where the Government of Nepal (inclusive of foreign assistance) will have 70% share followed by 15% share which will be occupied by Authority and the remaining 15% by the local bodies.



methods. Management contracts are often formed where there is a lack of local skills to run a project. It is an alternative to foreign direct investment as it does not involve as high risk and can yield higher returns for the company.

Airport services have been considered as an essential component of the national and international transport system. Globally, business of airport is operated directly by governmental entity, by semi-governmental organisation, management contracted or by private organisation. In our context, Civil Aviation Authority of Nepal is responsible to manage airports in the country. Level of services, quality and operations of airports are of great public interest and often become a news item as can be noticed from the coverage in national dailies. More than 70 organisations have been working in Tribhuvan International Airport premises. Most are government organisations such as immigration, customs, police, military, labour desk, etc. Some are semi-government and some are private organisations. Though the roles and responsibilities may be different, all these organisations working in the operations of air transportation services have a common goal-ensuring safe and secure air service.

Much of the world is moving to a new paradigm–the airport as a for-profit enterprise–that is far more consistent with a dynamic, competitive airline market. Airports should be privatized to improve its service standards, to be under one management stream, to get investment opportunity from own earnings. In this era, adopted concept of airport operation and management by various countries are beneficial and passenger / customers focused as well as operationally cost effective. Recent research at Oxford University has shown that the management approach of privatized airports is–not surprisingly–significantly more passenger-friendly than that of traditionally managed airports. India also implemented such approaches on its major international airports bringing satisfaction to users on changed level of airport services. Nepal also needs to consider this. Deplorable condition of baggage trolley, toilets, transportation, thefts, telephone, trespassing are some of the common issues raised in respect of TIA by media circles. Full responsibilities to address and resolve such issues lie not only with the Civil Aviation Office but they are also a collective accountability of those units working in these premises. Increasing political influences and unionism in work places indirectly decreases the level of services in various organisations in the country. Therefore, these facts need to be assessed as TIA is also a sufferer of this observable fact.

Recent ICAO's Universal Safety Oversight Audit Programme conducted in May 2009, has given 101 recommendations towards improvement and management of civil aviation, which also leads that more independence is required in this field. It is clearly stated that Nepal should revise the structure of the civil aviation system to ensure a distinct separation is effectively implemented between regulatory and service provider functions with respect to all civil aviation activities.

Hence, all the circumstances, evidence, global trends and recommendations point towards "alteration" of this sector. This is eventually possible by transforming the organisation. Some possible ways could be management contract, leasing, commercialization of units, partnerships, privatization and or any other possible transformation process. A single set of theory and norms on transformation may not be enough to make this a success.

Primarily, partial leasing will be beneficial for TIA by handing over the leasing of facilities. Facilities such as space rent, restaurant, duty free shop, ground handling, catering, check-in and cleaning should be handed over to the privet sector. Furthermore, based on the experience of partial leasing new thoughts can be given to the whole TIA management on lease in the future. For sustainable long-term operation of non performing domestic airports should be handed over to local authority, municipality or private organisation on systematic manner.

The ultimate development of aviation in Nepal is possible only with the close interaction, cooperation and collaboration among regulator, service provider and operator for the safe, regular, efficient and economical air transport. Hence a collaborative approach towards a separate regulator and separate service provider may be the next step towards a new dawn in the history of Nepalese civil aviation.

We have learnt from the experience in banking sector that contracting out management to the private sector works. Before adopting any transformation process, contextual seminars must be organised extensively to consult and discuss with relevant stakeholders such as government, CAAN and industry. Civil aviation is not just airlines, but a complex multidisciplinary space. Multiple organizational cultures crisscross one another. Therefore, embarkation on privatization of air navigation service under the broad concept of privatizing for infrastructure development and management needs a proper and meditative care. Alongside, it is necessary to assess the risks involved and ways to overcome them. Management contract may hardly prove harmful in an initial stage of privatization if the latter is adopted in consideration of possible risks and hazard.

Reference:

- Annual Performance Review of Public Enterprises 2009, Ministry of Finance, Nepal
- Aviation Policy-2006, Ministry of Tourism and Civil Aviation, Nepal Government
- Privatization: Trends and Recent Developments, Sunita Kikeri and Aishetu Fatima Kolo, World Bank World Bank Policy Research Working Paper 3765, November 2005
- Privatization in Nepal, Dr Narayan Manandhar and Dr. Puskar Bajracharya
- Risk and due diligence in airport privatization, Victor Craig, Director Air Transport, Halcrow AirPlan - Malaysia
- Privatisation of Airport, Keshab Raj Khanal, CAAN Souvenir 2005
- Collaborative Approach-the Next Step Forward, Kamal Kumar K.C., CAAN Souvenir 2007

Landfill Site and Bird Hazard

Ramesh M. Joshi
Aviation Consultant

On 29 Sept. 2000 Nepal Airlines flight RA 229, a B- 757 aircraft, while taking off at Tribhuvan International Airport (TIA), had a bird strike on its right engine. Aircraft diverted back to Kathmandu and luckily landed safely. The aircraft engine was badly damaged. It had to be sent to China for major repair. NAC spent more than a million dollar as direct cost and probably many more million dollars as indirect cost due to the cancellation of other flights for weeks, not to mention the loss on the part of the image of TIA as a safe "International Airport" as well as the image of NAC itself. Not only TIA has many more such sad stories to tell but also the bird strikes in other airports of Nepal, or other countries for that matter are more than numerous to count. Bird hazard has been a grave issue for the pilots and the aircraft manufacturers alike since the early days of aviation industrialization, about a century ago.

Better late than never, International Civil Aviation Organization (ICAO), a specialized agency of United Nation was created in 1945. It is supposed to cater for everything related to international civil aviation, including the control of bird hazards to aircraft.

To date damage due to bird strikes have cost billions of dollars and lives of thousands of people.

Lot of efforts have been made and are still being made for the reduction of bird hazard. Yet the hazards, at times, still exist, sometimes for small reasons. Sometimes a war is lost because of a nail.

Operating nature of a sanitary landfill site as well as its distance from airport also are to be considered among many possible reasons for bird hazards.

ICAO suggests that dump sites should not be constructed within a radius of 13 km from the airport. It must be noted at this point that ICAO do not go in depth as to how should a sanitary landfill site be constructed and / or operated to keep the birds away.

It has been found by actual experience in Nepal that, besides the distance, the nature of the construction and operation of a landfill site play a vital role in attracting or distracting the birds. This is a case where ICAO must explore in depth and bring out an internationally acceptable level of construction criteria if it is really serious about the reduction of bird hazard to aircraft. Nepal is a good country for experimentation.

We have, presently, only two landfill sites in operation in Nepal. First one is Bachhe Baduwa sanitary landfill site, 5 km from Pokhara Airport to serve Pokhara Sub-Metropolis and second one is Sysdol in Okharpauwa of Nuwakot district to serve Kathmandu Metropolis, just 15 km from TIA. Bachhe Baduwa Sanitary Landfill Site is scientifically built and operated. It is not that big or complex for the construction party, so to say. It has never been a factor for bird hazard to aircraft as such: Builder- the Second Tourism Infrastructure Development Project and operator- Pokhara Sub-metropolitan Office both deserve appreciation.

Sysdol landfill site also is not that big or complex for the construction party, yet it is designed and built in a wrong way. It continuously produces foul gases and leachet from the underground. The over-flowing leachet is just left open in the open air to dry away. But, in effect, it did not dry. Its foul smell is spread widely 24 hours a day making the life of local people a hell. One has to keep the nose shut as soon as leaving Kathmandu valley through Balaju (Road to Okharpauwa / Dhunche/ Kakani). The ever-existing foul smell is the main reason behind the arrogant behavior of the local people, that is, stopping the waste carrying vehicles to ply to Sysdol or back, not to mention the frequent existence of birds of prey overhead creating hazard to aircraft. The site lies on the route Pokahara - Kathmandu and Jomsom – Kathmandu.

Temporarily built landfill sites at Gokarna and Guheshori has had its adverse impact on TIA just a few years ago. They have been closed by the government particularly because of the insistence from the Ministry of Tourism and Civil Aviation and then Civil Aviation Department. So much so that then HMG of Nepal also constituted a national level "Airport Bird Hazard and Reduction Committee" in September, 2000 for the first time in history in line with ICAO guidelines.

What went wrong?

Sysdol is already filled up. Kathmandu Metropolitan Office is soon going to start another landfill site at Banchare adjacent to Sysdol for the next thirty years.

Landfill site or Dump Site is a necessity of every city in the world today. It is more

appropriately termed as Sanitary Landfill Site now for obvious reasons. Quite a few scholars have written books on its construction and operation.

