

Discussion Paper #1

Developing a framework for a modern TDG Training Regime

Governments and industry have long recognized that the safe transport of dangerous goods depends on well trained people who are aware of the risks that these goods pose and their potential for causing accidents.

Part 6 of the TDG Regulations requires that a person who handles, offers for transport, transports, or imports dangerous goods be adequately trained and hold a training certificate. The only exception to this rule is if that person performs those activities in the presence and under the direct supervision of a person who is adequately trained and who holds a training certificate.

There exists ambiguity around what it means for someone to be considered “adequately trained”. Persons are deemed to be adequately trained if they have a sound knowledge of topics that relate directly to their duties and to the dangerous goods handled, offered for transport, transported, or imported. Employers issue a training certificate to an employee when they believe that the employee is adequately trained. Currently, all a training certificate demonstrates is that the employee has received training – it does not evaluate the level of knowledge or skill of the employee.

Transport Canada (TC) does not specify a curriculum, training standard or competency framework, which makes it difficult to measure the success of the training. TC recognizes that there is a need for more stringent training requirements to ensure that all dangerous goods training certificate holders are competent to do their job safely. TC understands that any training regime must be flexible based on the industry and the job functions performed.

TC is considering various options to ensure that all persons involved in the handling, offering for transport, transporting, or importing of dangerous goods are “adequately trained”. These options include: competency-based training and assessment; standardized curriculum and standardized tests; certification of individuals and accreditation of training institutions; as well as other options. Note that, not all options will be implemented and that the final proposed amendments to the regulations may be some combination of options that would deliver on the goals of increasing clarity, compliance, and public safety.

Discussion Paper #2

Competency-Based Training and Assessment

Issue

The goal of this discussion paper is to present the idea of competency-based training and assessment (CBTA) as a potential option for training persons who handles, offers for transport, transports or imports dangerous goods. It is not an exhaustive narrative on CBTA but rather a high level synopsis aimed to support discussion and debate on the feasibility of developing a transportation of dangerous goods (TDG) CBTA program.

Background

CBTA is not a new concept; its roots can be traced to the efforts in the 1960s in the United States to reform teacher education and training.¹ Since then, the concept has been exported, adopted, and adapted to meet the training requirements of industry.

The CBTA concept is performance and standards-based and is related to realistic workplace practices. By focusing on the result of the training, CBTA ensures that persons are equipped with the skills and knowledge specific to their industry. From a practical perspective, CBTA focuses on what a person can do rather than the courses taken, and it measures a person's achievement against an industry or workplace benchmark rather than a person's achievement relative to others in a group.

The idea of 'competency' is central to CBTA. According to an Australian definition, found in their qualifications framework, competency is the "specification of knowledge and skill and the application of these within the workplace to the standard or performance required"². Inherent in this definition is the transferability of learned skills, knowledge, and behaviours to new situations and environments. These behaviours help describe the competency and affect the performance of the task. By extension, a competency standard that is used to assess persons defines the major skill area(s) of an industry and relates to realistic workplace activities.

Assessing what an individual has learned is an important element of CBTA. Without assessment, there is no way to know what competencies a person has and if the training would enable them to enter and succeed in the workplace. With the CBTA concept, assessment is a process that involves the collection of evidence and judgments about a person's performance against established competency standards. To assist with this process, assessments often include measurement criteria to lessen subjectivity and heighten performance outputs.

¹ UMUC Centre for Innovation in Learning and Student Success, pg 1.

² National Training Reform – Australian Qualifications Framework.

The CBTA concept recognizes that people learn at different rates, therefore the training activities are centred on the learner and their particular needs. As a result, CBTA is self-paced with opportunities for feedback and has performance improvement built into the learning plan. The training becomes more of a coaching program whereby learners can work toward mastering the skills, behaviours, and knowledge needed for their jobs. Assessment, which is not a one-size-fits-all test, will occur only when learners are ready to have their knowledge and skills assessed.

CBTA and the Transportation of Dangerous Goods

In Australia, the *Model Subordinate Law on the Transport of Dangerous Goods by Road or Rail 2007*, as referenced in the Australian Dangerous Goods Code 7.3, states that a person who is responsible for management or control of a task related to dangerous goods must not employ, engage or permit someone else to perform the task if the other person has not received, or is not receiving, appropriate instruction and training so as to be in accordance with the Code and the subordinate law. All training and testing must ensure that a person has the skills and knowledge to perform the task safely.

