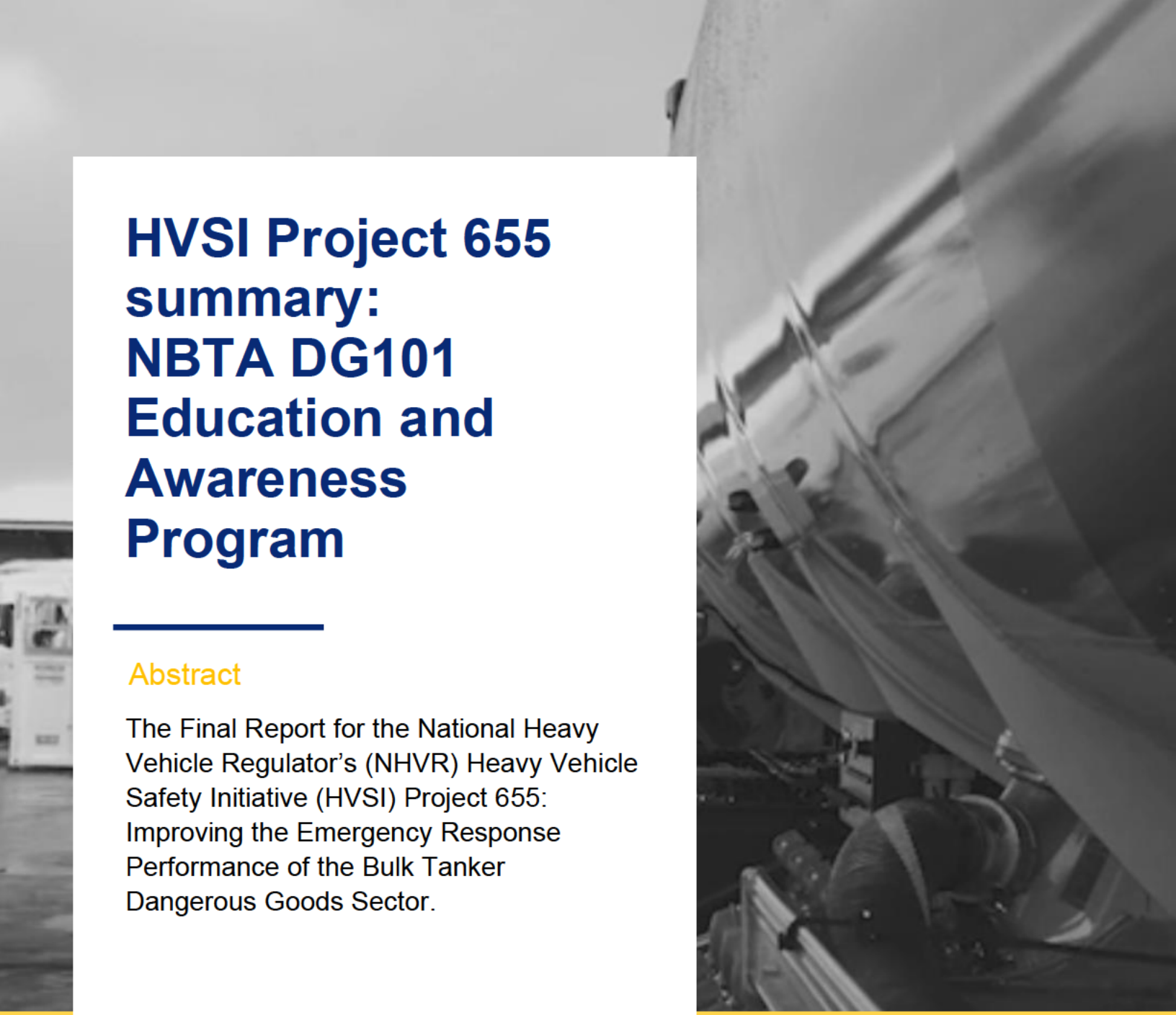


HVSI Project 655 summary: NBTA DG101 Education and Awareness Program

Abstract

The Final Report for the National Heavy Vehicle Regulator's (NHVR) Heavy Vehicle Safety Initiative (HVSI) Project 655: Improving the Emergency Response Performance of the Bulk Tanker Dangerous Goods Sector.

July 2023

Prepared for the NHVR by the National Bulk Tanker Association Inc.

Final report for HVSI Project 655: Improving the Emergency Response Performance of the Bulk Tanker Dangerous Goods Sector.

July 2023

FINAL v1.1

Disclaimer

Contents

Executive summary

This report provides a summary of Project 655 delivered by the National Bulk Tanker Association Inc. (NBTA) under the National Heavy Vehicle Regulator's (NHVR) Heavy Vehicle Safety Initiative (HVSI) funding program supported by the Australian Government.

The aim of Project 655 was to improve the safety of vehicles transporting dangerous goods (DG) and comprised three major components:

- The development of an online education and awareness course to improve dangerous goods regulatory awareness, Transport Emergency Response Plans (TERP) and emergency response obligations (**dangerous goods education course**).
- In-field training with the support of emergency services agencies (**TERP in-field training**); and
- development and promotion of performance criteria on the dangerous goods industry response times, causality and data to assist with understanding how the industry is performing (**performance criteria**).

All three components of the project were successfully completed, and this executive summary provides a brief description of each and the project outcomes.

Dangerous Goods education course

The road transport of dangerous goods involves various laws, codes, and standards.

The NBTA designed and developed the DG101 Education and Awareness course to help individuals to better understand their obligations when transporting bulk dangerous goods by road. This was done as Stage 1 of this project.

The course comprises 12 education modules and is applicable to anyone working in the road transport of bulk dangerous goods such as drivers, business owners, contractors, consignors, loaders and their supervisors and managers.

The 12 education modules were designed such that participants can complete the modules at their own pace and need only undertake the modules that apply directly to their job and responsibilities. DG101 is an online, user -friendly course and structured to present the content so it is easily accessible and understood.

At the end of each module there is a test to confirm that participants understand the content, and upon successful completion of each module participants will receive a certificate of completion.

The 12 education modules are:

1. Legal framework
2. Classes and codes
3. Documentation
4. Placarding
5. Safety laws, schemes and vehicle safety
6. Safety equipment
7. Dangerous goods rules on the road
8. Transferring dangerous goods
9. Maintenance check lists
10. Developing a Transport Emergency Response Plan
11. Exercising a Transport Emergency Response Plan
12. The driver's role in a dangerous goods incident.

The DG101 Education and Awareness course was officially launched on 28 February 2023. The course was made available at no cost using a discount coupon. The course is available for free for 12 months. Up to June 2023, there had been 2,160 enrollments in the modules. The launch and uptake of the course has been a success and has received positive feedback from operators and those in the DG sector who have enrolled in the course.

TERP in-field training

All companies transporting dangerous goods must have a written Transport Emergency Response Plan (TERP) in place to meet regulatory requirements. A TERP is a pre-prepared framework that assists companies respond in the event of an incident involving dangerous goods. It is noted that every TERP needs to be regularly tested to ensure it is current and effective.

The NBTA with the assistance of industry experts and representatives from the Fire and Emergency services developed and delivered a TERP in-field training workshop. The TERP in-field training was developed as Stage 2 of this project with the aim of sharing information to assist with preparing and testing a company's TERP through joint exercises with industry and the Australasian Fire Authorities Council (AFAC).

Performance criteria

The ability to measure performance and trends over time is fundamental if improvements in any industry are to be achieved. For the bulk road transport of Dangerous Goods, data on vehicle incident frequency and causality along with response performance should be readily available.

Performance criteria were developed in collaboration with the Environmental Protection Agency of NSW who currently Chair the Competent Authorities Panel (CAP) which is the peak body for all State and Federal agencies responsible for dangerous goods regulation. This work was completed as Stage 3 of this project and included recommendations and the next steps required for implementing a data capture and data sharing system to measure the safety performance of the sector.

Project outcomes

The outcomes of this project included:

- Development of DG101 Education and Awareness modules
- Launch and ongoing hosting of online education platform
- Development of TERP in-field training content and delivery of two workshops
- Setting of performance criteria and key performance measures (KPM)
- Identification of current and potential sources of data for the recommended KPMs
- Recommendations and next steps for data capture and a data sharing system to measure the safety performance of the DG bulk transport sector.
- Engagement with the Competent authorities and gained support for the development of a process and system for data collection and reporting of performance metrics.

Next steps

The NBTA is an advocate for safety and the sharing of information to improve the safety of the bulk tanker sector. The NBTA will continue to support, promote and make available the DG101 Education and Awareness program and TERP in-field training.

The NBTA has engaged with the Competent authorities and AFAC and gained support for the setting of key performance criteria. Further to this, is the development of a process and system for data collection and reporting of performance metrics. The next step is to commence collecting incident data, this is dependent on the successful funding of a project focused on this outcome and to measure the safety of the bulk DG transport sector.

1 Introduction

The National Bulk Tanker Association (NBTA) comprises member companies and organisations involved in the manufacture, storage and distribution of liquid bulk products, including a strong membership base involved in the dangerous and hazardous goods sector. The NBTA serves its members by sharing learnings and leading the discussion and development of new solutions to improve outcomes in the following areas:

- safety in the industry
- accreditation programs
- emergency response
- safety issues concerning vehicles and personnel
- national audits, rehabilitation, and other OH&S issues.

The NBTA received funding to deliver project (665) as part of the NHVR's Heavy Vehicle Safety Initiative program support by the Australian Government.

The aim of the project was to improve the safety of vehicles transporting dangerous goods and comprised three major tasks:

- The development of an online education and awareness course to improve dangerous goods regulatory awareness, Transport Emergency Response Plans (TERP) and emergency response obligations (**dangerous goods education course**).
- In-field training with the support of emergency services agencies (**TERP in-field training**); and
- development and promotion of performance criteria on the dangerous goods industry response times, causality, and data to assist with understanding how the industry is performing (**performance criteria**).

All three tasks were successfully completed, and this report documents the outcome of the project.

1.1 Report layout

The layout of the report is as follows:

- **Background**: the context for safety and regulations applicable to the transport of bulk dangerous goods.
- **Education and Awareness course**: a description of the development of DG101 – the NBTA Education and Awareness online program delivered as part of stage 1 of this project.
- **TERP in-field training**: a description of the TERP in-field training content delivered as part of stage 2 of this project.
- **Safety performance criteria**: review of safety and environmental performance criteria and the setting of appropriate performance criteria for measuring the safety and environmental performance of bulk DG transport, delivered as part of stage 3 of this project.
- **Conclusion**: a summary of key findings, project outcomes and next steps for the continual improvement of safety and the data requirements, quality metrics and system requirements for measuring trends over time.

2 Background

Transporting dangerous goods by road or preparing dangerous goods for road transport are activities that pose a high risk, due to the potential severity of the consequences associated with an incident involving dangerous goods. Dangerous goods road transport is a highly regulated activity, and the risk is managed, by taking proper precautions and through the implementation of controls.

For example, the list of controls listed by Environment Protection Authority (EPA) NSW, the competent authority for NSW, include the following:

- Truck inspection manuals
- Licensing and training
- Transport documents
- Placard loads
- Emergency information
- Stowage
- Segregation
- Safety equipment
- Prohibited routes for DG transport
- Vehicle maintenance
- Tank design approvals
- Dangerous goods public register.

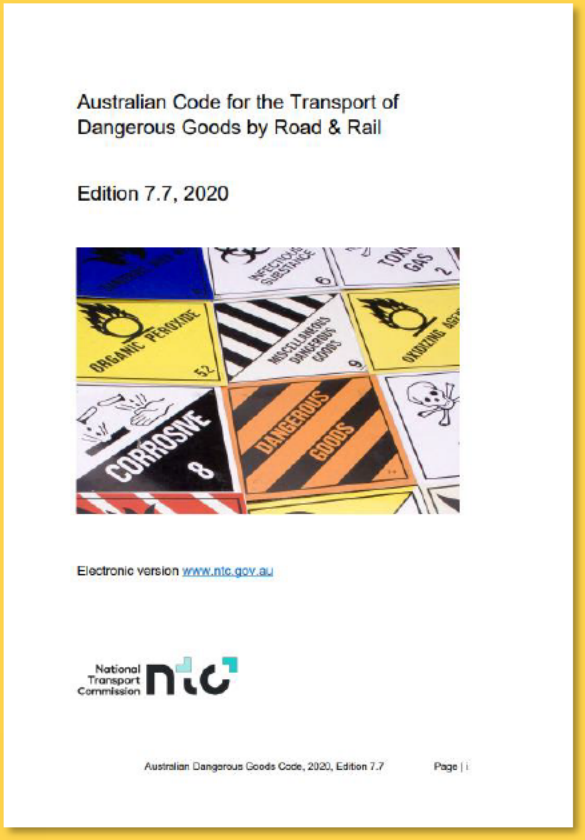
It is assumed that if precautions are taken and the industry is compliant with the regulations that dangerous goods operators will have fewer incidents and overall performance of the industry in terms of safety and the environment will be improved. However, there is currently

no process of measuring the effectiveness of these regulations or other safety improvements in areas such as the vehicle, the driver, and operations. Section 5 (performance criteria) discusses this need in more detail.