The basic theory is very simple, as simple as that of the operation of a pressure cooker. Just as you want to play with a pressure-cooker to cook something you want, a sanitary land fill site can also be taken as a pressure cooker where you put something, treat as you like and ultimately bring out from the pressure cooker what you like. A good sanitary landfill site is one which is well protected from outside unwanted interference. And a bad sanitary landfill site is one which is not well protected from the outside element and thus cannot control the output from the pot. One such measure is laying of high density polythene sheets at the bottom of the landfill pit. It costs only a very small portion of the total cost of the construction. This polythene sheet is well laid in Bachhe Baduwa and the landfill pit is designed in such a way that any kind of bi-products of the landfill site could be treated scientifically and ultimately mixed in Seti river for use by river users. Besides, a peripheral drainage has been built to keep the outside water flow at bay even at the time of heavy rain.

Protection from outside elements is not made at Sysdol landfill pit. Neither the polythene sheets were laid at the bottom level to keep the pit safe from underground water mixing with the waste, thus producing heavy volume of leachet, nor the peripheral drain to keep the flow of outside water from entering the sanitary landfill pit was constructed. It was a test operation of the Japanese idea of running a sanitary landfill pit. They thought that the leachet produced by the sanitary landfill pit will just drain away to the underground keeping the upper layer dry at all times. Instead, the underground water in Sysdol propped up from the underground and got mixed with the waste directly, thus producing immense amount of leachet all the times, more so in the monsoon period. Since no leachet was supposed to stay at surface level, no particular scientific system of treating the leachet was constructed. The ever present leachet exposed to the atmosphere made the whole region very very stinky and the unbearable. As a result extra water so produced could not be mixed in the adjoining stream. The simple people dwelling permanently in the surroundings of Sysdol could do nothing except to halt the plying of the garbage carrying vehicles with various demands, which is, nevertheless, the moral responsibility of the government. The result is the deposition of garbage at every nook and corner of Kathmandu, a source for the spreading of various diseases, and, last but not the least, attracted birds creating additional havoc to the aircraft flying in the valley. Thank god, Sysdol will be no more a waste filling station. We can only hope this landfill pit is scientifically closed with ideal use of land by the government for some other purposes as prescribed.

At this stage the least the government should do for the new site at Banchare is that it must not allow the contractors easily get away with an unscientifically designed and built sanitary landfill site and re-face the problems faced at Sysdol landfill site for the next 30 years. TIA Civil Aviation Office / CAAN also must take up this issue with Kathmandu Metropolis rather strongly or repent in leisure.

Bachhe Baduwa Sanitary Landfill Site is built so nicely that students of environment management are advised to this station thoroughly. It can also be a very good site for actual experimentation by ICAO to determine the distance from the airport vis-à-vis strict construction criteria, possibly to the exactness of universally acceptable standards.

Remote Airfield Operation
Necessity and Challenges

Sagar K. Acharya
Aviation Consultant

Background

The aviation and tourism industry in Nepal has always been playing an important role in the economic and social activity of the country. Definitely, country will like civil aviation and tourism sectors to continue their role to contribute on the economic and social growth of the country as a whole. Country can also benefit more by recognizing many impacts of the aviation and tourism industry that have been ignored so far. Available statistics shows that in the year 2008, the gross foreign exchange earnings in convertible currency from tourism stood at US$ 351.9 million compared to US$ 230.6 million of the year 2007, which represented an increase of 52.6%. Also in the year 2008, Visitors entering by air constituted 3,74,661 (74.9%) of total arrivals whereas 1,25,616Ê (25.1%) entered Nepal by land. Though, total tourist arrivals dropped by 5% compared to year 2007, but tourist coming to Nepal by air increased by 3.9% in 2008. Airports also facilitate growth of high-value and perishable trade; in the year 2007, 3923923 kgs freight were carried by air for exports and imports in Nepal. The industry is also routinely providing connectivity to remote areas otherwise inaccessible by other modes of transport.

The air transport service of Nepal is comprised of two distinct and separate types of services. The first one is air transport service that is provided on general commercial or marketing viability basis. The next one is air transport service provided in combination with social and distributive objectives, including connectivity with the remote areas. Responsible regulatory authority and service providers (airline operators) should evaluate now whether or not liberal sky policy has fulfilled the expected specific needs and realities of Nepal's air transportation requirements.

Natural beauty, gorgeous mountains, beautiful lakes, variety of cultures and many other features of the country has always been alluring the tourists. Without doubt, improvement of the facilities, services, and other aspect pertaining to the aviation and tourism industry will draw more tourists which in turn will draw more foreign currency. But to achieve this we must think about the following elements; the state of our airports, safe and efficient air transport services, reliability of airline, comfortable and secure accommodation, security of the tourists, etc.

To develop aviation and tourism industry of the country, the existing situation, trend, future plan and action needed to overcome the present problems must be discussed and improved. Comparing with the aviation growth of the neighbouring countries, development of aviation sector is very slow in Nepal. This is due many reasons such as; no new airports are being built, less participation of private parties, inadequate airport facilities, political instability, security problems and high operational cost of air services. Now, CAAN as facilitator and air operator as service provider needs to review their role and performances and do the needful to develop aviation industry. Some of the elements which both should discuss are:

- Tax and financial services charges involved;
- private participation and competition;
- reforming bureaucratic practices;
- adherence to rules, regulations and safety standards;
- viability and affordability of commercial operations; and
- facilities for remote area operator.

This article is intended to focus on air transportation services related with the remote areas.

Remote Area Air Service Market– An Overview

Initially, it seems "Short Take-Off and Landing" (STOL) airfields were built to link remote areas with the developed urban places, but it showed more promises in its ability to develop not only the surroundings of the airfields but also large regions adjacent to the airfields. Its importance increased as the necessity and the demands of air services increased.

It is clear by now that the air transportation services to the remote areas have captivated the imagination of the isolated community with its support to the growth and exposure of their community to the rest of the country. Regular and reliable air transport services to these areas not only helped to fulfill the basic requirements of the community but also helped to develop infrastructure of those areas.

Difficult terrain, lack of other means of transportation, far distances from towns and small populations mean that only air services can provide essential links for such remote communities. Normally, competitive market offers many facilities and services for consumers. The length and small market size of remote community routes and the high per passenger operating cost of small aircraft clearly point out that air operations on these routes are not very easy. Many domestic air operations linking remote airports, however, are not economically viable because of low volumes of traffic and low air fare. Regular and reliable operations require some sort of support to domestic airlines to continue their air services.

Introducing competition may result in lower fares in the short term, but there is the risk that it will lead to the withdrawal of the air operators and also new entrant may not take interest in those areas, leaving the affected community without any air services, at least for certain time.

Government's Responsibilities and Support for Remote Air Services

Government's policy indicates that it is their responsibility in a deregulated environment to ensure that minimum required air transport support essential for the social and economic well being of the remote communities is provided. The programs through which the government has planned to provide assistance for air operators to ensure air transport services to remote communities include the 'Remote Air Service Subsidy Scheme (RASS)'.

It seems that government is not getting enough support for its financial assistance programme 'RASS" targeted to remote communities. Government should take effective major for the implementation of the same and spend the collected money through RASS to ensure the continuation of air services on remote airfields routes operated by domestic airlines.

The government agrees that it has a role to play in ensuring the continuation of vital air links to rural and remote communities that lack the population density to sustain viable commercial services. Government in its 'Civil Aviation Policy, 2063' has stated that necessary steps shall be taken for the effectiveness of the RASS. Input from industry stakeholders should be welcomed so as to develop a national approach and for an appropriate model.

The Challenges

Aviation is a risky business, and carriers around the world have lost big money for a variety of reasons – from rising oil prices to a slowing world economy. In order to function efficiently and to survive in a competitive environment, they work more closely to match service with demand.

Domestic airlines are facing increasing competition from road travel as buses and road infrastructure improve. Due to the vast differences in cost and convenience too, most

people preferred to travel by road transport than fly. In addition, domestic hub markets have been affected by advanced turboprop aircraft services operated by the major domestic airlines. These services are more attractive to travelers due to better comfort and also operating airlines offer attractive air fare. Most of the STOL airfields, however, have no ability to enhance runways or terminals facilities quickly to accommodate larger aircraft. The aircraft operating on STOL airfields and other airports located in hilly areas are compelled to concentrate their operation on those sectors only. All most all aircraft operating on remote airfields are non-pressurized and they are less comfortable than the pressurized aircraft operated in hub airports. So, there is less chances for the STOL operator to operate on hub airports.

