

CHARTERED INSTITUTE OF LOGISTICS AND TRANSPORT IN IRELAND

PRINCIPAL MARKER'S REPORT FORM

DANGEROUS GOODS SAFETY ADVISER EXAMINATION

SUBJECT: PAPER 2

EXAMINATION DATE: 3rd March 2020

PART TWO – COMMENTS MAY BE CIRCULATED

No Attempting Examination:	64
No Passing Examination:	56
% Pass Rate:	87.50%
Average Mark	54.30

A. General Comments

- This was the fourth diet of exams to be based on the new examination system with two papers per diet only. For this second paper the pass rate is slightly up on the November 2019 result. The average mark has also gone up slightly.
- No one scored 100%. However two candidate scored more than 90%
- The compulsory case study concerned the transport of a high strength water based solution of a substance of Class 5.1 liquid in a UN multimodal portable tank
- Of the other two where candidates must choose one or the other:
 - The second concerned the international transport of a blasting explosive of Class 1.5
 - The third concerned the international transport of a flammable liquid in IBCs.
- The average marks attained by candidates were much of a muchness at 27.28, 27.63 and 26.67 respectively. Of the optional case studies, the number of candidates who selected the third outweighed those who chose the second in the ratio of two to one.

B. Comments on Individual Questions

Please make comments as appropriate for each question.

Case Study 1

No one made the fatal mistake of mixing up UN portable tanks subject to the provisions of Chapters 4.2 and 6.7 of ADR with RID/ADR tank containers subject to the provisions of Chapters 4.3 and 6.8 of the ADR I am pleased to say.

In part (a) which was a question in three subparts, one question concerned the vehicle which needed to be used to carry the UN portable tank i.e. an FL vehicle. A few candidates mistook the question as requiring the Portable Tank Instruction (T-code) applicable to the substance whilst who did, in fact give the RID/ADR tank code as the vehicle code.

The third part of this case study was in five subparts. The first four subpart questions could all be answered by reading off the requirements for a T9 UN portable tank from the T-code table in 4.2.5.3 i.e. 4 bar, 6mm, NORMAL and not allowed. Most made light work of answering the 1st, 2nd and 4th part of this question but not so for the 3rd part. This required candidates to determine whether the pressure relief valve situated on top of the tank should be preceded by a bursting disc (also known as a rupture disc and as a frangible disc in the regulations). The answer was quite simple. It said NORMAL in the column for pressure relief devices in table 4.2.5.3 meaning a bursting disc was not required – simple, really? Many went delving into Chapter 6.7 looking for rules about pressure relief devices which was unnecessary.

23.5% of candidates discovered that Special Portable Tank Provision TP6 applied to the substance in the case study. Sure, TP6 describes a situation where one or more bursting discs are required on the UN portable tank. However this provision whilst mightily important had no relevance to the question. A further 18.5% attempted some other answer.

The column in the T-code table for pressure relief devices is about whether a bursting disc is required *in series* i.e. fitted underneath the pressure relief valve. There are two main reasons why these much smaller bursting discs are fitted to UN portable tanks:

1. When made of a compatible material to protect the pressure relief valve from the corrosive effects of the substance being carried; and/or
2. To ensure when toxic substances are being carried that the pressure relief valve will only operate to release toxic vapour when absolutely necessary and that the relief valve will not operate inadvertently e.g. due to surge of liquid within the tank.



This is the sort of bursting disc the question was about with an external diameter of about 11 cm.



This is how it would look fitted beneath a pressure relief valve. A ‘tell-tale’ manometer (pressure gauge) is then fitted above the bursting disc and below the relief valve to detect rupture of the disc. The pressure relief valve, incidentally, is surrounded by a gauze, a flame trap to ‘prevent the immediate passage of a flame’ into a tank shell.

The substance in the question has the word “STABLIZED” in its Proper Shipping Name. Usually this word is added when the substance is capable of a dangerous polymerization reaction but in this case it is for a different reason. The substance concerned is capable of rapid dissociation causing huge volumes of vapour to be produced to the extent that the flow capacity through a standard relief valve normally fitted to UN portable tanks intended for the carriage of liquids cannot cope. TP6 requires an additional bursting disc to be fitted *in parallel* i.e. alongside the pressure relief valve rather than underneath it. These bursting discs typically have a diameter of three times that of the kind of bursting disc shown above, around 30 cm diameter. Whilst I commend the 23.5% of candidates who found and thought about TP6 it was not part of the answer.