There are many training courses available that pertain to the transportation of dangerous goods ranging from the most basic course which covers the skills and knowledge required to prepare for the transport of dangerous goods (checking the dangerous goods load; assessing vehicle suitability to transport the intended load; checking emergency procedures and equipment; evaluating documented route plan) to advanced courses related to licensing, legislative, regulatory or certification requirements of the current Australian Dangerous Goods Code. The training is designed according to the competency required and desired behaviours of individuals who want to work in the industry.

The International Civil Aviation Organization (ICAO) provides another example for the implementation of the CBTA concept with regard to the transportation of dangerous goods. ICAO has drafted a number of related documents including guidance material, a generic competency framework, a template for determining the level of knowledge for each function, as well as proposed amendments to the training provisions in Chapter 4 of Part 1 of the Technical Instructions. The idea behind the new provisions is to ensure that employees are trained to perform their dangerous-goods related functions competently. Employers remain responsible for establishing and maintaining a dangerous goods training programme; however the type of training and assessment to be administered may be based on the CBTA model.

ICAO's guidance material and generic competency framework documents are helpful in understanding the requirements needed to adopt the CBTA model for TDG training writ large. Collectively, these two documents outline the expectations and responsibilities for all involved in the adoption of CBTA (employer, instructor, trainee and the regulator) and clarifies the skills required to safely work with and handle dangerous goods. In addition, these templates may help standardize the training programs offered and by default create a skilled workforce with portable training.

Potential Option

Transport Canada is considering the development and adoption of the CBTA concept for the transportation of dangerous goods. This could be structured as an introduction to the transport of dangerous goods and would cover the training requirements currently listed in Part 6 of the TDG Regulations. All of the requirements would be tied to a competency or competencies required of persons to safely do their tasks. These competencies would be developed in conjunction with industry to ensure that the training and assessment meet the needs of industry.

The generic competency framework developed by ICAO can be used as an example of how to structure a Canadian TDG competency framework, with a focus on competencies that apply regardless of mode of transports (air, marine, rail and road) or degree of responsibility. The initial and on-going assessments would be structured to ensure that the theoretical knowledge of how to do something is demonstrated by the skills and behaviours that are developed throughout the training. Employers would retain the discretion to refer their employees for in-depth or specific training should the job require it.

Discussion Paper #3

Standardized Tests

Issue

Currently, there is no nation-wide standardized curriculum and test that allows employers, via institutions, to uniformly and consistently test and certify their employees who are involved in the transportation of dangerous goods (TDG). This lack of a measurable national benchmark does not provide an objective framework to assess whether individuals involved in the transport of dangerous goods are adequately trained. In addition, while individuals can demonstrate that they are qualified by providing a valid certificate, there is no way to validate what “qualified” means.

This paper reviews options for a standardized test for TDG training based on tests that have been developed at Transport Canada (TC) but not directly related to the transportation of dangerous goods, and tests that have been developed externally by international trade associations or other governments, which are directly related to the transportation of dangerous goods.

The goal of this paper is to stimulate discussions and present options for the development of a standardized test(s) through potential amendments to Part 6 (Training) of the regulations.

Background

According to the SAGE Encyclopedia of Social Science Research Methods, a *standardized test* has certain distinct features such as:

- having clearly stated purposes;
- being developed using highly structured procedures;
- having carefully controlled conditions of administration;
- utilizing systematic score interpretation; and
- possessing various technical properties.¹

This implies that a standardized test is well structured, however its development may be resource intensive as various iterations of the test need to be evaluated and agreed upon by consensus. By providing a national benchmark, a standardized test can be used as a tool to accredit institutions, certify trainers, and confirm an employee’s eligibility for subsequent certification by an employer.

Research indicates that other areas within TC already have standardized tests, for example, marine tanker safety training courses, and Railway Employee Qualification Standards. Collectively, these programs utilize general testing to assess the basic skills required to do the

¹ The SAGE Encyclopedia of Social Science Research Methods, Volume 1. By Michael S. Lewis-Beck, Alan Bryman, Tim Futing Liao. ISBN: 0-7619-2363-2 p. 1070.

job, and specialized testing to assess special knowledge and skills, based on the concept of competency-based training and assessment.

Considerations

Possible advantages of Standardized Curriculum and Testing:

- Allow for the assessment of an employee's understanding of what they need to know to do their job and to comply with the legislation.
- Identify specific areas of training where the employee has a poor understanding and therefore needs to pay particular attention.
- Improve training programs by identifying problem areas that are not attributed to the employee but to the program itself.
- Provide guidance to trainers since standardized tests often have an instructional framework that specifies what needs to be taught and the most appropriate training tools and/or approach for effective delivery.
- Establish performance standards that would allow employees, trainers, and training institutions to monitor and improve performance on an ongoing basis.
- Expand the existing pool of trained employees available to an employer by allowing for mobility between employers and within jurisdictions, thereby reducing labor shortages.