Challenges facing the domestic airline industry operating on remote areas are not likely to dissipate in the immediate future. A number of factors having a detrimental impact on the industry, and in particular on smaller independent operators are:

- limited facilities at STOL airfields;
- no effective support program to motivate STOL operator;
- difficult operating condition;
- lack of skilled captains;
- ageing fleets;
- low cash reserves and high cost of borrowing;
- increasing competition from road transport and other airlines;
- difficulty attracting and retaining skilled staff (pilots and engineers) and managers; and
- higher operating cost.

Comparatively, airfares charged for the tourists or foreigner not only increases the level of airline profitability but also brings chances of continuing the air services provided at present. Therefore, it is very essential to attract more tourists too. Well developed plan and programs are essential to attract more tourists and it is also important to motivate visiting tourist to pay a visit to those remote areas where they can see the natural beauty, different culture, traditions, etc. of Nepal. A well-planned tourist's traveling itinerary, satisfactory services, good network of airports backed with economic, reliable and efficient airlines system is must for promoting aviation and tourism industry.

Time is running out on the building of new international airport at Nijgargh, Bara to meet anticipated demand. The strain on Tribhuvan International Airport is already apparent, which was expected and now noticed by many aviation experts. Statistic published in CAAN Report confirms that in the year 2008, some 3,74,661 passengers used the Tribhuvan International Airport and that the number could grow considerably in 2009.

Building new capacity

When air travel becomes unsafe, unreliable and unsatisfactory, the industry misses its chance to fulfill its role as a primary catalyst for economic growth and prosperity. Ministry of Tourism and Civil Aviation has declared year 2011 as a Nepal Tourism Air and expecting that 1 million passengers will visit Nepal that year. That is good news for aviation industry and program is expected to give development opportunity for the entire range of aviation stakeholders.

In order to achieve the targeted aim and also for the future of the aviation industry, government should plan and build new airports at remote areas too, and upgrade the facilities of the existing airports. Airports also play significant role by providing the required essential comfort, services and can also motivate community people to develop the area to attract more tourists. Time is running very fast and such development activities take some time to plan and implement, therefore, it is important to act as quickly as possible.

The existing and new built airports must have the required amenities such as; passenger lounge, check-in counter, security screening and baggage delivery rooms, etc.. Higher passenger numbers also put pressure on immigration and customs services to process greater numbers of travelers in and out of international gateways.

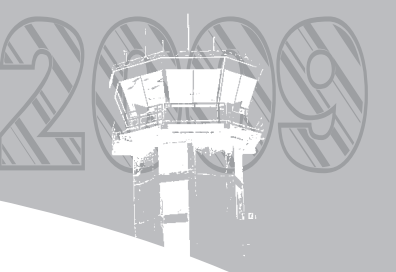
Civil Aviation authority of Nepal should implement modern developed methods to fulfill the regulatory requirements to minimize regulatory touch in the area of economics. Regulation which distorts market forces or creates expensive, time-consuming bureaucratic hurdles to complete necessary formalities disturbs air operators from their core mission: that is to serve the community and region and deliver services for airport users in an efficient and cost-effective manner. In sum, governments must simplify regulatory barriers to build confidence among the air operators for expanding existing air transportation operation to develop the remote areas. Again, let us hope that CAAN will adopt this regulatory approach, and it will stay the course.

Conclusion

We are in a period of restructuring the nation, aviation and tourism industry can contribute a lot for that. Despite global financial problem, increasing fuel prices and political disturbances in the country, there is rapid traffic growth. Deregulation and liberalization of aviation in the past decade have given good result to many countries.

Different approaches to support domestic remote airfield operation can be adopted. Any support in the form of transparent financial assistance on unprofitable routes/sectors may help in ensuring the continuation of vital air links to rural and remote communities that lack the population density to sustain viable commercial service. However, necessity or requirements for supporting these remote airfield operations vary between airports and airports.

Realization of this is necessary and there is a need for expeditious redress of the above deficiencies. Government must develop necessary strategy and chart a road map for developing and reforming the aviation sector rapidly. Also, it is the responsibility of government to attract airport investments and private sector funding for development of aviation and tourism sector through its policies.



A DECADE OF RADAR SERVICE IN TIA

Devendra Joshi, Manager, TIA
Bikram Thapa, Asst Manager, TIA
Rabindra Shrestha, STO, TIA.

RADAR service in TIA has completed a period of one decade. Radar service started in 1997. It was established with the grant aid of Rs. 1.8 Billion from Japan Government. Now the Radar service has been inevitable facility for the safety of aircraft flights in the mountainous valley of Kathmandu and for efficient air traffic controlling service. It has been reliable facility to assure international airlines for safer air operation in Nepal. Along with the facility for safety and efficiency, it has been the matter of service and symbol of pride for the only international airport of Nepal, the Tribhuvan International Airport (TIA). RADAR system has proved its contribution for safety of aircraft movements in Kathmandu and to enhance the air traffic handling capacity of TIA. Also, it is the living mark of Nepal-Japan cooperation.

Background

The requirement of visual based Air Traffic Controlling Service was desperately realized after the two big air accidents occurred in the vicinity of Kathmandu valley in 1992 AD. The flight TG-311 of Thai Airways International crashed in the mountain slope in Langtang National Park area, North of Kathmandu on July 31, 1992. It claimed all on board 113 passengers which included some Japanese

tourists and officials. Another big accident occurred on Sept. 28, 1992, just 59 days after the Thai accident, on approach path on which the aircraft of Pakistan International Airways (PQ268) crashed 10NM South of Tribhuvan International Airport. It was assumed that if there had been visual based monitoring facility, these mishaps might have been avoided. Then Nepal requested Japan for assistance to establish surveillance facility in Tribhuvan International Airport. As the result of the request, Radar facility was established in TIA in 1997.

Chronology

JICA team did study in 1994. On the basis of the study, the RADAR project started in 1995 and completed installation in 1997. The Radar system was kept on Technical Test from September to December 1997 and from January 1998 Radar service was given from 10 a.m. to 5 p.m. on local time on Test Operation. From April 30, 1998 Test Operation of Radar service was kept from 6 a.m. to 6 p.m. Formal operation started on September 09, 1998, 00:45 UTC, on which day its inauguration took place. The operation hour was from 6 a.m. to 6 p.m. Radar service for three shift period started from Feb. 1st 1999.

Technical aspects

- **Equipments**

Two types of radar facilities have been installed in TIA, namely ASR and SSR. ASR (Airport Surveillance Radar) is the Primary RADAR. It detects target on the principle of echo detection. Primary radar transmits high power electro-magnetic wave through antenna and detects the reflected wave from moving targets like aircraft from the same antenna. It gives accurate position of detecting objects like aircraft.

SSR stands for Secondary Surveillance Radar. It gets information from the aircrafts about its identification and altitude as the code transmission from aircraft upon the interrogation transmitted from the ground equipments of SSR in the form of mode. Combination of these two information make a complete data about the accurate position of aircraft and its identification. On the basis of these two types of data, computer system of Radar combines them with other required information from flight plan. Radar computer systems calculate the ground speed of aircraft and make suitable data format for visual display on Radar Scope called PPI.

- **The Display System**

The simple ASR and SSR signal (video) cannot distinguish different targets. There is no means to identify particular aircraft by itself. So a system of identifying the particular aircraft is necessary. A system is developed to specify targets, which is known as RDPS. RDPS stands for Radar Data Processing System and it is a software that detect the target information and combine the information on Flight Plan on the basis of aircraft identification that is assigned separately for each aircraft. These combined information produce suitable data for display on Radar Scope called PPI (Plan Position Indicator) with clear identification and other required information. These information move with the particular target movement that also predict the probable direction of the aircraft heading. This moving information with target position is the visual aid for reliable air traffic controlling. This visual aid is the help for efficient air traffic controlling and safety enhancement. Facility to have visual display over simply relying on the information provided by aircraft by voice is a great leap in getting accurate position of aircraft on air. This is the means to alert pilot from possible dangers.

A decade of RADAR service in TIA

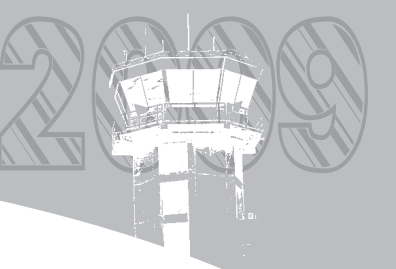
More than a decade period has passed since the Radar service was introduced in Tribhuvan International Airport (TIA). It has proved its utility for efficient air traffic controlling and safety enhancement. It is harder to prove the contribution it made in safety enhancement by quantification. Safety is not related to any one aspect. It is the result of combined contribution of all concerning factors. It is quite logical to assume that the decreased numbers of accident are contributed somehow by the visual aid. The reduced number of accident with the rapid growth in air traffic is the logical basis to assume the contribution of Radar facility in enhancing the safety aspect.

