



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

AUG 28 2017

Michael Yarwood
Claims Executive
TT Club
90 Fenchurch Street
London EC3M 4ST

Reference No. 17-0046

Dear Mr. Yarwood:

This letter is in response to your April 3, 2017, email requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the transport of phosphorous oxychloride and phosphorous trichloride in United Nations (UN) portable tanks. The hazardous materials are transported from Europe to the United States in UN portable tanks in accordance with the International Maritime Dangerous Goods Code. Specifically, you ask whether these UN portable tanks must be marked with a "U" stamp.

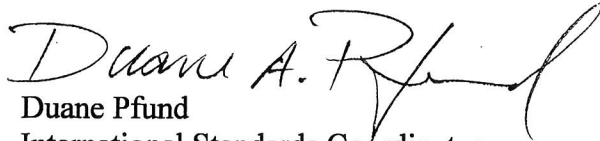
A UN portable tank used to import "UN1810, Phosphorus oxychloride, 6.1, (8), PG I, Toxic Inhalation Hazard Zone B" and "UN1809, Phosphorus trichloride, 6.1, (8), PG I, Toxic Inhalation Hazard Zone B" into the United States must be designed and constructed in accordance with the requirements in Section VIII, Division I of the American Society of Mechanical Engineers (ASME) Code. Additionally, portable tanks must have an ASME certification and a "U" stamp when used for Hazard Zone A or B toxic by inhalation liquids as required by § 178.274(b)(1). The U.S. Department of Transportation requires Zone A or B toxic by inhalation liquids to be transported in ASME Code "U" stamped portable tanks regardless of what other regulatory standards may allow. Other design codes may be used if approved by the Associate Administrator.

In your email, you reference a letter of interpretation previously issued under Reference No. 13-0151 that authorizes in the United States the use of a UN standard packaging, including a UN portable tank, manufactured outside of the United States in conformance with national or international regulations based on the UN Recommendations on the Transport of Dangerous Goods. This response remains correct for hazardous materials that are not toxic by inhalation. However, the response in 13-0151 is not applicable to materials toxic by inhalation or the

situation described in your email. Specifically, § 171.23(b)(10)(ii) requires a material toxic by inhalation to be packaged in accordance with the requirements of this subchapter. As such, all relevant requirements in the HMR apply including §§ 173.244, 178.273(b)(6), and 178.274(b)(1).

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

A handwritten signature in black ink, appearing to read "Duane A. Pfund". The signature is fluid and cursive, with a large, sweeping "D" and a long, trailing flourish at the end.

Duane Pfund
International Standards Coordinator
Standards and Rulemaking Division

Dodd, Alice (PHMSA)

heavy
178 0754
Portable Tanks
17-0046

From: Webb, Steven (PHMSA)
Sent: Friday, April 28, 2017 9:37 AM
To: Dodd, Alice (PHMSA)
Cc: Pfund, Duane (PHMSA)
Subject: FW: US DOT CFR49 Query
Attachments: Transport of Phosphorus Oxychloride and Phosphorus Trichloride in Portable Tanks.docx; Italmatch USA.brief re UN portable tanks.032417.docx; Italamtch Responsive Memorandum 3.28.17_(29442200)_1).docx

Hello,

Can one of you please log this request for an interp in. It's an international letter, so it can be assigned to an international staff. The folder will need all three attachments.

Thanks

Steve

From: Michael Yarwood [mailto:Michael.Yarwood@thomasmiller.com]
Sent: Monday, April 03, 2017 7:13 AM
To: Webb, Steven (PHMSA) <steven.webb@dot.gov>
Subject: FW: US DOT CFR49 Query

Dear Steven,

Apologies for reaching out unannounced, a colleague kindly provided me with your contact details.

We have a Member who has posed a query to the Club in relation to the "U" stamp where loaded tank containers are transported from US ports through into the hinterland for final delivery by road. The tanks were loaded and shipped from Germany in Europe.

Our Member in this instance does not own the tanks themselves, they are shipper owned. The tanks we understand do not have a "U" stamp and our Members' customer is requesting that the tanks are transported to destination in the US hinterland by road.

Our Member has highlighted the need for the "U" stamp to be present for such journeys and essentially refused to move the tanks to destination at this time.

Both our Member and their customer have in the last week sought separate expert advice on the matter at hand and both have come back conflicting with one another, which isn't obviously helping to resolve the current dispute.

