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**State Profiles:  
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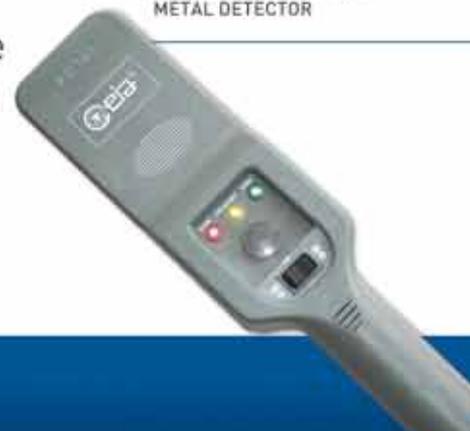
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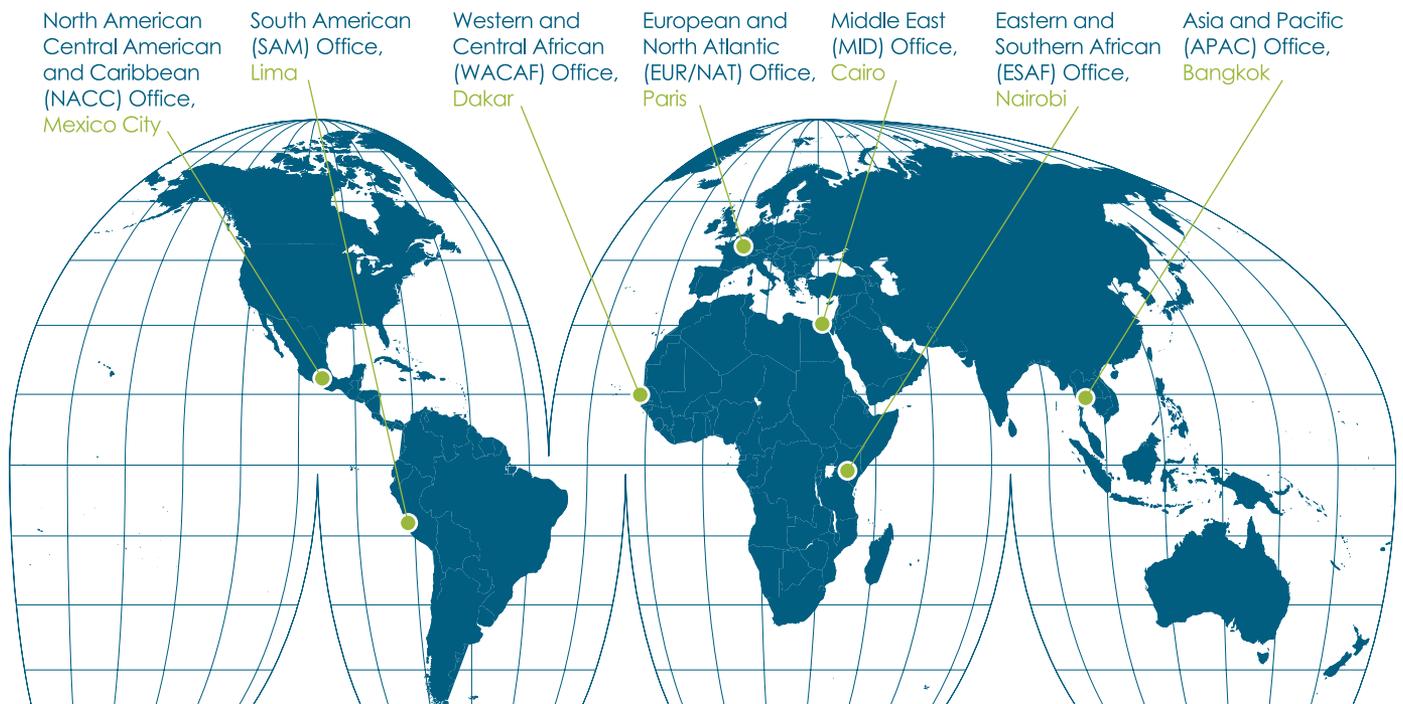
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## ICAO's Global Presence



## The ICAO Next Generation Aviation Professionals initiative:

# NGAP

Industry research has revealed that, within just ten years time, global commercial aviation will be facing shortfalls of over 200,000 pilots and 400,000 skilled maintenance personnel. To address this potentially critical crisis to aviation operations, ICAO has launched the Next Generation Aviation Professionals (NGAP) initiative—building on and complimenting the work of the IATA Training and Qualification Initiative (ITQI).

NGAP stakeholders established a Task Force which is now quantifying the scope of current and pending shortages and identifying barriers to entry and methods to address them. The *Journal* caught up to the NGAP Task Force in late 2009 as it reviewed the status of its activities and established the priorities for the coming March 2010 ICAO NGAP Symposium.

The predictions are seemingly dire. Aviation will require 207,600 new pilots by 2018; 352,900 by 2026. Maintenance personnel figures are even more dramatic, with the IATA Training and Qualification Initiative (ITQI) projections now indicating that 405,500 aircraft mechanics will be needed to fill new and existing positions as of 2018, and almost three quarters of a million (739,000) by 2026 (*readers may wish to review a more detailed account of the ITQI 2009 projections in the table on page 8*).

Although the ITQI figures are based on specific research applied only to pilots and maintenance personnel, ICAO, IATA and a wide range of industry, education and human resources stakeholders have also drawn attention to the fact that additional aviation professions (controllers, managers, inspectors, technicians, etc.) will likely demonstrate similar vulnerabilities.

### Key IATA role in highlighting the crisis

As far back as 2007, the IATA operations Committee was making preliminary assessments of general industry preparedness for the double-digit growth that was being projected in some Regions. Günther Matschnigg, IATA Senior Vice-President, Safety, Operations & Infrastructure, had come to the 2007 meeting armed with a preliminary survey

**“When revenues begin to diminish it can be difficult to maintain a focus on longer-term, more strategic priorities, but my team and I stressed to the major players that, regardless of 2008 and 2009 industry results, a pilot shortage was coming and a serious need remained to review pilot and maintenance worker training requirements. These were decades old and out-of-step with contemporary industry priorities.”**

“At this stage we really had to fight to maintain this as a priority area for more research and effective solution development,” Matschnigg stressed. “When revenues begin to diminish it can be difficult to maintain a focus on longer-term, more strategic priorities, but my team and I stressed to the major players that, regardless of 2008 and 2009 industry results, a pilot shortage was coming and a serious need

‘yonder’ is no longer as glamorous or exciting as it was once perceived by younger demographics.

It has also been highlighted that the particularly cyclical nature of air transport economics, with the commensurate hiring and layoff periods these produce, makes personnel attraction and retention more difficult. Furthermore, non-harmonized government programmes can have a tendency to exacerbate wider industry recruitment issues and concerns.

First responses to the significant challenge these projections and concerns pose to global aviation and many of its stakeholders came in the form of a special Next Generation Aviation Professionals (NGAP) Roundtable in May 2009, organized jointly by ICAO and IATA. The event was held primarily to solicit input and opinion from 43 expert participants representing industry, regulatory bodies, universities, training providers and other relevant associations to assess early objectives.

### – Günther Matschnigg, IATA

that IATA had conducted of projected training outputs versus projected aircraft deliveries. Even without comprehensive numbers that included factors such as looming retirements, etc., the numbers were staggering.

“It really has to be stressed that the growth figures we were projecting in 2007, especially in the Asia-Pacific and Middle East Regions, were truly unprecedented,” Matschnigg remarked. “We’re talking 15 percent for India and even higher than 20 percent in some of the specific markets. This was the first time that these shortages of upwards of several hundred thousand positions first began to come to light.”

The Operations Committee and subsequently the IATA Board of Governors didn’t need much convincing about the seriousness of the issue, but subsequent downturns as a result of the 2008 financial system collapse, H1N1 and other factors began to lessen its urgency in the mind of some IATA Members.

remained to review pilot and maintenance worker training requirements. These were decades old and out-of-step with contemporary industry priorities.”

Matschnigg’s efforts resulted in the ITQI activities proceeding with the full backing of IATA and industry leaders, resulting in the compelling 2009 ITQI report data and projections that are now driving a global and ICAO-led public and private sector response to what may have otherwise been a crippling blow to the international air transport system.

### Contributing factors and early efforts

Causes for the trends being revealed range across demographic, social, sectoral and political factors. They include the increase in the median age of practitioners, the fact that many aviation skill sets are very desirable for, and transferable to, other industries, that sector needs can vary considerably depending on the States or Regions under consideration, and the reality that the ‘wild blue

Participants to the ICAO Roundtable reached early consensus that staff shortage issues within the aviation industry will cause serious problems in the foreseeable future. They agreed to establish a viable NGAP roadmap for the next decade and to promote new global partnerships based on more effectively-shared resources. The improvement of training processes to better ensure job readiness on a worldwide basis was also agreed as a guiding priority.

It was also reinforced during the first NGAP Roundtable that the initiative would need to be led by ICAO due to the global and particularly comprehensive scope of the issues and participants required to effectively address the concerns that were emerging. It was stipulated that ICAO’s activities should support and complement existing and future ITQI efforts in this regard.

Roundtable participants were asked to identify the ten most important issues or actions surrounding the following questions:

- a. What is constraining recruitment, retention and training/education of pilots, controllers and maintenance personnel as well as other aviation professionals?
- b. What global initiatives can facilitate the recruitment, retention and training/education?

These discussions led to the development of more specific action lists based on three main categories: Human Resources Planning; Methodology; and Outreach.

Participants agreed that a special NGAP Task Force (NGAPTF/1) would need to be formalized and volunteers emerged to assume responsibility for both the main Task Force itself as well as the action areas it would be concerning itself with.

NGAPTF/1 responsibilities were therefore allotted as follows:

*NGAP Task Force Chairperson*

- Thomas Carney, Purdue University, Aviation Accreditation Board International (AABI)

*NGAP Task Force Team Leaders:*

- Human Resources Planning—Robert Donald, Canadian Aviation Maintenance Council (CAMC)
- Outreach—John Watret, Embry-Riddle University
- Methodology—Farid Zizi, École Nationale de l'Aviation Civile (ENAC).

**NGAP Task Force established**

NGAPTF/1 met for the first time in October 2009 at ICAO to review the status of its research and finalize the programme and objectives for the upcoming 2010 NGAP Symposium, to be held March 4–10 at ICAO Headquarters.

The meeting was opened by Mr. Vince Galotti, Deputy Director of the ICAO Air Navigation Bureau, and Mr. Mitchell A. Fox, Chief, ICAO Flight Safety Section, who stressed to the 29 participants the scope and importance of the task that lay before them. A list of the participating organizations to the October Task Force review can be found at the top of page seven.

“As the Task Force proceedings commenced, and I took a quick assessment of who was gathered around that table and was immediately struck by the breadth of experience and knowledge represented in the invited participants,” began Dr. Thomas Carney, NGAP Task Force Chair. Carney is a professor at Purdue University and is the President of the Aviation Accreditation Board International—a group which advances quality aviation education worldwide through accreditation and leadership.

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Mitchell Fox (center; Chief of ICAO's Flight Safety Section) and Vince Galotti (center-right; Deputy Director of the ICAO Air Navigation Bureau) welcome the participants to the Next Generation Aviation Professionals Task Force Meeting at ICAO Headquarters last October.

**“In the Asia-Pacific Region, for example,” Carney continued, “current Boeing projections are that air travel is expected to grow at an average annual rate of 6.5 percent over the next 20 years. That percentage may not seem significant at first, but for China alone that translates into a need to more than triple the size of its fleet to 4,610 airplanes by 2028, also according to the Boeing forecasts, with attendant growth in the number of new professional pilots to get them where they’re going.”**

**– Dr. Thomas Carney, AABI**

Carney went on to describe some of the general factors now affecting aviation hiring and retention trends, noting of course the important role that accreditation has to play in ensuring that suitably-qualified personnel find their ways into safety-critical positions. He also stressed that current market realities would likely mean that the pending personnel shortages will be characterized by strong Regional or State-based components; with countries such as China, India and other expanding markets being the first to experience critical needs.

“In the Asia-Pacific Region, for example,” Carney continued, “current Boeing projections are that air travel is expected to grow at an average annual rate of 6.5 percent over the next 20 years. That percentage may not seem significant at first, but for China alone that translates into a need to more than triple the size of its fleet to 4,610 airplanes by 2028, also according to the Boeing forecasts, with attendant growth in the number of new professional pilots to get them where they’re going.”

Chinese pilots-in-training already occupy a significant number of positions in global training institutions, highlighting how the educational and training infrastructure will need to be adjusted to meet the new demands being placed on it.

Regional and political implications of these trends also point to how States will need to better support and better harmonize

their sectoral training and certification programmes. This will mean keeping close track of industry and labour-force trends—something Canada has quietly been excelling at in recent years.

Robert Donald, head of the NGAPTF/1 Human Resources Planning activities, is also the Executive Director of the Canadian Aviation Maintenance Council (CAMC) and a former General Counsel of IATA. Canada has established a range of these ‘sector councils’, covering a wide variety of segments of the Canadian economy. Their purpose is to help their respective industries manage human resources issues, including the certification of individuals in relevant professions and trades, developing curricula, accrediting curricula offered by colleges and keeping track of, and adjusting to, new trends in Canadian aviation and aerospace labour markets.

“CAMC works with industry and the Canadian aviation training organizations (e.g. colleges) to develop standardized curricula which respond to industry needs,” Donald commented. “There are only three aviation and aerospace trades licenced by Transport Canada at present but, in addition to these, there are many others for which there were no standards at all only a short time ago.

“To fill this void, CAMC has developed 26 national occupational standards for aviation and aerospace trades.”

Donald's team is now compiling data, initially for pilots, controllers, maintenance technicians and engineers, ATSEPs and regulatory personnel (especially in the personnel licensing area). The information being sought includes numbers of type ratings and licences, as well as manufacturer delivery/order data—including figures for smaller aircraft. They are also considering data collection on airport/airline managers and non-licensed personnel.

"We've all read about the looming personnel crisis in Western developed economies," he summarized, "and that there are simply not enough people in the pipeline coming up to replace retirees. *The Economist* recently ran a 16-page feature on the issue. In aviation, that trend is even more pronounced than in other sectors given the very significant projected growth of the worldwide industry. We're going to need to become very creative and diligent about how we assess and re-purpose skill-sets between sectors, such as retraining automobile assembly-line painters to become certified aviation painters.

There's also a great need for workers specializing in composites, such as those now being used in advanced aircraft like the Boeing Dreamliner or Airbus A-380. For example, industry needs a large number of composite specialists—today—and the global workforce cannot supply them. We need to put in place programs to migrate people with associated skill sets into this and other new focus areas of labour demand. The solution is going to require harmonized national and international programmes. It's a tremendous challenge for all the stakeholders."

In the area of Outreach, headed-up by Embry-Riddle Aeronautical University's Associate Vice President of Academic Affairs and Chief Academic Officer, Dr. John R. Watret, near-term priorities include initiating the collection of readily-accessible data for applicant

pools and enrolments in education and training programmes as well as the development of a research proposal to support a worldwide survey and discussion mechanism aimed specifically to youth demographics with the support of the AABI and UAA.

This research would identify the perceptions of the next generation towards aviation professions based on Regional criteria, as well as highlighting any barriers now preventing the next generation to access aviation professions. It would also look into the development of appropriate recruitment and training methods to respond to new attitudes, perceptions and learning styles reflected in today's youth markets.

**ATTENDING ORGANIZATIONS TO THE NGAP TASK FORCE MEETING, ICAO HQ, OCTOBER 2009**

- ACI
- CAE
- CAMC
- CAMAQ
- EASA
- FAA
- FSF
- IAOPA
- IATA
- IBAC
- IFATCA
- IFALPA
- IFATSEA
- PBAC
- Transport Canada
- Embry-Riddle University
- McGill University
- Purdue University
- University of Illinois

In the area of Methodology, being led by ENAC's Farid Zizi, several topics under consideration were directly related to ICAO and its roles in licensing and developing guidance for the approval of organizations that deliver

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**– Robert Donald, CAMC**



competency-based training. This included enhanced guidance in ICAO's Doc. 9841—*Manual on the Approval of Flight Crew Training Organizations* as well as the harmonization of knowledge testing requirements for the Airline Transport Pilot License (ATPL) based on a proposal submitted by the Professional Aviation Board of Certification (PABC).

Within the NAPTF/1 Methodology priorities, it was reflected that ICAO could also explore partnerships to establish data collection activities for Multi-crew Pilot Licenses (MPLs) based on ICAO State Letter AN 12/50-07/37. Furthermore, and with the assistance of the NGAP Task Force, ICAO has been tasked with expanding the PANS-Training document to include the definitions of competencies for other aviation professions (including pilots—other than those licensed with the MPL, controllers and air traffic safety electronics personnel) and guidance on the training and assessment of threat and error management.

Maintenance personnel competencies would also be looked at within the Methodology framework (efforts already under development through ITQI) as well as definitions of core competencies for airport/airline managers.

### General Task Force conclusions

All participants agreed that a disconnect now exists between licensing requirements (ICAO Annex 1) and what is actually required by the industry to enter the cockpit. It was suggested the industry standards should be more transparent and a mechanism identified to more effectively correlate licensing and industry requirements.

Concerns were also raised that, as the industry continues to grow, it becomes further constrained by the number of people available to do the job, leading to a decline in the skills considered acceptable when new personnel report for duty. Participants voiced opinions that simply defining minimum standards for licences has become insufficient. One potential solution, proposed by the PABC, is the introduction of a professional certification mechanism which would be non-disruptive to the licensing procedures while leveraging existing ISO processes. It was suggested such a mechanism could facilitate the transferability of competencies and support harmonization, and that it should be the responsibility of individual States. Some participants noted that bilateral

agreements had already been introduced among States to facilitate the transfer of competencies, and that these may still prove to be the best means to achieve this objective.

Another area of general concern was the lack of formal training requirements for certain non-licensed aviation disciplines. It was suggested that consideration should be given to accreditation mechanisms for these disciplines whereby competency standards could be supported, and that associated accreditation criteria should be developed using industry input. The NGAPTF was acknowledged as a de facto industry/educator forum suitable for advising ICAO on these issues.

The essential need to recruit candidates that have the 'right stuff' was also highlighted. It was noted that failures to do so are costly in terms of training and have a negative impact on safety. Selection is an industry process that doesn't fall under ICAO's role, but it was suggested that the Organization could play a part in better-defining the competencies that should be demonstrated for given aviation functions.

The next generation of skilled aviation workers requires training and education that engages them personally. This implies that ways of achieving competency standards should be flexible and varied to accommodate learning styles and modes of delivery. Skill assessment should be based on the competency that can be demonstrated rather than the institution or method by which the competency was obtained. This is reflected in the model that the academic world is now adopting, where the focus is on what is being learned rather than how it is being taught.

### Concluding results

Besides firming-up the programme for the 2010 Symposium, the goals of the October gathering were to establish the work programme for the NGAP Task

### Results from the IATA ITQI Report, 2009

| AIRCRAFT DEMAND   | 2018    | 2026    |
|---|---------|---------|
| Total Aircraft  | 17,650  | 2,000   |
| Additional Aircraft   | 12,355  | 21,000  |
| PILOT AND TRAINING DEMAND   | 2018    | 2026    |
| Total pilots needed to fly new aircraft   | 193,100 | 350,200 |
| New pilots for additional aircraft  | 135,000 | 227,500 |
| New pilots needed to fill the fluctuation and retirement gap                      | 72,600  | 125,400 |
| Total new pilots (additional aircraft and fluctuation) needing ab-initio training | 207,600 | 352,900 |
| Total new pilots needing transition training on replacement aircraft              | 57,930  | 122,700 |
| MAINTENANCE DEMAND  | 2018    | 2026    |
| Total mechanics needed for additional aircraft                                    | 247,100 | 420,000 |
| Total mechanics including fluctuation and retirement                              | 405,500 | 739,000 |

IATA ITQI Report, 2009, Section 4.1, pp. 9–10

Force Teams, including scope-definition and timelines run on as developing a clearer picture of the magnitude of the world wide shortage in the near- and long-term. Participants reviewed the extent of the problem both by geographic region and by career path (pilot, controller, mechanic, ATSEP, etc.).

In general, the need for accurate and timely data was stressed, as was the role and participation that States would need to assume. Attendees clarified what they would need from ICAO

and established that a more practical level of understanding was required with respect to future 'best practices' for attracting, training and retaining young people with respect to the disciplines required by the industry.

It was agreed that the NGAP Task Force team leaders would regularly conduct telephone conferences during the lead-up to the May 2010 Symposium and that the second meeting of the NGAPTF/1 would be slated for March 5, 2010. ■

## 2010 NGAP SYMPOSIUM AT-A-GLANCE

### Symposium theme:

Looking beyond the economic crisis: mobilizing the aviation community to recruit, educate, train and retain the next generation of aviation professionals.

### Key objectives:

- Determine the nature, magnitude and Regional characteristics of the human capital challenge in aviation professions.
- Raise awareness and engage participation in finding solutions.
- Share best practices about how to train and educate differently, including different economic models.

### MARCH 1, 2010

#### Topic: Evidence-Based Training (EBT)

- Genesis and update on EBT-IATA Training and Qualifications Initiative.
- EBT regulatory impact.
- EBT for other aviation professions.

#### Topic: Competency-based maintenance training and assessment

- Genesis and update on ITQI work on maintenance personnel.
- Regulatory impact of competency-based maintenance training and assessment.
- Future work.