Nowadays control service providing from Dark Room has been the usual scenario of TIA Operation Building. It has been inevitable service for safer air operation and growing air traffic. To assume providing air traffic controlling service without Radar facility is almost impossible due to highly increased volume in air traffic in the past decade. This increasing trend is still continuing. There is no option but to strengthen the surveillance facility to cope with the continuously increasing traffic volume in TIA. Along with regular service to air traffics, it has been useful means for safe landing of aircrafts in case of emergency situations.

In special cases the visual aid of Radar scope helped for safe movement and landing of aircrafts at the time of failure of facilities of aircrafts that are required for safe maneuvering when on air. Providing such facilities is the matter of satisfaction for the unit who provide and maintain this facility. Providing service uninterrupt is the greatest challenge for the unit who provide the service and maintain it. It requires dedication of trained and experienced manpower of all concerning aspects of the field. Radar system is the integrated system of electronics, computer processing and mechanical systems. Expert manpower of all these sectors are required for smooth operation of the Radar system. Radar maintenance unit of TIA possess those trained manpower and so far have been able to provide smooth and continuous service for air traffic controlling. This unit has continuously supported with hard work to ensure reliable service. With the help of Radar, air traffic controlling unit has been able to provide efficient service for rapidly increasing air traffics otherwise not possible.

Involvement of technical team in maintenance

As the system was quite new for Nepal, the



technical knowledge and experience of handling highly sophisticated equipment and method of service providing to aircrafts were lacking. Considering this fact, the required trainings programs were arranged within the package of radar project.

Now these manpower have been experienced by more than ten years. During this period they faced many challenges and got many experiences to tackle problems. They have been monitoring system, identifying problem, analyzing errors and taking corrective measures to ensure uninterrupted service.

They have successfully replaced heavy and sophisticated parts of the system. They have been able to apply alternative methods to continue service at the failure of main system and at no solution to correct them. They have successfully replaced heavy parts like Antenna Driving Motor and Rotary Joint of antenna system on their own knowledge and skill. They have successfully revived Radar Simulator System at Sanothimi Training Station and another Simulator System at TIA both had been out of service for few years.

They have experience of maintaining and repairing the hardware parts as well as software of sophisticated computer system Radar Data Processing System (RDPS). They are applying their own knowledge and skill since the expiry of Five Year Maintenance Contract with manufacturer in August 2002.The facility of Maintenance Support for Five Year was provided by manufacture under the provision of the contract. After the expiry of this period Nepalese manpower have been totally responsible to take care the system. They are maintaining a healthy trend of team-spirit while working, be it for regular maintenance or emergency maintenance as working culture for efficient outcome.

Pride and challenges

The technical manpower of CAAN have been highly resposive to the challenges of providing technical maintenance of highly sophisticated and complicated radar system. The training and experience received in Japan helped them to be technically sound and confident to work with sophisticated equipments.

There is practically no end of technical knowledge. Technology is changing continuously and rapidly. Even mastery over the existing system is a difficult task. There is no space to assume that the training received so far is enough to tackle with all types of problems that occur during operation. Refreshing of knowledge and updating with the contemporary technology should be a regular feature. Preparing new manpower is equally important as the older generation is gradually phasing out.

Future prospective

The current Radar facility is available to Kathmandu valley only. It does not cover the trunk routes of domestic and international flights. The need for visual based service to these routes has been realized, but establishing another Radar station is the matter of high cost. In the recent days other technologies of surveillance system have developed. They can provide alternative to Radar.

In the present system controllers have to work in Dark Room as the requirement of PPI characteristics. It is stressing to eyes to work for long. Now display system operable in bright light have been developed. Even the Radar technology has advanced to lighter, power efficient and compactness. These have helped to reduce cost and been more users friendly. We have to advance to modern technology sooner or later as the present system is getting older and availability of spare parts is getting scarce.

On the basis of cost effectiveness, compatibility and requirement of the country, a suitable system is to be adopted that serve the best. For the perfect accuracy, some kind of active sensor like radar is required for the airport approach. For air routes, other modes of facilities like ADS-B or Multi-Lat may be powerful and reliable aid for air traffic controllers. The experience, knowledge and skill of the host of technical manpower of CAAN may serve a great leverage to our transition to modern technology particularly in the air navigation field.

Cape Town Convention- Candid way to Equipment Financing

Buddhi Sagar Lamichhane
Senior officer, CAAN, Head Office

Aviation Industry is one of the high tech international and volatile industries. It requires large amount of finance for the successful and durable operation. Because of the inherent quality of mobility of aircraft, financing in such equipment is more complex and risky. Any way there is no alternate of well managed environment and regulation of international financing in aircraft equipment to cope with the problem of cross border aircraft financing. Realizing this fact the world Aviation community has adopted the "Convention on International Interest in Mobile Equipment, Cape Town 2001".

In light of the changes in the aviation sector, asset based fincing and leasing are the methods of choice for financing the acquisition and use of aircraft equipment. These financing techniques presuppose the existence of effective legal rights, particularly those relating to the ability to promptly enforce contractual terms. The Cape Town convention and the Aircraft protocol facilitates the financing of aircraft by: (a) providing creditors with internationally recognized set of rights in the event of a debtor's default or insolvency; and (b) allowing creditors to register their interests to guarantee the priority of their claim against other parties.

Main Objective of the Convention

The principle objective of the convention is to facilitate the efficient financing and leasing of the mobile equipment. The convention is designed, so as to bring significant economic benefit to the contracting states. It will not only benefit creditors but also to the debaters making able them to get finance at lower cost.

Principles of the Convention

The convention and Aircraft equipment protocol are governed by the following five principles:

a. Practicality in reflecting the salient factors characteristic of asset based financing and leasing transaction.

b. Party Autonomy in contractual relationship reflecting the fact that parties to a high value cross- border transaction in equipment of the kind covered by the convention will be knowledgeable and experienced in such transaction and expertly represented, so that in general their agreements should be respected and enforced.

c. Predictability in the application of the convention, a feature which is specifically mentioned in the interpretation provisions of Article 51 and reflected in the concise and clear priority rules which give the pre-eminence to certainty and simplicity and a rule based rather than standards based approach.

d. Transparency through rules which provides for registration of an international interest in order to give notice of it to third parties and which subordinate unregistered international interests to registered international interests and to the rights to purchasers.

e. Sensitivity To national legal cultures in allowing a contracting state to weigh economic benefits against established rules of national law to which it attaches importance and to make declarations in some of the matters.

The Central Feature of the System

Following are the central features of the Cape Town Convention System

a. A uniform criterion for creating an international interest (i.e. a security

agreement, title reservation agreement, or leasing agreement) in aircraft equipment is specified.

b. A first to file priority rule based on an electronic, notice based international registry, created by the treaty system itself, applies,

c. Default remedies are available to creditors, and absent default or contrary agreement, quiet possession rights are granted to debtors.

d. Jurisdictional rules are provided.

Benefits of the Convention System

Although the precise economic benefits of the convention are difficult to predict exactly, a study undertaken during the development of the convention estimated that the potential world wide economic benefits of the convention would be several billon dollars in relation to aircraft equipment alone. The economic benefit would be widely shared among airlines, manufacturers, and the national economies in which the airlines were located. In advance of the entry into force of the convention and aircraft protocol, these economic benefits have already begun to be realized with the Ex-Im Bank of the United states announcement in August, 2004 that it would offer a one third reduction of its exposure fees to buyers of US large commercial aircraft in countries that sign, ratify and implement the convention.

Asset based financing and leasing are efficient forms of credit extension in which prompt recourses to the value of underlying assets (i.e. aircraft equipment) is a central feature in the analysis of overall risk in transactions. National legal rules which are inconsistent with the general principles underlying these transaction types impose costs, financing is comparatively more costly or, where excessive risk is present, unavailable.

The Cape Town convention and Aircraft protocol will reduce risk applicable to these transaction types by establishing an international legal framework backed by treaty relations and where necessary implementing domestic- laws embodying principles promoting asset-based financing and leasing. This risk reduction will increase the availability and reduce the cost of aviation credit, thus broadening the spectrum of financing alternatives available to users of aircraft equipment.

A research conducted in 1998 by New York University, Salomon Centre to examine the economic impact assessment of this convention is very encouraging. It shows the aggregate global cost savings range between $ 498 billion to $ 729 billion or approximately 15% to 20% of the expected cost of the future (20 years) demand for airline deliveries.

