APPENDIX H—TRAINING PROVISIONS UNDER THE COMPETENCY-BASED TRAINING APPROACH

Introduction

The goal of competency-based training and assessment is to provide focused training in order to produce a competent workforce. It does so by identifying key competencies that need to be achieved, determining the most effective way of achieving them and establishing valid and reliable assessment tools to evaluate their achievement.

ICAO introduced the Procedures for Air Navigation Services—Training (PANS-TRG, Doc 9868) in the form of guidance as a first step towards implementation of competency-based training in 2006. Since then, competency-based training assessment guidance has been developed for several aviation functions including aircraft maintenance personnel, designated medical examiners, flight procedure designers, flight validation pilots, air traffic controllers and air traffic safety electronics personnel.

The ICAO Dangerous Goods Panel (DGP) undertook the development of guidance on a competency-based approach to dangerous goods training. The guidance aims to assist operators and other entities involved in the transport of dangerous goods to implement a competency-based approach.

The IATA DGR require that employers ensure personnel are trained to perform their designated function(s) competently. While a competency-based training approach is an effective way to ensure compliance with dangerous goods training requirements, other training approaches may also be considered acceptable as long as they result in the development of a trained person competent to perform their designated function(s).

An essential component of a competency-based approach to training is the development of a competency framework. A competency framework is a structure outlining an employee's expected performance for given functions. The framework consists of competency units, competency elements and performance criteria. Competency standards are defined based on expected job performance in a specific work context.

While the wording of the revised provisions has changed, the principle of "commensurate with responsibilities" and the goal of ensuring all employees perform their functions competently has not. The revisions simply emphasize these principles by supporting a competency-based approach to training and assessment and provides guidelines and tools for the implementation.

A summary of the most noticeable changes to be considered are:

1. **Removal of Table 1.5.A and Table 1.5.B:**

    — Tables 1.5.A and 1.5.B currently match various categories of dangerous goods personnel with specific subject matter for which they should be familiar. While these tables are intended as guidance, they are often considered as mandatory requirements which contradicts the overarching principle of "commensurate with responsibilities" required of dangerous goods training curricula in DGR 1.5.2.1. This has led to the unintended consequence of training curricula being developed based on employee titles or positions instead of the functions they perform resulting in some employees being trained on subject matter unrelated to the functions they perform and not being adequately trained on subject matter that is related to the functions they perform. This approach is in complete contrast to the principles of competency-based training and assessment. By removing the tables, the need for employers to determine the type and level of knowledge necessary to perform specific functions is reinforced and supports the requirement for employees to be trained commensurate with their responsibilities.

2. **Shift from requiring tests to verify understanding to requiring continuous assessment of competency:**

    — The Regulations currently require the provision of tests following training to verify understanding. While this method is useful in determining the degree to which dangerous goods personnel may understand the material, it should not be the only activity that an employer utilizes to assess an employee's competency in an assigned function. The application of a competency-based approach is to determine the expected standards of performance of personnel. Once established, these standards support the development of appropriate assessment to ensure that personnel not only understand the subject matter involved in their job, they also have the required skills and knowledge to carry out their function in compliance with safety standards.

The provisions below represent the additional attachments to be published by ICAO in the 2017-2018 edition of the Technical Instructions. The objective is to seek comment from States and all parties involved on the proposed content for competency-based dangerous goods training and its impact. ICAO will be collecting

feedback and comments. These must be submitted by **31 March 2017** through the following web site:

Website:
www.icao.int/safety/DangerousGoods/Pages/NewTraining
Provisions0630-4506.aspx

Based on comments received, further amendments to the proposed training provisions, competency framework and additional guidance material may be presented to the DGP for further consideration at its twenty-sixth meeting which will be held during the fourth quarter of 2017 for possible inclusion in the 2019-2020 Edition of the Technical Instructions.

Since these changes are significant, and given the need for all parties in the transport chain to be aware of the potential impact on existing dangerous goods training programs, we provide below the relevant information on how it would modify Section 1.5 of the DGR. The related information presented below includes:

● impending changes to Section 1.5 of the DGR;
● competency framework developed by the ICAO DGP Training Working Group.

