



**WORKING PAPER**

**DANGEROUS GOODS PANEL (DGP)  
MEETING OF THE WORKING GROUP OF THE WHOLE**

**Atlantic City, United States, 4 to 8 April 2011**

**Agenda Item 5: Resolution, where possible, of the non-recurrent work items identified by the Air Navigation Commission or the panel:**

**5.4: Development of performance standards for State employees**

**COMPETENCY FRAMEWORK**

(Presented by T. Muller)

**SUMMARY**

This working paper presents the results of the DGP training (drafting) working group that was established on developing a competency framework for State employees involved in the regulation and oversight of the air transport of dangerous goods for consideration by the working group.

Action by the DGP-WG is in paragraph 4.

**1. INTRODUCTION**

1.1 The DGP decided to establish a small drafting group to develop a proposal on performance standards and requirements for competency-based training of State employees involved in the regulation and oversight of the air transportation of dangerous goods. The task of the group was to develop a competency framework that would support the Member State authorities to adopt national regulations / rules regarding the competences of their dangerous goods staff. The group initiated its work in July 2010 by email correspondence and by exchanging available national common practices. A progress report of the drafting group was presented to the DGP training working group in Abu Dhabi (7 to 11 November 2010). An initial draft document on the competency framework has been finalized early February 2011 based on current ICAO documentation and common practices in some of the participating Member States. This draft document was presented to a meeting of the drafting group in Montreal (28 February to 2 March 2011) in which the document was reviewed and amended as appropriate.

## 2. COMPETENCY-BASED TRAINING AND ASSESSMENT IN ICAO

2.1 ICAO introduced the *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868) in 2006. The aim of the first edition of this document was to provide general guidance on the implementation of competency-based training and assessment and more particularly for the multi-crew pilot licence proposed by the Flight Crew Licensing and Training Panel (FCLTP). During its deliberations, the FCLTP recognized that many civil aviation functions could benefit from the implementation of a competency-based approach and that eventually the PANS-Training would expand its scope to other disciplines.

2.2 Since the FCLTP, competency frameworks were developed for several aviation functions: Aircraft maintenance personnel, designated medical examiners, flight procedure designers, flight validation pilots. Work is presently underway through the Next Generation of Aviation Professionals (NGAP) Task Force to develop competency frameworks for flight crew instructors/evaluators, inspectors, air traffic controllers, aeronautical information personnel, and air traffic services electronics personnel.

2.3 ICAO has recognized that the implementation of a competency-based approach for safety-critical functions is essential to ensure that enough qualified and competent personnel support the air transportation system.

2.4 Under its Strategic Objective of Safety, the organization has introduced Programme No. 15 entitled Qualified Aviation Professionals. The objective of this programme is to work through an industry task force, develop and rollout a global programme, which will ensure that the future demand for professionals is met. Among the expected result under this programme is the introduction of the use of a competency-based approach to training and assessment. This is particularly relevant to DG given the results of safety oversight audits.

## 3. DRAFTING WORKING GROUP MEETING

3.1 The Drafting working group meeting was attended by:

FAA	Janet McLaughlin, Tom Kenny
Canada	Micheline Paquette, Daniel Sylvestre
UK	Geoff Leach
France	Joseph Le-Tonqueze
The Netherlands	Teun Muller, Bert Kraan
ICAO Consultant	Judith Code

Support was provided by the ICAO Secretariat: Nicole Barrette-Sabourin, Katherine Rooney and Lynn McGuigan.

3.2 The initial task of the meeting was to agree on the principles to be applied in a competency framework, the document structure and the detail in which the task related competences need

to be reflected in the document. In order to maintain consistent with current ICAO policies regarding development of competency frameworks in other areas, the ICAO secretariat recommended to follow the guidance published in Doc 9868 on competency-based training for pilots and current ICAO draft guidance material for competency-based training of medical examiners and instrument procedure designers. The Task Force agreed to distinguish in the framework different functional levels (strategic, management and operational) in safety oversight of the transport of dangerous goods where such related tasks might impact the safety of the transport of dangerous goods.