Status of the Convention

The Cape Town convention 2001 and its aircraft protocol are adopted in the conference of Cape Town, South Africa in 2001. Both the instruments entered into force since 1 March, 2006. Till date 32 States including EU (27 countries) are parties to the convention. The states parties to the convention are as follows Afghanistan, Albania, Angola, Bangladesh, Burundi, Canada, Cape Verde, Chile, China, Colombia, Congo, Cuba, Ethiopia, European Union, Kazakhstan, Kenya, Lesotho, Luxemburg, Malaysia, Mexico, Mongolia, Nigeria, Oman, Pakistan, Panama, Saudi Arabia, Senegal, Singapore, South Africa, Syria, United Arab Emirates, Tanzania, United States of America, Zimbabwe. In South Asia India, Pakistan, Bangladesh has already become the parties to the convention. The data shows that more than 80% of the aviation market countries have already become the parties to the convention and Aircraft Protocol. This fact automatically proves the importance of the Cape Town Convention system.

Conclusion

The country lacks adequate aircraft financing mechanism and ways. This has created hue and cry in Nepal. Our national economy is not capable to finance billions of Rupees to purchase long Haul aircraft equipments. Recently in a seminar the President of the bankers association of Nepal, has revealed the fact that at present Nepalese banks are not in position to finance huge amount of money to buy big aircraft. So alternate financing source for aircraft equipment has to be sought.

If really we want to boost up our National economy National airlines capacity should be strengthened. Our airlines should have enough number of aircraft equipments to operate flight to required destination. Flag carriers should be able to cover the span of market developed by the Air Service Agreement. The adequate number of aircraft equipment for domestic and international flight will expand the horizon of tourism industry and increase national revenue as well as international trade.

Appropriate step should be taken in time to gain the benefits of the system. It's in our hand whether to gain the benefits by adopting the convention system and formulating domestic law in harmony with the convention. It will open the door of international financing market with national commitment and international remedy.

This Convention system should be the matter of interest of aviation entrepreneurs which are interested to operate international flights. At moment Nepal Airlines Corporation must take up this Convention as a remedial instrument to resolve the present problem.

Cultural Encounters at Surkhet Airport: A Memoir to share

Umesh Kumar Panthi
Ass. ATS Manager -TIA

Introduction:

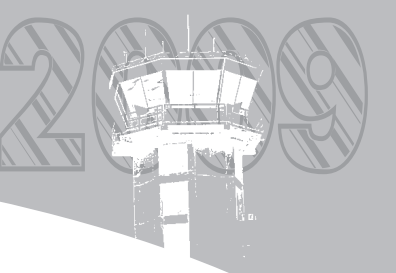
It was 17 June 2008, when Kathmandu was getting warmer, and I chanced to get temporarily transferred from Tribhuvan International Airport Civil Aviation Office (TIA-CAO) to Surkhet Civil Aviation Office (SK-CAO) on a relief deputation. Located in mid-western Nepal, Surkhet, at the outset offered a little discomfort to me due to warmer weather there compared to Kathmandu. Besides, I had problems in finding appropriate place for daily meals of my choice in the beginning. The first week ran smoothly, by which time I had visited all the surrounding sites in the valley and was almost conversant with the local environment.

Encounters:

I began to feel myself more responsible when the problems began piling up day by day. That time of year there was fuel crisis everywhere. Its impact on aviation was obvious. Currently, Surkhet is one of the busiest airports in Nepal after TIA and has turned to a main hub for helicopter operations to mitigate the deepening food crises in the nearby remote districts. Coincidentally, it was the tedious period of setback caused by long hours of load shedding which imposed extra burden in the office to work without fan or windows that could let in fresh air to breathe a sigh of relief. During the day time fuel crisis created a situation of chaos as we had to run the generator in the nighttime for the security of airport and the aircraft parked in the bay.

It was an extra burden when many aircraft were compelled for night stop at Surkhet Airport. While there are only five aircraft parking spaces, there used to be 7-8 aircraft for night stop. These problems were some how handled with added cautions and efforts in co-operation with airlines as these were the common operational problems which I even face at Kathmandu and more importantly it has become a part and parcel of the life of air traffic controllers at Kathmandu. Needless to say, such problems fall within the scope of ATS management. Apart from the hectic business of this airport given by fixed wing traffic and heavy cargo helicopter movements, the airport tower, our working abode, had a pathetic ambience. The environment was very noisy with the roar of helicopters taking off and landing at the runway, which presented a sonorous reverberation to my delicate eardrums through steady vibrations sustained by the windowpanes. It was distracting, indeed. It was very difficult to work singly (in a 2-men console) in simultaneity with other administrative works and handling busy telephone calls. Difficulty got aggravated when tower VHF communications remained totally overlapped by high level aircraft overflying that area particularly Buddha Air Beechcraft aviators who were busy calling to Dhangadi Tower as all the nearby Aerodrome Tower Frequencies were the same. All of these problems became regular, though many new problems, challenges and personnel security threats began to mount alarmingly.

At the close of the fiscal year, some more problems began to emerge in addition to the financial obligations of the office. Airport expansion plan that was pending form previous fiscal year was a very hot issue, with land acquisition plan of the government still pending; value fixing of the land and the properties of the public to be taken by the airport for its expansion were yet to be finalized in one hand whereas on the other this process had to be completed at any cost within the same fiscal year. Local people were divided



on the issue of airport expansion. There were strong political pressures from the leaders of the political parties for its immediate implementation. Financial obligation of the temporarily transferred staff was also questioned. I was supposed not to take any financial decisions of lasting character in that regard.

While those problems intact, nine different organizations of mid- and far-western Nepal, especially Karnali residents, presented an ultimatum to the Government through SK-CAO and asked either to fulfill their demand immediately or face the consequences including indefinite padlock of the airport. The demands put forth were of different nature: short term, medium term and long term. Hence, demands were not easy to be fulfilled immediately. Media attention was highly drawn to this appalling situation.

Huge amount of food items under World Food Program (WFP) had to be transported by the different charter parties (charter fare was reasonably higher than the normal local charter fare). Similar or more amount of food belonging to Nepal Food Corporation (NFC) was still in the warehouse at Surkhet and a must delivery obligations by the end of same fiscal year was aggravating the situation as charter parties were not willing to resort to charter service in lesser fare (compared to WFP) of NFC. A big hue and cry was prevailing in the nearby remote district due to acute shortage of food. In such a situation, I had to be readied myself to cope with any likelihood of situations by making use of my fullest potentials besides normal office duty to fulfill the professional and social obligations. Manpower problem was another factor as we had to operate airport from 5.45 AM in the morning until 7.30 PM in the evening with only one ATS manpower to share the work in two-man console environment. Surprisingly, the above situations and the problems were experienced in a very relatively short span of my being there. While explaining these complex situations I cannot omit the incident that nearly ruined my life, which happened in the staff quarters. I had encountered a snake. It was none but the Karate – one of the deadliest poisonous snakes found in the Terai belt of Nepal), when I stepped my bare right foot on the snake while proceeding to toilet during a long power cut.

Initiatives

- All the problems and the situations were both tackled and managed.
- Four-five rounds of formal and informal talks were made with the agitating public in airport premises and consensus of agreements was signed.
- Property valuation was finalized in full co-operation and involvement of district administration office. Property value disbursement cash was acquired from the CAAN head office and handed over to district administration office for the distribution to stakeholder.
- Helicopter charter fare rates were finalized for different locations in the presence of chief district officer in a meeting of all stake holders organized by NFC.
- All sector airfares were made public.
- All scheduled flights were made public.
- All the flights made by different airlines during the season were made public.
- Local level action plans were made to address the public demands.
- A district level monitoring committee was formed with the inclusion of the representatives from the local people.
- Long-term solutions were sought and forwarded to higher authority for timely address.
- Notice board was assigned accessible to public for daily reporting of the flight schedules and their progress.
- Nepal Oil Corporation was requested to make notification to SK-CAO in case of fuel stock reduction from normal level or any predictable fuel crises in advance.
- Flight safety and weather issues were briefed to public. Similarly ATC profession and role and responsibilities of CAAN were briefed to the public.

Outcome

- In spite of Airport padlock twice for some period airport opening was negotiated; as a result no scheduled or charter flights were impeded.
- There were no confrontations or clashes with the agitating public hence no loss or damage of public or private property.
- SK-CAO and the local communities' relations were improved with the understanding of each other's limitations.
- Local people were satisfied with the new arrangements of transparency regarding the flight schedule progress and its monitoring mechanism.
- Local people became aware of the behavior of different but difficult weather conditions and the fate of the flight.
- Local people became aware (to some extent) of the ATC profession and roles and responsibilities of CAAN.
- Stakeholders were satisfied with the outcomes.
- CAAN appreciated the successful handling of the problems and situations at local level.