Possible disadvantages of Standardized Curriculum and Testing include:

- They can cause trainers and institutions to only “teach or train to pass the test,” thereby not allowing for the development of analytical thinking and judgment that is necessary to ensure compliance.
- They evaluate an employee's performance on one particular day which may not be reflective of the employee's ability to retain and apply the knowledge over a period of time, nor the employee's commitment to continuous improvement.
- They can be resource intensive and time consuming to develop, especially where there may be difficulties in reaching consensus.

Special instances

Recognizing the complexity of the TDG regime, based on the various classes of dangerous goods and multiple job functions, there may be varying capacity conditions nationwide depending on geographical locations. Therefore standardized testing may need to allow for greater flexibility, yet maintain a degree of consistency. For example, in remote areas, an employee may hold multiple job responsibilities (e.g., consignor and truck driver primarily dealing with air transport) which requires a wide base of knowledge; however, the employee may not need to have knowledge, or be tested, in another area (e.g., rail transport) because their job responsibility may never require it.

However, in cases where the employee transitions to another role or geographical location, standardized testing, based on a bank of questions, would allow for a form of graduated testing and would provide flexibility for this transition. For example, if the employee moves to a large city that primarily transports dangerous goods by rail, then a test specifically on Part 10 (Rail) of the *Transportation of Dangerous Goods Regulations* could be administered to ensure specialized knowledge in that area.

Using a nation-wide standardized test would also allow for transferability insofar as this would be similar to how drivers' test are transferable between provincial and territorial jurisdictions, allowing for individuals to move from one province/territory to another and not require another driver's test to be taken unless they are changing class type.

Potential Option

A potential option could entail working with partners and stakeholders (e.g., Employment and Social Development Canada, provinces and territories, training institutions, trade associations, etc.) to develop an approved competency framework that would form the basis for developing a standardized curriculum and test. This would set a nationwide baseline to assess individuals who must achieve a set pass mark that demonstrates that they are adequately trained and can be certified, and that they possess the necessary skills to be involved in the safe transport of dangerous goods nationally.

Generalized Test

One method that could be employed in the testing is to use a bank of questions where each part of the regulations (e.g., classification, documentation, means of containment, etc.) has a pre-approved bank of questions from which the training institution can draw upon to test individuals. Variance in the testing could either be through a set number and a set selection of questions to be used, or either through a set number and a randomized selection of questions to be used by the institution; in any case, the questions would be originating from a pre-determined set that would allow for a controlled setting.

Specialized Test

Specialized tests may need to be administered to demonstrate an employees' knowledge based on specific job responsibilities. For example, someone who is a consignor may require different knowledge than a truck driver who is transporting the dangerous goods, as the consignor is responsible for areas such as classification, documentation, Safety Marks, Means of Containment, etc; whereas a truck driver requires knowledge in Safety Marks, Documentation (placement within the truck), Emergency Response Assistance Plans, and Accidental Release and Imminent Accidental Release Report Requirements. In order to achieve this, it may be possible to develop additional tests with the other questions in the bank of questions that the consignor (or the truck driver) would need to pass for an extra level of certification in the respective specialized areas.

Part 6 - Discussion Paper #4

Certification and Accreditation

Issue:

Part 6 (Training) of the Transport of Dangerous Goods Regulations (TDGR) requires a person who handles, offers for transport, transports or imports dangerous goods to be “adequately trained” and hold a training certificate. However, there is ambiguity around what it means for a person to be adequately trained and the usefulness of a training certificate is questionable; it only demonstrates that a person has received training – it does not evaluate the person’s level of knowledge or skill. Furthermore, the variability of options available contributes to a mixed market for transportation of dangerous goods (TDG) training that can result in inconsistently trained persons.

This discussion paper examines a number of options that may increase the consistency of training by validating the training offered through independent quality monitoring and endorsement from a higher authority. These options include the accreditation of training institutions, and the certification of trainers and employees.

Background/Context:

Accreditation: Accreditation is the certification of an institution or organization to train and administer the testing of an employee or individual’s competency and knowledge. Accreditation by a government, regulatory body or other industry recognized authority provides legitimacy to the training institution and its training material and provides assurance that certificates obtained through the institution are an accepted proof of competency.