### MARCH 2 TO 4, 2010

Opening: Keynote speaker(s)

#### Topic 1: Wanted! Aviation professionals

- The importance of numbers: training needs and training capacity.
- The profile of the next generation of aviation professionals.
- The changing nature of aviation professions.
- New aviation professions.
- Affording access to the aviation professions.

#### Topic 2: Educating and training the next generation

- The benefits and challenges of competency-based approaches.
- Combining best practices of the academic and training worlds.
- The future of simulation: Flight Simulation Training Devices, Maintenance, Air Traffic Management and beyond.
- Leveraging the new training technologies

#### Topic 3: Updating and harmonizing regulations

- Transitioning regulatory frameworks to support competency-based training and assessments.
- Facilitating global recognition of competencies.
- Training and educational accreditation.
- ICAO: what's next.

### Symposium conclusions

For more on the Symposium please visit: [www.icao.int/ngap](http://www.icao.int/ngap)

# AENA Spain and ICAO TCB: Expanding on Latin American training cooperation

For the last seven years, the Spanish State-owned company **Aeropuertos Españoles y Navegación Aérea (Spanish Airports and Air Navigation—AENA)**, which is under the Spanish Ministry of Public Works, has been working closely with the **International Civil Aviation Organization (ICAO) Technical Cooperation Bureau** on an international programme.

**This international cooperation project has been under development since 2003, under the aegis of a memorandum of understanding and three specific cooperation agreements between AENA and ICAO. It has been assigned to the International Cooperation and Protocol branch of AENA.**

In accordance with the general objective of raising AENA's public profile and in keeping with AENA's responsibility to support the harmonious and consistent development of air transport, over the past few years we have been consolidating a series of training activities directed at aviation professionals in countries having historical ties with Spain.

In conjunction with the International Civil Aviation Organization and as part of its own cooperation programme, AENA is carrying out three distinct groups of activities, each of which falls under an agreement signed with ICAO. These activities are the Fellowship Programmes, the organization of Technical Cooperation Seminars in Latin America, and the loaning of experts, through a cooperative arrangement established under the aforementioned agreements.

## Fellowship Programmes

The Fellowship Programmes comprise specialized training activities which take place in Spain and which deal with different aspects of civil aviation, primarily those concerning airport management. Each year, six fellowships are awarded for the Airport Systems master's programme at the Escuela Técnica Superior de Ingenieros Aeronáuticos (School of Aeronautical Engineering—ETSIA) of Madrid Polytechnic University. This is the only Spanish-language, classroom-based master's programme which fully specializes in the various disciplines involved in airport management.

The project's particular advantage resides in its combination of theoretical university education and the supervised practical training undergone by fellowship recipients. This training takes place from January to December at various AENA offices, depending on the trainee's interests and professional background. The annual call for applications to the master's programme, which will be in its 16<sup>th</sup> session in 2010, is normally made in May, and applications can be submitted until the end of August. The 14 modules of the Airport Systems master's programme cover the main subjects and disciplines related to airport management: environment, legislation,



Participants from the Cartagena technical cooperation seminar, part of AECID's Latin American Specialized Technical Training Programme. These constitute the second specific pillar of the AENA-ICAO cooperation activities.

infrastructure planning, airport operations, air navigation and its environment, human resources, energy management, maintenance, financial management, projects and construction, security and airport management.

As part of the training offered in Spain, a parallel fellowship is also awarded for the master's programme in Public Service and Infrastructure Management of the School of Civil Engineering. This is a ten-month programme which, like the other six fellowships mentioned, includes training at different AENA offices in addition to theoretical training.

To date, 39 professionals (six of whom are currently in training) from the Latin American civil aviation sector have benefited from these annual fellowships for the Airport Systems master's programme. Five workers from the Grupo Aeroportuario del Pacífico (Pacific Airport Group), a Mexican body in which AENA is involved, have taken the master's programme in Public Service and Infrastructure Management (one of these workers is currently enrolled in the programme), carrying out their professional training at AENA.

In addition to these long-term fellowships, between 25 and 30 two-week fellowships are offered and awarded annually

**Summary of attendance at international cooperation seminars organized by AENA, the Spanish Agency for International Cooperation for Development (AECID), and ICAO**

| YEAR | TRAINING CENTRE                   | TITLE  | DATE                      | TOTAL NO. OF ATTENDEES | NO. OF COUNTRIES WITH ATTENDEES | RATING (FROM 1 TO 10) (*)   |
|------|-----------------------------------|--|---------------------------|------------------------|---------------------------------|---|
| 2009 | Cartagena (Colombia)              | Planning and Management of Human Resources and Training at Airports  | 19 to 23 October          | 80*                    | n/a                             | n/a   |
| 2009 | Santa Cruz de la Sierra (Bolivia) | Strategies for Planning, Promotion and Management of Infrastructure for Air Cargo at Airports  | 1 to 5 June               | 61                     | 14                              | 9.15  |
| 2009 | Antigua (Guatemala)               | <ul style="list-style-type: none"> <li>■ Economic Aspects of Airports and Air Navigation</li> <li>■ Fee and Cost Models and Systems</li> </ul> | 23 to 27 February         | 70                     | 20                              | 9.22  |
| 2008 | Santa Cruz de la Sierra (Bolivia) | Aerodrome Certification and Airport Safety Management Systems  | 16 to 20 June             | 62                     | 13                              | 9.48  |
| 2008 | Cartagena (Colombia)              | Airport Infrastructure Planning and Economic Viability   | 31 March to 4 April       | 79                     | 16                              | 9.19  |
| 2007 | Santa Cruz de la Sierra (Bolivia) | Airport Maintenance System Planning and Management   | 29 October to 2 November  | 49                     | 12                              | 9.38  |
| 2007 | Cartagena (Colombia)              | Challenges in the Airport Environment: Safety and Social Responsibility  | 7 to 11 May               | 80                     | 14                              | 9.25  |
| 2006 | Santa Cruz de la Sierra (Bolivia) | The Future of Communications in Air Navigation   | 16 to 20 October          | 47                     | 12                              | 8.73  |
| 2006 | Antigua (Guatemala)               | Airport Project Management   | 8 to 12 May               | 63                     | 19                              | 9.36  |
| 2006 | Cartagena (Colombia)              | Development and Management of Air Cargo at Airports  | 27 February to 3 March    | 60                     | 12                              | 9.25  |
| 2005 | Santa Cruz de la Sierra (Bolivia) | The Airport: Safety of People and Property   | 14 to 18 November         | 58                     | 13                              | 9.30  |
| 2005 | Antigua (Guatemala)               | Marketing and Commercial Development   | 6 to 10 June              | 67                     | 15                              | No questionnaire  |
| 2005 | Cartagena (Colombia)              | Airport Infrastructure and Master Plans  | 14 to 18 March            | 83                     | 16                              | 9.27  |
| 2004 | Cartagena (Colombia)              | <ul style="list-style-type: none"> <li>■ The Challenges of Air Navigation in the 21<sup>st</sup> Century</li> <li>■ AIS</li> </ul>             | 19 to 22 October          | 60                     | 20                              | 9.20  |
| 2004 | Antigua (Guatemala)               | Innovation and Technology in Airport Management  | 27 September to 1 October | 53                     | 17                              | 8.56  |
| 2004 | Santa Cruz de la Sierra (Bolivia) | Modern Economic Management in Airports and Air Navigation  | 22 to 26 March            | 24                     | 6                               | 8.70  |
| 2003 | Cartagena (Colombia)              | Airport Management   | 27 to 31 October          | 55                     | 11                              | 8.65  |
| 2003 | Antigua (Guatemala)               | The EGNOS/GALILEO Global Navigation Satellite System (GNSS) in CAR/SAM Regions   | 23 to 25 June             | 40                     | 11                              | 9.00  |
| 2003 | Santa Cruz de la Sierra (Bolivia) | Airport Planning, Commercial Management and Business Management  | 26 to 29 May              | 39                     | 12                              | There is a questionnaire, but the evaluation is not comparable with the others. |
| 2002 | Antigua (Guatemala)               | Airport Management—Safety and Quality: Compatible Commitments  | 14 to 18 October          | 65                     | 14                              | There is a questionnaire, but the evaluation is not comparable with the others. |

**TOTAL NUMBER OF ATTENDEES AT 20 SEMINARS: 1,195**

\*AECID questionnaire handed out to participants

for participation in specific courses of the ETSIA Airport Systems master's programme. These courses are normally broken down into four modules which are selected to ensure that each year different subjects are covered and that they provide opportunities for all specialists in the various fields of aviation. In addition to specialized theoretical education, these short-term fellowships also include other activities, such as talks by AENA experts and visits to airport facilities. To date, these activities have benefited 131 professionals from 18 Latin American countries and from Cape Verde.

The remaining activities on the 2009 schedule included: an Airport Projects course (September); the Airport Management course (October/November); and an Airport Certification course (November 11–16). Applications to participate in these and other AENA courses must be submitted at least 40 days prior to the date on which the activity in question begins.

Additionally, between 2003–2009, a further 218 airport and air navigation professionals from other States have benefited from similar courses under the framework of specific collaboration agreements with AENA.

To provide some perspective on the level of activity involved in these educational endeavours, 78 people came to Spain in 2008 to participate in AENA's various training programmes, carried out in collaboration both with the ICAO

Technical Cooperation Bureau and other Latin American institutions. These numbers are expected to be higher both in 2009 and 2010.

### Seminars

The Spanish Agency for International Cooperation for Development (AECID) is a government body under the Ministry of Foreign Affairs and Cooperation. In addition to the training programmes which take place in Spain, mention must be made of the technical cooperation seminars which are part of AECID's Latin American Specialized Technical Training Programme. These constitute the second specific pillar of the AENA-ICAO cooperation activities.

The subject matter of these seminars is established by mutual agreement among all the participating institutions and aims to meet the training needs of both the aeronautical industry and the guest countries. The seminars are held at the AECID training centres in Latin America, namely: Cartagena, Colombia; Santa Cruz de la Sierra, Bolivia; Antigua, Guatemala; and, since 2009, Montevideo, Uruguay.

On average, two or three seminars are organized annually. Since 2002, a total of 19 seminars have taken place, and more than 1,100 professionals from all the countries in Latin America have attended them. The programme for these seminars is finalized in October, once AENA and ICAO have agreed upon the subject matter to be covered. Seminar program-

ming always takes into consideration the requests made by and surveys taken of previous activity attendees as well as the availability of AENA and AECID facilities. Applications to participate may be sent either to AECID or to ICAO three months before the event.

Three successful 2009 seminars have taken place: one, on airport fees and costs, in Guatemala; one on air cargo, in Bolivia; and lastly one recent event in Cartagena, Colombia, which dealt with human resources planning and management and training at airports. Seminars planned for 2010 will cover environment planning and management in airports, air traffic management, airline and passenger customer service and Safety Management System (SMS) in airport operations.

In addition to these two important groups of activities, which AENA carries out in collaboration with ICAO and within the framework of the agreements signed with ICAO, the Spanish public enterprise's cooperation programme extends to other areas as well. These areas include training fellowship agreements with Latin American institutions and an on-line training programme begun in 2008—in collaboration with the CEDDET (Centre for Distance Education for Economic and Technological Development) Foundation. This rounds-out AENA's international cooperation activities.

AENA's collaboration with ICAO comprises the better part of its programme. To date, the experience has been very beneficial, both from the point of view of the excellent understanding between the two organizations and from the perspective of the training results themselves. In 2010, the extension of the cooperation agreements will make it possible to continue down the path established in 2003, a path which every year aims for qualitative and quantitative improvement, and to include more Latin American professionals and countries and to better share aviation knowledge and experience. ■



Participants from another AENA-ICAO technical cooperation seminar in Santa Cruz. Since 2002, 19 of these seminars have taken place.

# Data-driven development

## ICAO/AFRAA event provides practical forecasting data-analysis tools and understanding to AFI States



*Zubair Anwar presently holds the position of Associate Economist in the Economic Analyses and Databases (EAD) Section of ICAO. He joined the Organization in 1974 and has contributed to many studies conducted by ICAO on the economic aspects of civil aviation, including a recent traffic scenario to the year 2050 which was published in the*

*1999 IPCC report. Anwar also develops global, Regional and route-group aviation traffic forecasts and their methodologies as well as conducting workshops on forecasting methodologies, productivity trends and financial forecasts.*

ICAO's EAD Section and the African Airlines Association (AFRAA) held a special meeting on civil aviation statistics and forecasting last August in Nairobi, Kenya. The event built in part on the major success of the first ICAO/AFRAA workshop held in Addis Ababa, Ethiopia, October, 2008. The Nairobi meeting was designed by the organizers to attract participants not only from AFI Civil Aviation

Attendees to the ICAO EAD/AFRAA special meeting on civil aviation statistics and forecasting in Nairobi, Kenya. A wide range of AFI stakeholders participated in the August 2009 event.

Authorities (CAAs) and Air Navigation Service Providers (ANSPs), but additionally AFI operators.

In all, 70 participants from 21 States and four Regional organizations (20 of whom represented 12 African carriers) attended the Nairobi meeting. Two lecturers, one each from ICAO's Economic Analyses and Databases (EAD) Section and its Air Transport Bureau (ATB) facilitated the workshop.

### Addressing carrier needs in a new era of privatization

As privatization becomes an increasingly predominant evolutionary step for many AFI carriers and airport facilities, the role and importance of ICAO's activities can sometimes get obscured in the rush to migrate activities from public to private sector models.

By organizing these data and forecasting-related events in association with an airline body, ICAO is able to more clearly demonstrate to AFI carriers and facility operators that many of its activities, such as in this case the Organization's data collection and analysis work as delivered by the EAD Section, are extremely relevant to the development of practical business performance indicators, budgets, and additional planning and management tools.

In Nairobi, ICAO and AFRAA were able to demonstrate how data collection and analysis have a significant impact on improving the efficiency and viability of the concerned stakeholders, notably, airlines, airports and ANS providers. The event addressed the key role played by accurate, timely and reliable forecasts in the planning efforts of air carriers and explained to participants some of the methods used to develop models, traffic forecasts and airport peak-period analyses.

The meeting also sought to sensitize participants about the vital role reliable information plays in securing credit

as well as the bottom-line implications of having accurate information when conducting a fleet and route planning exercise. The facilitators reviewed best practices regarding the collection and dissemination of civil aviation data by Member States, and also introduced the participants to the on-line version of the ICAO Integrated Statistical Database (ISDB) available at: [www.icaoodata.com](http://www.icaoodata.com)

### Data collection purpose and analysis

Presentations provided participants with an overview of the African Region and current trends in traffic growth globally. Unlike past workshops where ICAO statistical data reporting forms were discussed on the basis of stakeholders having data already in-hand, the Nairobi event lent equal weight to processes and factors important in advance of the data collection process. This included drawing clear connections between data collection and interpreting demand, fleet planning, route planning, variance analysis as well as the management indicators used for decision-making to improve the competitiveness of carrier operations.

In addition to these presentations, traditional lectures were also provided and a fleet planning exercise was also performed. This was especially useful for airline participants and illustrated how operators should select an optimum aircraft type on a typical route for the purpose of fleet modernization and improved operating results. This exercise was interactive and participatory and met with a very positive response from the event attendees.

It was repeatedly emphasized that all stakeholders must have the capability to collect accounting and operational data in a raw format and to create a repository from which the data could be interpreted and reported to improve the competitiveness and safety of their operations. The means and best practices to be adopted in collecting raw data and interpreting them were also disseminated in the workshop through various presentations and two information papers, namely:

- An information paper on the relationship between statistical data collection and economic efficiency and the methods to be adopted to collect data in an organized manner.
- An information paper on interpreting data for decision-making through the medium of variance analysis.

### Forecasting—Route planning

A major part of the workshop was devoted to forecasting and economic planning, including traffic forecasts developed by ICAO for Africa along with analyses of traffic growth potential for the Region. Route planning and market-share analysis and forecasting were similarly covered, along with airport forecasting and planning that included an overview of peak-period parameters.

In order to develop a better understanding of forecasting methods, a sample model was developed using existing ICAO data and participants were guided step-by-step to illustrate the connection between these models and the forecasts they can generate. The relationship between demand and explanatory variables was explained in detail and a market-share model for the demonstration of a route-planning exercise was similarly prepared. For this purpose, a decade of historical data was collected based on a popular city-pair served by five carriers. Numbers of passengers carried, frequencies offered and corresponding Gross Domestic Product (GDP) per capita were used as data samples to develop the model. It was demonstrated that this model can be used to project demand on a particular route segment for a short-term forecast and thereby help an airline improve its future market share. This was highly appreciated by the airlines and CAA participants since it provided the requisite tools to align demand with capacity—thereby improving efficiency and profitability of operations.

An illustration of airport peaking for Nairobi's Jomo-Kenyatta international airport, in terms of monthly, weekly, daily and hourly factors, was also analyzed. This provided an insight into how the periodical assessment of these parameters might prompt an early review of airport facilities and infrastructure as well as assisting airport authorities and planners in resolving air traffic congestion issues.

### Exemplary, practical results

The information provided in this ICAO meeting is not available to participants from other industry sources. The objective was that participants would be able to walk away with enough practical knowledge to develop actual forecasts for their own airlines or organizations. Participants were made aware of the importance of Africa-Indian Ocean Traffic Forecasting Group (AFI TFG) as well as the role it plays in the development of route-group forecasts on a Regional basis and as per Flight Information Region (FIR) peak-period parameters. This is part of the AFI TFG mandate to provide assistance to the Africa Planning and Implementation Regional Group (APIRG).

All of the Nairobi participants exhibited an overwhelming sense of accomplishment and agreed that the type of training received was pertinent to their requirements. ICAO's role was in this type of outreach was clearly understood and appreciated. The workshop concluded with the participants reiterating their commitment to collect data and report the same to ICAO. All the participants on the closing day commented on the excellent presentations made and the depth in expertise of the ICAO Secretariat presenters. They also commented that, in view of their quickly-evolving industry, such workshops should be held more frequently as they provide real value to the participants in improving the efficiency and safety of their operations. ■



NORDICAO



## State Profile Special Feature

Celebrating the very successful and historic civil aviation cooperation which has been established between Denmark, Iceland, Finland, Norway and Sweden.

A comprehensive look at the exemplary civil aviation frameworks and approaches that have been developed and adhered to by the Nordic States, inclusive of the autonomous regions of Greenland and the Faroe and Åland Islands.



# Nordic States at-a-glance

**Denmark** is a constitutional monarchy in north western Europe, the southernmost of the Scandinavian countries. Denmark comprises the Jutland peninsula, which extends about 338 km in a north and south direction, as well as numerous islands in the Baltic and North seas. Far to the northwest of Jutland, in the Atlantic Ocean between the

Shetland Islands and Iceland, lie the Faroe Islands—a group of 18 islands that are part of Denmark. Near the North American mainland, between the North Atlantic and the Arctic oceans, is the island of Greenland; also an integral part of the Danish Monarchy. Both the Faroe Islands and Greenland are self-governing entities. Denmark has an area of 43,094 km<sup>2</sup> with Copenhagen (København) being the capital and largest city.

**Finland** is a republic in northern Europe, bordered on the north by Norway, on the east by Russia, on the south by the Gulf of Finland, on the southwest by the Baltic Sea, and on the west by the Gulf of Bothnia and Sweden. The Åland Islands, an autonomous province of Finland, are located at the entrance to the Gulf of Bothnia. Nearly one-third of Finland lies north of the Arctic Circle. The area of Finland, including 33,551 km<sup>2</sup> of inland water, totals 338,145 km<sup>2</sup>. Helsinki is the capital and largest city of Finland.

**Iceland** is an island republic with the oldest legislative parliament—established in the year 930—still in existence. In 1980, Iceland was the first State in the world to elect, in a democratic election, a female president. Iceland is located in the North Atlantic Ocean, approximately 300 km east of Greenland and 1,000 km west of Norway. Iceland covers 103,000 km<sup>2</sup>, extending 305 km from north to south

and some 485 km from east to west. Iceland is the most sparsely populated country in Europe. It was not until 1974 that the so-called ‘ring road’ was completed, making it possible to drive around the island. Aviation has therefore played a very important role as a means of public transportation in the latter part of the 20<sup>th</sup> century. Reykjavík is Iceland’s capital and largest city.

**Norway** is a constitutional monarchy in northern Europe, occupying the western and northern portions of the Scandinavian peninsula. It is bordered on the north by the Barents Sea, an arm of the Arctic Ocean, on the northeast by Finland and Russia, on the east by Sweden, on the south by Skagerrak Strait and the North Sea, and on the west by the Norwegian Sea. The Norwegian coastline extends some 2,740 km. Including all the fjords and offshore islands, the coastline totals approximately 21,930 km. Norway has a land area of 385,639 km<sup>2</sup> and Oslo is the capital and largest city.

#### QUICKFACTS ON THE NORDIC REGION

- The Nordic region consists of: The Kingdom of Denmark (including the autonomous regions of the Faroe Islands and Greenland); The Republic of Finland (including the autonomous region of Åland Islands); The Republic of Iceland; The Kingdom of Norway; and The Kingdom of Sweden.
- The region’s five nation States and three autonomous regions share common history as well as common traits in their respective societies, such as their political systems and the Nordic social model.
- Politically, the Nordic States do not form a common entity. They do co operate, however, in different organizations, including their joint representation to ICAO: *NORDICAO*.
- The Nordic States have a combined population of approximately 25 million inhabitants, spread over a land area of 3.5 million km<sup>2</sup>.