Conclusion

My deputation to Surkhet airport turned to be a unique opportunity for me to understand people, their feelings, local aviation problems, and complexity of multiple problems associated with air transport. Anyway, this provided me an awesome food for thought as I learned the politics, culture, nature, power and behavior of the region and its people. This helped me to adopt appropriate means and measures to facilitate resolving problems outside of my profession. It is worth pondering that an ATC's life at many such airports of Nepal tends to be an amalgamation of two facets of a coin - professional and humane.

■

RT Discipline and Its Importance in Safety

Ritcha Sharma
Senior Officer, TIA

It is of course important that radio equipment should be reliable and easy to use and should be capable of conveying the spoken word clearly and without distortion over long distances. The Communication between Pilots and ATCs is a process that is vital to the safe and efficient control of air traffic. Although data link communication has reached an advanced stage of development, verbal communication is likely to remain the prime means of air –ground communication for many years.

Radiotelephony (RTF) provides the means by which ATCs and Pilots communicate with each other. One of the many factors involved in the process of communication, phraseology is perhaps the most important because it enables both the parties to communicate quickly and efficiently despite differences in language and reduces the opportunity for misunderstandings. Phraseology is actually a coded language which, unlike plain language, is standardized, non-idiomatic and void of courtesies. The standard phraseology is designed scientifically to make communication as concise, brief and unambiguous as possible. Use of standard phraseology helps in fulfilling the ATC's obligations to guide the aircrafts safely and the pilots' responsibility to fly safely.

process of communication is equally important and must be successful even in the most difficult conditions. Good radio discipline is essential to this process. It is very vital that the RT discipline practiced by both pilots and the controllers be guided by the philosophy of safe, orderly and expeditious operation of the aircraft.

ICAO Annex 10 Volume II (Aeronautical Communications) urges, "In all communications, the highest standard of discipline shall be observed at all times. Only when standard phraseology cannot serve the intended transmission, plain language should be used."

Steps to maintain RT discipline.

1. Using proper phraseology by the controllers and the pilots.

2. Reading back of the ATC instructions by the pilots.
3. Listening carefully to the read back by the controller.
4. Rectifying it in case of error.

- Standardized Phraseology reduces the risk that a message will be misunderstood. Pilots must report their situation, intensions requests to the controllers in a clear and unambiguous way and the controller must respond by issuing instructions that are equally clear and unambiguous. That means, pilots and ATCs must make the practice of using standard phraseology as their daily habits.

- Strict adherence to the read back procedures ensures not only that the clearance has been received correctly but also that the clearance was transmitted as intended. It also serves as a check that the right aircraft and only that aircraft will take action on the clearance. Similarly, an accurate read back of clearance ensures mutual understanding between the controllers and the pilots about what the pilot is going to do.

  ICAO Annex II (Air Traffic Services) states that the safety related parts of any clearance or instruction must be read back to the air traffic controller. The controller must insist on an accurate read back of clearances both after initial issue and after any correction.

  ICAO has set the mandatory items to be read back by the pilots in Annex 10 (Vol.II). These items include taxi instructions, level, heading and speed instructions, airways or route clearances, Runway in use, clear to enter, land on, take off on, back track, cross or hold short to an active runaway, SSR operating instructions, altimeter setting, frequency changes and types of RADAR services.

- The controller must make sure that the read back of a pilot is accurate and complete. ATCs must, that's why, be an attentive listener also. They should be able to detect the error if any in the read back so that the pilots can be made aware on time. Wrong read back complies that the pilot has misunderstood the clearance. Consequently, the pilot will follow an incorrect clearance which has significant safety risk. Finding out about the risk is the duty of an ATC which can be done just by being attentive or listening carefully to the pilots. The ATCs should be careful not just to hear what they expect to hear.

- If an aircraft read back of a clearance instruction is incorrect, the controller must transmit the word 'negative' and followed by the correct version. In case if the ATC fails to rectify incorrect read backs, significant safety risk arises. Therefore if the ATC is in doubt about any transmission received or does not receive an expected read back, he should check immediately.

  It is very important that the ATCs and the pilots follow all these steps while communicating. Communication between ATCs and pilots remains one of the vital parts of air traffic control operations and communication problems can result in hazardous situations.

Clout Transmission

There are a number of cases wherein ATCs and pilots have entered into unnecessary arguments on RT. During winter season immediately after the airport opens followed by a long closure due to fog, the Surface Movement Control frequency becomes one of the busiest at Kathmandu Tower. The pilots get irritated after a long wait and due to the probable closure of their destination because of time factor. Airports like Lukla and Jomsom are suitable for flight in the mornings only because of which the pilots seem in a great hurry. These external factors play provocative parts in case of pilots. This gives rise to superfluous transmission. But for safety, it is necessary for them to maintain calm composure, be patient and hold own temper.

It should be noted that both ATCs and Pilots work at high level of stress and work load which demand full concentration. Any distraction, like unnecessary arguments is likely to affect concentration and state of mind with an increased possibility of making error of judgment. This affects safety of flight operations adversely.

In addition, unnecessary argument blocks RT channel due to which other aircrafts in need to communicate do not get to do so on time. This is not a healthy situation and should be stopped immediately.

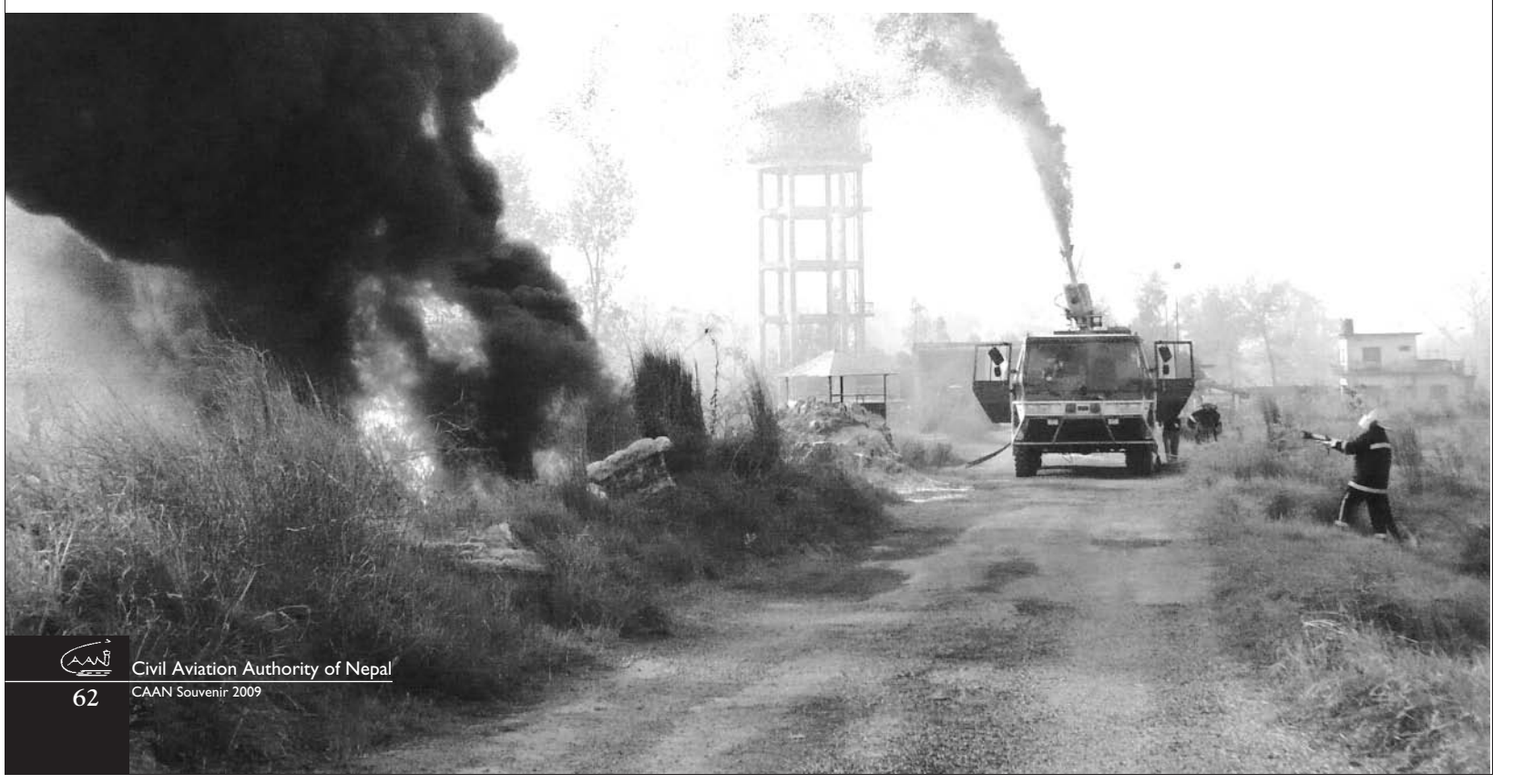
Thus, use of correct phraseology, following all steps of communication process with an utmost sincerity and avoiding superfluous transmission are to be adopted by the ATCs and Pilots to maintain RT discipline and thus ensure safety.