I wonder if you would possibly be able to look over the two sets of advice as attached and provide a definitive position as to whether or not the loaded tanks can move to destination without the presence of the "U" Stamp.

Thank you in advance.

Best regards,

Mike.

Michael Yarwood

Claims Executive

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for the TT Club

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Transport of Phosphorus Oxychloride and Phosphorus Trichloride in Portable Tanks (Tank Containers)

Introduction – U-Stamp Requirement

I have been asked to comment on whether UN specification portable tanks (tank containers) intended for the transport of phosphorus oxychloride and phosphorus trichloride between Europe and the United States of America are required to have been constructed in accordance with the American Society of Mechanical Engineers (ASME) pressure vessel code by manufacturers who hold the U-stamp qualification awarded by ASME.

Introduction – R. P. Boneham

I am professional in the transport of dangerous goods (hazardous materials), a profession I have followed in one way or another since 1967.

For a period of time between 1967 and 1977 I was employed in logistics for the UK chemical manufacturer Albright and Wilson Ltd., based in Oldbury, near Birmingham. That company does not exist anymore but parts of the business are now in the ownership of the Belgian company Solvay through various take-overs and mergers.

That company manufactured among other chemicals elemental phosphorus, phosphorus oxychloride and phosphorus trichloride.

From 1977 until 1985 I headed up the tank container department for the short-sea container shipping line Bell Lines.

Between 1985 and 1987 I worked for the UK daughter company of the German Hoyer group in various capacities.

Since 1987 I have been a trainer and consultant in the transport of dangerous goods specialising in the tank container

Introduction – ATCO, EPTA and ITCO

Introduction – Representation of the Industry at the United Nations etc.

In 1980 I took an initiative to found the first trade association anywhere in the world to represent the interests of the tank container industry. It was called the Association of Tank Container Operators (ATCO). I was assisted by several tank container operating companies of the day to do this including Bailee Freight Services (now part of the Den Hartogh group), Trafapak (now part of the Stolt group), Unispeed (no longer in existence) and Suttons.

In 1987, when I became an independent consultant, steps were taken to broaden the geographical base of the trade association. Its name was changed to the European Portable Tank Association (EPTA). By this time it had grown to include as members the two largest operators of tank containers, Stolt and Hoyer as well as several tank container construction and leasing companies.

At this time, too, I was asked by ATCO/EPTA to represent the interests of the tank container industry on international bodies which make regulation and/or standards. I immediately

sought and gained consultative status with the United Nations Committee of Experts on the Transport of Dangerous Goods (UNCoETDG). Consultative status was awarded jointly to EPTA and a similar USA based trade association called the Tank Container Association (TCA). In this capacity I attended many of the meetings of this body during the period 1987 to 1997. I will say more about this later.

I also served on committees at the European international level for the RID, the ADR and the ADN which make regulations for the transport of dangerous goods by rail, road and inland waterways.

I have attended meetings with the International Maritime Organisation.

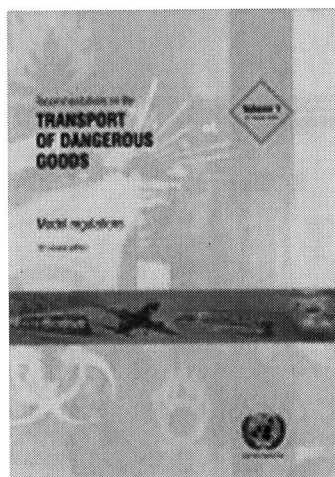
I have served on the technical committee advising the European Commission on the transport of dangerous goods.

These days in my early 70s I do not attend the international meeting but still remain an adviser to the UK's Department for Transport and its agencies responsible for the various modes of transport.

A synopsis of my curriculum vitae is appended.

The Work of the United Nations Committee of Experts on the Transport of Dangerous Goods

The prestigious UNCoETDG was set up by the UN in the 1950s with the purpose of drafting a set of recommendations on the transport of dangerous goods which could be adopted by all national and international law makers. Its function is to ensure safety of life and environmental protection by making its recommendations as well as to try to ensure there are *harmonised* regulations throughout the world for the multi-modal transport of dangerous goods i.e. that to try to ensure that wherever possible the same regulations apply to their transport by air, inland waterways, rail, road and sea. It publishes its recommendations in the United Nations Recommendations for the Transport of Dangerous Goods – Model Regulations. Currently these have reached 19 published revisions with another 20th edition awaiting publication in a few months' time:



It may be freely downloaded from:

http://www.unece.org/trans/danger/publi/unrec/rev19/19files_e.html

The provisions of each revised edition are traditionally incorporated into the USA Code of Federal Regulations Title 49 Transportation in Parts 171 to 180, Subchapter C. (CFR 49). Canada adopts a similar process.