2.1 Australian Dangerous Goods Code

The Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code) sets out the requirements for transporting dangerous goods by road or rail.

The ADG code is an important technical resource to help Australia's transport and logistics industry to operate safely when carrying dangerous goods. The code is used by all members of the supply chain, including the consignor, packer, truck driver and dangerous goods transport companies, along with dangerous goods professionals and trainers.



Australian Code for the Transport of Dangerous Goods by Road & Rail

Edition 7.7, 2020

Electronic version www.ntc.gov.au

National Transport Commission

Australian Dangerous Goods Code, 2020, Edition 7.7 Page | i

Subject matter includes rules and recommendations covering:

(a) the definition, classification, packaging, marking and labelling of substances and articles that meet the United Nations classification criteria for dangerous goods or are prescribed as dangerous goods by the competent authority; and

(b) the consigning of dangerous goods for transport, including loading, stowage, load retention and segregation; and

(c) the provision of transport documentation describing the dangerous goods being transported, and appropriate emergency information for those goods; and

(d) the unloading, receipt and transfer of dangerous goods; and

(e) the transport of dangerous goods; including the use of vehicles, containers and equipment, and the provision of safety equipment.

The Code should be read in conjunction with the specific dangerous goods transport legislation that has been enacted in the relevant state or territory.

2.2 Competent Authorities for DG

In each jurisdiction there is a competent authority for road transport responsible for administering the ADG code in particular:

- licensing
- classification
- day-to-day operational issues relating to the transport of hazardous substances and dangerous goods.

The competent authorities for each jurisdiction are listed below.

COMPENT AUTHORITIES

AUSTRALIAN CAPITAL TERRITORY
Dangerous Substances Licensing

NEW SOUTH WALES
Environment Protection Authority

NORTHERN TERRITORY
NT WorkSafe

QUEENSLAND
Industry and Operator Authorization Unit
Department of Transport and Main Roads

SOUTH AUSTRALIA
SafeWork SA

TASMANIA
WorkSafe Tasmania

VICTORIA
Victorian Workcover Authority

WESTERN AUSTRALIA
Resources Safety
Department of Mines,
Industry Regulations and Safety.

State regulations require all incidents involving dangerous goods to be reported to the competent authority.

Businesses transporting dangerous goods on road must comply with their state / territory specific Act and Regulations and the ADG Code. Each state and territory implement the updated ADG Code and associated updates to their dangerous goods transport regulations separately.

Each state and territory's dangerous goods transport act and regulations are listed in Table 2-1.

Table 2-1: State and territory acts and regulations

State/Territory	Act	Regulation
Australian Commonwealth Territory	Dangerous Goods (Road Transport) Act 2009	Dangerous Goods (Road Transport) Regulations 2010
New South Wales	Dangerous Goods (Road and Rail Transport) Act 2008	Dangerous Goods (Road and Rail Transport) Regulation 2014
Northern Territory	Transport of Dangerous Goods By Road and Rail (National Uniform Legislation) Act	Transport of Dangerous Goods By Road and Rail (National Uniform Legislation) Regulations
Queensland	Transport Operations (Road Use Management) Act 1995	Transport Operations (Road Use Management-Dangerous Goods) Regulation 2018
South Australia	Dangerous Substances Act 1979	Dangerous Substances (Dangerous Goods Transport) Regulations 2008
Tasmania	Dangerous Goods (Road and Rail Transport) Act 2010	Dangerous Goods (Road and Rail Transport) Regulations 2010
Victoria	Dangerous Goods Act 1985	Dangerous Goods (Transport by Road or Rail) Regulations 2018
Western Australia	Dangerous Goods Safety Act 2004	Dangerous Goods Safety Regulations

Source: https://www.infrastructure.gov.au/infrastructure-transport-vehicles/transport-strategy-policy/transport-australia/transport-dangerous-goods/transport-dangerous-goods-road-and-rail-legislation-status

The dangerous good industry is highly regulated to manage the risk associated with a dangerous goods incident.

2.3 Project reference group and technical advisors

A project reference group including technical advisors and subject matter experts was formed at the start of the project, to provide direction and content. The project reference group's focus was the content for the online course and the depth of material to be provided to course participants. The group's expertise in dangerous goods operations was invaluable. The project reference group also provided advice on the development of the TERP in-field training content and the performance criteria for measuring safety.

3 Education and Awareness course

The NBTA with the assistance of the project reference group developed the content for the Dangerous Goods 101 Education and Awareness course. The course provides detailed information about the obligations of all personnel involved in the bulk tanker dangerous goods industry and the content is presented in 12 modules. The 12 modules are accessible online, and the modules can be completed at each participant's own pace. The 12 modules in the program cover the following topics:

1. Legal Framework
2. Classes and codes
3. Documentation
4. Placarding
5. Safety - Laws, Schemes, & Vehicle Safety
6. Safety equipment
7. Procedures on the Road
8. Transfer of Dangerous Goods
9. Maintenance
10. Developing a TERP
11. Emergency Response for a Company
12. A Driver's Role in an Emergency Response

A brief description of each module is included in Section 3.3. The online course meets the commitment to improve awareness of the regulatory requirements for the road transport of dangerous goods and Transport Emergency Response Plans (TERPs). The course provides an interactive experience for participants. Each module has an instructional video followed by a short test. A Certificate of Completion is issued when successfully completed. The course is available at nbta-education.thinkific.com.

3.1 How to access the online course

The steps for how to access and enroll are described below. The full guide is included in Appendix A.

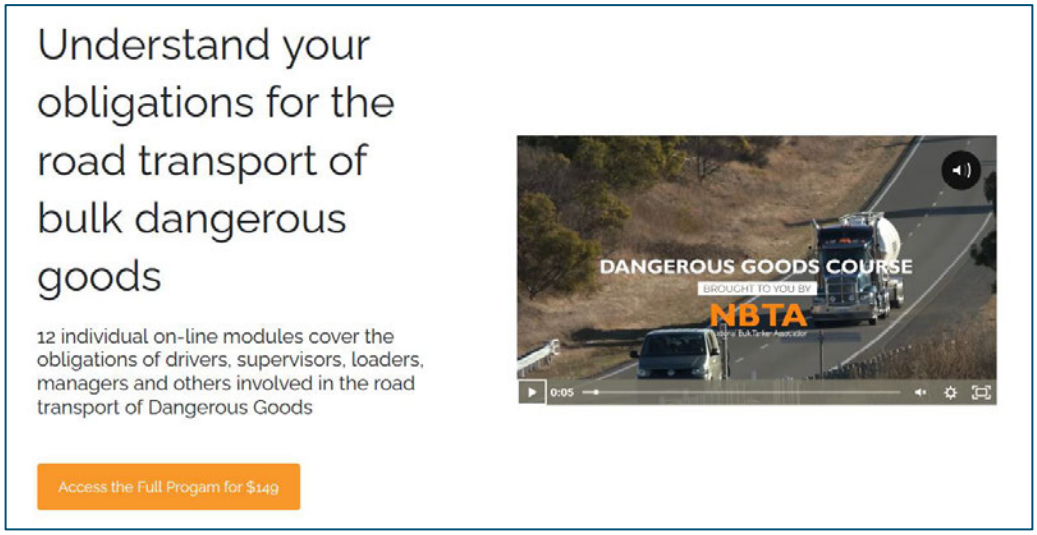
The website landing page for DG101 is available at nbta.com.au/dg101. The landing page includes a brief description of the course, a direct link, frequently asked questions and an online form to request discount coupons. The course is available for free for 12 months. This discount is available to both members of the NBTA and non-members using the following discount coupons: NBTAmember2023 and HVSI2023.

The NBTA website landing page is shown in Figure 3.1

Figure 3.1 The NBTA website landing page for DG101

The course is hosted using the Thinkific platform and is available at nbta-education.thinkific.com the welcome screen is shown in Figure 3.2.

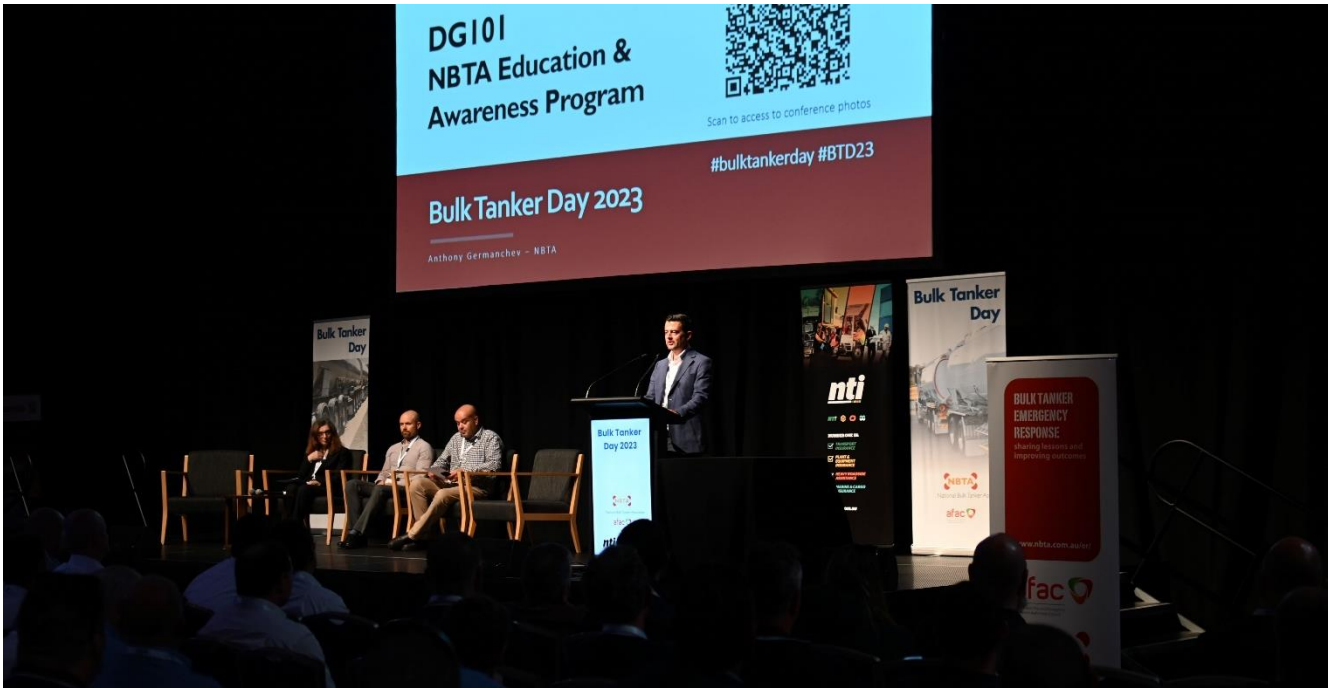
Figure 3.2 The DG101 online course



3.2 Official launch and promotion

On 28 February 2023, the DG101 Education and Awareness Course was launched at the NBTA general meeting in Sydney and again in May 2023 at Bulk Tanker Day at the Brisbane Showgrounds. The DG101 program featured in the conference proceedings, as shown in Figure 3.3.

Figure 3.3 DG101 presentation at Bulk Tanker Day conference



The course was promoted via the NBTA's newsletter (see Appendix B) and made available to AFAC and WorkSafe for distribution via their networks and communication channels. The course is suitable for all involved in the transport of DG as listed in Figure 3.4.

