Final Report

International Civil Aviation Organisation
Cooperative Development of Operational Safety and Continuing Airworthiness Programme for the South Asia region

ICAO COSCAP-SA Aviation Medicine Missions:
16 February – 02 March 2008; and
10 January – 30 January 2009.

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Introduction

The International Civil Aviation Organisation (ICAO) contracting States of the South Asian Association for Regional Cooperation (SAARC - Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka) identified regulatory aviation medicine as a focus area for technical assistance effort. In response to the need identified by the SAARC States the ICAO Cooperative Development of Operational Safety and Continuing Airworthiness Programme for the South Asia region (COSCAP-SA) undertook a project to provide aviation medicine technical assistance to the SAARC States.

This project was undertaken during calendar years 2008 and 2009 under the auspices of the ICAO COSCAP-SA, and was funded through the International Financial Facility for Aviation Safety (IFFAS). The ICAO Technical Co-operation Bureau (TCB) administers COSCAP-SA, while the ICAO Air Transport Bureau (ATB) administers IFFAS.

The aviation medicine technical assistance of this COSCAP-SA project was undertaken primarily during the periods 16 February – 01 March 2008 and 10 – 30 January 2009. During the first of these periods the two appointed Aviation Medicine Experts, Dr Jarnail Singh and Dr Dougal Watson, visited India and Pakistan to provide aviation medical technical assistance. During the second of these periods the two experts visited Sri Lanka, Bangladesh, and Nepal to provide aviation medical technical assistance.

Method

As part of the first phase of the project the two aviation medicine experts visited Delhi, India during the week 16 – 22 February 2008, and Karachi, Pakistan during the week 23 February – 01 March 2008.

For the second phase of the project the two experts visited Colombo, Sri Lanka during 11 – 16 January 2009; Dhaka, Bangladesh during 16 – 22 January 2009; and Kathmandu, Nepal during 22 – 28 January 2009.

Each visit included a two-day regulatory aviation medicine seminar / workshop as well as several days of discussions and meetings with local civil aviation medicine stakeholders. In

Pakistan, the seminar was augmented to incorporate additional material concerning Pandemic Preparedness planning in the aviation sector.

Results, Discussion, & Recommendations

States from the SA region are each discussed below in sections sorted in alphabetical order by State name (Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka) and followed by a section concerning ICAO / COSCAP-SA and all States of the SA region. Each section contains observations and recommendations concerning the State or ICAO / COSCAP-SA, and each section starts on a new page.

Bangladesh

Bangladesh was visited during these COSCAP-SA missions.

In Bangladesh the aviation medicine experts:

- Ran a two-day regulatory aviation medicine seminar;
- Met with and interviewed a variety of people with an interest in the Bangladeshi civil aviation system;
- Worked through the medical items in the ICAO USOAP checklist with Civil Aviation Authority (CAA-Bangladesh) personnel;
- Updated CAA-Bangladesh personnel on ICAO medical provisions; and
- Reviewed the Bangladeshi civil aviation medical legislation and guidance material.

After leaving Bangladesh, the experts continued to provide (via email) information and advice to CAA-Bangladesh and other personnel.

Civil Regulatory Aviation Medicine Seminar in Bangladesh

Bangladesh hosted a very successful two-day aviation medicine seminar in Dhaka on 20 – 21 January 2009. Participants included personnel from the Bangladesh Civil Aviation Authority (CAA-Bangladesh), the airlines, the air force, individual medical examiners, and personnel involved with regulatory aeromedicine in the Maldives. 20 - 30 people, plus the two aviation medicine experts, attended the two-day seminar.

Attendees at the CAA-Bangladesh included relatively few medical practitioners and a wide range of operational personnel from the armed forces, civilian operators, and the staff of the regulatory authority.

The Civil Regulatory Aviation Medicine System in Bangladesh

In Bangladesh the Civil Aviation Authority (CAA-Bangladesh) is the organisation with responsibility for the civil aviation medical regulatory system (aeromedical system). CAA – Bangladesh is answerable to the Ministry of Civil Aviation and Tourism.

CAA – Bangladesh has no Chief Medical Officer (CMO) on staff, the medical assessment system is managed and administered by non-medical personnel, and the Medical Examiner and Assessor functions are performed by uniformed military medical personnel within a

military medical facility. Access to the medical facility was not provided to the experts and only one of the military medical officers involved in the civil medical assessment system attended the seminar and spoke with the experts.

CAA-Bangladesh has approximately 1,000 licences on issue where periodic medical assessment is required. At the start of 2009 there were 301 PPLs, 432 CPLs, 293 ATPLs, 54 Flight Examiner Licences, and 58 Flight Operations Officer Licences on issue, as well as 695 Instrument Ratings to the various pilots. Less than half of these were considered current and valid at the time the experts visited Bangladesh: 18 PPLs, 144 CPLs, and 235 ATPLs. Air Traffic Controllers are not subjected to periodic medical assessment by CAA-Bangladesh, although the experts were advised that this practice was being changed via legislative amendments[1]. The PPLs on issue were noted to be primarily people in training and on their way to become CPL / ATPL holders, as there is virtually no private recreational aviation activity in Bangladesh.

Legislation

The primary legislative basis for the Bangladesh civil aviation aeromedical regulatory system is found in the Civil Aviation Ordinance (XXXII) of 1960 (1985 amendment). The secondary legislation is contained in the Civil Aviation Rules of 1984 (CAR84, 2003 amendment).

The CAA – Bangladesh medical standards are incorporated into CAR84 (parts 51 - 54). The medical legislation is augmented by additional provisions in Air Navigation Orders (e.g. ANO OPS 5 – Validity of Licence / Ratings).

CAA – Bangladesh personnel noted that a revision of CAR84 had been underway but that the draft new CAR had not yet passed through the necessary legislative processes. CAA – Bangladesh personnel provided a softcopy of the draft new CAR (Part 1), but were unable to advise any likely time frame for passage of the new draft CAR through the legislative processes. Parts 51 – 54 of the draft CAR contained the medical provisions and these were noted by the experts to be more compliant with the ICAO Annex 1 requirements than the current CAR84.

1. It was also noted that the current version of CAR84 (2003 amendment) contained, at Part 51(2)(c) a provision specifying Class 3 Medical Assessment for the holders of ATC Licences.

Structure

At the operational level CAA-Bangladesh's aeromedical system is being run by Bangladesh Air Force medical personnel. CAA-Bangladesh has no medical personnel on staff and there are no private sector Medical Examiners or Medical Assessors in Bangladesh.

A 21 November 2004 letter from the CAA-Bangladesh Director of Flight Safety & Regulations, documents six military medical officers having been designated as "accredited medical examiners" for the purpose of medical assessment of personnel required under the Rules.

Different combinations of military medical personnel perform the various Medical Examiner and Medical Assessor (per Annex definitions) roles for CAA-Bangladesh.

Observations

A number of matters were observed where changes might be made that may result in regulatory aeromedical improvements.

1. Responsibility for the Bangladesh civil aeromedical assessment system

While it was apparent that the Bangladesh military performed the operational roles of the CAA-Bangladesh aeromedical system there appeared to be very little management control or responsibility for the system assumed by CAA-Bangladesh personnel. It may be that this apparent absence of management and oversight has been contributory to some of the issues discussed in the following sections concerning Bangladesh.

The Bangladesh medical assessment system is run by Bangladesh military medical personnel. There are no civil sector alternatives to examination and assessment by military medical personnel. Those military personnel rely primarily on the legislation and other correspondence passed to them from CAA-Bangladesh.

Many of the people who spoke with the experts identified the Bangladesh medical system as being cumbersome, unresponsive, inefficient, and out of date. The aviation operational personnel wanted a more efficient system delivering more modern and up-to-date medical assessment outcomes. CAA-Bangladesh personnel wanted their system to be ICAO compliant and efficient. The military personnel also wanted the system to be efficient and up-to-date.

The interested parties appeared to differ only in their views on who was, or should be responsible, for the current situation and for the changes that are needed.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 1.1 Ensure that there are CAA-Bangladesh personnel with clear responsibility for the management and oversight of the medical assessment system.

2. Lack of medical resources within CAA-Bangladesh

CAA-Bangladesh has no in-house aeromedical capability. CAA-Bangladesh is entirely dependent on the Bangladesh military for any aeromedical advice and opinion. There are no medical personnel involved in CAA-Bangladesh's management of their medical assessment system.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 2.1 Seek to engage the services of a suitably qualified aeromedical specialist to provide advice and possibly a centralised medical assessment function.

3. Medical assessment outcomes

The seminar attendees, and others who spoke with the experts, appeared unanimous that the Bangladesh medical assessment system operated in an unnecessarily conservative and restrictive way. Some identified the reason for this as being the understandable inclination for military medical officers to assess personnel to military standards. Others identified the reason as being inadequate oversight of the medical assessment system by CAA-Bangladesh, and still others the inadequate indoctrination and ongoing training of the military medical personnel for their civil aeromedical assessment responsibilities.

No-one appeared to be happy with the current system and there was almost universal agreement that CAA-Bangladesh should: establish an in-house aeromedical capability; ensure relevant initial and periodic refresher training of that person; and shift the medical assessment role to that person. Several people suggested that the size and complexity of the Bangladesh civil aeromedical responsibility was unlikely to justify CAA-Bangladesh establishing a full-time position, and further suggested that a suitable initial step might be to pursue an agreement with the military to access, at CAA-Bangladesh Headquarters, the services of one of the senior military aeromedical specialists.

The experts saw the change suggested as being a logical step in the progression from military to civil management of the civil aeromedical system, and noted that such a progression was found in the histories of many States. The system proposed (military officer on secondment to CAA-Bangladesh) is very similar to the system presently employed in India.

Some suggested that a non-military aeromedicine specialist should be hired and trained for the purpose but the experts had trouble in obtaining information about anyone who might be suitable, except perhaps the current Chief Medical Officer with Biman Airlines.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 3.1 Seek to establish an in-house aeromedical medical officer position to provide, among other things, a centralised medical assessment capability.

This position could be filled on a part-time or full-time basis depending on the scope of the position's roles and responsibilities.

BD 3.2 Establish initial and ongoing CAA-funded training for the aeromedical medical officer position to ensure that their aeromedical and regulatory knowledge is up-to-date.

BD 3.2 Considers approaching the Bangladesh Armed Forces to ascertain whether it would be possible and practical to fill a CAA-Bangladesh aeromedical medical officer position via the secondment of a senior military medical officer trained and experienced in aeromedicine.

4. Single-source provision of examination services for civil medical assessment

The Bangladesh medical assessment system relies on medical examinations undertaken only by military medial officers. The required further tests and investigations, as well as specialist consultations, are requested by the military medical officers either via the local military hospital or other external medical facilities used by the military.

Many of the operational personnel interviewed suggested that the current system was inefficient and very demanding of their time. Contrary views were heard as to whether specific-time appointments were available to applicants or whether applicants arrived at the facility and awaited the availability of the required personnel. Additional difficulties were

noted for applicants who were not Bangladeshi citizens as access to the military facility was not easily available to others (as was the experience of the experts during this visit).

The Chief Medical Officer of Biman suggested that the current military-run system presented further unnecessary expenses. The Biman aeromedical centre was already resourced to undertake many of the investigations required but was unable to do so. The investigation costing arrangements, between the military and external service providers, were at least 25% more expensive than similar contracts negotiated by Biman. During a visit to the Biman Aeromedical Centre the experts noted a greatly underutilized resource.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 4.1 Expand their medical examiner role so that suitably trained non-military medical personnel can also become Medical Examiners;

BD 4.2 Work with Biman to establish a civil aviation medical examiner function within the Biman Aeromedical Centre.

The Chief Medical Officer of Biman has probably already undertaken adequate initial aeromedical training for the purpose. Biman may also see economic benefit in offering suitable external training to one or more of their younger junior doctors.

The potential conflicts of interest (employer undertaking regulatory medical examinations of employees) can be managed through: Training and indoctrination of the Biman medical personnel; Close supervision by CAA-Bangladesh; and the establishing of a central CAA-Bangladesh medical assessment function (See sections 2 and 3 above).

5. Legislative system

The Bangladesh medical standards are contained in an item of secondary legislation that requires involvement of the government legislature to implement change. This legislative structure is employed by many States. One advantage of such a system is that any changes are given a very through consideration by the State's lawmaking authorities. One disadvantage is that it is very difficult and time consuming to implement even minor changes.

The difficulty in making changes leads to a slowness in responding to any changes in the Annex 1 provisions. Other Sates in the SA region have addressed this issue in two notable

ways. Sri Lanka has incorporated the Annex 1 provisions into their legislation by reference. This way changes to Annex 1 are semi-automatically carried into the Sri Lankan medical assessment system. The Nepali legislation is structured so that the Director of Civil Aviation is able to issue the medical standards, and the medical manual. This allows operational changes to be made to the medical assessment system in less time.

Even if the medical standards were kept within CAR84 there is an additional layer of adaptability offered via the provision of medical guidance material and the use of formal flexibility in aeromedical assessment (1.2.4.8).