**Sweden** is a constitutional monarchy in northern Europe, occupying the eastern portion of the Scandinavian peninsula. Sweden includes the islands of Gotland and Öland in the Baltic Sea. Sweden’s 449,964 km<sup>2</sup> makes it the fourth largest country in Europe. Stockholm is the country’s capital and largest city. ■

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# The pioneering spirit of Nordic aviation

**Aviation has been an integral part of the Nordic States' transportation infrastructure for decades. It is the only means of long-distance transport in some of the Arctic parts of the region, where cities and towns are remotely located on a rugged landscape.**

Since the 1920s, the transport of goods and passengers has risen steadily in the Nordic countries.

Danish airline DDL was founded in 1918, and national airlines were founded in Sweden and Norway in 1924 and 1927 respectively. In 1946, the three national air carriers united in a joint Scandinavian airline which in 1951 became Scandinavian Airlines System (SAS). SAS was the world's first airline to fly the Copenhagen-Los Angeles polar route in scheduled services in 1954.



Kastrup Airport circa 1950. Three SAS DC-4s, two DC-6s, one Scandia, three DC-3s and one Swissair Convair-liner 240 can be seen on the apron.

The first flight in Iceland took place over Reykjavik in 1919 when an Avro 504 K took off from Reykjavík Airport, located in the centre of the capital. Air Iceland, from which Icelandair traces its roots, was established the same year, well before Iceland's parliament passed its first aviation legislation in 1930. Today, there are 18 AOC holders worldwide with an Icelandic AOC operating 60–70 aircraft with an MTOW of over 10 tonnes.

Finnair, one of the world's oldest continually operating airlines, was founded on November 1, 1923. In recent years, Finnair's strategy has included strengthening the company's position in the Asian market and increasing the number of routes between Europe and Asia.

In Denmark, Kastrup Airport (as Copenhagen Airport was originally called) opened on April 20, 1925. It was the first airport in the world designed exclusively for civil traffic. At the time, there were only a few small hangars and two short runways. Flying was limited to the summer months, since there were no navigational aids. Improved technology allowed for year-round flying in the 1930s and it wasn't long before Copenhagen Airport became the primary connecting point between the Nordic countries and the rest of Europe.

The Nordic region's rich tradition in aviation includes aircraft manufacturing. Early in the 20<sup>th</sup> century, several experiments with various motor-powered 'flying devices' were carried out. In Denmark, Mr. Jacob Christian Ellehammer, who had previous commercial success with an early motorcycle design, pursued his dream of powered flight. His studies of birds enabled him to calculate the horsepower required to fly and to translate these calculations into his own design of a radial engine.

Unaware of the Wright brothers' successful controlled and manned powered flight in 1903, Ellehammer continued to experiment. On September 12, 1906, he became one of the first Europeans to fly an airplane. His flight of 42 metres at an altitude of 50 centimetres occurred on the tiny island of Lindholm. It was, however, never recognized as a 'free motor powered flight' because the aircraft was tied to a pole in order to keep it flying over the island and prevent it from going astray into the sea.

In the 1920s and 1930s, aircraft production became much more sophisticated. Numerous aircraft were built both for military and civilian purposes in Denmark, Norway, Finland and Sweden—the most well-known of these aircraft manufacturers being SAAB (Svenska Aeroplan Aktiebolaget).

Founded in 1937, SAAB's primary aim was to supply military aircraft in Sweden. Today, SAAB has a military and civilian aircraft production as well as avionics and technical solutions for the global aviation industry. ■



The Douglas DC-6B Arild Viking made history during its delivery flight by departing Los Angeles on November 19, 1952, and landing 28 hours and 6 minutes later in Copenhagen after refuelling stops at Edmonton, Canada and Thule, Greenland. On November 15, 1954, SAS inaugurated its first regular polar route between Copenhagen-Sondre, Stromfjord (Greenland), Winnipeg (Canada) to Los Angeles.



A DC-3 at Lillehammer, Norway. The Norwegian SAS-partner DNL operated a total of 13 DC-3s from 1946 onward.



J.C. Ellehammer became one of the first Europeans to fly an aircraft when he took his invention on its inaugural flight on the island of Lindholm in 1906, propelling it 42 metres at an altitude of 50 centimetres (Photo courtesy of Danish Museum of Science and Technology).

# Effective cooperation to promote safety and efficiency

The Nordic States have successfully created a framework that enables air traffic to operate as safely and efficiently as possible for the benefit of air passengers and society alike.

Whether you travel through the major airports in Copenhagen, Helsinki, Reykjavik (Keflavik), Oslo or Stockholm, or if you go to the more isolated areas in the Nordic region, you will find airports that are in full compliance with the Standards of ICAO. This is also true of the approximately 200 domestic, regional and long-haul airlines serving the region.

Due to the geography and climate of the region, and because of the vast distances involved, aviation constitutes an important and vital part of the infrastructure in the Nordic States. By way of example, the distance between Oslo, the capital of Norway, and the northernmost part of that country, is approximately the same as the distance between Oslo and Rome, Italy.

More than 100 airports with regular domestic and international flights—as well as several heliports and helistops in the more remote areas—are serving the population throughout the region.



In 2008, almost 115 million passengers were departing from and/or arriving at Nordic airports on international and domestic flights.

With respect to its planning, the development and operation of the airport network, its airlines, air navigation services and technical infrastructure, safety has the highest priority in Nordic aviation. The focus of all the Nordic States will remain on developing aviation as a safe and efficient means of transportation. ■

## Nordic aviation by-the-numbers

|  | DENMARK    | FINLAND    | ICELAND   | NORWAY     | SWEDEN     | TOTAL              |
|--|------------|------------|-----------|------------|------------|--------------------|
| Arriving and departing passengers 2008             | 25,914,000 | 17,544,522 | 1,991,338 | 41,188,787 | 28,076,000 | <b>114,714,647</b> |
| Movements in major airports (Dep. + Arr.) 2008     | 454,800    | 273,550    | 164,188   | 561,037    | 323,092    | <b>1,776,667</b>   |
| IFR operations grand total for 2008                | 635,597    | 266,483    | 110,366   | 870,365    | 726,195    | <b>2,609,006</b>   |
| Aircraft on national register grand total for 2008 | 1,123      | 1,472      | 406       | 1,159      | 1,735      | <b>5,895</b>       |
| Total number of certified personnel <sup>1</sup>   | 11,228     | 9,396      | 2,201     | 12,858     | 11,132     | <b>46,815</b>      |
| Number of airports (excl. private airfields)       | 29         | 28         | 59        | 56         | 60         | <b>223</b>         |
| Number of AOC-holders                              | 27         | 38         | 18        | 28         | 76         | <b>183</b>         |

<sup>1</sup>Numbers reflect that one person may hold more than one certificate.



# Nordic 'Just culture' and non-punitive occurrence reporting

The constant improvement of aviation safety is based mainly on systematic data collection and the subsequent analysis of accidents and incidents.

There is a need to learn from accidents and incidents through safety investigations in order to take appropriate actions to prevent the repetition of such events. Also, minor occurrences need to be investigated in order to prevent faults that could lead to accidents. Statistics and analysis of aviation occurrences indicate that the primary cause of aircraft accidents and serious incidents are connected to human factors. This fact should motivate and encourage everyone to turn human



weakness into strength by learning from each mistake and by reporting all incidents without the risk of recrimination. In that manner, both flight safety and the enjoyment of flight will be increased for all those who fly.

This requirement calls for reporting systems that disclose human errors and other faults that transpire on a regular basis. It is imperative, however, to create an environment in which people are encouraged, even rewarded, for providing essential safety-related information—but in which there is clarity on where the line must be drawn between acceptable and unacceptable behaviour.

The Nordic States have worked together for decades to produce such an environment within Nordic civil aviation—an environment often referred to as a ‘Just Culture.’ It is a culture in which frontline operators or others are not punished for their actions, omissions or decisions that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated.

A ‘no-blame’ culture, with blanket amnesty on all unsafe acts, would generate legal problems and would likely lack credibility. What is desired,

therefore, is an atmosphere of trust, where errors are reported, analyzed and then used to further optimize safety.

By seeking to obtain an environment based on a ‘Just Culture,’ the Nordic safety regulators believe that both the level of safety awareness as well as the sharing of safety related information, are improved.

One of the cornerstones in collecting and analyzing safety-related information is a confidential and non-punitive reporting system; one which facilitates the collection and exchange of information on actual or potential safety hazards and deficiencies while contributing to the prevention of aircraft accidents as required in ICAO Annex 13, Chapter 8.

In 2001, the Danish Parliament approved national legislation introducing mandatory, confidential and non-punitive occurrence reporting and, based on the positive experiences with this system, the Nordic States actively sought to have a similar system introduced in the European Union.

This was accomplished two years later through European legislation on occurrence reporting in civil aviation—Directive 2003/42/EC. The Directive

establishes requirements for mandatory reporting of occurrences which, if not corrected, would endanger the safety of aircraft, its occupants or any other person. The Directive has been incorporated in national legislation throughout the European Union since 2005.

Directive 2003/42/EC defines a detailed list of safety occurrences to be reported to the competent authorities by personnel with functions within the following areas:

- Operation of aircraft.
- Ground handling of aircraft.
- Maintenance of aircraft.
- Maintenance, repair and overhaul of air navigation facilities.
- Air Traffic Control and Flight Information.
- Airport operations.

To pool the safety occurrence information in Europe and overcome the problems rooted in incompatible data collection and data storage formats, the European Union introduced harmonized safety occurrence reporting requirements and developed the ECCAIRS (European Co-ordination Centre for Accident and Incident Reporting Systems) database. Iceland was the first State in Europe to fully share its data in the ECCAIRS central database.

The database offers standard and flexible accident and incident data collection, representation, exchange and analysis tools. The database is compatible with ICAO’s ADREP system and supports the presentation of information in a variety of formats. Several non-European States have decided to implement ECCAIRS to take advantage of the common classifications.

It is generally acknowledged within the aviation community that, without intervention, an increased number of flight operations will result in an increased number of accidents. Hence the aim of a ‘Just Culture’ and the introduction of confident and non-punitive reporting systems will contribute to further ‘fine-tune’ flight safety. ■

# Equal opportunity for unequalled careers

## Women take on more and more key roles in Nordic aviation



Women in aviation have a long history in the Nordic countries and the number of women in the industry is growing. By the 1950s, several Nordic women had received their pilot's licences and, since 1980, the number of female licensed air traffic controllers has risen dramatically.

Although a career in the aviation industry is not commonly considered a job for women, there is no field of aviation in the Nordic region today which does not have female representation in its workforce. Today, women in Norway are working as air force pilots flying F-27s as well as helicopter pilots flying for the Norwegian coast guard and rescue team.

In Sweden, women account for approximately 4.5 percent of total pilot licences with a high of 9.1 percent in the CPL (A) category. In Iceland, six percent of pilots (CPL, ATPL) are women, while only 0.6 percent of licensed aircraft maintenance staff are female. 26.6 percent of all Icelandic air traffic controllers are women.

It's also noteworthy that, on the Icelandic Women's Rights Day, June 19, 1999, for the first time in that country's

history, all crew members on an Icelandair international flight from Reykjavik to Copenhagen were women.

Although there has been a strong tradition in the Nordic countries to provide equal opportunities for all regarding education and occupation, there still seems to be some professions that women are reluctant to seek—aviation being one of them. When it comes to licensed cabin crew one will inevitably find that a majority are women, whereas it is somewhat more difficult to spot a female airline pilot, mechanic or flight engineer.

In Denmark, fewer than 200 women are licensed out of a total number of approximately 4,700 pilot's licences that have been issued. These women pilots are represented in the categories of Private Pilot's License, Commercial Pilot's License and Air Transport Pilot's Licence, and are flying fixed-wing as well as rotor-wing aircraft.

In the Royal Danish Air Force it was made possible for women to become military pilots as early as 1992, and though a few women have been occupied in the air force since then, flying helicopters and transport aircraft, it was not until 2006 that the first female Danish fighter pilot went solo in an F-16 fighter.

On the other hand, approximately 30 percent of Danish air traffic controllers are female and occasionally the number of female ATCO's has reached an even higher amount.

Sweden got its first female air traffic controller in 1969. As of today, approximately 50 percent of the air traffic controllers in Sweden are women.

Even when it comes to the operation of airports you can find women in central positions in the Nordic countries. Finland has one female airport director and, in Sweden, at the state-owned LFV Group, seven out of fifteen airport managers are women. That is probably the highest percentage in the entire world.

So when a few decades ago young girls would dream about becoming a 'stewardess' or maybe a private pilot, today you will find more and more young girls saying they want to become commercial pilots or even air force pilots when they grow up.

The opportunities are there—all that remains is for these new women candidates to reach out and give aviation a try. ■

# NUAC: A first step towards a common airspace

Sweden and Denmark are taking an initial step towards the improved harmonization of European airspace. This bold and pioneering measure will be achieved through the introduction of a new body which will jointly oversee the air navigation areas now serviced separately by the two Nordic States.

The new joint airspace will be administered by an organization known as Nordic Upper Area Control (NUAC), which will be co-owned by LFV/ANS in Sweden and Naviair in Denmark. Management is expected to be selected and onboard by early 2010, and the company should be fully-certified and up and running by 2012.

“With this joint venture Sweden and Denmark will be at the forefront when it comes to efforts to harmonize and make more efficient use of European airspace,” commented Sweden’s Minister of Infrastructure, Åsa Torstensson. The fact that national borders will no longer decide which route an aircraft can choose also means that the Swedish/Danish collaboration should serve as an important benchmark in the continued development of ATM/ANS in the Nordic region of Europe specifically and the broader European airspace as well.

## **Pioneers in a cooperative approach to airspace management**

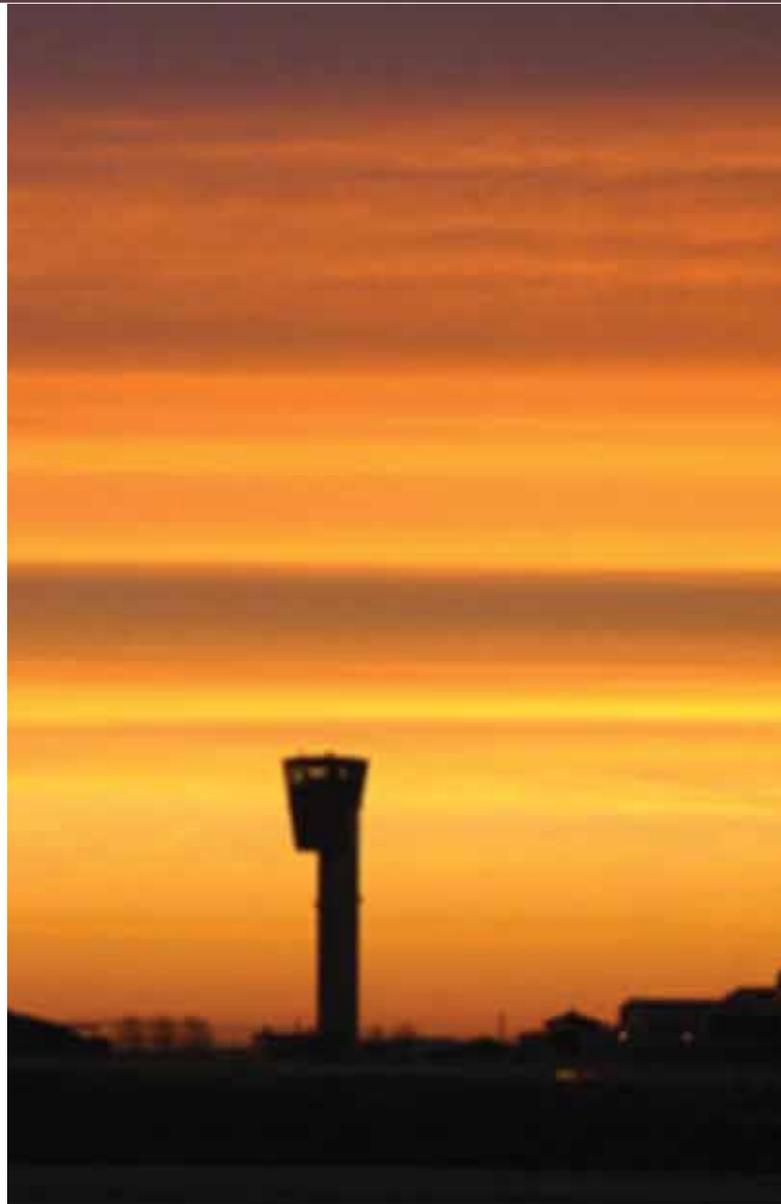
The merging of Danish and Swedish airspace will provide for more efficient air traffic control and additional savings that will allow carriers to enjoy fuel savings and passengers to expect shorter flying times.

The decreased fuel consumption and its associated reduction in carbon dioxide emissions promised through the merged airspace and employing its newer, shorter routes is currently estimated at 52,000 tonnes per year.

This corresponds to an estimated cost saving of about 45 million Euros per year, not to mention additional increases in the overall airspace capacity.

Although the Swedish and Danish Ministers of Transport presented their plan for a common airspace earlier in 2009, preparations had in fact been going on for several years in the two countries. A key objective of the new body will be to see more countries joining in the near- and mid-term future.

NUAC will maintain the three control centres in Stockholm and Malmö in Sweden, and Copenhagen in Denmark. Its underlying agreement also specifies that all staff will keep their positions in their national companies and be, in effect, ‘on loan’ to NUAC, which will have about 50 staff when it’s fully operational. ■





## Providing historic leadership and assistance through a joint Nordic Delegation to ICAO

Since 1944, the Scandinavian States—and later all Nordic States—have maintained a joint Delegation to the International Civil Aviation Organization (ICAO). This joint Nordic Delegation, known as *NORDICAO*, is comprised of representatives from Denmark, Finland, Iceland, Norway and Sweden.

**The existence of this cooperative body, as well as the regular presence of a NORDICAO participating delegate on both the ICAO Council and Air Navigation Commission, has helped to foster highly harmonized civil aviation regulations and legislation within the five Nordic States as well as a set of unique contributions to ICAO throughout its history.**

The NORDICAO Delegation's primary aim is to foster the Nordic States' aviation interests within the framework of ICAO and to strengthen ICAO's role as the global organization for developing and harmonizing civil aviation SARPs and guidance material.

The present NORDICAO Delegation is staffed by four persons:

- Head of Delegation and Representative on the Council, Mr. H. Sigurdsson.
- Alternate Representative on the Council, Mr. F. Christensen.
- Air Navigation Commissioner, Mr. B. Eckerbert.
- Administrative Officer, Mrs. A. Westin/Mrs. B. Riedler.



Iceland was elected ICAO Council Member for the triennium 2007 to 2010. The Icelandic Representative on the ICAO Council for this triennium, and present head of the Nordic Delegation, Mr. Hallgrímur (Halli) Sigurdsson, has an operational and managerial background in Air Traffic Management. Mr. Sigurdsson has furthermore been actively involved in NATO operations at Kosovo's Pristina Airport as well as Kabul Airport in Afghanistan.

The Delegation members are in close contact with their national safety regulators and report directly to the Directors General of Civil Aviation (DGCA) for each of the five Nordic States. The DGCA meet regularly to coordinate the tasks for the Delegation.

The cooperation between the Nordic States goes all the way back to the Chicago Conference in 1944 where Norway, as a newly-elected Member of the Interim Council, was considered a Representative for the Nordic geographical area.

The Interim Council, first elected on December 6, 1944, consisted of 20 Delegates. Regrettably India, with its



Halli Sigurdsson, current Head of the NORDICAO Delegation and its Representative on the ICAO Council.



An SAS DC-4 reg. LN-IAD overflies the Statue of Liberty, New York. Copenhagen-New York, the first SAS route, was inaugurated September 17, 1946.

geographical position and large population, was not elected. On December 7, the very last day of the Conference, the Norwegian Ambassador, Mr. Wilhelm Munthe de Morgenstjerne, announced that Norway, elected as one of the 20 Members of the Interim Council, would offer its seat to India. The Cuban Delegate, Mr. Felipe Pazos, asked Norway to withdraw its offer, and in turn offered Cuba's seat to India, since the Caribbean Region was well represented in the Interim Council.

In this way India became a Member of the Interim Council and the President of the Conference and Chairman of the American Delegation, Mr. Adolf Berle, remarked that these two examples of nobility promised a successful future for the newborn organization.

Three years later, in May 1947, the first Assembly of the International Civil Aviation Organization took place in Windsor Hall, Montreal. Neither Norway nor Denmark ran for a seat in the Council, in order to facilitate the election of Sweden. The Swedish delegate expressed his gratitude for his country's election to the Council, commenting at the time that the actions of Norway and Denmark demonstrated: "Further evidence of that spirit of cooperation which the Scandinavian countries have already shown on international air routes, where they are, in fact, operating a joint airline service."<sup>1</sup>

The Scandinavian Delegation originally comprised Denmark, Norway and

Sweden. Finland joined on March 1, 1976, and, to reflect this inclusion of a Nordic country, the term *Scandinavian Delegation* was changed to *Nordic Delegation*. On July 1, 1980, Iceland also joined the Nordic Delegation which now encompassed all five Nordic States.