Notes:
1. *Editorial notes have been added where appropriate to assist users to understand the implications of the changes. Provisions that are still subject to ongoing discussion by the ICAO DGP are enclosed in square brackets [ ] to identify that they may not appear as shown in this appendix or may be modified in the final Regulations.*

2. *To assist readers of this appendix, the section references in the appendix reflect those within the DGR, for example H.1.5.A identifies the changes that will appear in 1.5. The likely impact on the various DGR sections are identified by way of the standard reference marks used throughout the DGR (see Appendix B.2.1).*

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SECTION H.1—APPLICABILITY

H.1.5 Training Requirements

△ H.1.5.0 General

[The employer must ensure that personnel are competent to perform any function described in these Instructions for which they are responsible prior to performing any of these functions. This must be achieved through training and assessment.]

[The employer must ensure that personnel with responsibilities for the processing, acceptance or handling of cargo, mail or passengers or of checked and/or carry-on baggage are competent to perform the function for which they are responsible prior to performing any of these functions. This must be achieved through training and assessment.]

H.1.5.1 Dangerous Goods Training Programmes

△ H.1.5.1.1 Establishment and Maintenance

H.1.5.1.1.1 The employer must establish and maintain a dangerous goods training programme.

Note:
A training programme includes elements such as design methodology, assessment, initial and recurrent training, instructor qualifications and competencies, training records and evaluation of the effectiveness of training.

H.1.5.1.1.2 Training courses may be developed and delivered by or for the employer.

Note:
General information on the provisions for dangerous goods carried by passengers and crew (see 2.3) should be included in training courses, as appropriate.

H.1.5.1.1.3 Personnel must be trained and assessed commensurate with the functions for which they are responsible prior to performing any of these functions. Personnel that have received training but that are assigned to new functions must be assessed to determine their competence in respect of their new function. If competency is not demonstrated, appropriate additional training must be provided. Personnel must be trained to recognize the hazards presented by dangerous goods, to safely handle them and to apply appropriate emergency response procedures.

Note:
[In order to prevent the introduction of undeclared dangerous goods into air transport, any person who performs functions that may indirectly impact the movement of cargo, COMAT, baggage, passengers, or mail such as passenger or cargo reservation personnel and engineering personnel should also be trained.]

H.1.5.1.1.4 Personnel must receive recurrent training and assessment within 24 months of previous training and assessment to ensure that competency has been maintained. However, if recurrent training and assessment is completed within the final three months of validity of the previous training and assessment, the period of validity extends from the month on which the recurrent training and assessment was completed until 24 months from the expiry month of that previous training and assessment.

H.1.5.1.1.5 All operators must establish a dangerous goods training programme regardless of whether or not they are approved to transport dangerous goods as cargo.

H.1.5.1.1.6 Security personnel who are involved with the screening of passengers and crew and their baggage and cargo or mail must be trained irrespective of whether the operator on which passenger or cargo is to be transported carries dangerous goods as cargo.

H.1.5.1.2 Designated Postal Operators Training Programmes

Staff of designated postal operators must be trained commensurate with their responsibilities. The subject matter to which their various categories of staff should be familiar with is indicated in Table H.1.5.A.

H.1.5.1.3 Review and Approval

H.1.5.1.3.1 Dangerous goods training programmes for operators' personnel must be subjected to review and approval by the appropriate authority of the State of the operator.

H.1.5.1.3.2 Dangerous goods training programmes of designated postal operators must be subjected to review and approval by the civil aviation authority of the State where the mail was accepted by the designated postal operator.

H.1.5.1.3.3 Dangerous goods training programmes for personnel with responsibilities related to dangerous goods as mentioned in H.1.5.0, other than operators and designated postal operators, should be reviewed and approved as determined by the appropriate national authority.

H.1.5.1.4   Record of Training and Assessment

H.1.5.1.4.1   The record of training and assessment must be maintained, which must include:

- the individual's name;
- the most recent training and assessment completion month;
- a description, copy or reference to training and assessment materials used to meet the training and assessment requirements;
- the name and address of the organization providing the training and assessment; and
- evidence which shows that personnel have been assessed as competent to perform their responsibilities.