3.3 It was recommended by the ICAO Secretariat to leave out “Generic Competences” of State employees at this stage of development since the issue is still under discussion in what way and to what extent to include these in a competency framework. Based on the task descriptions and competency profiles contained the available State common practices, the Task Force derived a competency framework at the agreed high level of detail. During the developing process the ICAO secretariat kept monitoring the consistency with the principles established in the Doc 9868. The draft competency frame work is in the Appendix to this WP as developed by the Task Force for consideration and approval by the DGP Working Group of the Whole.

#### 4. ACTION BY THE DGP-WG

4.1 Given ICAO’s initiatives to ensure that enough qualified and competent personnel support the air transportation system, and the existing dangerous goods training requirements found in the Technical Instructions, the DGP Working Group of the Whole is invited to:

- a) Review the Appendix to this WP “Competency Framework for State employees” and provide comments, as appropriate;
- b) Amend Chapter 4 of the Technical instructions to introduce competency-based training and assessment for dangerous goods functions, including the Competency Framework for State employees as amended;
- c) Introduce reference to Chapter 2 of the PANS-Training document in the revised Chapter 4 of the Technical Instructions;
- d) Develop guidance on the implementation of competency-based training and assessment for DG functions to support ICAO Member States; and
- e) Instruct the Task Force and /or the Secretariat for any additional follow-up action.

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Concept (version 5, 29 -03-11)

**Competency Framework for State employees involved in the  
Regulation and Oversight of Transport of Dangerous Goods by Air**

***DGP drafting working group on Competency framework***

***(Montreal 28 February - 2 March 2011)***

## ***Competency framework for State employees involved in the Regulation and Oversight of Transport of Dangerous Goods by Air***

### **1. Introduction**

The objective of ICAO in publishing this document is to provide guidance to Contracting States to implement competency-based training and assessment for personnel engaged in policies, regulation, inspection and supervision of dangerous goods transported by air.

This document “Competency framework for State employees in the Transport of dangerous goods by air” has been prepared by the Dangerous Goods Panel. It includes a basic competency framework for the uniform implementation of training and assessment required for State employees who have to ensure compliance with their State’s obligations and in compliance with Annex 18 — *The Safe Transport of Dangerous Goods by Air*.

It has been noted that States use a variety of systems to exercise safety oversight in the transport of dangerous goods by air. ICAO’s safety oversight audits have identified discrepancies among States in their inspectors’ performance standards and in the implementation of their respective civil aviation dangerous goods programme. For example, one State may have a clearly-defined process for the approval of dangerous goods training programmes, while another may not.

In order to harmonize performance standards of State employees, there is a need to develop a generic competency framework for State employees. This competency framework would reflect safety-critical tasks. In turn, this would have a positive impact on the specific dangerous goods function and the ability of the individual to perform the job successfully to the required standards. Each Member State shall provide to each of its employees, who will be involved in policy making, regulation and oversight of compliance of dangerous goods transport by air, specific training for these functions.

## **Terminology**

*For the purposes of this document , the following terminology applies:*

*Air operator certificate*

A certificate authorizing an operator to carry out specified civil air transport operations.

*Competency.*

A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard.

*Competency-based training and assessment.*

Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

*Competency element.*

An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.

*Competency unit.*

A discrete function consisting of a number of competency elements.

*Dangerous goods.*

Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

*Inspection Method*

Techniques that are used during the course of evaluating compliance with relevant regulations. The inspection methods include:

- a. *Observation:* visually observing the performance of regulatory requirements for compliance with relevant regulations.
- b. *Interview:* a technique by which questions or discussions with persons performing transportation functions are used to gather information concerning the transportation of dangerous goods
- c. *Document Review:* reviewing paper or electronic records to determine whether required documents are properly prepared, contain accurate information, and maintained as required by the regulations.
- d. *Verification:* using third party information to independently confirm whether regulatory requirements are being met.
- e. *Procedure evaluation:* ensuring appropriate written procedures, addressing all regulated activities undertaken, are in place.

