2007

UNIVERSAL SAFETY OVERSIGHT AUDIT PROGRAMME

Comprehensive systems approach (CSA)

Analysis of audit results

Reporting period April 2005 to May 2007

This analysis is based on the results of the first 53 Contracting States audited under the Comprehensive Systems Approach (CSA).

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FOREWORD

Transparency and sharing of safety-related information are fundamental tenets of a safe and healthy global air transport system. Indeed, timely, independent and authoritative data is essential for sound decision-making aimed at preserving the integrity of the world's airways and related supporting systems.

This first in-depth analysis of audit results under the comprehensive systems approach of the Universal Safety Oversight Audit Programme (USOAP) makes a significant contribution to our understanding of the level of implementation of ICAO safety Standards and Recommended Practices (SARPs) and of the specific areas where focused action is required to improve safety.

Dr. Taïeb Chérif – Secretary General

The critical importance of safety oversight was highlighted at the Directors General of Civil Aviation Conference on a Global Strategy for Aviation Safety held at ICAO Headquarters in March 2006, when participants unanimously agreed to the posting of the audit results on the Organization's public website. Such openness can encourage States to correct outstanding deficiencies more quickly and make it easier for donors to provide those in need with the required financial or human resources.

Safety oversight is at the heart of the re-energized ICAO Global Aviation Safety Plan (GASP), which integrates essential elements of the Global Aviation Safety Roadmap developed by the Industry Safety Strategy Group, in cooperation with ICAO.

The overall challenge for aviation safety, as defined by the GASP, is to drive an already low accident rate even lower, according to three targets for 2008-2011 set by ICAO: 1) to reduce the number of fatal accidents and fatalities worldwide irrespective of the volume of air traffic; 2) to achieve a significant decrease in accident rates, particularly in regions where these remain high, and; 3) to ensure that no single ICAO region shall have an accident rate more than twice the worldwide rate by thee end of 2011—based on a five-year sliding average.

Finally, this Report reflects the transition of ICAO to a more results-oriented and performance-based Organization, in line with fundamental changes in global aviation and the evolving requirements of all of our constituents. While out methods may change, however, safety remains the *raison d'être* of the Organization.

All members of the world aviation community share a common responsibility – to provide travellers with the safest air transport system possible. It is my hope that this Report contributes to achieving this objective.

INTRODUCTION

The ultimate objective of the ICAO Universal Safety Oversight Audit Programme (USOAP) is to promote global aviation safety through auditing Contracting States, on a regular basis, to determine States' capability for safety oversight. This objective is accomplished by assessing the effective implementation of the critical elements of a safety oversight system and the status of their implementation of safety-relevant ICAO Standards and Recommended Practices (SARPs), associated procedures, guidance material and safety-related practices. To understand the results of the audits conducted under the comprehensive systems approach, the information collected for the purposes of the audits and the findings identified during the audits must be systemically qualified and quantified.

Assembly Resolution A35-6 directed the Secretary General to ensure that all aspects of the auditing process are visible to Contracting States and to make relevant information derived from the Audit Findings and Differences Database (AFDD) accessible to Contracting States.

The AFDD was developed to archive findings and differences arising from safety oversight audits carried out under the ICAO USOAP. Information provided by States on the level of aviation activity and on the status of compliance with ICAO Annex provisions, along with findings identified during an audit, allow for the conduct of detailed analysis with the aim of enabling ICAO to be more effective in promoting global aviation safety. The data collected enables ICAO to:

a) determine the level of aviation activity: by State, by region, by a select group of States, or globally;

b) determine Contracting States' level of implementation of SARPs for each of the safety-related ICAO Annexes, based on compliance checklists completed and submitted by States and audit results;

c) determine the percentage of lack of effective implementation broken down by the eight critical elements (CEs) of a safety oversight system: by State, by region, by a select group of States, or globally; and

d) determine the types of difficulties experienced by Contracting States in establishing an effective safety oversight system in each of the eight areas audited:

   i. primary aviation legislation and civil aviation regulations;
   ii. civil aviation organization;
   iii. personnel licensing and training;
   iv. aircraft operations;
   v. airworthiness of aircraft;
   vi. aircraft accident and incident investigation;
   vii. air navigation services; and
   viii. aerodromes.

The analysis of the audit findings and differences will enable the identification and quantification of safety concerns for individual States and groups of States, at the regional and global levels. ICAO will then be able to evaluate their impact on safety and consider the various options available to improve conformance to the SARPs and assist States in establishing an effective safety oversight system. The resulting analysis will also allow the prioritization of actions required to resolve identified safety concerns.

This analysis is based on the results of the first 53 safety oversight audits conducted under the comprehensive systems approach. The information presented will vary as more States are audited and the corresponding results are entered in the database.

This report supports ICAO Strategic Objective A - *Enhance Global Civil Aviation Safety*. It has been prepared by the Safety and Security Audits Branch in coordination with the Air Navigation and Air Transport Bureaux.

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Compliance checklists results (Cont.)

Part III

Critical elements of a safety oversight system

General considerations

The CEs are essentially the safety defence tools of a safety oversight system required for the effective implementation of safety-related international standards and associated procedures. ICAO Contracting States, in their effort to establish and implement an effective safety oversight system that reflects the shared responsibility of the State and the aviation community, should address the eight CEs. The CEs encompass the whole spectrum of civil aviation activities, including personnel licensing, aircraft operations, airworthiness, air navigation services, aerodromes and aircraft accident and incident investigation. The level of effective implementation of the CEs is an indication of a State's capability for safety oversight.

ICAO has defined the following eight CEs of a State's safety oversight system (ICAO Doc 9734, Part A refers):

CE-1. Primary aviation legislation. The provision of a comprehensive and effective aviation law consistent with the environment and complexity of the State's aviation activity and compliant with the requirements contained in the Convention on International Civil Aviation.

CE-2. Specific operating regulations. The provision of adequate regulations to address, at a minimum, national requirements emanating from the primary aviation legislation and providing for standardized operational procedures, equipment and infrastructures (including safety management and training systems), in conformance with the Standards and Recommended Practices (SARPs) contained in the Annexes to the Convention on International Civil Aviation.

Note.— The term "regulations" is used in a generic sense to include but is not limited to instructions, rules, edicts, directives, sets of laws, requirements, policies, and orders.

CE-3. State civil aviation system and safety oversight functions. The establishment of a Civil Aviation Authority (CAA) and/or other relevant authorities or government agencies, headed by a Chief Executive Officer, supported by the appropriate and adequate technical and non-technical staff and provided with adequate financial resources. The State authority must have stated safety regulatory functions, objectives and safety policies.

Note.— The term "State civil aviation system" is used in a generic sense to include all authorities with aviation safety oversight responsibility which may be established by the State as separate entities, such as: CAA, Airport Authorities, Air Traffic Service Authorities, Accident Investigation Authority, and Meteorological Authority.

CE-4. Technical personnel qualifications and training. The establishment of minimum knowledge and experience requirements for the technical personnel performing safety oversight functions and the provision of appropriate training to maintain and enhance their competence at the desired level. The training should include initial and recurrent (periodic) training.

CE-5. Technical guidance, tools and provision of safety-critical information. The provision of technical guidance (including processes and procedures), tools (including facilities and equipment) and safety-critical information, as applicable, to the technical personnel to enable them to perform their safety oversight functions in accordance with established requirements and in a standardized manner. In addition, this includes the provision of technical guidance by the oversight authority to the aviation industry on the implementation of applicable regulations and instructions.

CE-6. Licensing, certification, authorization and/or approval obligations. The implementation of processes and procedures to ensure that personnel and organizations performing an aviation activity meet the established requirements before they are allowed to exercise the privileges of a licence, certificate, authorization and/or approval to conduct the relevant aviation activity.

CE-7. Surveillance obligations. The implementation of processes, such as inspections and audits, to proactively ensure that aviation licence, certificate, authorization and/or approval holders continue to meet the established requirements and function at the level of competency and safety required by the State to undertake an aviation-related activity for which they have been licensed, certified, authorized and/or approved to perform. This includes the surveillance of designated personnel who perform safety oversight functions on behalf of the CAA.

CE-8. Resolution of safety concerns. The implementation of processes and procedures to resolve identified deficiencies impacting aviation safety, which may have been residing in the aviation system and have been detected by the regulatory authority or other appropriate bodies.

Note.— This would include the ability to analyse safety deficiencies, forward recommendations, support the resolution of identified deficiencies, as well as take enforcement action when appropriate.

Audits completed as of 31 May 2007

Contracting State Audited	Audit Period
Andorra	26 to 28 February 2007
Azerbaijan	15 to 24 May 2007
Belgium	7 to 16 February 2006
Benin	27 February to 7 March 2007
Bhutan	24 to 31 October 2006
Botswana	9 to 18 May 2006
Brunei Darussalam	17 February to 1 March 2007
Bulgaria	30 May to 8 June 2006
Cameroon	6 to 15 June 2006
Canada	11 to 22 April 2005
Central African Republic	12 to 16 March 2007
China	20 March to 4 April 2007
Costa Rica	10 to 23 January 2006
Cyprus	5 to 14 February 2007
Czech Republic	6 to 15 December 2005
Democratic Republic of the Congo	18 to 26 September 2006
Egypt	14 to 23 November 2005
El Salvador	6 to 15 June 2006
Equatorial Guinea	14 to 18 May 2007
Ethiopia	4 to 13 December 2006
Fiji	17 to 26 January 2006
Gabon	2 to 10 May 2007
Gambia	20 to 29 September 2005
Germany	11 to 17 May 2005
Ghana	20 to 28 November 2006
Greece	16 to 25 May 2006
Guyana	12 to 21 February 2007
India	10 to 20 October 2006
Indonesia	6 to 15 February 2007
Israel	22 to 31 January 2007
Italy	16 to 25 May 2006
Jordan	20 to 28 November 2006
Kuwait	27 November to 2 December 2005
Liberia	15 to 19 May 2006
Luxembourg	21 February to 2 March 2006
Malaysia	28 June to 7 July 2005
Monaco	5 to 9 March 2007
Namibia	25 April to 5 May 2006
New Zealand	14 to 24 March 2006
Nigeria	7 to 17 November 2006
Norway	2 to 11 May 2006
Panama	18 to 27 October 2005
Peru	15 to 24 May 2007
San Marino	2 March 2007
Senegal	12 to 24 April 2006
Sierra Leone	8 to 12 May 2006
Solomon Islands	27 March to 4 April 2006
Sudan	21 to 30 November 2006
Thailand	28 June to 7 July 2005
Togo	19 to 26 February 2007
Trinidad and Tobago	30 January to 8 February 2007
Turkey	22 to 31 May 2007
Vanuatu	30 January to 7 February 2006

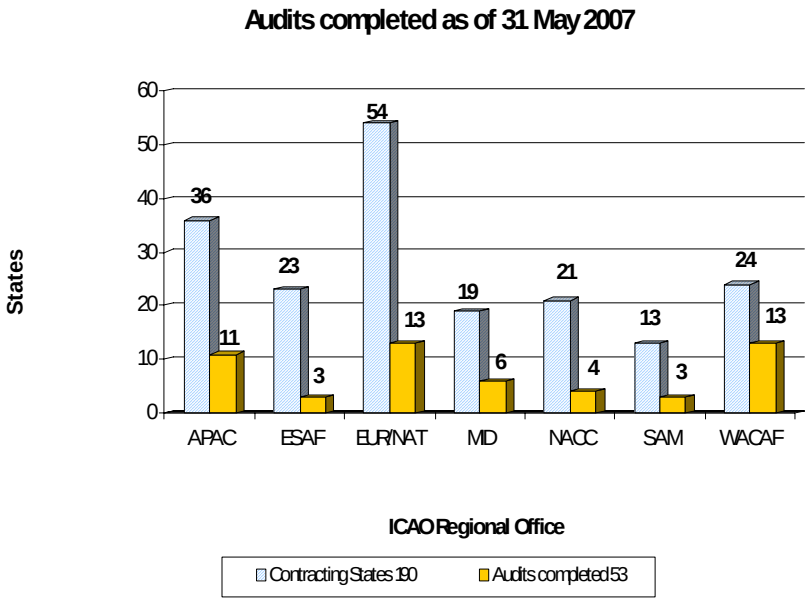

Figure1

Table 1

Figure 1 above shows the geographical distribution, by ICAO Regional Office, of the 53 Contracting States audited as of 31 May 2007 under the comprehensive systems approach. ICAO is on schedule to bring this total to 78 by the end of 2007, with 43 additional audits scheduled for 2008. The remaining Contracting States would be audited by the end of 2010.

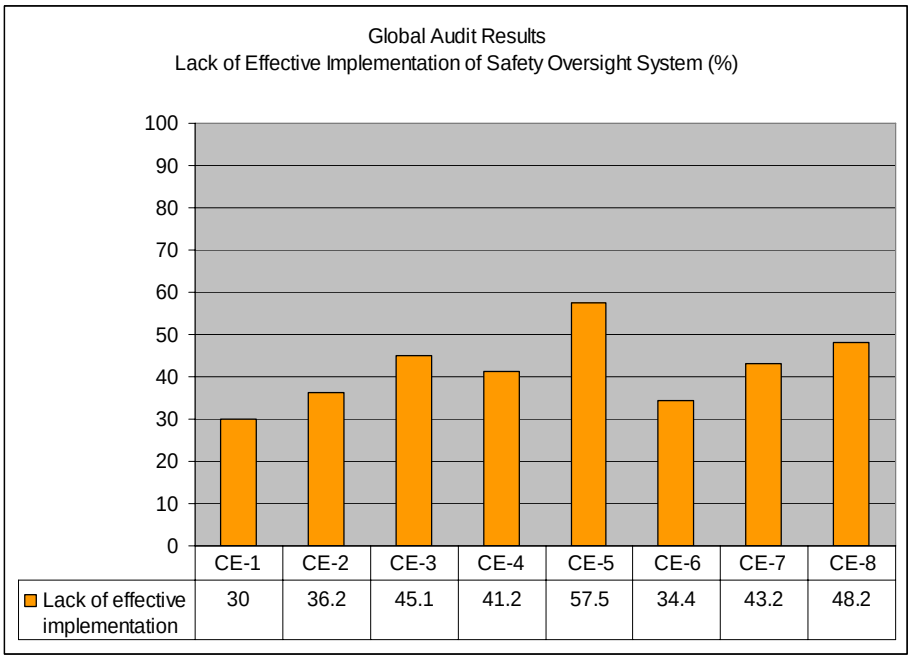

Figure 2

The results of the 53 safety oversight audits conducted under the comprehensive systems approach, as of 31 May 2007, covering the safety-related provisions in all safety-related Annexes, have been analysed using the AFDD. Figure 2 above shows the level of lack of effective implementation of the eight critical elements of a safety oversight system for the 53 Contracting States audited, with an average of 41.3 per cent. Most of the audit findings relate to the newly audited areas, i.e. aerodromes, air navigation services (ANS) and aircraft accident and incident investigation.

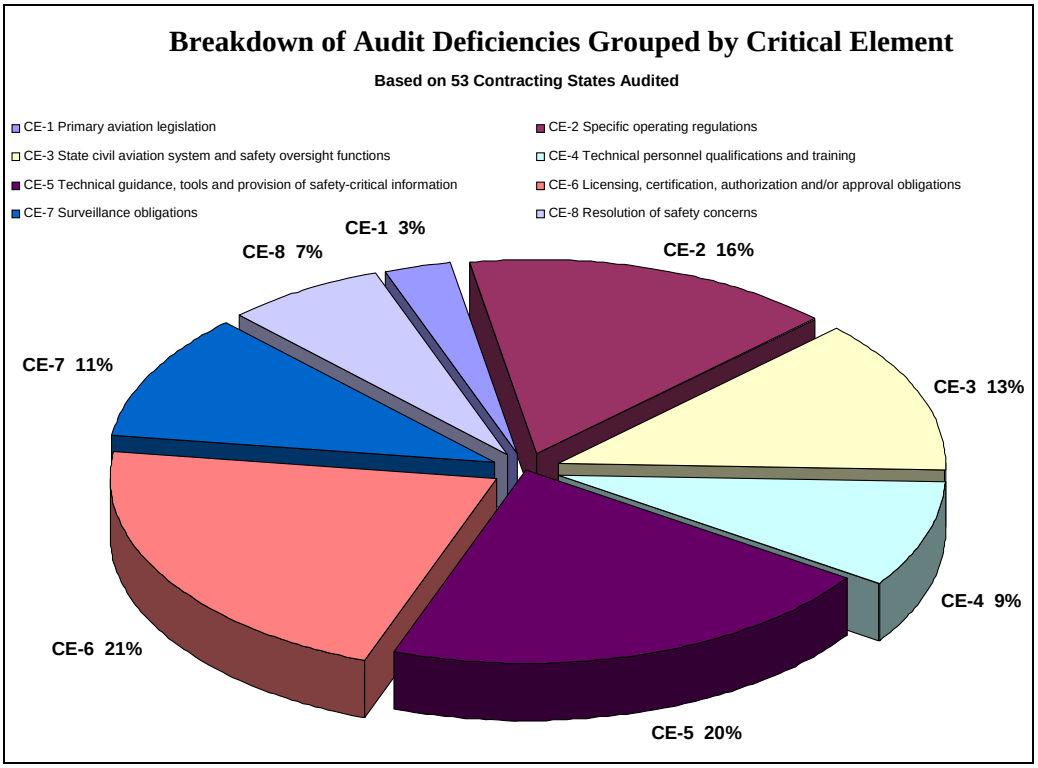

Figure 3

Under the comprehensive systems approach, ICAO conducts the audits using audit protocol questions (found in ICAO Doc 9735 – *Safety Oversight Audit Manual*). Each protocol question is linked to a critical element and, when marked "not satisfactory", is used to support an audit finding. Audit findings must be based on at least one not satisfactory protocol question. A not satisfactory protocol question may also be referred to as a deficiency.

Figure 3 above depicts the breakdown of the deficiencies for the eight CEs. 57 per cent of the total of deficiencies identified during the audits conducted was related to CE-2, CE-5 and CE-6. The remaining 43 per cent of the deficiencies were related to CE-1, CE-3, CE-4, CE-7 and CE-8.

To facilitate the conduct of the audits and distribution of work amongst the audit team members, the audit protocol questions are grouped into eight separate questionnaires, based on the following areas:

a) primary aviation legislation and civil aviation regulations;
b) civil aviation organization;
c) personnel licensing and training (Annex 1);
d) aircraft operation certification and supervision (Annexes 6, 18);
e) airworthiness of aircraft (Annexes 6, 7, 8, 16);
f) aircraft accident and incident investigation (Annex 13);
g) air navigation services (Annexes 2, 3, 4, 5, 10, 11, 12, 15); and
h) aerodromes (Annex 14).

Sub-groupings have also been identified within each CE to facilitate identification of specific issues that States are having difficulty in addressing.

PART I
ANALYSIS OF AUDIT RESULTS BY CRITICAL ELEMENT

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Critical Element 1

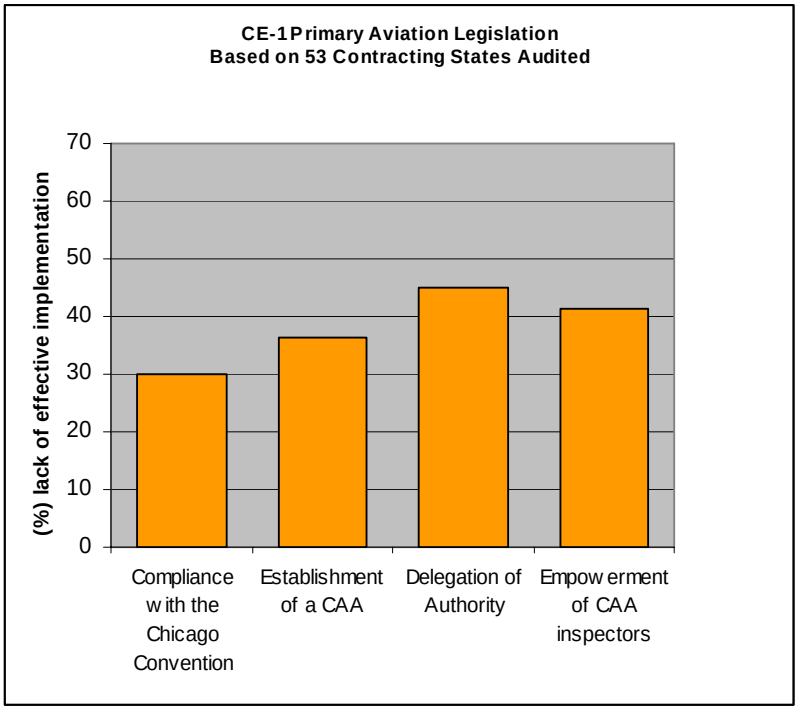

Figure 4

Of the 53 States audited, approximately 75 per cent have promulgated primary aviation legislation that applies to the current situation in the State. Almost all States audited have legislation that provides for the introduction/adoption of air navigation regulations and their promulgation thereof. However, almost half of the States audited has not established provisions to make compliance with aircraft interception orders from other States mandatory for any civil aircraft under their registry or operated by their operators. Although 45 of the States audited have ratified Article 83 *bis* to the Chicago Convention, 37 of them have not yet modified their primary aviation legislation and related operating regulations and procedures to reflect the transfer or acceptance of duties and responsibilities, as envisaged by Article 83 *bis*, including allowing for the recognition of licences and certificates issued by the State of the operator for aircraft operating under an Article 83 *bis* agreement.

All but six of the 53 audited States have legislation containing provisions for the establishment of the civil aviation organization(s) and the appointment of a Chief Executive Officer (CEO). Approximately 75 per cent of audited States has legislation which grants a clear legal authority to the head of the civil aviation organization(s). In 25 per cent of the audited States, the level at which the responsibility for the development, issuance and revision of the operating regulations is assigned does not allow the State to respond, in a timely manner, to keep pace with amendments to ICAO Annexes. Almost 50 per cent of the States audited has legislation which provides for the delegation of authority to their inspectors. More than 50 per cent of States audited have not established official inspectorate staff credentials.

Approximately 50 per cent of the States audited does not have primary aviation legislation that provides for the enforcement of the applicable legislation and regulations including provisions to allow inspectors unrestricted and unlimited access to aircraft and aviation facilities. Although most States provide inspectors with the right to access and inspect aviation documents and the right to detain aircraft for just cause, more than 50 per cent does not provide inspectors the right to prohibit any person from exercising the privileges of any aviation licence, certificate or authorization for just cause. Of the 53 audited States, 38 have not established a policy and detailed procedures for enforcement of applicable regulations and 25 per cent does not have provisions to allow the suspension, revocation or restriction of aviation documents.

Critical Element 2

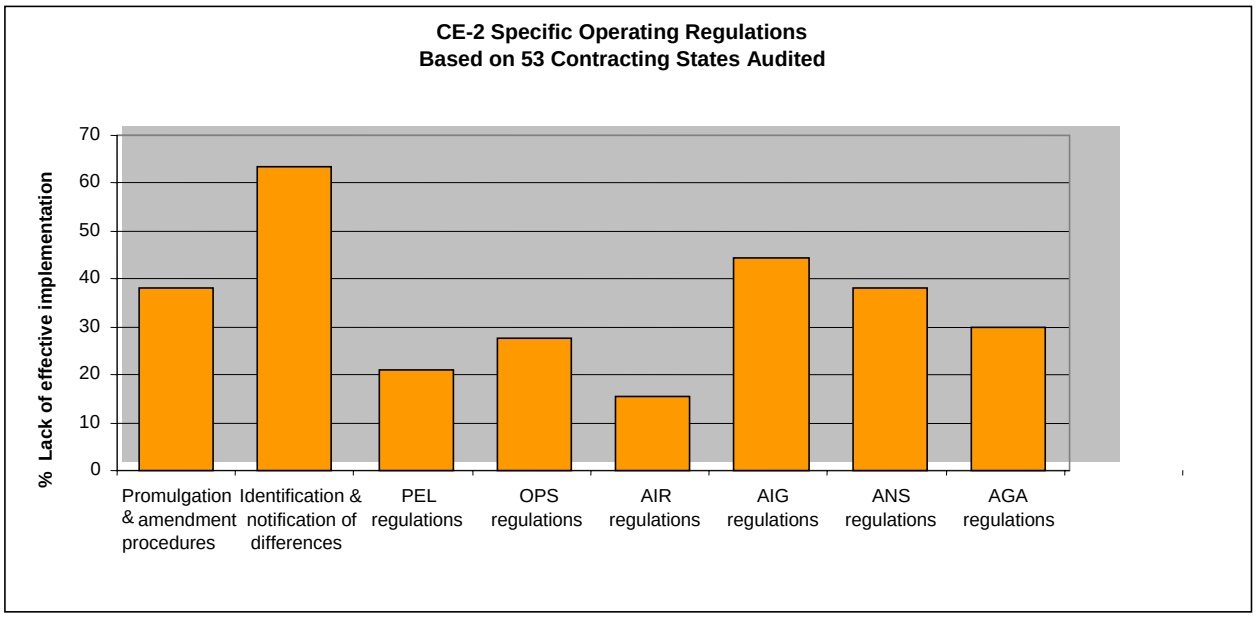

Figure 5

Figure 5 depicts the lack of effective implementation for the various sub-groupings under CE-2 Specific operating regulations. Likewise, it highlights the fact that many Contracting States have not developed an effective system for amending their regulations, pursuant to receiving ICAO Annex amendments. More than 60 per cent of audited States have not established a system for the identification and notification of differences to ICAO, with the majority of States not publishing their significant differences in the Aeronautical Information Publication (AIP), as per requirements of ICAO Annex 15.

This graph also shows that previously audited areas are better established, with the airworthiness area showing the lowest percentage in lack of effective implementation. This may be due to the fact that not many new provisions have been introduced in the airworthiness area since the last audit cycle, as compared to personnel licensing and aircraft operations which would be more heavily impacted by the absence of amendment procedures. In the area of aircraft accident and incident investigation, the main concerns are related to the lack of sufficient legal basis to ensure the functional independence of the investigation authority, the participation of all States concerned in the investigation, and the protection from disclosure of restricted information such as cockpit voice recorders and cockpit voice recorders transcripts. The newly audited areas, i.e. accident investigation, air navigation systems and aerodromes, show a lack of effective implementation between 30 per cent and 45 per cent.

Critical Element 3

CE-3 refers to State civil aviation and safety oversight functions. It shows, for the 53 audited States, a lack of effective implementation of more than 50 per cent with respect to staffing and recruitment procedures, which would allow the States to have a sufficient number of inspectors. Furthermore, the audits showed a 48.3 per cent lack of effective implementation regarding the provision of adequate financial resources. The results for the organizational structure reflect the fact that many States have yet to establish clear function and duty definitions and necessary coordination procedures for aviation activities within their own national administrations, where more than one entity deals with civil aviation. Moreover, separation of regulatory and service provider functions for aerodromes and air navigation services has not yet been established in many States to ensure that the safety oversight of the State's activities is free from conflict of interest.

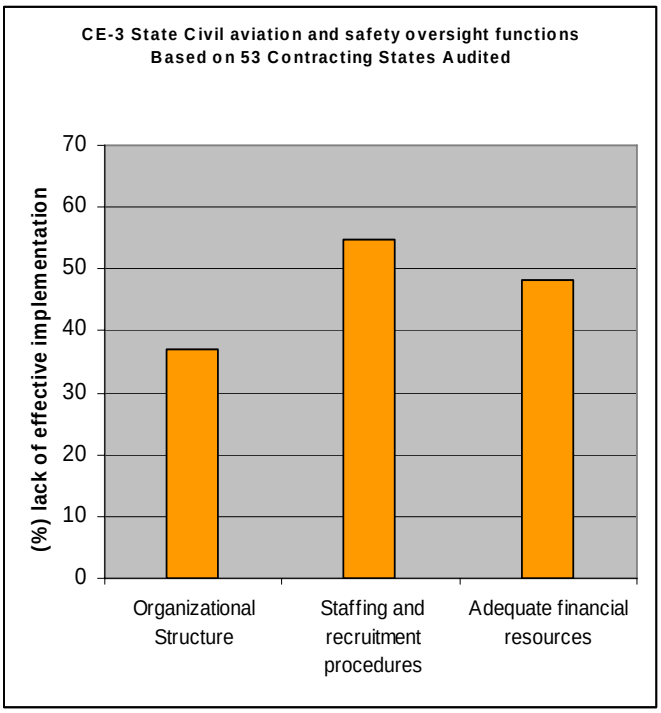

Figure 6

With respect to aircraft operations, approximately half of the audited States have an insufficient number of flight operations inspectors to adequately perform safety oversight of civil aviation activities. Often, this insufficient number of inspectors is due to the fact that a flight operations inspector's remuneration is not favourable when compared with corresponding remuneration in the aviation industry.

In the aircraft accident and incident investigation area, organizational difficulties are more often found in States that have not established an accident and incident investigation authority. The main difficulties relate to the absence of a formal organization for accident and incident investigation (designation of personnel and description of their functions), to the existence of potential conflict of interests, and to the difficulty in ensuring the release of seconded technical experts for the whole duration of the investigation. In addition, there is a lack of regional cooperation arrangements or mechanisms to assist States with no or limited accident and incident investigation capability.

Air navigation services encompasses air traffic management (ATM); procedures for air navigation services – aircraft operations (PANS-OPS); aeronautical information services (AIS); aeronautical charts; communications, navigation and surveillance (CNS); aeronautical meteorological services (MET) and search and rescue (SAR). The concept of a distinct entity/inspectorate to carry out safety oversight of the service providers is relatively new. The availability of sufficient legal authority to ANS inspectorate staff and adequately trained and qualified personnel is of major concern. The ANS Inspectorate is the generic term indicating the office or entity responsible to carry out safety oversight over the ANS providers. Audit results also show that minimum staffing requirements have not been established either. This is further exacerbated by the fact that in many regions States are reluctant to establish separate autonomous entities responsible for ensuring provision of ANS. Taking into account the concerns raised, the establishment of separate entities within the civil aviation authorities with clear lines of accountability with respect to regulatory and service provision functions is being recommended.

Another area of concern is the provision of MET to international air navigation, which is normally done by the meteorological authorities of the State. A need for an agreement between the air traffic services (ATS) and meteorological authorities has been identified.

Concerns have been raised with respect to the establishment and implementation of a properly organized quality system in conformity with the International Organization for Standardization (ISO) 9000 series of quality assurance standards, and certified by an approved organization. In addition, several States have not established agreements or mechanisms for carrying out safety oversight over the entity responsible for the provision of MET.

Concerns have also been raised with respect to the provision of SAR services. The lack of arrangements for using SAR units and other facilities to assist aircraft or its occupants who are in a state of emergency, proper coordination between aeronautical and maritime authorities, preparation of detailed SAR plans of operations and inadequate regular training and exercises have been noted.

In the area of aerodromes, approximately 66 per cent of the States audited has not yet established an organizational structure responsible for the certification and surveillance of aerodromes. In addition, about 58 per cent of the audited States has not defined clearly the functions and responsibilities of the aerodrome technical staff which normally include, but are not limited to: aerodrome certification, safety audits, development of aerodrome standards, and compliance and enforcement. Approximately 83 per cent of the States audited does not have sufficient human resources with the different technical disciplines required for the certification and surveillance of aerodromes, especially in the areas of airport operations and certification. Furthermore, 33.9 percent of States audited has not yet established a distinct separation between the service provider and the regulatory authority, as was the case in ANS.

Critical Element 4

CE-4 refers to technical personnel qualifications and training. With respect to personnel licensing, several audited States have not established formal training plans and programmes for their staff involved in personnel licensing processes, administration of such processes, examinations (theoretical and practical) and medical exams. States are facing problems in identifying training needs for their staff, have not established job descriptions and do not conduct training needs analyses to establish the type and scope of the training to be provided. In addition, in the majority of States audited, all exams are conducted by designated examiners, and there is no system to assess their qualifications, training and competency. Moreover, a system for the maintenance of training records has yet to be established in an effective manner by many States.