H.1.5.1.4.2   The training and assessment records must be retained by the employer for a minimum period of thirty-six months from the most recent training and assessment completion month and must be made available upon request to the employee or appropriate national authority.

H.1.5.1.5   Instructor Qualifications

H.1.5.1.5.1   Unless otherwise provided for by the appropriate national authority, instructors of initial and recurrent dangerous goods training programmes must demonstrate or be assessed as competent in instruction and the function that they will instruct prior to delivering such a dangerous goods training programme.

Note:
"Adequate instructional skills" can come from a variety of methods. A list of instructional techniques is found in the IATA Guidelines for Instructors of Dangerous Goods Courses.

H.1.5.1.5.2   Instructors delivering initial and recurrent dangerous goods training programmes must at least every 24 months deliver such a course, or in the absence of this attend recurrent training. Instructors must receive and understand updates to dangerous goods information and be made familiar with those changes by training or other means on an annual basis or as the Regulations are modified.

H.1.5.1.5.3   Organisations must ensure that the instructor receives updates to the Regulations and training material on an annual basis with the issuance of each edition of the DGR.

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TABLE H.1.5.A
Minimum Requirements for Training Curricula for Designated Postal Operators (H.1.5.1.2)

Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum	Designated Postal Operators		
	Category		
	a	b	c
General philosophy	X	X	X
Limitations	X	X	X
General requirements for shippers	X		
Classification	X		
List of dangerous goods	X		
General packing requirements	X		
Packing instructions	X		
Labelling and marking	X	X	X
Shipper's Declaration and other relevant documentation	X	X	
Acceptance of the dangerous goods listed in 2.4	X		
Recognition of undeclared dangerous goods	X	X	X
Storage and loading procedures			X
Provisions for passengers and crew	X	X	X
Emergency procedures	X	X	X

CATEGORY

(a) Staff of designated postal operators involved in accepting mail containing dangerous goods

(b) Staff of designated postal operators involved in processing mail (other than dangerous goods)

(c) Staff of designated postal operators involved in the handling, storage and loading of mail

H.1.5.2 Guidance Material

The following tools have been develop by the ICAO DGP Dangerous Goods Training Working Group as guidelines in the development and implementation of dangerous goods training under a competency based training approach.

H.1.5.2.1 Dangerous Goods Competency Framework

Abbreviations used

Abbreviation—Meaning

CU—Competency Unit

CE—Competency Element

PC—Performance Criteria

Competency Framework

CU 1 Classifying dangerous goods

CE 1.1 Evaluate substances or articles against classification criteria, as applicable

PC 1.1.1 Determine if it is dangerous goods

PC 1.1.2 Determine if it is forbidden under any circumstances

CE 1.2 Determine dangerous goods description

PC 1.2.1 Determine class or division

PC 1.2.2 Determine packing group, if applicable

PC 1.2.3 Determine proper shipping name and UN number

PC 1.2.4 Determine if it is forbidden unless approval or exemption is granted

CE 1.3 Review special provisions

PC 1.3.1 Assess if special provision(s) is applicable

PC 1.3.2 Apply special provision(s)

CU 2 Preparing dangerous goods shipment

CE 2.1 Assess packing options including quantity limitations

PC 2.1.1 Consider limitations (de minimis quantities, excepted quantities, limited quantities, passenger aircraft, cargo aircraft only, special provisions)

PC 2.1.2 Consider State and operator variations

PC 2.1.3 Determine if all-packed-in-one can be used

PC 2.1.4 Select how dangerous goods will be shipped based on limitations and variations

CE 2.2 Apply packing requirements

PC 2.2.1 Consider constraints of packing instructions

PC 2.2.2 Select packaging materials (absorbent, cushioning, etc.)