*Operations manual.*

A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

*Operator.*

A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

*Performance criteria.*

Simple, evaluative statements on the required outcome of the competency element and a description of the criteria used to judge whether the required level of performance has been achieved.

*Shipper.*

A person, organization or enterprise undertaking any of the shipper's responsibilities of Part 5 of the Technical Instructions.



## **2. Scope of the competency framework**

The scope of the competency framework concerns State employees involved in the regulation and oversight of the transport of dangerous goods by air based on obligations of Member States according to the Convention on International Civil Aviation:

- The State is responsible for implementing a system for determining compliance with Annex 18.
- The application of the basic principles of a competency-based approach determines the performance level for State employees in carrying out their function to meet the States obligations as defined by the Annex 18.

The competency framework has taken into account the “*ICAO Safety Oversight Transport of Dangerous Goods Audit Checklist*”, itemizing the separate civil aviation dangerous goods programme activities required by a Contracting State.

- a. Conduct initial review and approval of an operation manual and training programme on dangerous goods within the approval procedures for the AOC;
- b. Conduct initial inspection of new operator or operator that intends to commence carriage of dangerous goods;
- c. Conduct periodic inspection of the operator;
- d. Conduct an ad-hoc inspection on dangerous shipping and handling procedures
- e. Conduct an investigation on dangerous goods incidents and dangerous goods occurrences resulting from violations of the dangerous goods regulations;
- f. Conduct a review of a revised operation manual on dangerous goods within the approval procedures for the AOC;
- g. Conduct a review of a revised training programme for approval;
- h. Conduct periodic inspection of Shippers;
- i. Ensure that technical equipment required for inspection is being maintained and/or calibrated

These activities have been included in the competency framework.

The details of the competency framework are based on common practices as applied by a number of Contracting States on training, operational procedures for inspection, surveillance and enforcement.

### **3. Structure of the document**

In this document, distinction has been made between competencies of a “general nature” which are applicable to all State employees (see Note below) and competencies related to the actual “technical performance” of a State employee regarding their specific task in air transport (paragraph 5).

For the task-related competencies, the basic competency framework has been structured according to 3 levels as applied by ICAO in other aviation areas: **competency units, competency elements, and performance criteria** (definition: see chapter 2). Further detailing at these 3 levels has been derived from job and task analysis of common practices by some States.

Regarding the responsibilities of State employees and the principles applicable to the definition of the competency framework, distinction has been made between the different functional levels: *strategic, management and operational level*.

Taking into account the above, the competency framework for State employees is based on the following:

- a. *Core competencies applicable to all State employees*
  - Core competencies and personal attributes
  - General awareness, knowledge and skills
  
- b. *Competency units related to specific activities of State employees*
  - Promulgating regulations
  - Developing and issuing policy
  - Managing a dangerous goods oversight unit
  - Performing initial inspection for certification approval of an air operator(AOM)
  - Performing inspection of a passenger operator and a cargo Operator
  - Inspecting a dangerous goods shipper
  - Investigating dangerous goods incidents or accidents

*Note.— Core competencies have not been identified for State employees in this document. This will be done once the work of the Next Generation of Aviation Professionals task Force progresses its work and provides a standardized basis from which to work from.*

## 5. Competencies related to specific activities of State employees.

Dangerous goods are articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions. The transport of dangerous goods is recognized as an integral part of a State's overall safety oversight programme. Each State shall provide training to each of its dangerous goods employees which emphasizes a States specific dangerous goods standards and regulations. Training should be designed so that it enables all State employees involved in dangerous goods oversight to perform their tasks. In the same manner in which States require industries performing dangerous goods related functions to be trained in the transport of dangerous goods, States should provide their employees with training commensurate with their responsibilities. The following paragraphs are intended to identify competencies related to the specific activities conducted by dangerous goods state employees.