Today, the Nordic Delegation to ICAO represents a combined population of approximately 25 million, spread over a land area of 3.5 million km<sup>2</sup>. The airspace controlled by the five Nordic States totals approximately 8.4 million km<sup>2</sup>—comprising a vast area in Northern Europe and over the North Atlantic equivalent to 82 percent of the European landmass or the entire landmass of Brazil.

One achievement that has arisen from the close cooperation between the five Nordic States through the years is the remarkably harmonized national legislation within the five States regarding civil aviation regulation.

This has been made possible in part because a Nordic Representative has been steadily maintained on the ICAO Council and in the Air Navigation Commission. The Nordic States have succeeded in participating actively in ICAO's programmes, harmonizing—to the fullest extent possible—the Nordic position in all ICAO matters and ratifying international Conventions made under the auspices of ICAO.

The Nordic States consider ICAO the global focal point for the continuous improvement of aviation safety.

Consequently, aviation experts on different subjects have been seconded to the Organization when needed—and at no cost to ICAO. On several occasions, extra employees have been permanently placed in Montreal to assist ICAO Study Groups.

Another example of the close cooperation between the Nordic States is the Nordic Educational Board, tasked primarily to harmonize the education and training of safety inspectors through courses and exchanges of experience as well as to improve the inter-Nordic relationship and the harmonization of Flight Safety Inspections.

The Nordic Courses establish common grounds for basic and recurrent training for inspectors in 'safety inspector-related' positions. Participants are briefed on recent developments in international cooperation, Human Factors and Quality and Safety Management Systems in aviation.

The subjects covered in the course are generally of a legislative and regulatory nature and include topics such as Safety Management Systems and State Safety Programmes.

One of the key elements in the joint Nordic aviation safety work, in the near future, will be to establish State Safety Programmes to ensure the efficient implementation of oversight activities by service providers. These activities will be based on the assessment of safety performance as it relates to the service providers' Safety Management Systems and related objectives.

Such programmes will only be efficient when based on explicit policies, procedures, management controls, documentation and corrective action processes to keep State safety management efforts on track. The Nordic States plan to have completed this task by November 2010, in order to be effectively prepared for the challenges ahead and to further advance their ongoing efforts to promote safe and efficient aviation. ■

<sup>1</sup>The reference was made to the Scandinavian Airlines System (SAS), founded on August 1, 1946.

An aerial satellite photograph of Denmark, showing the Jutland peninsula and the island of Zealand. The land is a mix of green and brown, indicating vegetation and agricultural fields. The surrounding waters are dark blue, and the sky is a pale, hazy blue. The image is taken from a high angle, looking down at the country.

# The Kingdom of Denmark

**Including Greenland and the Faroe Islands**

## Progressing safely and efficiently: CAA Denmark

The Danish Civil Aviation Administration (CAA Denmark) is a specialized body whose focus areas are aviation safety, security and airspace regulation as well as economic and performance regulation.

CAA Denmark acts as the aviation regulator in Denmark, the Faroe Islands and Greenland on behalf of the Danish Ministry of Transport. It's engaged in national as well as international commitments. Flight safety inspections, as well as security inspections, are therefore conducted both on the Danish mainland as well as in the Arctic region, where aviation plays a significant role in day-to-day transportation requirements.

The basis for flight safety in these areas is achieved through CAA Denmark's civil aviation standards and the supervising of compliance to those standards by commercial and private operators. Thus, CAA Denmark

contributes towards creating a framework that enables air traffic to operate as safely and efficiently as possible.

Safety targets are established in order to avoid loss of life or serious personal injury as a result of aviation in Denmark or Danish aviation abroad. Flight safety must therefore be constantly improved and crimes or threats against civil aviation must be prevented. The regulations governing flight safety must be based on international standards and they must simply and clearly improve the overall level of safety.

CAA Denmark participates actively in and associates a high degree of priority to all international fora where regulations and standards are debated. Danish regulations are based on those of the European Union, the European Aviation Safety Agency, EUROCONTROL and ICAO as per the following principles:

- Danish regulations are based on international standards and must be in complete concurrence with them. Danish regulations may only deviate from the international standards in cases where special motivating factors exist.
- Danish regulations must enter into force concurrent to related applications of international standards.
- Danish regulations must be simple to comprehend and be available in printed and electronic formats.

A systematic analysis of Danish safety regulations and their relevance is performed regularly. The ICAO audit team visited Denmark in the fall of 2008 as part of its Universal Safety Oversight Audit Programme. The Audit Report revealed only minor deficiencies—all of which have since been corrected. ■



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# Perspectives and challenges for civil aviation



An interview with Director General CAA Denmark, Mr. Kurt Lykstoft Larsen



*The Director General for Civil Aviation in Denmark, Mr. Kurt Lykstoft Larsen, is also Vice-President of ECAC and ECAC's Focal Point for Security and Facilitation. He is also the Chairman of EUROCONTROL's Standing Committee on Finance and has been a Member of the European Aviation Safety Agency's (EASA) Management Board for a number of years.*

## Provide if you would a brief introduction to the Danish Civil Aviation Administration.

**Kurt Lykstoft Larsen:** The Danish Civil Aviation Administration (CAA Denmark) is the aviation regulator in Denmark, Faroe Islands and Greenland, acting on behalf of the Ministry of Transport. All civil aviation regulatory functions are integrated within this single, specialized body. In short, CAA Denmark contributes towards creating a framework that enables air traffic to operate as safely and efficiently as possible—for the benefit of air passengers and society alike.

## How can ICAO contribute further to flight safety?

One must remember that, in spite of cultural and other differences, the aviation community all over the world shares the same objective to constantly improve flight safety. ICAO is the global focal point for these efforts and has taken many important initiatives to help its Member States in achieving higher standards.

State Safety Programmes (SSPs) and Safety Management Systems (SMS) are just two recent examples. Since internal training is one of the key elements in the SMS approach, we took the initiative in CAA Denmark two years ago to



invite representatives from ICAO to Denmark to hold a course on SMS for 30 of our flight safety inspectors.

ICAO's Universal Safety Oversight Audit Programme (USOAP) is another example. Denmark has always supported USOAP, as we are of the opinion that it benefits global aviation to assist countries in complying with safety standards. As a matter of fact, Denmark was subject to an ICAO USOAP Audit in the fall of 2008.

## Are you satisfied with the Audit result?

Well, you are never quite satisfied, but it was encouraging to be able to conclude that all vital aspects our legislation, as well as our procedures, are in compliance with ICAO's Standards and Recommended Practices. The audit team, however, did have some findings with respect to minor deficiencies and that shows that there is always room for improvement.

## It has been brought up that Europe should take a more leading role regarding flight safety standards. Do you agree?

For more than 60 years ICAO has been the one global organization to set flight safety standards for civil aviation. The results speak for themselves since we have seen a steady growth in the number of flight operations and passengers combined with a steady decrease in the accident rates over the years.

In my opinion we cannot, in a global system, have different standards or definitions regarding flight safety. Therefore, ICAO has also in the future an essential role to play.

**Environmental issues have been put high on the agenda in recent years. Do you see possibilities for civil aviation as it seeks to cope with those challenges?**

It is correct that climate change and emissions are topics that are high on the agenda—not least in Europe. Civil aviation contributes two-to-three percent of total annual GhG emissions, and it is vital that the aviation community acknowledges its responsibility to decrease its share.

It is crucial to make use of all possible means at our disposal to decrease aviation's impact on the environment. However, aviation plays different roles in different parts of the world dependant on the geography and infrastructure of each country or region, so in dealing with these problems you have to bear in mind that one size does not necessarily fit all. Therefore, you have to carefully analyze the costs and effects before initiatives are taken or imposed.

**“The cost incurred by security measures should be proportionate to the added value of the measures.”**

**In July, 2008, you were re-elected as Vice-President for the European Civil Aviation Conference (ECAC) and as Focal Point for Facilitation and Security. What are the benefits of international cooperation on facilitation and security?**

It is of great value to exchange views on both topics with representatives from other Regions of the world. Sharing of experiences and best practices are undertaken under ECAC's Memoranda of Understanding with its sister bodies and with bilateral partners throughout the world.

Every second year, together with Singapore, we organize an aviation security forum for the Asia-Pacific Region, and in June 2009 I had the pleasure to chair the Joint Security Forum in Morocco, which was organized together with the Arab Civil Aviation Commission. We had a successful two-day workshop, discussing topics such as international cooperation seen from a regulator's perspective as well as security and facilitation as viewed from an airline's perspective.

**Are security measures going too far at the cost of facilitation?**

I am sure we all share the opinion that aviation security is of paramount importance and that security measures need to be efficient, well balanced and should be implemented in a

workable manner. Also the cost incurred by the measures should be proportionate to the added value of the measures.

But we also need to focus on a reasonable balance between security and facilitation, as facilitation is significantly affected by security measures. Maintaining this balance represents a real challenge since every time a security incident occurs and new measures are required, it comes at a price for facilitation. Operations at airports become more difficult, time consuming and expensive.

**How could such a balance be obtained?**

One of the major problems seems to be that we are adding extra layers to our security systems whenever we are faced with a different kind of threat—or rather when the already known threats take another shape or form. Of course, we all recognize the need for swift action whenever a security incident

happens, but it would be wise to assess the impact and know the operational consequences before we decide to implement any long-term security measures.

I am also convinced that new technology can play a very important role in the development of aviation security. In short, I am hoping for a development where impact assessments, technical knowledge, new technology and—in particular—common sense are the major ingredients of any proposed aviation security solution.

**How do you see the future role of ICAO?**

Today civil aviation plays an increasingly important role both as a Regional, national and international means of transportation. This development accentuates the need for a global and effective organization within the field of civil aviation, ready to meet the coming years' challenges.

I am convinced, therefore, that ICAO has a key role in safety promotion throughout the world and that it is similarly crucial that the Organization maintains and extends its leading role in setting standards for flight safety, security and environmental impact reduction. ■

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# ‘Green’ departures, flights and approaches

Environmental issues have been at the forefront of aviation agendas in recent years, not least in Europe. Civil aviation currently contributes between two and three percent of total greenhouse emissions on an annual basis and there is a broad consensus within the air transport community to acknowledge its responsibility and to strive to decrease this percentage even further.

“It’s crucial to make use of all possible means at our disposal to decrease aviation’s impact on the environment,” remarked Danish Director General for Civil Aviation, Mr. Kurt Lykstoft Larsen. “Aviation plays different roles in different parts of the world depending on the geography and infrastructure of each country or region, so in dealing with these problems you have to bear in mind that one size does not necessarily fit all. As a sector we have to carefully

analyze the costs and effects in each region before initiatives are taken—or imposed.”

Civil aviation is being proactive in its efforts to diminish its negative impact on the environment, primarily through research and development into more fuel efficient engines and airframes as well as efforts now looking into alternative forms of jet fuel. However it is also possible to further decrease fuel consumption by leveraging existing air transport instruments.

One of the key existing approaches available to save on fuel and other costs while minimizing negative impacts on the environment, is to implement a new set of behavioural patterns through training. One contemporary example is Eco Pilot Training which is currently offered by the Oxford Aviation



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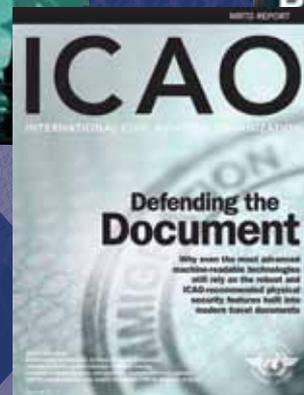
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Academy (OAA). This programme, which is also available both for new and existing pilots, has been developed not only to train or update pilots as per standard methodologies, but to teach them to be more effective ‘fuel managers’ as well.

Training pilots to become proactive fuel managers will benefit the environment and can save airlines as much as four-to-six percent in fuel costs. The OAA has reviewed extensive simulations and real airline test cases to prove that the concept delivers. A detailed consultation with a client airline is made before the start of the programme to determine the best course of action and the appropriate training syllabus. One big challenge is changing entrenched behaviours and mind-sets, but through simulator training pilots are able to evaluate and experience the new efficiency benefits first-hand.

Another example of an existing tool that can be employed to improve efficiency is ‘green’ approaches, which have been tested for the past couple of years both at Stockholm Arlanda Airport and Copenhagen Airport.

A ‘green’ approach is basically synonymous with a Continuous Descent Approach (CDA). Since the early tests completed in this regard, more than 15,000 CDAs have now been performed at Arlanda Airport with fuel savings totalling more than 1,000 tonnes.

Continuous Climb Departures (CCD) are now also used for the vast majority of take-offs at Copenhagen Airport. A CCD procedure allows aircraft to climb directly to a designated flight level without going through a levelling-off stage. In more than 90 percent of the take-offs it oversees, Naviair, the Air Navigation Service Provider (ANSP) at Copenhagen Airport, allows for this deviation from Standard Instrument Departures (SID) to allow departing aircraft to climb directly to their cruising level.

SID procedures normally require aircraft to level-off at 6,000 feet before climbing further, requiring extra fuel as a consequence. At Copenhagen the SID Procedures are only mandatory during peak traffic hours, thus enabling Air Traffic Controllers to deviate from the conventional procedures for all non-peak take-offs. Because it is surrounded by water on three sides, Copenhagen is more able to fully employ this environmentally-friendly concept with suitably-equipped aircraft.

These ‘green’ concepts were first introduced in 1996, but the advantages have only now been proven based on an analysis made by EUROCONTROL’s System for Traffic Assignment & Analysis at the Macroscopic Level (SAAM)—a European Airspace Design Evaluation tool used to model, analyze and visualize Route Network and Airspace developments with current or future

traffic data at local, regional and European-wide levels. Typically, SAAM is used by airspace planners to improve TMA and/or en-route airspace system safety and capacity and to perform strategic traffic flow organization.

“We find the development of this unique concept for take-offs at Copenhagen Airport extremely positive,” commented Andrew Watts of EUROCONTROL. “Our simulations substantiate significant fuel savings with reduced effect on the climate and we fully support the ANS providers’ individual development of the best and most efficient solutions within their specific area.”

EUROCONTROL’s computer simulations show that the concept of continuous climb during take-off, on average, saves 200 kg of fuel per take-off—equivalent to a reduction of approximately 620 kg of CO<sub>2</sub>. Another benefit is the reduced emissions of a range of other environmentally-damaging substances.

Air Navigation Services at Copenhagen Airport therefore saves its airline customers approximately 10,000 tonnes of fuel annually, while remaining cost efficient. On an annual basis it reduces CO<sub>2</sub> emissions by more than 30,000 tonnes. ■

An aerial satellite-style image of Finland, showing its characteristic shape with numerous lakes and a complex coastline. The land is depicted in shades of green and brown, while the surrounding water is a deep blue. The map is centered on the country, with parts of Sweden and Norway visible to the west and east respectively.

# The Republic of Finland

# Thinking globally, acting locally

Taking a look at current aviation issues from the Finnish perspective—an interview with Mr. Kim Salonen, Director General, CAA Finland.



Kim Salonen has been in charge of Finnish flight safety since 1993. The Finnish Civil Aviation Authority was established in 2006 as an independent agency under the Ministry of Transport and

Communications. It handles flight safety, aviation security and air transport issues.

In 2010, CAA Finland will become part of the new Transport Safety Agency that will oversee Finland's aviation, rail, maritime and road transport safety. The new agency's aim will be to manage the Finnish transport system as a harmonized entity, promoting innovation and expertise and improving productivity.



In your opinion, what are the most important elements of aviation safety in Finland?

**Kim Salonen:** For Finland, as for all Nordic States, ICAO is the number one global player in the field of flight safety. ICAO is the focal point for all our work to improve Finnish aviation safety. At the same time, we are part of Europe, and our work is more and more governed by common EU legislation. Continuous growth in aviation and a steady liberalization process mean that supervision must be based on extensive international cooperation.

Open competition in air transport was the starting point for all common work in the European aviation sector. The European Aviation Safety Agency (EASA) was established to maintain a high uniform level of civil aviation safety in Europe, and many of its regulations are already effective in

Finland, such as those concerning airworthiness and maintenance. Next on the list are flight operations and licensing, followed by aerodromes and air navigation services.

**EASA’s authority is now extending over flight safety regulations in Finland. How does this affect the responsibilities of the national aviation authority?**

New regulations will bring significant changes to our tasks and operating practices. The trend is clear: in all commercial aviation, the focus in flight safety oversight is gradually shifting from a detailed level, such as annual inspections of aircraft, to more general supervision of organizations and their staff. In other words, we are moving towards the inspection of larger entities—from nuts and bolts to Safety Management Systems (SMS).

Finnish aviation organizations today are increasingly responsible for the safety of their own activities, equipment and personnel. Our job is to make sure that companies—airline operators, maintenance companies, pilot schools—have drawn up and are applying their own SMS programmes. For us, a good and functional SMS is an assurance of quality. Moreover, it helps an organization to improve its operations on all levels.

As the focus of decision-making now shifts to EASA, the nature of national regulatory work is changing as well. Renewed expertise, work responsibilities and customer awareness are now, more than ever, required of our national authorities.

In addition to overseeing systems, Finland also conducts ramp inspections coordinated by EASA and aimed at ensuring that only safe airlines are allowed to operate within the EU. More than 3,000 ramp inspections are made at European airports each year, both on domestic and foreign aircraft. These have proven to be an efficient way to monitor flight safety and keep national authorities in Europe well-informed about recurring problems. Through these inspections, the countries of Europe contribute to the safety of aviation all over the world.

**Let’s talk more about the liberalization of air transport policy. What are its advantages?**

Well, first of all, air transport always generates prosperity in the local economy: e.g. in the forms of jobs and tourism. Tourism and air transport combined are the largest of all industries worldwide. In many countries, such as those that are islands, landlocked or otherwise peripherally located, travel by air is often the fastest or simply the only feasible mode of transport.

By permitting the aviation market to respond to the needs of business and tourism, I believe the most optimal air transport system will take form. Of course, there are always remote areas with low population density that will not attract airlines for normal operations. In the European Union, governments can buy capacity on such routes as public service.





By removing the barriers from free competition, we help to bring down the price of air transport for business and tourism. The yield per passenger for the airlines may decrease, but lower prices will be compensated for by more passengers and a less costly bureaucracy. This will accrue benefits to passengers and airlines alike.

**Do you see any threats from open competition?**

There are some, but they are outweighed by the potential it represents. The world consists of richer and poorer countries and not all will have the chance to invest in aviation as heavily as others. On the other hand, the cost of work varies largely between countries, putting some at an advantage, and there is also the risk of unfair competition. Sometimes it is a choice between attracting investments and jobs or protecting a national airline. The current transition phase is most difficult. Certain governments still limit the routes that airlines can fly as well as the capacity which directly restricts competition.

There are various subsidies to airlines or aviation infrastructure in virtually every country, for instance in the form of

charging schemes for air navigation and airport services, security services, fiscal taxation and public investments. Although they might not be direct subsidies in all circumstances, the national differences affect the environment in which the airlines operate. You could even say it is distorting competition in some cases.

We should, however, little by little, dismantle hindrances to air transport and start trusting the market. In doing this, we must look for a level playing field, acceptable to all. Safety will always remain fundamental but we must not forget that other issues are becoming more and more important as well. Security, the environment, capacity and facilitation will definitely be keeping us busy.

**This leads us into the issue of environmental protection. Is it to some extent irresponsible to praise open competition which undoubtedly increases air transport and places a burden on the environment?**

In promoting competition, we must not forget the underlying and urgent responsibility we all share for the environment. Exercising a liberal air

transport policy does not have to contradict environmental values.

This winter, all industries will have to make some tough decisions to limit the impact of their activities on global warming. Doing nothing is not a choice. Some emissions trading schemes make it possible to move emissions allowances from other industries to air transport by investing in more cost efficient projects with an aim to reduce carbon dioxide emissions—for example, better power plant technology.

We also need to improve the efficiency of air transport through new technology, improved airspace management and switching to alternative fuels. It is better to see environmental protection as a window of opportunity and market advantage than to see it as a threat.

I believe the air transport community will come up with a global solution. Environmental protection schemes, preferably global, can and should be part of creating a level playing field. ■

# Firm but Kind

**Raija Niskanen, Finland's first female airport director, likes to talk things out**



Located in Eastern Finland, about 400 km from the capital Helsinki, Kuopio is a city of 90,000 inhabitants. Kuopio—and its airport—are situated in the middle of the beautiful, natural surroundings of the Finnish Lake District.

Some 300,000 passengers fly to and from Kuopio annually, making it the seventh busiest airport in Finavia's network. In May 2010, the airport will mark its 70<sup>th</sup> year of operation.

Raija Niskanen, or simply “Raija” to her staff, has been the Director of Kuopio Airport and Finavia's Regional Director of Eastern Finland since November 2008. She is one of the few female airport directors worldwide, and the first in Finland. In addition to heading Kuopio Airport, she is “the boss” for 180 people working at eight airports in Eastern Finland.



The Finnish landscape during the start of an approach to Kuopio airport. Sixty percent of Kuopio's passengers are business travellers, and the city's university and many thriving companies in the area rely on the facility's 10 essential daily connections to Helsinki.

*Photo courtesy Milka Kostamo.*

Raija Niskanen first came to work at the Kuopio airport as its financial manager. Prior to that, she had no experience in aviation.

“But,” she noted, “I soon became very enthusiastic about my new surroundings.”

After six years in the finance office, Niskanen was appointed airport director.

“They definitely chose the best applicant,” she remarked with a smile, adding “I knew the place well, and had a solid background in economics.”