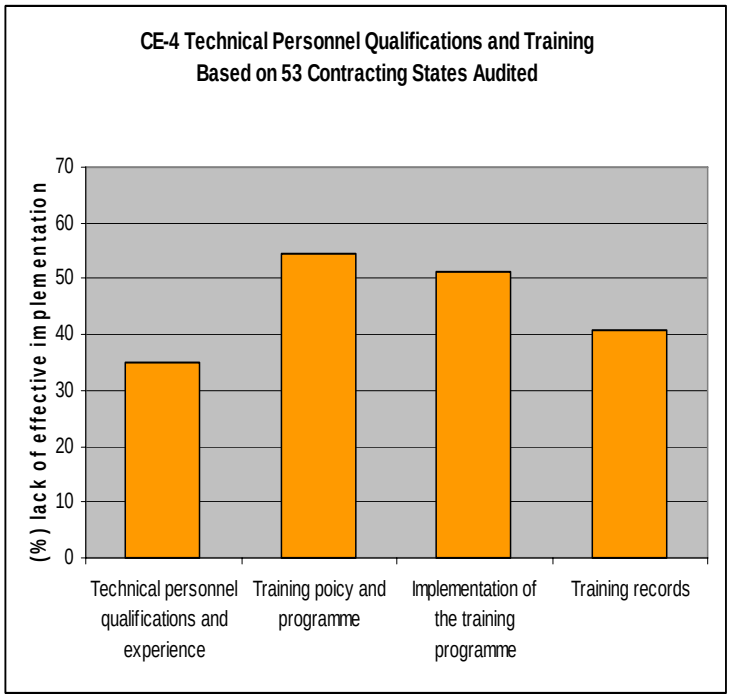

Figure 7

With respect to aircraft operations, approximately 25 per cent of the Contracting States audited has not established minimum flight and work experience requirements to become an operations inspector. More than two thirds of the audited States have not adequately developed and implemented a training programme for operations inspectors to provide them with initial and recurrent training in order to maintain the competency of technical staff performing inspections. Half of the States have not addressed the issue of the transport of dangerous goods by air, as they have not designated and trained personnel to perform dangerous goods inspections and oversee dangerous goods programmes.

In the area of airworthiness, approximately 25 per cent of the States audited has not established the minimum qualifications and experience required for an airworthiness inspector, and two thirds of the States has not developed and implemented a training programme for their inspectors. On-the-job training is not completed in a satisfactory manner in approximately 50 per cent of the audited States. In the airworthiness engineering field, approximately 20 per cent of the States of design has not developed and implemented training programmes.

In the area of aircraft accident and incident investigation, notwithstanding the existence of a dedicated ICAO circular related to investigator training, very few States have established formal training programmes and comprehensive training plans for their investigators or, in the absence of full-time investigators, for their technical staff designated to carry out investigation tasks when needed.

With respect to ANS, States have not established the minimum qualification and experience of the ANS inspectorate staff or the entity responsible to carry out safety oversight over the ANS provider(s). In addition, a periodic training programme detailing the type of training to be given to ANS inspectorate staff has not been developed and implemented.

With respect to aerodromes, approximately 66 per cent of the States audited has not established an organizational structure responsible for the certification and surveillance of aerodromes; as a result, technical personnel qualifications and experience have not been established. This is reflected in the graph under technical personnel and qualifications and experience. Approximately 83 per cent of the States audited has not developed and implemented a training policy and programme; therefore, a major part of the percentage in lack of effective implementation shown in the graph regarding the training policy and programmes is linked to the area of aerodromes.

Critical Element 5

CE-5 refers to technical guidance, tools and the provision of safety-critical information. With respect to personnel licensing, the lack of adequate guidance material and procedures directly affects the proper administration of a personnel licensing system. The audit results revealed that some States lacked adequate procedures for the validation/conversion of foreign licenses and ratings, including procedures for appealing CAA decisions on licensing. Furthermore, procedures for the evaluation of application forms to ensure that the applicant meets the requirements in terms of age, knowledge, skill and medical fitness were also lacking in some States.

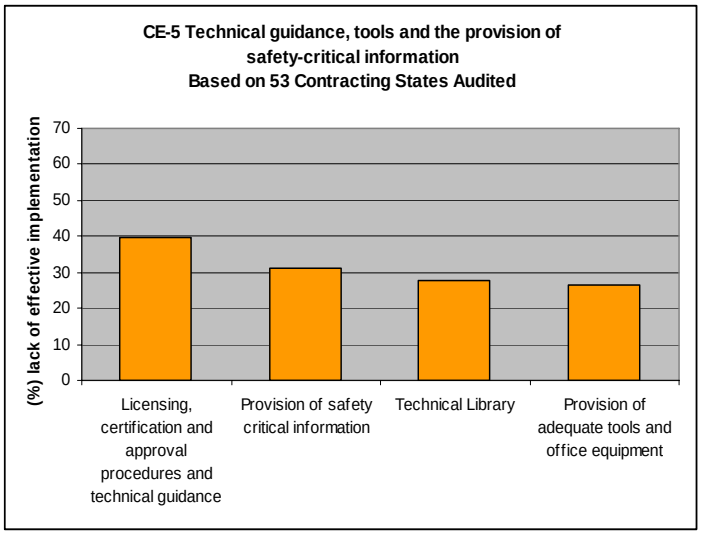

Figure 8

In the area of aircraft operations, one third of the audited States has not developed adequate procedures for providing oversight of the individuals the State has designated to perform tasks on its behalf, even though these individuals are performing safety-critical functions, such as flight competency checks, route checks, instrument rating checks and upgrade checks. More than two thirds of the States does not provide operations inspectors with adequate technical guidance materials and tools for overseeing compliance with the national civil aviation regulations, such as inspection checklists and standardized work performance guidelines. Half of the audited States has not developed standardized procedures for surveillance and enforcement of the State's dangerous goods regulations. More than 40 per cent has not developed adequate procedures for reviewing and approving the contents of an air operator's operations manual, crew training programmes, minimum equipment lists or dangerous goods training programmes. Half of the States has not established procedures in relation to Article 83 *bis* agreements and the approval of aircraft leasing arrangements.

In the airworthiness area, about half of the Contracting States audited does not provide access to design documentation for the aircraft on the State's register. Likewise, several States do not have detailed procedures for the approval of modifications and repairs, guidelines for the reporting of unapproved parts, as well as for the proper usage of parts removed from aircraft no longer in service. In 25 per cent of the audited States, detailed procedures are missing for the following activities: issuance of certificates of registration, validation/acceptance of type certificates, maintenance of the aircraft registry, issuance of documents attesting to noise certification, development of mandatory airworthiness action, issuance of special flight permits, review of AMO procedures manuals, review of the airworthiness aspects of leasing agreements, and guidelines for qualification procedures for special maintenance activities. Finally, the procedure for the transfer and acceptance of tasks in relation to the application of the Article 83 *bis* of the Chicago Convention is missing in more than half of the States audited.

Concerning aircraft accident and incident investigations, a majority of the audited States has not yet established comprehensive procedures and guidelines for the notification and investigation of accidents and serious incidents, for the completion and release of final investigation reports, and for their participation in investigations conducted by other States. The equipment available to the investigators is often insufficient.

With respect to ANS, the need for the development of a manual/handbook incorporating applicable procedures for all functional areas to be covered within the framework of its safety oversight system for ANS inspectorate staff has been recognized. Many States have not developed and promulgated contingency plans to be used in the event of disruption or potential disruption of ATS or related supporting services, although guidance is provided in Attachment D to Annex 11 on this issue.

A large part of the lack of effective implementation percentage shown in Figure 8 is linked to aerodromes, since approximately 66 per cent of the States audited has not established procedures for the certification of aerodromes. Likewise, about 70 per cent of the States audited has developed little or no guidance for the certification and surveillance of their aerodromes both for their technical personnel and for the industry's. With regard to the provision of safety-critical information, most States have not implemented a quality system; in practice, they are using an *ad hoc* method for the provision of safety-critical information.

Critical Element 6

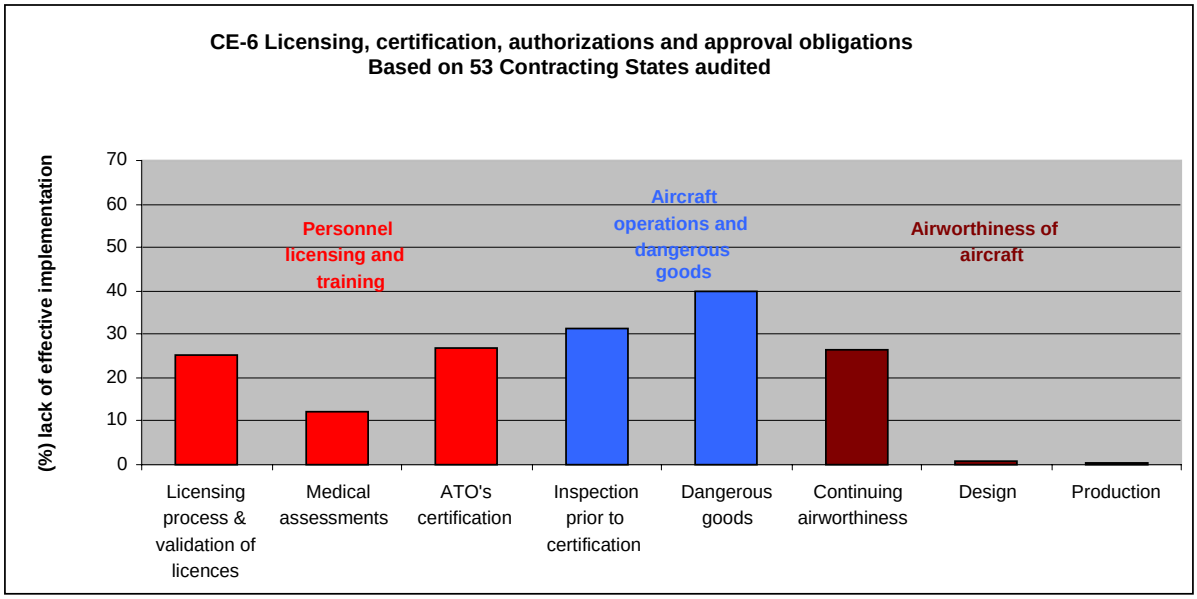

Figure 9

CE-6 refers to licensing, certification, authorizations and approval obligations. With respect to personnel licensing, several States have not issued appropriate approvals and do not ensure that the training organizations have established a procedures manual to be used by their personnel, as well as having adequate infrastructure, equipment and qualified staff. In addition, some States have not established a system to ensure the qualification and competency of the instructors in all training organizations. Moreover, where training is carried out in foreign States, no effective oversight is performed by the State who issued the licence.

With respect to medical assessments, several States have not established a system for the designation of medical examiners; and, in some cases, do not ensure that medical examiners are appropriately trained before they are designated, nor do they employ a medical assessor. Therefore, medical reports are not submitted by the designated examiners and evaluated as required by the provisions of Annex 1.

The audits have revealed that several States are lacking a system for the evaluation of applicants' knowledge and skills, including a system for the designation of flight examiners and periodical supervision of the conduct of flight and practical test delivery. In some cases, States were not issuing or validating licences in conformance with Annex 1. Furthermore, almost 38 per cent of States has not implemented language proficiency requirements, as set forth in Annex 1.

With respect to aircraft operations, almost 50 per cent of the audited States do not ensure that an air operator has developed an accident prevention and flight safety programme or a safety management system, including the development of a non-punitive flight data analysis programme. 40 per cent of the States does not adequately review and approve a prospective air operator's training manual before granting an air operator certificate (AOC), including the training manuals for flight and cabin crew members and for aircraft dispatchers/flight operations officers. Almost half of the States does not adequately review the prospective air operator's ground handling arrangements and responsibilities before issuing an AOC, including the development of a ground handling manual and staff training requirements. Concerning the transport of dangerous goods, 40 per cent of the States do not require

State approval before an air operator carries dangerous goods, and does not have requirements for air operators to develop acceptance procedures and checklists in the event of spillage or in-flight emergencies. Furthermore, 40 per cent of the Contracting States audited does not adequately review and approve the dangerous goods training programmes that air operators provide to their employees, and do not approve a prospective air operator's security training programme before granting an AOC.

Approximately 62 per cent of States audited does not formally include the airworthiness inspection division in the approval of an air operator certificate or the associated specific operational approvals including minimum equipment lists, extended range operation by twin-engine aeroplane (ETOPS), reduced vertical separation minimum, and the approval of aircraft leases. Almost the same percentage of States has not established an adequate system for the approval of modifications and repairs. For approximately 30 per cent of the States audited, deficiencies were also identified related to the certificate of registration, the certificate of airworthiness, export airworthiness approvals and the issuance of approved maintenance organization certificates, including the review and approval of the maintenance procedures manual. It is worth noting that only 20 per cent of the audited States has activity in design and production of aeronautical products.

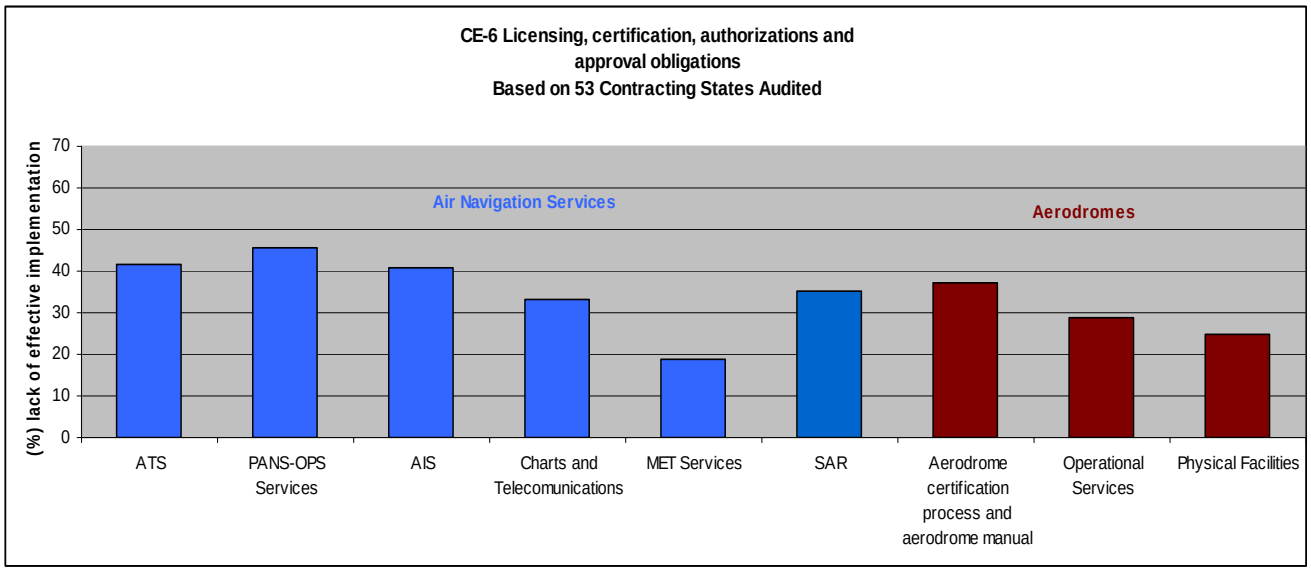

Figure 10

One of the common findings in the air navigation services is the need for the establishment of an ATS safety programme by the regulatory authorities, including a requirement for the ATS providers to implement an ATS safety management system which is acceptable to the States. The establishment of requirements, policies, regulations and guidelines, definition of acceptable levels of safety and identification of resources to support the implementation of the programme have not been addressed by many States.

Another concern is the lack of establishment and implementation of a runway safety programme so as to prevent inadvertent runway incursions. Critical areas identified related to overall runway safety include radiotelephony, phraseology, language proficiency, air traffic control (ATC) procedures, standards and performance requirements for equipment, aerodrome lighting and marking, aerodrome charts, operational aspects, situational awareness and human factors.

Likewise, many States do not ensure that there is a properly organized quality system for AIS, which provides users with the necessary assurance and confidence that distributed aeronautical information

and data satisfy stated requirements for data quality (accuracy, resolution, integrity and timeliness), in accordance with the provisions of ICAO Annexes 4 and 15.

Thirty four per cent of audited States has not developed job descriptions or established training programmes for their technical staff in the areas of aeronautical charts, and CNS.

With respect to MET, the entities providing such services have not developed job descriptions for their technical staff in 21 per cent of the audited States and have not established a training programme in 42 per cent of the audited States. Thirty eight per cent of the audited States do not ensure wind shear warnings are issued for aerodromes where wind shear is considered a safety factor.

Concerning SAR, rescue coordination centres (RCCs) have not developed job descriptions for their technical staff in 28 per cent of the States audited and have not established training programmes in 49 per cent of them. In 30 per cent of the audited States, States do not ensure that RCCs rescue coordination personnel involved in the conduct of radiotelephony communications are proficient in the use of the English language. Likewise, SAR personnel are also not regularly trained and appropriate SAR exercises are not carried out in 51 per cent of the audited States.

With respect to aerodromes, the almost 40 per cent lack of effective implementation depicted on the graph pertaining to aerodrome certification is due to the fact that most of the audited States have not certified their aerodromes, including compliance with the international standard for a safety management system (SMS), and have not submitted to the appropriate authority an aerodrome manual for its review and approval. As part of the certification process, many States have not ensured that aerodrome operators comply with all of the requirements pertaining to aerodrome operational services and physical facilities. Figure 10 shows that in 20 to 30 per cent of the 53 States audited, aerodrome operators do not comply with the requirements related to operational services and physical facilities. In addition, for the States that have not certified their aerodromes, the operational services and physical facilities have not been inspected as part of the aerodrome certification process.

Critical Element 7

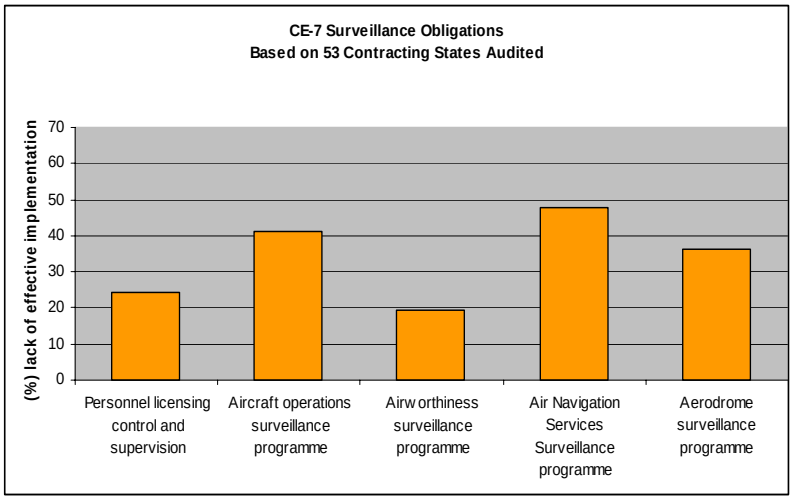

Figure 11

CE-7 refers to surveillance obligations. In the area of personnel licensing and training, the lack of implementation regarding surveillance obligations is impacted by the limitations observed in the licensing system. The main areas of concern are the system for surveillance of training organizations, the review of medical assessment, and the administration of licensing processes. Several audited States have not established a formal surveillance plan and programme for the supervision of medical examiners, flight examiners, and approved training organizations, to ensure they continue to comply with approval requirements. In addition, many States have not established methods to ensure the maintenance of competency of licensed personnel and a system to re-establish privileges of expired licences and ratings. Moreover, few States are still facing problems in establishing a filing system to maintain personal files for each of their applicants and licence holders, which contains all correspondence, applications, assessments, examination results and other licensing documentation.

Concerning aircraft operations, 68 per cent of the audited States has not developed a formal surveillance programme to monitor air operators' compliance with national regulations and international standards. Almost 65 per cent of the audited States does not carry out regular and random dangerous goods inspections to ensure conformance with ICAO Annex 18. More than 50 per cent of the audited States does not conduct surveillance when the ground handling services have been contracted to a service provider. One third of the States does not conduct surveillance over the individuals and organizations that have been designated to perform tasks on behalf of the State, and does not perform surveillance over appointed instructors and examiners. In addition, one third of the States does not conduct surveillance of flight and cabin crew flight time limits and required rest periods.

With respect to airworthiness, 55 per cent of the States audited has not developed a formal surveillance programme for the continuing airworthiness supervision of the operations conducted by AOC holders and approved maintenance organizations (AMOs). In addition, approximately 25 per cent of the audited States does not perform continuous oversight of reliability programmes established by air operators and 20 per cent does not conduct the expected oversight of the tasks delegated to other CAA divisions, State bodies, regional organizations, private agencies or individuals.

The ANS area shows the highest lack of effective implementation of surveillance obligations, reaching almost 50 per cent. In the absence of an ANS safety oversight system, many States do not conduct any surveillance and have not established any mechanism to oversee, in an objective manner, that the entity responsible for the provision of ANS is effectively implementing safety-related policy and procedures. Figure 11 also reflects the fact that many States have not established and implemented a monitoring mechanism in support of navigation performance and periodic safety assessments of navigation systems which have been implemented within the framework of regional air navigation agreements or Planning and Implementation Regional Groups (PIRGs). With regard to the construction of visual and instrument flight procedures, many States are using the PANS-OPS criteria for procedure design; however, in many instances, these States make no reference to the criteria

established by the State for the development of procedures or the adoption of the PANS-OPS criteria. In addition, some PANS-OPS service providers do not retain procedure design documentation so as to allow any data anomaly or errors found during the production, maintenance or operational use of the procedures to be corrected. Flight inspections of instrument flight procedures, including obstacle checks, are also a concern.

With respect to aerodromes, Figure 11 shows a lack of effective implementation of 36.1 per cent for aerodrome surveillance, reflecting that the audited States have not established a formal surveillance programme for the continuing supervision of aerodrome operators. Some States are conducting surveillance with an *ad hoc* approach and have not established and formalized a surveillance programme. In other cases where there is no clear separation of authority between the service provider and the regulatory function, the State is conducting surveillance only as the service provider. The audit results have also shown that some States do not have personnel with the required expertise in the different technical areas to conduct the surveillance of aerodromes.

Critical Element 8

CE-8 refers to the resolution of safety concerns and represents the capability of the 53 audited States to resolve deficiencies identified during inspections performed during the surveillance conducted under CE-7 for personnel licensing, aircraft operations, airworthiness, air navigation services and aerodromes, as well as the establishment of mandatory and voluntary reporting systems including the forwarding of information to the appropriate entity for analysis and action.

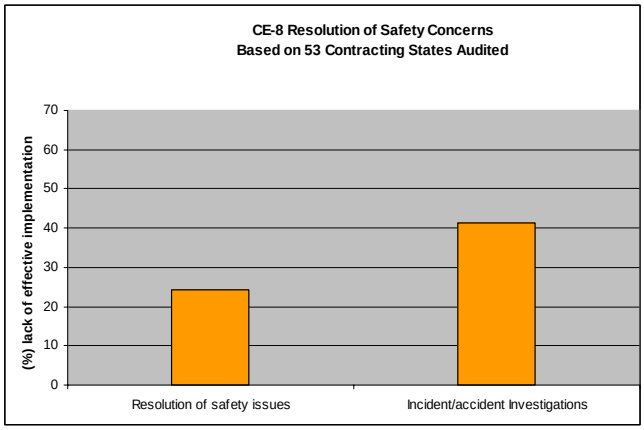

Figure 12

Results of the 53 audits show a 34-per cent lack of effective implementation regarding the resolution of safety concerns.

With respect to airworthiness, 25 per cent of the Contracting States audited does not ensure that information on faults, malfunctions and defects for aircraft registered in a State is transmitted to the organization responsible for the type design. Similarly, either as a consequence of the lack of specialized training on ETOPS and monitoring of reliability programs, or as a consequence of the absence of an equivalent system in place, no special evaluation of information obtained from reliability monitoring with regard to level of safety is carried out.

In the aircraft accident and incident investigation area, most of the States have not implemented formal processes to ensure compliance with ICAO provisions regarding the issuance of, and reply to, safety recommendations, as well as the forwarding of preliminary and data reports. Regarding aircraft accident and incident databases, these have not yet been established in all States. While mandatory incident reporting systems are generally in place, their implementation is not always effective. The number of States having established voluntary incident reporting systems managed at the State level and ensuring the protection of the source of information remains very limited.

Regarding ANS, several Contracting States have not established a mechanism for the elimination of deficiencies identified either during inspections or within the framework of the PIRGs.

Top-ten protocol questions directly related to ICAO Annexes provisions not satisfactorily implemented by the audited States

Personnel Licensing and Training

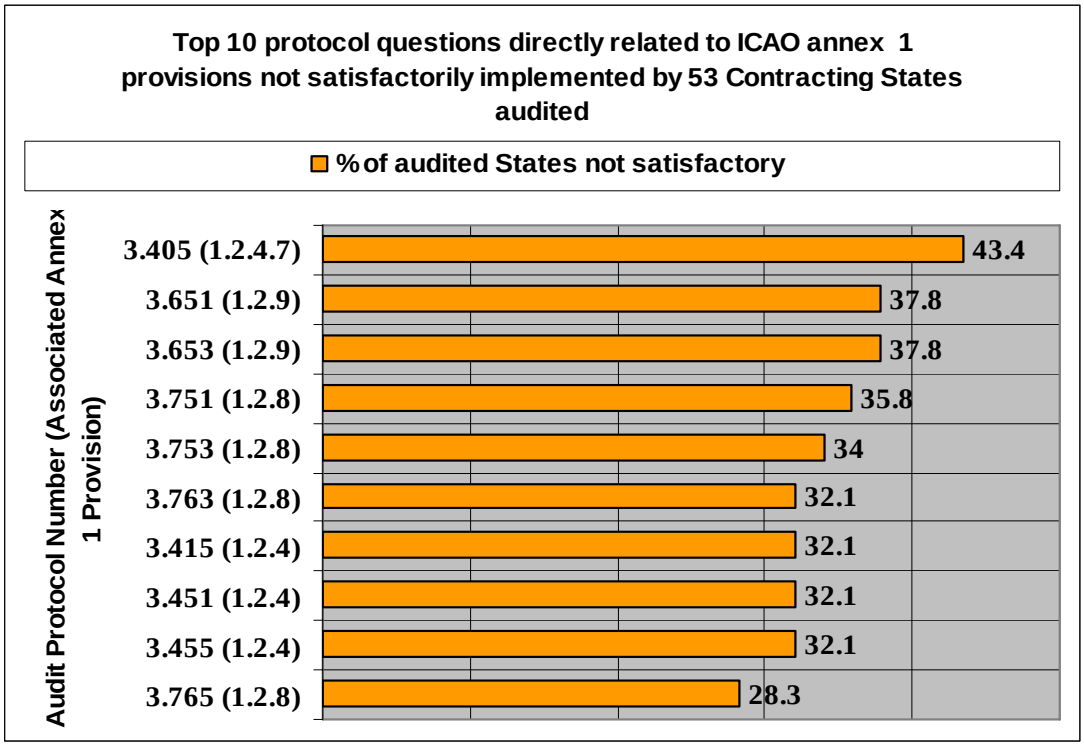

Figure 13

Figure 13 depicts the top-ten not-satisfactory personnel licensing and training protocol questions related to an ICAO Annex Standard for the 53 audited States. Approximately, 40 per cent of audited States did not have an effective system for the assessment of medical fitness of applicants, including the designation of medical examiners, follow-up on their training at regular intervals, and appropriate evaluation of medical reports submitted by the designated medical examiners. Approximately 38 per cent of the audited States has not adequately established a system to evaluate the language proficiency of licence holders and develop a plan to implement the relevant ICAO provisions related to language proficiency by March 2008. Finally, approximately 30 per cent of the audited States has not established an effective system for the certification (authorization) of aviation training organizations, to ensure that they have appropriate facilities, a training and procedures manual, staffing, and qualified instructors.

Audit Protocol No.	Audit Protocol question	Associated Annex provision	# of States audited not satisfactory	% of States audited not satisfactory
3.405	How does the State ensure the evaluation of medical reports submitted by the designated medical examiners?	Annex 1 STD 1.2.4.7	23	43.4
3.651	Has the State established requirements for aviation personnel to demonstrate their ability to speak and understand the language used for radiotelephony communications?	Annex 1 STD 1.2.9	20	37.8
3.653	Has the State established a plan to implement relevant ICAO provisions to ensure that licence holders would demonstrate their ability to speak and understand the language used for radiotelephony communications at the level required for their licence?	Annex 1 STD 1.2.9	20	37.8
3.751	Has the State established a system for the certification (authorization) of aviation training organizations?	Annex 1 STD 1.2.8	19	35.8
3.753	Has the State established a system to ensure the qualification and competency of the instructors in all aviation training organizations?	Annex 1 STD 1.2.8	18	34.0
3.763	Does the State ensure that the approved training organization develop and publish a training and procedures manual for the use of personnel concerned, the content of which conforms with Annex 1, Appendix 2?	Annex 1 STD 1.2.8	17	32.1
3.415	Is medical information submitted to the authority sufficient to enable the authority to audit medical assessments?	Annex 1 STD 1.2.4	17	32.1
3.451	Has the State established a system for the designation of medical examiners?	Annex 1 STD 1.2.4	17	32.1
3.455	Do the State's designated medical examiners receive refresher training at regular intervals?	Annex 1 STD 1.2.4	17	32.1
3.765	Does the process of issuing an approval to an approved training organization take into account pertinent aspects related to infrastructure, equipment and key personnel contained in Annex 1?	Annex 1 STD 1.2.8	15	28.3

Table 2

Aircraft Operations

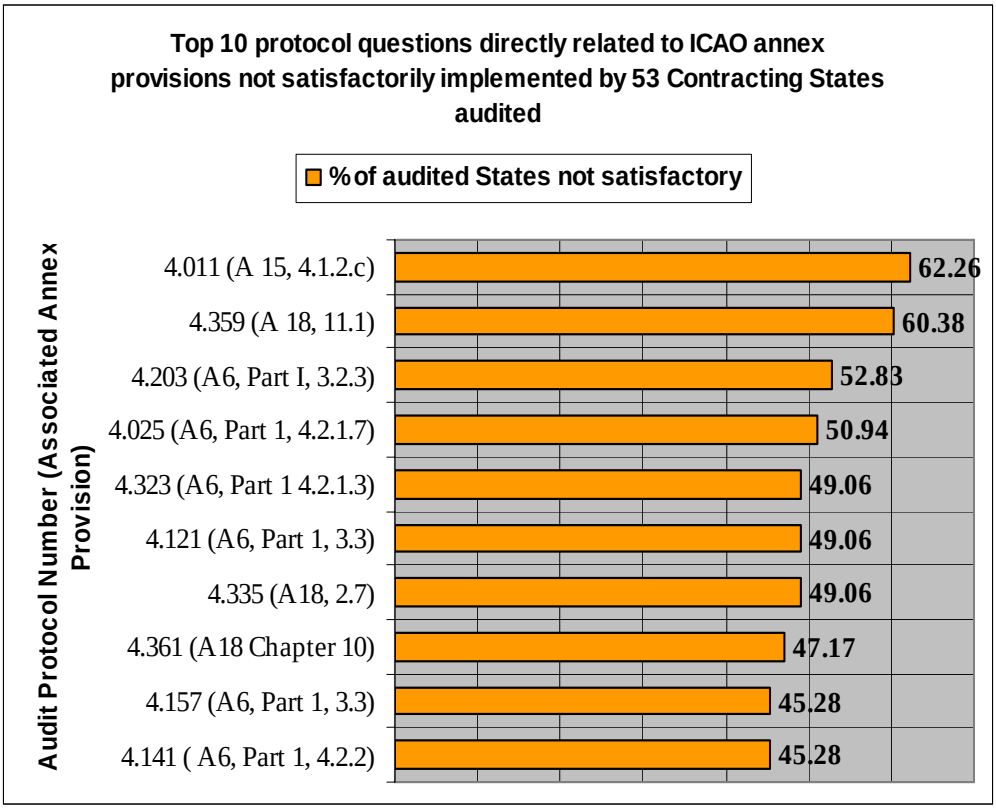

Figure 14

Figure 14 depicts the top-ten not-satisfactory aircraft operations protocol questions related to an ICAO Annex Standard for the 53 audited States. Over sixty per cent of the States audited does not publish significant differences in the AIP, and does not conduct dangerous goods surveillance inspections. More than 50 per cent of the States audited do not have a sufficient number of qualified operations inspectorate personnel, do not require international air operators to maintain a flight data analysis programme, and do not have oversight of ground handling operations. Almost half of the States audited do not require air operators to maintain a flight safety documents system, to establish an accident prevention and flight safety programme SMS, or to provide initial and recurrent training on dangerous goods. Almost 50 per cent of the States have not identified the authority responsible for the oversight of the transport of dangerous goods. Forty per cent has not developed regulations and procedures to ensure that air operators develop an operations manual in accordance with ICAO Standards.