Certification: Certification of an employee or trainer is a recognized credential granted by a certification body or other legitimate authority upon demonstration of competency. Competency is the measurable skill or set of skills and level of knowledge required to perform job-specific tasks. Certification by a government body, such as Transport Canada (TC), provides a nationally recognized assurance that certain competencies have been demonstrated.

Accreditation and certification typically require the use of a prescribed set of learning and testing materials, an audit of teaching methods, the administration and passing of an approved test of essential information, and/or other predetermined criteria respectively.

Current TDG training regime:

A number of private organizations offer TDG training to persons who handle, offer for transport, transport, or import dangerous goods. While TC maintains an online list of organizations across Canada that offer training, it does not validate or endorse these institutions or their trainers¹.

¹ <http://wwwapps.tc.gc.ca/saf-sec-sur/3/train-form/search-eng.aspx>

Furthermore, there is a diverse range of options offered for training in terms of cost, duration, and content. For example, courses can range in price and vary widely in format from online self-learning to multi-day classroom sessions. Content also ranges from general “TDG 101” material to more specialized, mode-and-role specific advanced courses.

This inconsistency contributes to a varied market for TDG training. It can result in inconsistently trained operators and employees, potentially increasing the risk associated with the transport of dangerous goods.

Proposed Options:

Accreditation of institutions and/or the certification of trainers or persons who handle, offer for transport, transport or import could potentially be administered by TC.

Accreditation: Training institutions are already “certifying” handlers, shippers, and receivers of dangerous goods in Canada; however, accreditation of these institutions would allow TC to ensure that there is consistency in the quality of the TDG courses offered. Training institutions could apply to TC for an audit of their training courses and programs. The completion of a successful audit by TC would result in the training institution receiving “Accredited Status”. This accreditation could be time-limited (e.g., 5 years) and be subject to additional audits, as determined by TC. For example, regulatory amendments could trigger a review process.

Certification: Two certification options exist: First, TC could formalize the training process by offering a certification to trainers who provide TDG training to employees/regulatees. Trainers who successfully complete the TC program would then be certified to provide independent TDG training to the public. This could be done either through an online training platform or through classroom courses. Certification could be time-limited, and could cover scalable material, ranging from certifying a trainer for base knowledge TDG (TDG 101) courses to more advanced certification based on specific dangerous goods classes and job functions

Alternatively, TC could centralize the training and certification process by developing a TDG certification program that would involve establishing standard criteria to be used in the training and testing of employees. The successful completion of a course would result in a TDG Certificate awarded to the individual. It could also be time-limited, and could cover scalable material. For example, TC could develop a basic course “TDG 101” to cover common knowledge of TDG. More advanced training, based on specific dangerous goods or job-functions, could be the responsibility of the employer to provide.

These options would allow TC to ensure that a high quality of training is provided to regulatees by setting the standards by which to measure these institutions and individuals, allow for portability of training certificates across provinces and modes, and would serve to ensure consistency of training across Canada.

Benefits of an Accreditation and/or Certification regime:

Accreditation

- Provides a means to audit training institutions for TDG training in Canada.
- Contributes to public safety by ensuring that TDG training is administered by institutions that meet established quality standards.
- Assists in providing consistent cross-Canada training for TDG Regulations.
- Supports the portability of TDG training for employees across Canada.

Certifications

- Provides consistent quality monitoring of training for TDG training in Canada.
- Contributes to public safety by ensuring that employees are well trained and employable across Canada.
- Assists in providing consistent cross-Canada TDG training.
- Supports portability of training for trainers across Canada, thus allowing for employment mobility between training institutions.
- Supports the portability of certificates offered by TC or another recognized Canadian body.

Potential Proposals:

- 1) Develop a TC Accreditation Program for private institutions, who can then award valid TDG certificates to employees. A TDG Accreditation Program would determine the criteria against which to measure the accuracy, applicability, and credibility of the training institutions and curriculum. It could involve the development of an audit process for institutions wishing to receive or renew accreditation status. This could also require the development of standardized criteria (curriculum and/or tests) for training institutions to follow.
- 2) Develop a TC-endorsed Certification Program for instructors. The instructors would need to demonstrate, through TC administered written tests and on-the-job evaluations, that they have the knowledge base and expertise to teach a standardized curriculum, and can effectively transmit knowledge and experience to students. Once the instructors pass the evaluation, they receive their certification from TC, which would enable certified instructors to establish their own training institutions or work for existing institutions across Canada.
- 3) Develop a TC-endorsed or operated TDG 101 certification program for employees and employers that handle, offer for transport, transport, or import dangerous goods in Canada. This could include the development of training modules or programs. Advanced training on advanced aspects of TDG would be the responsibility of the employer to provide.