PC 2.2.3 Assemble package

CE 2.3 Apply marks and labels

PC 2.3.1 Determine applicable marks

PC 2.3.2 Apply marks

PC 2.3.3 Determine applicable labels

PC 2.3.4 Apply labels

CE 2.4 Determine if overpack can be used

PC 2.4.1 Apply marks if necessary

PC 2.4.2 Apply labels if necessary

CE 2.5 Prepare documentation

PC 2.5.1 Complete the dangerous goods transport document (Shipper's Declaration)

PC 2.5.2 Complete other transport documents (e.g. AWB)

PC 2.5.3 Include other required documentation (e.g. approvals/exemptions, etc.), as applicable

PC 2.5.4 Retain copies of documents as required

CU 3 Processing/accepting cargo

CE 3.1 Review documentation

PC 3.1.1 Verify air waybill

PC 3.1.2 Verify dangerous goods transport document (Shipper's Declaration)

PC 3.1.3 Verify other documents as applicable (exemptions, approvals, etc.)

PC 3.1.4 Verify State/operator variations

CE 3.2 Review package(s)

PC 3.2.1 Verify marking

PC 3.2.2 Verify label

PC 3.2.3 Verify package type

PC 3.2.4 Verify package conditions

PC 3.2.5 Verify State/operator variations

CE 3.3 Complete acceptance procedures

PC 3.3.1 Complete acceptance checklist, if applicable

PC 3.3.2 Provide shipment information for load planning

PC 3.3.3 Retain documents as required

CE 3.4 Process/accept cargo other than dangerous goods

PC 3.4.1 Check documentation for indications of undeclared dangerous goods

PC 3.4.2 Check packages for indications of undeclared dangerous goods

CU 4 Managing cargo pre-loading

CE 4.1 Plan loading

PC 4.1.1 Determine stowage requirements

PC 4.1.2 Determine segregation, separation, aircraft/compartment limitations

CE 4.2 Prepare load for aircraft

PC 4.2.1 Check packages for indications of undeclared dangerous goods

PC 4.2.2 Check for damage and/or leakage

PC 4.2.3 Apply stowage requirements (e.g. segregation, separation, orientation)

PC 4.2.4 Apply ULD tags when applicable

PC 4.2.5 Transport cargo to aircraft

CE 4.3 Issue NOTOC

PC 4.3.1 Enter required information

PC 4.3.2 Verify conformance with load plan

PC 4.3.3 Transmit to loading personnel

CU 5 Accepting passenger and crew baggage

CE 5.1 Process baggage

PC 5.1.1 Identify forbidden dangerous goods

PC 5.1.2 Apply approval requirements

CE 5.2 Accept baggage

PC 5.2.1 Apply operator requirements

PC 5.2.2 Advise pilot in command

CU 6 Transporting cargo/baggage

CE 6.1 Load aircraft

PC 6.1.1 Transport cargo/baggage to aircraft

PC 6.1.2 Check packages for indications of undeclared dangerous goods

PC 6.1.3 Check for damage and/or leakage

PC 6.1.4 Apply stowage requirements (e.g. segregation, separation, orientation)

PC 6.1.5 Verify that NOTOC reflects against aircraft load

PC 6.1.6 Verify passenger baggage requirements if applicable

PC 6.1.7 Inform pilot-in-command and flight operations officer/flight dispatcher

CE 6.2 Manage dangerous goods during flight

PC 6.2.1 Detect presence of dangerous goods not permitted in baggage

PC 6.2.2 Apply procedures in the event of an emergency

PC 6.2.3 Inform flight operations officer/flight dispatcher/air traffic control in the event of an emergency

CE 6.3 Unload aircraft

PC 6.3.1 Apply specific unloading considerations as applicable

PC 6.3.2 Check packages for indications of undeclared dangerous goods

PC 6.3.3 Check for damage and/or leakage

PC 6.3.4 Transport cargo/baggage to facility/terminal

TABLE H.1.5.2.A
Dangerous Goods Competency Framework

Template for determining the knowledge personnel performing specific functions should maintain
(CU = Competency Unit CE = Competency element)