Figure 3.4 DG101 target audience

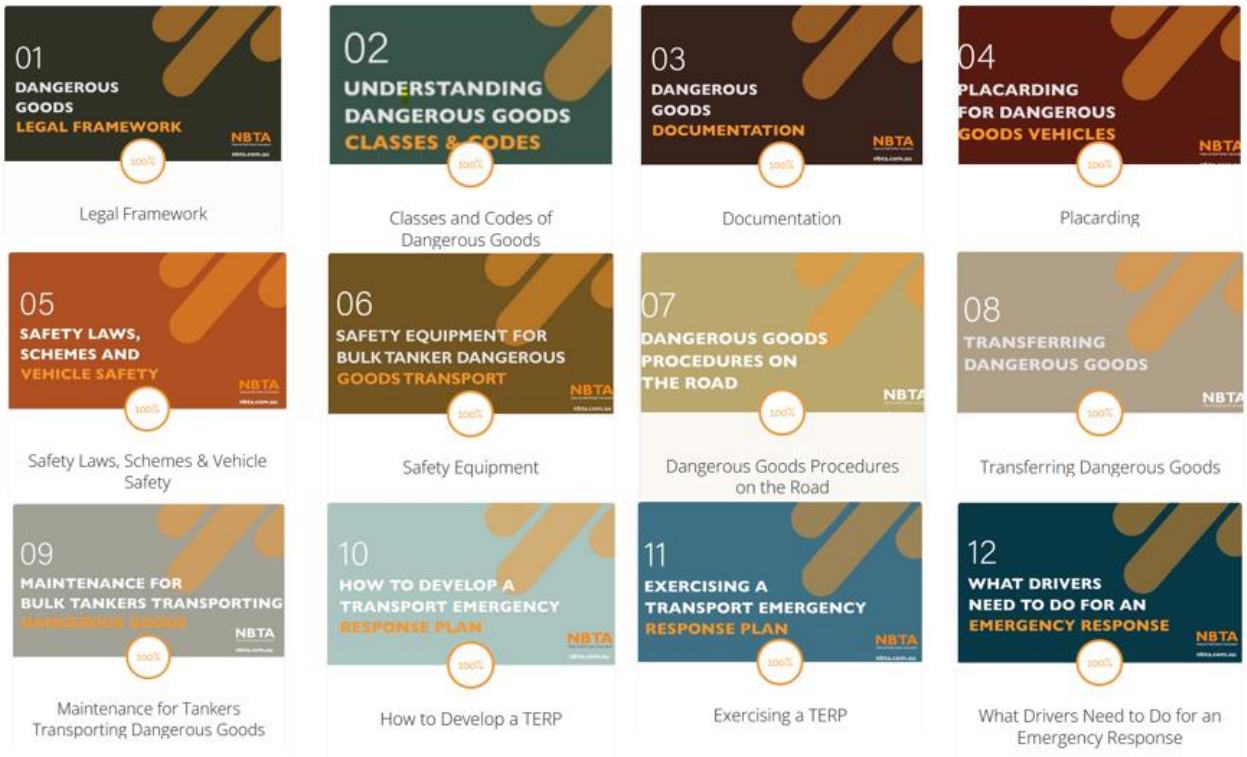
3.3 The 12 education modules

There are 12 modules in the program covering the following topics:

1. Legal Framework
2. Classes and codes
3. Documentation
4. Placarding
5. Safety - Laws, Schemes, & Vehicle Safety
6. Safety equipment
7. Procedures on the Road
8. Transfer of Dangerous Goods
9. Maintenance
10. Developing a TERP
11. Emergency Response for a Company
12. A Driver's Role in an Emergency Response

The 12 modules as they are displayed in the online dashboard are shown in Figure 3.5.

Figure 3.5 The 12 education modules available online



3.3.1 Legal Framework

Module 1 covers the dangerous goods legal framework and the laws and regulations that apply to the transport of bulk dangerous goods. The topics included in this module are:

- The Heavy Vehicle National Law
- Dangerous Goods Transport Legal Framework
- The role of Competent Authorities
- Australian Dangerous Goods Code
- AS2809.

3.3.2 Classes and codes

Module 2 covers what are Dangerous Goods and their classes and codes and when you need a dangerous goods license. The topics included in this module are:

- General provisions for Dangerous Goods
- Dangerous Goods list
- The Classes of Dangerous Goods
- Classes and Divisions
- Subsidiary Hazards
- Packing Groups and Special Provisions.

3.3.3 Documentation

Module 3 covers the documentation which must be carried when transporting dangerous goods. The topics included in this module are:

- Importance of DG Documentation
- Dangerous Goods transport document
- Amending a transport document
- Emergency information
- Emergency Procedure
- Emergency Procedure Holder.

3.3.4 Placarding

Module 4 covers the planning required for vehicles transporting dangerous goods. The topics included in this module are:

- Why you need a placard
- Who is responsible for placarding
- When to placard
- Penalties for not placarding
- Emergency information and action codes
- Labelling of mixed loads.

3.3.5 Safety – Laws, Schemes and Vehicle Safety

Module 5 covers safety laws and vehicle safety applicable to the transport of bulk dangerous goods. The topics included in this module are:

- Role of the NHVR
- Chain of Responsibility
- Industry Codes of Practise
- National Heavy Vehicle Accreditation Scheme
- Fatigue Regulations
- Vehicle Safety Features and Technologies.

3.3.6 Safety equipment

Module 6 covers the safety requirements to transport placarded loads and bulk dangerous goods in tankers. The topics included in this module are:

- Safety Equipment required for carrying Placarded Loads of Bulk Dangerous Goods
- The Location, Type and usage of Fire Extinguishers
- Safety Triangles
- Personal Protective Equipment (PPE).

3.3.7 Procedures on the Road

Module 7 covers the procedures and general precautions required during the transport of dangerous goods. The topics included in this module are:

- Breakdowns
- Passenger restrictions
- Parking requirements
- Detaching a trailer
- Route restrictions.

3.3.8 Transfer of Dangerous Goods

Module 8 covers the equipment and procedures needed in the transfer of dangerous goods. The topics included in this module are:

- The Dangerous Goods Checklist for Drivers
- General Requirements for the Transferring of Dangerous Goods
- The Transfer of Gas and Class 3 Flammable Liquids
- Where to Transfer Dangerous Goods
- Transfer Equipment and Hose Assemblies
- Hose testing and Record Keeping.

3.3.9 Maintenance

Module 9 covers what to consider when maintaining tankers for transporting bulk DG.

- Why maintenance is important
- Maintenance Management Module and National Heavy Vehicle Inspection Manual
- Australian Standard 2809 Inspection and Maintenance Interval Checklist
- The NSW EPA Dangerous Goods Tank Vehicle Inspection Manual.

3.3.10 Developing a TERP

Module 10 covers transport emergency response plans and how they are developed. The topics included in this module are:

- What is a TERP
- Why TERPs are important
- Who should have access
- What should be included
- How to develop a TERP
- Sample guides for TERP development.

3.3.11 Emergency Response for a Company

Module 11 covers the roles and responsibilities involved in exercising a TERP and the incident site management practises used by emergency services. The topics included in this module are:

- Preparedness
- Activation of the plan
- A company's role in supporting emergency services
- Emergency services conducting incident management.

3.3.12 A Driver's Role in an Emergency Response

Module 12 covers the role and responsibilities of drivers during an emergency response.

- Why drivers are important during an emergency response
- Driver responsibilities
- What to do when an incident occurs.

4 TERP in-field training

The TERP in-field training was developed as part of stage 2 of the project with the aim of testing a company's TERP through joint exercises with industry and AFAC.

4.1 Course locations and dates

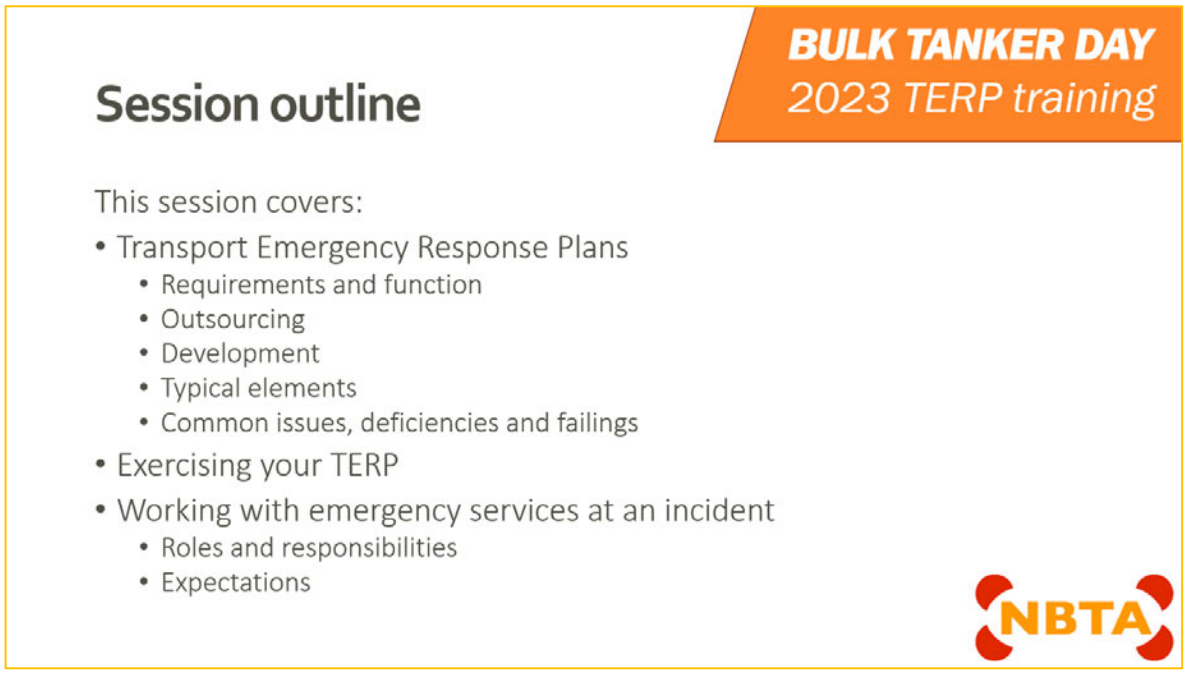
The NBTA held two courses during the funding period of the project with the latest being held on 16 May 2023 in Brisbane. This workshop was presented by the NBTA, Queensland Fire and Emergency Services and ISS First Response as shown in Figure 4.1. Future workshops will be scheduled at various venues throughout each year.

Figure 4.1 TERP in-field training workshop

4.2 Course content

The TERP in-field training covers the topics outlined in the slide shown in Figure 4.2.

Figure 4.2 TERP in-field training session outline slide



The content covers the relevant legislative obligations and the implications for parties. The workshop allows participants to gain an understanding of their obligations and review what this means in terms of response capability, roles and responsibilities of bulk tanker operators and first responders.

The workshop includes the following topics:

1. Developing your TERP
2. Access, awareness and currency
3. Elements of the typical TERP
4. Absent or inadequate information
5. TERP – Activation, Response Tasks, Resources
6. Equipment
7. Exercising your TERP – Desktop Exercises
8. Exercising your TERP – Practical Exercises
9. Prerequisites for attendance
10. Emergencies – Roles and responsibilities.

Prerequisites for attendance

Participants in the TERP in-field training workshop were required to complete modules 1, 10, 11 and 12 of the online DG101 education and awareness course before enrolling. This was to ensure course participants understand the obligations of their company about response capability in the event of a bulk DG tanker incident occurring, including the relevance of their TERP and why it needs to be exercised. Attendees were also encouraged to bring a copy of their company's TERP. Figure 4.3 shows the workshop held in Brisbane in May 2023.

Figure 4.3 TERP in-field training workshop held in Brisbane, May 2023

Field testing of the TERP

Field simulation of an incident and role playing of responses from both incident commanders and controllers and incident responders. Figure 4.4 shows the TERP in-field training equipment demonstration held in Brisbane.

Figure 4.4 TERP in-field training equipment demonstration

Desktop testing of the TERP

The workshop includes desktop simulations of bulk DG tanker incidents involving flammable, chemical and / or gas related products in urban and non-urban environments and the adequacy of each TERP to respond appropriately. The simulated incidents will depend upon the relevance to the audience attending.

Review of Lessons Learnt

The workshop concludes by summing up lessons from the desktop and field simulations and review of each TERP in terms of its adequacy to respond to the incident.

Post course review

Attendees will be expected to use the lessons from the day to improve their company TERP and to also run a desktop exercise on a regular (minimum annual) basis within their company to share the lessons and improve safety outcomes. Figure 4.5 shows emergency response vehicles displayed by the Queensland Fire & Emergency Services.