### 5.1 Competency unit: Establish and maintain dangerous goods oversight programme

#### *Introduction*

Each State shall take the necessary measures to achieve compliance with Annex 18 and the detailed provisions contained in the Technical Instructions for the Safe Transport of Dangerous Goods by Air.

The competency elements and related performance criteria at regulatory, policy and management level are as follows:

<b>Competency element</b>	<b>Performance criteria</b>	<b>Reference to int. regulations.</b>
Promulgate and maintain dangerous goods regulations	<ul style="list-style-type: none"> <li>• Ensure National dangerous goods regulations are complete and up- to-date.</li> <li>• Establish exemption and approval procedures</li> <li>• Establish procedures for approving operations specifications for the transport of dangerous goods</li> <li>• Establish regulations for oversight of Shippers of dangerous goods</li> <li>• Establish regulations for oversight of Operators for dangerous goods responsibilities</li> <li>• Participation with international rule making bodies as appropriate to support national safety programme</li> <li>• Initiating amendments to national dangerous goods regulations to implement changes to ICAO SARP's and regulations.</li> </ul>	Annex18: 2.7 National authority <i>Each Contracting State shall designate and specify to ICAO an appropriate authority within its administration to be responsible for ensuring compliance with this Annex.</i>

<b>Competency element</b>	<b>Performance criteria</b>	<b>Reference to int. regulations.</b>
Establish and maintain dangerous goods oversight programmes	<ul style="list-style-type: none"> <li>• Develop dangerous goods programme policy process</li> <li>• Develop risk based inspection programme</li> <li>• Establish inspection procedures and process</li> <li>• Develop, implement and maintain inspection protocols and tools</li> <li>• Develop compliance and enforcement programme and process</li> <li>• Develop a framework for an education programme to include response to public requests for advice and guidance</li> <li>• Support dangerous goods related research and development</li> <li>• Develop, implement and maintain initial and recurrent training programme for dangerous goods personnel</li> <li>• Develop and maintain performance plans and objectives for dangerous goods personnel</li> <li>• Develop and maintain occupational safety programme</li> </ul>	
<i>Conduct planning and organization</i>	<ul style="list-style-type: none"> <li>• Coordinate inspections programme.</li> <li>• Establish priorities (risk based approach).</li> <li>• Establish inspection procedures</li> <li>• Establish exemption and approval procedures</li> <li>• Coordinate input by staff into dangerous goods policies</li> <li>• Develop a framework for an education programme and response to requests for advice and guidance</li> </ul>	ICAO ANNEX 18, paragraph 2.1 <i>"States may grant exemptions from the provision, .etc</i> <i>Paragraph 2.5</i> <i>Notification of variations from the TI.</i>

<b>Competency element</b>	<b>Performance criteria</b>	<b>Reference to int. regulations.</b>
<i>Special operations</i>	<ul style="list-style-type: none"> <li>• Exercise sound judgment in granting of exemptions and approvals</li> <li>• Determine suitability of an operator or shipper to be granted an exemption or approval</li> <li>• Use judgment to detain an aircraft when appropriate</li> </ul>	Annex 18: 2.2.1 <i>Each Contracting State shall take the necessary measures to achieve compliance with the detailed provisions contained in the Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284),</i>

## 5.2 Competency unit: Conduct inspection for certification / approval of an operator

### *Introduction*

An operator engaged in commercial operations needs an Air Operators Certificate (AOC) issued by the State of the Operator. The AOC certification process for all operators includes elements related to dangerous goods (e.g. approval of training programmes and operations manual) to minimise the likelihood of safety being compromised by non-compliance with the requirements. Operators who wish to carry dangerous goods as cargo are subject to additional authorization, which is dependent on enhanced operational manuals and training programmes with adequate processes and procedures in place to ensure compliance with the requirements of the Technical Instructions . The competence elements and related performance criteria are defined as follows:

*Note.— Non-AOC operators are also subject to these requirements.*

<b>Competency element</b>	<b>Performance criteria</b>	<b>Reference to int. regulations.</b>
<i>Review of the application and the operations manual</i>	Verify: <ul style="list-style-type: none"> <li>• The identification of the applicant (Air Operators. certificate and authorized operations/ limitations)</li> <li>• Completion of appropriate application forms.</li> <li>• Clarification of administrative details of the approval process.</li> </ul>	ICAO ANNEX 6, para 4.2 " <i>Operational certification and supervision</i> ".  ICAO audit checklist: <i>Conduct an initial</i>

<b>Competency element</b>	<b>Performance criteria</b>	<b>Reference to int. regulations.</b>
	<ul style="list-style-type: none"> <li>• Dangerous goods acceptance, handling, loading, inspection and transport procedures.</li> <li>• Dangerous goods documentation management</li> <li>• Reporting procedures of dangerous goods incidents / accidents and undeclared or misdeclared dangerous goods</li> <li>• Emergency response procedures during ground handling and notification to emergency services</li> <li>• Emergency response guidance for incidents during flight and notification to ATC</li> <li>• Adequacy and operation of the internal Quality Monitoring System to ensure compliance to the TI.</li> </ul>	<i>inspection of a new operator or an operator intending to commence carriage of dangerous goods.</i>
<i>Approve operations manual</i>	<ul style="list-style-type: none"> <li>• Reviewing and approving the operations manual associated procedures and supporting documents.</li> </ul>	
<i>Inspect facilities</i>	<p>Conduct an inspection to verify:</p> <ul style="list-style-type: none"> <li>• The application by the operator’s staff of the dangerous goods procedures for acceptance, handling, loading, inspection and transport.</li> <li>• Familiarization of the operator’s staff accepting and handling the dangerous goods consignments and associated documents.</li> </ul>	Technical Instructions chapter 7 “Operators responsibilities”.
<i>Evaluate and approve training programmes</i>	<ul style="list-style-type: none"> <li>• Assessing the operator’s initial and recurrent training programme for aircrew, employees and agents against the TI requirements.</li> <li>• Assessing the program’s continuous evaluation and update process as appropriate due to changes in the TI, operations manual and dangerous goods procedures.</li> <li>• Assessing the dangerous goods instructor’s qualification against TI requirements.</li> </ul>	Technical Instructions paragraph 4.1 “Establishment of training programmes” and review by State authorities ( paragraph 4.1.2.).
<i>Provide recommendation report</i>	Provide a recommendation for issuing certificate / approval.	

### 5.3 Competency unit: Conduct Inspection of an Operator

#### **Introduction**

A State must inspect operators as part of routine surveillance and/or based upon non-compliance, trend analysis or safety concerns.

Note: Inspections may take place at facilities located on or off the airport and at those entities acting on behalf of the operator.

For each of the following competency elements and performance criteria, the inspector will utilize the applicable inspection method.

<b>Competency element</b>	<b>Performance criteria</b>	<b>Reference to int. regulations.</b>
<i>Conduct pre-inspection process</i>	<ul style="list-style-type: none"> <li>• Collect information on dangerous goods related activities of an Operator</li> <li>• Analyze information on dangerous goods related activities of an Operator</li> <li>• Organize inspection activities</li> </ul>	ICAO ANNEX 18, para11.1 Inspection systems: <i>Each Contracting State shall establish inspection, surveillance and enforcement procedures with a view to achieving compliance with its dangerous goods regulations.</i>  ICAO ANNEX 18 Chapter 8: <i>Operators responsibilities</i>
<i>Conduct inspection process</i>	Conduct opening briefing Evaluate compliance with: <ul style="list-style-type: none"> <li>• Shipping and transporting aircraft spares and their replacements</li> <li>• <b>Note: A shipper inspection is to be conducted on such activity.</b></li> <li>• Limitation of dangerous goods on aircraft</li> <li>• General applicability</li> <li>• Acceptance procedure requirements</li> <li>• Storage and Loading requirements</li> <li>• Inspection and decontamination requirements</li> <li>• Provision of information requirements</li> <li>• Provisions concerning passengers and crew</li> <li>• Provisions for dangerous goods carried by passengers and crew</li> <li>• Provisions to aid recognition of undeclared dangerous goods</li> <li>• Conduct closing briefing</li> </ul>	
<i>Conduct post inspection process</i>	<ul style="list-style-type: none"> <li>• Record inspection result</li> <li>• Determine follow up action</li> </ul>	