Audit Protocol No.	Audit Protocol question	Associated Annex provision	No. of States audited not satisfactory	% of States audited not satisfactory
4.011	Has the State published in the AIP, Part 1 GEN, significant differences between its national regulations and practices and ICAO Standards, Recommended Practices and procedures to enable users to differentiate readily between State's requirements concerning operating regulations and related ICAO provisions?	Annex 15 STD 4.1.2	33	61.11
4.359	Does the aircraft operations organization or the organization responsible for the transport of dangerous goods by air carry out regular and random inspections to ensure compliance with Annex 18 and the Technical Instructions?	Annex 18 STD 11.1	32	59.26
4.203	Does the aircraft operations organization ensure that the operator has established and maintained a flight data analysis programme as part of its accident prevention and flight safety programme?	Annex 6, Part I STD 3.2.3	28	51.85
4.025	Does the aircraft operations organization have sufficient human resources to carry out its functions and mandate?	Annex 6, Part I STD 4.2.1.7	28	51.85
4.323	Does the aircraft operations organization ensure that the air operator has developed an aircraft handling manual which includes training requirements, subcontracting policies, handling processes, procedures and practices for all ground handling operations?	Annex 6, Part I STD 4.2.1.3	27	50.00
4.335	Has the State designated and specified to ICAO the appropriate authority responsible for the transport of dangerous goods by air?	Annex 18 STD 2.7	26	48.15
4.121	Does the aircraft operations organization ensure that an applicant for an AOC has established and maintains a flight safety documents system?	Annex 6, Part I STD 3.3	26	48.15
4.361	Does the aircraft operations organization or the organization responsible for the transport of dangerous goods by air ensure that initial and recurrent dangerous goods training programmes have been established and maintained by the organizations or agencies which are involved in the transport of dangerous goods by air?	Annex 18 Chapter 10	24	44.44
4.157	Does the aircraft operations organization ensure that the operator has established a safety management system or an accident prevention and flight safety programme?	Annex 6, Part I STD 3.3	24	44.44
4.141	Has the aircraft operations organization developed adequate procedures to ensure that an operations manual is organized with an adequate structure, as provided for in Appendix 2 of Annex 6, Part I?	Annex 6, Part I STD 4.2.2 and Appendix 2	22	40.74

Table 3

Airworthiness of Aircraft

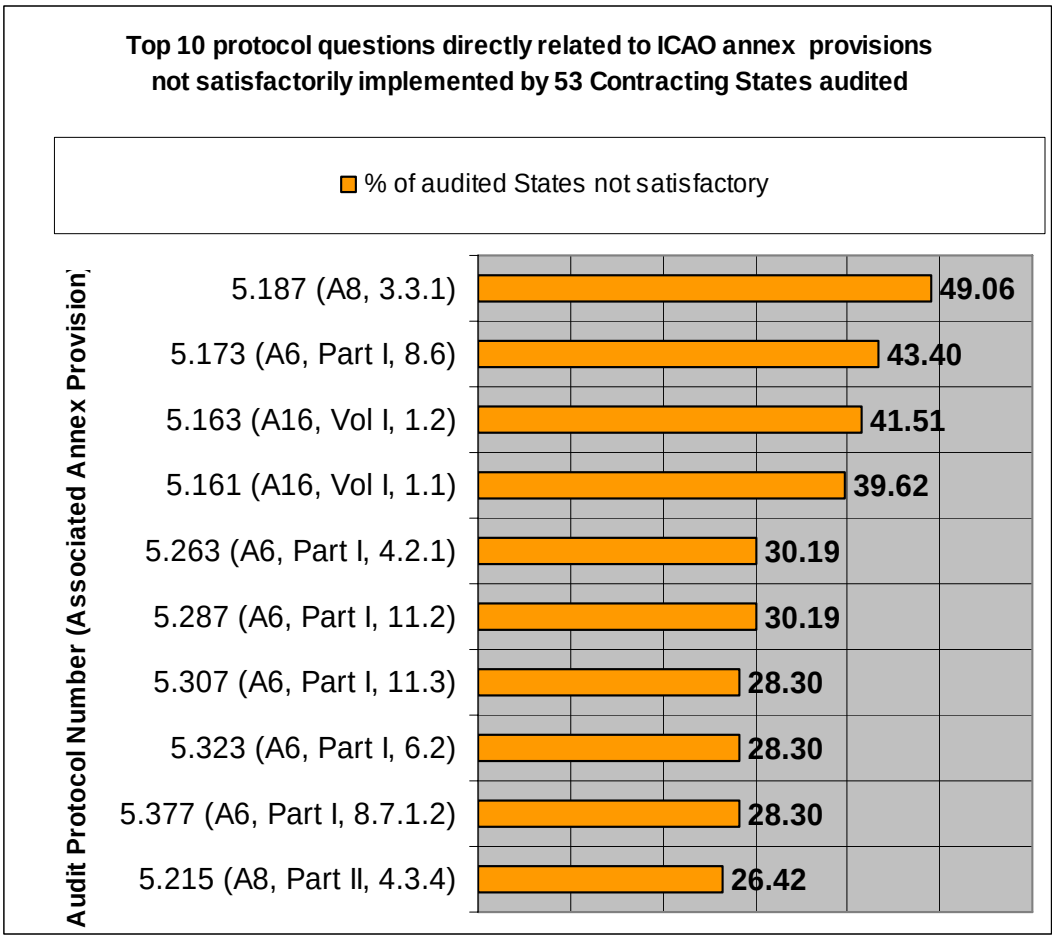

Figure 15

Figure 15 depicts the top ten not satisfactory airworthiness of aircraft protocol questions related to an ICAO Annex Standard for the 53 audited States. It is worthy to note that none of the top-ten airworthiness of aircraft protocol questions exceeded 50 per cent. The top four provisions that States have not satisfactorily implemented are related to the information contained in the certificate of airworthiness, the approval of modifications and repairs and the requirement for all airplanes to comply with the noise certification Standards of Annex 16 and the related issuance of the proper documents to be carried on board as should be required by the State of Registry. The remaining list falls between 26 per cent and 31 per cent not satisfactorily implemented and is associated with the involvement of the Aircraft Inspection Division in the issuance of an AOC, including the approval of the maintenance control manual and the Minimum Equipment List (MEL), the review and approval of maintenance programmes, the issuance of AMO certificates and procedures for the development of mandatory airworthiness action by a State that is not the State of design.

Audit Protocol No.	Audit Protocol question	Associated Annex provision	# of audited States not satisfactory	% of audited States not satisfactory
5.187	Does the certificate of airworthiness issued by the State contain all the information required by Annex 8?	Annex 8 STD 3.3.1	26	49
5.173	Has the State developed procedures for the approval of modifications and repairs?	Annex 6, Part 1 STD 8.6	23	43.4
5.163	Has the State, as a State of Registry, developed procedures for the granting or validation of noise certification?	Annex 16, Vol. I 1.2	22	41.5
5.161	Has the State established a requirement for all aeroplanes to comply with the noise certification standards in Annex 16, Volume I?	Annex 16 Vol. I STD 1.1	21	39.6
5.263	Is the AID involved in the process of evaluating an operator for the issuance of an AOC?	Annex 6 Part 1 STD 4.2.1	16	30.2
5.287	Does the AID review and approve or accept the maintenance control manual as part of the AOC issuance process?	Annex 6 Part 1 STD 11.2	16	30.2
5.307	Does the AID review and approve maintenance programmes in accordance with established requirements and procedures?	Annex 6 Part 1 STD 11.3.3	15	28.3
5.323	Has the CAA developed procedures for approving an MEL?	Annex 6 Part 1 STD 6.2	15	28.3
5.377	Has the AID issued AMO certificates in accordance with the established requirements and procedures?	Annex 6 Part I STD 8.7.1.2	15	28.3
5.215	Has the State established procedures for developing its own mandatory airworthiness action on a product for which it is not the State of Design?	Annex 8 Part II STD 4.3.4	14	26.4

Table 4

Aircraft Accident and Incident Investigation

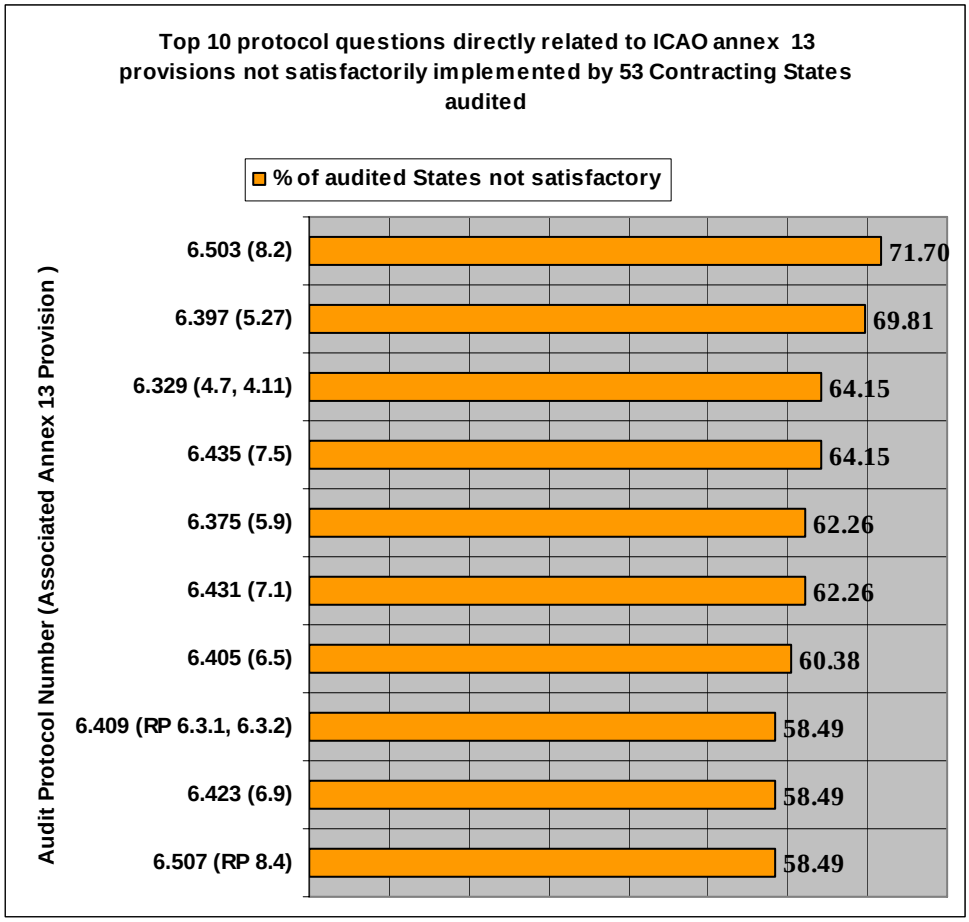

Figure 16

Figure 16 reflects the top-ten not-satisfactory aircraft accident and incident investigation protocol questions related to an ICAO Annex Standard for the 53 States audited. A majority of audited States has not established policies and procedures related to their participation in investigations conducted by other States, either as State of Registry, State of the Operator, State of Design, State of Manufacture or State having suffered fatalities to its citizens. Specifically, procedures and checklists are often missing to ensure that accredited representatives and advisers are appointed, and to communicate, without delay, details on the crew, the aircraft or other relevant elements to the State conducting the investigation. Approximately 60 per cent of the audited States preliminary and data reports is not forwarded, as required, to the States concerned and to ICAO. Policy or procedures are missing to ensure that the final report is completed and released as soon as possible, and that safety recommendations are issued when necessary. In more than 50 per cent of the States, final reports are completed without having sent the draft final report to the States and organizations concerned. Despite the existence of confidential reporting systems within the industry, few States have implemented voluntary confidential reporting systems at the level of the State. In addition, 58.5 per cent of the States audited has not yet established an aircraft accident and incident database to enable the storage and analysis of safety data.

Audit Protocol No.	Audit Protocol question	Associated Annex provision	# of audited States not satisfactory	% of audited States not satisfactory
6.503	Has the State established a voluntary incident reporting system to facilitate the collection of information that may not be captured by a mandatory incident reporting system?	Annex 13 RP 8.2	38	71.7
6.397	Has the State, as a State having suffered fatalities or serious injuries to its citizens, established procedures for sending an expert to the State of Occurrence?	Annex 13 STD 5.27	37	69.8
6.329	Has the State, as the State of the Operator, established procedures for providing the State conducting the investigation with the details of dangerous goods on board the aircraft with a minimum of delay and by the most suitable and quickest means available?	Annex 13 STD 4.7 STD 4.11	34	64.1
6.435	Does the State prepare and send accident data reports to ICAO, involving aircraft of a maximum mass of over 2 250 kg, as soon as practicable after the investigation?	Annex 13 STD 7.5	34	64.1
6.375	Has the State made arrangements with the appropriate authorities to ensure that autopsy examinations are carried out?	Annex 13 STD 5.9	33	62.3
6.431	Does the State prepare and send preliminary reports, when the aircraft involved in an accident is of a maximum mass of over 2 250 kg, to all involved States and ICAO?	Annex 13 STD 7.1	33	62.3
6.405	Has the State, as the State conducting the investigation of an accident or incident, established procedures for the release of the final report as soon as possible?	Annex 13 STD 6.5	32	60.4
6.409	Does the State, as the State conducting the investigation, send a copy of the draft final report for comment: 1. Through the State of the Operator to the operator? 2. Through the State of Design and State of Manufacture to the organizations responsible for the type design and the final assembly of the aircraft?	Annex 13 RP 6.3.1 RP 6.3.2	31	58.5
6.423	Does the State, as the State conducting the investigation of accidents or incidents, address, when appropriate, any safety recommendations arising from its investigations to accident investigation authorities in other State(s) concerned and, when ICAO documents are involved, to ICAO?	Annex 13 STD 6.9	31	58.5
6.507	Has the State established an accident and incident database for facilitating the effective analysis of information obtained, including that from its accident and incident reporting systems?	Annex 13 RP 8.4	31	58.5

Table 5

Air Navigation Services

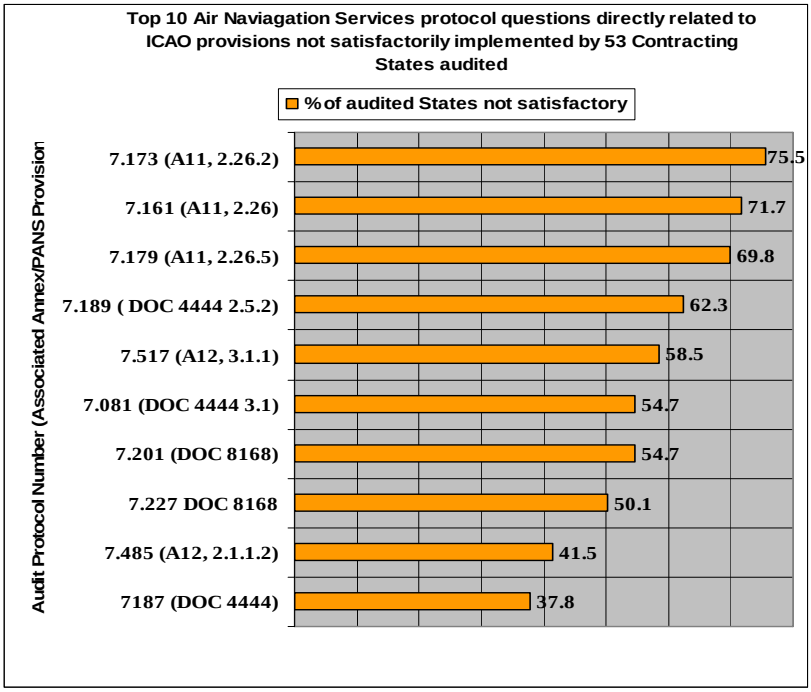

Figure 17

Figure 17 above reflects the top-ten not satisfactory air navigation services (ANS) protocol questions related to an ICAO Annex standard.

Establishment of ATS Safety Management Programmes - Over 71 per cent of the States audited so far have not yet established and implemented an ATS safety management programme. It should be noted, however, that as of November 2006, new safety management harmonized provisions became applicable, encompassing aircraft operations, maintenance organizations, air traffic services and aerodrome operations. The term “safety management programme” has been replaced by “safety programme” in an ongoing effort to harmonize and consolidate States’ safety efforts thereby avoiding the requirement for separate safety programmes for each aviation activity. In an effort to address any shortcomings while moving States toward a more proactive approach to their safety work, ICAO has embarked on an extensive programme that as of 30 August 2007 has delivered 37 in-country, train-the-trainer SMS courses, and seven regional SMS courses. The Air Navigation Bureau’s SMS Programme for the next triennium will develop, among other things, model safety management regulations and guidance material for the integration of safety programmes by national oversight authorities; develop focal points to further pursue safety management activities on a regional basis; establish safety data collection and analysis systems; develop safety data analysis capabilities in States, establish a regional system for the exchange of safety information and analysis and support States in enacting national legislation(s) to protect all relevant sources of safety information. Lastly, safety reporting and safety information exchange are activities in progress under the SMS Air Navigation Integrated Programme.

Establishment of Runway Safety Programmes - Of the States audited, 62% have not established and implemented a runway safety programme. It is worthy to note, new provisions have been included in PANS –ATM Doc 4444 in relation to uncertainty of positions on the manoeuvring area of

aerodromes and the inclusion of “hot spots” which would eventually give States additional guidance in this area.

Provision of Search and Rescue services – 52 per cent of States audited has not established the required legal framework and the responsible authority, including the necessary coordination within the State and with neighbouring States.

Criteria for Procedure Design and Establishment of Aerodrome Operating Minima - 55% of the audited States has not established specific criteria for the design of PANS-OPS procedures or for determining aerodrome operating minima. In addition, with respect to procedures for the establishment of aerodrome operating minima, guidance has not been developed by ICAO to assist States in approving the minima established by operators.

ATS System Capacity- 59 per cent of States has not established a mechanism for determining the capacity of their ATS system to address the growth of traffic.

Audit Protocol No.	Audit Protocol question	Associated provision	# of States audited not satisfactory	% of audited States not satisfactory
7.173	Has the State established criteria for determination of safety performance indicators and safety performance targets to be used for the monitoring of safety performance and the assessment of safety or new systems and procedures within the ATS system?	Annex 11 STD 2.26.2	40	75.5
7.161	Has the State implemented an ATS safety programme?	Annex 11 STD 2.26	38	71.7
7.179	Does the State ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met?	Annex 11 STD 2.26.5	37	69.8
7.189	Has the State established and implemented a runway safety programme?	PANS Doc 4444 2.5.2	33	62.3
7.517	Does the State coordinate its SAR organization with those of neighbouring States?	Annex 12 STD 3.1.1	33	62.3
7.081	Does the State ensure that the service provider responsible for ATS has developed policy and procedures for determining the capacity of the ATS system including the number of staff required to ensure the provision of an adequate ATS system?	PANS Doc 4444 3.1	31	58.5
7.201	Has the State established criteria as a basis for procedure design in accordance with ICAO PANS-OPS provisions?	PANS Doc 8168	29	54.7
7.227	Has the State established general criteria and developed adequate procedures for the establishment of aerodrome operating minima?	PANS Doc 8168	29	54.7
7.485	Does the SAR services system include a legal framework, a responsible authority, organized available resources, communication facilities and a workforce skilled in coordination and operational functions?	Annex 12 STD 2.1.1.2	22	41.5
7.187	Has the State established and implemented a system for reporting ATC incidents?	PANS Doc 4444	20	37.8

Table 6

Aerodromes

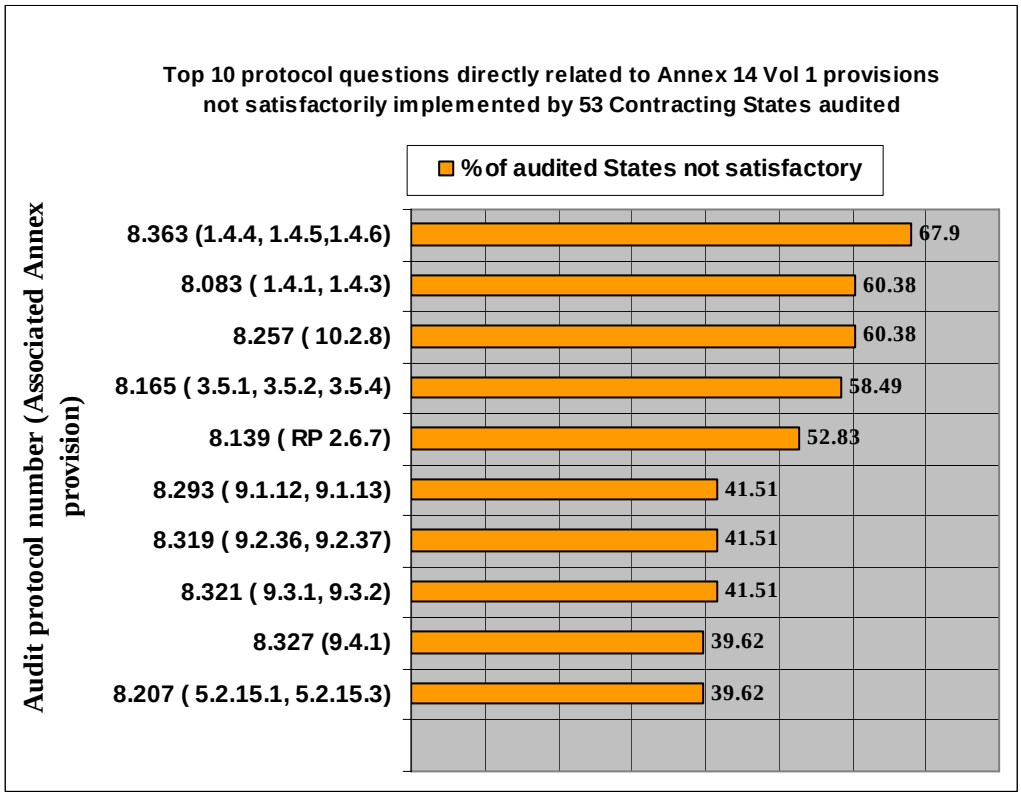

Figure 18

Figure 18 reflects the top-ten not-satisfactory aerodromes protocol questions related to an ICAO Annex Standard for the 53 States audited. With respect to aerodromes, a large number of the States audited has not yet certified or established a process for the certification of aerodromes; this is reflected by the majority of the not-satisfactory protocol questions presented in the graph above. In particular, most States have not ensured that aerodrome operators implement an SMS as part of their aerodrome certification process. The provisions relating to runway friction, runway end safety areas, pavement use and the periodic testing and review of aerodrome emergency plans show a lack of compliance by a high percentage of the audited States. Other high percentages of not-satisfactory questions depicted in Figure 18 stem from weaknesses in a State's surveillance programme, including lack of expertise in highly specialized areas, such as rescue fire fighting and bird hazard control.

Audit Protocol No.	Audit Protocol question	Associated Annex provision	# of States audited not satisfactory	% of audited States not satisfactory
8.363	If the State does have a requirement for certified aerodromes to have a SMS in operation, has it been implemented	Annex 14 Vol 1 STD 1.4.4 STD 1.4.5 STD 1.4.6	36	67.9
8.083	Has the State established a process for the certification of aerodromes?	Annex 14 Vol 1 STD 1.4.1 STD 1.4.3	32	60.4
8.257	How does the State ensure that aerodrome operators maintain good friction characteristics and low rolling resistance on runways?	Annex 14 Vol 1 STD 10.2.8	32	60.4
8.165	If the requirements for RESAs have not been implemented at all aerodromes open to public use, how does the State satisfy itself that the runway surroundings are safe for use by aircraft in the event of an aircraft overrunning or undershooting the runway?	Annex 14 Vol 1 STD 3.5.1 STD 3.5.2 STD 3.5.4	31	58.5
8.139	Has the State established criteria and associated industry guidelines to regulate the use of a pavement by an aircraft with an aircraft classification number (ACN) higher than the reported pavement classification number (PCN)?	Annex 14 Vol 1 RP 2.6.7	28	52.8
8.293	Does the State require the periodic testing and review of aerodrome emergency plans?	Annex 14 Vol 1 STD 9.1.12 STD 9.1.13	22	41.5
8.319	How does the State ensure that there are sufficient trained personnel to operate all the necessary RFF equipment at maximum capacity, meet the minimum response times and maintain continuous agent application at the appropriate rate?	Annex 14 Vol 1 RP 9.2.36 RP 9.2.37	22	41.5
8.321	Does the State require and ensure that the aerodrome has adequate plans for the removal of disabled aircraft, including arrangements for coordinators to be designated, the rapid availability and deployment of salvage and removal equipment between aerodromes, and the protection of evidence, custody and the removal of aircraft in accordance with Annex 13?	Annex 14 Vol 1 RP 9.3.1 RP 9.3.2	22	41.5
8.327	Does the State require a bird strike hazard assessment for each of its aerodromes?	Annex 14 Vol 1 STD 9.4.1	21	39.6
8.207	Has the State assessed the effectiveness of road holding position markings for the purpose of preventing vehicles from unauthorized entry to a runway or a taxiway?	Annex 14 Vol 1 STD 5.2.15.1 STD 5.2.15.3	21	39.6

Table

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PART II
SAFETY OVERSIGHT AUDIT
COMPLIANCE CHECKLISTS RESULTS

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Safety Oversight Audit Compliance Checklists Results

The Compliance Checklists have been prepared to assist Contracting States in ascertaining the status of implementation of Standards and Recommended Practices (SARPs) and in identifying any difference that may exist between the national regulations and the relevant ICAO Annex provisions.

The compliance checklist is one of the major tools for conducting a safety oversight audit of all Contracting States under the comprehensive systems approach. Contracting States are required to complete the compliance checklists within a predetermined period and submit it to ICAO for evaluation and recording. The compliance checklists also enable Contracting States to identify differences between their own practice and that established by the international standard (Article 38 of the Convention refers.)

The submitted information also enables ICAO to maintain an up-to-date database on a State's level of compliance with the ICAO SARPs and helps facilitate the conduct of standardized audits of all Contracting States.

This section of the report provides the results for the 53 Contracting States audited that have completed the compliance checklists to various degrees. Figure 19 identifies the level of compliance with the ICAO Annex provisions for the 53 States audited. It should be noted that the analysis in the following pages is based on two of the categories used as a guide in determining reportable differences. These categories are:

More exacting or exceeds – This category applies when the national regulation is more exacting than the corresponding ICAO SARP or imposes an obligation within the scope of the Annex which is not covered by an ICAO Standard;

Less protective or partially implemented / not implemented – this category applies when the national regulation is less protective than the corresponding ICAO SARPs; or when no national regulation has been promulgated to address the corresponding ICAO SARP, in whole or in part.

Compliance Checklists Results

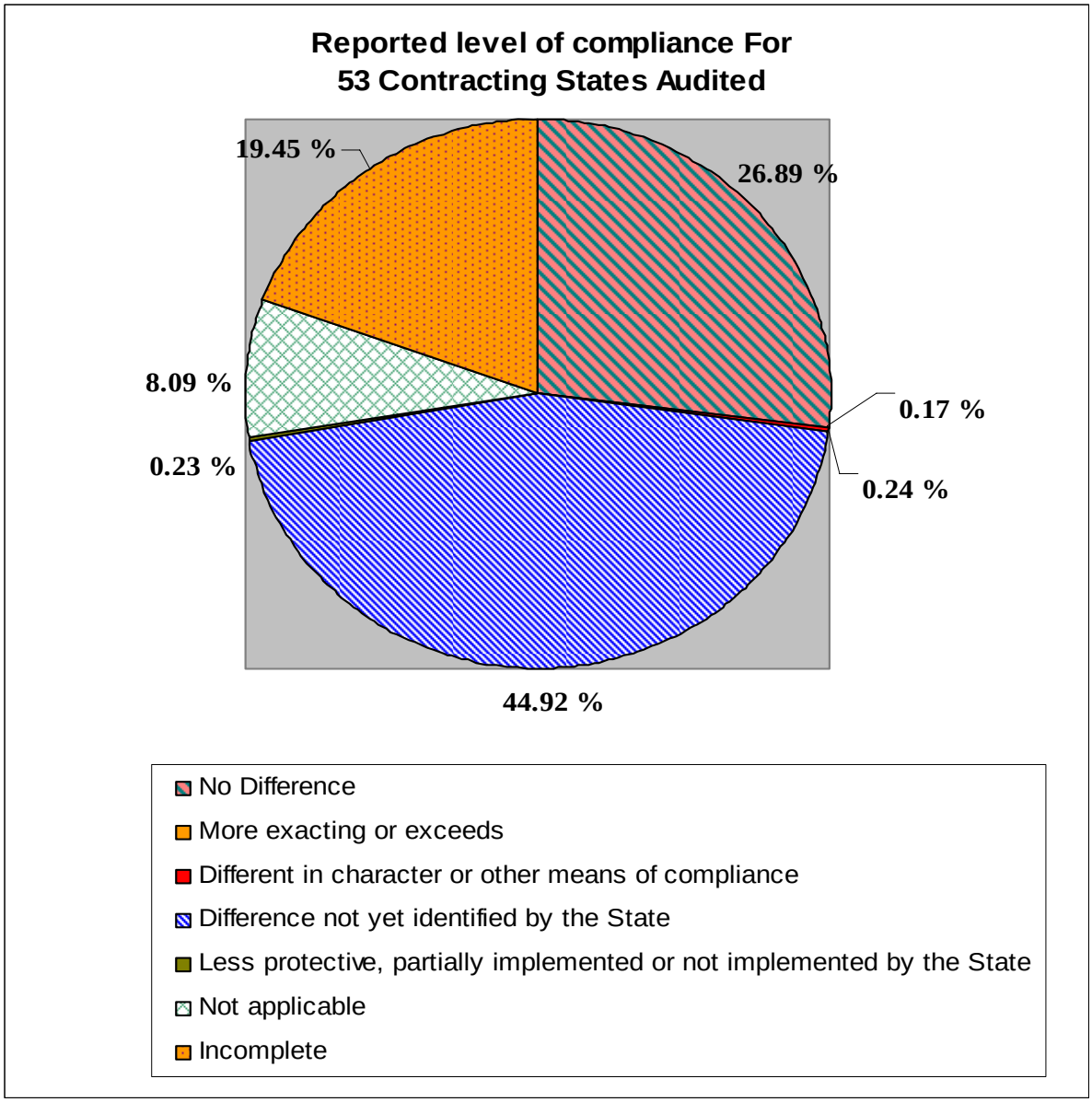


Figure 19

Only 35.62 per cent of all the SARPs identified in the compliance checklists was duly completed by the 53 Contracting States audited. The remaining 64.38% were either left blank or fully completed by the States. Therefore, the compliance checklists results for each Annex are based on the 35.62 per cent which was completed.