Such guidance material (e.g. a Medical Manual) could be beneficial in that it encourages uniformity of medical examination practices and medical assessment decisions, and in that it can be more readily amended and updated than a Rule or Regulation.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 5.1 Consider the possibility of moving some of the medical provisions (including the medical standards) to lower levels of legislation that are more readily changed;

BD 5.2 Adopt the ICAO Manual of Civil Aviation Medicine (Doc 8984 and the 'draft' chapter updates and newer chapters) as the basis of an aeromedical guidance material document for Medical Examiners and Assessor(s).

6. Frequency and content of medical examinations

Some difficulty was experienced in clarifying the exact nature and frequency of the medical examinations undertaken by Bangladeshi aircrew. The impression was that professional aircrew underwent a basic examination and assessment every six months and then a more thorough "Board" examination / assessment every two years. Both the basic and "Board" examinations were undertaken by personnel at the military aeromedical centre.

Discussions suggested that at the time of each examination the applicant is required to undergo: fasting blood glucose; HbA1c; Full/Complete Blood Count; Urea/Creatinine and electrolytes, Syphilis and HIV serology. Resting ECGs are required 2-yearly for applicants under 40 years of age, annually for 40 – 50 year old applicants, and 6-monthly for applicants

over 50 years of age. Audiometry is required 5-yearly up to 40 years of age and 3-yearly thereafter. Chest radiography (x-ray) is required every two years.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 6.1 Revise the frequency / periodicity requirements for medical examination / assessment to comply with the Annex 1 provisions (1.2.5);

BD 6.2 Review the routine examination test requirements to comply with the Annex 1 provisions, and to only include additional tests that are necessary for aviation safety purposes.

Chest radiography should be performed as part of an initial examination (6.3.2.9.1) and, given the prevalence of pulmonary infective disease in Bangladesh, would be reasonable to perform periodically (Note to 6.3.2.9.1). However, it may be questionable whether two-yearly is an appropriate frequency for re-examination chest radiography.

Little safety relevance could be found in periodic HIV, and even less so syphilis, serology for civilian aircrew.

Routine periodic HbA1c assay did not appear to be a reasonable deployment of medical resources when a fasting blood glucose assay was routinely undertaken.

7. Handling and security of medical information

CAA-Bangladesh has no medical personnel on staff. CAA-Bangladesh has no administrative personnel specially trained in the handling of medical information. The medical information of Bangladesh pilots (etc) are maintained along with the general pilots' files and is not afforded any special protection or handling.

The handling of applicant medical information by CAA-Bangladesh may be in contravention to domestic medical ethics provisions. The handling of applicant medical information by CAA-Bangladesh is probably not compliant with Annex 1 provisions 1.2.4.9, 1.2.4.9.1, and 1.2.4.9.2.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 7.1 Implement measures to ensure that medical confidentiality is respected at all times (1.2.4.9).

BD 7.2 Change the structure and storage of their pilot files to ensure that medical records are securely held with accessibility restricted to authorized personnel (1.2.4.9.1).

A number of relatively simple steps could be implemented to achieve this. The medical information for each applicant should be separated into a different file, and those files should be stored in locked cabinets in a separate location to the main files. In-house procedures should be changed so that the only medical information routinely passed to the non-medical personnel within the CAA-Bangladesh Personnel Licensing Department is the medical assessment form, stating only the pass-fail status and any medical conditions, restrictions, or limitations that need to be applied to the licence.

BD 7.3 Empower their medical assessor (See **BD 1**, **2**, and **3**) with the responsibility of determining the extent to which pertinent medical information is presented to other officials of CAA-Bangladesh (1.2.4.9.2).

An administrative assistant to the Medical Assessor could also be charged with the safe keeping of a key to the medical files so that access can be achieved by non-medical personnel, with the approval of the Medical Assessor but without their needing to be present in person.

8. The role of "DMS"

All of the medical examinations / assessments that are completed by the military aeromedical personnel are approved by a military officer designated as "DMS" (Likely Director of Medical Services). DMS is usually a senior army medical officer and is unlikely to have undertaken any aeromedical training.

Advice was received that the DMS approval was largely an administrative one, but also that DMS did occasionally reject an examination / assessment. The fact that DMS could, and did, reject examinations / assessments suggested that DMS (with no aeromedical training) may actually be acting as a Medical Assessor as defined in Annex 1.

While it is perfectly acceptable for the Bangladesh military to implement their own quality control and chain-of-command approval procedures for work that is undertaken by their

personnel, it would be useful to ensure that DMS's approval role is clearly a military administrative step and not in any way a medical assessor (per ICAO Annex 1) function.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 8.1 Ensure that the scope of DMS approval of examinations / assessments undertaken by military aeromedical personnel is not at risk of being interpreted as being a medical assessment.

9. Air Traffic Controllers and Class 3 medical assessment

The experts received advice that Bangladeshi Air Traffic Controllers did not currently require periodic CAA-Bangladesh medical assessment. Review of the current Bangladeshi Civil Aviation Rules (CAR84) suggests that there is a legislative requirement, and Class 3 medical standards, for the periodic regulatory medical assessment of air Traffic Controllers. The draft replacement Civil Aviation Rules also contain a requirement for ATCs to hold Class 3 medical assessments, and the Class 3 medical standards in the draft CAR84 are more compliant with similar ICAO provisions.

It appears that CAA-Bangladesh is not fully implementing the requirement for Bangladeshi Air Traffic Controllers to hold a Class 3 medial assessment, despite enabling provisions in the legislation.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 9.1 Implement a requirement for periodic Class 3 medical assessment of Air Traffic Controllers consistent with the current ICAO Annex 1 provisions; and

BD 9.2 Use Class 3 medical standards that are consistent with the current ICAO Annex 1 provisions.

10. Conservative medical assessment decisions and flexibility

The requirements and guidance material provided to the military medical personnel by CAA-Bangladesh do not encourage the further (1.2.4.8 flexibility) consideration of applicants who fail to meet the medical standards.

It was apparent that the military medical personnel were well trained in aviation medicine, and their contribution to case discussions during the seminars showed that they were relatively adept and able to take a flexible risk-management approach to aeromedical decision-making. It was also apparent that those military medical personnel felt constrained by the requirements and guidance (or lack thereof) that CAA-Bangladesh had provided them.

Recommendations (Bangladesh)

It is recommended that CAA-Bangladesh:

BD 10.1 Adopt the ICAO Manual of Civil Aviation Medicine (Doc 8984 and the 'draft' chapter updates and newer chapters) as the basis of an aeromedical guidance material document for Medical Examiners and Assessor(s).

BD 10.2 Establish a method for further considering applicants who fail to meet the medical standards (per 1.2.4.8 flexibility).

A relatively simple way to formalise such an arrangement would be for the Medical Assessor to refer all cases who cannot be assessed as meeting the medical standards to a "Board" for flexibility considerations, and for the Medical Manual to be used as a guide for both the application of the medical standards and the formal provision of flexibility.

Bhutan

Bhutan was not visited during these COSCAP-SA missions. No personnel from the Bhutan civil aviation regulatory authority attended any of the seminars held in India, Pakistan, Sri Lanka, Bangladesh, or Nepal during this project.

No information was obtained concerning the Bhutan civil aviation medical regulatory system.

India

India was visited during this COSCAP-SA mission.

In India the Aviation Medicine experts:

- Ran a two-day regulatory aviation medicine seminar;
- Met with and interviewed a variety of people with an interest in the Indian civil aviation system;
- Worked through some of the medical items in the ICAO USOAP check-list with Directorate General of Civil Aviation (DGCA-India) personnel;
- Updated DGCA-India personnel on ICAO medical provisions; and
- Reviewed the Indian civil aviation medical legislation and guidance material.

After leaving India the experts continued to provide (via email) information and advice to DGCA-India and other personnel.

Civil Regulatory Aviation Medicine Seminar in India

India hosted a very successful two-day aviation medicine seminar in Delhi on 20 – 21 February 2008. Participants included personnel from the Directorate General of Civil Aviation (DGCA-India), the airlines, individual medical examiners, the hospitals involved in medical examination of applicants, and personnel involved with regulatory aeromedicine in Bangladesh and the Maldives.

The two-day aviation medicine seminar was attended by 30 - 40 people, as well as the 2 aviation medicine experts.

The Civil Regulatory Aviation Medicine System in India

In India the Directorate General of Civil Aviation (DGCA-India) is the organisation with responsibility for the civil aviation medical regulatory system (aeromedical system). The current Chief Medical Officer (CMO) is an Indian Air Force (IAF) Group Captain aerospace medicine specialist on secondment / posting to DGCA-India. Previous CMOs have also been senior IAF aerospace medicine specialist medical officers. The CMO's position title is Director of Medical Services (Civil Aviation). Other than the CMO, there are no staff medical officers at DGCA-India, and the current incumbent is directly supported by a small group of

administrative staff. There is no formal civilian aviation medicine training required of, or provided to, the CMO.

During 2007 DGCA-India issued approximately 12,000 medical assessments (approximately 43% Class 1 and 57% Class 2), of which approximately 9,500 were initial assessments (approximately 30% Class 1 and 70% Class 2). Class 3 medical assessments are issued directly to applicants by Medical Examiners and not by DGCA. Approximately 6000 initial medical assessments were issued during 2006, 2500 during 2005, and several hundred during each of the previous several years. The 2008 initial medical assessment numbers are likely to exceed those of 2007.

Legislation

The legislative basis for the Indian civil aviation aeromedical regulatory system is found primarily in Rule 39B of the Aircraft Rules 1937. This requirement is implemented through a variety of additional legislation, including:

- Government of India, Office of Director General of Civil Aviation, Civil Aviation Requirements, Section 7 – Flight Crew standards, Series 'C', Part 1, "Medical requirements and Examination for flight crew licences and ratings", Issued 26 August 1999, current amendment (Rev 5) 04 July 2007 (CAR 7);
- Five Aeronautical Information Circulars (AICs) - AIC 5/2007 Disposal Post Abdominal Surgery Cases; AIC 4/2007 Chronic Obstructive Pulmonary Disease and Asthma (COPD); AIC 3/2007 Diabetes Mellitus; AIC 4/1995 Periodic Stress test and Biochemical Profiles of flight crew; & AIC 28/1999 Disposal of cases of Ischaemic Heart Disease; and
- One flight crew licensing circular (No. 1/2000) titled "Flying by Pilots having Medical Restrictions".

This legislation is supported by a 2005 "Handbook on Medical Assessment of Civil Flight Crew in India", a number of forms, and various other items of guidance material that can be accessed from the DGCA-India website (www.dgca.gov.in).

Structure

At a basic level DGCA-India's aeromedical system comprises a number of people and institutions that act as *medical examiners* (per ICAO Annex 1 definition) with the DGCA

CMO (Director of Medical Services (Civil Aviation)) providing a centralised *medical assessor* (per ICAO Annex 1 definition) function[2].

The medical examiners are divided broadly into two groups:

- Those that are able to perform only Class 2 and 3 examinations (50 – 70 in number); and
- Those that are able to perform Class 1, as well as Class 2 and 3, examinations (15).

The medical examiners for Class 1 medical assessments are further divided into several overlapping subgroups based on which medical examinations (e.g. initial issue, renewal, fourth yearly renewal, lapsed for two year etc) they are authorised to perform. These aspects of the DGCA-India aeromedical system is prescribed in section 3 of CAR 7.

The medical examiners that are only able to perform Class 2 and 3 medical examinations are individual medical practitioners in private practice who are approved for that purpose by DGCA-India. The remainder of the medical examiner function is undertaken by institutions, a combination of 12 Indian Air Force medical facilities and 3 private, or *corporate*, hospitals. Two institutions, the Air Force Central Medical Establishment (New Delhi) and the Air Force Institute of Aerospace Medicine (Bangalore), are authorised to perform all of the Class 1 medical examination types specified in CAR 7.

Six institutions, three Indian Air Force facilities and three private hospitals, are authorised to perform the medical examinations for initial issue Class 1 medical assessments. DGCA-India anticipates that the three private hospitals will soon also be able to perform the medical examinations for Class 1 renewal medical assessments.

Observations

A number of matters were observed where changes might be made that may result in regulatory aeromedical improvements.

2. This is the case with the exception of Class 3 medical assessments. For Class 3 medical assessments the Medical Examiners also act as Medical Assessors and issue the medical assessments directly to the applicant. DGCA is not directly involved in these assessments unless the Medical Examiner seeks advice or assistance.

1. Regulatory philosophy

The medical personnel of DGCA-India take a somewhat holistic view of their regulatory role. Interviews with various personnel suggest that local airline economics and recruiting can play a role in the approach to medical assessment: "If you have a licence you will get a job" and "the airline is an integral part of the nation … and so we have a responsibility to support the airline". DGCA's medical personnel also viewed their responsibilities in a social context: "If you get a licence today you must be fit for the next 10 – 15 years".

As a result the role of DGCA-India's aeromedical assessment function appears to extend beyond that which is seen in most states. Where many regulatory authorities would see themselves as being quite separate from the needs or desires of the State airlines, and would see their aeromedical assessments as relating solely to the applicant's medical "fitness" to fly during the assessment period, DGCA-India appears to see their role, in-part, as part of the supply chain for these airlines. This "dual" role of being the regulator and employer has the potential to result in a conflict of interest with regard to the aeromedical decisions being made. In this context, it is to be noted that an employment decision carries with it many more considerations that are socio-economic rather than aeromedical in nature. Purely regulatory aeromedical decision making, on the other hand, adopts a risk management approach and caters only to flight safety concerns.