Aerial view of the city of Kuopio. In 2010 the municipality will host Finland's national housing fair where visitors will be able to inspect a real residential area, with numerous buildings and saunas, installed along the city's beautiful lakeshore.



The new Lake Terminal was built to enhance tourism in the Lakeland area. In the summer, both boats and hydro planes dock at the facility and, in the winter, you can rent skis or a snowmobile.

### Things tend to work out

The Kuopio Airport director's responsibilities include management of human resources, finance and organization and facility coordination. Her motto—"Things tend to work out"—reflects her positive attitude towards new challenges.

"I was fascinated to learn how interesting and varied these tasks are. There are all kinds of questions you need to find an answer to!"

Niskanen considers herself as a very open person. Her staff can talk to her about any topic and her door is always open. She is convinced that open communication does not weaken her position as a leader but, on the contrary, feels that openness is essential in her work. Niskanen believes that

employees feel free to talk to her openly about their concerns, in part, because of her gender.

"For a woman in a leading position, particularly in a field dominated by men, it is important to be confident, daring and able to make independent decisions," she commented. "One would expect aviation to be a masculine business because of its technical character but, today, there are many women in leading positions in aviation."

Niskanen has received only positive feedback on her appointment, but her gender sometimes is a surprise for customers, especially in foreign countries. At home her appointment was warmly greeted by her husband and two grown-up children. She says her family is her biggest supporter.

### CAA FINLAND: SERVING FINNISH AVIATION

The Finnish Civil Aviation Authority ensures the safety of civil aviation and handles issues related to air transport and the smooth flow of air traffic in Finland. The authority is responsible for issuing aviation regulations, and granting licences and overseeing their holders. CAA Finland grants certificates to Finnish air navigation service providers and supervises their operations. The authority also ensures that aerodrome movement areas, facilities and equipment meet all national and international aviation regulations. Ensuring passenger security and facilitating air travel are also central goals of CAA Finland.

Finavia is a state enterprise with a network of 25 airports in Finland. Finavia is responsible for the infrastructure and development of its airports and for providing high standard air navigation services. All Finavia airports are overseen by CAA Finland.

### Multi-skilled staff

Niskanen has always enjoyed working with men, and says she has had no problems with her male colleagues at other Finnish airports, or with her own employees.

"I have a feeling that I can always call other airport directors and ask for advice. They have really been very helpful thus far."

She compliments her staff and explains that her people are true professionals with many and varied skill sets. Many of them are capable of performing multiple tasks at the airport. By way of an example, Niskanen noted that one of her staff who takes care of the runways in the morning can be seen making passenger security checks in the afternoon.

"The team spirit here is excellent," she added.

## LET IT SNOW! KUOPIO AIRPORT IS READY FOR WINTER

“All our snow-clearing equipment—sweeper-blowers, snow blowers, chemical spreaders and friction testers—will be checked and maintained by the end of September,” noted Kuopio Airport mechanic Robert Purdy.

During the winter months, it is essential that runways and apron areas are kept clear of ice and snow, for reasons of both safety and punctuality. Finland’s northern weather conditions demand that the snow clearing teams employ a variety of skills and powerful equipment.

Most Finnish airports keep their runways free of snow and ice throughout the winter, ensuring that the surfaces have sufficient grip, or friction. Runways are most susceptible to skidding when temperatures rise above and dip below zero. The alternate thawing and freezing of the surface makes it extremely slippery.

“Dry winters are the best,” Purdy remarked bluntly.

At Finavia airports, the runways are regularly inspected so that there is time to improve surface friction, if necessary. A special vehicle is used to take friction measurements whenever there is a change in weather conditions.

“We use primarily mechanical methods for keeping good friction on runways, which means sweeping and snow ploughing,” Purdy concluded. “Chemical substances, such as acetates and formates, are used for removing slush and ice on the runway surface and for skid prevention. These substances have not been classified as environmentally hazardous.”



### Customers, competition and environmental concerns

Kuopio Airport is concerned with topical global issues, including the pressing financial crisis and improved protection of the environment. Environmental issues are crucial not only for Kuopio, but for Finavia on the whole. In this regard there have been improvements in the use and disposal of runway chemicals, the status of the lakes surrounding the airport is constantly monitored, and new infrastructure has been built to reduce noise.

After recently receiving a new environmental permit, Niskanen remarked that “despite recent accomplishments, we need to be even more aware of the impact of air traffic on the environment.”

Three airlines operate from Kuopio Airport. There are some ten daily connections to Helsinki and a flight to Riga, Latvia, four times a week. Sixty percent of Kuopio’s passengers are business travellers, and Kuopio University and many thriving companies

in the area rely on the facility’s essential connections to Helsinki.

“Competition has also been good for air transport in recent years,” added Niskanen. “It’s had a downward affect on prices and gives passengers greater choice. There are, however, an increasing number of passengers who now choose to take the train to Helsinki, and not only because of the environment.”

“We’re constantly trying to improve our services and to better market the airport,” commented Niskanen. “The eight regional airports of Eastern Finland work closely together—both to boost tourism in the area and to cope with temporary lay-offs.”

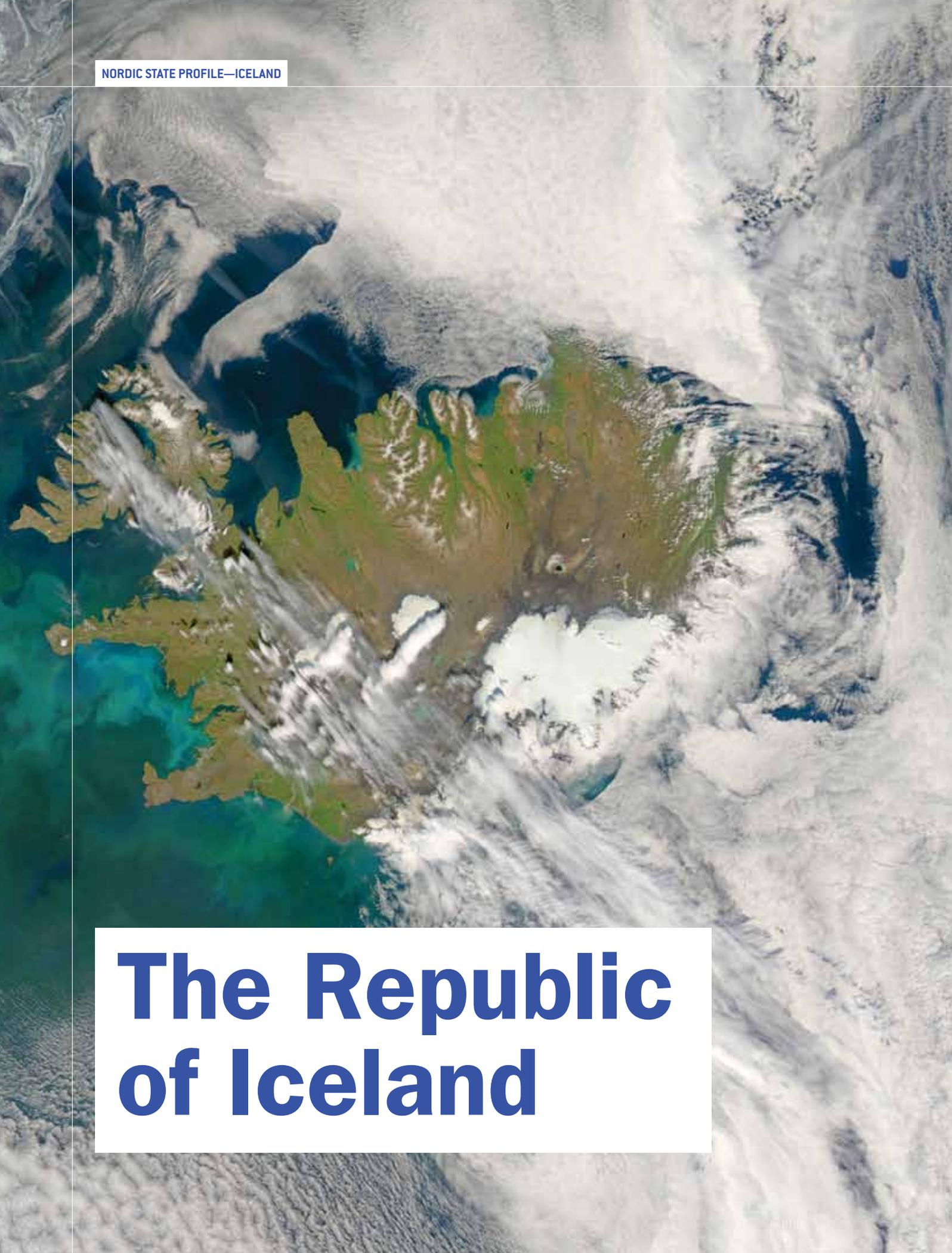
### Civil and military role

Kuopio airport has one particularly important customer—the Finnish Defense Forces. The facility is one of Finavia’s ‘joint operation’ airports that host both civil and military aviation. Kuopio, in this regard, provides both air navigation and

maintenance services for the Karelia Air Command. With its 20 Hornets, the air command keeps the airport busy on a daily basis.

For Niskanen, it is crucial to ensure a high level of service, including high safety standards, for all airport customers.

“As long as there is air traffic, there will be an airport in Kuopio,” she concluded. ■

An aerial photograph of Iceland, showing its rugged terrain, numerous waterfalls, and snow-capped mountains. A semi-transparent topographic map is overlaid on the image, highlighting the island's geographical features in shades of green and brown. The surrounding ocean is a deep blue, and the sky is filled with soft, white clouds.

# The Republic of Iceland

# The ICAA

## Meeting or exceeding world-class levels of flight safety and operational efficiency



**Since its foundation in 1945, the Icelandic Civil Aviation Administration (ICAA) has played an important role in the development of aviation in Iceland. Petur K. Maack Ph.D., General Director, ICAA, took some time to highlight his administration's achievements and objectives for this special contribution to the Icelandic portion of the Nordic State Profile.**

The ICAA has gained recognition abroad through decades of hard work in introducing, implementing and upholding international regulations—primarily those of ICAO—that govern international civil aviation activities. This has been achieved, in part, by the numerous operations audits conducted by international bodies (ICAO, JAA/EASA) as well as having successfully provided economical air navigation services to international air traffic in the North Atlantic area for decades. This reputation is vital for the Icelandic aviation industry which is much larger than the country's domestic air transport market.

The Icelandic aviation industry, with flight operations now reaching across the globe, obtains 80 percent of its income from abroad. The economic value of aviation production is on par with fishing and energy production—all large Icelandic industries.

Surveys show that the ICAA enjoys a high level of public trust, for which the organization and its staff are grateful. This has been achieved with the concerted efforts of the staff which from the outset has performed its tasks with great enthusiasm and skill.

The ICAA's safety and security auditors are highly qualified. They travel around the world to audit the activities of Icelandic operators and often seek the cooperation of local authorities to participate in leading audits. The ICAA's auditors are also often recruited as members of international safety and security audit teams—recognition of the Administration's reputation and expertise, and providing opportunities for further developing staff skills and knowledge.

Most regulations in Iceland related to flight safety—and the culture of the Icelandic aviation industry—are international by origin. Iceland signed the Convention on International Civil Aviation on December 7, 1944, and became a founding Member State of the European Civil Aviation Conference (ECAC) in 1955. The ICAA participated actively in the development of the JARs under the umbrella of the Joint Aviation Authorities, after having signed the Cyprus Arrangement in 1990. In 2003, it became a member of the European Aviation Safety Agency (EASA).

In 1979, ICAA General Director Agnar Kofoed-Hansen (1954–1982), was awarded the Edward Warner Award for his outstanding performance and contribution to international civil aviation. The Edward Warner Award is presented by ICAO on behalf of its Member States to aviation pioneers or organizations that have made outstanding or otherwise significant contributions to civil aviation. The award is named after Dr. Edward Pearson Warner, the first President of the Council of ICAO, and no other international aviation award confers this level of recognition or acclaim.

### **Reykjavik Area Control Center**

The Joint Financing Agreement, concluded under the framework of ICAO and regarding air traffic services in the North Atlantic region, has made it possible for Iceland to manage one of the largest air traffic control areas in the world.

The airspace managed by the Reykjavik Area Control Center is about 5.4 million km<sup>2</sup>. Its range extends from the Greenwich meridian in the east to the west of Greenland, and from the North Pole to south of the Faroe Islands, close to Scotland.



Keflavik International Airport is the main international aerodrome in Iceland, processing more than 95 percent of the passengers visiting the country. It also serves as a hub for Icelandair's scheduled flights between Europe and North America. The highly rated and modern Leifur Eiriksson Terminal offers transit passengers a relaxed layover.

The Reykjavik Control Area (CTA) comprises the Reykjavik Flight Information Region (FIR) and the Sondrestrom FIR.

Isavia, a government-owned shareholding company, has provided the CTA services since 2007, after the separation of service provision and regulation commenced in 2006. A new regulation requiring an air navigation service provider to be certified by a national supervisory body also came into effect at that time—a role administered by the ICAA.

The vertical limits of the control area are from flight level 055 within the Reykjavik FIR and flight level 195 within the Sondrestrom FIR, with no upper limit. The oceanic area is divided into four smaller areas to facilitate control

of air traffic. About one-quarter of the air traffic in the North Atlantic Area passes through this area controlled by Isavia. It has a unique position among oceanic areas because of flexibility with respect to the choice of flight routes and flight levels. This is made possible by the Reykjavik ACC's sophisticated technical systems and unique radar surveillance availability within the busiest part of the area.

In recent years, air traffic has increased at an annual rate of 7.5 percent which is significantly higher than the increase on the busiest routes across the North Atlantic.

Keflavik International Airport is the main international aerodrome in Iceland, processing more than 95 percent of

the passengers visiting Iceland. It also serves as a hub for Icelandair's scheduled flights between Europe and North America. The highly rated and modern Leifur Eiriksson Terminal offers transit passengers a relaxed layover with bargain shopping opportunities. Keflavik's runways are 3,000 m long and 60 m wide, and the airport is an important alternate for aircraft crossing the North Atlantic. The runway layout and periodic meteorological conditions make Keflavik ideal for aircraft performance testing under safe conditions, such as icing trials and crosswind research. The crosswind testing of both the Boeing 777 and the new Airbus A-380 was conducted at Keflavik.

There are, at present, 18 air carriers holding an Icelandic AOC, operating more



# FIRST CLASS SERVICE IN THE NORTH ATLANTIC

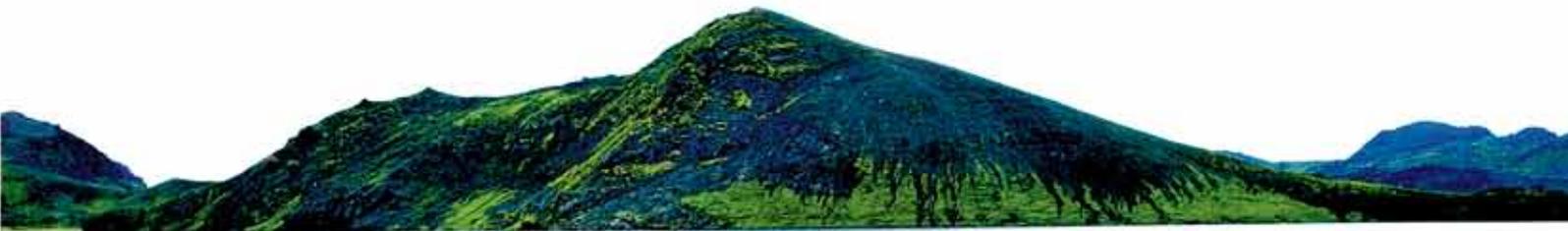
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For more information [kefairport@kefairport.is](mailto:kefairport@kefairport.is) or [isavia@isavia.is](mailto:isavia@isavia.is)



Tern Systems



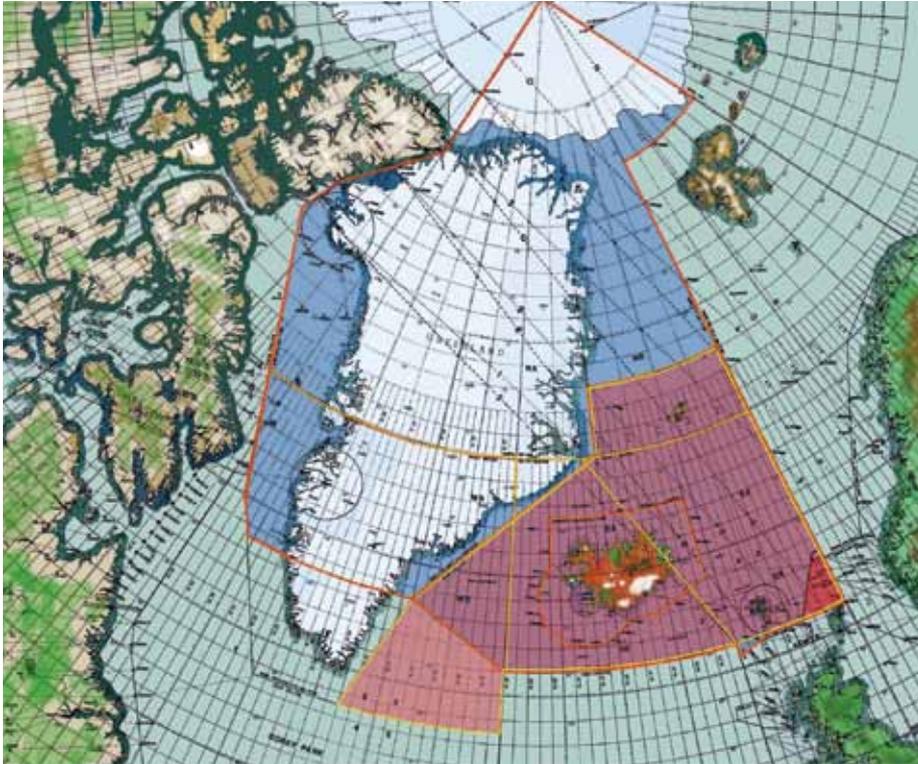
GANNET ATS COM



ISAVIA



KEF KEFLAVIK  
INTERNATIONAL AIRPORT



The airspace managed by the Reykjavik Area Control Center is about 5.4 million km<sup>2</sup>. It comprises the Reykjavik Flight Information Region (FIR) and the Sondrestrom FIR.

**Figure 1: Icelandic AOC holders routes**



than 60 aircraft with a MTOW of over 10 tons. An overview of the routes that they have recently served is provided in Fig 1 (page 48, below). The carriers are managed with different business models.

Icelandair is a customer-oriented travel service company that currently serves 23 gateways in Europe, the United States and Canada. Air Atlanta Icelandic specializes in leasing aircraft on an ACMI (Aircraft, Crews, Maintenance, Insurance)/wet lease basis to airlines worldwide needing extra passenger and cargo capacity. It also operates charter services for Icelandic tour operators. In mid 2007, the airline decided to shift its focus to Air Cargo operations. Bluebird Cargo is a part of the Icelandair Group and operates freight missions within Europe and Scandinavia, and to North Africa, the Middle East, Canada and Greenland. Air Iceland is also a part of the Icelandair Group with firm roots going back to the early years of aviation in Iceland. Air Iceland is mainly a domestic airline, but it also serves the West Nordic countries. Icejet is a charter company operating private jets and the only Dornier 328 jet operator in the world permitted to fly into London City Airport. Norðurflug Helicopters is a charter operation based in Reykjavík that prides itself on its good service and experienced pilots. There are several other carriers—operating flights to Greenland and Vestmann Islands—that also play an important role in delivering supplies to rural parts of Iceland and have a role in Iceland’s healthcare system by flying patients to Reykjavík’s University Hospital, the biggest hospital in Iceland.

The ICAA strives to ensure that Icelandic aviation meets or exceeds world-class levels of flight safety and operational efficiency, regardless of whether these involve major airline operations, air navigation services to international air traffic, or the construction and operations of airports and other infrastructure for domestic and international air transport in Iceland. ■

# ICAA Special Project:

## Certification of Pristina International Airport in Kosovo

**The Icelandic Civil Aviation Administration (ICAA) has been involved in several international aviation projects over the years. One major project was the management and regulation of the aerodrome in Pristina during its development and transformation from a military airport to a civilian airport, as per the ICAO SARPs published in Annex 14 to the Chicago Convention.**

**The Pristina project commenced formally on April 1, 2004, and the final aerodrome certificate was issued on October 30, 2008. The total cost for the five-year project was 20 million Euros.**

The Pristina Airport project had two distinct but related objectives which were kept separate during the entire process, and which were run by two units—the Flight Safety Division and the Airports and Air Navigation Systems Division.

The task of the former included regulatory oversight and certification. The function of the latter was to provide assistance and operational services to the aerodrome operator. In 2006, the ICAA underwent major institutional changes when it ceded control of its service provision duties to Isavia, the new state-owned shareholding company. Isavia, therefore, added operations of airports and provision of air navigation services to its duties in Kosovo while the ICAA continued with regulatory duties.

The Pristina project was based on an agreement between UNMIK (United Nations Interim Administration Mission in



**“The certification of Pristina Airport has been a major project involving the participation of several entities. In March 2004, the ICAA made an initial audit of the facility. Subsequently, a declaration of fitness for the airport was issued. An interim aerodrome certificate was later issued after corrections—based on the audit—were completed Under responsibility of the ICAA, the audit team’s members were airport experts/auditors from Iceland, Finland and Denmark.**

**In 2006, Pristina International Airport was chosen by Airports Council International as the best European airport serving fewer than a million passengers.”**

Kosovo) and the Government of Iceland. The main tasks were to provide the following civil aviation functions on behalf of UNMIK:

*Regulatory and oversight tasks:*

- Licensing of air traffic controllers.
- Certification of Pristina International Airport, including equipment and services.
- Provision of aeronautical information services and meteorological services.