Compliance Checklists Results – Annex 1

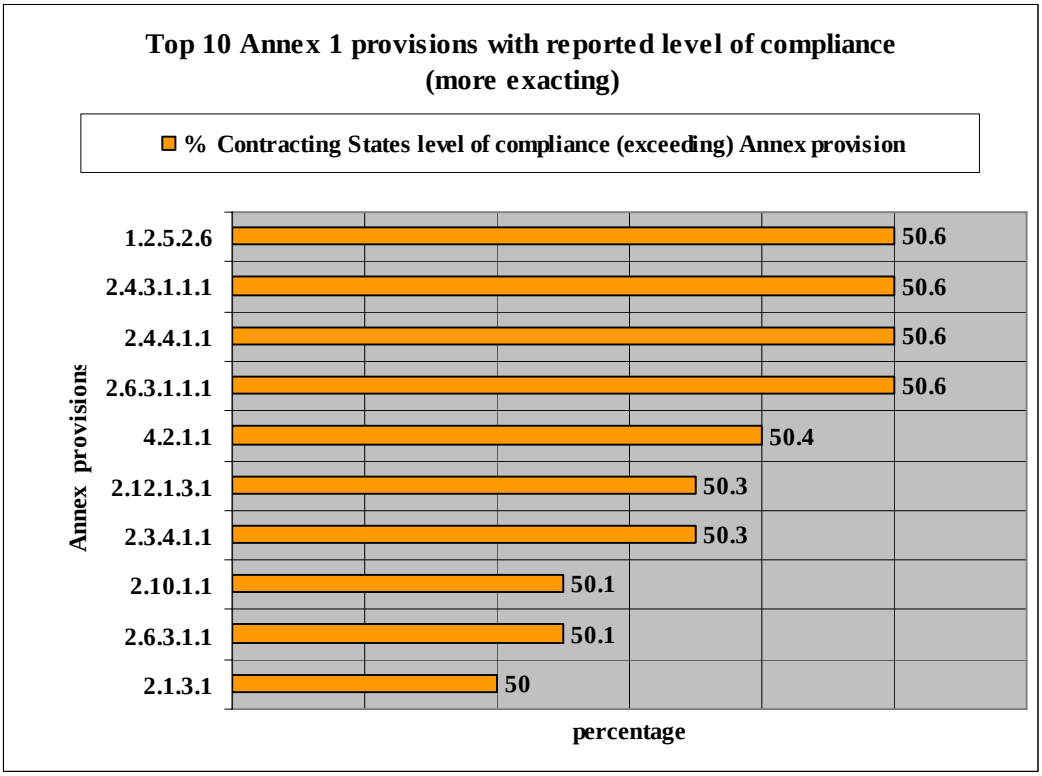


Figure 20

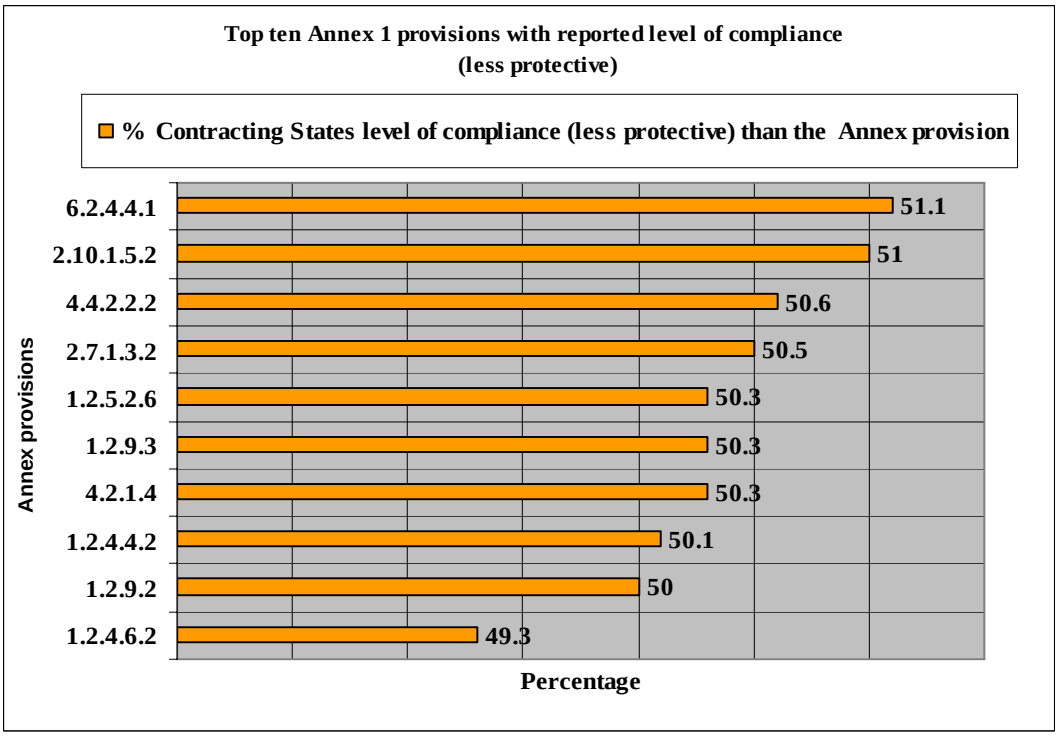


Figure 21

Compliance checklists results - Annex 2

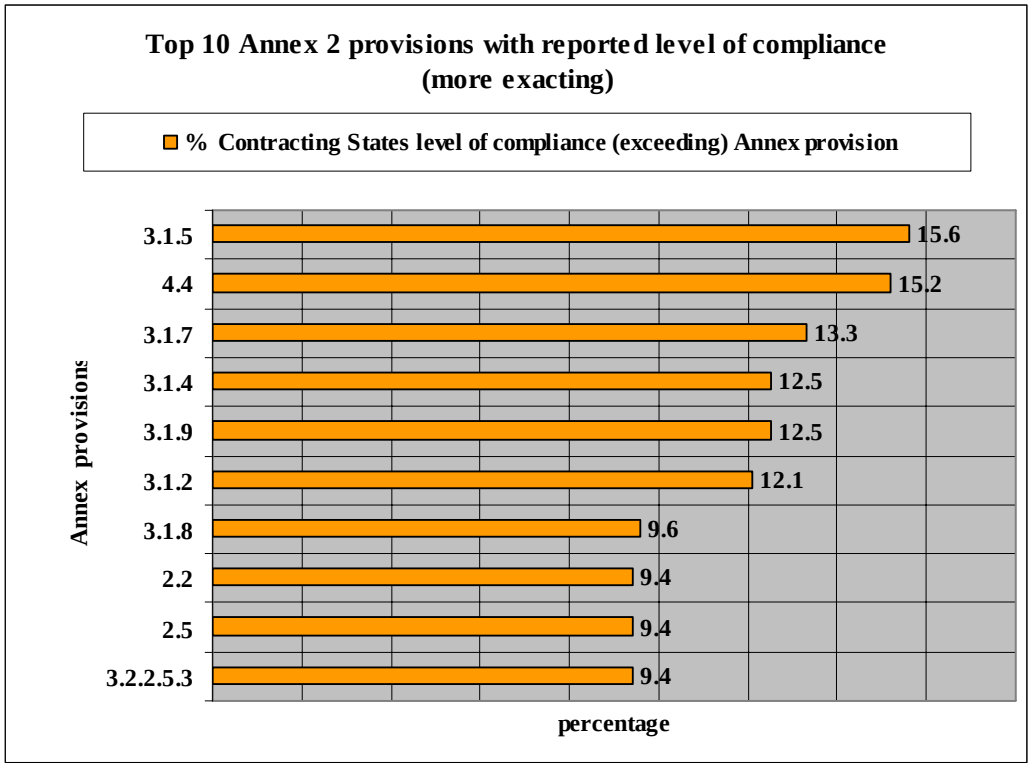


Figure 22

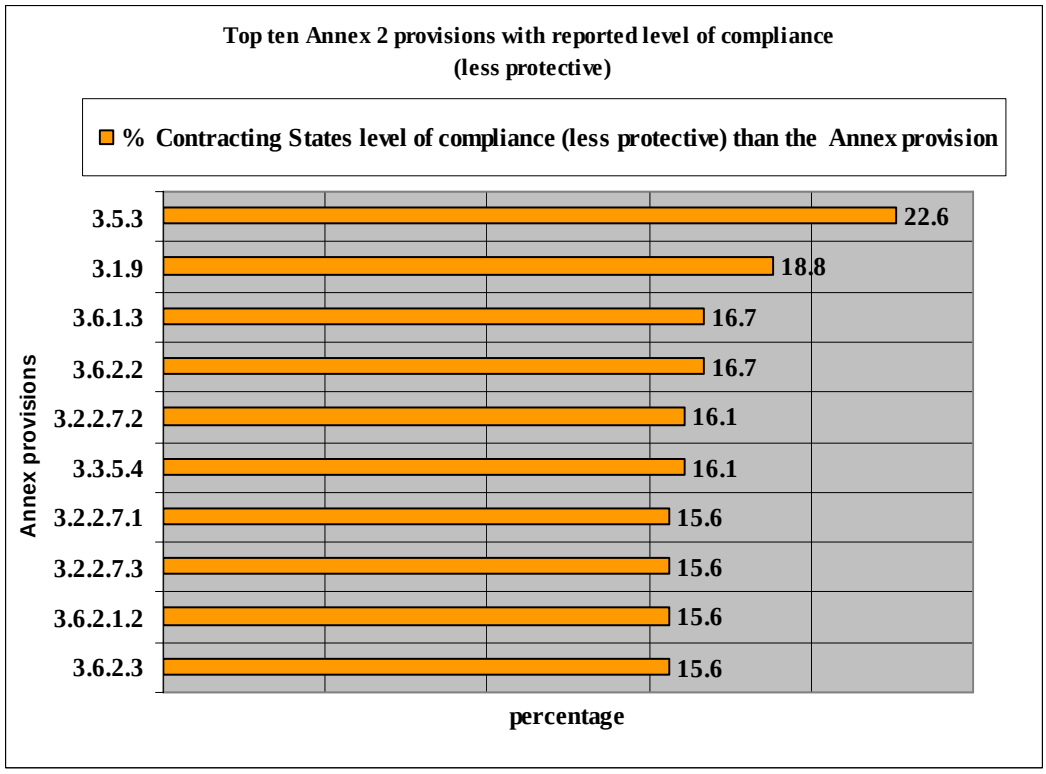


Figure 23

Compliance checklists results - Annex 3

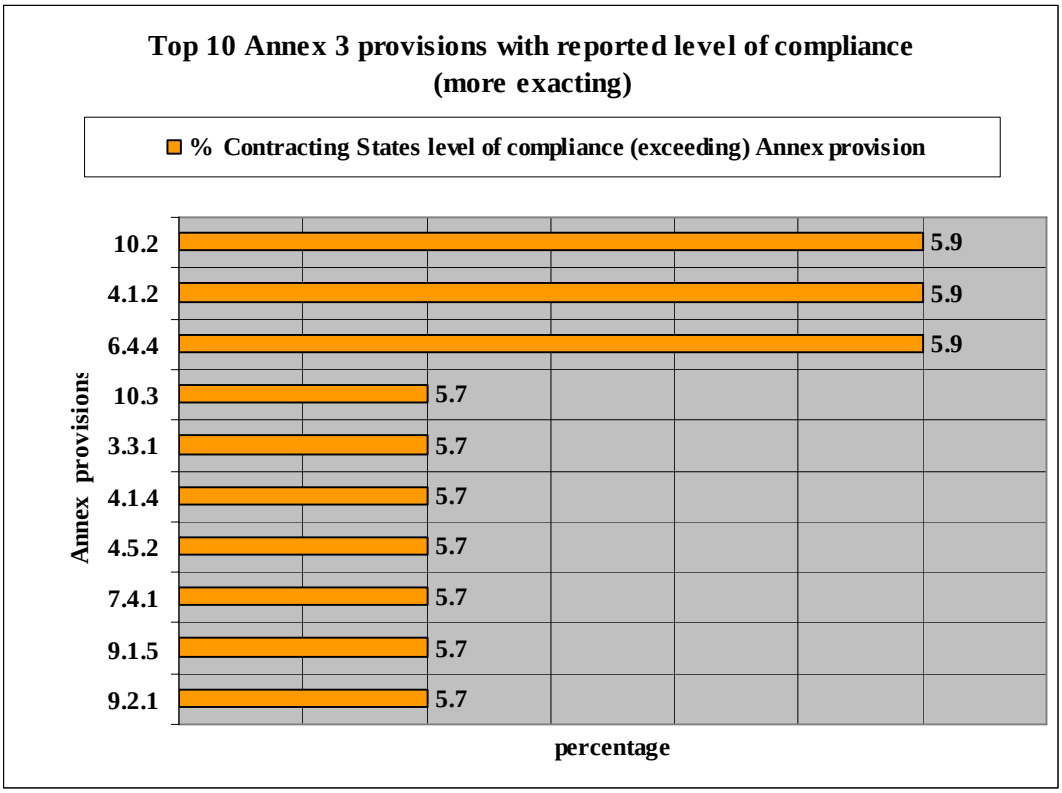


Figure 24

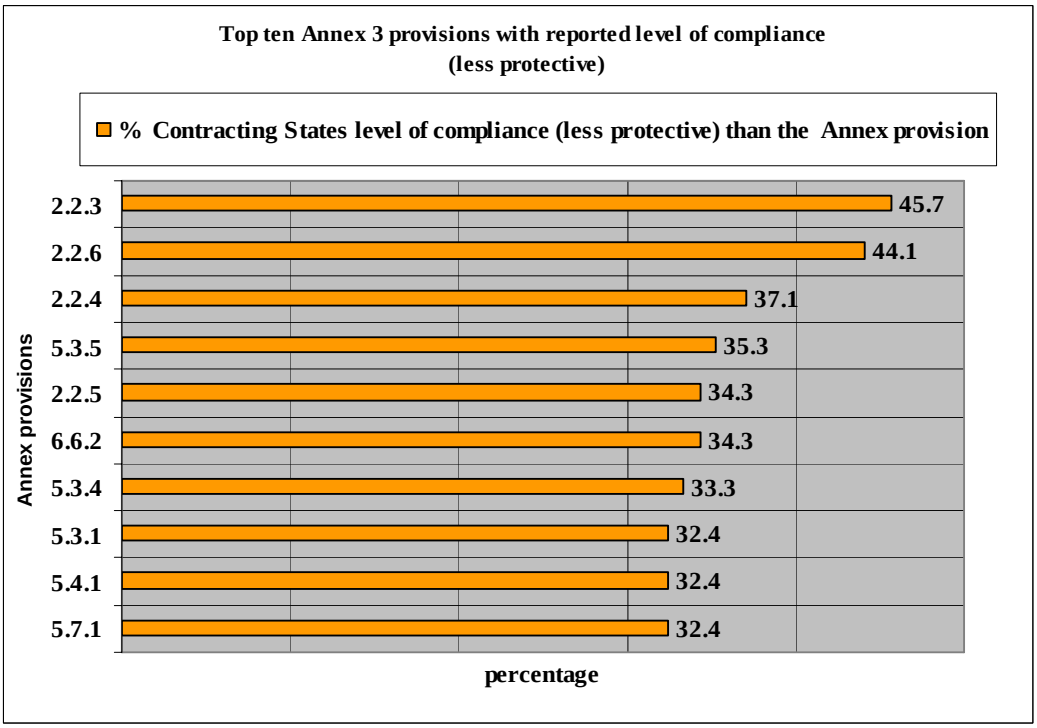


Figure 25

Compliance checklists results - Annex 4

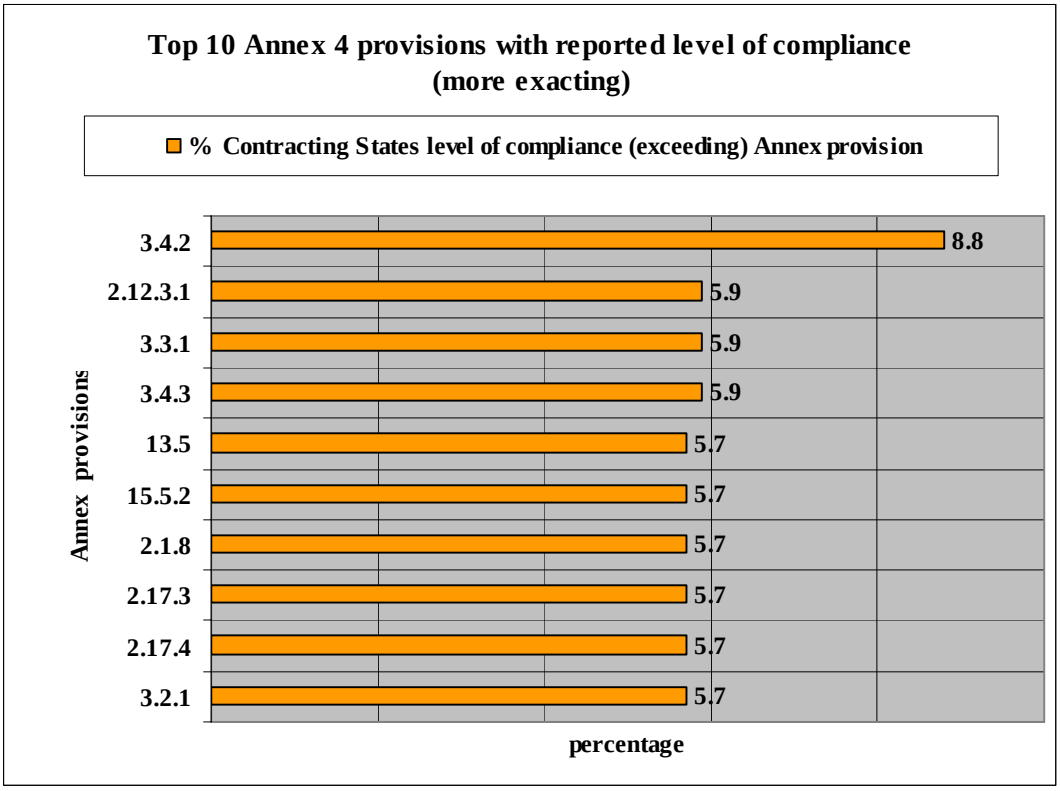


Figure 26

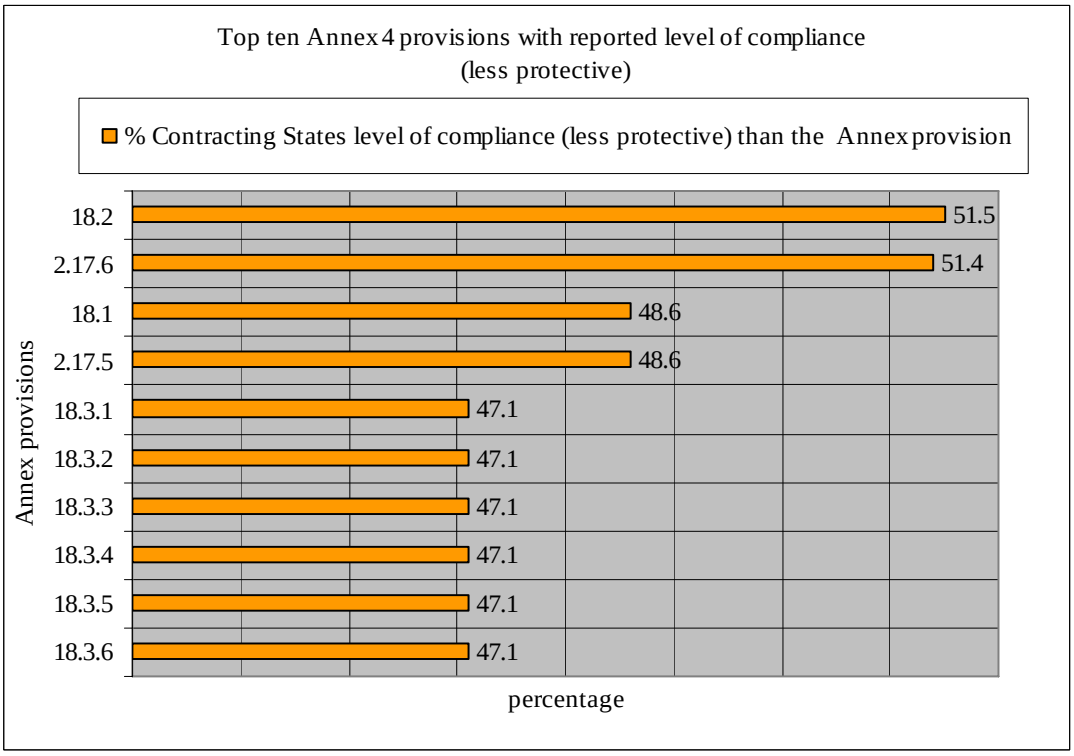


Figure 27

Compliance checklists results - Annex 5

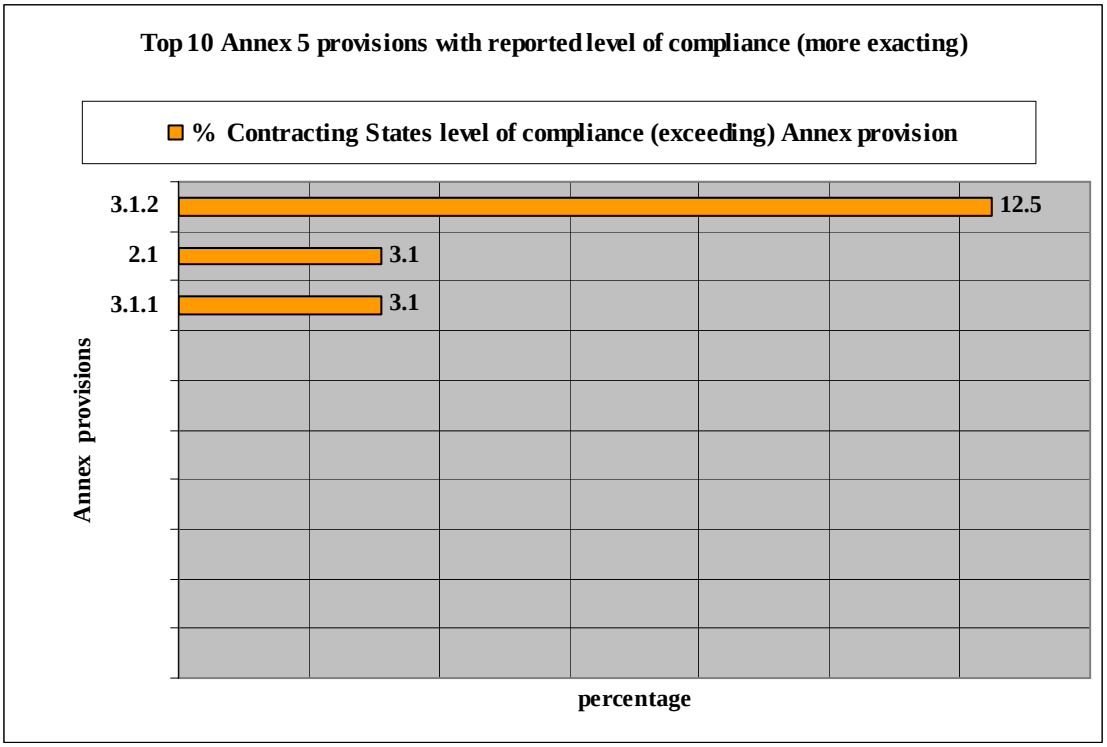


Figure 28

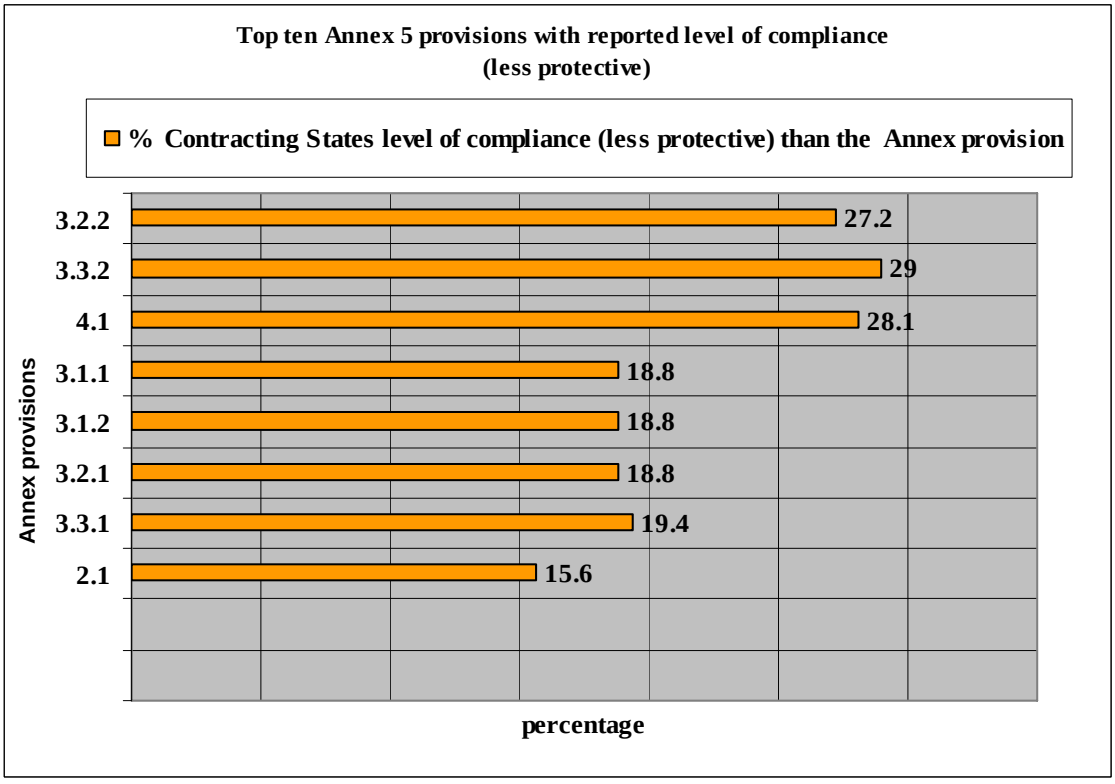
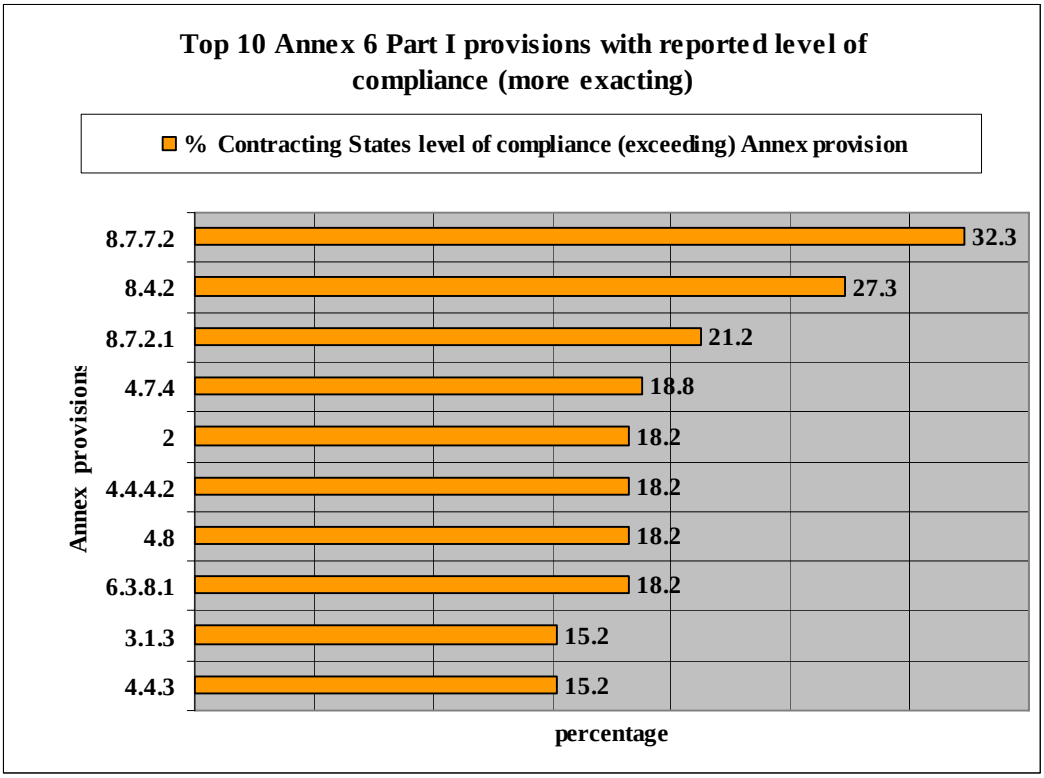
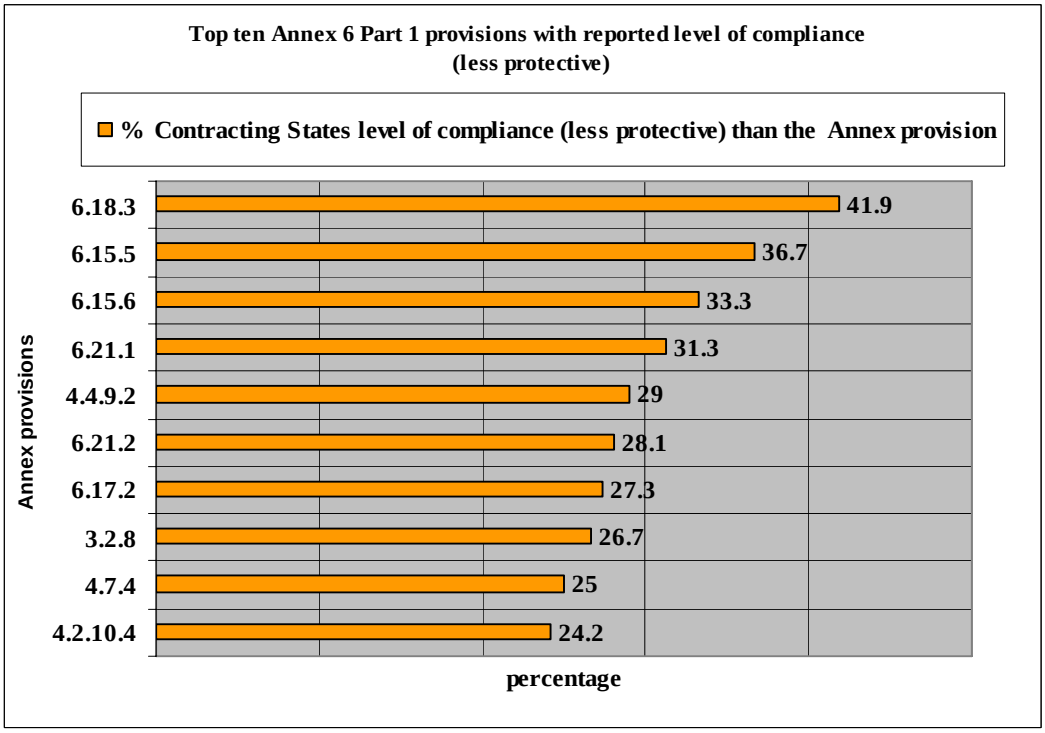