It is to be noted that at no time was any activity or decision-making observed that might suggest that safety was compromised through this philosophy.

<u>Recommendations (India)</u>

It is recommended that:

> **IN 1.1** The DGCA-India aeromedical decision-making process should assume a regulatory philosophy and that the socio-economic concerns pertaining to employability / employment decisions are left to the applicants and the airlines;
>
> **IN 1.2** Consideration is given to the induction training of seconded Indian Air Force doctors to DGCA-India, possibly with the support of international civil aviation regulatory authorities, to familiarise those new personnel with civil regulatory aeromedical practices and principles.

2. Workload changes over time

The growth of India's civil aviation sector has been phenomenal over recent years. It is inconceivable that the same single medical officer position is able to cope with the 30 - 50 fold workload increase in medical assessment throughput without some aspect of their duties suffering.

Recommendations (India)

It is recommended that DGCA-India:

IN 2.1 Review their medical staffing requirements in the context of the growth of India's aviation industry;

IN 2.2 Consider induction training of seconded Indian Air Force doctors to DGCA-India, possibly with the support of international civil aviation regulatory authorities, to familiarise those new personnel with civil regulatory aeromedical practices and principles.

IN 2.3 Review some of their medical assessment practices and standards, as described below, in an effort to both increase ICAO compliance and to reduce unnecessary DMS workload.

3. Medical Standards and related practices

Some of India's medical assessments are for a 6-months period of validity whereas the ICAO equivalent is 12-months. Aligning medical assessment validity periods with the Annex 1 provisions would also reduce DGCA's medical assessment workload.

DGCA-India continues to require routine EEGs of aircrew applicants. As far as the authors are aware India is in the minority of States that follow this practice, and ICAO does not recommend routine EEGs

The authors are not aware of a convincing, high quality, literature base to support the screening use of EEGs in an otherwise healthy population such as aircrew applicants.

Removal of the EEG requirement would improve compliance with ICAO provisions, would reduce medical assessment compliance costs, and would reduce overall administrative workload. There is no convincing evidence to suggest that removal of the requirement for a screening EEG would lead to any aviation safety reduction.

DGCA-India handles the medical assessment of Air Traffic Controller personnel, who require Class 3 medical assessments, in a different way to pilots and applies a different level of oversight. The SARPS in Annex 1 describe a similar system for the medical assessment of Air Traffic Controllers as for private and professional pilots, although using different medical standards for each group.

Recommendations (India)

It is recommended that DGCA-India's regulatory medical standards and practices be more closely aligned with the provisions of the ICAO SARPS. In particular it is recommended that:

IN 3.1 The periods of validity of medical assessments (in particular Class 1 assessments) be adjusted in accordance with Annex 1 [SARP reference];

IN 3.2 DGCA-India critically reviews the requirement for an EEG to be undertaken as a part of initial Class 1 medical examinations (CARs 7 series C part 1 2.6.1), with a view to the possibility of removing that requirement.

IN 3.3 It is recommended that DGCA-India review their regulatory practices to align the oversight procedures of the medical assessment of Air Traffic Controller personnel with those of pilots. Doing this will, in turn, result in similar systems, but applying different medical standards, for the medical assessment of Air Traffic Controllers, Professional Pilots, and Private Pilots.

4. Access to up-to-date aeromedical information

Discussion with DGCA-India personnel suggested that even though the Indian civil aviation medical personnel (including uniformed medical personnel on posting / secondment to DGCA) are very highly trained in the field of aviation medicine, this training is normally acquired in the context of military operations and they have limited appreciation of, and access to, the most up-to-date information in the field of civil regulatory requirements, processes and procedures.

Recommendations (India)

It is recommended that:

IN 4.1 DGCA-India, perhaps in liaison with ICAO COSCAP-SA, increase efforts to provide their Chief Medical Officer (DMS DGCA) with access to current and up-to-date aeromedical knowledge and other information.

This could be achieved, in part, by inviting international speakers from other major civil aviation regulatory authorities to local aviation medical conferences and / or by regularly sending DGCA-India medical personnel to the major international aviation medicine conferences.

5. Access to up-to-date ICAO provisions

Discussion with DGCA-India personnel suggested that their Medical Services were not always as up-to-date on ICAO provisions as might be desirable. They were not aware of many of the changes of the recent several amendments to Annex 1.

Recommendations (India)

It is recommended that:

IN 5.1 DGCA-India establish processes to ensure that ICAO amendments of medical relevance are communicated to DGCA-India medical personnel.

6. Training and quality assurance for Medical Examiners

India has military aviation medicine training programs but no civil equivalents. Most of the current Medical Examiners in India have gained their aviation medicine training via the armed forces and / or via additional overseas specialty training.

The system for certificating Medical Examiners, and the quality control systems applied to the work of those Medical Examiners, was not discussed in detail with DGCA-India personnel. While the excellence of the local military aviation medicine training was regularly noted by interviewees, the absence of local training directly suitable for civilian Medical Examiners, covering relevant aviation medicine and related regulatory functions and responsibilities, was also mentioned by many.

The provisions under discussion in the subsequent ICAO State Letter AN 5/22-08/33 of 05 May 2008 are worthy of note in this context. The proposed changes to Annex 1, especially 1.2.4.4.3 and 1.2.4.7.1, will place a direct responsibility upon the medical assessor (often the senior medical personnel of the regulatory authority) for the quality assurance of medical examiners, ensuring that they comply with applicable requirements.

Recommendations (India)

It is recommended that DGCA-India review ICAO State Letter AN 5/22-08/33 in the context of both:

IN 6.1 The roles and responsibilities of DGCA-India medical personnel; and

IN 6.2 Opportunities to encourage the development of local or regional aviation medical training as well as mutual-support and information-sharing structures.

The issue of developing a regional committee or 'board' of CMOs and aeromedical experts is also discussed in the "ICAO, COSCAP-SA, and all SA regional civil aviation regulatory authorities" section below and is subject to recommendation **COSCAP 1** and, less directly, recommendation **COSCAP 2**.

Maldives

Maldives was not visited during these COSCAP-SA missions. One civilian medical practitioner from the Maldives attended the seminar held in Delhi, India and one armed forces medical practitioner attended the seminar held in Colombo, Sri Lanka.

No information was obtained concerning the Maldives civil aviation medical regulatory system other than that it catered to approximately 300 pilots and utilised the services of five medical examiners.

Nepal

Nepal was visited during these COSCAP-SA missions.

In Nepal the aviation Medicine experts:

- Ran a two-day regulatory aviation medicine seminar;
- Met with and interviewed a variety of people with an interest in the Nepali civil aviation system;
- Worked through the medical items in the ICAO USOAP check-list with Civil Aviation Authority (CAA-Nepal) personnel;
- Updated CAA-Nepal personnel on ICAO medical provisions and recent changes; and
- Reviewed the Nepali civil aviation medical legislation and guidance material.

After leaving Nepal the experts:

- Continued to provide, via email, information and advice to CAA-Nepal and other personnel;
- Drafted a set of medical standards for CAA-Nepal that were compliant with all ICAO Annex 1 provisions, and forwarded a soft-copy via email; and
- Revised the CAA-Nepal Medical Manual and forwarded a soft-copy via email.

Civil Regulatory Aviation Medicine Seminar in Nepal

Nepal hosted a very successful two-day aviation medicine seminar in Kathmandu on 23 and 25 January 2009. Participants included personnel from the Nepal Civil Aviation Authority (CAA-Nepal), medical examiners, and a small number of operational personnel.

The two-day aviation medicine seminar was attended by 15 - 20 people, as well as the 2 aviation medicine experts.

The Civil Regulatory Aviation Medicine System in Nepal

In Nepal the Civil Aviation Authority (CAA-Nepal) is the organisation with responsibility for the civil aviation medical regulatory system (aeromedical system).

CAA – Nepal has no Chief Medical Officer (CMO) staff position, and the Nepali medical assessment system is managed and administered by non-medical personnel. CAA-Nepal has

recently engaged the part-time services of a medical officer, with aviation medicine training, who replaces another similar part-time incumbent.

CAA-Nepal regulates a system with approximately 300 CPL / ATPL holders, several PPL holders (until recently only two - The King and his son), approximately 150 ATC licence holders, 200 – 300 AME engineers, and a number of Flight Attendants. There is virtually no *ab initio* pilot training in Nepal, with most pilots receiving their training overseas and obtaining conversions / type ratings upon coming to Nepal.

The CAA-Nepal medical system periodically examines and assesses the pilots and air traffic controllers. The AME engineers undergo an initial medical assessment but no subsequent periodic CAA-Nepal regulated medical examinations. Changes are currently underway so that Flight Attendants will be licensed by CAA-Nepal and will be required to undergo periodic medical examinations and assessments.

The Nepali civil aviation regulatory medical system utilises the services of sixteen private-practice Medical Examiners: five constituting a "Physical & Mental Examination Group"; six an "Ear, Nose & Throat and Hearing Group"; and five an "Eye Examination, Vision, and Colour Perception Group".

Legislation

The primary legislative basis for the Nepali civil aviation aeromedical regulatory system is found in the Civil Aviation Authority of Nepal Act 2053 BS (1997 AD) as amended, and the secondary legislation is contained in the Civil Aviation Regulations 2058 BS (2002 AD) (CAR). Most of the operational medical legislation, including the medical standards, is contained in a Medical Manual, issued by the Director General of Civil Aviation under authority of rule 82 of the CARs.

The current version of the CAA-Nepal Medical Manual is the second edition, dated 11 July 2004, which replaced the March 2000 first edition. The current Medical Manual contains three parts: Policies and procedures for medical examination and assessment; Medical standards of licensing requirements; and Guidelines on Medical Conditions. The provisions in the Medical Manual are modelled on the Annex 1 provisions of the time, subject to local modification.

At the time of the experts' visit to Nepal a new 2009 *Personnel Licensing Requirements* (PELR) document, issued by the Director General of Civil Aviation under authority of rule 82

of the CARs, was coming into force. Sections 25 – 40 of Part 1 of the new PELR document relate to the regulatory medical system.

Structure

CAA-Nepal's aeromedical system comprises sixteen medical practitioners, in private practice, who undertake the *medical examiner* and *medical assessor* functions (per ICAO Annex 1 definitions, but with an unusual subdivision as detailed below), a part-time medical adviser / coordinator, as well as management and administrative support from non-medical CAA personnel.

The roles of the medical examiners/assessors are divided into three subcategories: Physical & Mental Examination; Ear, Nose & Throat and Hearing; and Eye Examination, Vision, and Colour Perception. Within each of these groups, the responsible medical examiner undertakes the examination of the applicant and the assessment as to whether the applicant meets the relevant subsection of the medical standards (Physical/Mental, ENT/Hearing, or Vision).

The applicant is required to attend one of each of the three groups of medical examiner for each examination / assessment. The CAA nominates which medical examiners an applicant sees on each occasion and ensures that an applicant does not see the same medical examiners each time.

If each of the three medical examiners assesses the applicant as being 'fit' then the part-time CAA-Nepal medical officer issues a medical assessment, this is passed to the Licensing personnel, and the applicant is issued the relevant licence.

If any of the involved medical examiners, or the CAA-Nepal Medical Officer, are not satisfied that the applicant meets the medical standards then the case is usually referred to a "Civil Aviation Medical Board" (CAMB). The CAMB is usually made up of 6 – 10 people comprising predominantly of medical examiners but also including 3 – 4 non-medical CAA-Nepal personnel.

A decision of the CAMB may be subjected to further appeal to the Director General of Civil Aviation (DGCA-Nepal). There is also the possibility of a case being appealed to the courts although no-one interviewed was aware of an applicant having pursued this option.

Observations

A number of matters were observed where changes might be made that may result in regulatory aeromedical improvements.

1. Medical Standards published by DGCA

The medical standards, and related procedures and requirements, used by CAA-Nepal are published under the authority of the Director General CAA-Nepal (DGCA). DGCA is vested the authority to issue these documents pursuant to Rule 82 of the Civil Aviation Regulations 2058 BS (2002 AD) (CAR).

This approach differed from most States the experts have dealt with, and was seen as advantageous because it allowed for change at the operational level without the undue delays inherent in most legislative systems.

Recommendations (Nepal)

It is recommended that CAA-Nepal:

NP 1.1 Maintain the capacity for DGCA to issue the medical standards and related procedures and requirements.

2. Medical assessment system structure and responsibilities

The Nepali medical assessment system is unusual in a number of ways. Applicants are all required to see three medical examiners each time a licence renewal is required. Each of those medical examiners also fulfils, at least in part, the medical assessor role (per ICAO Annex definition) in signing that the applicant meets (or does not meet) a subcomponent of the medical standards[3]. The Nepali system was also unusual in that all of the medical examiners were clinical medical specialists (e.g. general physicians, cardiologists, gastro-enterologists, ophthalmologists, ENT surgeons etc) and none were non-specialists, family medical practitioners, or occupational medicine practitioners.

The experts were advised that family practitioners / general practitioners, as well as occupational medical practitioners, were virtually unknown in Nepal.

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3. One of the medical examiners is responsible for each of the "Physical & Mental" examination, the "Ear, Nose & Throat and Hearing" examination, and the "Eye, Vision, and Colour Perception" examination.

Most of the medical examiners had not received training in aviation medicine.