Dangerous goods knowledge	CU 1 Classifying dangerous goods			CU 2 Preparing dangerous goods shipment					CU 3 Processing/ accepting cargo				CU 4 Managing cargo pre-loading			CU 5 Accepting passenger and crew baggage		CU 6 Transporting cargo/baggage		
	CE 1.1	CE 1.2	CE 1.3	CE 2.1	CE 2.2	CE 2.3	CE 2.4	CE 2.5	CE 3.1	CE 3.2	CE 3.3	CE 3.4	CE 4.1	CE 4.2	CE 4.3	CE 5.1	CE 5.2	CE 6.1	CE 6.2	CE 6.3
Scope and applicability																				
Limitation of dangerous goods on aircraft																				
Definitions																				
Training																				
Dangerous goods security																				
General provisions concerning radioactive material																				
Reporting of dangerous goods accidents, incidents and other occurrences																				
Classification—General																				
Classification—Class 1																				
Classification—Class 2																				
Classification—Class 3																				
Classification—Class 4																				
Classification—Class 5																				
Classification—Class 6																				
Classification—Class 7																				
Classification—Class 8																				
Classification—Class 9																				
Dangerous goods list—General																				
Dangerous goods list—Arrangement																				
Special provisions																				
Dangerous goods in limited quantities																				
Dangerous goods packed in excepted quantities																				
Packing Instructions—General																				
Packing Instructions—Class 1																				
Packing Instructions—Class 2																				
Packing Instructions—Class 3																				
Packing Instructions—Class 4																				
Packing Instructions—Class 5																				
Packing Instructions—Class 6																				
Packing Instructions—Class 7																				
Packing Instructions—Class 8																				

TABLE H.1.5.2.A
Dangerous Goods Competency Framework *(continued)*

Template for determining the knowledge personnel performing specific functions should maintain
(CU = Competency Unit CE = Competency element)

Dangerous goods knowledge	CU 1 Classifying dangerous goods			CU 2 Preparing dangerous goods shipment					CU 3 Processing/ accepting cargo				CU 4 Managing cargo pre-loading			CU 5 Accepting passenger and crew baggage		CU 6 Transporting cargo/baggage		
	CE 1.1	CE 1.2	CE 1.3	CE 2.1	CE 2.2	CE 2.3	CE 2.4	CE 2.5	CE 3.1	CE 3.2	CE 3.3	CE 3.4	CE 4.1	CE 4.2	CE 4.3	CE 5.1	CE 5.2	CE 6.1	CE 6.2	CE 6.3
Packing Instructions—Class 9																				
Preparing dangerous goods shipment—general																				
Package markings																				
Labelling																				
Documentation																				
Packaging applicability, nomenclature and codes																				
Marking of packagings other than inner packagings																				
Requirements for packagings																				
Packaging performance tests																				
Requirements for the construction and testing of cylinders and closed cryogenic receptacles, aerosol dispensers and small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas																				
Packagings for infectious substances of Category A																				
Requirements for the construction, testing and approval of packages for radioactive material and for the approval of such material																				
Acceptance procedures																				
Storage and loading																				
Inspection and decontamination																				
Provision of information																				
Provisions concerning passengers and crew																				
Provisions to aid recognition of undeclared dangerous goods																				
Helicopter operations																				
Provisions for dangerous goods carried by passengers or crew																				

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Competency elements

1.1—Evaluate substances or articles against classification criteria, as applicable

1.2—Determine dangerous goods description

1.3—Review special provisions

2.1—Assess packing options including quantity limitations

2.2—Apply packing requirements

2.3—Apply marks and labels

2.4—Determine if overpack can be used

2.5—Prepare documentation

3.1—Review documentation

3.2—Review package(s)

3.3—Complete acceptance procedures

3.4—Process/accept cargo other than dangerous goods

4.1—Plan loading

4.2—Prepare load for aircraft

4.3—Issue NOTOC

5.1—Process baggage

5.2—Accept baggage

6.1—Load aircraft

6.2—Manage dangerous goods during flight

6.3—Unload aircraft

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**FIGURE H.1.5.2.B
Dangerous Goods Functions Process Flowchart**