*Operational responsibility and support including consultancy services:*

- Responsibility for the provision of air traffic services.
- Support of operational services of the airport by provision of key personnel for the management of core airport services, including fire and rescue services, mechanical maintenance activities, navigational aids and the training of local staff.
- Training of air traffic controllers including initial training in Iceland.
- Consultancy and planning of extensive infrastructure improvements, including runway resurfacing and lighting systems, radar system acquisition and the development of emergency plans.
- Development and implementation of an aerodrome manual, including a Safety Management System (SMS).

Licensed local air traffic controllers were established within the first year, and nine novice controllers later received full training in Iceland. In total, 26 Pristina locals were trained and licensed as air traffic controllers. Provision of aeronautical information and meteorological services was established early and developed further throughout the duration of the project.

The certification of Pristina Airport has been a major project involving the participation of several entities. In March 2004, the ICAA made an initial audit of the facility. Subsequently, a declaration of fitness for the airport was issued. An interim aerodrome certificate was later issued after corrections—based on the audit—were completed. Under responsibility of the ICAA, the audit team’s members were airport experts/auditors from Iceland, Finland and Denmark.

The findings of the initial audit resulted in the launch of several sub-projects, the first and most important being airport infrastructure. This was naturally the most expensive part of the total project. The role of the Icelandic organization in this project was mostly consultancy. Secondly, the sub-projects included the development of procedures for the management and operations of the airport: i.e. the development of the aerodrome manual, including the SMS component. Thirdly, a comprehensive training of aerodrome personnel was organized.

The whole programme lasted almost five years, during which inspections and audits occurred regularly. From the first declaration of fitness, Pristina was in operation as an international airport, with several European airlines using it as a part of their route network. This was possible because of several mitigating activities that were set in motion in order to compensate for those non-conformities that existed during the transition period, but which were gradually closed. The operation of the airport has been financially self-sustainable without any serious incidents occurring.

In 2006, Pristina International Airport was chosen by Airports Council International as the best European airport serving fewer than a million passengers (for more on this award, please visit [www.aci.aero](http://www.aci.aero)).

The Icelandic Civil Aviation Administration and Isavia take pride in having been participants in this highly successful project. ■

# The Kingdom of Norway

# Aviation:

## The backbone of the Norwegian transportation system

**Commercial civil aviation provides, in many ways, the foundation of the Norwegian transportation system. It fills an essential role servicing a sprawling, rural population despite harsh climatic conditions, long distances between some populated areas and the State's challenging topography.**

**Norwegians use domestic flights more often than any other Europeans and Norway has more airports per citizen than any other European country. When it comes to air freight services, Norway similarly tops the list among its Nordic and European counterparts.**

In 2008, there were almost 42 million air passengers in Norway, more than 22 million of which took domestic flights. Through the 1990s there was steady passenger growth. As in most other countries worldwide, this expansion was followed by a downturn towards the end of the century, with the decrease being most significant in total domestic passengers.

A second and considerable passenger growth period followed this downturn during the first years of the new millennium, but by the end of 2008 passenger totals had again decreased considerably and this trend continued through 2009 following the international financial crisis.

In the summer of 2008, the Ministry of Transport and Communications presented its new strategy for Norwegian civil aviation. Many government ministries and authorities, including the Civil Aviation Authority, contributed to the strategy and the Ministry of Transport and Communications also sought to involve non-governmental bodies in the strategy process. Based on this review, strategies have been singled out with respect to the future policies that the Government has chosen to pursue.

The strategy document itself is a broad review of the state of, and the challenges facing, civil aviation in Norway today. It



also provides an important contribution to the White Paper on the National Transport Plan for the period 2010–2019 which the Government unveiled earlier in 2009. The Ministry of Transport considers the independent strategy document best suited to address the wide-ranging challenges of Norwegian civil aviation. The document also allows issues specific to civil aviation, and beyond the natural scope of a National Transport Plan, to be considered and addressed.

The main goal of the Government's transport policy is to ensure that Norway has a transport system that facilitates flying within a particular State region or between regions. Norway's goals for its transport system include that it be characterized by a high degree of safety, significant regard for the environment and accessibility to all users. These overall goals for the transport sector and policy also underlie the strategy for civil aviation.

It must be noted, however, that the civil aviation strategy has been developed from a broader viewpoint than the transport policy alone. It addresses most areas in which the authorities have some impact on civil aviation, including policies relating to taxation, industry, consumer, competition, education and labour markets. Underlying the strategy is the knowledge that civil aviation plays a more important role in the transport pattern in Norway than it does in most European countries

and that civil aviation makes an important contribution to maintaining settlements and social networks and improving employment throughout the country.

Aviation is not only an important factor for continued rural settlement in Norway, but also for facilitating trade and industry throughout the country. The commercial sector and local governmental administrations depend heavily on safe and efficient air transport. Air transport allows Norway's rural industries to offer their products and services to a larger market and a well-developed route network is a major factor for allowing the spread of knowledge and competence throughout the country. Many are of the opinion that civil aviation has contributed greatly to Norway's current prosperity.

Oil and gas industry employees are one example of frequent air travellers who are able to work at offshore installations in the North Sea and other places along the Norwegian coast, and live anywhere in Norway.

The oil and gas industry uses helicopters for transport of personnel to and from its offshore oil and gas installations.

Public health services also benefit from frequent use of Norwegian aviation. For the last decade, health service has become more specialized, requiring increased numbers of patients to travel by plane to seek treatment or undergo surgery. This is particularly true in northern Norway.

When patients cannot be transported through the ordinary route network, air ambulance, by plane or helicopter, is often used. Air ambulances are stationed throughout the country and give the public a fast and efficient way to get specialized health services in case of an emergency.

Aviation is also a major factor for full employment and settlement throughout Norway. A well-developed route network

makes the distance drawback a minor problem and makes it possible for varied industry, in any part of the country, to survive where they are. Aviation secures the Norwegian population access to health, education and cultural activities as well as sports.

In Norway, passengers often have one or more stops in their journeys. An important part of a well-developed aviation transport system is airlines offering a countrywide route network where passengers can fly multi-leg journeys without leaving the aircraft. This is also an important part of the ministry's aviation strategy for the future.

### **The Norwegian Civil Aviation Authority (CAA)**

CAA Norway is located in Bodø, the second largest city in the State's northern region. Mr. Heine Richardsen was appointed Director General (DG) by



Norway DGCA  
Mr. Heine Richardsen

the Norwegian Government on May 16, 2006. Mr. Richardsen has a broad and varied background in the Norwegian aviation industry—both professionally and based on his union experience.

The Norwegian CAA has 170 highly-devoted employees in seven departments: Flight Ops; Technical; Aerodromes and Air Navigation Services; Security; Legal; Trend/Analysis/Quality; and Administrative Affairs. Reporting directly to the DG are the Communications Department and Aeromedical Section. The DG's staff also consists

## **Aviation is not only an important factor for continued rural settlement in Norway, but also for facilitating trade and industry throughout the country. The commercial sector and local governmental administrations depend heavily on safe and efficient air transport.**



## IMPORTANT ASPECTS OF NORWAY'S CIVIL AVIATION STRATEGY

### Civil aviation—an international industry

Many aspects of civil aviation are regulated at the international level. The Government and the Ministry of Transport and Communications will actively seek to promote Norwegian interests and ensure sound international solutions in the civil aviation sphere. The Civil Aviation Authority participates in international discussions together with the representatives from the Ministry of Transport whenever and wherever they take place.

### Safety is the highest priority

Norwegian civil aviation is considered among the safest air transport systems the world and Norway intends to maintain this ranking. Efforts to enhance safety in this industry are on an increasingly international footing. A main challenge for the Norwegian authorities in the future will be to ensure that international standards are adapted to Norwegian conditions. In this respect, the Norwegian CAA plays a very important role as the State's competent authority. Through international audits, including those by EASA, Eurocontrol and ICAO, the Norwegian CAA and the aviation industry are all important contributors to safe and sustainable aviation in Norway.

### More sustainable civil aviation

Global climate challenges raise the question of whether the current rate of growth in air traffic, in particular the growth in the number of holidays taken abroad, can continue. Although civil aviation accounts for a small part of overall greenhouse gas emissions, the industry must shoulder its share of the responsibility. Norwegian civil aviation has drawn up measures that will curb the growth in greenhouse gas emissions by the industry. The climate threat is a global challenge, however, which cannot be overcome by the Norwegian civil aviation industry alone. The Government and the Ministry of Transport and Communications will work for global solutions to this problem, in which civil aviation will play its part.

### Nationwide infrastructure

Through its ownership of Avinor, the Ministry of Transport and Communications will ensure a good, useful network of airports across the entire country. Avinor is responsible for 46 State airports as well as air traffic management. Avinor faces challenges in the years ahead in terms of ensuring that the infrastructure has sufficient capacity. The ministry will play its part in enabling Avinor to continue to develop so that the company can continue to discharge its important social tasks in the future.

### Guaranteeing air services and passenger rights

The Government will give airlines the framework conditions needed to ensure that the bulk of domestic air services offered can be maintained on commercial terms and conditions. It is also important to ensure the continued existence of an airline that offers a nationwide air services network in Norway and commensurate ticket schemes. In cases where the market offering is inadequate, the Ministry of Transport and Communications will continue its policy of purchasing air services.

Strengthening air passenger rights is another Government priority. This particularly applies to air passengers with reduced mobility. The Civil Aviation Authority has already taken this into consideration and has allocated resources to secure that this part of the strategy is followed up.

### Education, work environment and labour market

The Government will ensure that good civil aviation training and education facilities are available in Norway. The Government will also see to it that the legislation ensures a high-quality work environment for civil aviation employees. Norwegian civil aviation has at times seen labour conflicts. Responsibility for wage bargaining and for industrial peace rests with the social partners' organizations. The partners need to ensure that such conflicts do not unreasonably affect the wider society and third parties.

of a group of special advisors who report directly to the Director General.

Audits by international organizations such as ICAO, EASA and Eurocontrol have revealed that Norway's CAA employees demonstrate high levels of knowledge with respect to State aviation practices and legislation. The audit results also confirm that Norwegian aviation safety ranks high based on global comparisons—a great source of national pride and a testament to the commitment of the State's aviation professionals.

### The Norwegian Scat-I project

There have been two serious CFIT (Controlled Flight into Terrain) accidents at Norwegian regional airports. In May 1988, a Dash-7 flew into a mountain at Brønnøysund due to a missed step-down fix. There were no survivors. In October 1993, a DHC-6 crashed short of the runway at Namsos because of the so-called 'black hole effect'—whereby pilots approaching visually at night, over featureless terrain, tend to keep the visual angle of the runway constant and follow an arc which can result in an impact short of the runway. There were several survivors.

In 1996, the Norwegian parliament resolved to improve the approach and landing aids at applicable State facilities in order to minimize the risk of such accidents in the future. Since the accidents had been caused by poor vertical guidance, there was a need for electronic glide paths. Developments in satellite navigation offered long-term alternatives to ILS technology with the potential to meet ICAO Cat. I Standards, but the only system sufficiently developed at that time was the interim solution known as Special Category I, or SCAT-I.

Following a 1996 parliamentary decision, a project group was established under the leadership of Avinor, the state-owned airport owner and operator. The task of developing the ground system was given to the Oslo-based company NAVIA (now



A remote Norwegian airport. Challenging topography and the distance between many rural settlements and industries make aviation a key component of Norway's day-to-day social and economic activities.

known as Park Air Systems (PAS)). PAS is a leading manufacturer of ground-based navigation and air traffic landing aids, well known worldwide for its instrument landing systems. Funding came jointly from Avinor and NAVIA/PAS. The development of the airborne avionics was entrusted to Universal Avionics Systems Corporation (UASC) of Tucson, Arizona, USA.

#### Other organizations involved in the SCAT-I initiative were:

- Widerøe (Headquarters in Bodø), one of Europe's largest regional airlines, which employs the new system in its Bombardier DASH-8 (DHC).
- The US Federal Aviation Administration, specifically the Los Angeles Air Certification Office (FAA LA ACO), responsible for the approval of the airborne avionics.
- The Norwegian Civil Aviation Authority (NCAA, located in Bodø), responsible for approval of the ground equipment, each individual SCAT-I ground installation and its approach procedures, and validation of aircraft installation approval.
- Transport Canada (Ottawa).
- Field Aviation (Toronto, Canada), responsible for the installation of avionics in the DASH-8.

The concept of the proposed SCAT-I system was approved in 1997. As early as 2001, a prototype of the PAS NM8001 SCAT-I ground station was installed at Torp Airport, southwest of Oslo. It was used for initial test flights with very satisfactory results and subsequently provided significant test data.

Norway has 29 regional airports with regular services. Most are in remote areas surrounded by mountainous terrain (see Fig.1, page 57). Generally they are served by turboprop aircraft

carrying 20–70 passengers and airport runway lengths are on average 800–1,200 metres in length. The biggest operator is SAS group company Widerøe, the largest regional airline in the Nordic countries, with smaller companies also contributing.

Traffic at these airports is generally light, but regularity requirements are demanding since aviation is the best option for rapid transport to and from small communities with advanced commercial and industrial activities.

The approach and landing aids at these airports are usually NDB, DME or VOR/DME, as well as ILS localizer, with non-precision, step-down procedures using baro altimeters. The difficult terrain surrounding many of the airports makes installing Cat I. glide paths either impossible or else technically demanding and extremely costly.

The process of approving a new approach and landing system is exceptionally long and complex and involves many aviation authorities. The FAA continued its support for the remaining certification activities related to the airborne avionics of the Norwegian system under its bilateral agreement with the CAA Norway. Once the development of the ground station had been nearly completed, in early 2004, PAS applied to the CAA Norway for technical approval of the station. This required flight trials, so PAS subsequently sent a ground station to Universal Avionics Systems Corporation (UASC) of Tucson, Arizona, for trials in conjunction with UASC's certified (TSO approved) aircraft avionics.

Completion of the project was delayed by administrative problems, and economic limitations had slowed down the development of the airborne equipment. By 2004, however,

**Audits by international organizations such as ICAO, EASA and Eurocontrol have revealed that Norway's CAA employees demonstrate high levels of knowledge with respect to State aviation practices and legislation. The audit-results also confirm that Norwegian aviation safety ranks high based on global comparisons—a great source of national pride and a testament to the commitment of the State's aviation professionals.**

the two other main participants, Avinor and Widerøe, were sufficiently satisfied with progress to authorize Field Aviation to install the avionics in 18 Widerøe aircraft. At the same time, the FAA's LA ACO worked on completing the certification of the new airborne avionics.

In 2004, the participants accelerated their activities so that, by the end of 2005, the following had been completed:

- RTCA 178B approval of the ground station software (follow-up after SW audit).
- The SIP's review of the integrity of the airborne processing.
- Verification by system-level testing that the ground station met accuracy requirements.
- Completion by PAS of the system's Technical Handbook covering the installation, maintenance and operational safety procedures.

After the successful resolution of the remaining airborne equipment integrity issues, the SIP formally declared to the CAA Norway, in January 2006, that its tasks had been completed.

In March 2006, Avinor applied to the CAA Norway for operational approval of the first SCAT-I ground station, installed at Brønnøysund Airport. The authority inspected the

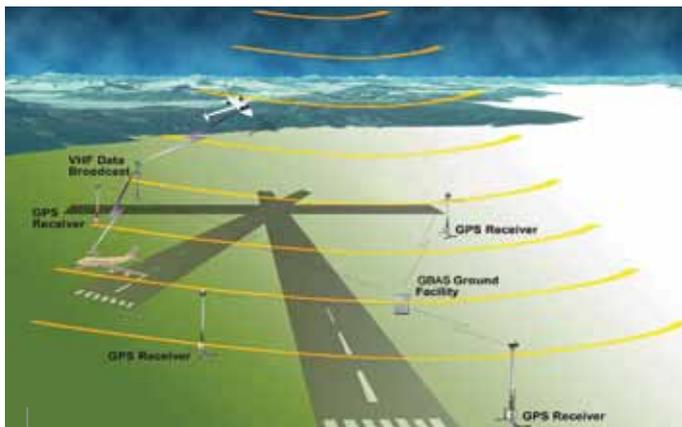


Illustration of Special Category I (SCAT-I) electronic glide path system. The concept of the proposed SCAT-I system was approved by Norway in 1997. As early as 2001, a prototype of the PAS NM8001 SCAT-I ground station was installed at Torp Airport, southwest of Oslo. It was used for initial test flights with very satisfactory results and subsequently provided significant test data.

installation there in October 2006 and, after minor modifications and a flight inspection in December 2006, approved it in January 2007.

This approval included the approach procedures developed by Avinor which were based on ICAO requirements. An Aeronautical Information Circular (AIC) and a supplementary Aeronautical Information Publication (AIP) were then issued. As is customary, the AIP contained airport charts, charts of airspace and military low-flying areas, radio frequencies, opening times, deviations from international regulations, etc. This kind of information rarely changes. The AIC contained the short-term technical, administrative and regulatory aspects of air safety and air navigation matters.

The System Safety Assessment Operational Performance document for the Brønnøysund SCAT-I installation was then updated, and in March 2007, the CAA Norway received Readiness Statements from the Air Traffic Services at Brønnøysund and the regional Air Traffic Control Centre in Bodø.

Operational approval for the Brønnøysund ground station was given by the CAA Norway in April 2007. This, together with an approved training programme for Widerøe's pilots, paved the way for the approval of Widerøe as an airline operator of SCAT-I as of August 2007.

The new aircraft installations also required approval. A Supplementary Type Certificate (STC) was issued for the flight inspection aircraft, LN-ILS, and for all Widerøe aircraft of types DHC 8-101, -102, -103 and -106. The STC covered the use of dual Universal GLS-1250 DGPS SCAT-I Landing System airborne equipment. All aircraft and the flight inspection procedures were approved by the NCAA.

In the meantime, other certification actions were taken in North America and Europe:

- In February 2006, the FAA issued an STC to UASC covering the installation of the airborne equipment, a single UNS-1D Flight Management System, including the VHF data link. In March 2006, UASC applied to the European Aviation Safety Agency (EASA) for validation of this STC. In May 2006, EASA requested that the NCAA execute this validation on its behalf. The NCAA then organized test flights at Brønnøysund between June 15–27, 2007. These were

**Figure 1: Norwegian airports and their locations**



judged to be successful, whereupon EASA issued the required European STC in July 2007.

- Just before Christmas 2005, Transport Canada issued an STC to Canadian company Field Aviation East Ltd., covering the installation of Dual GLS-1250 (Dual -1F FMS). Field Aviation sent a request to EASA in March 2006, asking for a validation of this STC by EASA. In June, EASA asked the NCAA to carry out this validation on its behalf. Three weeks later, the NCAA confirmed a successful validation to EASA by means of a Technical Visa.

- Widerøe at once started implementation of the STC in the first of their aircraft.

As can be concluded from the description above, completing certification of the system was a prolonged and demanding process. Upon completion, however, all parties derived great pleasure and satisfaction in participating in the official inauguration of the system at Brønnøysund Airport in October 2007—an event which featured a Widerøe passenger-carrying Dash-8 flight making the first SCAT-I precision approach.

Avinor claimed to be “the first airport operator in the world to put a satellite-based precision approach system into commercial operation.”

The most important beneficiaries of the new system, however, will be the passengers and pilots of Widerøe, and the citizens of the remote communities of northern Norway who will now enjoy guaranteed improved flight regularity and safety. ■

A satellite-style map of Sweden, showing the country's geographical features, including the Scandes Mountains, the Baltic Sea, and the Gulf of Bothnia. The map is oriented vertically, with the top of the country at the top of the page.

# The Kingdom of Sweden

# The Swedish domestic market post-deregulation

For almost 40 years, the airlines SAS and Linjeflyg had a virtual monopoly on domestic air transport in Sweden. Despite the fact that there were a number of regional operators serving the Swedish market, SAS and Linjeflyg were dominant and thus dictated the conditions for market entry. Deregulation of domestic aviation in the 1990s changed the domestic market and led to the emergence of new airlines and today's innovative air travel organizers.

Although there has been a reduction in Swedish domestic passenger numbers since 1990, the total number of airlines has not fallen significantly. In fact, not only has there been an increase in the number of airlines entering the Swedish market, but also in those leaving the market. Today it is increasingly seeing new types of market actors in the form of air travel organizers as well as airlines that do not carry their own traffic, but function merely as suppliers of capacity through wet-lease arrangements.