When an applicant is being examined / assessed no one of the medical examiners involved is appointed "to be responsible for coordinating the results of the examination, evaluating the findings with regard to medical fitness, and signing the report" (Annex 1 1.2.4.6.2).

CAA-Nepal employs a part time medical officer whose role also appears to be that of a medical assessor (per ICAO Annex definition), although some opinion was received that this medical officer's role was administration and coordination, and not medical assessment. This part-time medical officer has received aviation medicine training.

The experts also observed that the number of cases that were subjected to CAMB deliberations appeared to be very high given the small overall size of the Nepali aviation system. It is possible that this observation stems from an absence of central aviation medicine trained expertise guiding the examination and assessment of applicants.

Exploring these issues further with seminar attendees and others, suggests that CAA-Nepal will face some difficulties in attempting to clarify the roles of the medical practitioners operating in the system and making that system more compliant with ICAO Annex 1. These difficulties may stem from some participants' individual sensitivities relating to status and possibly also to income.

Despite these potential difficulties it is desirable for CAA-Nepal to make changes to their medical systems because the current system:

- Is not compliant with the Annex 1 provisions in a number of ways;
- Is structured with ambiguous and possibly conflicting examination / assessment roles, responsibilities, and inter-relationships;
- Uses medical officers who have no aviation medicine training both examining and assessing applicants (Annex 1 – 1.1 medical examiner & medical assessor, 1.2.4.4);
- Uses several clinical medical specialists (ophthalmologists, cardiologists, ENT surgeons, general physicians, etc) for every medical assessment examination (unnecessarily complicated and expensive);
- Uses multiple medical examiners for each case yet does not have any one of those medical examiners assuming the coordination role (Annex 1 - 1.2.4.6.2);

- Appears to utilise CAMBs to a greater extent (and therefore expense) than the size of the Nepali aviation industry warrants.

Recommendations (Nepal)

Implementing these recommendations will require detailed long-term strategic planning by CAA-Nepal, as well as an awareness of the local medical interactions, relationships, and sensitivities. A step-wise approach over 5+ years is likely to be necessary, although many of the changes can probably be implemented relatively quickly.

It is recommended that CAA-Nepal:

NP 2.1 Clarify and alter the responsibilities of the part-time CAA-Nepal medical officer (CMO) position as follows –

a. Designate the CMO as a medical examiner;

The incumbent CMO is already a medical examiner.

b. Delegate the CMO the authority to issue medical assessments;

The incumbent seems to be presently partly fulfilling this role.

c. Establish the CMO in a central medical assessment role;

This may involve changing the role of most of the other current medical examiners subtly from assessing the applicant "is / is not medically fit" to making a recommendation, to the CMO, that the applicant appears to meet (or not meet) the medical standards.

d. Empower the CMO to refer cases that cannot be assessed as meeting the medical standards to the CAMB;

e. Authorise the CMO to chair the CAMB when it sits.

NP 2.2 Alter the medical examination and assessment processes as follows –

a. In the short term, ensure that a single medical examiner is "responsible for coordinating the results of the examination, evaluating the findings with regard to medical fitness, and signing the report" (Annex 1 1.2.4.6.2);

This is not likely to be easy if consideration is limited to the current 'specialist' medical examiners. Initially it may be most convenient to let this

responsibility rest with the CMO position, who (see NP 2.1a) is also a medical examiner.

Later, it may be prudent to try to establish another, more general, medical examiner who may be able to assume this role (see NP 2.3).

b. In the longer term, move towards a system where the applicant is examined by a single medical examiner and clinical specialist input is not required at every examination (perhaps only some initial examinations and where clinically indicated subsequently);

This would involve most of the current group of medical examiners becoming specialist consultants rather than medical examiners. Such a move may not be attractive to some of the specialists.

Taking this step will also require that a suitable medical examiner (see NP 2.3) is available.

c. Alter the current forms so the current specialist medical examiners are making a recommendation to the (CMO) medical assessor;

This is a relatively minor change and does not avoid the fact that most of the medical examiners are not trained in aviation medicine. However, it does change the current situation where much of the medical assessor role is also being undertaken by practitioners who are not aviation medicine trained.

d. Empower the CMO medical assessor to determine which cases are referred to the CAMB;

e. Define the role of the CAMB to reflect the application of formal regulatory flexibility (per Annex 1 1.2.4.8).

NP 2.3 Identify a local non-specialist medical practitioner (or practitioners) who may be interested in the field of aviation medicine, encourage them to undertake aviation medicine training, with a view to gradually changing the system so that they assume a medical examiner role and the current specialists become consultants rather than medical examiners;

NP 2.4 Try to ensure that all the medical examiners operating in the CAA-Nepal medical system have undertaken appropriate aviation medicine training.

This may be difficult to achieve while all of the medical examiners are also clinical medical subspecialists. It may be possible to pursue this if some sort of "regional regulatory aeromedical resource" (See the "COSCAP-SA, ICAO, and all SA civil aviation regulatory authorities" section of this report, and recommendations COSCAP 1 and COSCAP 2) was established and one of its tasks was this sort of training.

3. Medical assessment outcomes

Some of the cases discussed during the seminar suggested that the Nepali medical assessment system has been operating in an unnecessarily conservative and restrictive way. Some more recent decisions that were discussed also suggested that this might be in the process of changing.

A possible reason for this is a history of inadequate refresher and ongoing aviation medicine training of the medical personnel involved in the system. The difficulties experienced by poor States in getting their personnel adequately trained was mentioned and discussed in several contexts.

Recommendations (Nepal)

It is recommended that CAA-Nepal:

NP 3.1 Ensure initial and ongoing training for the CAA medical officer position to ensure that their aeromedical and regulatory knowledge is up-to-date.

The obvious and easiest way to provide this training is via overseas courses and attendance at major overseas aviation medical meetings (e.g. the Aerospace Medical Association annual scientific meeting or the International Congress of Aviation and Space Medicine).

However, this approach is likely to be prohibitively expensive for CAA-Nepal. Because of this:

It is further recommended that DGCA-Nepal:

NP 3.2 Reviews the "COSCAP-SA, ICAO, and all SA civil aviation regulatory authorities" section of this report and consider the benefits of establishing such a "regional regulatory aeromedical resource" charged, among other things, with the development and provision of this sort of training.

4. Structure of CAMB

Difficult cases are usually referred to the CAMB (Civil Aviation Medical Board). The CAMB is defined in the medical manual as "a board comprising of designated AMEs and CAAN officials to recommend to Director General (DG) of CAAN as to the action to be taken in case of the flight crew and air traffic controller with suspicious or overt medical condition and in other medical related matters".

In practice the CAMB usually consists of 6 – 10 people, mainly medical examiners but also including 3 – 4 non-medical CAA-Nepal personnel.

This structure of the CAMB requires that medical information concerning an applicant is made available to non-medical CAA-Nepal personnel. This does not appear to be appropriate management of medical confidentiality (Refer Annex 1: 1.2.4.9, 1.2.4.9.1, & 1.2.4.9.2).

Recommendations (Nepal)

It is recommended that CAA-Nepal:

NP 4.1 Remove the requirement for non-medical personnel to be party to the CAMB considerations; and

NP 4.2 If it is essential for non-medical personnel to be a part of the medical assessment decision-making process structure the CAMB proceedings so that the CAMB makes an assessment outcome recommendation to the non-medical component.

Little merit can be seen for any non-medical process beyond the final deliberation of the CAMB (flexibility per 1.2.4.8), other than the implementation of that outcome.

5. Protection of physical medical information

The CAA-Nepal medical files are co-located with the general pilot files. Although these files are secured the medical information is not secured separately and access is not restricted to medical and other authorised personnel.

The current Annex 1 provisions concerning medical confidentiality state that:

1.2.4.9 Medical confidentiality shall be respected at all times.

1.2.4.9.1 All medical reports and records shall be securely held with accessibility restricted to authorized personnel.

1.2.4.9.2 When justified by operational considerations, the medical assessor shall determine to what extent pertinent medical information is presented to relevant officials of the Licensing Authority.

Recommendations (Nepal)

It is recommended that CAA-Nepal:

NP 5.1 Separate the medical documents from the current pilot files onto a separate medical file for each licence holder / applicant;

NP 5.2 Store the new medical files in a separate secure location;

A lockable filing cabinet in the room presently used by visiting medical examiners / assessors would probably be suitable.

NP 5.3 Identify (or establish) a CAA-Nepal administrative staff position with the responsibility of assisting the CMO medical assessor;

NP 5.4 Limit access to the medical files to the CMO medical assessor and designated CAA-Nepal administrative staff member (per NP 5.3);

NP 5.5 Empower the CMO medical assessor with the responsibility of determining to what extent pertinent medical information is presented to relevant other CAA-Nepal officials (per 1.2.4.9.2).

6. Audit of Medical Examiners

The current CAA-Nepal medical assessment system subjects the medical examiners to no audit of their examination and assessment outputs. A periodic review is undertaken of their practice premises and equipment.

Recommendations (Nepal)

It is recommended that CAA-Nepal:

NP 6.1 Include in the CMO's job description the role of ensuring the periodic audit of medical examiners;

NP 6.2 Review whether any such audit would be best carried out by the CMO or whether external resources (See "COSCAP-SA, ICAO, and all SA civil aviation regulatory authorities" section of this report) might be suitable for this role.

7. Same CAMB reviews appeal cases

When an applicant appeals, to DGCA-Nepal, the decision of the CAMB the appeal case is usually referred back to a similarly or identically constituted CAMB. This approach has the risk of suggesting that the review may not be independent, impartial, and fair.

The experts' discussions with Nepali personnel suggest that the actual behaviour of the CAMB has been entirely impartial and fair, but that does not remove the potential for a different perception.

Recommendations (Nepal)

It is recommended that CAA-Nepal:

NP 7.1 Ensure that a differently constituted CAMB, or other review entity, reviews medical assessment appeal cases;

It may be convenient for DGCA-Nepal, when managing an appeal case, to direct the CMO to convene a differently constituted CAMB, perhaps still chaired by the CMO, for the case.

8. ICAO Annex 1 compliance of medical standards and related provisions

The experts commenced working through the medical section of the ICAO USOAP checklist with CAA-Nepal staff. It soon became apparent that aspects that were non-compliant greatly outnumbered the areas of compliance.

Inadequate time was available in nepal for the experts to work entirely through the checklist and help document every non-compliance and each possible solution. The experts felt that it would be more effective use of CAA-Nepal personnel time to entirely rewrite the medical provisions, and implement these new provisions, prior to the USOAP audit.

It was acknowledged that CAA-Nepal would not be able to record preliminary compliance to most of the USOAP medical checklist but that if the effort was made they should be able to present a largely compliant medical system to the actual audit. The benefits of the Nepali civil aviation legislative system (see subsection 1 of this report section: "Medical Standards published by DGCA") were noted in this respect in that it would be possible to draft new provisions and implement them (DGCA-Nepal willing) in only a few months.

Recommendations (Nepal)

It is recommended that CAA-Nepal:

NP 8.1 Redraft their medical manual to ensure ICAO Annex 1 compliance of the medical standards;

The experts have drafted a set of Annex 1 compliant medical standards and forwarded these to CAA-Nepal personnel.

NP 8.2 Redraft their medical manual and / or related Air Navigation Orders to ensure ICAO Annex 1 compliance of the other medical requirements;

The experts have agreed to review the entire current CAA-Nepal medical manual and, if practicable, to revise that document for CAA-Nepal. At the time of writing of this draft report this task has not been completed.

Of particular note here is that fact that medical assessments are required more often in Nepal than specified in Annex 1. The redraft of the CAA-Nepal requirements should include harmonisation of the medical assessment periodicity requirements with Annex 1.

NP 8.3 Redraft, as appropriate, the new (PELR) document to ensure ICAO Annex 1 compliance of the medical system.

9. Guidance material to assist medical examination / assessment

The current CAA-Nepal medical manual contains a selection of material including items that are requirements and others that are for guidance purposes.

Recommendations (Nepal)

It is recommended that CAA-Nepal:

NP 9.1 Use the recent chapters of the ICAO medical manual (document 8984) for guidance purposes.

10. Access to up-to-date aeromedical information

Very few of the medical personnel operating within the CAA-Nepal medical assessment system have had any formal aviation medicine training. Fewer still have undertaken refresher training to ensure that their aviation medicine knowledge is as up-to-date as possible.

Recommendations (Nepal)

It is recommended that CAA-Nepal, perhaps in liaison with ICAO COSCAP-SA:

NP 10.1 Increase efforts to provide their CMO (and other medical personnel as appropriate) with access to current and up-to-date aeromedical knowledge and other information.

This could be achieved, in part, by inviting international speakers from other major civil aviation regulatory authorities to local aviation medical conferences and / or by regularly sending CAA-Nepal medical personnel to the major international aviation medicine conferences.

11. Access to up-to-date ICAO provisions

Discussion with CAA-Nepal personnel suggested that their medical personnel were not always as up-to-date on ICAO provisions as might be desirable. They were not aware of many of the changes of the recent several amendments to Annex 1.

Recommendations (Nepal)

It is recommended that CAA-Nepal:

NP 11.1 Establish processes to ensure that ICAO amendments of medical relevance are communicated to CAA-Nepal medical personnel.