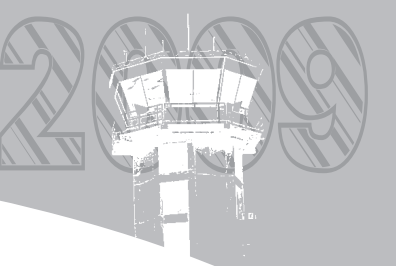
■

Aviation Fire Service

Narayan Bdr. Rawat
Chief Fire Officer, CAAN

The history of fire service dates back to 1931 when the U.S. army realized the need for better protection, and started innovation that resulted in the acquirement of a specialized aircraft fire fighting vehicle for the purpose of control of aircraft fire and rescue operation. In 1955 Mr. Henry Gascoigne joined as a motor driver on a fire tender. He was nominated for the fire equipment training and appointed fire captain. Soon, he established a fire crew unit. He worked his way up through the service to finally retire as director of fire services. The same year ICAO introduced for the first time guideline material on the provision of rescue and fire fighting services at the airport. There are different manual, directives, requirements, documents, rules and regulation published by ICAO for the development of aviation fire fighting facilities. The Federation Aviation Administration (FAA) established an office in 1960 to develop the types of extinguishing agents such as foams, carbon dioxide, dry chemical, halogens, etc. This was a significant step in the history of aviation fire fighting and rescue services. ICAO appointed a team of experts 1969 to review some documents related to fire facilities. The expert team came up with the final report in 1970 with recommendations for the provision of fire fighting facilities. Also there were created special work groups that had to control and to focus the development of technologies on the more scientific basis. Annex 14, Aerodrome, has made provision of rescue and fire fighting service facilities to be adopted by all the States. Later ICAO worked out a number of suggestions for aircraft rescue and fire fighting requirements. Periodically those requirements have been modernized and improved. In 1990 was established Aircraft Rescue & Fire Fighting Working Group-a non profit international organization dedicated to the sharing of aircraft rescue & fire fighting information to the airport firefighters, airport rescue & firefighting equipment manufacturers, municipal fire department and all others concerned with aircraft fire fighting. This organization exists to discuss and analyze procedure to be utilized when dealing with factors behind the science of aircraft accident and incidents that involved.





The fire Service is one of the world's most honored services but very dangerous occupations. Its prime job is to practice life safety, every fire related incident control and property conservation. The fire fighter's job is not easy or comfortable but full of high level stress and danger for individual. Some great events of fire witnessed in the past are:

The Great Chicago Fire

The Great Chicago fire is considered one of the most famous events that have occurred over the past 100 years. This fire occurred in the evening of October 8, 1871 and killed 300 people, destroyed more than 17000 structures-over 2000 acres in 27 hours.

The Great Fire of London

London's historical fire, the second major incident erupted from baker's shop on September 2, 1666 and destroyed more than 13000 structures.

San Francisco Earthquake Fire

This great fire occurred as a result of tremendous earthquake that took place in morning April 18, 1906. This fire began from stoves and lamps that fell about due to powerful tremors. This disaster killed 3000 people and destroyed 3,00,000 structures.

United States Twin tower attack

In sept. 11, American twin tower, the world trade center, was ablaze by hijacked jet aircraft set to hit the tower by terrorists. Many fire fighters were killed in this incident.

Therefore, we must know about the behavioral fire in the daily life and aviation rescue & fire fighting field. There are some basic valuable norms and conditions in the aviation rescue and fire fighting service that must be accomplished through training, unity of command, span of control, division of work, and discipline, etc. Aircraft fire prevention and protection training is extremely valuable to all types of accidents of aviation fire fighting field. Such trainings are as follows:- 1) Airport Familiarization 2) Aircraft Familiarization 3) Personal Safety 4) Emergency communication 5) Fire Hose, Turrets, nozzles, other equipments, 6) Fire extinguishing agents 7) Emergency Aircraft Evacuation 8) Firefighting Operations 9) Adopting Structural equipment to Fire Fighting 10) Aircraft Cargo Hazard 11) Airport Emergency Planning and 12) Operation Management and 13) Breathing Apparatus 14) Management risk and so on.

What is Fire?

We use the fire in daily life but everybody has no answer how to burn fire. "Fire is a chemical reaction of fuel (solids, liquids, gasses) with oxygen (air contain) under the presence of heat (certain temperature)". Four components are needed for combustion of fire such as fuel, oxygen, heat and self sustained chemical reaction. This concept is extremely important to professionals of the fire suppression, prevention and investigation. Remove any one of the four components, combustion will not occur. In this context, we must known how to extinguish the fire when it is destroying buildings, materials and other things. There are three basic methods to extinguish the fire. 1) Starvation 2) Smothering 3) Cooling etc. Starvation:- Fire can be starved by removing fuel, materials or other matters from the environ of fire. Smothering:- If the oxygen supply is reduced to the burning material, fire will stop. Blanketing is an important practical method in which person's clothing, blanket, foam can be used. Cooling:- If the temperature is lost or reduced from the burning material cooling occurs. That is why water is used to extinguish fires.

Objective of Aviation Fire Service

The principle objectives of aviation fire fighting service is to save lives and properties in the events of aircraft accidents and fire hazard in different facilities such as buildings, equipments, apparatus. Thus volatile or hazardous accident and incident should be dealt with by quickest time and fastest means. Certain rules and regulations are determined by ICAO documents that should be followed up with their jurisdiction authorities in each organization. Therefore, command, control, coordination, communication, attack, control and rescue are main procedures in each accident or incident. Airport Emergency plan can also be helpful to complete the objective of Aviation Fire Service. Airport Emergency plan is process of preparing an airport to cope with emergency occurring at the airport and in its vicinity. The objective of this plan is to minimize the effect of the emergency, particular to save life and maintaining aircraft operation which is for coordination with the airport surrounding agencies (services) and those agencies could be assisting during the emergency.

General Consideration

Quality of service provided by Aviation Fire Service will conform to International Civil Aviation Organization requirements. Every rescue and fire fighting personnel has to be conversant with:

- Critical area :- The critical area is a concept for rescue of occupants of aircraft which are divided into two categories such as practical critical area which is related with actual aircraft accident condition, and seeks to control only adjacent of aircraft fuselage, and theoretical critical area in which entire area is affected by the spread of fire by aircraft.
- Control time:- The control time for aircraft rescue and fire fighting service is one minute in which to reduce a initial intensity fire by 90 percentage.
- Response time :- The response time for aircraft rescue and fire fighting service, within two minutes not more than three minutes at the end of each runway that practical judgment should be accomplished within from the initial call to rescue and fire fighting service in the positioning of responding fire vehicle to extinguishing apply at the rate of at least 50 percentage discharge rate.
- Airport category:- Airport category for rescue and fire fighting service should be determined as per the aeroplane using the airport by first their overall length and second their fuselage width.
- Airport emergency exercise:- The airport rescue and fire fighting service should accomplish different types of emergency exercise such as full scale emergency exercise at least once every two year for test the all facilities and associated agencies. Partial emergency exercise at least once each year for some of the new trained personnel, new equipments and new techniques to comply with subject-matters should be conduced. Tabletop exercise at least once each six months as a coordination for the full scale exercise or it may held in order to reconfirm procedures, policy, introduction, telephone numbers, radio frequencies and changes in key personnel.
- Extinguishing agents:- The principal extinguishing agents output a permanent control of fire for a long time i.e. foaming agents and complementary extinguishing agents as a partial control of fire for a short time i.e. carbon dioxide, dry chemical

powders or halons.