## Swift changes

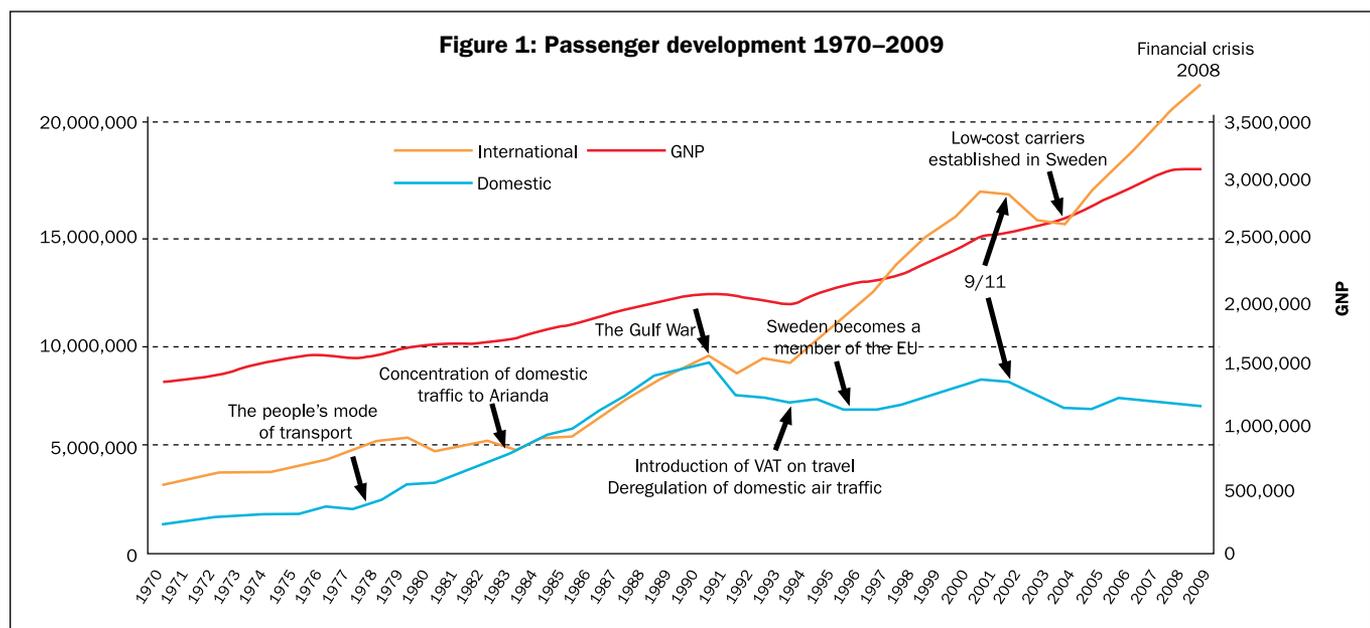
The Swedish aviation market has adapted to significant change in the last 10–15 years, continuing to evolve today to accommodate the newest innovators in air transport. There have been particularly rapid changes associated with two categories of Swedish air operators: Nordic regional carriers

and air travel organizers. These operators have been successful in developing seasonal traffic to certain regions by ensuring the necessary local and regional support.

An air travel organizer is not an airline per se, but sells tickets under its own name and provides air transport through agreements with other airlines. The activities of an air travel organizer do not require an operating licence, nor is it under the supervision of the CAA.

Air travel organizers have shown a high level of flexibility, adapting themselves to the need of regions to develop tourism and trade. Could this concept help reinvigorate domestic aviation... Or will it further contribute to the fragmentation of domestic aviation? Market forces have yet to determine these outcomes.

Despite the removal of institutional market obstacles, deregulation has not yet elicited the desired changes in the domestic market. SAS has a significant market position partly due to its cooperation agreement with Skyways. The two airlines together carry over 50 percent of the domestic passengers in Sweden. In general, ticket prices have increased since deregulation, however, on certain routes to major cities, ticket prices have dropped thanks to low-cost carriers entering the market. ■



# Ensuring the safety of Sweden's skies

Flying is dangerous—*that's why it's so safe!*

In order to attain a better grasp of the meaning of this aviation paradox, it's necessary to examine the past. Although the development of aviation is littered with incidents and accidents, lessons-learned have led to increased safety. It is thanks to continuing improvements that aviation has become the safest mode of transportation available today.

Aviation accidents have occurred ever since the days of the Wright brothers, when aircraft were relatively simple machines. In the aftermath of an accident aircraft were repaired, if possible, and returned to the skies shortly thereafter, without much thought or effort being expended to thoroughly establishing the cause(s) of the accident.

"In the area of aviation safety, we are currently working on an all-European State Safety Programme," began Lena Byström Möller, Civil Aviation Director at the Swedish Transport Agency. "Since we share this common activity, it is of the utmost importance that we also share the same goals when it comes to improved safety. In this context, it is also important that we take advantage of the experience obtained through our occurrence reporting system—and this is a matter that needs to be resolved globally. Safety culture matters will become increasingly important for a long time to come."

## Routines for current Swedish safety programmes

The Analysis Section at the Swedish Transport Agency is responsible for

administering and analyzing the Aviation Safety Reports (ASRs) pertaining to Swedish operations. The Swedish Transport Agency Aviation Department Analysis Section receives approximately 4,000 ASRs per year. These reports list occurrences ranging from minor incidents to serious accidents. Mandatory reporting of occurrences, and the individuals responsible for reporting them, are detailed in Swedish Aviation legislation and the Rules and Regulations for Aviation. These rules are based on a European Union Directive dating from 2002 (42/2002).

Each reported event is analyzed and classified in terms of seriousness by a flight safety analyst, who also recommends the appropriate implementation of proactive safety measures. In cases where the event might call for a deeper and/or additional investigation, the report is

also distributed to the Swedish Accident Investigation Board. The flight safety analysts within the section have operational experience as pilots with a background in commercial aviation operations and air traffic controllers. The section also has a human factors specialist.

Each of the submitted reports is routinely coded, in accordance with the ADREP taxonomy, and the information is subsequently stored in the ECCAIRS database. Flight safety-related trends can be diagnosed and analyzed from these statistics—which also form the basis for decisive and timely measures in specific target areas. The agency, for example, has seen evidence of a disturbingly sharp rise in the number of airspace infringements over the past few years. Consequently they have initiated an investigation whose mandate is to identify the cause(s) and propose suitable improvement measures. ■



The Swedish Transport Agency Aviation Department Analysis Section receives approximately 4,000 Aviation Safety Reports (ASRs) per year, listing occurrences ranging from minor incidents to serious accidents. Mandatory reporting of occurrences, and the individuals responsible for reporting them, are detailed in Swedish Aviation legislation and its Rules and Regulations for Aviation. These rules are based on a European Union Directive dating from 2002 (42/2002).



# SNAM

## A unique resource facilitating medical evacuation from disaster-stricken areas

If a major accident or disaster should occur in Sweden and the affected community's normal resources for patient transport do not suffice, the Swedish National Air Medevac, or SNAM, becomes the resource of choice for aid and assistance.

SNAM can be employed nationally as well as internationally for both civil and military incidents, transporting victims of major accidents in one part of Sweden to the nearest Swedish facility to assist them, as well as carrying foreign patients who need to be evacuated from a distant country which has been hard hit by a disaster or terror attack. A recent example of SNAM in action internationally occurred in December, 2008, when SNAM personnel and planes transported wounded Britons and Spaniards to Great Britain for continued medical care after the major terror attack in Bombay.

SNAM generally transports stable patients who have already received treatment in hospitals but need to be moved for additional assistance. It is not an air ambulance for patients with emergency or acute conditions. The responsibility of administrating SNAM and its readiness efforts rests with the Swedish Transport Agency.

### Major players in the SNAM system

The **Swedish Transport Agency**, in accordance with its instructions from the Swedish Government, is responsible for:

*"...maintaining readiness in order to, in consultation with the Swedish Civil Contingencies Agency and the National Swedish Board of Health and Welfare, decide on and carry out airborne patient transport"*

### SNAPSHOT OF AN SNAM 'FLYING HOSPITAL'

During a SNAM response a regular passenger airplane is used, namely a Boeing 737-800.

The airplane is built and equipped with:

- Six intensive care units for those seriously injured.
- Six regular stretchers for those mildly injured.
- Approximately 20 seats for ambulatory patients and relatives.

On board the plane there are specially-trained, experienced personnel, including:

- Eleven nurses.
- Nine doctors.
- One mission coordinator (representing the Swedish Transport Agency).
- One turnaround coordinator.
- One medical technician.
- One flight technician.
- Air crew.

This mandate therefore formalizes SNAM and its mission.

The **Västerbotten County Council** (VLL) trains and is responsible for SNAM medical personnel. SAS in accordance with an agreement is responsible for the flights. The **Swedish Civil Contingencies Agency** furnishes the mission coordinator.

#### How SNAM functions

When a need for SNAM arises a series of responses is immediately initiated to satisfy the requirements of the emergency mission.

The Aeronautical Rescue Coordination Centre (ARCC), which is manned around the clock, receives the initial enquiries and provides preliminary data to the Swedish Transport Agency's point of contact.

When the decision on an air medevac is made, the airplane to be used is flown to Stockholm Arlanda Airport for any required remodelling. The medical personnel are simultaneously activated and transported to Arlanda. A mission coordinator then arrives and required staffers are assembled at a central management location at Arlanda. These personnel are comprised of technicians and experts from the Swedish Transport Agency, which leads the effort, and

representatives for care providers (VLL) and the airline (SAS).

When the plane is ready, medicine and other medical care materials are loaded and personnel board the aircraft. Depending on the flight and which patients will be transported to what location, contacts with appropriate officials and facilities are established, for example hospitals, embassies and other authorities. Arlanda Airport and its resources functions as a hub during the mission.

When required, a reconnaissance team can be sent out to the site where the patients are to be picked up. The purpose of this function is to clarify the patients' status and the capability to be transported as well as preparing for the arrival of the SNAM plane so that it remains on the ground for the shortest time possible. The SNAM stretchers can be lifted out of the plane and transported to the hospital to pick-up and drop-off patients. These intensive care stretchers have batteries as well as oxygen for such transports.

SNAM-retrofitted aircraft generally have a range of approximately 3000 km without intermediate landings, but can of course fly much longer stretches with refuelling stops, changes of pilots, etc. ■

## About us:

# The Swedish Transport Agency

The Swedish Transport Agency was established on January 1, 2009. It constantly seeks to achieve the most accessible, high quality, secure and environmentally sustainable rail, air, sea and road transport. The agency has overall responsibility for drawing up regulations and ensuring that authorities, companies, organizations and citizens abide by them.



Sweden's Civil Aviation Department formulates regulations, examines and grants permits, and assesses civil aviation operations and infrastructure with particular regard to safety and security. It also monitors developments in the aviation market.

The Civil Aviation Department is located in Norrköping. Mrs. Lena Byström Möller was appointed Director, Civil Aviation, on January 1, 2009.

Lena Byström Möller, Director, Sweden Civil Aviation Department



## A look back: Sweden and the EU, 2001

The last time Sweden held the EU Presidency was in the first six months of 2001. At that time, the EU consisted of 15 Member States, a number that has now increased to 27. Expansion of the EU was one of Sweden's priorities and an issue to which it was strongly committed when it assumed the EU Presidency.

Most people will remember the civil disturbances in Göteborg in June of 2001, in connection with the EU summit meeting held there and the visit by George W. Bush, but not everyone will remember which issues were at the top of the agenda for aviation in 2001.

For this special Nordic profile Sweden looks back at some of the major issues that were on the broader Swedish and EU agendas during this crucial moment in aviation history.

Journalists and guests gather just prior to the presentation of the most recent Swedish Presidency at the EU in 2009.

Photo courtesy EU.

Sweden's priorities in 2001 were characterized by the three 'Es': Employment; Enlargement; and the Environment. In the area of civil aviation, the environmental issues of noise and emissions attracted considerable attention. Noise around airports was a particularly big problem facing several EU Member States and agreement was reached on the need to reduce noise levels at the Transport Ministers' meeting in April, 2001.

With regard to the United States, a dispute was in progress that had started in March, 2000, when the United States brought the EU Member States before the ICAO Council with respect to the EU's 'hush-kit' regulation from 20 April, 1999. This regulation<sup>1</sup> limited the possibility of adding further hush-kitted aircraft to the European aircraft register as well as the use of non-EU registered hush-kitted aircraft at European airports after 2002.

<sup>1</sup>Regulation 925/1999

Most of the affected aircraft were of American manufacture and the United States claimed that the regulation unilaterally prescribed standards that were inconsistent with Annex 16 of the Chicago Convention (as it excluded aircraft which met the applicable standards from the market). The United States also considered the regulation to be discriminatory, as it limited the use of hush-kitted aircraft based on the country in which the aircraft was registered, and the regulation had a disparate impact on American interests.

This issue was finally resolved in 2002 when the EU withdrew the 'hush-kit' regulation and replaced it with Directive 2002/30/EC on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports. This Directive included a 'balanced approach' that enables big airports to introduce certain operational restrictions in order to limit the effects of noise.

One of the biggest issues in other civil aviation areas in 2001 was the establishment of EASA.<sup>2</sup> Discussions here centred on the scope of the EASA regulations along with the aims and types of inspections it would perform. A preliminary agreement was reached under the Swedish Presidency regarding the new agency.<sup>3</sup>

The Council of Transport Ministers also adopted a Resolution in April, 2001, with respect to the European satellite navigation system, Galileo. This formed the basis on which to proceed with the development phase.

The problem of airspace congestion and consequent delays had been causing difficulties for European commercial aviation for a long time, and a group of experts had been working on a proposal to improve the efficiency of European air traffic control. In March, 2001, the Commission confirmed its aim to establish a single European sky and presented a proposal based on the group's report in 2001.

This eventually led to the so-called 'Single Sky Regulations'. These regulations have been reviewed in connection with the transfer of safety-related tasks, in the fields of aerodromes and air traffic management/air navigation services, to EASA.

Passenger rights were another important issue in 2001. ECAC<sup>4</sup> and the Commission, together with consumer organisations, airport and airlines, prepared voluntary commitments to improve service levels for passengers. The undertakings were presented in a joint ECAC/EU dialogue in Lisbon in May, 2001, and covered areas such as information and assistance to passengers in the case of delayed or cancelled flights, information on the lowest available fares, on-time baggage delivery, etc.

Another important step to promote passenger rights was taken by the EU Council at the Transport Ministers' Meeting in April,

2001, when the decision was taken to ratify the Montreal Convention with respect to airlines' responsibility for damage for the purpose of incorporating the relevant sections of the Convention into EU legislation at a later date.

Six months after the Swedish EU Presidency had ended, the terrorist attacks of September 11, 2001, occurred in the United States. They had a powerful influence on aviation security measures and, in the long run, also on passengers.

### Issues on the agenda during the current Swedish Presidency

On May 12, 2009, the EU Commission put forward a proposal for a Directive on Aviation Security Charges. The question of how aviation security measures should be financed has engaged the European Parliament, which considers that Member States should take greater responsibility for financing. The Council has not accepted such a solution. Instead, the Commission was given the task of preparing a report on the principles that determine how measures should be financed and how to ensure transparency in the various systems. The Commission presented its report in February, 2009. This was followed, later in the spring, by the above-mentioned Directive proposal, which is now being dealt with during the Swedish Presidency.

On October 29, 2009, the Commission put forward a proposal for a Regulation on investigation and prevention of accidents and incidents in civil aviation. The proposal is currently being discussed within the Council Working Party on Aviation.

The negotiations with the United States on a comprehensive air transport agreement are continuing during the Swedish Presidency. Other countries on the negotiating list during this period are Israel, Tunisia, Jordan, Georgia, Ukraine, Lebanon, Australia and New Zealand.

Furthermore, a mandate for the Commission to negotiate certain aspects, on behalf of the Community with ICAO, has been dealt with within the Council Working Party on Aviation. This is expected to have been on the agenda for the next Transport, Telecommunications and Energy Council in December, 2009. In addition, a mandate for the Commission to open negotiations on a Memorandum of Cooperation in Civil Aviation Research and Development with the FAA of the United States (SESAR/NextGen) and a mandate for the Commission to negotiate a bilateral agreement on civil aviation safety with Brazil, have been approved by the Council.

During the Swedish Presidency, the EU Council Working Party on Aviation is being led by the Swedish attaché in Brussels, Tomas Brolin. Staff from the Ministry of Enterprise, Energy and Communication is representing Sweden in the Working Party on Aviation, assisted by experts from the Civil Aviation Department of the Swedish Transport Agency. ■

<sup>2</sup>European Aviation Safety Agency

<sup>3</sup>This work gradually led to the European Parliament and Council Directive (EC) 1592/2002 dated 15 July 2002.

<sup>4</sup>European Civil Aviation Conference

# An AFI training master plan: Harmonizing aviation training in Africa to meet current and future human resources challenges



The Special Africa-Indian Ocean Regional Air Navigation Plan (AFI-RAN) identified the harmonization of training policies and standards in Africa as one of the primary means of addressing the challenges related to skills shortages in African aviation regulatory bodies and industry providers.

ICAO's AFI Comprehensive Implementation Programme (ACIP), in conjunction with the African Civil Aviation Commission (AFCAC) and participating AFI training institutes, therefore created a Training Experts

Working Group which is expected to finalize a framework for the harmonization of aviation training in Africa by January 30, 2010.

As Maamoune Chakira, ICAO Safety Officer, ACIP, Nairobi reports, the framework is to be adopted at the Second Pan-African Aviation Training Coordination Conference in May 2010.

The aviation industry has always attached a high priority to the availability and qualifications of aviation personnel. Over the years, States, operators and industry organizations continue to invest heavily in institutions dedicated to training personnel for all types of aviation activities.

ICAO has introduced into the annexes to the Chicago Convention Standards and Recommended Practices (SARPs) related to competency, proficiency and skill requirements for a number of categories of personnel throughout the aviation system. Indeed, the level of knowledge and experience of the personnel performing aviation functions is considered to be one of the critical elements necessary to establish and maintain effective safety oversight systems. Further, State Safety Programmes (SSPs) and services providers' Safety Management Systems (SMS) are fully dependant on the availability of fully trained and qualified personnel.

The Global Aviation Safety Roadmap (GASR), developed by the Industry Strategy Safety Group (ISSG) and adopted by ICAO as part of its Global Aviation Safety Plan (GASP), similarly

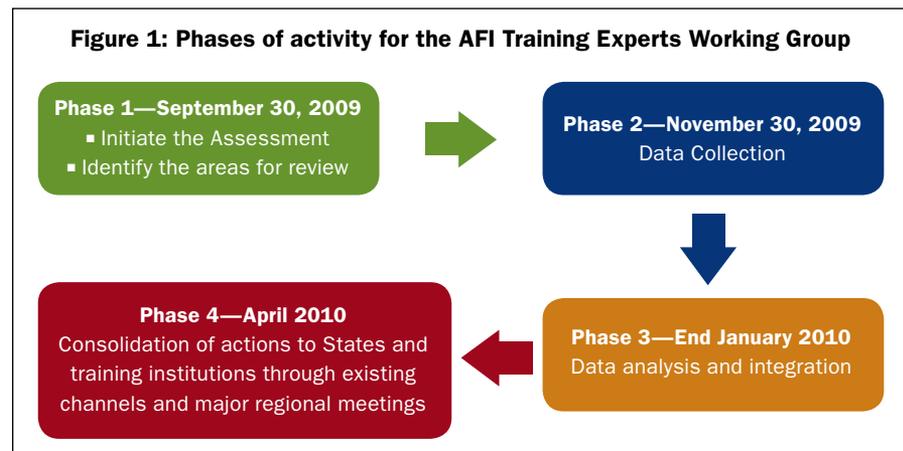
identifies recruitment, training and retention of qualified personnel as one the key focus areas to be addressed for the enhancement of safety levels across global aviation.

Africa-Indian Ocean (AFI) civil aviation is no different from any other Region in this respect. Demographics now indicate that the AFI industry needs to enlist young recruits to replace those who are due to retire. Another important factor in AFI personnel development is the limited availability of local training institutions—which means AFI States and organizations are often required to send trainees

to institutions outside the continent at high financial cost. To avoid these costs, it is unfortunately tempting for stakeholders simply to cut on personnel investment and, in particular, remuneration levels and training budgets.

Finally, as a result of an increasingly globalized workforce, the African aviation industry is faced with the migration of its personnel to other Regions of the world which are perceived to have better employment and wage conditions than Africa can presently provide.

**Figure 1: Phases of activity for the AFI Training Experts Working Group**





Participants to the first ICAO ACIP SSP/SMS Train the Trainers Course, held in Johannesburg, South Africa, September 21–25, 2009. Eighteen instructors were trained at the event and a similar course was held for 20 French speaking instructors in Bamako, Mali, in September-October, 2009.

Each of the above challenges needs to be addressed in order to ensure continued availability of qualified personnel for AFI aviation. It is recognized that the solutions may vary depending on the industry sectors, the States and the sub-Regions under discussion, but agreement is clear that any long-term solution to the shortage of skills in AFI personnel must include the increase and rationalization of local and affordable training opportunities that also addresses the development of trainers throughout Africa.

The Special Africa-Indian Ocean Regional Air Navigation Plan (AFI-RAN, as agreed at Durban, South Africa, November 2008) identified the harmonization of training policies and standards in Africa as one of the primary means of addressing the challenges related to skills shortages in African aviation regulatory bodies and industry providers. It also noted that it is necessary to rationalize the capacity of training centres in order to limit duplication in efforts in civil aviation training. The meeting agreed that this would require strategic planning and cooperation among AFI Contracting States and further recommended the development of a master plan for the harmonization of training in the Africa-Indian Ocean Region as well as new State human resources strategies.

A meeting of African aviation training institutes, organized by the ICAO AFI Comprehensive Implementation Programme (ACIP) and African Civil Aviation Commission (AFCAC), in collaboration with the Airports Company South Africa (ACSA) and the South Africa Civil Aviation Authority in Johannesburg, South Africa, May 2009, led to the formation of a Training Experts Working Group (TEWG) to help give effect to the aforementioned AFI-RAN recommendations. Its mandate is to develop a framework for harmonization of aviation training in Africa and establish a database for aviation training needs and capacities in Africa.