Pakistan

Pakistan was visited during these COSCAP-SA missions.

In Pakistan the Aviation Medicine experts:

- Ran a two-day regulatory aviation medicine seminar;
- Met with and interviewed a variety of people with an interest in the Pakistani civil aviation system;
- Worked through some of the medical items in the ICAO USOAP check-list with Civil Aviation Authority (CAA-Pakistan) personnel;
- Updated CAA-Pakistan personnel on ICAO medical provisions;
- Visited Aga Khan University, and discussed the possibility of a local aviation medicine course being established with university personnel; and
- Reviewed the Pakistani civil aviation medical legislation and guidance material.

After leaving Pakistan the experts:

- Continued to provide (via email) information and advice to CAA-Pakistan and other personnel;
- Provided draft medical assessment procedures documents suitable for revision and incorporation into the Pakistani system;
- Provided aeromedical training information and syllabus material to assist Aga Khan University; and
- Made introductions and established communications links between Aga Khan University personnel and aviation medicine training agencies around the world.

Civil Regulatory Aviation Medicine Seminar in Pakistan

Pakistan hosted a very successful two-day aviation medicine seminar in Karachi on 25 – 26 February 2008. Participants included staff from the Civil Aviation Authority (CAA-Pakistan), the airlines, individual medical examiners, personnel from the Pakistan Armed Forces, and academics from the Aga Khan University.

The two-day aviation medicine seminar was attended by 50 - 60 people, as well as the 2 aviation medicine experts.

The Civil Regulatory Aviation Medicine System in Pakistan

In Pakistan the Civil Aviation Authority (CAA-Pakistan) is the organisation with responsibility for the civil aviation medical regulatory system (aeromedical system). The current Chief Medical Officer (CMO) is a CAA-Pakistan employee medical officer with aviation medicine training. The CMO's position title is currently *Director General Aeromedical* and was previously *Chief of Aviation Medicine*. The CMO's role extends beyond his main role of the medical assessment of aircrew and air traffic control personnel to include such activities as (for example) maintenance of the workplace health and safety of airport personnel, and the CMO is supported by a number of medical officers and other personnel in these various roles.

During 2007 CAA-Pakistan issued approximately 2400 medical assessments, of which close to 100% were Class 1 medical assessments. Of those 2400 medical assessments approximately 1500 were examined in Karachi, 600 in Islamabad, 200 in Lahore, and less than 100 in various other locations. These numbers do not represent a substantial change from recent previous years.

The CAA-Pakistan aeromedical system does not currently issue Class 3 medical assessments. Legislation does contain provisions for Class 3 medical assessment in the Civil Aviation Rules (Section 2 – Licensing of personnel other than flight crew members) and in ANO 91.0101 (pp 66 – 79).

Legislation

The legislative basis for the Pakistan civil aviation aeromedical regulatory system is found primarily in the Civil Aviation Rules, 1994 (CAR94, especially Part V – Personnel Licences). CAR94 is issued by the Pakistan Federal Government.

The medical requirements of CAR94 are implemented primarily through an Air Navigation Order (ANO 91.0101, Manual of Flight Crew Medical Requirements, May 1999) (ANO91) and a number of forms. ANO91 is issued by the Director General of the CAA (DGCAA).

Aeronautical Information Circulars (AICs) can also be issued to further support the provisions of ANO91 and CAR94, although there are currently no valid AICs. AICs are issued by the

Departmental Head responsible for the area of operation covered by the AIC (e.g. Director Airworthiness, Director Flight Standards, Director Operations etc).

The CAA-Pakistan website (www.caapakistan.com.pk) does not provide online access to legislation, guidance material, or forms related to medical assessment.

Structure

At a basic level CAA-Pakistan's aeromedical system comprises a number of individuals and groups of people that act as *medical examiners* (per ICAO Annex 1 definition) with the CAA CMO (Director General Aeromedical) providing a centralised *medical assessor* (per ICAO Annex 1 definition) function[4].

The medical examiners are divided broadly into two groups: Individual Aviation Medical Examiners (AMEs), approved by DGCAA; "Boards" of several medical practitioners, constituted by DGCAA at various locations. The Boards are headed by a President. Pakistan has several individual AMEs located at Karachi, Islamabad, Lahore, and other locations. There are three Boards, based in Karachi, Islamabad, and Lahore.

Individual AMEs are able to perform medical examinations for:

- Private Pilot Licence holders (initial and renewal);
- Glider Pilot Licence holders (initial and renewal);
- Cabin / crew attendant competency certificates (initial and renewal);
- Some renewals of Commercial Pilot Licences and Airline Transport Pilot Licences (renewals other than every fourth, if 40 years of age or less, or every second if greater than 40 years of age).

The Boards perform medical examinations for:

- Initial issue of Commercial Pilot Licences and Airline Transport Pilot Licences;
- Some renewals of Commercial Pilot Licences and Airline Transport Pilot Licences (every fourth, if 40 years of age or less, or every second if greater than 40 years of age);

4. It is also possible to interpret the legislation and the observed practices as representing a system where most *medical examiners* are also *medical assessors*, but that a central medical assessor also retains an approval (or perhaps veto) power over the assessments made by the other medical assessors.

- Other individual cases required to undergo Board examination for other reasons (e.g. complex cases and appeal / review cases).

At the conclusion of the medical examination the AME or the President of the Board completes, and signs, a Medical Certificate (form CAA-43) which is then submitted, along with the applicant's medical file, to the CMO (Director General Aeromedical). The CMO endorses each Medical Certificate with a "verified" stamp and signature and the certificate is then passed on to the Licensing department for the issue of the appropriate license.

Observations

A number of matters were observed where changes might be made that may result in regulatory aeromedical improvements.

1. Regulatory philosophy

The role of CAA-Pakistan's aeromedical assessment function appears to extend beyond that which is seen in most states. Where many regulatory authorities would see themselves as being quite separate from the needs or desires of the State airlines, and would see their aeromedical assessments as relating solely to the applicant's medical "fitness" to fly during the assessment period, CAA-Pakistan appears to see their role partly as a component of the supply chain for these airlines. This "dual" role of being the regulator and employer has the potential to result in a conflict of interest with regard to the aeromedical decisions being made. In this context, it is to be noted that an employment decision carries with it many more considerations that are socio-economic rather than aeromedical in nature. Purely regulatory aeromedical decision making, on the other hand, adopts a risk management approach and caters only to flight safety concerns.

It is to be noted that at no time was any activity or decision-making observed that might suggest that safety was compromised through this philosophy.

<u>Recommendations (Pakistan)</u>

It is recommended that:

> **PK 1.1** the CAA-Pakistan aeromedical decision-making process assume a regulatory philosophy and that the socio-economic concerns pertaining to employability / employment decisions are left to the applicants and the airlines.

2. Clarity concerning Medical Assessor function

There were two main groups of opinions concerning who (or what) discharged the Medical Assessor responsibilities within the Pakistan aeromedical system. One view was that it was the President of the Board (or the Aviation Medical Examiner) that made the medical assessment decisions and that the CAA Director General Aeromedical provided administrative and other support. The other main view was that the CAA Director General Aeromedical (formerly Chief of Aviation Medicine) made the medical assessor decisions.

Review of ANO91 failed to clarify the situation. While ANO91 contains a range of provisions concerning the responsibilities of various people within the aeromedical system those provisions appear, in places, to be contradictory, inconsistent with observed practices, and ambiguous. Two examples are included below while twelve others have been listed in Appendix 1 of this report:

- The definition of "CAMBs" (p2) suggests a possible medical assessor role ("accredited medical opinion") in respect of cases referred by "DGCAA, Chief of Aviation Medicine and AMEs".
- The definition of "Competent Medical Authority" (p2), in reference to the authority of the Chief of Aviation Medicine, refers to that position's role in ascertaining the medical fitness for flying duties. This suggests that the Chief of Aviation Medicine may act as a medical assessor.

Discussion with personnel and review of documents indicates that:

- The Medical Certificates (medical assessments) are signed, in the box titled "Authorized Signature", by the Presidents of the Civil Aviation Medical Boards or by Aviation Medical Examiners. This suggests that Presidents of Boards and Aviation Medical Examiners are acting as medical assessors.
- The Chief of Aviation Medicine stamps and signs each Medical Certificates (medical assessments) to indicate that it has been "verified". Some view this as a purely administrative check while others view it as being the legal authority under which the certificate (assessment) is issued. This may suggest that the Chief of Aviation Medicine is acting as the medical assessor.

- All waiver / flexibility cases require sign-off by DGCAA to be issued medical certificates. This suggests that, in the case of flexibility assessments, DGCAA himself is acting as a medical assessor.

Of the individuals and groups referred to above, only the Chief of Aviation Medicine (currently titled GM Aero Medical), the Aviation Medical Examiners, and some presidents of the Civil Aviation Medical Boards have training and / or expertise in aviation medicine.

The Chapter 1 (section 1.1 Definitions) provisions of Annex 1 include the definitions of Medical Assessment, Medical Assessor, and Medical Examiner. The Medical Assessor is required to be "A physician qualified and experienced in the practice of aviation medicine …" with the term physician being used in the general context of a medical practitioner rather than the more limited context of an internal medicine specialist medical practitioner. The Medical Examiner is required to be "A physician with training in aviation medicine and practical knowledge and experience of the aviation environment."

The current legislation and the practices of the CAA Pakistan aeromedical system do not clearly indicate who (singular or plural) it is that acts as the medical assessor(s) in the system. Various provisions and practices suggest that individual Aviation Medical Examiners, several types of Boards, the Presidents of those Boards, the Chief of Aviation Medicine, and the Director General of the CAA act as medical assessors. Not all of these people are physicians and some of the physicians are not qualified and experienced in the practice of aviation medicine.

The practice of referring flexibility decisions to the Director General of Civil Aviation (DG) himself was felt to be unnecessary and inefficient. The decision to issue (or not) a medical assessment, whether in response to an applicant meeting the medical standards or after flexibility considerations, is a medical one. Sending such decisions to the DG himself adds additional levels of paperwork and approvals and adds the potentially problematic dimension of a non-physician issuing a medical assessment. It is the opinion of the ICAO aviation medicine experts that this decision should reside with the person, or persons, who fulfil the medical assessor role as defined in ICAO Annex 1.

<u>Recommendations (Pakistan)</u>

It is recommended that CAA-Pakistan review the structure and function of their aeromedical system so as to:

PK 2.1 Clearly identify the individual(s) or group(s) that function as medical assessors;

PK 2.2 Ensure that those who are acting as medical assessors and medical examiners comply with the Annex 1 requirements that relate to those roles.

PK 2.3 It is also recommended that CAA-Pakistan review the need for any medical assessment decisions to be referred to the Director General of the CAA, or to any point within the organisation beyond the person or persons who fulfil the medical assessor role.

3. Air Navigation Order 91.0101

ANO91 was reviewed throughout this mission. The document was found to be internally inconsistent, ambiguous, and non-compliant with Annex 1 provisions. It also contained material that might better be placed in guidance material (medical manuals etc) than in legislation.

Recommendations (Pakistan)

It is recommended that:

PK 3.1 CAA Pakistan engage personnel familiar with the drafting of legislation to revise and update the current Air Navigation Order 91.0101 and to bring it in line with the ICAO SARPs. A sample of draft legislation was provided to CAA-Pakistan for this purpose.

4. Constitution of Boards

ANO91 requires that Civil Aviation Medical Boards, constituted by DGCAA, comprise of "Physician, ENT Specialist, and a co-opted Cardiologist where-ever necessary." These Boards do not only consider complex cases but undertake routine (initial and periodic) examinations and assessments of all medical assessment applicants.

While the experts accept that there are cases that may warrant the expert opinion of such specialists, it was felt that such cases were too few and far between to justify them as permanently constituting the Boards. Requiring these medical specialists for all such Boards seemed to represent inefficient, and expensive, utilisation of specific medical specialists.

It was felt that a more efficient model for the CAA-Pakistan aeromedical system might be found in Annex 1. Such a model might incorporate medical examiners at various locations throughout the country (as occurs presently with AMEs and Boards) and a small number of medical assessor(s) located either centrally or regionally. In this model the medical examiners would undertake, supported by their nursing or other personnel, the examination of applicants while the medical assessor(s) would consider the results of those examinations and decide whether to issue a medical assessment (certificate) to the applicant. Both the medical examiners and the medical assessor(s) would be free to utilise the specialist medical expertise of people such as Internal Medicine physicians, ENT or Eye specialists, and Cardiologists as the specific features of a case may warrant.

Recommendations (Pakistan)

It is recommended that:

PK 4.1 CAA-Pakistan review the structure and function of their aeromedical system encapsulating the earlier recommendations (PK 2.1 and 2.2) concerning Medical Assessors and Medical Examiners, and utilising the services of specialist medical practitioners (such as physicians, ENT & Eye specialists, or cardiologists) only when necessary to do so.

5. Access to up-to-date aeromedical information

Discussion with CAA-Pakistan personnel suggested that they have limited appreciation of, and access to, the most up-to-date information in the field of regulatory aviation medicine.

Recommendations (Pakistan)

It is recommended that:

PK 5.1 CAA-Pakistan, perhaps in liaison with ICAO COSCAP-SA, increase efforts to provide their senior medical personnel with access to current and up-to-date aeromedical knowledge and other information.