Figure 4.5 TERP in-field training response vehicles outdoor exhibit

5 Safety performance criteria

The ability to measure performance and trends over time is fundamental if improvements in any industry are to be achieved. For the bulk road transport of Dangerous Goods, data on vehicle incident frequency and causality should be readily available to enable performance measurement.

Task 2 of this project was to develop and promote performance criteria on the dangerous goods industry response times, causality, and data to assist with understanding how the industry is performing.

Companies as well as industry should be able to measure their performance against other transport sectors as well as within the bulk transport DG sector itself. This data could then be used to help identify key risk factors and trends in causality which in turn can assist in developing future policies to improve safety outcomes.

Whilst there can be many measures of performance, this part of the project focused on data that will inform the safety and environmental (as opposed to the financial or operational) performance of the industry, and in turn how that might lead to better safety and environmental performance in the future.

The overall aim of setting performance criteria is to better understand how the industry is performing, and in turn how that might lead to better outcomes. There are many datasets that can be drawn upon to do this, each offering different information. Examples of the information that can be used to measure safety include:

- evidence of compliance with regulations
- documentation of safe engineering design and practices
- records generated from incidents
- road-side enforcements statistics
- road crash data
- workplace accordance
- insurance claims
- vehicle telematics (historic data and live monitoring)
- emergency response records.

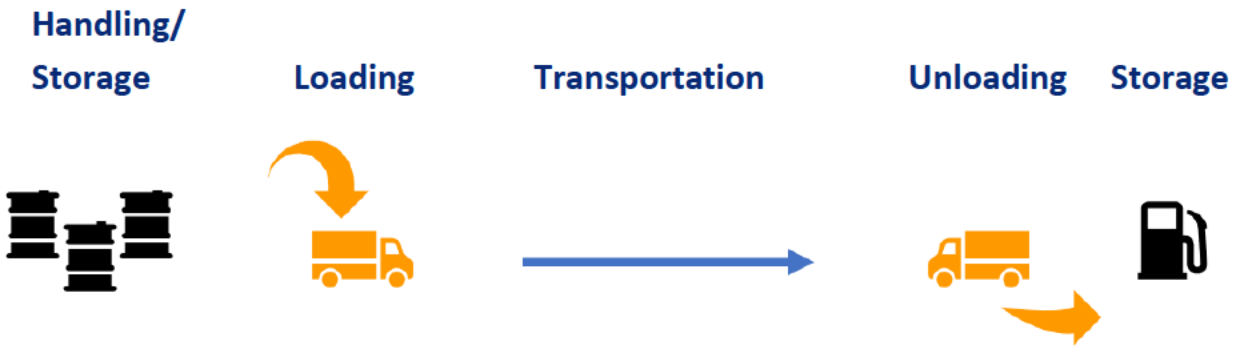
The datasets listed above contain different information, each of varying importance and levels of detail. The inconsistencies between datasets create challenges when attempting to harmonise and aggregate the data. The most effective strategy for overcoming these challenges is to eliminate them early in the process, this can be done by defining the performance criteria, understanding what data are required to measure performance, restricting the collection or standardizing its collection and then only working with the

essential data. The first step towards achieving this is to limit the data collection to the tasks within the freight task that are of most interest, this is discussed in the following section.

5.1 Defining the steps in the freight task

Datasets are generated at different times during the freight task. By defining the data generated at each step, they can then be identified and grouped. In some states one competent authority is responsible for the handling/storage task and another for the transport task. Figure 5.1 shows a simplification of the steps involved in the freight task.

Figure 5.1 The start and end of the freight task



Data owners/authorities				
Site owner Operator Worksafe Insurance Emergency responder	Operator Worksafe Insurance Emergency responder	Operator Worksafe Telematics Service Provider Road managers NHVR Police Emergency responder	Operator Worksafe Insurance Emergency responder	Site owner Operator Worksafe Insurance Emergency responder
Data types				
Company records - internal reports	Company records - internal reports	Company records - internal reports Telematics data Enforcement records Police/road manager reports	Company records - internal reports	Company records - internal reports

To develop performance criteria that are effective and practicable it is important to understand the limitations of the data generated at each step.

Figure 5.1 shows that there are more data owners/authorities and data types associated with the transportation task. This offers more options for measuring performance, for example, the transport task has a much richer dataset due to the tracking of movements using telematics devices.

5.1 Data quality metrics

Data quality is essential for ensuring the information obtained from the data is correct and can be relied upon. Data quality metrics, shown in Figure 5.2 are well established and form an important part of any future data collection process or system.

Figure 5.2 Data quality metrics

The data quality metrics can be esoteric when described in general terms. For each metric a dataset specific to the dangerous goods industry has been used as an example in the description.

5.1.1 Accuracy

Data accuracy is a measure of how accurately the data reflects the real-world event. An example of data accuracy is a police report in which an estimate of speed is included in the report, typically these will be made based on the damage sustained to the vehicle. This data would be considered less accurate compared with truck telematics data recorded from a GPS receiver.

5.1.2 Validity

Validity is a measure of how well data conforms to required value attributes. For example, ensuring dates conform to the same format, i.e., date/month/year or month/date/year.

Common typos or formats can be matched and with the use of automated scripts this can be done efficiently. However, unique manual entry errors can be difficult to identify. An example of invalid data is the recording Kenworth as KW (how it reads on the bonnet badge) examples of this were found during the review of the national crash database.

5.1.3 Consistency

Consistency is important when collecting data over an extended period of time and when combining data from different sources. An example of an inconsistency is when state road authorities classify a minor or serious injury differently, for example if the injury classification is based on medical costs, the threshold may differ between states, or may or may not include care post hospitalisation. Such differences can even occur over time as organisations re-evaluate how they classify data.

5.1.4 Completeness

This measures whether all the necessary data are present in a specific dataset. An example for completeness is the percent of data fields that have values entered into them or correctly entered into them. In the case of road crash data an attribute that might be missing could be whether the vehicle was a semi-trailer, B-double or road train, often only ‘truck’ is entered. Completeness can also applied to the total number of records, using road fatalities as an example, all road fatalities are recorded by the state road authorities and reported to BITRE his would be considered a 100% complete dataset. However, data from insurance providers would only include those vehicles insured with that provider and therefore would be incomplete.

5.1.5 Timeliness

Timeliness is important to effectively track changes over time and observe trends. The transport industry includes data at both ends of the spectrum with telematics data able to be received in real-time at one second intervals whereas crash data can take over 12 months before it is made public by state road authorities.

5.1.6 Integrity

Integrity of data can be affected when the data are aggregated, translated, or summarised. A measure of poor data integrity is when the sum of the raw and processed data is no longer equal.

5.2 Data sharing platform

To share learnings and improve outcomes, performance must not only be measured but also shared. Therefore, a method for sharing data must be considered as part of the solution. The key functions required to enable an effective data collection and sharing system include:

- access to inputs - managing the input data from a range of sources
- data processing – a consistent and auditable method for processing raw data
- data storage – secure retention of datasets and metadata
- ability to share relevant data – via personalised interfaces
- reporting and data delivery - adding value and producing insight via tools and reports.

5.3 Review of data sources

Table 5-1 lists the available data sources grouped by data type.

Table 5-1: Available data sources

Type	Data	Potential source
On-road incidents/spills/crashes		
Incident	Location: GPS Date: Time/Day/Month/Year Incident type: fire/spill/contained Injury severity: damage only/minor/serious/fatal	Police NHVR enforcement records National Crash Database Insurance companies Prime contractors
Vehicle	Type: semi-trailer/B-double/etc Permit: RAV, PBS, General Access Industry/Product: petrol/chemical EBS/TEBS fitted: Yes/No RSS/RSP fitted: Yes/No	Police NHVR enforcement records National Crash Database Insurance companies Prime contractors
Road	Road name: Posted speed limit: Road surface: sealed/unsealed Ownership: state/local government private Weather: wet/dry	Police NHVR enforcement records National Crash Database Insurance companies Prime contractors
Enforcement		
Vehicle	Total number of inspections by infringement issues (%) Total no. of inspections by infringement issued (%) Total no. of infringement notices issued Notices issued by industry: gas, petrol Notices issues by category: minor, serious, major	Police NHVR enforcement records
Workplace Accidents		
Incident	Total recordable injury frequency rate (TRIFR) Lost time injury frequency rate (LTIFR) Total lost time injury (LTI) and time since last LTI	WorkSafe/Cover Organizations Prime contractors
Insurance		
Vehicle	Number of major claims by industry including costs	Major insurers of DG heavy vehicles

5.4 Incident data held by competent authorities

As described in Section 2.1, legislation requires that any dangerous goods incident that results in a dangerous situation, must be reported within 24 hours, and a detailed written report within 21 days.

A dangerous situation may occur during the transport, loading or unloading of dangerous goods. A dangerous situation is any incident that can cause, or is likely to cause, an imminent risk of:

- death or injury to a person
- harm to the environment
- damage to property.

5.4.1 Initial reporting of a dangerous goods incident

The prime contractor (and the driver in some states) must report a dangerous goods incident within 24 hours of the incident.

The initial report must include:

- the nature of the incident
- where and when the incident happened
- what dangerous goods were being transported.

5.4.2 Detailed written report of a dangerous goods incident

The prime contractor transporting dangerous goods by road must provide the competent authority with a detailed written report within 21 days of the incident.

For incidents reported in Queensland and Western Australia prime contractors must use the incident reporting forms supplied by their respective competent authorities. No incident reporting forms were found for the other competent authorities.

Unfortunately, there is no reporting of these incidents by the competent authorities to the DG industry as required by the regulations.

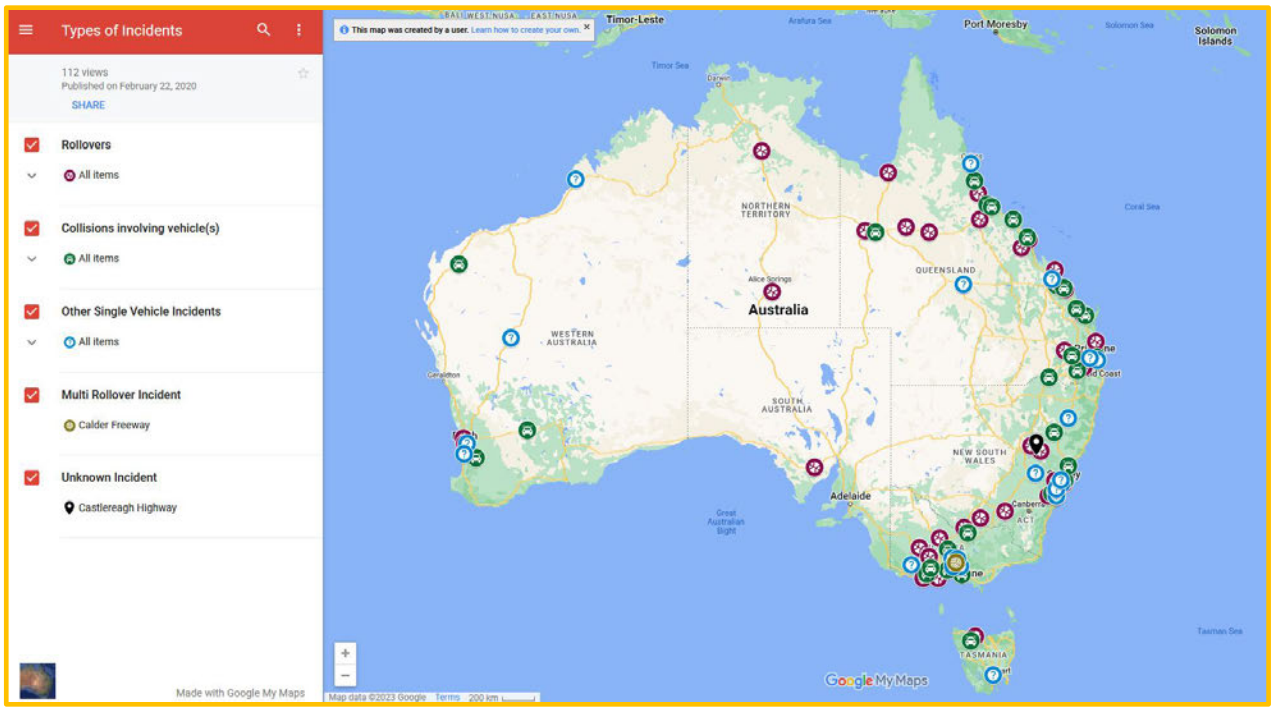
5.5 Bulk tanker incident data collated by the NBTA

The NBTA has actively sought DG incident data in their role as the leading association for bulk DG transport operators. The NBTA compiled data from several sources including de-identified coronial information and online sources.