The TEWG is comprised of 8 members from Regional aviation organizations and training institutions across the continent. ICAO ACIP and AFCAC jointly provide secretariat support for the TEWG. It started its work in July, 2009, and adopted a phased approach to perform the tasks assigned to it as described in Figure 1 (page 15). It is anticipated that the framework for the harmonization of aviation training in Africa will be finalized by January 30, 2010 and adopted at the 2<sup>nd</sup> Pan-African Aviation Training Coordination Conference, to be held in May, 2010. It will later be submitted to AFI States and training institutions.

A questionnaire was also developed to assess the needs for training from civil aviation authorities, airlines, maintenance organizations, airports, air navigation services providers and all other AFI aviation services providers. A second questionnaire will request aviation training institutions to provide information on their capabilities in terms of learning facilities, training aids, instructors and logistic support for students.

The objective is to have completed the collection and an initial analysis of data on training needs and resources in Africa by the end of 2009. The TEWG is expected to complete its work by the first quarter 2010 and determine the course of actions that States and training institutions need to undertake to ensure the development of a harmonized and contemporary training system.

In addition to the TEWG's activities, ACIP is dedicating 2010 to building African capabilities through the provision of training courses to aviation professionals from African States and industry. These courses will cover the following areas: establishment and management of safety oversight organizations, accident investigation, SSPs, SMS, safety inspections in aircraft airworthiness, air operations, personnel licensing and aerodromes.

The courses will be delivered by ICAO-approved instructors who are either ICAO technical officers or experts from African States and industry—trained by ACIP through a rigorous 'train the trainers' scheme.

The next step will then be the aggregation of the results of the training needs analysis with the States' human resources plans (to be developed by States as required by Recommendation 5/8) into a strategic plan on the reinforcement and rationalization of aviation training resources in Africa.

It will then be up to States and training institutions to remain involved in the development and continued maintenance of the new training system for aviation in Africa. Only by these measures will Africa as a continent and industry be able to ensure the continued availability of qualified personnel so the aviation industry can continue to assume its expected role as an engine of growth for the economies of African States. ■

# ANC Celebrates 60<sup>th</sup> Anniversary

Throughout 2009, ICAO's Air Navigation Commission (ANC) has been celebrating its 60th Anniversary. The ANC is composed of independent technical experts nominated by Contracting States. Since its first meeting on February 7, 1949, it has focused on air navigation matters and its primary role has been to provide advice to ICAO's governing body, the Council. Anniversary year events have included a June meeting where past Presidents and Secretaries of the Commission, as well as ANC Laurel Award recipients, were invited to join current members in examining the mandate and role of the Commission over the past 60 years and the challenges that lie ahead. More recently, the Commission decided to rename the ANC Laurel Award the Walter Binaghi ANC Laurel Award, in order to honour its first President.



ANC in the early years and the ANC today.



Mr. O.R. Nundu, President of ANC (Tanzania) receiving the IAC's commemorative plaque and presenter Mr. Vladimir Dorofeyev, Representative of the IAC at ICAO. The engraving on the plaque noted:

*"To Air Navigation Commission of ICAO for its exceptional contribution to the effective development of the international civil aviation, elaboration and proliferation of ICAO Standards and Recommended Practices and in commemoration of the 60th Anniversary of the establishment of the Commission."*

*Chairperson of Interstate Aviation Committee  
Doctor of Science, Professor, Academician  
Edward Warner Award Winner*

T. Anodina

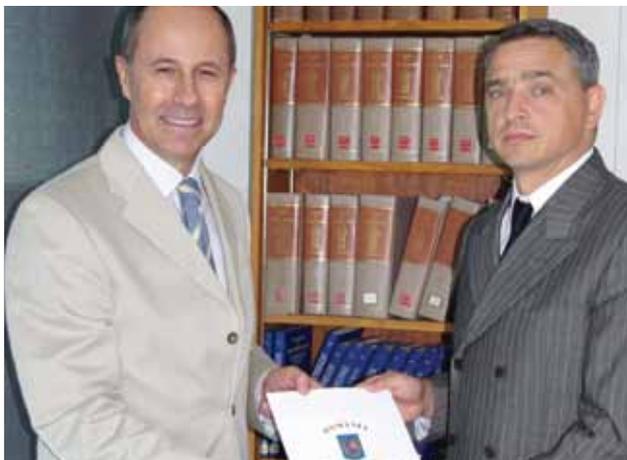
## Latin American/ Caribbean Workshop on aviation statistics and forecasting

A workshop on Aviation Statistics and Forecasting for the States in the Latin America and Caribbean Region was conducted recently by ICAO's Economic Analyses and Databases (EAD) Section. The event took place at ICAO's North American, Central American and Caribbean (NACC) Regional Office in Mexico City and was attended by 40 participants from 12 States, and one Regional and one international organization.

These workshops are conducted periodically in accordance with Assembly Resolution with an objective to provide Member States assistance and guidance in the fields of economics, statistics and forecasting.



In the picture from left to right are: Mr. Z. Anwar (Assistant Secretary to the workshop); Ms. L.J. Martin (Regional Director, NACC Office); Mr. A. Sainayaran (Secretary to the workshop) and Mr. M. Vreedenburgh (Deputy Director, NACC Office).



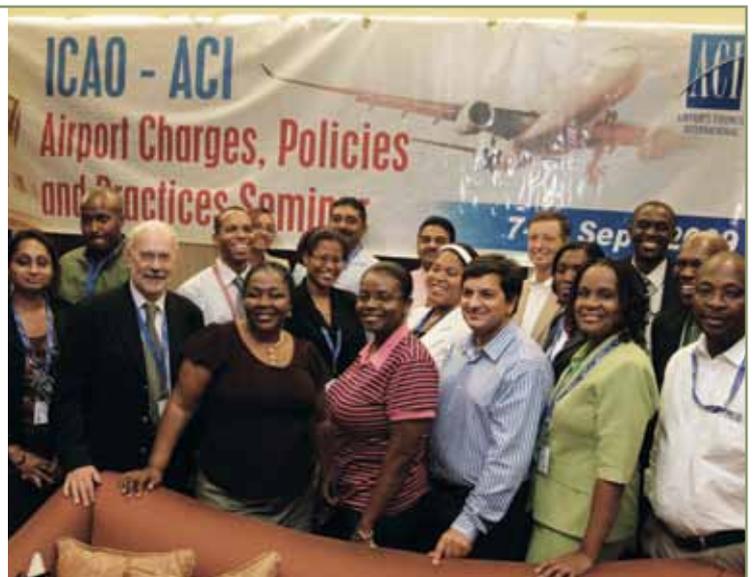
## Deposit by Romania

Romania deposited its instruments of ratification of two Protocols of amendment to the Chicago Convention during a brief ceremony at ICAO Headquarters on August 14, 2009. The Protocols amend the final paragraph of the Chicago Convention to provide for the authentic texts of the Convention in the Arabic and Chinese languages.

Shown on the occasion (from left to right) are: Mr. Denys Wibaux, Director, Legal Affairs and External Relations Bureau; and Mr. Catalin Cotrut, Representative of Romania on the ICAO Council.

## ICAO/ACI Airport Charges Workshop

A joint ICAO/ACI workshop on ICAO's policies on airport charges was held in Port of Spain, Trinidad & Tobago, from September 7–11, 2009. Eighteen participants attended the workshop which addressed the basics of user charges as well as airport economic and management issues. Emphasis was placed on practical cases and exercises, with policies on consultations between airports and users practiced through case studies. The ICAO/ACI charges workshops provide an effective forum for participants to exchange views and experiences between themselves and with the instructors.



# Leadership and Vision in Global Civil Aviation



# 2010 ICAO CALENDAR OF EVENTS

| Meetings  | Site                        | Duration           |
|---|-----------------------------|--------------------|
| Next Generation of Aviation Professionals Symposium | ICAO Headquarters, Montreal | March 1-4, 2010    |
| ICAO Global Air Transport Outlook Symposium (GATOS) | ICAO Headquarters, Montreal | April 13-15, 2010  |
| ICAO Environment Symposium                          | ICAO Headquarters, Montreal | May 10-14, 2010    |
| Diplomatic Conference                               | ICAO Headquarters, Montreal | Jun 21-Jul 9, 2010 |





# Ecuador



**Integrating Our Regions  
Through Aviation**



**Republic of Ecuador****Area:** 256,370 km<sup>2</sup>.**Population:** 13,000,000 inhabitants**Major Cities:** Quito, Guayaquil, Cuenca**International Airports:**

Mariscal Sucre in Quito

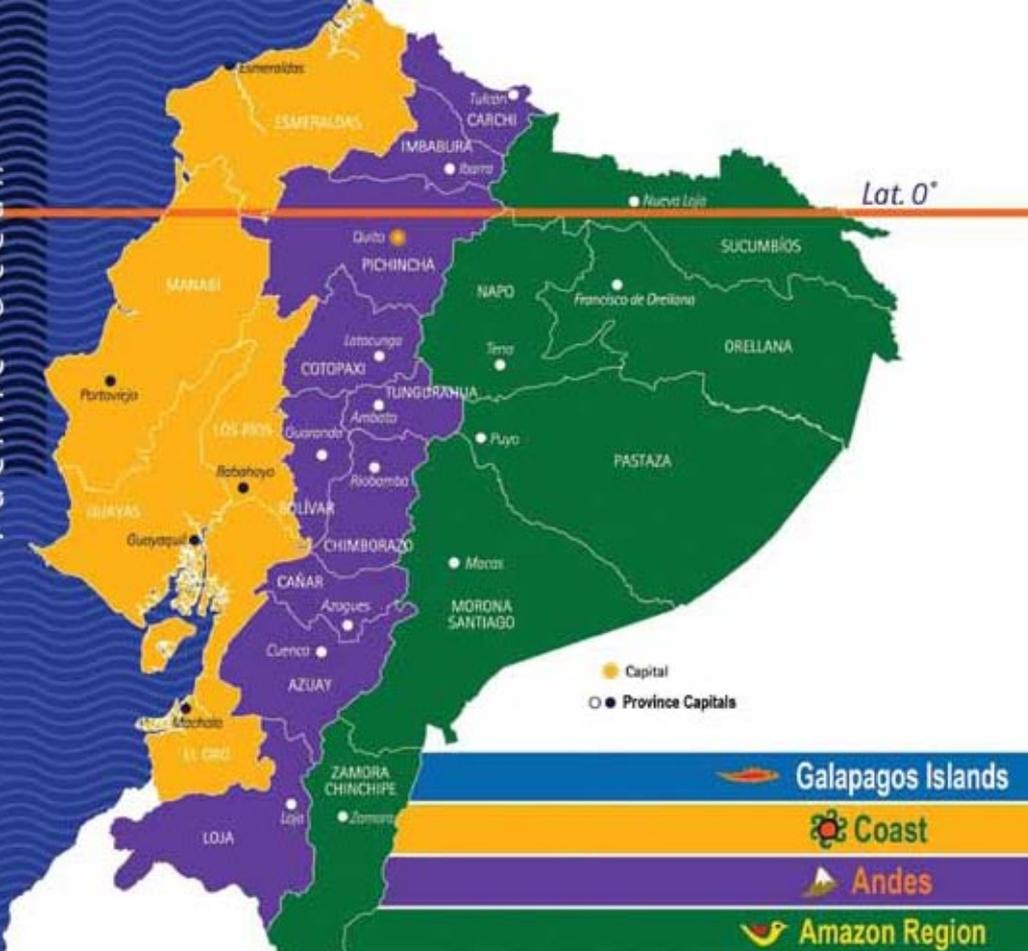
José Joaquín de Olmedo in Guayaquil

Eloy Alfaro in Manta

Cotopaxi in Latacunga

**Official Currency:** U.S. dollar**Official Language:** Spanish, Quichua**Time Zone:** GMT +5 on the continent

GMT +6 in the Galapagos Islands



# ECUADOR

The Ecuadorian Government, through its Civil Aviation Undersecretary's Office and the Directorate General of Civil Aviation, has made the modernization of the State's aeronautical and airport infrastructure a high priority so that Ecuador's airports can fulfill their role as cornerstones of the nation's sustainable social and economic development.

At present, numerous Ecuadorian airports are being constructed and extensively upgraded. The **Santa Rosa Airport**, located south of the country, is a new airport inserted in a highly productive region, and it's currently scheduled to start operations at the end of 2009. The **Cotopaxi International Airport**, in the city of Latacunga, is very centrally located, a fact that is well-appreciated by airlines. Cotopaxi's Master Plan is now being updated to respond to formal technical requirements and growing export expectations of that region. Meanwhile, the strategic location of **Baltra Airport**, in the famed Galapagos Islands, also has intricate challenges associated with its need to reflect the highest standards of environmentally-friendly operations. As a result, Baltra has become a world-class example of what it means to be an "ecological airport facility". The **Tena Airport**, a new airport located in the center of the Ecuadorian Amazon Region, to serve the largest and growing tourist potential that Ecuador has and wants to show to the international community.

All of these developments form part of a much longer list of ongoing Ecuadorian aviation projects that seek to respect and, where possible, exceed the needs of local air transport operators regarding an effective and open air traffic environment. The projects will similarly encourage the increased development and economic success of Ecuador's regional communities and industries.

Ecuador, though a developing country, takes great pride in its sovereignty and in the solutions it is putting in place to improve the economy and quality of life of all its citizens. Its air transport sector has a history of being a key component in the country's efforts in this regard; with many aviation sector initiatives having already left the drawing board or commenced operation.

Ecuador's challenges are now on a much larger scale and the pursuit of excellence remains our foremost commitment as we approach new solutions. Our State continues to break new ground and overcome new barriers with each step in its progress, and the hard work of our aviation sector and the results it achieves remain the greatest testament to our country's ongoing commitment and success.



# BALTRA–GALAPAGOS ISLANDS GREEN AIRPORT

‘FIRST ECOLOGICAL AIRPORT IN THE WORLD’

*The Ecuadorian Government prioritizes the protection of the environment.*



The comprehensive renovation of Baltra Airport deserves special attention due to the facility's status as the gateway to one of the most important natural heritage sites in the world: the Galapagos National Park. The park remains a must-see destination for eco-tourists and faithful disciples of Darwin alike.



## BALTRA

The airport's clean energy, water conservation, healthy materials, sustainable site and overall environmental quality are a beacon of what can be accomplished in the future.

Baltra's architecture uniquely expresses its function: clean lines; bio-environmental, low-impact design; landscape restoration/retention; and all-natural ventilation, air conditioning and lighting.



# ECUADOR'S INVESTMENT IN AIRPORTS

## CONNECTIVITY BOTH WITHIN THE COUNTRY

The renovation, modernization and construction of Ecuador's airports provide quality operations by improving safety and efficiency.

Airports affected under current programmes and associated budgets are as follows:



**LATACUNGA**  
26,100,000



**TENA**  
35,000,000



**ESMERALDAS**  
3,500,000



**MANTA**



**SALINAS**  
15,000,000



**SANTA ROSA**  
30,000,000



**LOJA**



The Government of Ecuador has embarked on an ambitious and urgent mission to restructure and develop its civil aviation sector to enhance aviation safety and security while protecting the environment. This will create good momentum for increased economic growth and employment.

The Ecuadorian airports modernization programme is designed not only to increase holding capacities, but also to provide travellers with an efficient and comfortable experience.

# RT PROJECTS PROMOTES IMPROVED COUNTRY AND AROUND THE WORLD



**LAGO AGRIO**  
5,000,000



**COCA**  
5,000,000



**GREEN AIRPORT**  
World's First Ecological Airport



Upgrades to Ecuador's air navigation infrastructure not only bring safety improvements but also enhance efficiency by increasing the nation's airspace two-fold.

Ecuador's human resources are being developed to their maximum potential in order to reinforce the foundation of skills and experience that is essential to a safe and efficient civil aviation sector.

# THE GOVERNMENT OF ECUADOR PROMOTES BOTH INTERNATIONAL AND NATIONAL CIVIL AVIATION

“The aeronautical authorities are striving to integrate Ecuador’s national airport system into the international grid...”



“...Ecuador is advancing towards an integrated airport system”  
Rafael Correa Delgado (Left)—President of Ecuador

## “Air transport operators, passengers and users benefit from dynamic improvements performed by the government in the republic of Ecuador”

**The elimination of tariffs for aircraft and its parts.** This encourages local air fleet renewal, saving on fuel and reducing emissions and noise, mitigating climate change, and providing environmental protection.

**Regulation of domestic fuel subsidies.** Presidential Decree 1405 removed the subsidy on aviation fuel for those pre-1990 aircraft models that do not satisfy Stage 4 technical requirements. This will help to ensure the modernization of the Ecuadorian national fleet.

**Customer service offices.** In compliance with ICAO Facilitation Annexes, the aeronautical Authorities installed these facilities in the nation’s airports to provide information on the rights of users of air transport services, guidance on complaints procedures and collaborate in solving passenger problems.

**Consumer protection.** Domestic and international airlines must include taxes and special charges when publishing their ticket prices so that users can know the final cost of their flights—thus avoiding misleading advertising.

**Protection of the elderly and disabled.** The Ecuadorian Government is putting into effect several programs to protect the disabled. In this sense, the Aeronautical Authorities established a mandate to the Airlines applying the statutory 50 percent discount on all rates offered to these market segments.

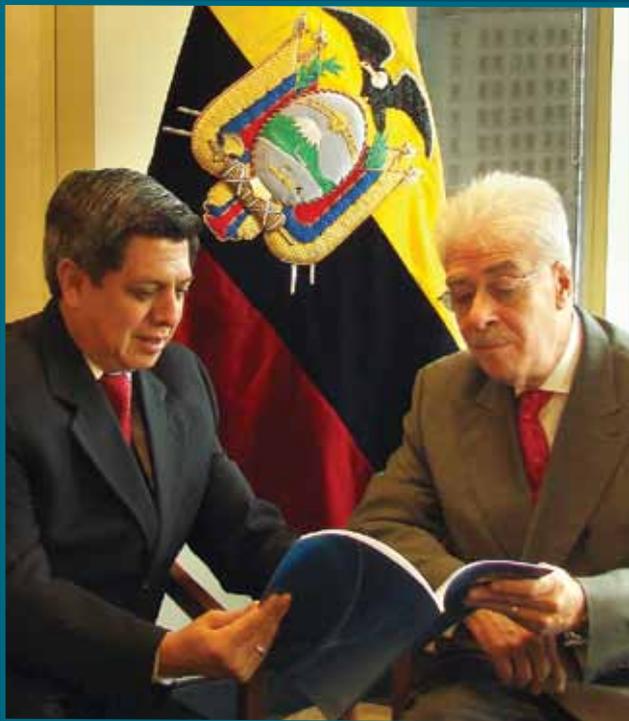
**Efficient human resources in the Civil Aviation structure.** An aviation career programme has been established to professionalize all personnel involved in Ecuador civil aviation activities. Under the initiative of the Undersecretary of Civil Aviation, Cap. Guillermo Bernal, since May 29, 2008, an agreement was signed between the Army Polytechnic School (ESPE) and the Aeronautical Institute (ISTAC) to train professionals in all technical and operational areas of aviation. These operational areas will be filled by pilots, mechanics, flight dispatchers, air traffic controllers, aeronautical meteorologists, flight attendants and security and safety managers.



## AIR TRANSPORT UNDERSECRETARY

### Guillermo Bernal Serpa

“The Government of Ecuador is providing unique support to the aviation sector in order to usher in a new era of growth for the air transport industry. The National Council of Civil Aviation is working in partnership with the Ministry of Transport and Public Works, the Civil Aviation Undersecretary’s Office, the Civil Aviation Director General and domestic and foreign enterprises. With the support of these stakeholders we will make the industry safe, secure, environmentally friendly and competitive.”



## GENERAL SECRETARY OF ICAO

### Raymond Benjamin (right)

“Ecuador is a longstanding and founding member of ICAO since 1944 and, as an elected member of the Council of ICAO at the present time, it has made significant contributions to meet the strategic objectives of the Organization.

I am encouraged by the decision of the Government of Ecuador and the Ecuadorian Civil Aviation Authorities to invest large sums of money to upgrade, expand and build new airports and navigational infrastructure to prepare Ecuador to meet the challenges of international civil aviation in the new millennium.”

## REPRESENTATIVE OF ECUADOR ON THE COUNCIL OF ICAO

### Ivan Arellano Lascano (left)

“Ecuador’s presence in the international civil aviation community has been enhanced through its active contributions to execute the strategic objectives of ICAO, as well as its ongoing pursuit of all major developments meant to promote continuous Ecuadorian air transport safety, security and efficiency.”



## GENERAL DIRECTOR OF CIVIL AVIATION

### Fernando Guerrero López

“Civil aviation in Ecuador is on the threshold of rapid development and growth. Regulatory reforms are in place to facilitate the orderly and safe development of the air transport sector. The air traffic services have been reorganized and modernized with state of the art equipment. All airports have been upgraded and improved and new airports have been planned to enhance national connectivity. The entire system will be integrated into international frameworks.”

# ECUADOR



*Keeping Peace and Justice Near to our National Heart*



Ministry of Transportation  
and Public Works



Undersecretary  
for Civil Aviation  
Transport



Directorate General of Civil  
Aviation of Ecuador

# Effective Global Leadership Through Balanced Priorities

# AMHS

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