This could be achieved, in part, either by encouraging international speakers at local aviation medical conferences, and / or by regularly sending CAA-Pakistan medical personnel to the major international aviation medicine conferences.

6. Access to up-to-date ICAO provisions

Discussion with CAA-Pakistan personnel suggested that their Medical Services were not up-to-date on ICAO provisions. They were not aware of changes of the recent amendments to Annex 1.

Recommendations (Pakistan)

It is recommended that:

> **PK6.1.** CAA-Pakistan establish processes to ensure that ICAO amendments of medical relevance are communicated to CAA medical personnel in a timely manner.

7. Policies relating to "OML" aircrew.

The experts observed an apparently high proportion of Class 1 medical assessments resulting in "OML" restrictions (limiting their flight to multicrew operations). Some of the medical conditions for which OML restrictions were issued were conditions that did not necessarily result in an increased risk of medical incapacitation. It appeared that in some of these cases an OML restriction was utilised where perhaps a reduced validity-period assessment or additional surveillance (reports or tests required during the validity period of the medical assessment) during the validity of the assessment might be more appropriate.

CAA-Pakistan also has a policy whereby two airline pilots who both have "OML" restrictions (limiting their flight to multicrew operations) are unable to fly together.

A review of the ICAO SARPs and guidance material revealed nothing to either endorse this practice or to suggest it is inappropriate. Further enquiry indicated that some other countries that employ "OML" restrictions, such as the JAA/EASA States in Europe, employ a similar policy while some others do not.

The coupling of a high number of OML pilots and the operational pairing (of OML pilots) restriction may place an unnecessary administrative and scheduling load on the airlines.

Recommendations (Pakistan)

It is recommended that:

> **PK 7.1** CAA-Pakistan review their policies concerning the issue of "OML" restricted medical assessments.

This review will have to take into consideration the medical conditions that warrant the use of an OML restriction. Note: Many medical conditions may be appropriately handled with a reduced validity-period assessment or additional medical surveillance (reports or tests required) during the validity period of the medical assessment rather than an OML restriction.

8. Licensing and the medical examination of flight attendants

ICAO has no requirements for the licensing of Flight Attendants (Cabin Crew).

The forms for the medical examination of Cabin Crew viewed included sections requiring vaginal and rectal examination of the crew.

Recommendations (Pakistan)

It is recommended that:

PK 8.1 CAA-Pakistan review the current requirement to license Cabin Crew.

PK 8.2 The requirement for vaginal and rectal examination be reviewed considering that there is little conceivable safety benefit in such examinations on a routine basis.

9. Class 3 medical assessments (Air Traffic Controllers)

The CAA-Pakistan aeromedical system does not currently issue Class 3 medical assessments. Legislation does contain provisions for Class 3 medical assessments in the Civil Aviation Rules (Section 2 – Licensing of personnel other than flight crew members) and in ANO 91.0101 (pp 66 – 79). Staff indicated that it is planned for CAA-Pakistan to commence Class 3 medical assessments in the near future.

The SARPS in Annex 1 describe a similar system for the medical assessment of Air Traffic Controllers as for private and professional pilots, although using different medical standards for each group.

Recommendations (Pakistan)

It is recommended that:

PK 9.1 CAA-Pakistan review their regulatory practices to align their medical assessment of Air Traffic Controller personnel with the provisions of ICAO Annex 1.

Doing this will, in turn, result in similar systems, with a similar level of oversight from the Authority, but applying different medical standards, for the medical assessment of Air Traffic Controllers, Professional Pilots, and Private Pilots.

10. Four different application forms

Pink form CAA-105 is an initial application form for "aircrew members other than private or glider pilots": Class 1 initial. Blue form CAA-112 is the renewal application for "aircrew members other than private or glider pilots": Class 1 renewal. Pale green form CAA-41 is for initial examination of "private / glider pilot's licence or air traffic controller's licence": Class 2 initial. Yellow form CAA-42 is for renewal of "private / glider pilot's licence or air traffic controller's licence": Class 2 renewal.

Recommendations (Pakistan)

It is recommended that:

PK 10.1 CAA-Pakistan review their application forms with the view to merging the requirements of some of these forms and reducing the overall number of forms published and printed. There may also be some cost-saving in changing to plain-paper forms (rather than purpose-printed on coloured paper) and developing the forms in digital (perhaps PDF) format so that applicants might be able to download the forms from the CAA-Pakistan website, print them out and fill-in the relevant sections themselves before presenting for their examinations.

11. Training and quality assurance for Medical Examiners

Pakistan has military aviation medicine training programs but no civil equivalents. Most of the current Medical Examiners in Pakistan have gained their aviation medicine training via the armed forces and / or via additional overseas specialty training.

ANO 91.0101 includes the requirement, 2.2.2, that an "approved medical examiner shall have or had training in aviation medicine from recognized Aero-Medical Institute, with requisite experience in aviation medicine". In paragraph 2.2.8(f) of ANO 91.0101 a passing reference is made to some quality assurance responsibilities of CAA-Pakistan in respect to the Medical Examiners, although section 2.3 (Role of Chief of Aviation Medicine) makes no mention of this function. Section 2.3 does contain a provision, 2.3.2(a), relating to Medical Examiners,

Airline Aviation Medical Advisors, and Central Aviation Medical Board specialists attending international aviation medical seminars.

The system for certificating Medical Examiners, and the quality control systems applied to the work of those Medical Examiners, was not discussed in detail with CAA-Pakistan personnel. The absence of local training suitable for civilian Medical Examiners, covering relevant aviation medicine and related regulatory functions and responsibilities, was mentioned by seminar participants and interviewees.

The provisions under discussion in the subsequent ICAO State Letter AN 5/22-08/33 of 05 May 2008 are worthy of note in this context. The proposed changes to Annex 1, especially 1.2.4.4.3 and 1.2.4.7.1, will place a direct responsibility upon the medical assessor (often the senior medical personnel of the regulatory authority) for the quality assurance of medical examiners, ensuring that they comply with applicable requirements.

Recommendations (Pakistan)

It is recommended that CAA-Pakistan review ICAO State Letter AN 5/22-08/33 in the context of both:

PK 11.1 The roles and responsibilities of CAA-Pakistan medical personnel; and

PK 11.2 Opportunities to encourage the development of local or regional aviation medical training as well as mutual-support and information-sharing structures.

Local aviation medicine training is considered in Pakistan subsection section 11, below, and also subject to recommendation **PK 12.1**. The issue of developing a regional committee or 'board' of CMOs and aeromedical experts is also discussed in the "ICAO, COSCAP-SA, and all SA regional civil aviation regulatory authorities" section below and is subject to recommendation **ICAO 1** and, less directly, recommendation **ICAO 2**.

12. Aga Khan University and civil aviation medicine training

During the visit, after the workshop/seminar, meetings were held with medical academic personnel from the Aga Khan University (AKU). The AKU personnel expressed an interest in the possibility of establishing a program of civil aviation medicine training, initially for Pakistan students but with the potential of offering such training to others in the region.

The experts saw great merit and potential benefit in these ideas, provided what information they could, and undertook to assist any such effort that AKU chose to pursue. The general

development model under discussion saw some initial benefit in using international experts to help establish a program and deliver some of he initial training material, to concurrently have some pivotal AKU staff undertake external post-graduate civil aviation medicine training (such as via Kings College, UK or Otago University, New Zealand), and then to progressively shift the program to become entirely dependent on local resources.

It was apparent, from the earliest of discussions, that not only did CAA-Pakistan stand to benefit in the long run from such training being established in Pakistan, but also that the support of CAA-Pakistan and associated enterprises would be essential to AKU being able to establish such a course. Also, given the likelihood that the majority of those who complete the course (at least initially) will want to be engaged within the CAA-Pakistan regulatory aeromedical system it is important that CAA-Pakistan endeavour to maintain a degree of oversight involvement in the course and its development.

Recommendations (Pakistan)

It is recommended that:

PK 12.1 CAA-Pakistan give consideration to providing support to, and oversight of, of Aga Khan University in establishing Pakistan-based civil aviation medicine training.

Sri Lanka

Sri Lanka was visited during these COSCAP-SA missions.

In Sri Lanka the aviation medicine experts:

- Ran a two-day regulatory aviation medicine seminar and a one-day specialist clinical aviation medicine workshop;
- Met with and interviewed a variety of people with an interest in the Sri Lankan civil aviation system;
- Worked through the medical items in the ICAO USOAP checklist with Civil Aviation Authority (CAA-SriLanka) personnel;
- Updated CAA-SriLanka personnel on ICAO medical provisions; and
- Reviewed the Sri Lankan civil aviation medical legislation and guidance material.

After leaving Sri Lanka the experts continued to provide (via email) information and advice to CAA-SriLanka and other personnel.

Civil Regulatory Aviation Medicine Seminar in Sri Lanka

Sri Lanka hosted a very successful two-day aviation medicine seminar in Colombo on 12 – 13 January 2009. Participants included personnel from the Sri Lanka Civil Aviation Authority (CAA-SriLanka), the airlines, the air force, individual medical examiners, and personnel involved with regulatory aeromedicine in the Maldives (1 x armed forces Medical Officer with the rank of Major). Approximately 10 - 15 people, plus the 2 aviation medicine experts, attended the two-day seminar.

A further 1-day workshop was hosted by CAA–SriLanka. This workshop involved system-specific regulatory aviation medicine discussion (e.g. cardiology, neurology, and ophthalmology) and attendees included personnel from CAA-SriLanka, the individual medical examiners, and specialists working in each of the areas of medicine under discussion. Approximately 8 - 12 people, plus the two aviation medicine experts, attended each of the different sessions of this one-day workshop.

The Civil Regulatory Aviation Medicine System in Sri Lanka

In Sri Lanka, the Civil Aviation Authority (CAA-SriLanka) is the organisation with responsibility for the civil aviation medical regulatory system (aeromedical system). CAA–SriLanka has no Chief Medical Officer (CMO) on staff and the medical assessment system is managed and administered by non-medical personnel.

The Sri Lanka civil aviation regulatory medical system utilises the part-time services of six Medical Examiners.

CAA-SriLanka issues 1,000 – 1,500 medical assessments per year (800 - 1000 Class 1, 200 - 600 Class 2, and 50 Class 3). Class 2 medical assessments are issued mainly to Flight Attendants[5], as well as approximately 20 private pilots who all in the training process to become professional pilots. The medical assessment numbers have been relatively stable during the last few years.

Legislation

The primary legislative basis for the Sri Lankan aeromedical system is found in the Ceylon Air Navigation Act (No 15) of 1950 (the Act), most recently amended on 28 November 2002 (Amendment 1264/33). The secondary legislation is contained in regulations 59 – 63 of the Air Navigation Regulations (Chapter 365) (the Regulations).

The CAA–SriLanka medical standards are those of Annex 1 to the Chicago Convention. These standards are incorporated into the Regulations (No 01 of 2002) by reference, subsequent to Amendment 1264/33 (2002) of the Act.

A major revision of the Regulations has been developed, but this document has spent some years in the necessary parliamentary process. Because of higher priorities, the new Regulations have not yet been brought into force.

Some of the Sri Lankan medical assessment practices are not entirely consistent with the legislation presently in force but, according to CAA-SriLanka personnel, many of these are more consistent with the new Regulations that have not yet been formally implemented.

5. While the Flight Attendants represent approximately 3000 medical assessments per year 80% of those are undertaken by airline medical personnel and do not involve CAA-SriLanka directly. Every fifth Flight Attendant medical assessment is undertaken by CAA-SriLanka.

Structure

At a basic level the Sri Lankan aeromedical system comprises six medical practitioners who are not CAA-SriLanka staff as well as non-medical CAA-SriLanka personnel who manage and administer the system. The medical practitioners each perform both the *medical examiner* and *medical assessor* functions described in ICAO Annex 1. One of these medical examiners/assessors works with the national airline, three with the air force, and two are in private practice and working primarily in the field of family medicine. All six of the medical examiners/assessors have had training in aviation medicine.

The medical examiners/assessors are able to examine all classes of applicants and issue medical assessments to those that meet the medical standards. For applicants who do not meet the medical standards, flexibility (per ICAO 1.2.4.8) may be utilised via the Medical Board, a collegial gathering of more than one of the six medical examiners/assessors as well as other advisers or consultants as necessary. This is contingent on the applicant applying for a review and is not an automatic process.

The operation of the aeromedical system requires the applicant to first obtain a 'prescription' (essentially a list of investigations that need to be done), from the CAA, of the tests and investigations needed for that particular assessment. The applicant then takes that *prescription* to a nominated hospital where the required tests are undertaken. When the test results have been sent to the CAA the applicant makes an appointment to see a medical examiner, at the CAA aeromedical centre, where the physical examination is performed. The medical examiner at this point will have the results of the investigations performed at the nominated hospital.

If the applicant meets the medical standards, the medical examiner/assessor completes a certificate that is passed to the CAA administrative personnel and leads to a medical endorsement being placed on the applicant's licence.

If the applicant is assessed as not meeting the medical standards then the applicant may apply for further consideration of their application by the CAA Medical Board. This further consideration may result in the issue or denial of a medical assessment.

It appears that there are also non-judicial and judicial review / appeal options available to an applicant who is dissatisfied with the final medical assessment decision.