The NBTA reviewed data supplied by the National Coronial Information Service (NCIS) summarising the outcome of coronial investigations involving bulk tankers over a 6-year period from the beginning of 2010 to the end of 2015.

The NBTA conducted its own online searches covering the period from 1 January 2016 through to the end of 2019. Figure 5.3 shows the location of the bulk tanker incidents that occurred between 2016 and 2019.

Figure 5.3 Location of bulk tanker incidents by type (NBTA study 2016 – 2019)



The data attributes included were:

1. Incident: {date/time/location information (road name, city, state)}
2. Crash type: {Single vehicle | multi-vehicle}
3. Rollover: {Y | N}
4. Loss of containment: {Y | N}
5. Type of Product: {open description}
6. Injury: {critical (0) | fatalities (0)}
7. Cause: {open description}.

The data collection and subsequent analysis conducted by the NBTA served as the impetus for developing a set of KPMs that can be used to measure performance and trends over time with the aim of improving performance.

5.6 Performance criteria summary

Measuring performance is fundamental to improved safety outcomes

The aim of this task was to achieve a better understanding of the safety performance of the bulk dangerous goods sector of road transport.

The essential metrics for measuring safety and environmental performance for bulk DG transport were developed in two tiers.

- Tier 1 provides the most basic level required for reporting an incident.
- Tier 2 has provision for additional information including causality and response times.

The Tier 1 essential metrics are:

1. **Incident**: {date/time/location information (road name, city, state)}
2. **Crash type:** {single vehicle | multi-vehicle}
3. **Rollover**: {Y | N}
4. **Vehicle configuration:** {light vehicle | rigid | semi-trailer | B-double | pig or dog trailer | A-double | multi-combination road train}
5. **UN number:** {UN number}
6. **DG class:** {Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8}
7. **Incident scale**: {no spill | minor spill (less than a quantity that needs a placard) | major spill (more than a placard quantity}
8. **Cost:** {limited to insurance claim (excluding consequential economic loss)}
9. **Injuries:** {minor | major and serious (requiring hospitalisation) | fatalities}
10. **Cause:** {open description}.

The Tier 2 essential metrics are:

1. **Incident**: {date/time/location information}
2. **Vehicle:** {make/model/DoM}
3. **Trailer:** {make/model/DoM}
4. **Vehicle configuration:** {Light vehicle | Rigid | Semi-trailer | B-double | Pig or dog trailer | A-double | multi-combination road train}
5. **UN number:** {UN number}
6. **DG class:** {Class 1 | Class 2 | Class 3 | Class 4 | Class 5 | Class 6 | Class 7 | Class 8}
7. **DG transport type**: {tank vehicle | bulk solids | receptacles > 500 L | packaged DG – this would separate out IBCs and other tanks from smaller packages and tankers}

8. **DG quantity present**: {volume/mass}
9. **DG quantity involved**: {volume/mass}
10. **Incident scale**: {breakdown | no spill | minor spill (less than a quantity that needs a placard) | major spill (more than a placard quantity}
11. **Load-involved fire**: {Y | N: initial location of fire (wheel | engine | load | other)}
12. **Cost:** {limited to insurance claim (excluding consequential economic loss)}
13. **Injuries:** {minor | major and serious (requiring hospitalisation) | fatalities}
14. **Causal factors**:
    a) **Mechanical failure:** {Y| N: DG equipment fault | incompatible goods | vehicle fault | other}
    b) **Vehicle related**: {Y | N (collision | rollover | loss of load)
    c) **Driver error:** {Y | N: (impaired by alcohol/drugs | fatigue | speeding | unsecured load | other)}
    d) **Weather conditions**: {open description}
15. **Incident response times**:
    a) incident occurred
    b) prime contractor became aware of the incident
    c) emergency services were notified
    d) emergency services first arrived on scene
    e) CAP was notified of the incident
    f) time the recovery coordinator arrived on scene
    g) time all necessary equipment to undertake the recovery of the DG arrived on scene
    h) decant began
    i) decant was completed
    j) incident declared rendered safe by incident controller.
16. **Site remediation:**
    a) How much earth/soil was removed from the site?
    b) When was the site remediation completed?

Current data sets do not give an adequate picture of performance

As part of Stage 3 of this project many data sets were reviewed but none were considered to adequately describe the performance of the bulk DG sector. The NBTA work from 2016 to 2019 did define some performance measures and a timeline of performance but this approach is no longer practical. This project has gone back to first principles to look at where the most promising data lies or could be obtained and how this might be developed. At present, no data set can deliver an adequate picture of the safety performance of this sector.

Data held by competent authorities offers the best opportunity

A record of DG incidents, held by competent authorities and underpinned by legislation was considered to provide the best opportunity to generate an ideal dataset. Further actions should focus on using this data including enhancing the collection and its accessibility.

There are other sources of data available, but at a basic level the incident data available does not identify the goods/product being carried by the heavy vehicle.

The data held by the competent authorities offers the greatest potential to both share performance data but also use this to enhance safety outcomes.

A data collection and sharing system is required

To share learnings and improve outcomes, performance must not only be measured but also shared. Therefore, a method for sharing data must be considered as part of the solution. The data produced by the system and made available to the DG transport industry would contain no personal information that would identify companies or personnel involved in incidents.

The proposed data system must be efficient, utilizing standardized data across jurisdictions, automated processing, and online platforms for storage and reporting.

The key functions required to enable an effective data collection and sharing system include:

1. access to inputs - managing the input data from the competent authorities and NHVR
2. data processing – a consistent and auditable method for processing raw data
3. data storage – secure retention of datasets and metadata
4. ability to share of relevant data – with appropriate permissions and authentication
5. reporting and data delivery - adding value and producing insight via tools and reports.

6 Project outcomes

The outcomes of this project included:

- Development of DG101 Education and Awareness course including 12 modules
- Launch and ongoing hosting of online education platform
- Development of TERP in-field training content and delivery of two workshops
- Setting of performance criteria and key performance measures (KPM)
- Identification of current and potential sources of data for the recommended KPMs
- Recommendations and next steps for data capture and a data sharing system.
- Engaged with the Competent authorities and gained support for the development of a process and system for data collection and reporting of performance metrics.

DG101 Education and Awareness program

The NBTA designed and developed the DG101 online program to help individuals to better understand their obligations when transporting bulk dangerous goods by road. This program was completed as Stage 1 of this project and now serves as an important resource for anyone working in the road transport of bulk dangerous goods.

TERP in-field training

The NBTA with the assistance of industry experts from the fire and emergency services developed and delivered TERP in-field training. The TERP in-field training was developed as Stage 2 of this project and allows for the sharing of information in a group environment and through joint exercises to assist with preparing and testing a company's TERP.

Performance criteria

The setting of performance criteria was done in collaboration with Environmental Protection Agency, NSW. This work was completed as part of Stage 3 of this project and included recommendations and the next steps required for implementing a data capture and data sharing system to measure the safety performance of the bulk DG sector.

Next steps

The NBTA is an advocate for safety and the sharing of information to improve the safety of the bulk tanker sector. The NBTA will continue to support, promote and make available the DG101 Education and Awareness program and TERP in-field training. The NBTA has engaged with the Competent authorities and AFAC and gained support for the setting of key performance criteria. Further to this, is a proposal to develop a process and system for data collection and reporting of performance metrics. The next step is to commence collecting incident data. Funding options to support the collection of detailed incident are being explored.

Appendix A

Appendix A.1 – Instruction guide for DG101

DG101

NBTA Education Program

Official launch and instructions

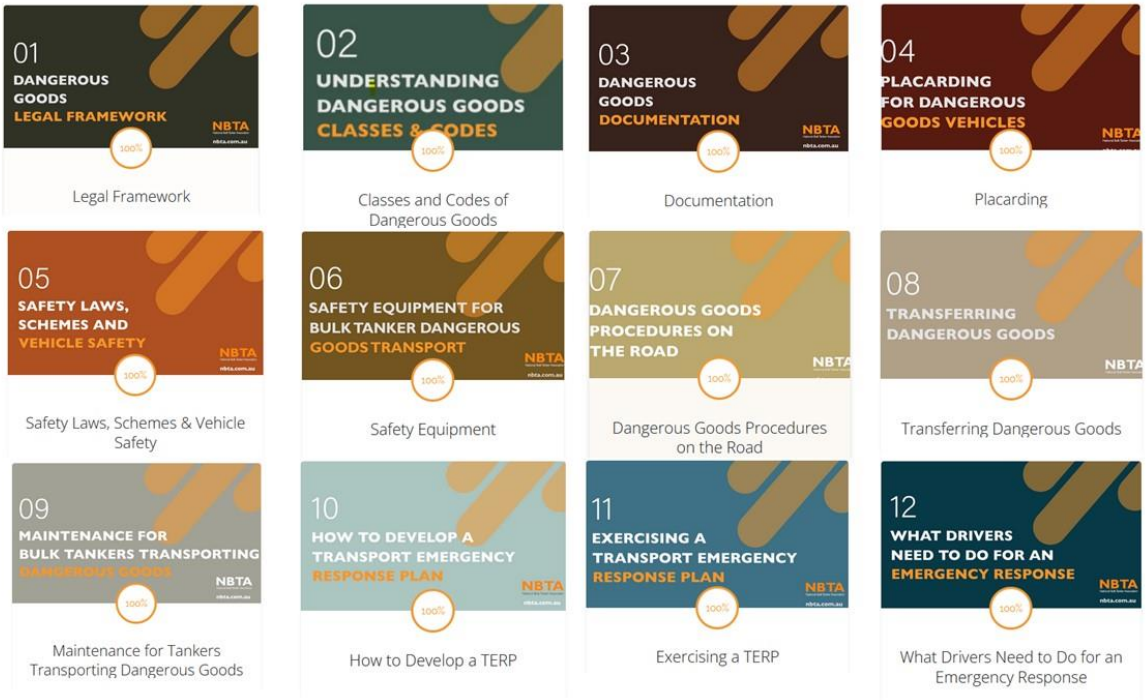
Anthony Germanchev – NBTA General Meeting 28 Feb 2023

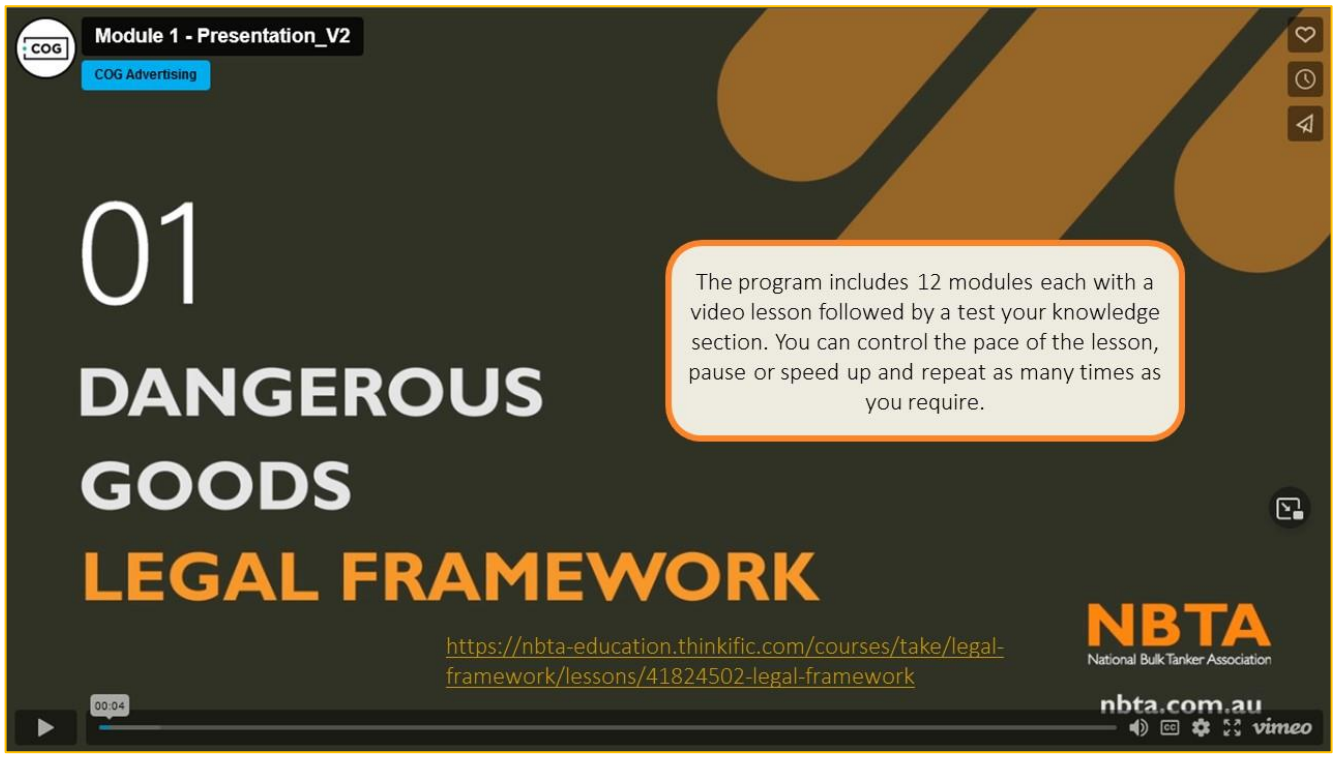
DG101 – NBTA Education Program

- An easily accessible education platform
- 12 on-line education modules
- Covering all aspects of bulk DG transport