## 5.4 Competency unit: Conduct Inspection of Dangerous Goods Shipper

### *Introduction*

A State must inspect shippers as part of routine surveillance and/or based upon non-compliance, trend analysis or safety concerns. A shipper may be an individual person (e.g. sending a package via a courier company) or a large company (e.g. chemical supplier, operator, repair station or freight forwarder shipping dangerous goods).

For each of the following competency elements and performance criteria, the inspector will utilize the applicable inspection method.

<b>Competency element</b>	<b>Performance criteria</b>	<b>Reference to int. regulations.</b>
<i>Conduct pre-inspection process</i>	<ul style="list-style-type: none"> <li>• Collect information on dangerous goods activities of shipper</li> <li>• Analyze information on dangerous goods activities of shipper</li> <li>• Organize inspection activities</li> </ul>	ICAO ANNEX 18, para11.1 Inspection systems: <i>Each Contracting State shall establish inspection, surveillance and enforcement procedures with a view to achieving compliance with its dangerous goods regulations.</i>
<i>Conduct inspection process</i>	Conduct opening briefing Evaluate compliance with: <ul style="list-style-type: none"> <li>• Provision of information to employees requirements</li> <li>• training requirements</li> <li>• classification requirements</li> <li>• documentation requirements</li> <li>• packaging requirements</li> <li>• labeling requirements</li> <li>• marking requirements</li> <li>• unit load device loading requirements, as applicable</li> <li>• Conduct closing briefing</li> </ul>	ICAO ANNEX 18 <i>Chapter 7: Shippers responsibilities</i>
<i>Conduct post inspection process</i>	<ul style="list-style-type: none"> <li>• Record inspection result</li> <li>• Determine follow up action</li> </ul>	ICAO audit checklist: <i>Conduct an ad-hoc assessment on dangerous shipping and handling procedures of operators</i>



## 5.5 Competency unit : Conduct Investigation

### **Introduction**

With the aim of preventing the recurrence of non-compliances with the Technical Instructions which occur in its territory and which involve the transport of dangerous goods originating in or destined for another State, Contracting States must establish procedures for the investigation of:

- dangerous goods accidents;
- dangerous goods incidents;
- discoveries of undeclared or mis-declared dangerous goods; and
- discoveries of dangerous goods in baggage which are not permitted

As part of a State's enforcement obligation, procedures must also be established for the investigation of other non-compliances (e.g. when discovered during an inspection).

The competence elements and related performance criteria are defined as follows:

<b>Competency element</b>	<b>Performance criteria</b>	<b>Reference to int. regulations.</b>
<i>Conduct pre-investigation process</i>	<ul style="list-style-type: none"> <li>• Collect information on dangerous goods related activities of an Operator</li> <li>• Analyze information on dangerous goods related activities of an Operator</li> <li>• Analyze event against regulatory framework</li> <li>• Organize investigation</li> <li>• Identify resources required</li> </ul>	ICAO Annex 18: paragraph 12.1 <i>Contracting State shall establish procedures for investigating and compiling Information of dangerous goods incidents.</i>
<i>Conduct investigation process</i>	<ul style="list-style-type: none"> <li>• Conduct interviews</li> <li>• Collect evidence</li> <li>• Assess evidence</li> <li>• Document investigation</li> <li>• Recommend corrective action</li> </ul>	ICAO audit checklist: <i>Conduct an investigation on dangerous goods incidents and dangerous goods occurrences resulting from violations of the dangerous goods regulations;</i>  ICAO ANNEX 18, Paragraph 9.6: <i>Provision of information in event of an aircraft accident or incident</i>