In the fifth subpart of this question, candidates were asked about the rules for the *maximum* degree of filling of the UN portable tank. At least no one mistook this as a question about the minimum degrees of filling (the 80% rule). The correct answer was to be obtained by noting that Special Portable Tank Provision TP2 applied to the substance concerned and following where this leads. It leads to the formula

95

Maximum % fill level = -----

$$1 + \alpha(t_r - t_f)$$

19% of candidates gave the alternative formula with 97 on the top line and were marked wrong.

A few more could not attempt this question whilst one person wished to resort to the International Convention for Safe Containers (CSC) which deals with gross mass, not volumetric filling levels;

Another substantial question in this case study concerned the transport document to accompany the laden UN portable tank on its outbound journey full from Germany to Ireland. There were very few errors made by candidates as to the entry for the dangerous goods to be put on the transport document (CMR Note?). One person thought that the control and emergency temperatures should be included but not so. As noted above, the word STABLIZED occurs in the Proper Shipping Name not because of a polymerization danger but because of the rapid dissociation that can happen with the substance.

In the second subpart of this question candidates were asked about what could be done to use the *road* transport document for the outbound journey full UN portable tank so that it could be used for the return journey. Most got this right, i.e. to strike out the quantity and write on it “EMPTY UNCLEANNED RETURN” though 12.5% gave some other answer or could not attempt it.

The third subpart concerned the languages in which the transport document had to be written. The correct answer was that in German was enough as this was both the language of the forwarding country *and* one of the three official languages of the ADR. 14% of candidates insisted that the document should be in English as well as any other language they gave on the grounds e.g. that English is the commonly spoken language in Ireland. Not so. Ireland would have to accept a document as we shall see later written in German or French!

It should be understood that the ADR is a treaty. There are three versions of the treaty held in the treaties section of the UN in New York. What candidates use for their exams and in their dangerous goods working lives is but a copy of the treaty albeit one which could be quoted in a court of law. If the judge, for example, trying a case of non-compliance with the ADR was unhappy about accepting evidence based on a copy of the ADR, s/he could call for in theory at least one of the official copies of the treaty to be brought over from New York so that he could examine it. And then, if there were any discrepancies between the three translations, the French copy would take the ascendancy. The reason the transport document have to be in either English, French or German is so that the entry on the transport document can be compared with one of these official translations to establish in law the substance actually being carried.

Sorry but I could not accept anyone who insisted that the document has to be in English.

The final part of this case study, in three major subparts and worth a total of 11 marks concerned the marking and placarding. A few called the placards labels – a heinous crime in the dangerous goods world if ever there was one. Others called the orange plates placards – another heinous crime!

It was posited in the question that the UN portable tank would be taken by a vehicle to a transfer station where the UN portable tank without its carrying vehicle could be transferred to rail. Some thought that the applicable regulations for the rail leg of the journey were still the ADR whereas it has to be the RID for the countries concerned. One person thought it was the IMDG Code. Another 20% said something else or could not even attempt this question. I remind candidates that even though they were attempting to qualify as DGSA's for road transport by taking this exam they are still required to know about the existence of “national law, international conventions and agreements” [see 1.8.3.1.1 (b)] meaning that they should at least be aware of the international rules for the transport of dangerous goods by air, inland waterway, rail and sea.

Candidates were required to say:

1. That best practice in the context of the journey that the vehicle carrying the tank container should have two *plain* orange plates at its front and rear
2. That the UN portable tank should have two additional orange plates on each side each bearing the HIN and UN number of the substance being carried
3. What the HIN and UN numbers actually are
4. That the orange plates should be 400 mm x 300 mm *with a border* and a dividing line across the middle 15 mm wide. I will come back to the border line issue shortly
5. That the digits forming the HIN and UN numbers should be 10 cm high and have a stroke thickness of 15 mm
6. That as the UN portable tank would be transferred to rail, it was not appropriate for the HIN number and UN number to be displayed on the vehicle carrying the UN portable tank as once the portable tank was lifted off the vehicle carrying it, this information would disappear during the journey by rail. I wanted candidates to say, therefore, that the option at 5.3.2.1.6 of Chapter 5.3 of the ADR whereby if a single substance is being carried the HIN and UN number may be displayed on the vehicle carrying the UN portable tank even though technically this might be allowable. For me reaching this conclusion was the most significant part of this subpart of the last question in the case study.

I remind DGSAAs about what it says at 1.8.3.3 that their primary duty is "...to facilitate the conduct of those activities [the carriage of dangerous goods] in accordance with the requirements applicable *and in the safest possible way*". For me, this means DGSAAs in the case of what is sometimes called "combined transport" (road + rail) should be able to think the situation through and conclude that the filler/portable tank operator should forgo the use of 5.3.2.1.6 of Chapter 5.3 of the ADR.