The 12 modules

1. Legal framework
2. Classes & Codes
3. Documentation
4. Placarding
5. Vehicle Safety
6. Safety Equipment
7. Procedures on the Road
8. Transferring Dangerous Goods
9. Maintenance
10. How to develop a TERP
11. Exercising a TERP
12. What Drivers Need to Do for an Emergency Response

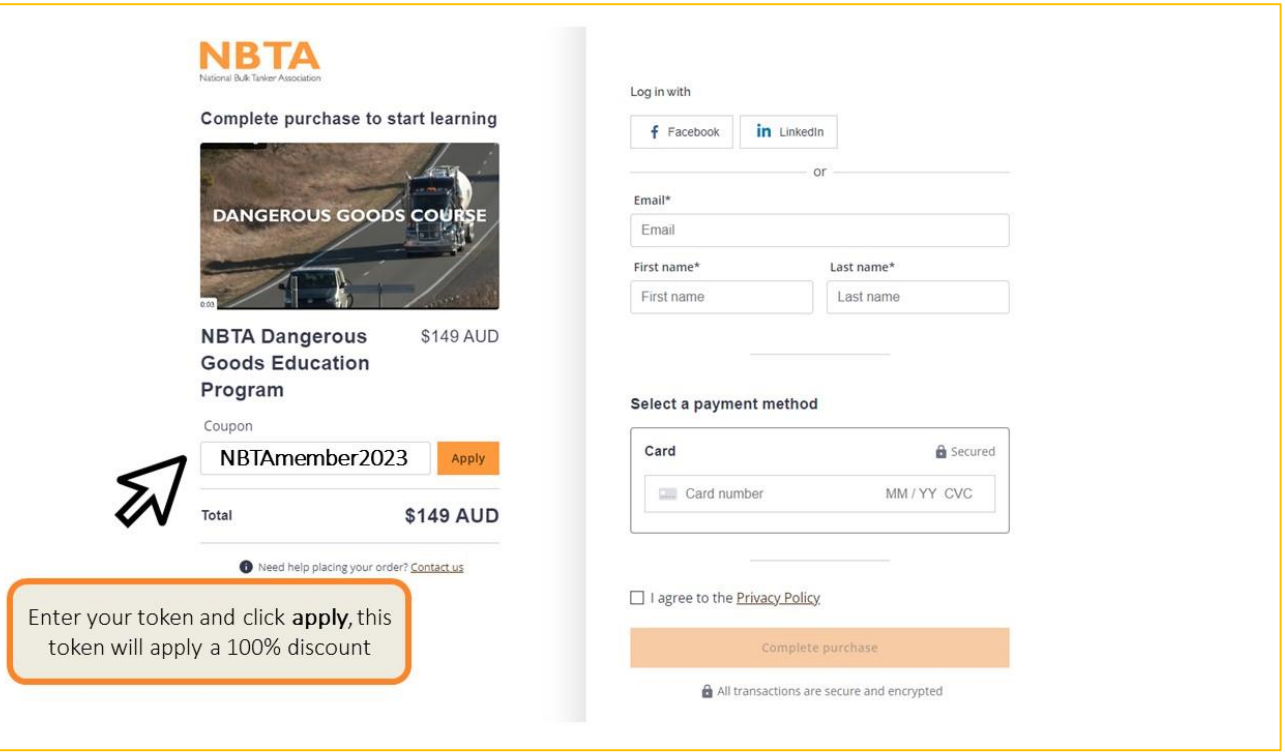


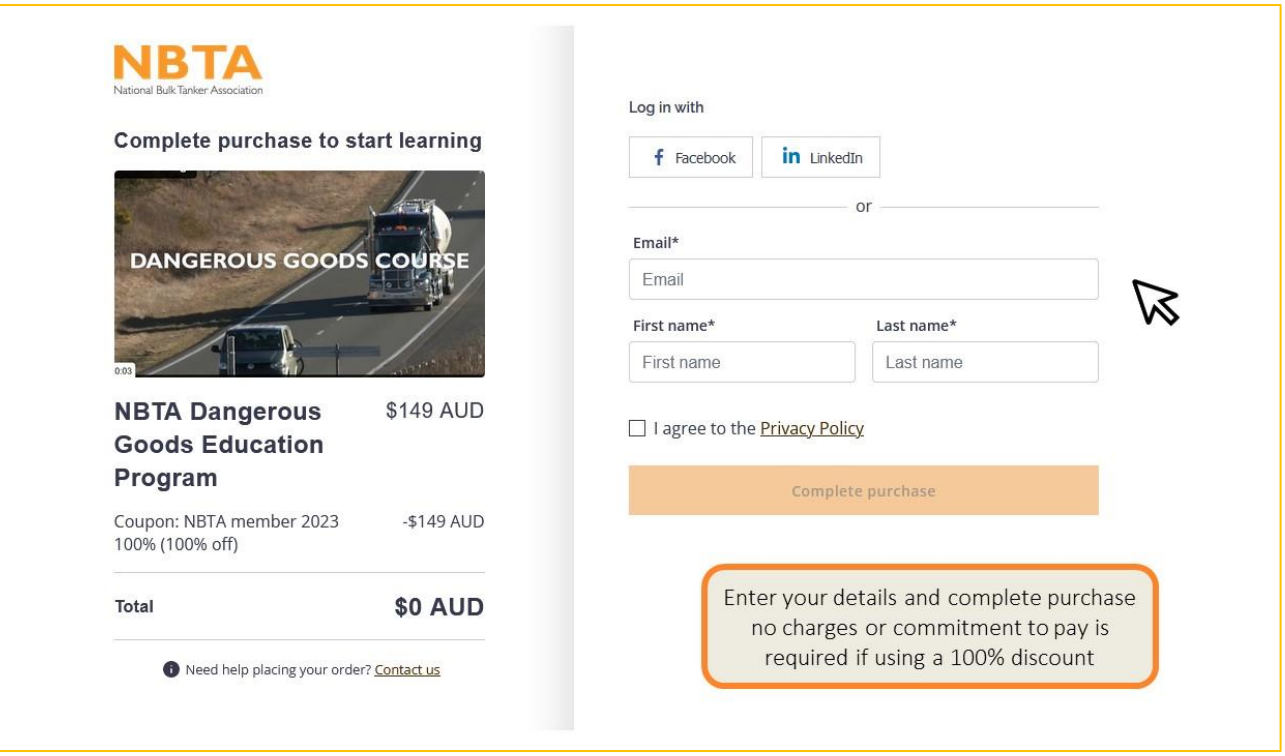


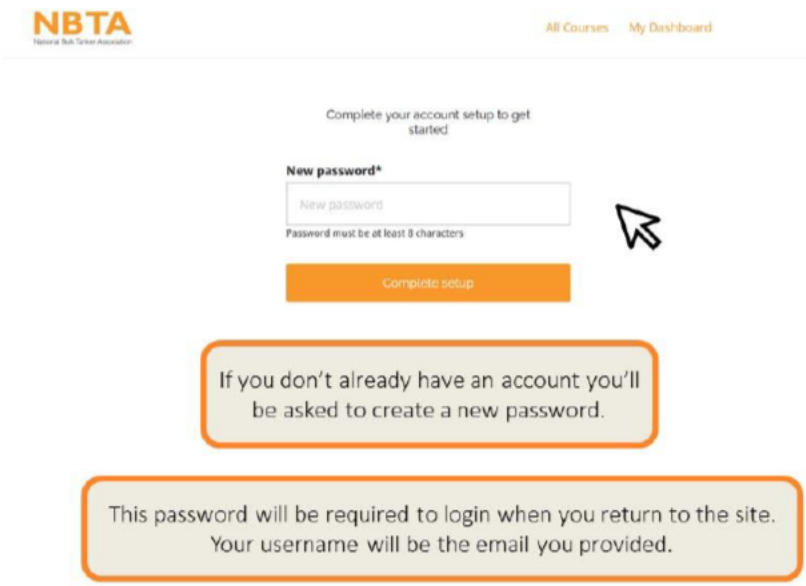
How do I get there?