- Positioning apparatus:- The desired positioning of fire apparatus will be a judgment decision. This judgment decision concerned with all factors in several apparatus and procedures.
- Wind:- Wind influence the aircraft rescue and fire fighting operation. It provide the visibility, breathing, decreased heat, reduce extinguishing and time.
- Terrain:- The influence of ground or road features for heavy apparatus may consideration at fire fighting and rescue operation. Fire apparatus should avoid gulleys, downhill, slope areas near the crashed aircraft.
- Rescue:- The prime objective during the fire fighting is the safe life of those personnel involved in the incident. Preparation must be ensured that the rescue procedure can begin as soon as the apparatus stops. Lives may depend upon speed of the operation. Rescue men should be extremely cautious when attempting to remove occupants from the aircraft which is surrounded by widespread fire.
- Ambulance service:- An ambulatory service is a part of the airport fire service that carrying personnel teams qualified in first aid and medical supplies are vital to the success of initial in the event of an aircraft accident.
- Communication:- Communication facilities must be available in the fire station so as to crew members take action immediately in the incident site. Watch room duty must keep the station crew aware of what is happening over the station. Watch room crew members responsible for looking any signs of an aircraft being in trouble.
- Breathing Apparatus:- Breathing apparatus is an another significance part of the aircraft rescue and fire fighting service that provides oxygen, when the fire fighters works with smoke or internal aircraft fire. The breathing apparatus is an importance device in rescue tasks there are a number of areas where life can not be maintained without use of breathing apparatus.
- Dangerous Goods:- Every fire fighters have to known about dangerous goods which are significant risk to health, safety and property when carried by aircraft. Dangerous goods classified by ICAO Technical Instructions into nine classes:- Explosives, Gases, Flammable liquids, Flammable Solids, Oxidizing Substances, Poisonous, radioactive, Corrosive, Miscellaneous etc.

Present Situation of Aviation Fire Service in Nepal

In 2022 B.S., aviation fire service was launched at the Tribhuvan International Airport with certain minimal manpower. There were no fire vehicles, no trained manpower, no own building and no other fire fighting equipments to accomplish the entire work. It was in 1973, that a first group was given fire fighting training in Nepal by TU/UNDP/DCA/CATC. Two Nepali fire experts and instructors with the cooperation of a foreign fire specialist, Mr. D. J. Woods launched their maiden fire-fighting training group in Nepal. Today, Civil Aviation Academy has been conducting Basic Aerodrome recue & fire fighting course, ARFF Refresher course, ARFF Advanced course, Breathing Apparatus Course, ARFF Field based course etc. From the 2030 B.S., started fire fighting service out of the Kathmandu valley in Simar, Bhairahawa, Pokhara, biratnagar and Nepalgunj airport with skilled manpower or different types of fire fighting vehicles such as large foam tender, medium foam tenders, Rapid International Vehicle (RIV), ambulance and portable fire fighting equipments. Now, we have more than 150 personnel working with modern fire equipments under the Aviation Fire Division in different Civil Aviation Airports. Tribhuvan International Airport, Fire Station operates 24 hours. There are 3 shifts of firefighters who take over and discharge on the rotation basis. The airport fire station is located to the east of the main runway, and provides fire fighting facilities of 8 categories. However, Civil Aviation Authority of Nepal is going to upgrade fire fighting service facilities to category-9 in future. Now, on the other airports, with two shifts, more than 10 skilled manpower are providing fire fighting facilities but this manpower is not sufficient to cope with the nature of work. It is a high time that Civil Aviation Authority of Nepal review the curent situation of aviation fire service in terms of manpower, equipment and transformation. It is estimated that by 2069 B.S., more than 40 percent of the existing manpower will have compulsory retirement from the profession. Some fire fighting equipments have become obsolete and can not meet the response time.

Conclusion:

The problem of fire fighting is one of the most real problems of our organization because despite great technological progress made by scientists elimination of a great deal of disasters and catastrophes is still a difficult job. The most up-to-date mechanisms and technologies have to replace old means of fire protection. Regular audits should be maintained by Aviation Fire Service or Aviation Safety. Details of academic, physical and medical standards for each fire fighter have to be conformed to required rules prescribed by organizational management. To ensure this, there would be standardization throughout. Every fire fighter must be familiar with his duties and demonstrate true humanitarian behavior. The aerodrome rescue and fire fighting service is a high expensive. Very high investment is needed to develop fire technologies and produce skilled manpower. Professional staff members at Aviation Fire Services do have necessary technical experts and experience but they lack higher professional and academy qualification. It is urgently required for CAAN to make provisions for quality abroad training to enhance capability of the manpower in their specialized fields. At present, CAAN's training activities are merely focused on fire fighting service field. The field of training programme should be made wider to include other sub-disciplines like curriculum, instruction, leadership training, and developmental trainings. Civil Aviation related workshops, seminars should be organized to activate the whole scenario. Aviation Fire Service needs to be continuously upgraded in respect of physical and technical resources. CAAN must make special plan to prepare high quality and sound instructors or sound supporting staffs. Strong manpower and adequate physical infrastructure must be considered as valuable assets of every organization.

References

Ref. Airport Service Manual, Doc. 9137 AN/898 Part-1

Ref. Airport Service Manual, Doc. 9137 AN/898 Part-7

The Role of Subordinates in CAAN Management

Sunil Mool
Senior Officer

Human resources are the key to the success of any organization and the main component for decision making. The importance of employees lies in the fact that organization is built around its human resources. In no way can the organization overlook its employees for the desired goal.

Generally an organization has the provision of three layers of employees.

a. High level employees
b. Middle level employees
c. Subordinates

Level wise staffing in public organizations is not the same and should not be the same. Particularly service dispensing or the nature of service provision determines the structure of level of staffing.

Organization provides the structure on which the management is based. The best organization is still skeleton. Each management level must know to whom we are accountable and on the downward who must take orders from whom. In a multi-disciplinary, high tech. and dynamic organization like CAAN, the importance of skilled and trained manpower does not need any elaboration.

In line with the policy of Government of Nepal civil Aviation authority of Nepal (CAAN) was established as an autonomous body in 1998 under the Civil Aviation Authority Act 1996 to regulate and develop civil aviation sector and to make air transportation safe, regular, economic and efficient. CAAN was a replacement of former Department of Civil Aviation directly under the Ministry of Tourism & Civil Aviation.

Civil Aviation Authority of Nepal looks after air transport and civil aviation obligations and is responsible for providing safe regular, standard and effective services and facilities required by air transport in civil aviation sector.

Within this organization there has been division of various levels (from 1 to 5 and 6 to 12) of various employees, comprising officer level and subordinate level employees. They are also divided in to administrative and technical groups. Subordinate groups fall under the category of assistant level from level 1 to 5.

As per the function of subordinate level employees it cannot be considered low as given in the organization. It seems that 1 to 4 level employees are purely administrative assistants, whereas from 5th level to 8th level employees they are the ones who are the main body to provide the input to the top level management. Although some services like ATS services particularly Air Traffic Control starts from 7th level directly. It mean that 5 to 8 level employees of CAAN are the backbone. Subordinates assist the top & middle management directly & indirectly. The quality of the work of higher levels depends upon the work of its subordinate staffs.

Subordinates have tot be trained and skillful as they are responsible for keeping records and giving inputs to the management .

Therefore employees have the responsibility and obligations to fulfill the organizational goal, they are not only responsibility to implement government policy in CAAN, they have to have well knowledge of their own profession in CAAN.

The subordinate level employees have to demonstrate their capability fulfilling the objective of CAAN and expectation of higher level management.

In CAAN the structure is the traditional hierarchical top down set up which builds on rules and procedures rather than result oriented and change. It provided to some extent job security and stability but absence of clear-cut will define job description regarding duties, responsibilities and accountabilities. It has the same set up of long procedures for decision making, lack of effective mechanism of grievance handling and many others. The structure is made up to solve the administrative problems in the customary way and not to change to achieve organizational goal which is rather safe, regular, economic and effective air transportation. The persons are not placed in the principle of right man in the right job. Without clear job description trained manpower are placed in the wrong place and work environment. Delegation of Authority with duties and responsibilities make people more responsive and work harder but delegation and decentralization are not implemented in CAAN. From the top level, preparedness to delegate is lacking by the and lower staffs are always overloaded and trained and qualified manpower are neglected.

There is also the tendency of the political influence that by someway or the other political worker or supporter enter in the organization and dictate the terms for the works making the organizational goal in jeopardy.

The way to develop and strengthen CAAN is to increase the productivity of the employee by have, new and modern organization structure. It should be guided by policy and plans. The organizations' mission, vision and goal should be clear for rank and file of the organization. Reduction or complete removal of nepotism, favoritism, corruptive practices and any other discrepancies in the organization is vital. Proper supervision, continuous monitoring and feedback mechanism should be developed. Work environment and tasks should match with the changing technology. Emphasis should be given to human machine inter-phase, commitment to performance, loyalty to the organization, treating people as a whole and proactive approach. Above all political and/or leadership commitment is the most important factor to sustain CAAN.

On the whole CAAN should encourage adequate decentralization, unity of command and line of responsibility clearly to its employees Channel of communication should be free and easy, Span of control should be legitimate not too wide and not too narrow without split in line of control. The functional level of the organization chart should be arranged with proper authority matching the tasks. The organization chart should avoid overlapping of function and authority. The organizational tree should be living vehicle for moving up and forward for the employees for career development.