(Indeed, there is a warning about these kinds of situations in the RID (though I cannot expect candidates to know what the RID says in a road mode paper.)

Most disappointingly only two candidates thought this through properly and stated that the 5.3.2.1.6 option should not be used meaning 97% of candidates did not think it through properly in my opinion.

47% of candidates failed to give the dimensions for the digits of the HIN and UN number, many not even providing any of these.

26.5% of candidates failed to give all the dimensions of the orange plates, particularly the width of the black border, some not even providing any of these.

20% of candidates failed to tell me about the orange plates required on the vehicle carrying the portable tank (with or without the HIN and UN number digits)

All in all this part of the case study concerning the orange plate marking for the vehicle and the UN portable tank was poorly answered, as I say, only two candidates thinking it through properly.

In the second subpart of the last question candidates were asked to say what placards were required on the portable tank and where these should be placed. This was done reasonably well by most candidates, they saying that a No. 5.1 and a No. 8 placard was needed on all four sides of the UN portable tank. A few only gave the primary placard whilst another few failed to mention that the placards were needed on the front of the UN portable tank.

In the final subpart of this last question, candidates were asked to give the dimensions of the placards. A few gave me details about the dimensions of the orange plates and/or the dimensions of the HIN and UN number which was what this part of the case study was not about.

There are **three** details concerning the dimensions of placards:

1. The external dimensions of 250 mm x 250 mm
2. The position of the line inside the edge i.e. 12.5 mm from the edge
3. The height of the class numbers in the lower corners of the placards i.e. at least 25 mm

I wanted all three dimensions. 39% of candidates did not give me the at least 25 mm height requirement for the class numbers. This detail is just as important. Some others omitted the position of the border line as well.

Case Study 2

This case study concerned the transport of an explosive intended for use in quarries.

The case study opened with a request to candidates to explain the explosive classification code. Most did this competently, explaining the meaning of the two parts, the “1.5” and the “D”

The second part about various packing and packing conditions for the explosive was also handled pretty well on the whole.

In the third part, candidates were asked to say what marks and placards were needed on the packages. A key part of the solution for this third part was that candidates should find that Special Provision 617 applied to the explosive concerned requiring the commercial name to be marked on. 15.5% of candidates who took this case study missed out on telling me that SP 617 applied and lost marks as a consequence.

In the fourth part, first subpart, candidates were asked to say whether an EX/II or an EX/III vehicle was required. Normally one would need to do a calculation of the net explosive mass involved in the consignment and then look at the thresholds in 7.5.5.2.1, Chapter 7.5. However for the UN number concerned there was an override in column (14) of the Dangerous Goods List requiring an EX/III for all quantities of this particular explosive. 57% of candidates used the rule expressed in column (14) though the remainder who took this case study missed this point.

The second subpart of this fourth part required candidates to consult the table in Chapter 9.2 to determine whether a particular construction requirement applied to EX/III vehicles. It seemed to present little difficulty for candidates.

There was a fifth part concerning whether the consignment could pass through the Dublin Port Tunnel, a category C tunnel. It, too seemed to present little difficulty for candidates.

Not quite so clear cut with the next part, however which concerned loading or unloading the explosives in a public place. What I really wanted was for candidates to discover that Special Provision for Carriage – Operations S1 applies to the UN number in the question. This gives an extensive list of requirements, one of which, for example, is that if two or more vehicles are loading or unloading in a public place they should be at least 50 m apart. Many attempted this from question from Special Provisions for Carriage – Loading, Unloading and Handling CV1 and CV2. Whilst this was not an unreasonable approach it did mean that they missed out on some of the additional requirements set out in S1. Only three candidates who took this case study out of 21 used S1 and gave me that extra 50 m separation rule. 17 of those who took this case study concentrated on the CV provisions.

The remaining parts of this case study, concerning the length of the additional initial training course for drivers of vehicles carrying explosives, fire extinguishers and vehicle marking and placarding were well handled on the whole. One subpart question asked whose duty it is to ensure the orange coloured marking plates were on display after loading and before setting off. I got a range of answers from the consignor, the driver, the DGSA, the filler and the loader. Fillers was an inappropriate answer because fillers fill tanks. Loaders was also inappropriate as they only have to do this for containers, not for vehicles.

Case Study 3

The case study concerned the transport of a large number of 1100 litre capacity IBCs from Italy to Ireland.