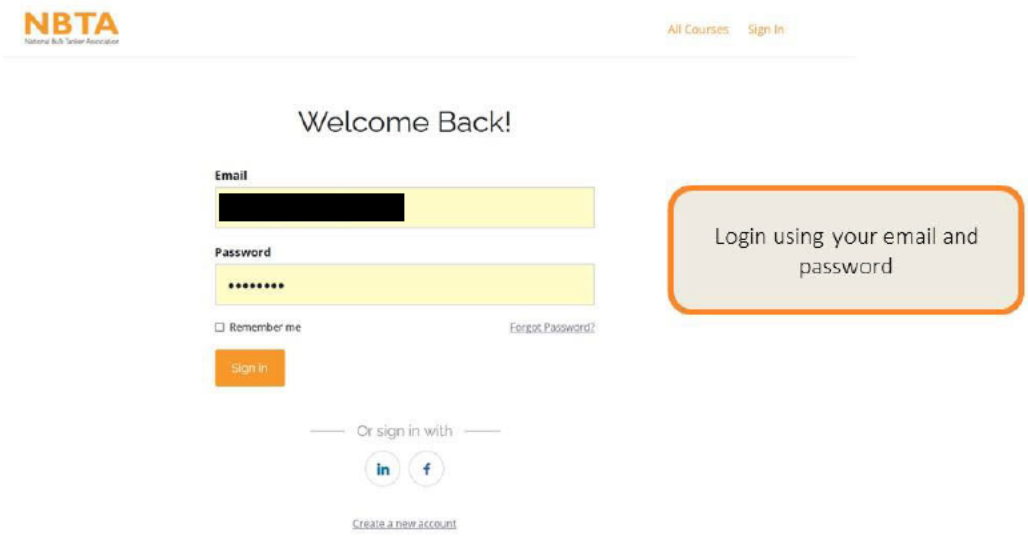
https://nbta-education.thinkific.com/

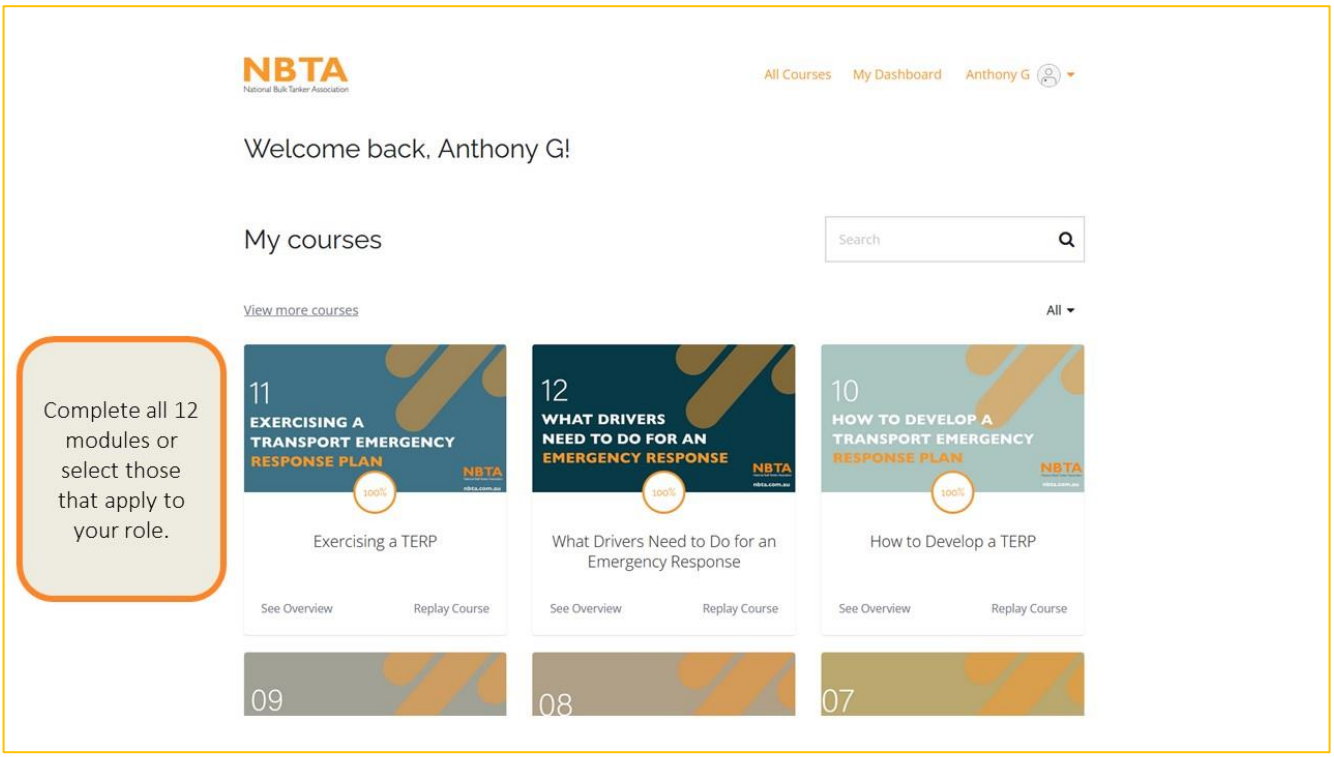
Go to this website or simply…

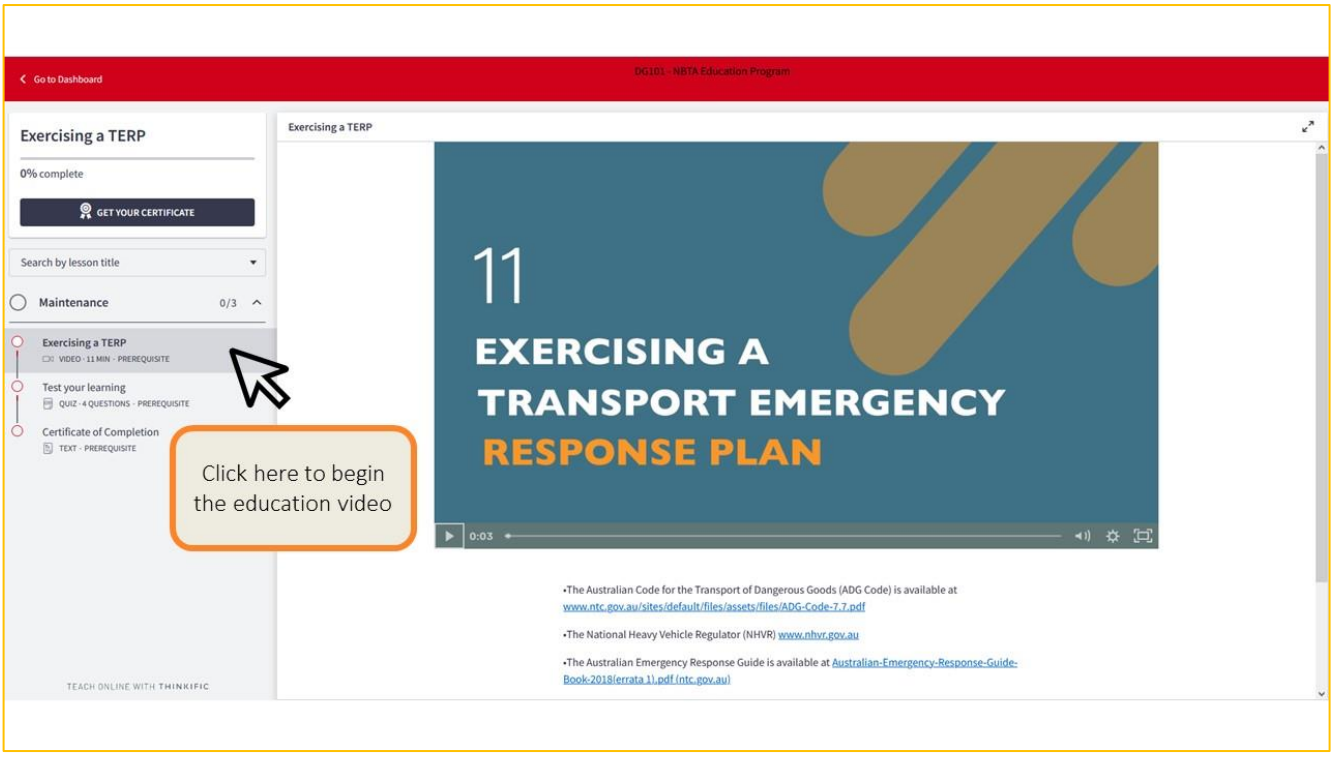

NBTA
National Bulk Tanker Association
Complete purchase to start learning
DANGEROUS GOODS COURSE
NBTA Dangerous Goods Education Program
$149 AUD
Coupon
NBTAmember2023
Apply
Total
$149 AUD
Need help placing your order? Contact us
Enter your token and click apply, this token will apply a 100% discount
Log in with
Facebook
LinkedIn
or
Email*
Email
First name*
Last name*
First name
Last name
Select a payment method
Card
Secured
Card number
MM / YY CVC
I agree to the Privacy Policy
Complete purchase
All transactions are secure and encrypted

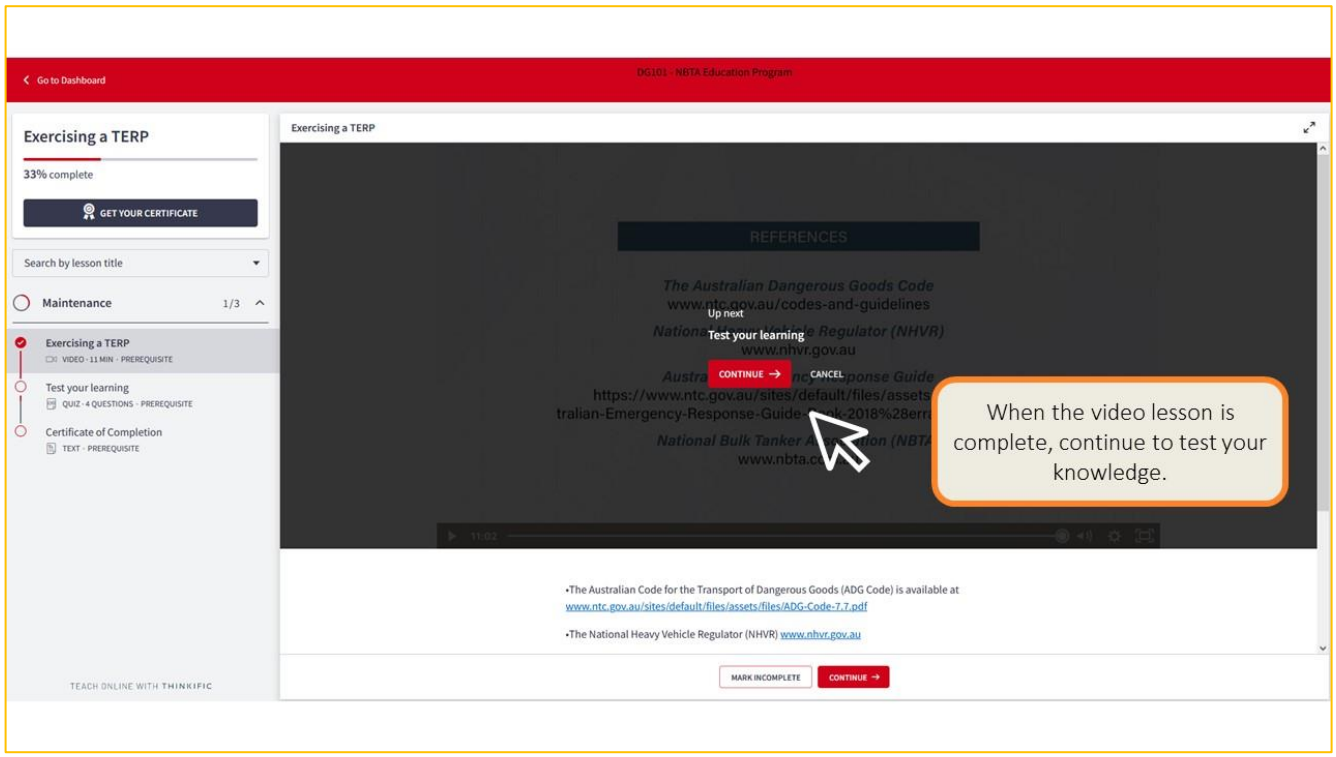

NBTA
National Bulk Tanker Association
Complete purchase to start learning
DANGEROUS GOODS COURSE
NBTA Dangerous Goods Education Program
$149 AUD
Coupon: NBTA member 2023
100% (100% off)
-$149 AUD
Total
$0 AUD
Need help placing your order? Contact us
Log in with
Facebook
LinkedIn
or
Email*
Email
First name*
Last name*
First name
Last name
I agree to the Privacy Policy
Complete purchase
Enter your details and complete purchase no charges or commitment to pay is required if using a 100% discount

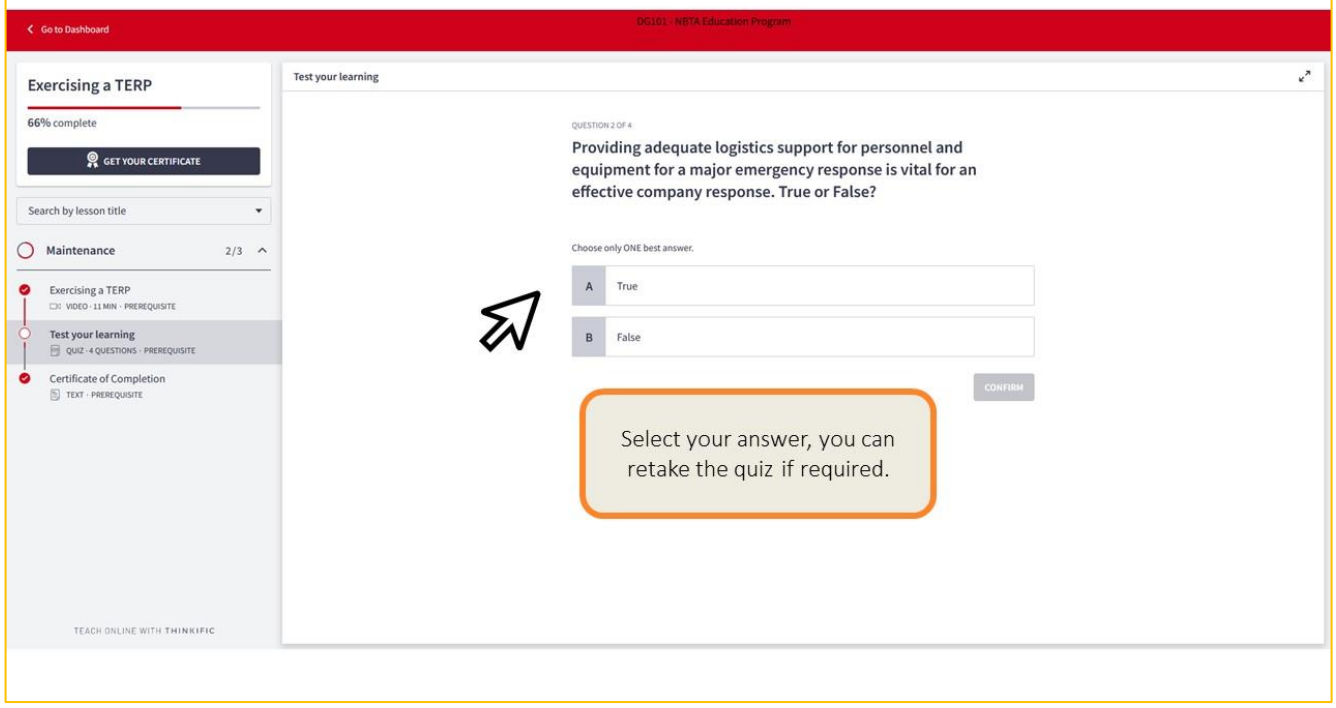

NBTA
All Courses
My Dashboard
Complete your account setup to get started
New password*
New password
Password must be at least 8 characters
Complete setup
If you don't already have an account you'll be asked to create a new password.
This password will be required to login when you return to the site. Your username will be the email you provided.