Figure 29

Compliance checklists results - Annex 6 Part I



Figure



30

Figure 31

Compliance checklists results - Annex 6 Part II

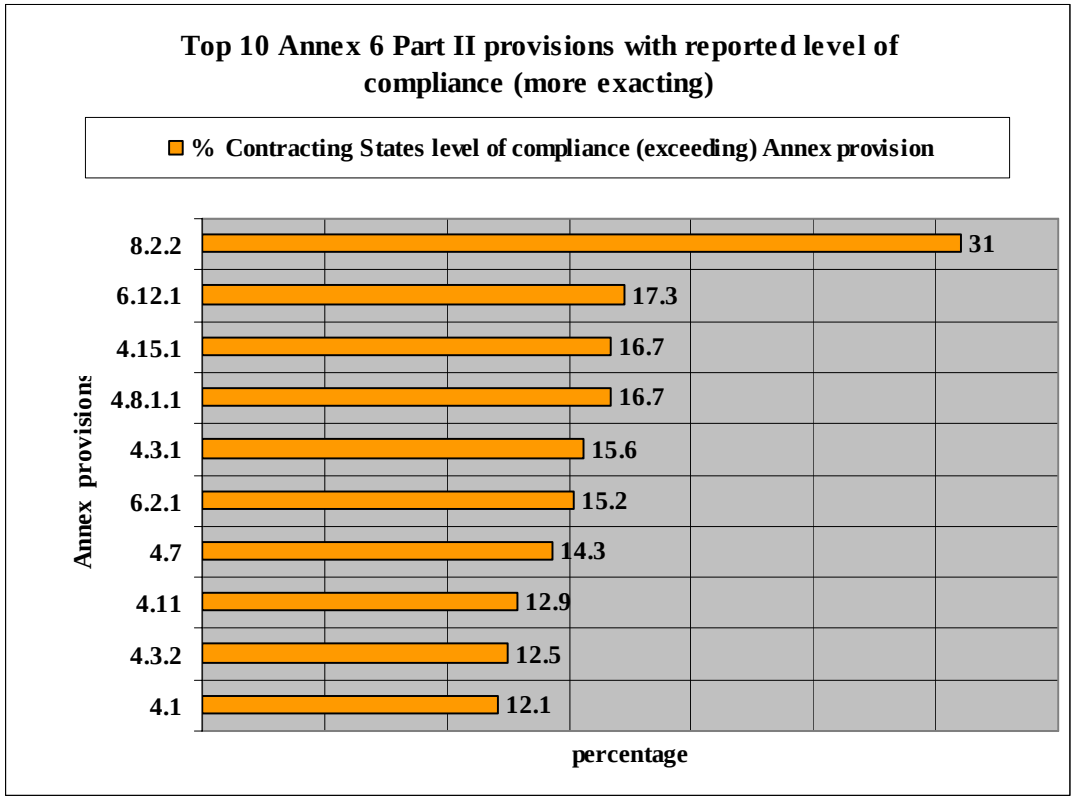


Figure 32

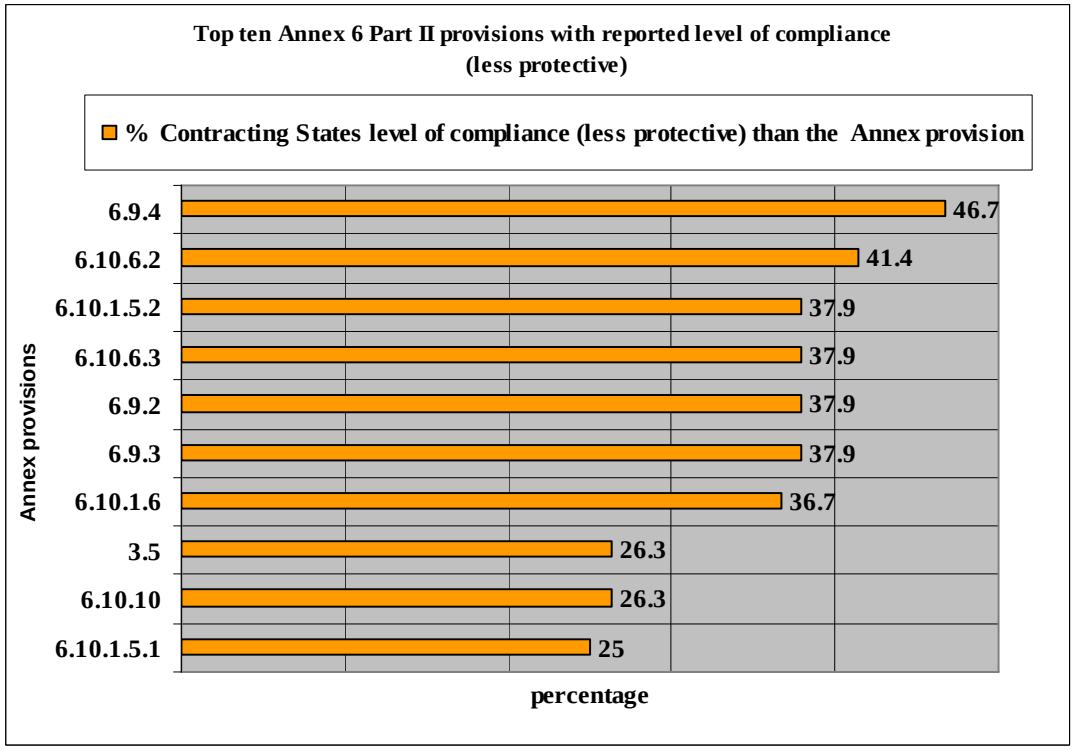


Figure 33

Compliance checklists results - Annex 6 Part III

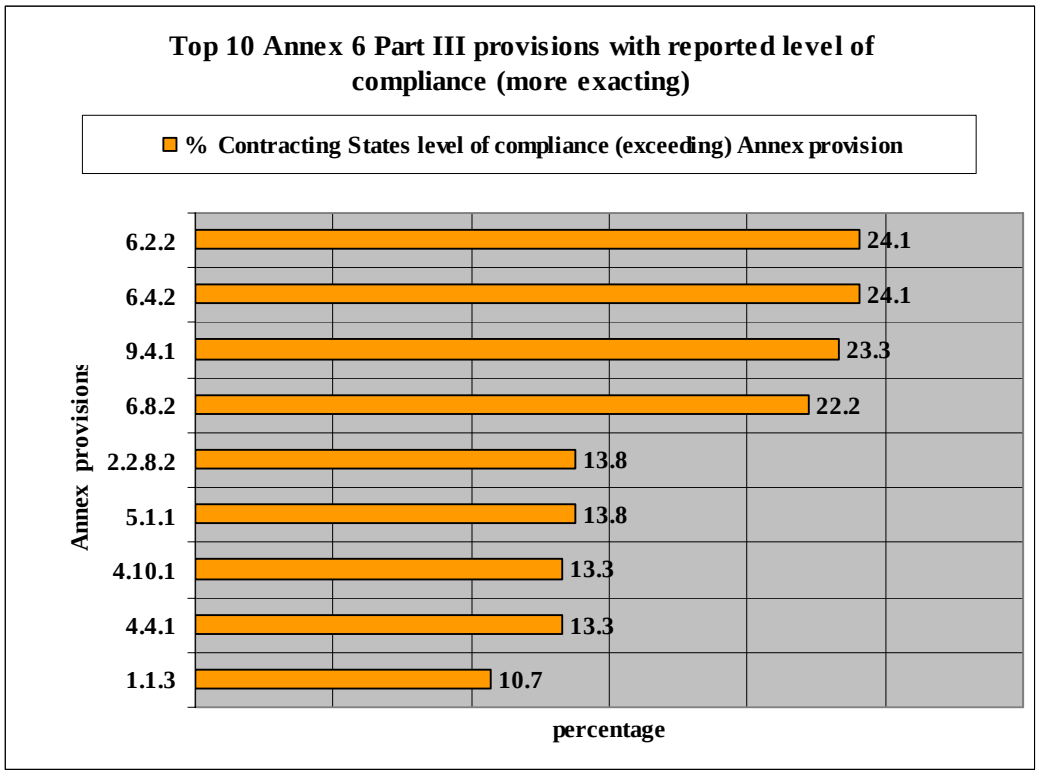


Figure 34

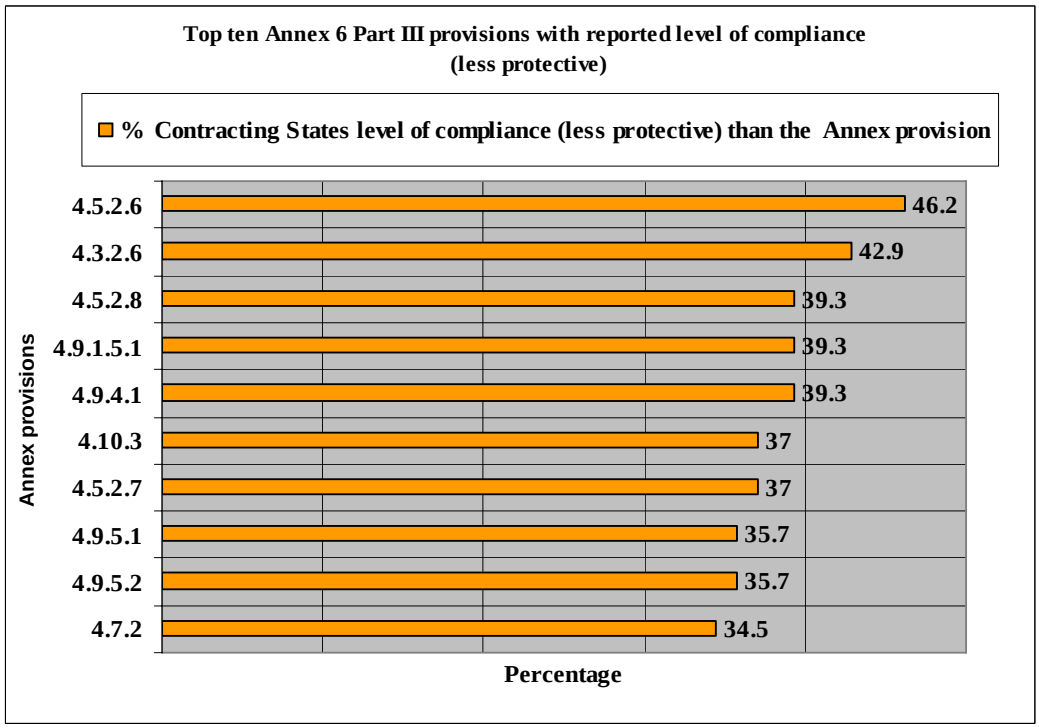


Figure 35

Compliance checklists results - Annex 7

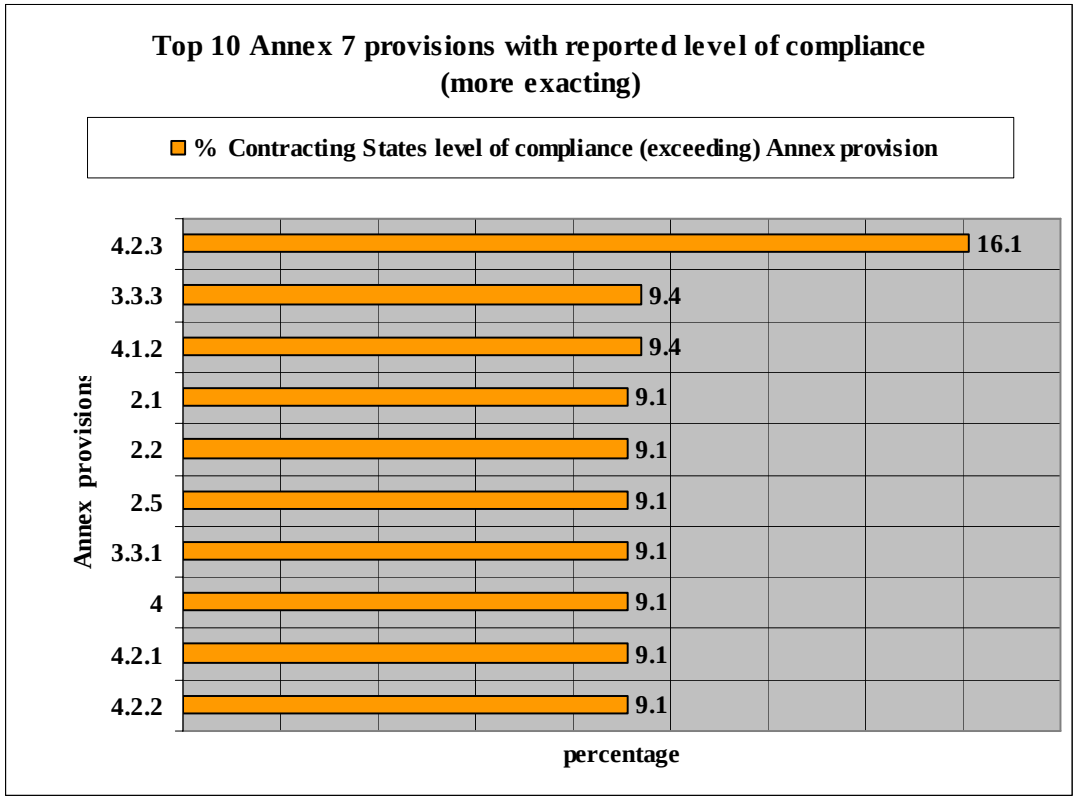


Figure 36

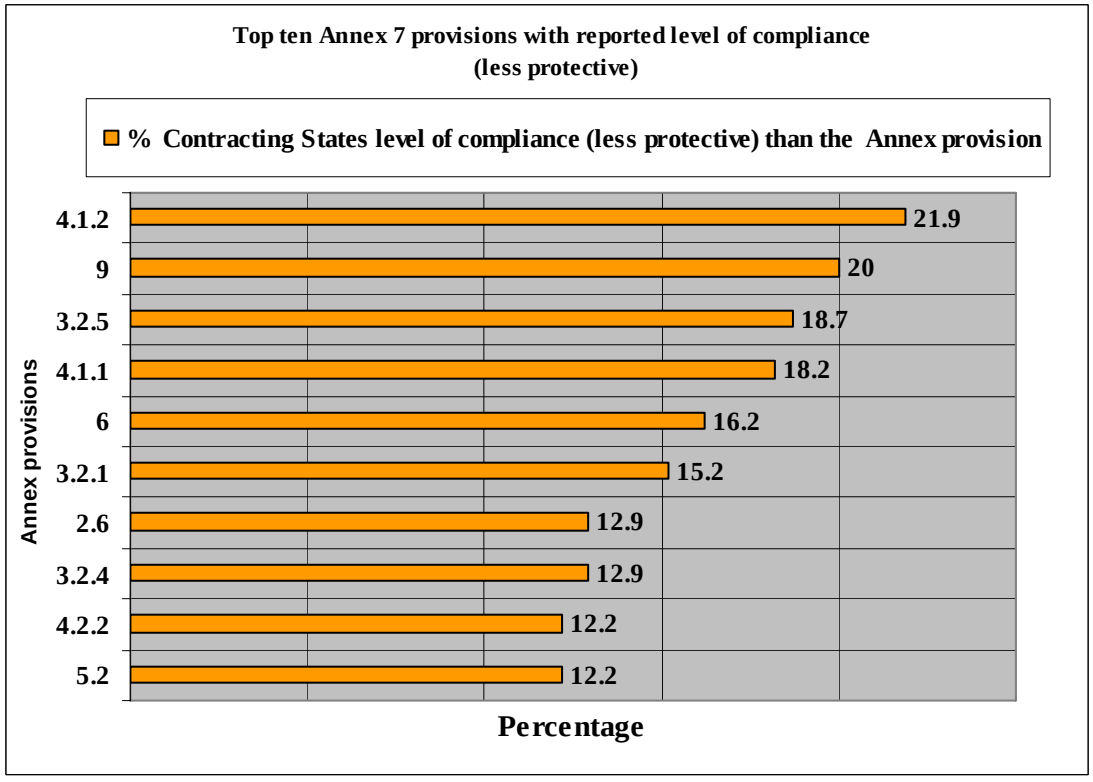


Figure 37

Compliance checklists results - Annex 8

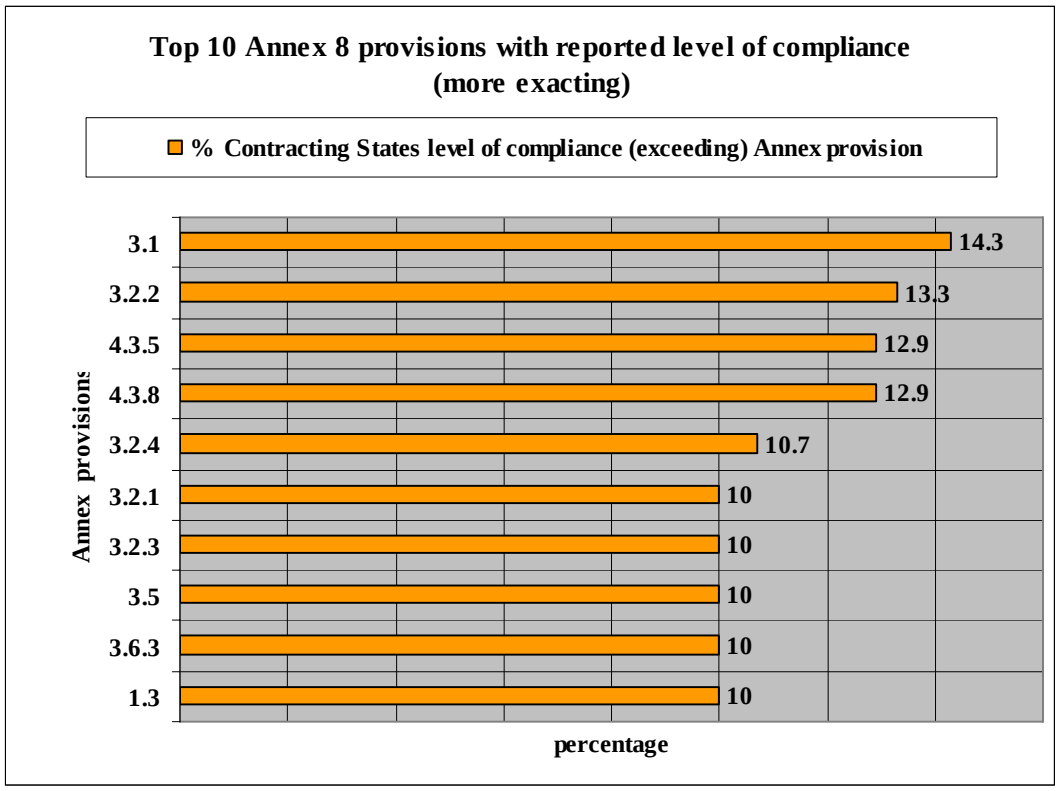


Figure 38

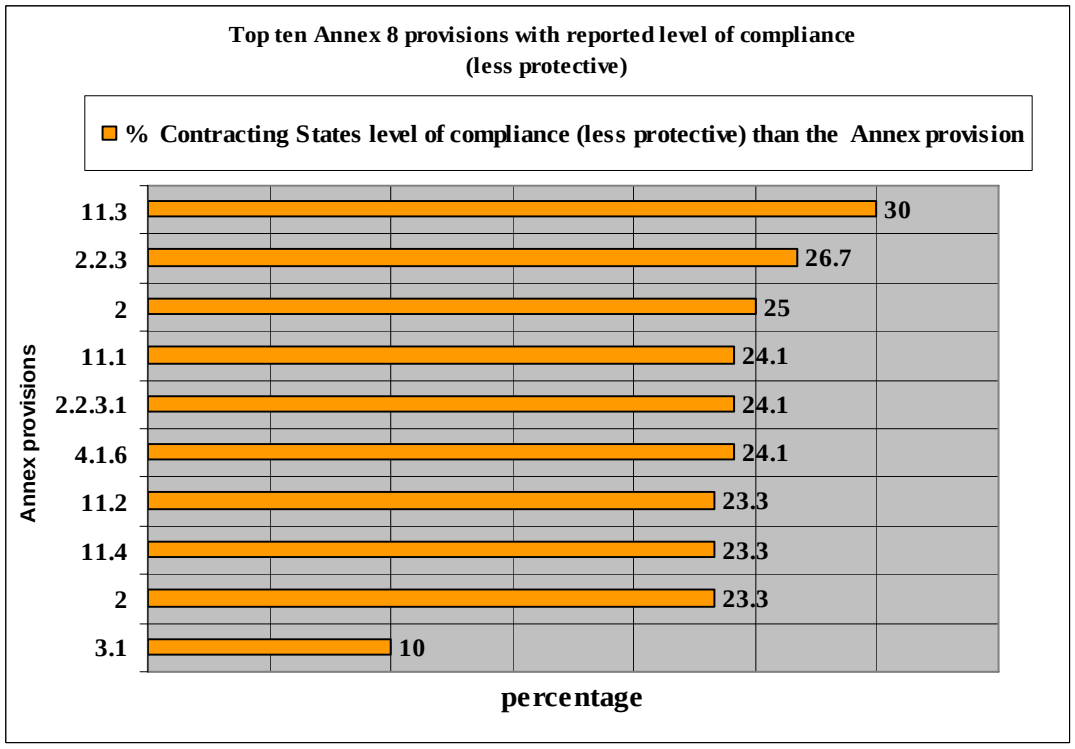


Figure 39

Compliance checklists results - Annex 10 Vol I

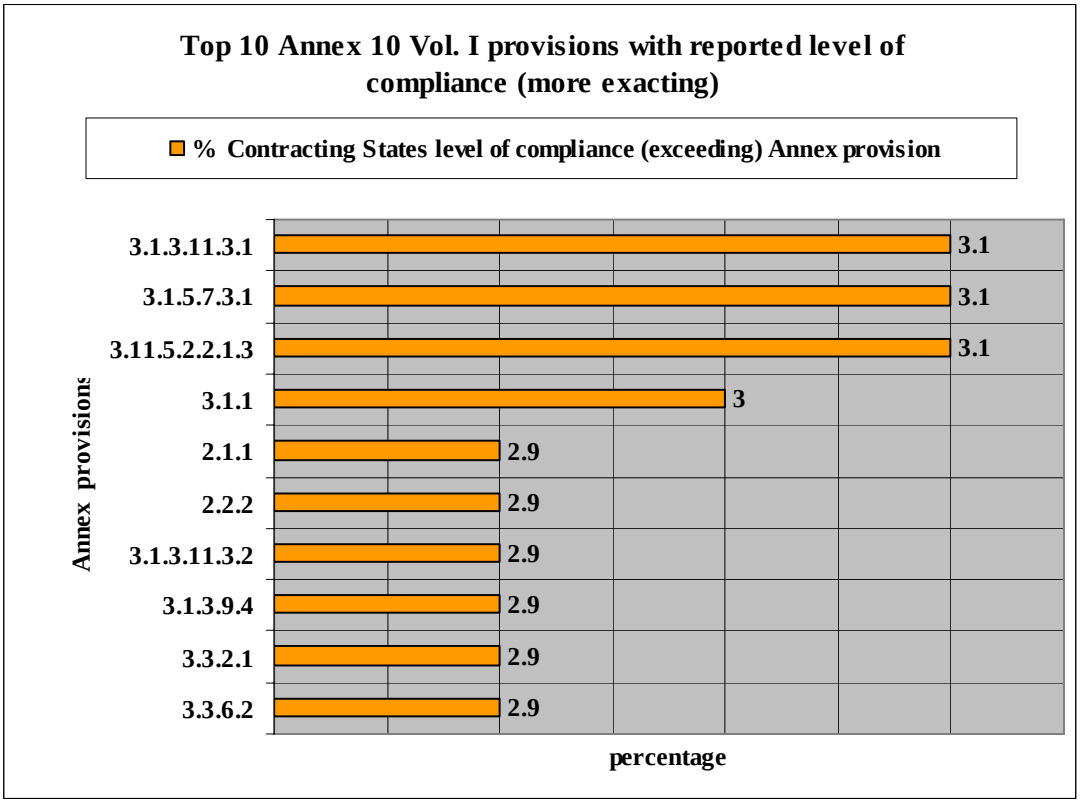


Figure 40

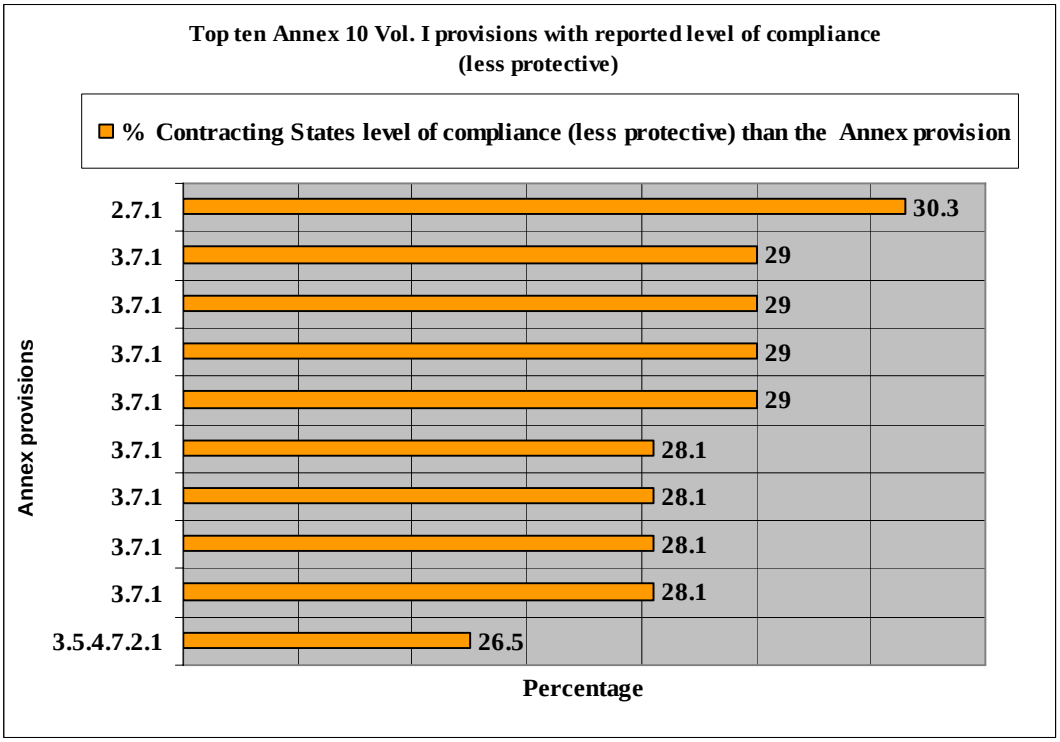
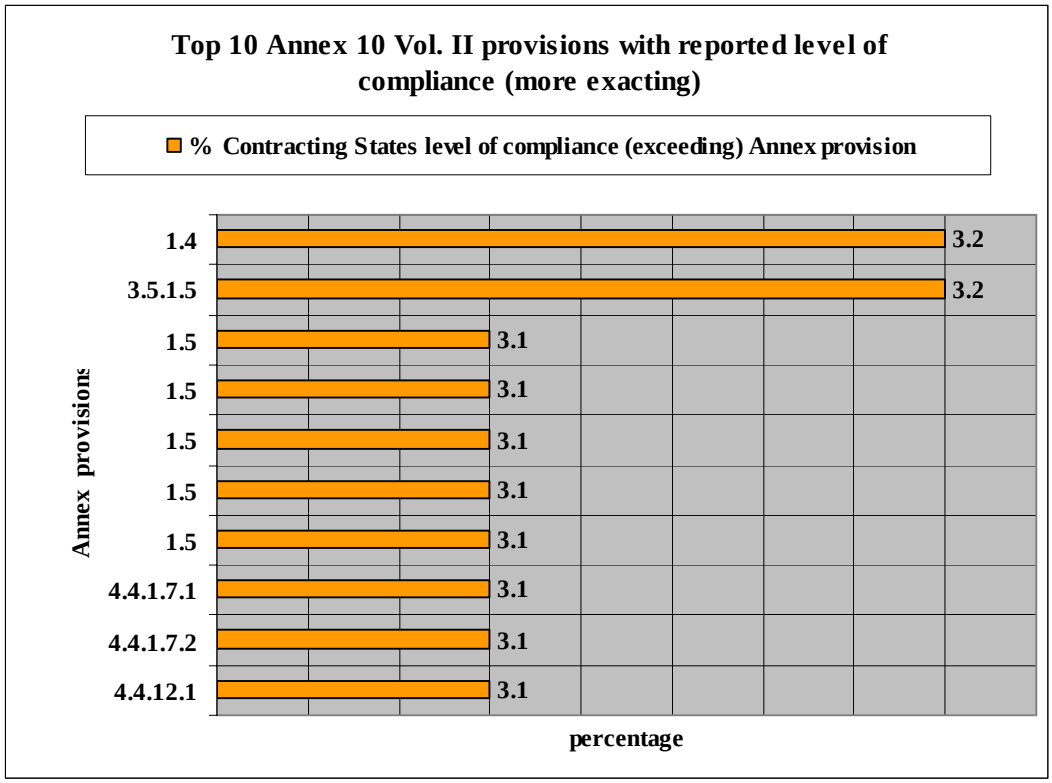


Figure 41

Compliance checklists results - Annex 10 Vol II



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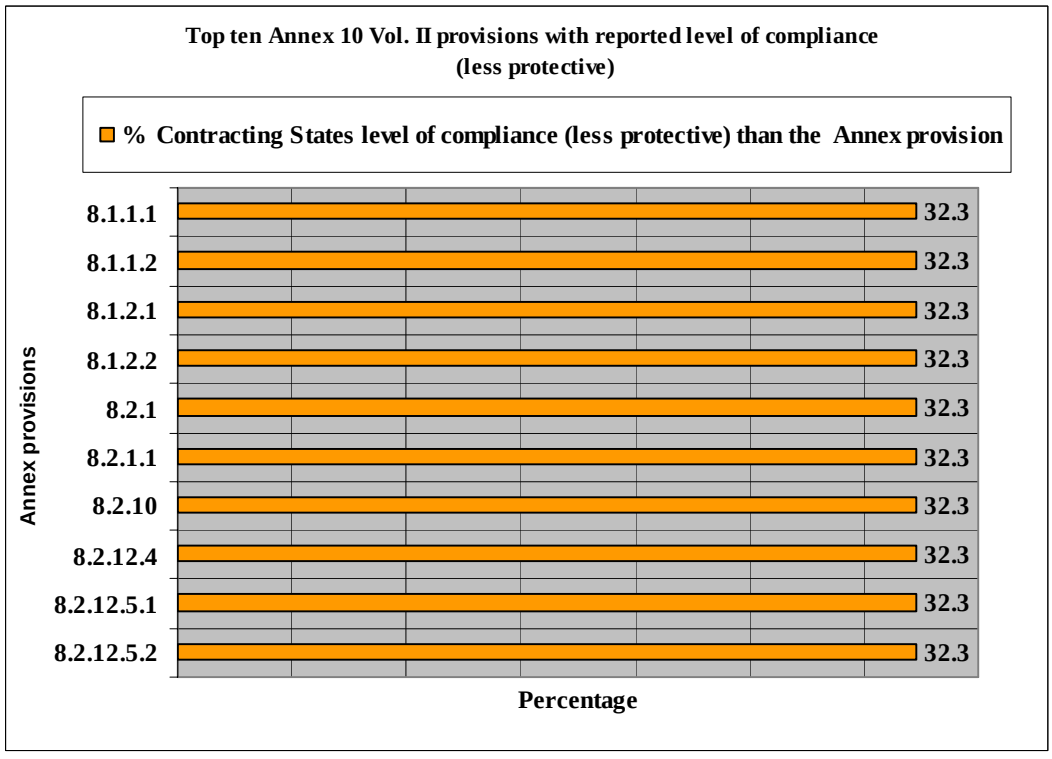