The applicant pays an application (administrative) fee to the CAA for each application, as well as paying the hospital directly for the tests undertaken. The applicant pays an additional fee if they seek for their case to be further considered by the Medical Board. The CAA pays the medical examiners/assessors directly, at approximately 75% of the application fee per case.

Observations

A number of matters were observed where changes might be made to improve compliance with the SARPs of ICAO Annex 1 or to otherwise improve the processes and efficiency of the regulatory aeromedical system.

1. Regulatory philosophy

The medical personnel of CAA-SriLanka occasionally take a somewhat holistic view of their regulatory role. Interviews suggest that considerations concerning the future employability, or long-term medical health, of the applicant may play a role in leading to an 'unfit' assessment of an applicant that might otherwise be considered 'fit' for the duration of the medical assessment that has been applied for.

As a result, the role of CAA-SriLanka's aeromedical assessment function appears at times to extend beyond that which is seen in most States. Where many regulatory authorities would see a medical assessment as reflecting the likely medical status of the applicant during the validity period of that assessment, CAA-SriLanka occasionally considers the possible / likely longer-term social community implications of the applicant's medical condition.

This approach, while clearly well intentioned and undertaken to the highest of ethical and medical standards, might be considered as being somewhat paternalistic in bypassing an applicant's ability to make decisions for themselves.

A modern, more purely regulatory aeromedical decision making approach, on the other hand, adopts a risk management approach, caters primarily to flight safety concerns, and limits the period over which an applicant's medical condition is considered to the period of validity of the medical assessment.

Rather than decline a medical assessment because an applicant's medical condition is likely, in the long-term, to result in their being 'unfit' it may be more appropriate to counsel the applicant on the implications of their medical condition, and issue a medical assessment

appropriate to their likely 'fitness' during the validity period of the assessment. Taking this approach will leave the applicant to make their own decision as to whether they will continue to pursue a career (or recreation) in aviation. The issue of employability should not be a factor when a regulatory aeromedical decision of fitness is contemplated.

It is to be noted that at no time was any activity or decision-making observed that might suggest that safety was compromised through the current Sri Lanka philosophy / approach.

Recommendations (Sri Lanka)

It is recommended that:

SL 1.1 The CAA-SriLanka aeromedical decision-making system should assume a regulatory philosophy and that the socio-economic concerns relating to employability decisions and long-term health be best left to the airlines and the applicants respectively.

2. Complexity of application / examination / assessment process

The CAA-SriLanka aeromedical system involves the applicant obtaining a 'prescription' of tests required, presenting to a hospital to have those tests, and later presenting to the CAA aeromedical centre for the physical examination. This system, especially when additional possible visits to CAA or medical personnel are added, was seen as being very effort-intensive and possibly over-complicated for the applicant.

Further discussions with Medical Examiners and CAA-SriLanka staff suggested that streamlining was possible and would probably be beneficial to all interested parties. Inspection of the CAA aeromedical centre revealed adequate space to establish a testing centre with ECG, audio, spirometry, and basic pathology specimen (blood and urine) collection. CAA-SriLanka also has a highly trained nursing officer on staff who already has experience with most of the procedures required and could be easily trained on the others.

Recommendations (Sri Lanka)

It is recommended that CAA-SriLanka:

LK 2.1 Restructure their medical assessment process so that the majority of the additional tests required can be undertaken at the CAA-SriLanka's aeromedical centre rather than via the applicant making a preliminary visit to a hospital. This would involve some capital outlay (e.g. ECG and audiometry equipment), some initial and ongoing

staff training (e.g. ECG, audiometry, spirometry, pathology specimens collection), and some contract negotiations with pathology service providers or hospitals (e.g. pickup and analysis of pathology specimens and system for provision of results).

LK 2.2 Revise the tests required of applicants (See next item).

3. Tests and investigations

The routine tests required of a Class 1 initial Medical Assessment applicant incude urine examination, full blood picture, full blood count, haemoglobin assay, ESR, fasting blood sugar, HbA1c, blood urea, liver function tests, lipid profile, blood grouping and Rh, VDRL, HIV serology, ECG and consultant reporting, echocardiography, exercise ECG, EEG and consultant reporting, lung function tests, chest xray and consultant reporting, audiogram and ENT consultation, and ophthalmology consultation.

The regulatory medical indication for each of these tests was discussed in some detail with the Sri Lankan medical examiners and CAA personnel. These discussions concluded that a significant portion of the tests ordered could be removed, or reduced in frequency, without any likely significant reduction in aviation medical safety. Subsequently the list was worked through methodically, again with the Sri Lankan medical examiners and CAA personnel, and each item reviewed for whether or not it should remain on the list. The recommendations below (LK 3.1 & 3.2) are the result of that collegial review process and further cross referencing with the provisions contained in ICAO Annex 1.

It should be noted here that these recommendations refer only to routine medical tests and do not apply to the testing that would be required of an applicant if a significant abnormality were detected, or if there was some other indication, such as a clinical indication or the presence of elevated risk factors.

<u>Recommendations (Sri Lanka)</u>

It is recommended that CAA-SriLanka:

LK 3.1 Reduce the number of medical tests required for Class 1 Medical Assessments.

A more appropriate Class 1 *initial* routine testing panel might include:

- Urine dipstick examination (including glucose);

- Full blood count;
- Lipid profile;
- ECG and reporting;
- Chest X-ray and reporting;
- Audiogram;
- ENT consultation; and
- Ophthalmology consultation.
- For initial applicants over 60 years of age an exercise stress ECG might be added

A more appropriate Class 1 *renewal* routine testing panel might include:

- Urine dipstick examination (including glucose) every year;
- Lipid profile every two years;
- ECG and reporting every two years for applicants between 30 and 50 years of age and every year for applicants over 50 years of age (Annex 1 – 6.3.2.6);
- Audiogram every five years for applicants up to the age of 40 and two yearly for applicants over the age of 40 (Annex 1 - 6.2.5.3); and
- Exercise stress ECG each year or two for applicants over sixty years of age.

LK 3.2 Similarly reduce, with reference to Annex 1 provisions, the number of medical tests required for other initial and renewal Medical Assessments.

4. Periodicity of Medical Assessment

Medical Assessments are performed in Sri Lanka more frequently than outlined in Annex 1.

Discussions with the Sri Lankan medical examiners and CAA personnel suggested that this was not the result of any decision to undertake more frequent examinations but was more the result of not having made changes as the ICAO provisions changed over time. In some situations medical examiners and CAA personnel appeared to have been unaware of some past changes to the Annex 1 and related ICAO requirements.

Recommendations (Sri Lanka)

It is recommended that CAA-SriLanka:

LK 4.1 Reduce the frequency of routine Medical Assessments to comply with the provisions of Annex 1 (1.2.5).

5. Absence of medical assessment 'failure to declare' provisions

Review of Sri Lanka's compliance with Annex 1 medical assessment provisions, based on the USOAP "PEL" checklist, suggested that CAA-SriLanka was not well prepared for compliance with 1.2.4.5.1 (PEL 3.409). Discussions with the Sri Lankan medical examiners and CAA personnel suggested that although detected false medical declaration was not common it was also not unheard of.

1.2.4.5.1 states that:

> "Any false declaration to a medical examiner made by an applicant for a licence or rating shall be reported to the Licensing Authority of the issuing State for such action as may be considered appropriate."

Recommendations (Sri Lanka)

It is recommended that CAA-SriLanka:

LK 5.1 Revise their procedures and legislative provisions for improved Annex 1 compliance, including 1.2.4.5.1.

6. 'Flexibility' only formally utilised if applicant applies and pays extra

The Sri Lankan medical assessment system does provide for the formal exercise of flexibility (1.2.4.8, PEL 3.419) on applicants who are not assessed as meeting the medical standards. To a small extent, flexibility can also be informally exercised by individual Medical Examiners also performing the Medical Assessor function.

The formal provision of regulatory medical flexibility is provided by the CAA Medical Board but this is only accessible if the applicant applies specifically for the board to be convened and it also involves the payment of an additional fee.

In discussions with the Sri Lankan Medical Examiners and CAA personnel, the suggestion was made that making the access to formal flexibility (1.2.4.8) can be made more routine and

universal. It was also pointed out that the requirement for the applicant to specifically apply for "board" consideration and to pay extra might disadvantage some applicants.

Two steps appear to be necessary to achieve this, within the current "Board" structure:

1. Formal flexibility (per 1.2.4.8) could be incorporated into the medical assessment system so that all applicants who are not assessed as meeting the medical standards are at least considered for flexibility.

   In some cases, the flexibility considerations will be relatively straightforward, especially if the applicant's medical condition clearly jeopardises flight safety. Consideration of these cases could be achieved with a relatively low administrative burden, possibly by way of a 'triage' step undertaken by the Medical Assessor.

   In other cases, the flexibility considerations will be more complex and demanding and would reasonably warrant consideration of the full "Board" and their seeking external expert advice.

   A suitable default situation might be that all cases assessed as not meeting the medical standards are subjected to formal flexibility considerations unless a decision is made otherwise by the Medical Assessor.

2. The fee structure could be reviewed to make formal flexibility equally available to all applicants.

Recommendations (Sri Lanka)

It is recommended that CAA-SriLanka:

LK 6.1 Review their procedures and requirements relating to applicants being able to access the flexibility considerations of the CAA Medical Board.

7. Medical assessment examination/assessment form signed-off by 'government'

Some discussions with the Sri Lankan CAA personnel suggested that the CAA medical application/examination form is "certified" at a "government hospital". Details of the legislative basis for this practice were not readily available, although indications were that the review was administrative in nature and that no aeromedical expertise was applied to the review.

Further discussion failed to identify any administrative or safety benefits in this practice.

Recommendations (Sri Lanka)

It is recommended that CAA-SriLanka:

LK 7.1 Review the necessity of the practice of having all CAA medical application/examination forms externally "certified".

8. Clarity of Medical Examiner and Medical Assessor roles

The Sri Lankan Medical Examiners also act as Medical Assessors, and undertake the medical assessment for applicants that they have examined. This is not necessarily a problem in its own right and is not contrary to the provisions of Annex 1. The system that currently operates in Sri Lanka also appears to work reasonably well, possibly due to the relatively small number of applicants and the relatively high levels of training of the current Medical Examiners. There may, however, be some longer term benefits in considering review of this aspect of the structure of the system.

Because the Medical Assessor role carries with it a higher aviation medical training requirement (and cost), it may be beneficial in the long run, to gradually shift away from having all Medical Examiners also acting as Assessors. The current Medical Examiners are all trained and experienced and so are able to undertake the Medical Assessor role but as the Sri Lankan aviation system grows there may be some advantage in making Medical Examiners, with lower levels of training, more widely available to applicants and limiting the medical assessment role to a smaller number of highly qualified personnel. These medical assessors can also then play an active role in training the medical examiners.

With the Medical Examiners also acting as Medical Assessors there is limited scope for the audit of the work of the Medical Examiners by a Medical Assessor. This would be possible, by having another Medical Assessor perform the audit, but could be difficult to achieve given that none of the Medical Examiners/Assessors are direct employees of the regulatory authority.

In considering this issue two slightly different system structures, possibly not mutually exclusive, appeared to be the most suitable. In the shorter term there may be some benefit in establishing a central Medical Assessor role and staffing it by rotating the current Medical Examiners into the position, possible for 3 – 6 months at a time. This would provide a separation of the examiner and assessor role, would centralise the assessor role within the

regulatory authority, and would make it relatively easy to build a system whereby the Medical Assessor was able to audit the work of the Medical Examiners.

In the longer term it may prove beneficial to gradually shift towards a smaller number of Medical Assessors, possibly to one only. The current medical assessment numbers would probably not justify a full-time Medical Assessor (Chief Medical Officer) position within the CAA but a gradual shift towards a single central Medical Assessor could continue to improve the system along the lines already mentioned. Such a move may also be desirable or convenient for the current Medical Examiners as their career paths progress.

Further centralisation of the Medical Assessor role would also offer the advantage of lower costs (less people) of ongoing aeromedical training and the training / exposure necessary to keep up with regulatory aeromedical trends (and ICAO provisions). It would also help to bring the Sri Lankan CAA in compliance with the ICAO USOAP audit requirements and hence ICAO Annex 1 SARPs.

This matter was discussed with the Sri Lankan CAA officials but not discussed directly with the current Medical Examiners and so it's practicality, in the Sri Lankan context, would need to be explored further with them before any changes are adopted.

Recommendations (Sri Lanka)

It is recommended that CAA-SriLanka:

LK 8.1 Explore their options whereby the Medical Assessor role might become more centralised, and separated from the Medical Examiner role, over time.

LK 8.2 Implement a system that allows for the audit of Medical Examinations by a Medical Assessor.

9. Guidance material to assist medical examination / assessment

The current Sri Lankan Medical Examiners were trained, experienced, and clearly competent and capable. There did not, however, appear to be a lot of clear and up-to-date medical assessment guidance material readily available to them, in particular to the Medical specialists to whom pilots were referred by the medical examiners.

Such guidance material (e.g. a Medical Manual) is beneficial in that it encourages uniformity of medical examination practices and medical assessment decisions.

No evidence was seen of inconsistent aeromedical decision making within the Sri Lankan system, and this was probably due to the small number of Medical Examiners, their expertise and experience, and their relatively close inter-relationships.