Candidates were firstly asked whether transport in the IBCs concerned (31A) was permitted which most did comfortably noting that 31As were authorised in the appropriate IBC Packing Instruction.

Candidates were then asked about the marking and labelling requirements for the IBCs. Candidates were asked to “Justify your answer”. Most candidates determined that the UN number needed to be marked on two opposite sides and said what this was. Most candidates, too, determined that a number 3 flammable liquid label was needed on two opposite sides. A few failed to mention that one or the other of these were needed.

What I really wanted as part of justifying their answers was to say why the double marking and labelling on two opposite sides was necessary i.e. because the IBCs were greater in capacity than 450 litres. No less than 58% of candidates who took this case study failed to mention this reason.

The next question in this case study perplexed many of the candidate who took it – to say whether transport of the IBCs on an open flatbed semi-trailer was permitted. 18.5% of candidates who took this case study suggested that this was allowable so long as the vehicle was FL approved. Not the answer as the provisions surrounding the use of AT and FL vehicles only apply when transport in tanks is to take place. IBCs count as packaged dangerous goods.

A further 25.5% of candidates who took this case study either could not attempt it or gave some other inappropriate answer.

What I wanted was for candidates firstly to determine that there were no restrictions indicated by any remarks in column (14) of the Dangerous Goods List for the substance concerned and then to turn to Chapter 7.2 to see whether this chapter had any restrictions on using open vehicles which it did not meaning thereby that transport of the IBCs was allowable by this kind of vehicle. Not terribly well answered on the whole. It may not have occurred to candidates that ADR does say what kind of vehicles we are allowed to use so that just because you’ve classified it, identified it (with a PSN and UN number), packed it correctly, found an ADR trained driver etc. still does not give you to transport dangerous goods on any vehicle you like.

There was a question about the transport document – what it should contain – which was well answered. In a subsequent sub-part, candidates were asked about the languages in which the transport document (CMR Note?) should be written. The answer was in Italian and one of the three official languages of the ADR – German, French or English – see my explanation about this in my comments on Case Study 1 above. Most determined that Italian was needed but 42% of candidates were insistent that English was the sole choice for the second language. Not so. The document has to be accepted in Ireland in French or German.

If the spoken language was a determinant of these matters in ADR which it is not, I ask candidates to consider that the greater part of the journey would have been across the territories of non-English

speaking countries such as (probably) France and parts of Switzerland or maybe through Belgium and Holland also touching parts of Germany all have which have populations far bigger than Ireland.

The next question to trouble candidates concerned the options for a driver to park up when his or her drivers hours have run out. Two options were ruled out in the question as not available from the hierarchical choices in Chapter 8.4 – a factory or depot and a supervised lorry park. Nevertheless endless candidates told me that the latter was one of the options despite it having been ruled out in the question. I do expect would-be DGSA's not only to know the ADR regulations but actually to be able to apply them!

More significantly, perhaps, the ADR contains a series of provisions for determining whether the provisions of Chapter 8.4 are applicable via a number of the Special Provisions for Carriage – Operations – the “S” provisions. In the case of the substance in this case study, this was S20 which triggers chapter 8.4 requirements if the load in packages exceeds 10000 kg. Establishing this fact and then determining whether the load exceeded 10000 kg (it did – 12000 kg) was a key part of the answer I was looking for. 23% of candidates who took this case study failed to explain how S20 affected their answers.

Apart from two more question in this case study which I will come to, the remainder of the questions were well answered on the whole but I do remind that the width of the black border on ADR orange plates is as important a dimension as any. 18.5% of candidates who took this case study left this detail out.

Candidates were asked about what to do in the case of detecting a leakage during unloading the IBCs. It required candidates to discover that 7.5.8.1 of Chapter 7.5 applied in such circumstances. I wanted candidates to state the requirements of 7.5.8.1 in full for the marks. Sadly 21% of candidates who took this case study could not even attempt this question whilst a further 39.5% of those candidates cut their answer short.

In the last question, candidates were asked to say at what point would it be necessary to submit an incident report as prescribed in 1.8.5 of Chapter 1.8 of the ADR to the national competent authority. As the substance belonged to Transport Category 2 and was a liquid was if the incident involved 333 litres or more. 18.5% of the candidates who took this case study could not answer this question.

C. Comments on Candidates' Performance (include identification of any gaps in knowledge\areas of weakness)

Any comments appear above.

D. Comments on the Marking Process

None.

SIGNATURE: DATE: 28.03.2020

Paper2 report/dgsa