Figure 43

Compliance checklists results - Annex 10 Vol III

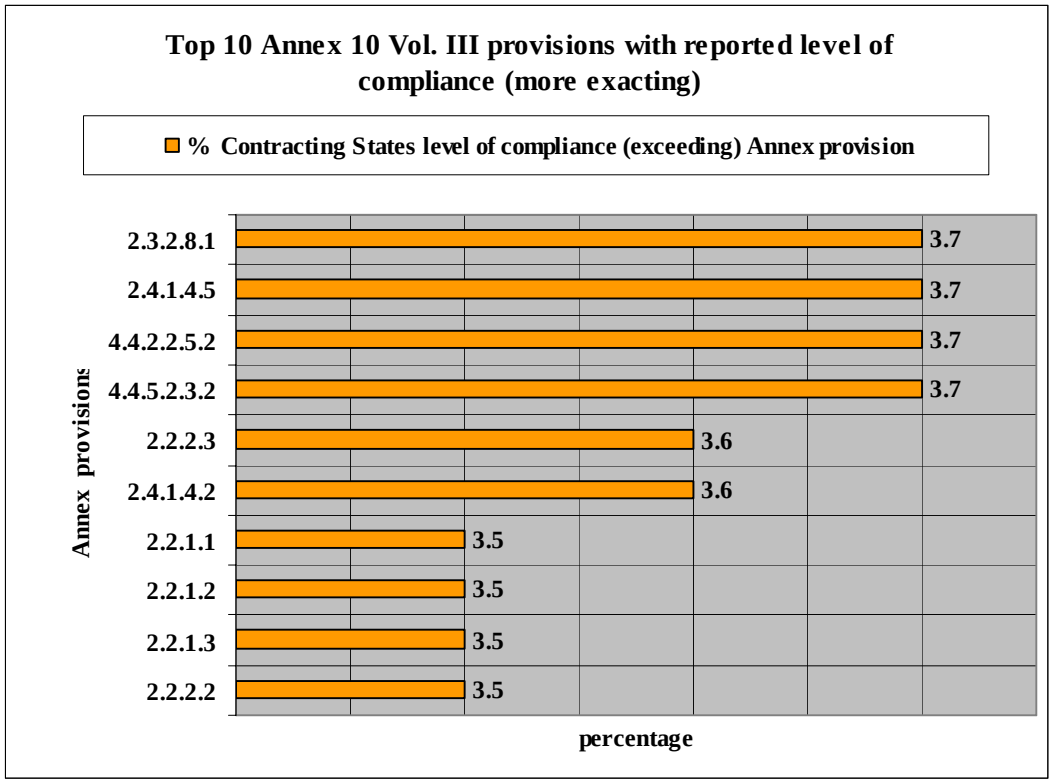

Figure 44

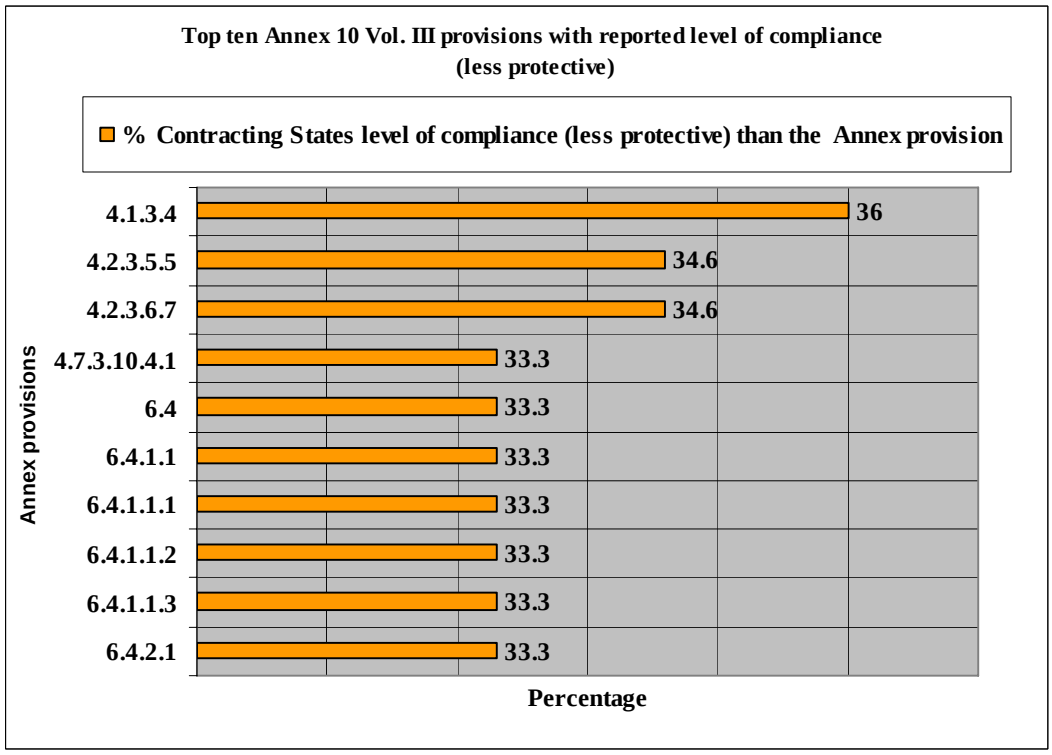

Figure 45

Compliance checklists results - Annex 10 Vol IV

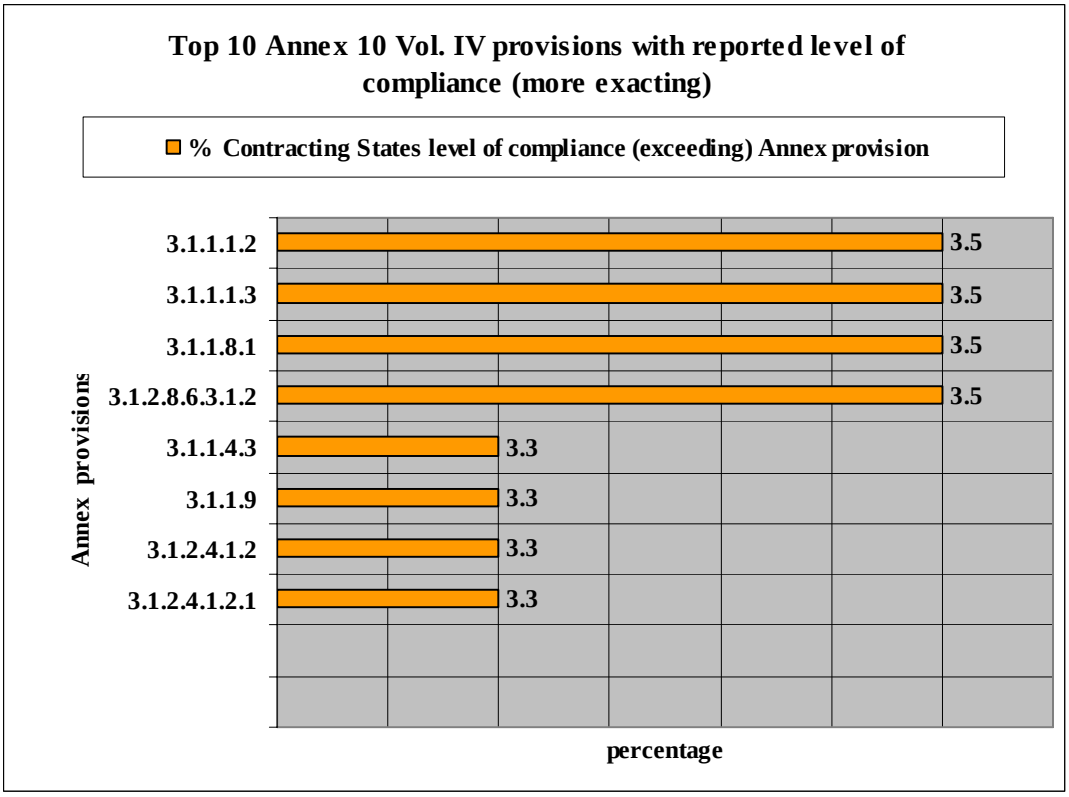

Figure 46

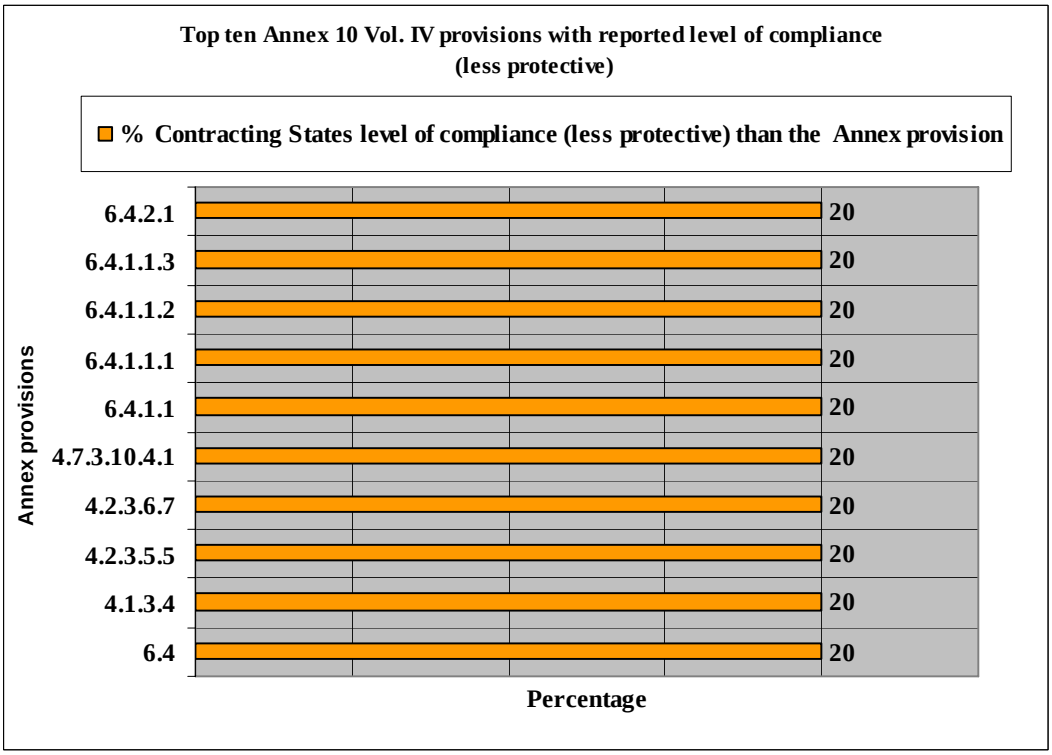

Figure 47

Compliance checklists results - Annex 10 Vol V

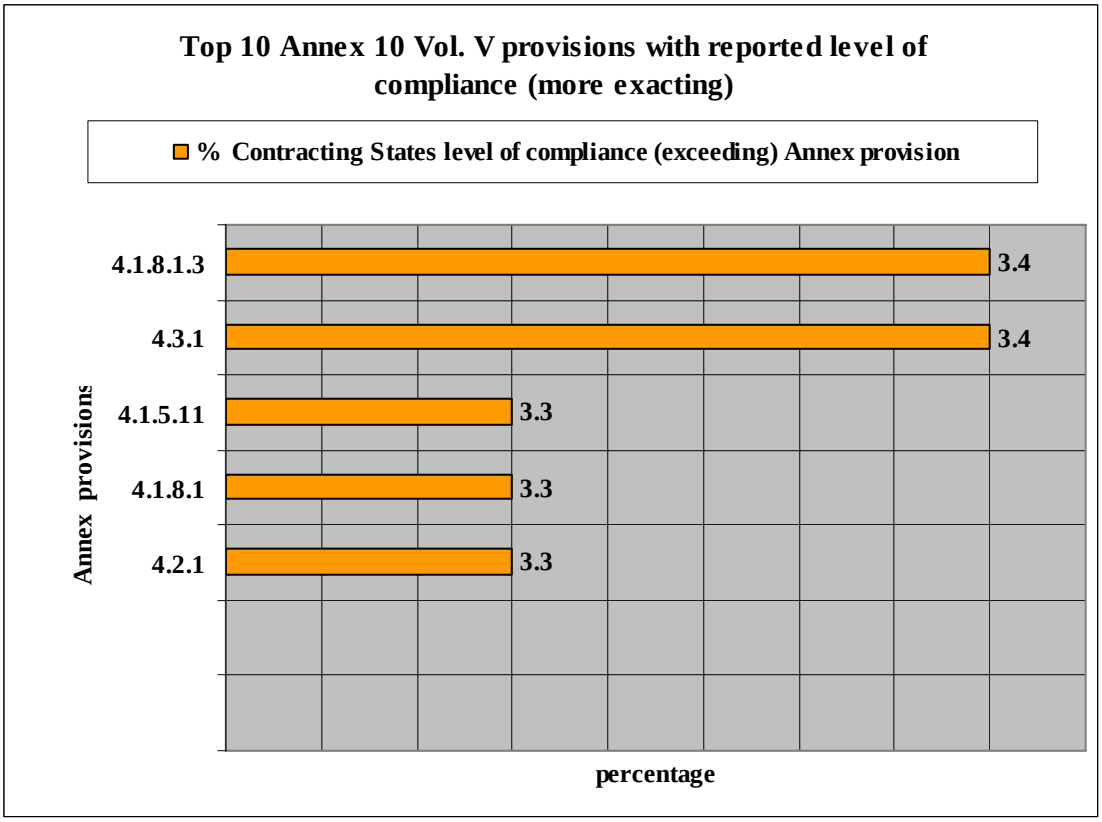

Figure 48

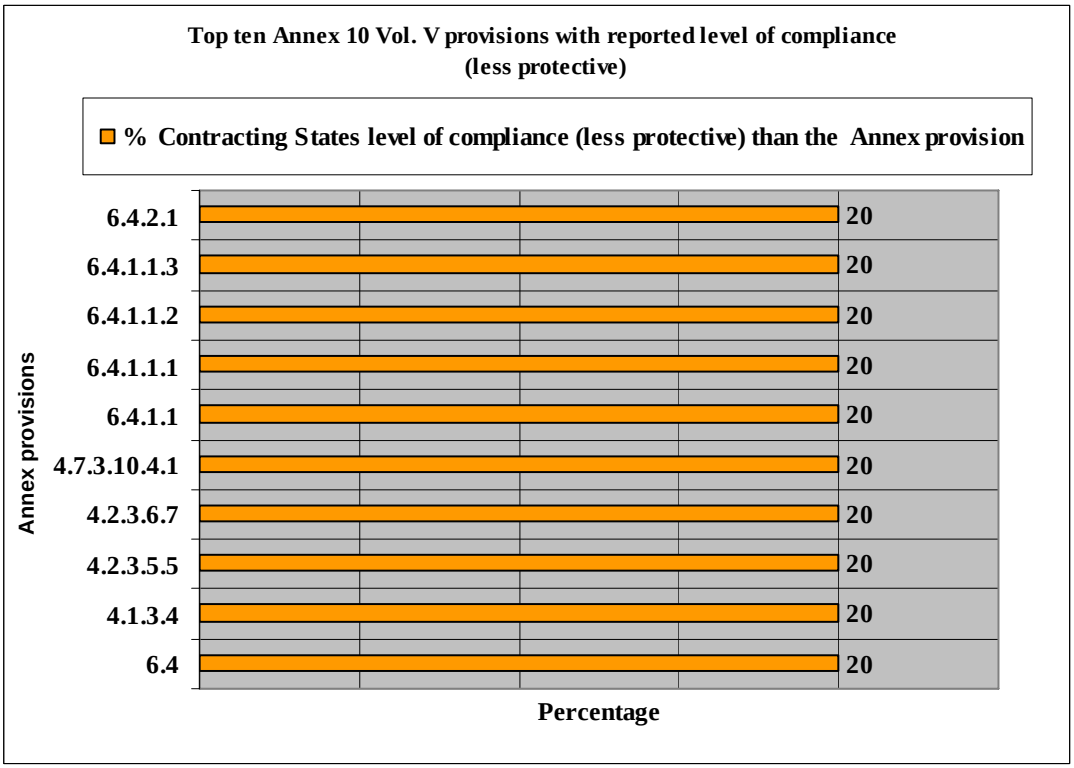

Figure 49

Compliance checklists results - Annex 11

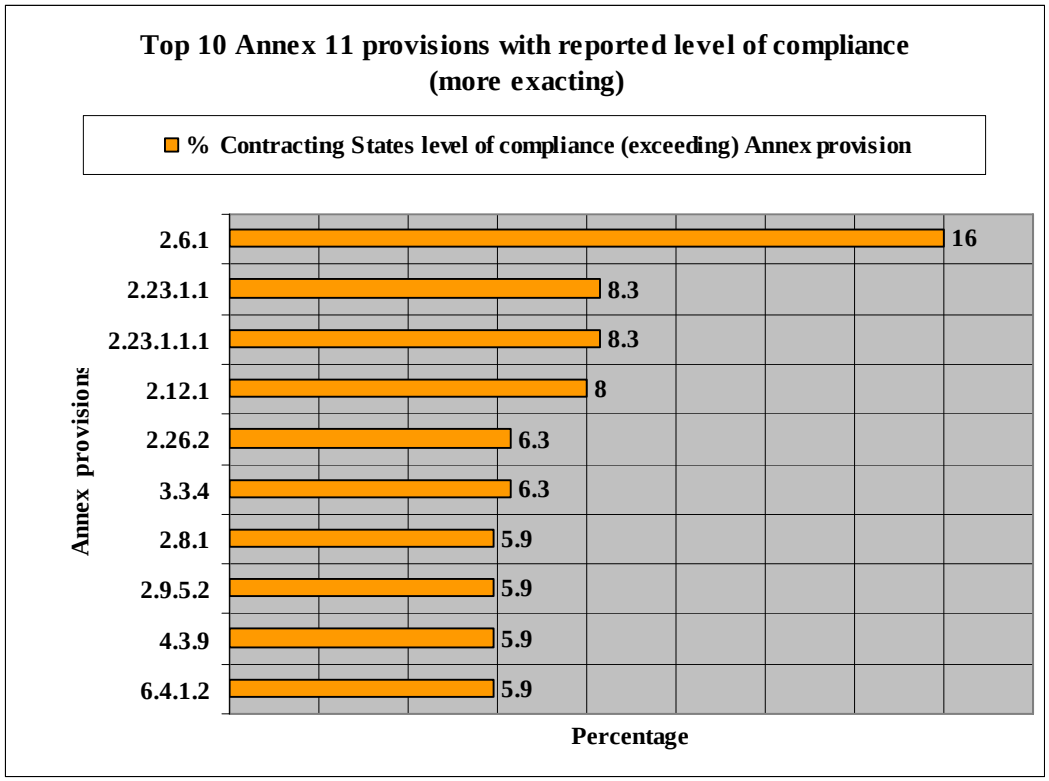

Figure 50

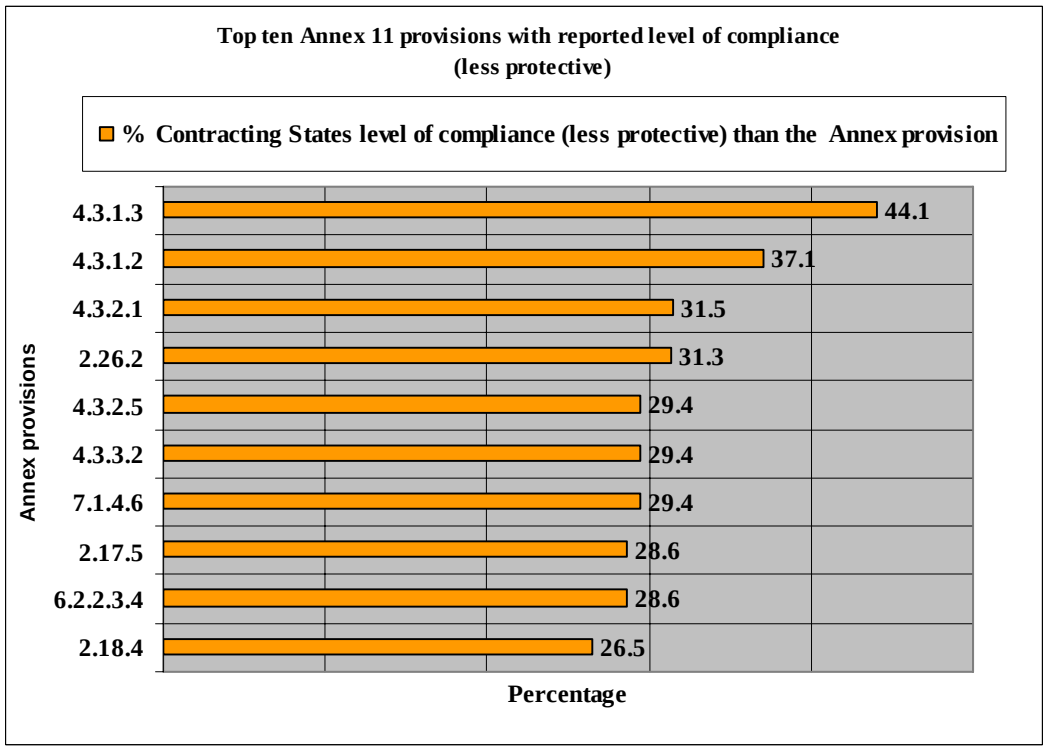

Figure 51

Compliance checklists results - Annex 12

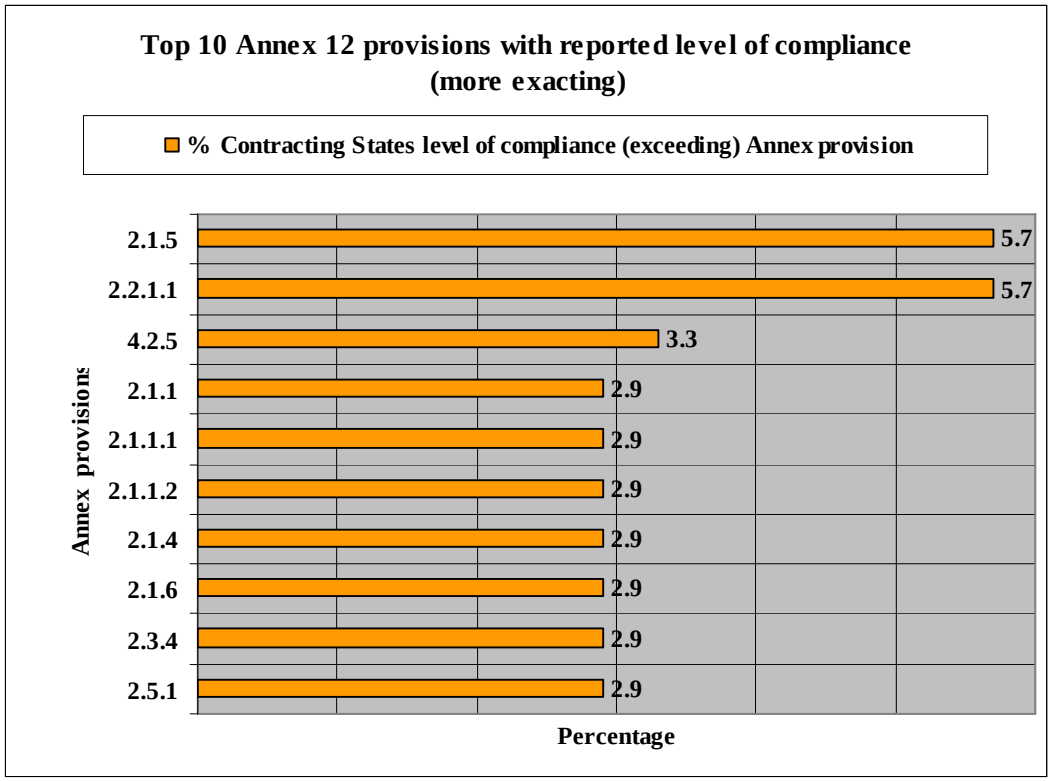

Figure 52

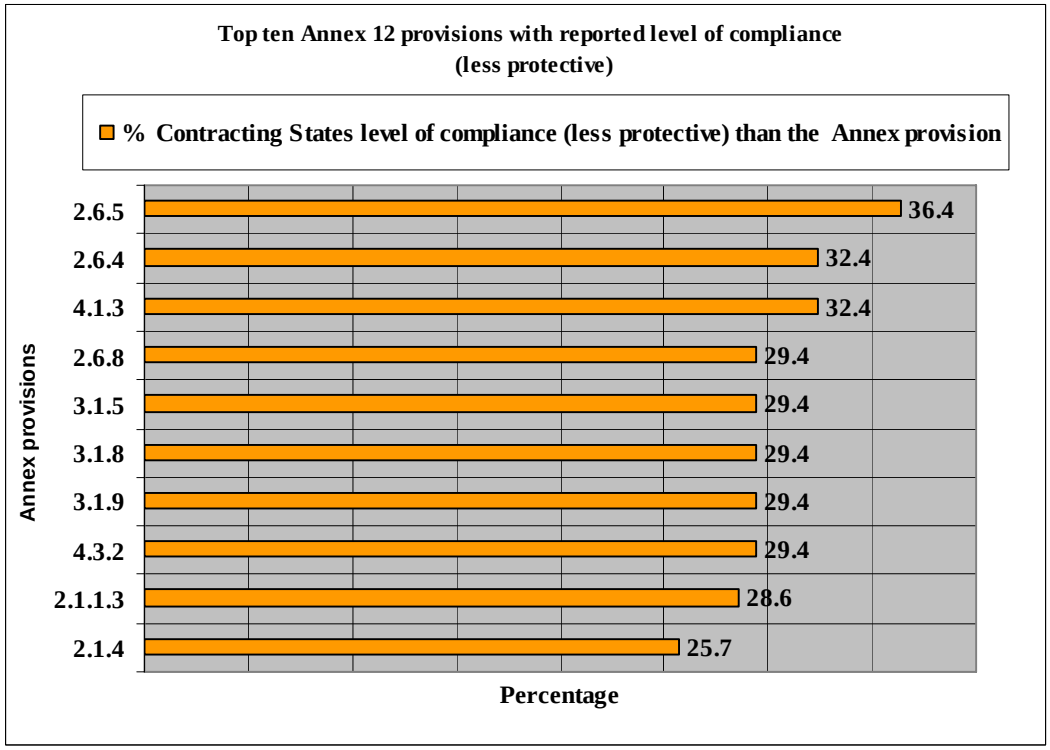

Figure 53

Compliance checklists results - Annex 13

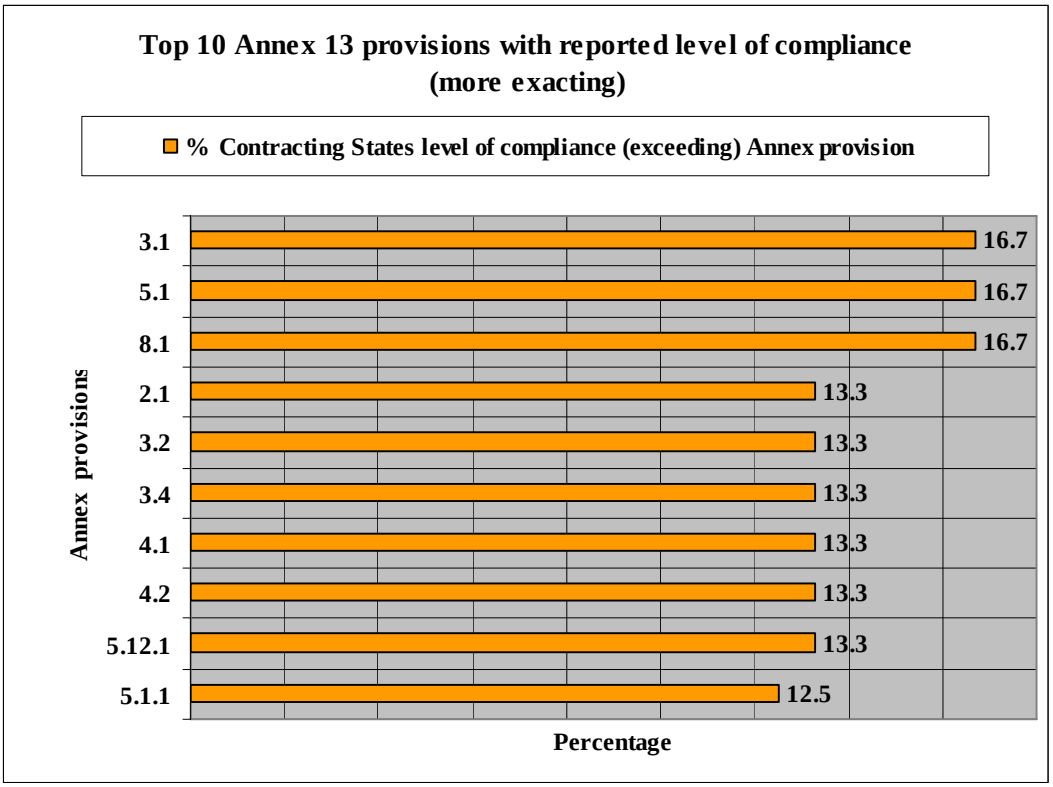

Figure 54

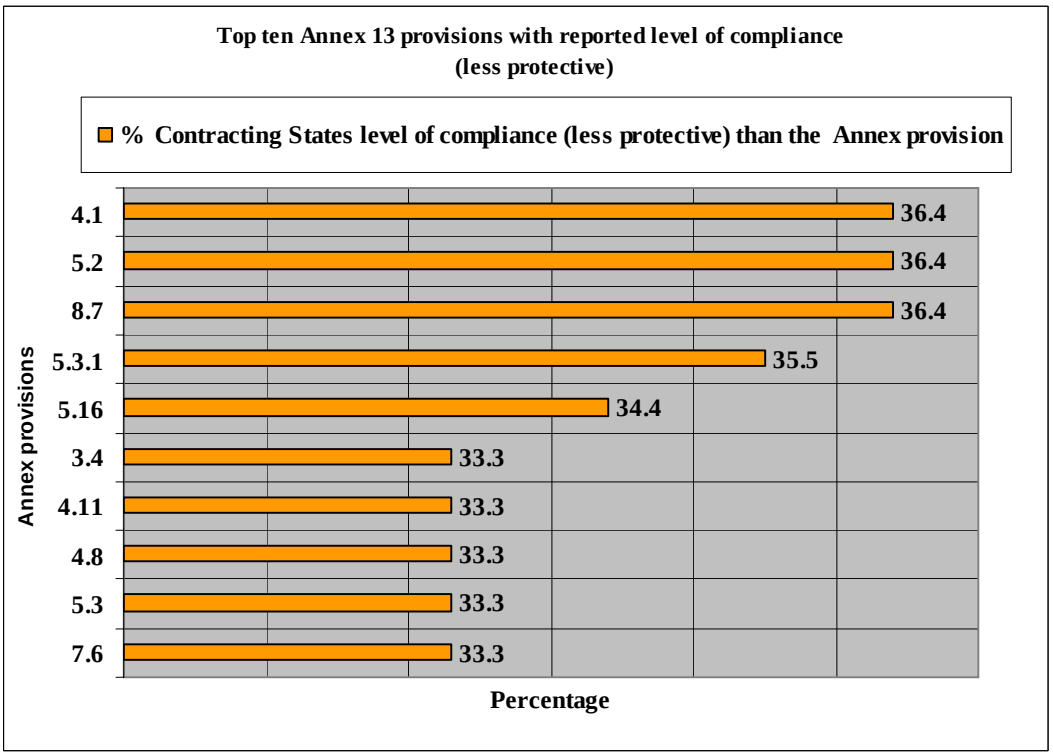

Figure 55

Compliance checklists results - Annex 14 Vol. I

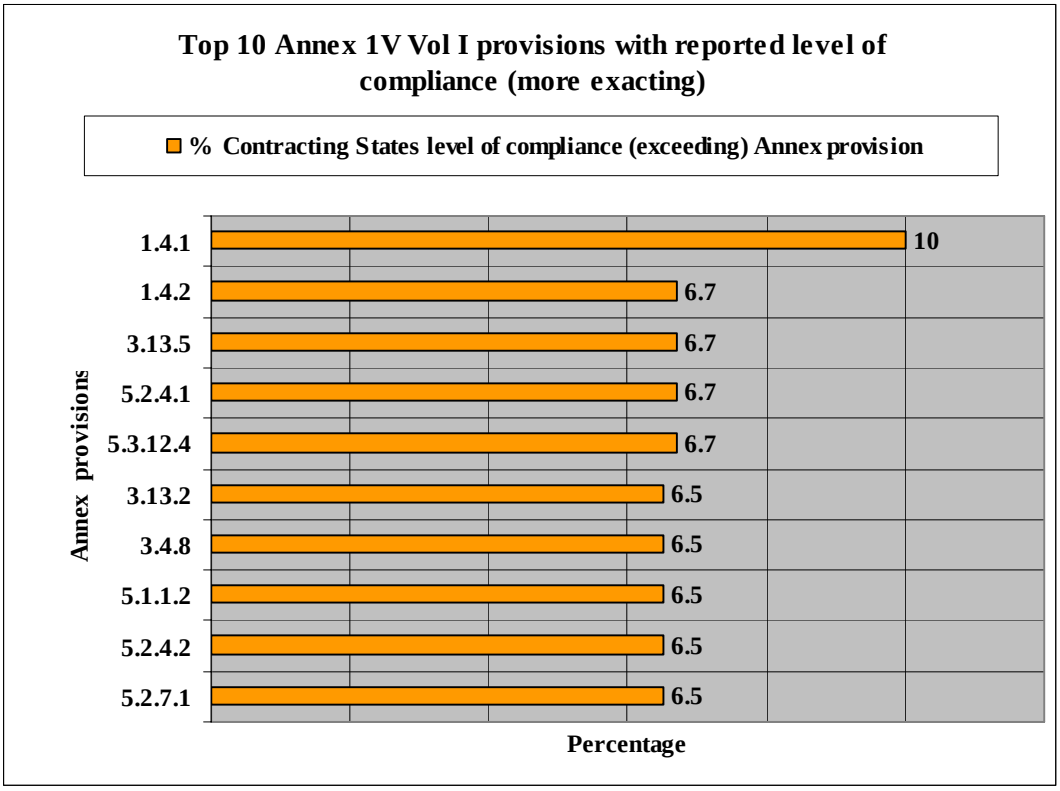