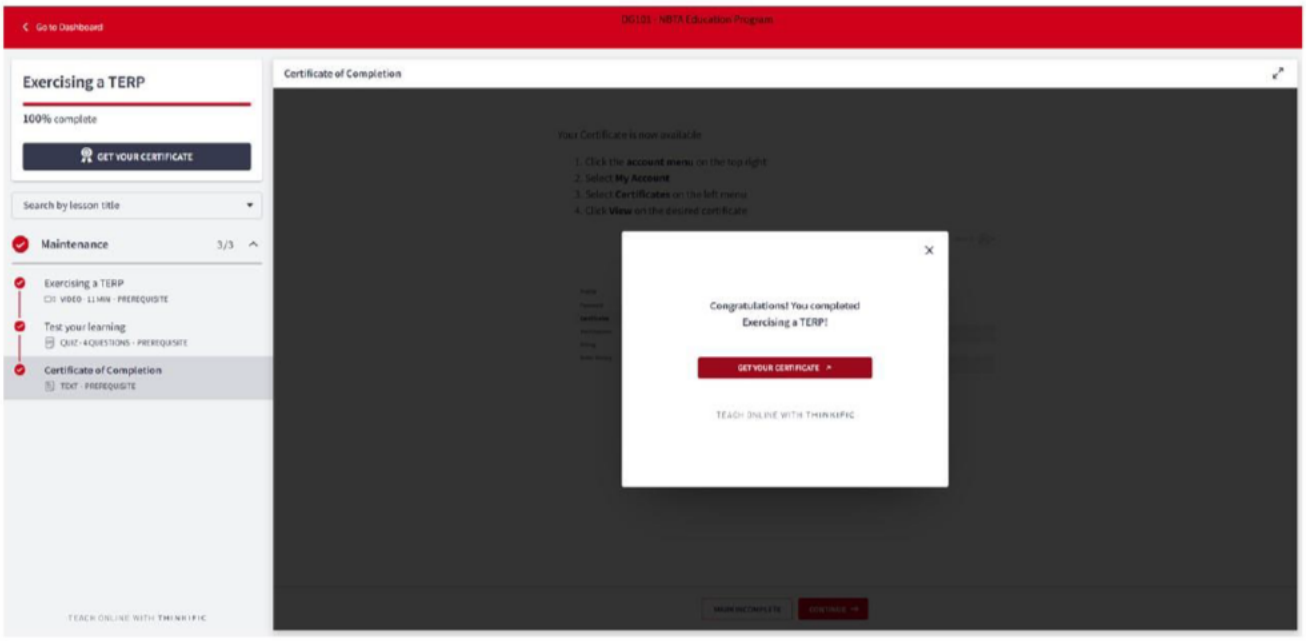

NBTA
All Courses
Sign In
Welcome Back!
Email
Password
Remember me
Forgot Password?
Sign In
Or sign in with
Create a new account
Login using your email and password


NBTA
National Bulk Tanker Association
All Courses
My Dashboard
Anthony G
Welcome back, Anthony G!
My courses
Search
View more courses
All
Complete all 12 modules or select those that apply to your role.
11
EXERCISING A TRANSPORT EMERGENCY RESPONSE PLAN
NBTA
Exercising a TERP
See Overview
Replay Course
12
WHAT DRIVERS NEED TO DO FOR AN EMERGENCY RESPONSE
NBTA
What Drivers Need to Do for an Emergency Response
See Overview
Replay Course
10
HOW TO DEVELOP A TRANSPORT EMERGENCY RESPONSE PLAN
NBTA
How to Develop a TERP
See Overview
Replay Course
09
08
07

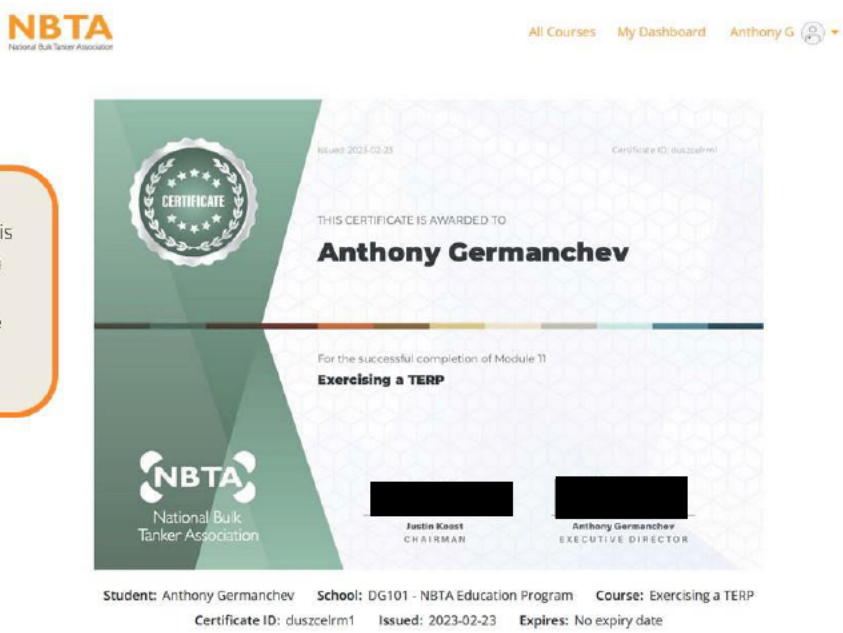

Go to Dashboard
DG101 - NBTA Education Program
Exercising a TERP
0% complete
GET YOUR CERTIFICATE
Search by lesson title
Maintenance
0/3
Exercising a TERP
VIDEO · 11 MIN · PREREQUISITE
Test your learning
QUIZ · 4 QUESTIONS · PREREQUISITE
Certificate of Completion
TEXT · PREREQUISITE
TEACH ONLINE WITH THINKIFIC
Exercising a TERP
11
EXERCISING A TRANSPORT EMERGENCY RESPONSE PLAN
0:03
Click here to begin the education video
•The Australian Code for the Transport of Dangerous Goods (ADG Code) is available at www.ntc.gov.au/sites/default/files/assets/files/ADG-Code-7.7.pdf
•The National Heavy Vehicle Regulator (NHVR) www.nhvr.gov.au
•The Australian Emergency Response Guide is available at Australian-Emergency-Response-Guide-Book-2018(errata 1).pdf (ntc.gov.au)


Go to Dashboard
DG101 - NBTA Education Program
Exercising a TERP
33% complete
GET YOUR CERTIFICATE
Search by lesson title
Maintenance 1/3
Exercising a TERP
VIDEO · 11 MIN · PREREQUISITE
Test your learning
QUIZ · 4 QUESTIONS · PREREQUISITE
Certificate of Completion
TEXT · PREREQUISITE
TEACH ONLINE WITH THINKIFIC
Exercising a TERP
REFERENCES
Up next
Test your learning
CONTINUE
CANCEL
When the video lesson is complete, continue to test your knowledge.
•The Australian Code for the Transport of Dangerous Goods (ADG Code) is available at www.ntc.gov.au/sites/default/files/assets/files/ADG-Code-7.7.pdf
•The National Heavy Vehicle Regulator (NHVR) www.nhvr.gov.au
MARK INCOMPLETE
CONTINUE


Go to Dashboard
DG101 - NBTA Education Program
Exercising a TERP
66% complete
GET YOUR CERTIFICATE
Search by lesson title
Maintenance 2/3
Exercising a TERP
VIDEO · 11 MIN · PREREQUISITE
Test your learning
QUIZ · 4 QUESTIONS · PREREQUISITE
Certificate of Completion
TEXT · PREREQUISITE
TEACH ONLINE WITH THINKIFIC
Test your learning
QUESTION 2 OF 4
Providing adequate logistics support for personnel and equipment for a major emergency response is vital for an effective company response. True or False?
Choose only ONE best answer.
A True
B False
CONFIRM
Select your answer, you can retake the quiz if required.


Go to Dashboard
DG101 - NBTA Education Program
Exercising a TERP
100% complete
GET YOUR CERTIFICATE
Search by lesson title
Maintenance 3/3
Exercising a TERP
Test your learning
Certificate of Completion
Certificate of Completion
Congratulations! You completed Exercising a TERP!
GET YOUR CERTIFICATE


Each certificate is unique and is a record of you completing the module


NBTA
National Bulk Tanker Association
All Courses
My Dashboard
Anthony G
CERTIFICATE
THIS CERTIFICATE IS AWARDED TO
Anthony Germanchev
For the successful completion of Module 11
Exercising a TERP
NBTA
National Bulk Tanker Association
Justin Kaast
CHAIRMAN
Anthony Germanchev
EXECUTIVE DIRECTOR
Student: Anthony Germanchev School: DG101 - NBTA Education Program Course: Exercising a TERP
Certificate ID: duszcelrm1 Issued: 2023-02-23 Expires: No expiry date

Appendix B

Appendix B.1 – Promotion of DG101

DG101 – NBTA Education Program

Official Launch

The NBTA's dangerous goods education and awareness program was officially launched at our General Meeting in Sydney on 28 Feb.

The online education program developed by the NBTA in partnership with COG is titled DG101 and includes 12 modules covering all aspects of bulk DG transport. The education program is available free to members and non-members for 12 months funded by the NHVR's Heavy Vehicle Safety Initiative.

You can find more information here https://www.nbta.com.au/dg101

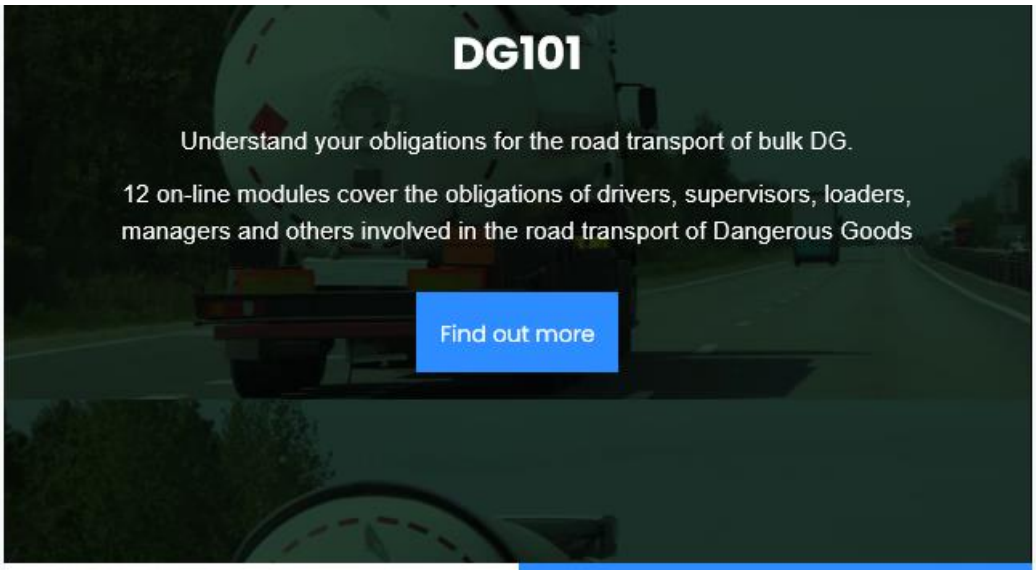
Click the button below to sign up for DG101 and apply your token for free access.

Sign up for DG101 Education Program

DG101 - NBTA education program breaks new ground

Since the launch over 700 applicants have enrolled in the education program. The aim of the program is educate those who involved in dangerous good road transport and increase the leve of awareness across the industry. The program has received much praise including from operators, trainers and compent authorities.

You can enroll via the button below and use the code below for free access.



DG101 - NBTA Education & Awareness program

Enroll in DG101 for free using this coupon

-100%

Coupon code for 100% discount on enrollment fees

NBTAmember2023