Recommendations (Sri Lanka)

It is recommended that CAA-SriLanka:

> **LK 9.1** Adopt the ICAO Manual of Civil Aviation Medicine (Doc 8984 and the 'draft' chapter updates and newer chapters) as the basis of an aeromedical guidance material document for Medical Examiners and Assessors.

10. Access to up-to-date aeromedical information

Discussion with the Sri Lankan Medical Examiners and CAA personnel suggested that even though the Medical Examiners are trained and experienced in the field of aviation medicine, they experienced great difficulty in maintaining currency in that training and in keeping up-to-date with aeromedical advances.

The cost of accessing suitable courses and meetings was identified as the main limiting factor.

Recommendations (Sri Lanka)

It is recommended that CAA-SriLanka, perhaps in liaison with ICAO COSCAP-SA:

> **LK 10.1** Increase efforts to provide their Medical Examiners with access to current and up-to-date aeromedical knowledge and related other information.
>
> This could be achieved, in part, by inviting international speakers from other major civil aviation regulatory authorities to local aviation medical conferences and / or by regularly sending CAA-SriLanka medical personnel to the major international aviation medicine conferences.
>
> See also Sri Lanka, Section 8 (Access to up-to-date ICAO provisions) and the section of this report concerning "ICAO, COSCAP-SA, and all SA regional civil aviation regulatory authorities".

11. Access to up-to-date ICAO provisions

Discussion with the Sri Lankan Medical Examiners and CAA personnel suggested that the Medical Examiners/Assessors were not always as up-to-date on ICAO provisions as might be

desirable. There was limited awareness of many of the changes of the recent several amendments to Annex 1.

Recommendations (Sri Lanka)

It is recommended that CAA-SriLanka:

LK 11.1 Establish processes to ensure that ICAO amendments of medical relevance are considered for incorporation into the regulatory medical system and are communicated to CAA-SriLanka medical personnel.

COSCAP-SA, ICAO, and all SA civil aviation regulatory authorities

Some of the matters that were discussed relate to all of the civil aviation regulatory authorities in the SA region. This report section addresses issues of regional or wider relevance and the recommendations are directed towards ICAO, COSCAP-SA, and all of the civil aviation regulatory authorities in the SA region.

Observations

The Medical Examiners and regulatory authority personnel of each SA State shared a number of difficulties. These matters included:

- Accessing initial and refresher aeromedical training for Medical Examiners and Medical Assessors;
- Access to support for the resolution, possibly via 1.2.4.8-style flexibility, of particularly difficult and complex cases;
- Audit and review of the output of their medical assessment systems;
- Keeping their medical examiners and assessors up-to-date with both current aeromedical knowledge and trends in regulatory aeromedicine (including ICAO provisions);
- Access to, and generation of, relevant aeromedical research.

Each of these items is discussed in more depth below, and a set of recommendations is made at the end of this section.

1. Aeromedical training of personnel

The Medical Examiners and Assessors in the SA States have gained their basic aeromedical training from various sources: military aeromedical training domestically and/or internationally; 'certificate' level civilian aeromedical training via international training facilities; and/or post-graduate 'diploma' level civilian aeromedical training via international training facilities. Most of the medical personnel met during these missions had received their aeromedical training via the local or regional armed forces.

In some SA States the Medical Examiners/Assessors were not all trained in aviation medicine.

Universally the cost (and therefore accessibility) of suitable, basic and advanced, aeromedical training was identified as a major impediment to local and regional regulatory aeromedical progress. Military aeromedical training was felt to be of a very high level but not always readily transferable to the modern civilian regulatory environment.

In one State, Pakistan, a local University expressed an interest in investigating the possibility of establishing local civil aviation medicine training. It is understood that this investigation is still underway, although the potential impact of the recently changed economic climate is not known. The experts also advised SA personnel of the known (local, regional, and international) aeromedical training options that might be suitable to their needs. The options mentioned included the Singaporean course designed to meet the ICAO requirements for Medical Examiners, and the higher level distance education course run by the University of Otago (New Zealand) which may be more appropriate for Medical Assessors or personnel intent on training regional Medical Examiners.

In some States the relationship between States was also identified as a potential impediment to the use, and subsequent expansion, of local and regional training options.

In every State the visiting experts were questioned as to whether ICAO and/or COSCAP had any capability for running local / regional aeromedical training suitable for current and intending Medical Examiners / Assessors.

2. Support and resolution for particularly difficult case assessments

It is not unique to the SA region that complex medical assessment cases can be very difficult and demanding of time and other resources. The States in the SA region identified this as being even worse for them because of their patchy access to the highest level of aeromedical expertise, the often lack of currency in the aeromedical training / expertise that was available to them, and the often lack of advanced, high-technology medical facilities for further investigations.

In each State the visiting experts were asked either:

- To review a number of individual difficult cases; or
- To provide such a review service in the future; or
- Whether ICAO and/or COSCAP had the capability to establish and coordinate a regional facility (preferably augmented with external expertise) to either assist in the

assessment of particularly difficult cases or to act as an independent external review facility for difficult-case assessment decisions.

Some personnel questioned whether a regional aeromedical assessment facility, not limited to difficult cases, might be feasible. The pros and cons of a JAA/EASA type of regional approach were discussed, along with the significant amount of diplomatic and political effort that would probably be required to establish such a system. In the end, the prevailing view was that although such a facility offered significant potential benefits the current political and economic situation within the region and individual States prevented it from being a reasonable short-medium term goal.

3. Audit / review of Medical Examiners and the medical assessment system

In general the audit and review of the medical systems of the SA States was limited to the periodic ICAO USOAP programme. The regulatory aeromedical systems were not structured in a manner that made it easy for Medical Assessors to review / audit the work of the Medical Examiners, and no external review / audit of the medical assessment decision-making was undertaken by any of the States.

In each State, upon becoming aware of the proposed wording of 1.2.4.4.3 and 1.2.4.7.1 as well as the intended application of Safety Management Systems within regulatory aeromedicine, questions were raised as to what audit / review options were available. Subsequent to that discussion the visiting experts were questioned as to whether ICAO and/or COSCAP had the capability to establish and run a regional aeromedical review / audit system.

4. Keeping up-to-date with regulatory aeromedical issues and trends

In most of the SA States visited the personnel responsible for the regulatory aeromedical system did not have a strong and up-to-date understanding of the ICAO aeromedical requirements. In some of the SA States a far higher awareness was observed, but it was apparent that this was more due to a recent response to the impending ICAO USOAP audit than an ongoing awareness of the ICAO requirements.

Similarly it was apparent that those personnel who had undertaken aeromedical training had done so some time ago and had not been able to engage in significant refresher and update training since, or had not undertaken any training to allow the adaptation of their military aeromedical training to the civil environment.

Again the visiting experts were questioned as to whether ICAO and/or COSCAP had the capability to establish and run some sort of regional aeromedical update and refresher training.

5. Research

In each State the regulatory aeromedical personnel noted the difficulty they experienced in accessing relevant published research and other topical literature. They also commented on their own small size and lack of funds while observing that they were unlikely to be able to meaningfully contribute aeromedically relevant research of their own.

After further discussion, including recognition of the simplicity of some useful research (e.g. monitoring of in-flight incapacitation statistics), personnel asked whether there was any way to establish a regional facility to assist both with their access to the published literature and to help make regional aeromedical research possible.

6. A regional regulatory aeromedical resource

Prompted by the matters outlined in this section the experts raised the possibility of the States of the SA region coordinating their efforts via COSCAP-SA, to establish a regional resource (panel, committee, board, or other title) to help coordinate and/or provide:

- Initial aeromedical training for Medical Examiners and Medical Assessors;
- Difficult-case assessment resolution;
- Audit of their medical assessment systems;
- Refresher aeromedical training and regulatory (e.g. ICAO updates) training;
- Research capabilities.

The States saw great merit in this idea, to address the matters outlined above, but raised a number of potential difficulties:

- Funding was universally identified as a difficulty. The experts suggested that such a facility might be primarily constituted from the regional Chief Medical Officers, or functional equivalents, possibly with a small initial international augmentation, so that the basic costs could be kept to a minimum. The experts also suggested that if the States of the region felt strongly enough about the issue, and it was represented accordingly by their *Directors* General of Civil Aviation to the Steering Committee Meeting of

COSCAP-SA then external avenues of funding assistance might be able to be investigated.

- Relationships between states in the SA region. Several States identified the sometimes lack of harmonious relationships between SA States as being a potential impediment to a regional solution along these lines. They specifically questioned the leadership and location of any such body and were invariably in favour of external augmentation to help smooth over some of the regional differences. The experts suggested that the UN/ICAO model for regional bodies tended to be based on rotating chairmanship and rotating, or agreed, location. The possibility of large amounts of business being done by internet communications was also seen as a potential benefit for any such facility to operate on a regional basis.
- Local-only is undesirable. While the aeromedical personnel saw a regional approach (self help) as being essential they also identified the possibility of limiting the scope to local or regional as being problematic. They identified that getting outside information and perspectives into the region was one of the underlying difficulties they faced, and this was not confined to the field of aeromedicine. They felt that it was essential that any such regional aeromedical resource should be augmented by external expertise, at least until the States in the region have secured other avenues to allow them to keep up-to-date with aeromedical and regulatory practices.

7. Consistent medical assessment outcomes

Prompted by the matters outlined in this section, as well as the observations discussed above in subsection 6, the experts note the potential for inconsistent medical assessment outcomes between States in the SA region. Such potential for variability is not limited to the SA region, although the scope of this report is.

Important tools for encouraging medical assessment consistency, or harmonization, include:

- Clear, detailed, and unambiguous national medical requirements;
- Access to education, training, and 'benchmarking' opportunities against other States by those responsible for the medical assessment systems within States;
- Access, by States, to internal and / or external audit opportunities.

In subsection 6, above, mention is made of "Audit of their medical assessment systems". The importance of this item is such that it warrants additional consideration.

Audit is a powerful tool for encouraging consistency. The ICAO USOAP in the aviation medicine field focuses attention on the interpretation of ICAO medical SARPs and helps reduce differences of interpretation between states. However this programme is normally insufficiently detailed to identify differences between States that may be the result of differing individual opinions of policy makers concerning acceptable levels of aeromedical risk. Such differences of opinion are often the result of a lack of training and 'benchmarking' against the knowledge and practices of other States' regulatory authorities.

It has already been noted that military aeromedical specialists commonly hold positions of influence within the civil aviation regulatory systems of the SA region. While this, by itself, need not be detrimental to the development of an effective national civil aeromedical system, military personnel need to be aware of the very different medical requirements of civilian licence holders in comparison to military personnel. An audit programme that includes evaluation by individuals having extensive civilian aeromedical experience would help ensure that any consistent bias towards a military approach with respect to civilian medical assessments is avoided. The potential advantages of this were demonstrated during the training activities undertaken as a part of this project, which involved training by two aeromedical specialists having wide experience in civilian aviation medicine. They highlighted many differences between the 'military' versus 'civilian' approach, and between different regulatory authorities in the region.

The potential benefits of audit methodologies might be best accessed by SA States using regional as well as international resources. The *regional regulatory aeromedical resource*, mentioned in subsection 6, may be a suitable vehicle to encourage and steer regulatory medical assessment audit activity within the SA region, or individual States may be able to seek or encourage such audit, on a periodic basis, with the guidance and assistance of COSCAP-SA.

Recommendations (COSCAP-SA, ICAO, & all SA States)

It is recommended that COSCAP-SA, with the assistance of ICAO and the South Asian regional civil aviation regulatory authorities:

COSCAP 1 Encourage and support the establishment of a regional resource of CMOs and aeromedical experts for the purpose of regulatory aeromedical information sharing and mutual peer support in the consideration of difficult cases and other regulatory aeromedical matters.

If needed, especially initially, such a committee could be augmented with the support of international regulatory aeromedical personnel.

COSCAP 2 Encourage and support the flow of current civil regulatory aeromedical information, opinions, and trends into the SA region through the provision of international experts to assist any regional committee that may be established and to periodically provide update workshops / seminars as felt suitable by the committee.

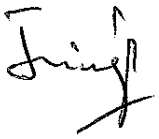
COSCAP 3 Encourage the internal and / or external audit of State medical assessment systems to foster consistency and harmonization in regional and international medical assessment outcomes.

Conclusions

ICAO and in particular COSCAP-SA is to be highly commended for arranging these seminars / workshops and consultative visits. The reception and feedback obtained from regulatory officials and other personnel during these technical assistance visits was overwhelmingly positive, supportive, and appreciative.

The ICAO aviation medicine experts are of the opinion that the mission objectives have been successfully concluded. It is hoped that the recommendations made will directly benefit the States of the SA region by helping streamline their medical assessment systems and by aligning those systems more closely with the ICAO SARPs, and thereby fostering the global harmonization that is necessary for reliable and safe air operations.

ICAO aviation medicine experts:



Dr Jarnail Singh
21 April 2009

Dr Dougal Watson
21 April 2009

Enclosures:

1. Enclosures for Bangladesh
2. Enclosures for Bhutan
3. Enclosures for India
4. Enclosures for Maldives
5. Enclosures for Nepal
6. Enclosures for Pakistan
7. Enclosures for Sri Lanka
8. Enclosures for COSCAP-SA, ICAO, and all SA civil aviation regulatory authorities