Figure 56

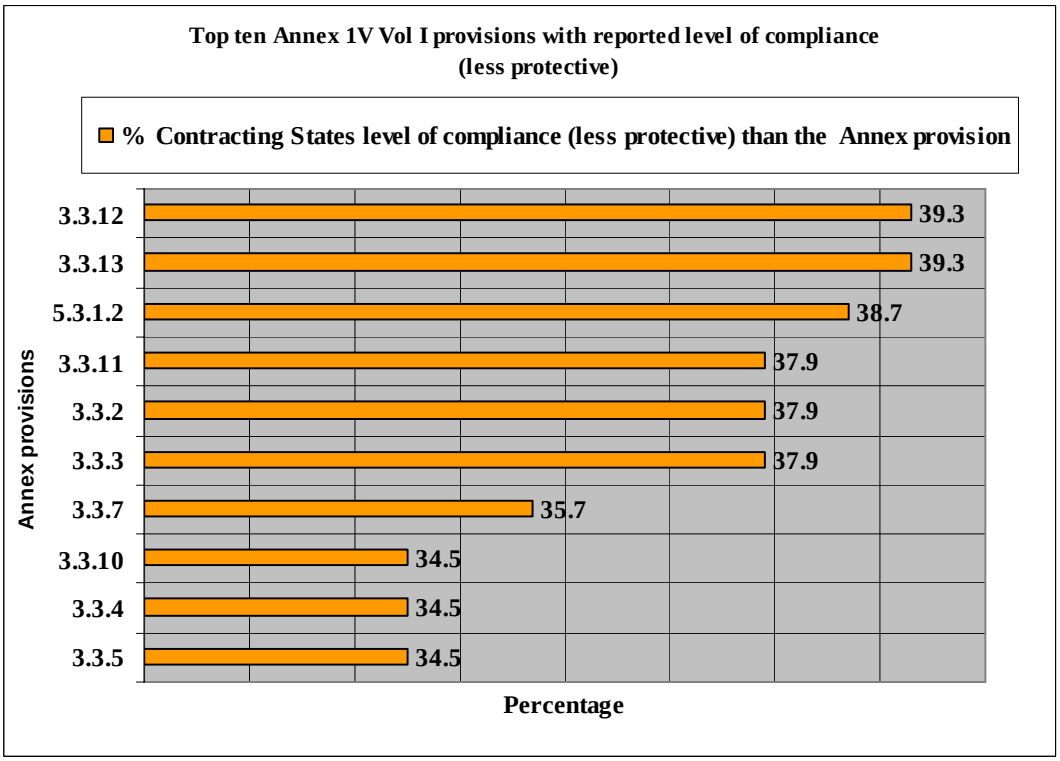

Figure 57

Compliance checklists results - Annex 14 Vol. II

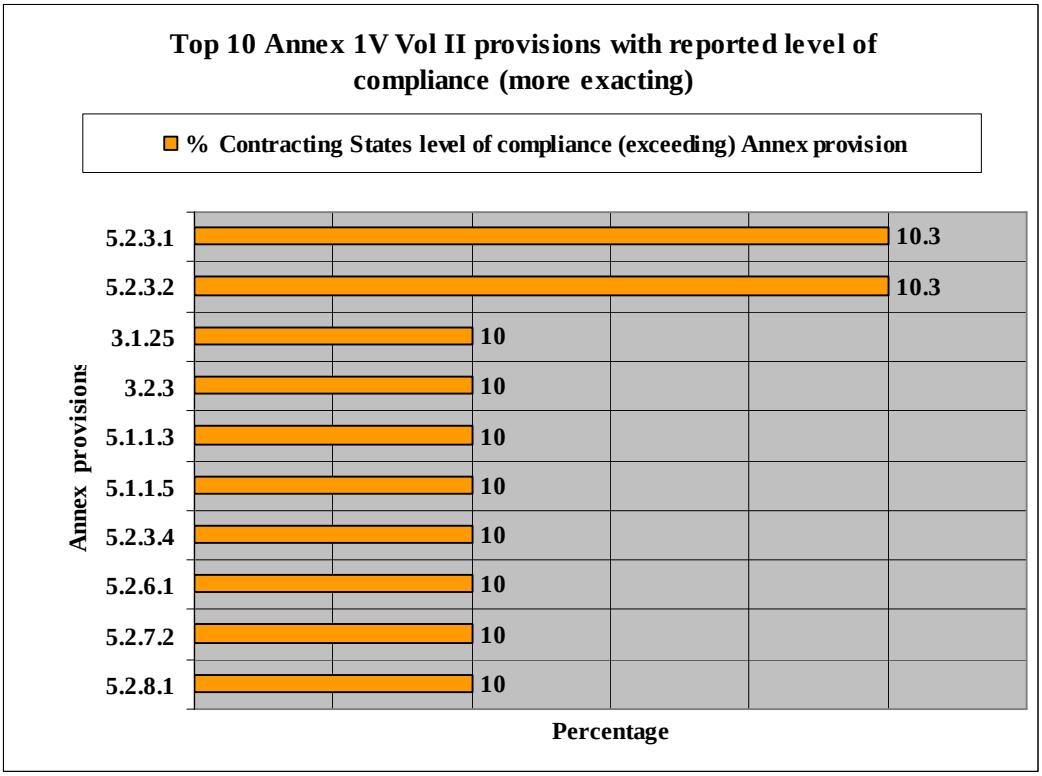

Figure 58

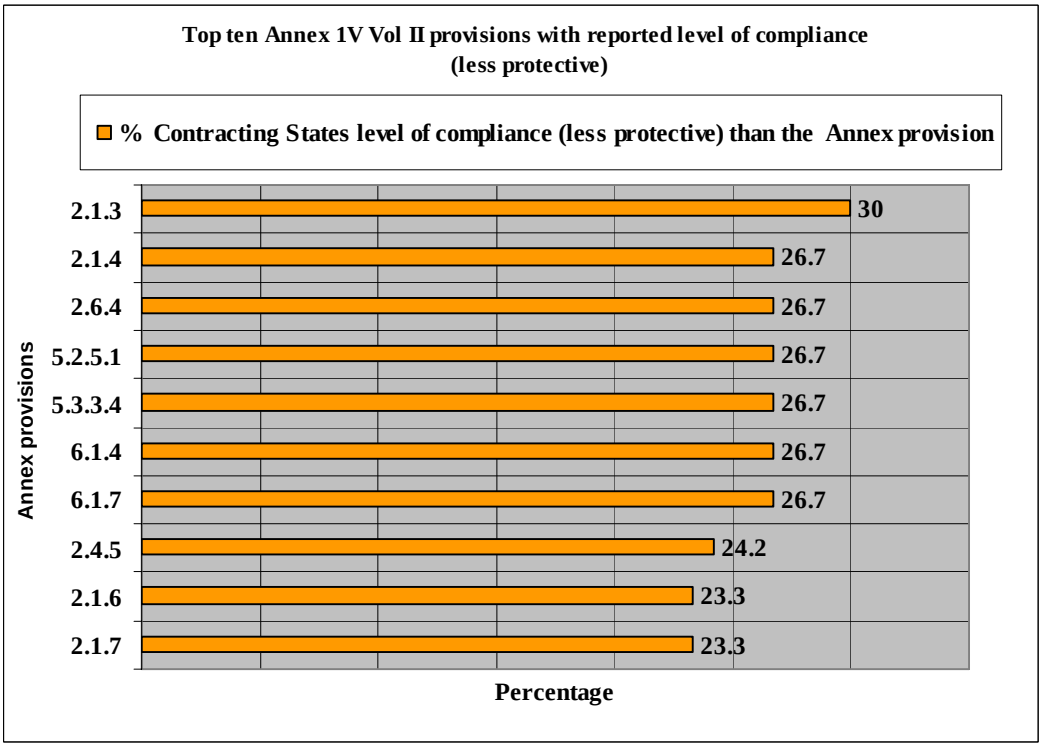

Figure 59

Compliance checklists results - Annex 15

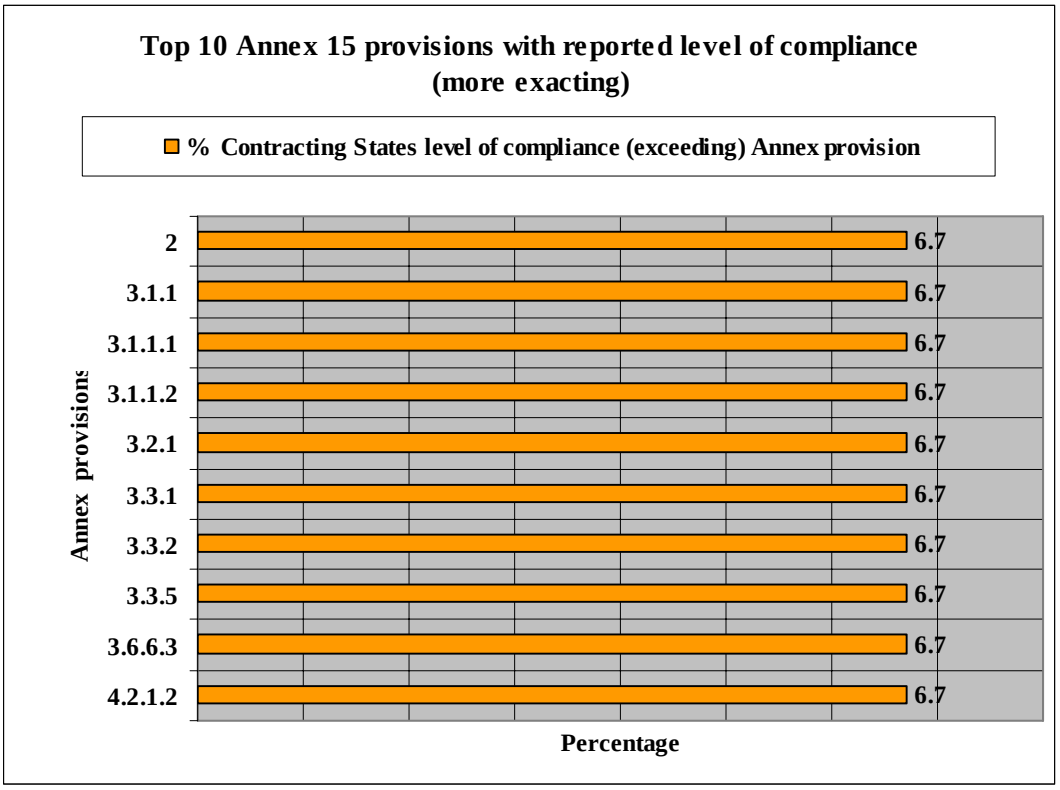

Figure 60

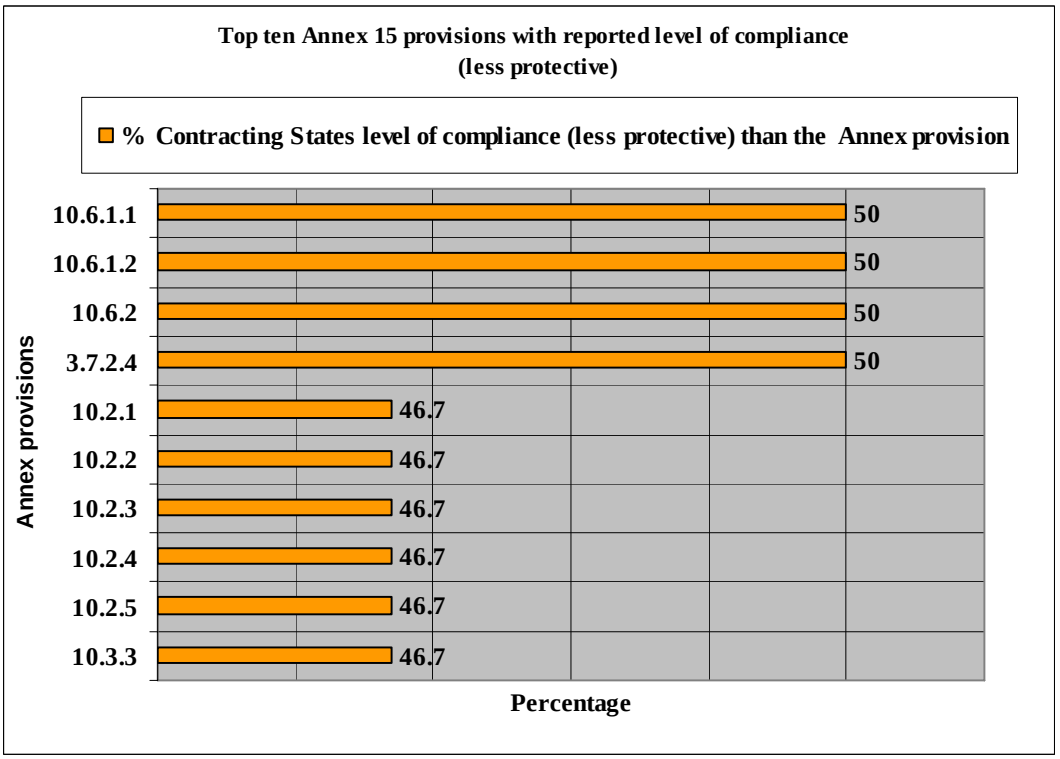

Figure 61

Compliance checklists results - Annex 16 Vol. I

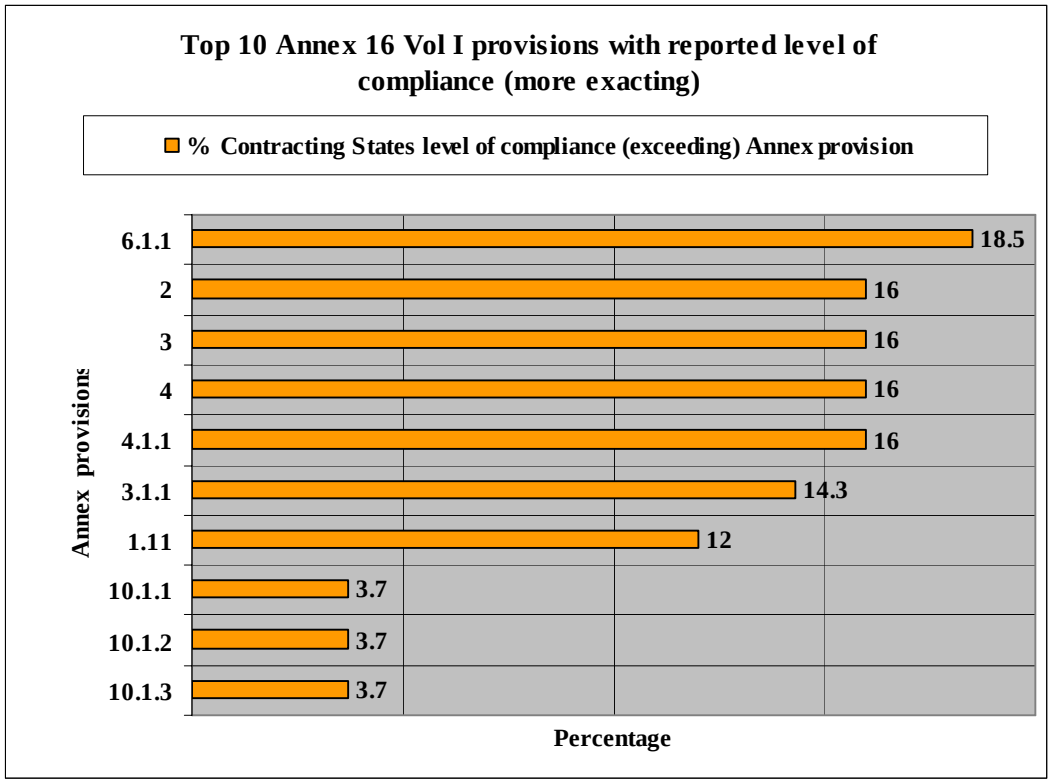

Figure 62

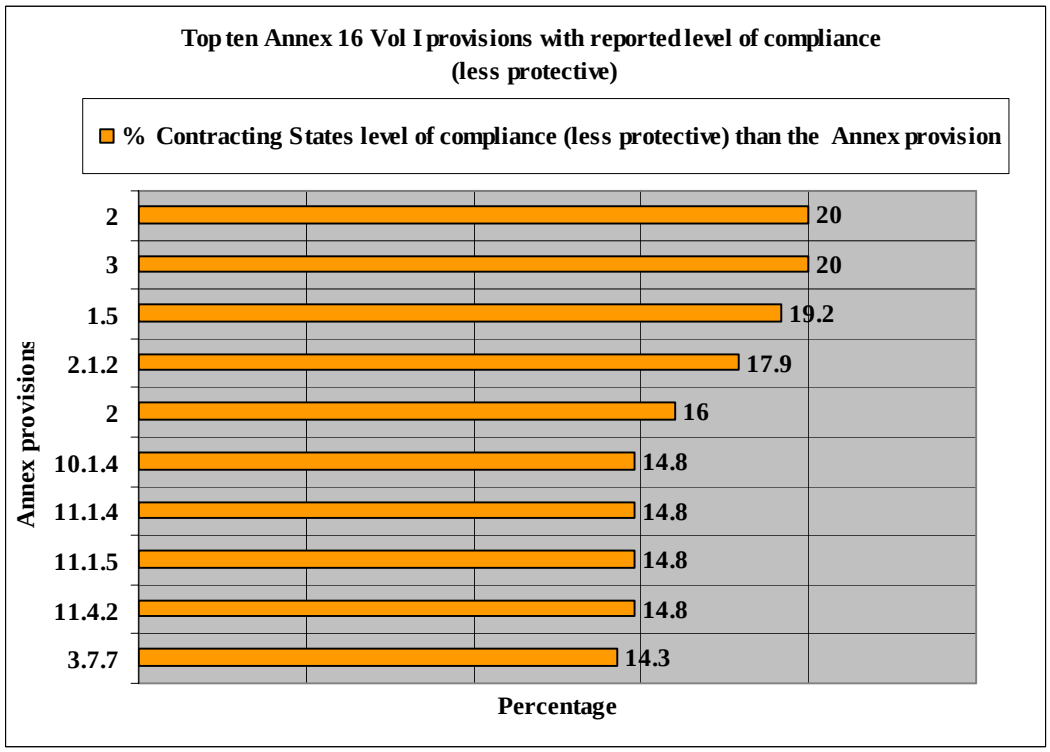

Figure 63

Compliance checklists results - Annex 16 Vol. II

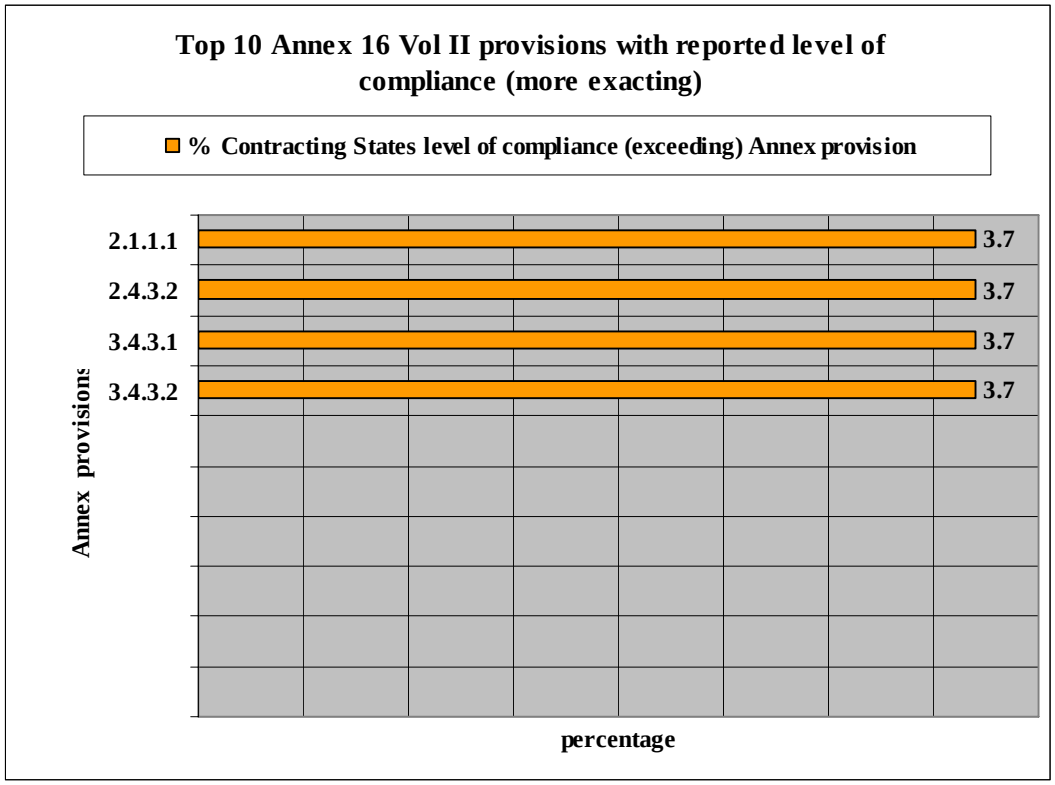

Figure 64

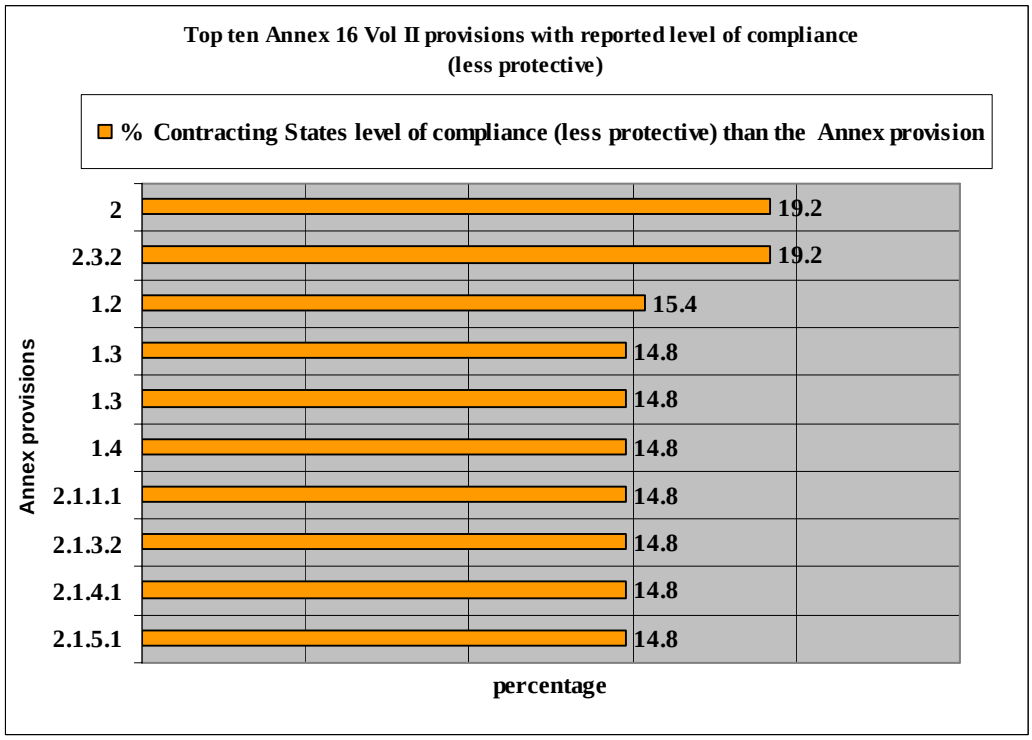

Figure 65

Compliance checklists results - Annex 18

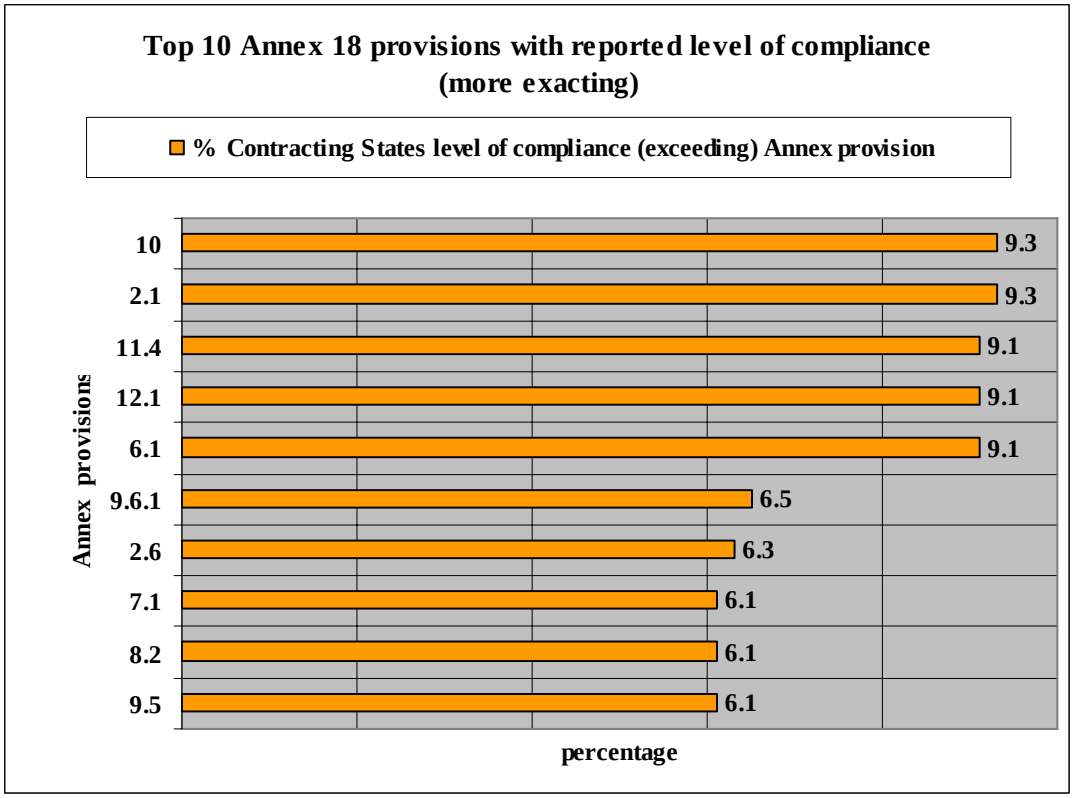

Figure 66

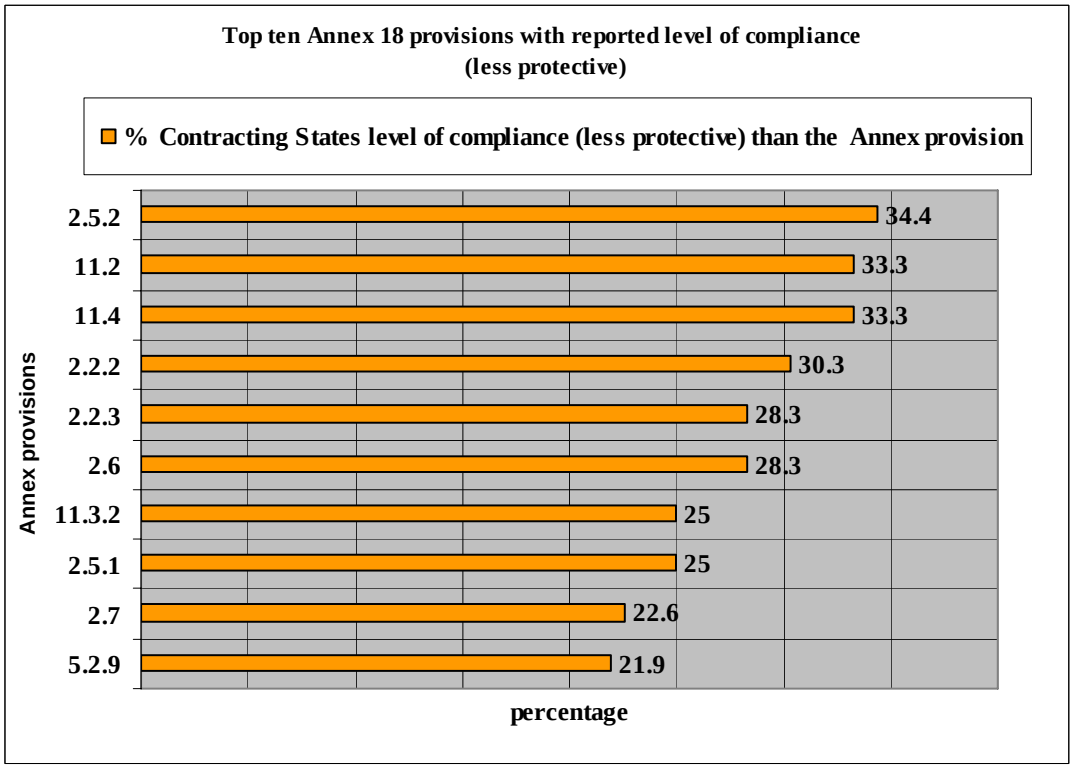

Figure 67

PART III
SAFETY ANALYSIS REPORT

This part of the report contains a deductive analysis and relates safety oversight audit results, by region, with accident rates.

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Accident rate (global) analysis

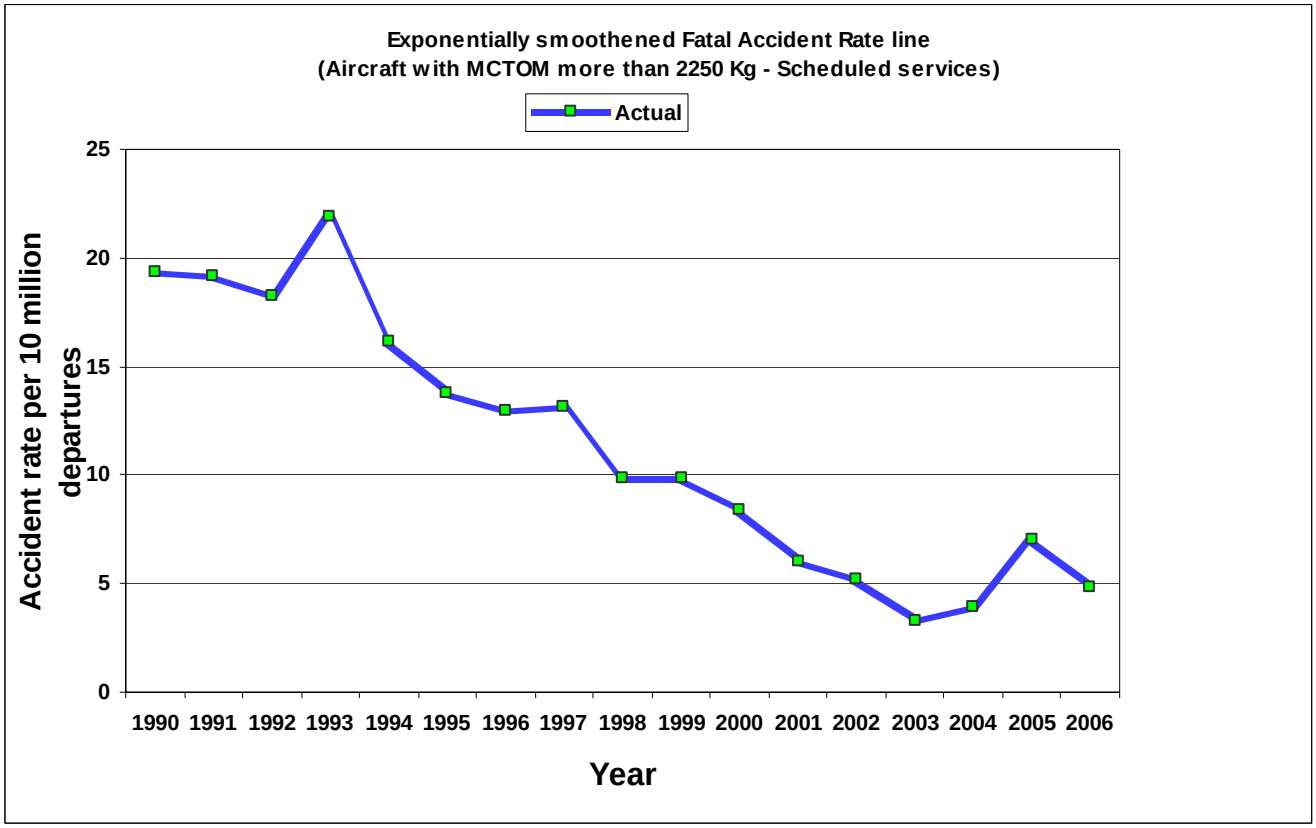


Figure 68

Figure 68 depicts the accident rates for the period ranging from 1990 to 2006. It takes into consideration all reported accidents involving aircraft of a maximum certified take-off mass (MCTOM) of 2550 Kg or more, for passenger scheduled services with fatalities.

All data included in this part of the report is based on information reported to ICAO by States and the industry through the Accident/incident Data Reporting (ADREP) System and is related to the State of registry of the aircraft involved in the accident.

Accident rate by region

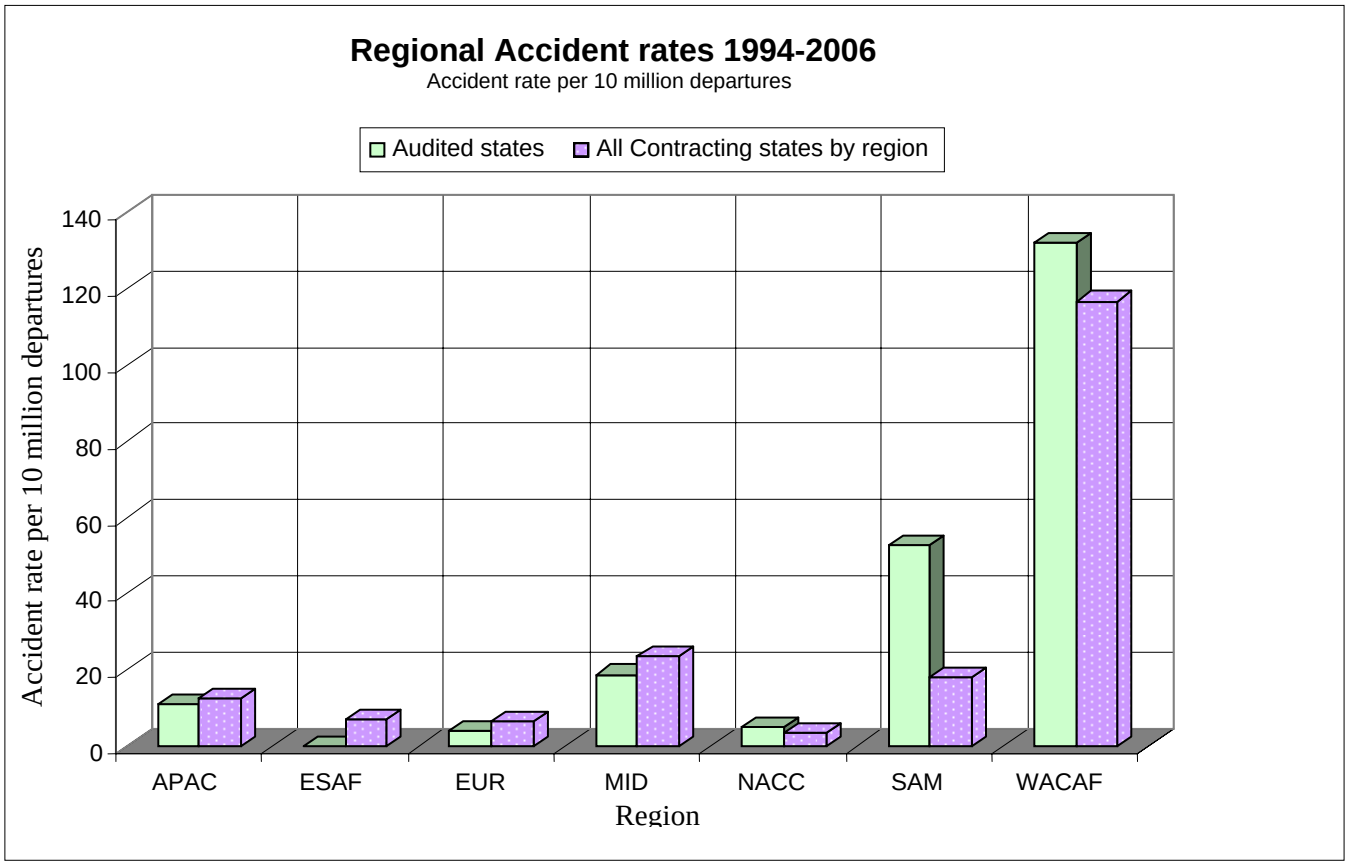
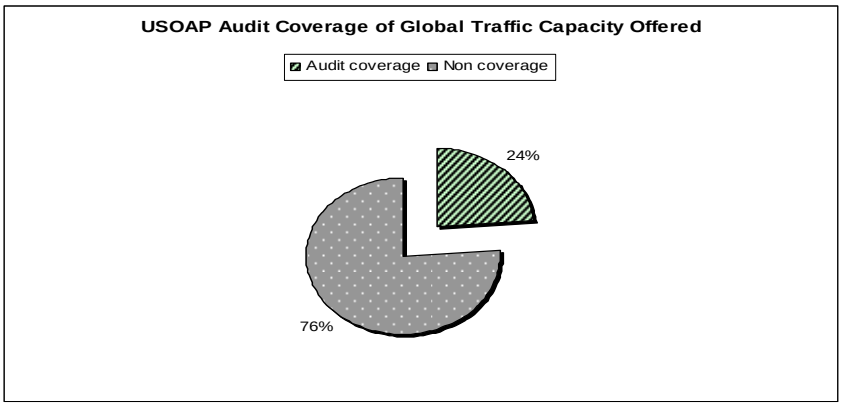


Figure 69

Of the 53 States audited, 25 States shown in the chart above (Figure 69) have had fatal accidents during the period 1994-2006, and represent 18 per cent of the global traffic capacity and the remaining 28 States audited have a relatively fatal accident-free record and represent six per cent of the global traffic capacity. It should be noted that the ICAO USOAP audit results indicate that there are several States having problems in establishing a sound accident and incident reporting system. This impacts the data generated by the ICAO Accident/Incident Data Reporting (ADREP) System database.



Overall, the 53 contracting States audited to date under the ICAO USOAP Comprehensive Systems Approach represent approximately 24 per cent of global air traffic capacity offered. (Figure 70)

Figure 70

Regional audit results of the lack of effective implementation of the critical elements of a safety oversight system

REGION	CE1	CE2	CE3	CE4	CE5	CE6	CE7	CE8
APAC	29.5%	31.2%	36.0%	48.9%	40.6%	25.2%	35.5%	35.8%
ESAF	20.5%	29.8%	45.9%	51.2%	43.9%	33.8%	47.1%	41.2%
EUR	27.2%	27.0%	31.7%	47.0%	28.3%	16.4%	28.1%	30.3%
MID	17.7%	23.2%	34.0%	51.4%	26.7%	25.4%	38.6%	35.9%
NACC	12.7%	16.1%	29.3%	38.3%	25.5%	17.0%	32.0%	28.0%
SAM	22.6%	25.6%	36.7%	53.1%	32.1%	20.1%	30.8%	36.8%
WACAF	44.5%	52.1%	56.7%	65.5%	58.6%	58.0%	58.4%	64.5%

Table 7

Table 8 and the graphs contained in the following pages depict, by region, the lack of effective implementation of the critical elements of a safety oversight system for the 53 audited States.

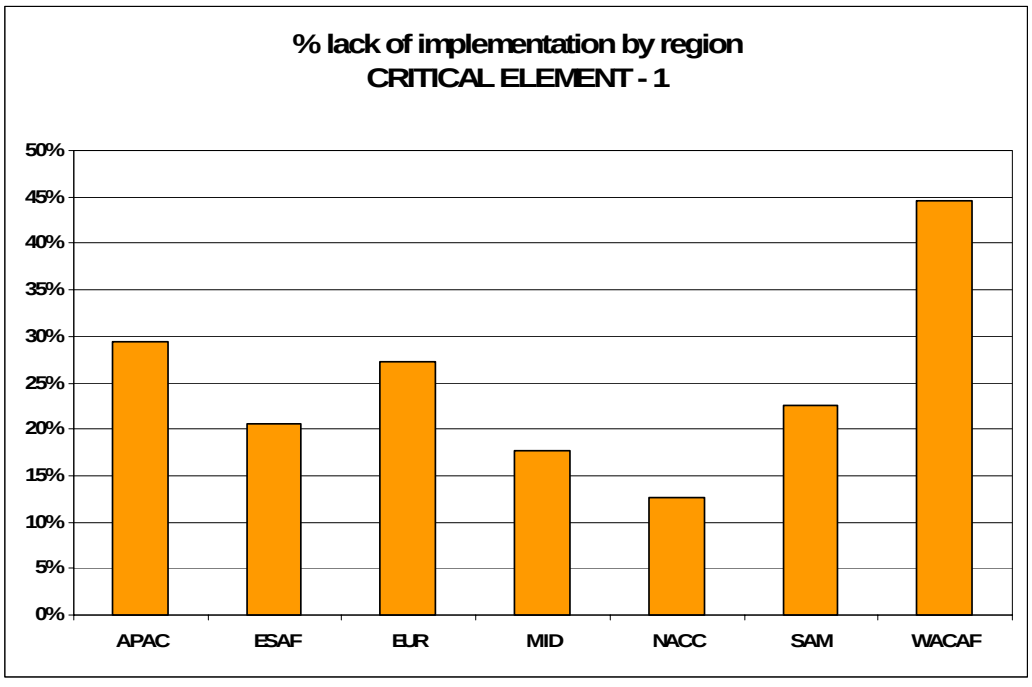


Figure 71

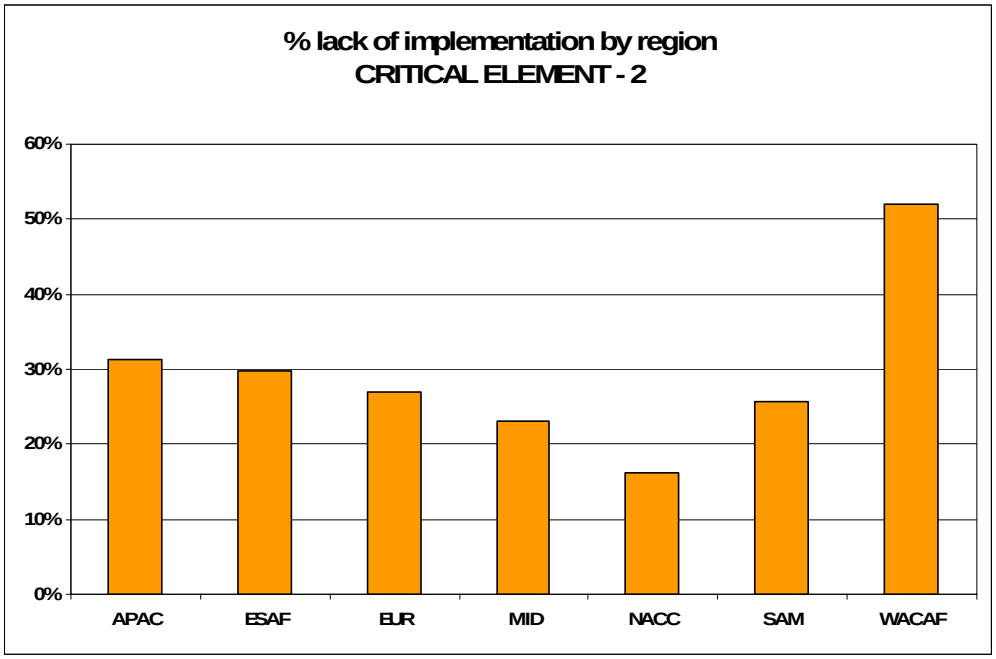


Figure 72

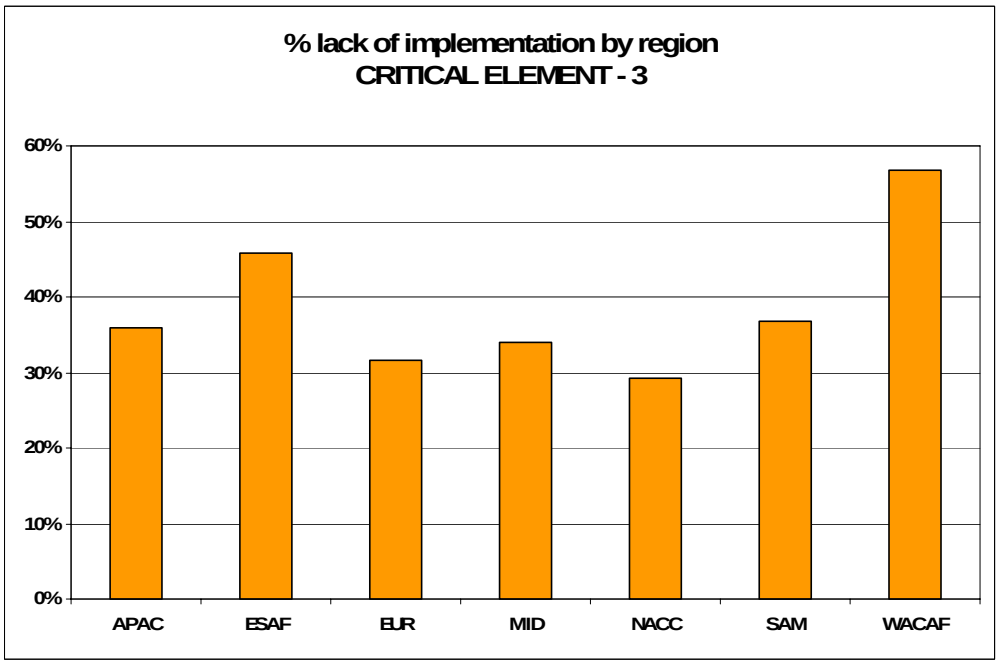


Figure 73

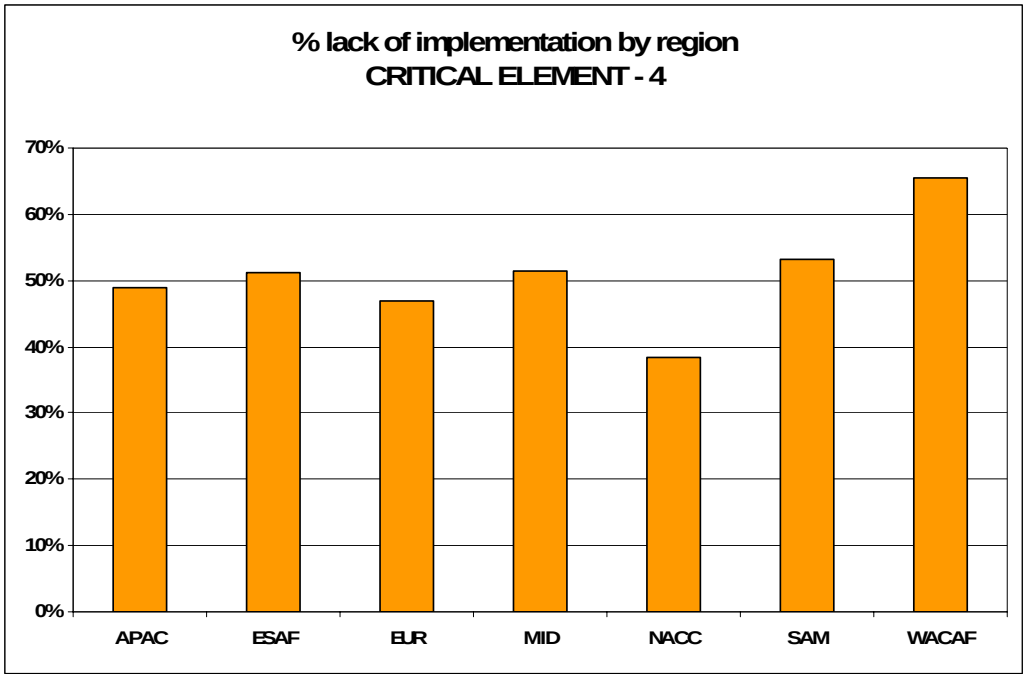


Figure 74

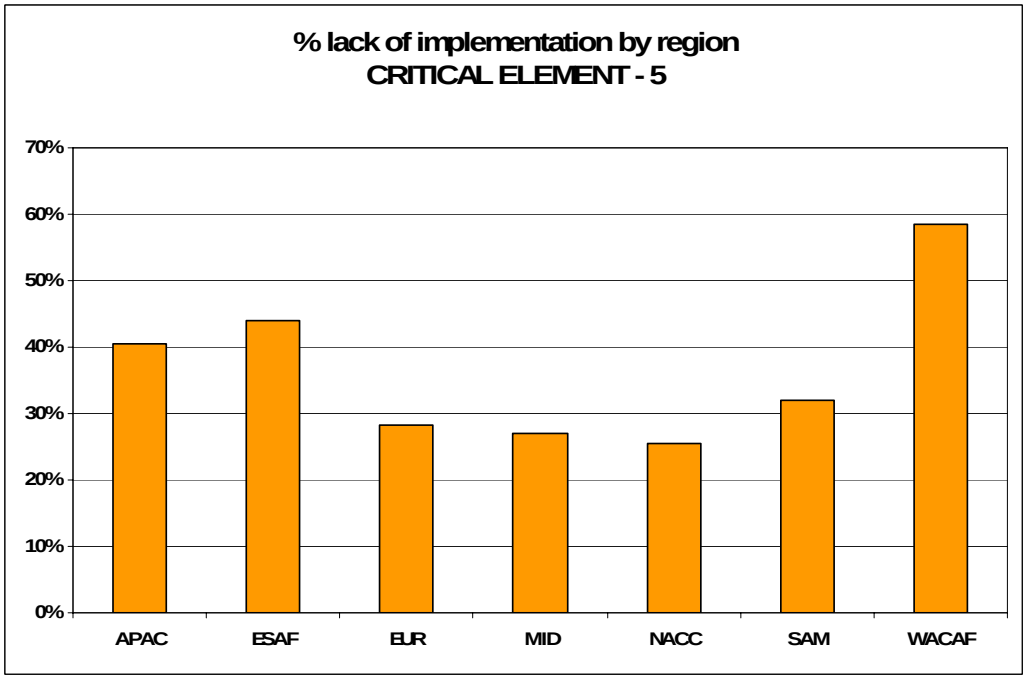


Figure 75

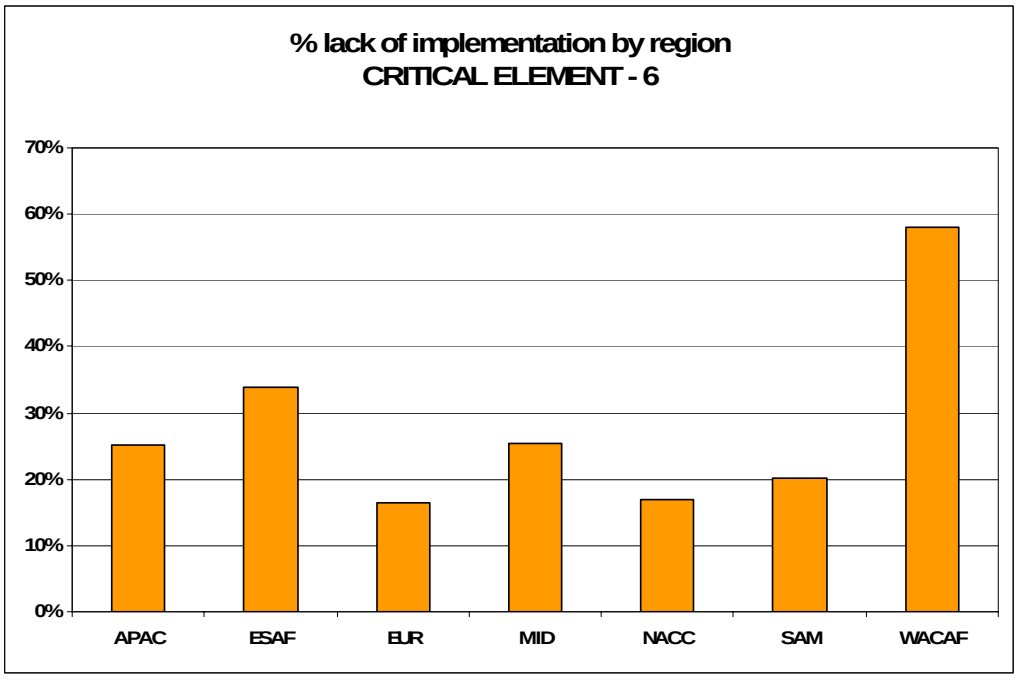


Figure 76

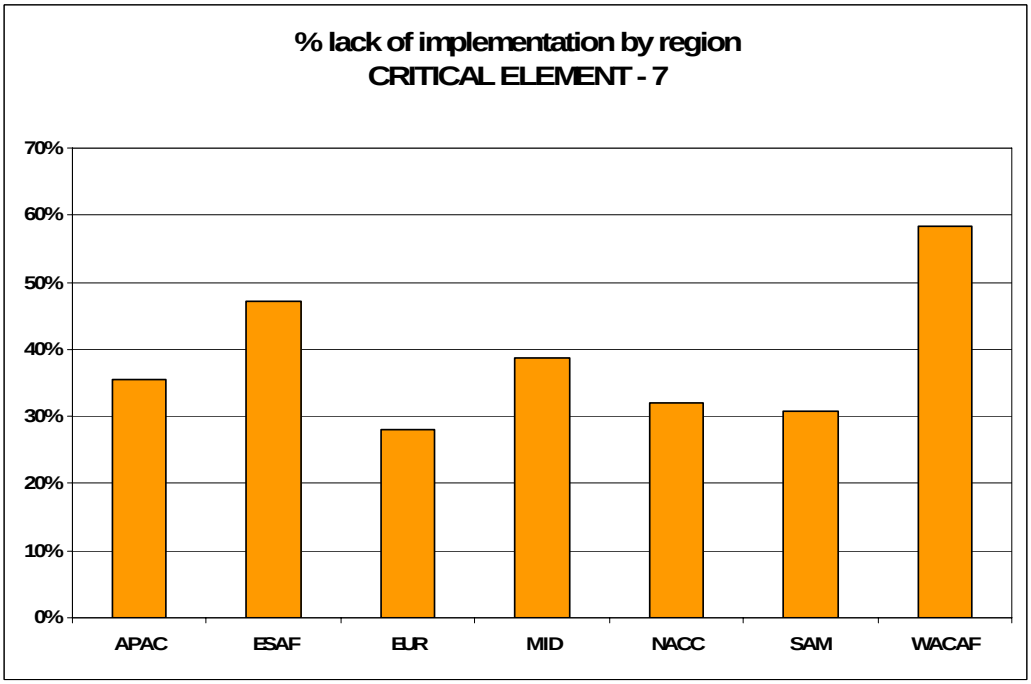


Figure 77

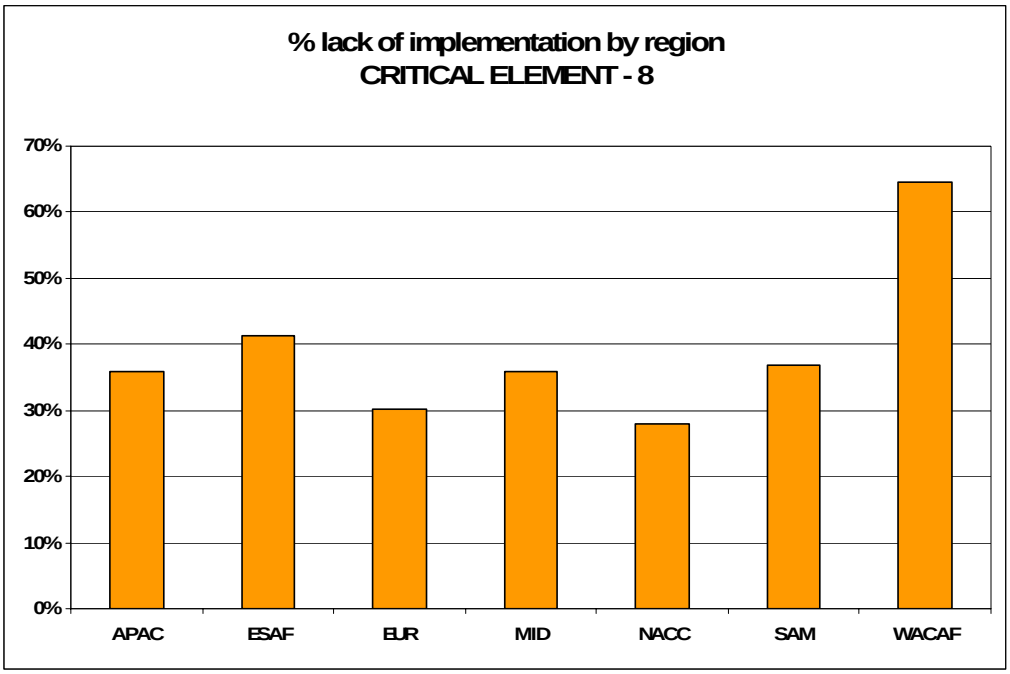

% lack of implementation by region
CRITICAL ELEMENT - 8
70%
60%
50%
40%
30%
20%
10%
0%
APAC
ESAF
EUR
MID
NACC
SAM
WACAF

Figure 78

Safety oversight audit results by region versus accident rates

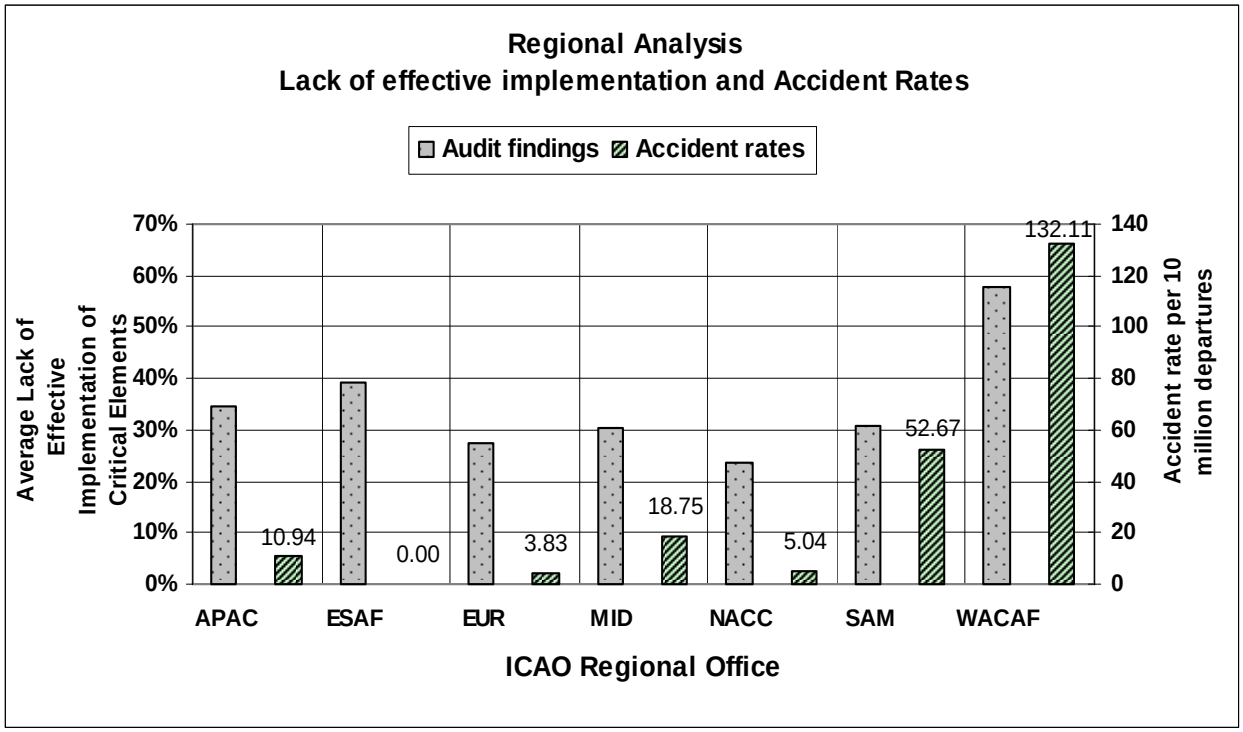


Figure 79

Of the 53 States audited, 25 States have had fatal accidents during the period 1994-2006. When plotting the results by region as shown in Figure 79, there is no strong correlation between accident rates and **overall** audit results; however, there is direct correlation between accident rates and specific CEs as demonstrated in Table 9.

Relationship between accident rates and individual critical elements

- Each critical element was tested independently for linear relationship. The strength of the linear relationship is depicted in the following analysis:

Critical element	R^2 (Relationship)
CE8	**0.96 (very strong)**
CE6	**0.95 (very strong)**
CE3	**0.95 (very strong)**
CE7	**0.93 (very strong)**
CE2	**0.76 (medium)**
CE5	**0.73 (medium)**
CE4	**0.72 (medium)**
CE1	**0.52 (weak)**

Table 8

- In Statistics, the coefficient of determination R^2 is the proportion of variability in a data set that is accounted for by a statistical model. R^2 is a statistic that will give some information about the goodness of fit of a model. In regression, the R^2 coefficient of determination is a statistical measure of how well the regression line approximates the real data points. An R^2 of 1.0 indicates that the regression line perfectly fits the data.

- Relationship between CE8, CE6, CE3 and CE7 and accident rates was found to be very strong.

- Relationship between CE2, CE5 and CE4 and accident rates was found to be medium

- Relationship between CE 1 and accident rates was found to be weak.

- This information would indicate that those States that ensure that personnel and organizations performing an aviation activity within their territory meet the established requirements before they are allowed to exercise the privileges of a licence, certificate, authorization and/or approval and conduct effective surveillance over their aviation industry, including the ability to identify and resolve safety-related deficiencies may reduce accident and serious incident rates.

– END –