A similar process is adopted by the UN agency responsible for international shipping matters, the International Maritime Organisation (IMO), the International Civil Aviation Organisation (ICAO) responsible for international transport of dangerous goods by air and the regional international regulations for the transport of dangerous goods by rail, road and inland waterways (RID/ADR/ADN) in Europe.

It hoped by these methods that the rules for the transport of dangerous goods in Portable Tanks are the same both in North America, for transport by air and sea and by the other modes of transport in Europe though it has to be said each of these authorities, either national or international reserve the right to withhold or amend a UN recommendation of which more shortly.

Lack of Harmonisation – First Generation Portable Tanks
UNSCoETDG Portable Tanks Working Group – Second Generation Portable Tanks
USA Capitol Hill and Responses to the Bhopal Incident

Despite the first tank containers as we know them today emerging in the late 1960s and despite providing a first set of recommendations for the design, construction, inspection, testing, certification, use, and in-service intermediate periodic and periodic testing of portable tanks in the early 1970s, the UNSCoETDG did very little to review and revise its recommendations in the intervening period until the 1990s. By then significant differences had arisen between the USA requirements for design etc. the requirements of the IMDG Code and the European RID/ADR. We can call these for the purposes of this paper “first generation portable tanks”.

In 1994 the UNSCoETDG authorised a working party to be set up to review all these differences, to try to bring back harmonisation in the requirements for the design etc. of portable tanks, in other words to make a new set of recommendations acceptable to these three main sets of regulation makers for a second generation of portable tanks.

I was a member of that working party tasked with producing what is, essentially, what we see today as Chapters 4.2 and 6.7 of the IMDG Code/RID/ADR/ADN and equivalent provisions of the CFR 49.

One cannot design a portable tank from Chapters 4.2 and 6.7 alone. Rather, as these must be pressure vessels, one takes a national pressure vessel code (if there were an ISO standard pressure vessel code that would be different as the UN always gives preference to ISO standards in its dangerous goods recommendations – there is an European EN standard for pressure vessel dangerous goods transport design etc. this cannot be accepted as it is a regional standard only). During our work some 24 or so national pressure vessels were identified.

The working group was chaired by Professor Ing. Bernt Schulz-Forburg from the BAM in Berlin, Germany. Its secretary was Mr. Bob Richards from the USA Department for

Transportation in Washington. Later Mr. Richards would become the chairman of the UNCoETDG itself.

One of the first and most contentious issues that had to be discussed was whether to specify just one national pressure vessel code for use worldwide in the transport of dangerous goods in the absence of a fully international code. Mr. Richards, carrying out the policy of the USA Department for Transportation (DOT) pushed hard for the ASME VIII Division 1 pressure vessel as the recommended pressure vessel code for worldwide use. Further he pushed for the adoption of the U-stamp qualification as a requirement for the design etc. of portable tanks intended to transport liquefied gases of Class 2 and for any liquid substance toxic by inhalation at the Packing Group I level of Class 6.1 (not if the substance was toxic by ingestion or absorption through the skin at the Packing Group I level, by the way). I shall refer to this range of chemicals as TIH products from now on.

I had little concern about this as an industry representative as this was already a requirement in the CFR 49 DOT 51 specification Portable Tanks. I knew that for the most part, the industry in those days and still today largely uses the ASME Division VIII pressure vessel code for all portable tanks as this was an established requirement of CFR 49 going back 10s of years. I also knew that there was the requirement in the CFR 49 for all those 10s of years for portable tanks for use in the USA even in international commerce intended to transport gases and liquids which are TIH. If we wanted portable tanks to be available for the transport of dangerous goods throughout the world including for transport into and from the USA we had to comply with the U-stamp requirement.

My colleagues from the ministerial delegations sitting on the portable tanks working group could not accept this proposition from the USA. A principle reason for this is that they, as diplomats, could not accede to any requirement which would effectively give the USA jurisdiction on their territories. Germany, France followed e.g. by the Netherlands, Spain and the UK strongly opposed the USA proposition about the precedence they wished to establish for the ASME code and above all for the U-stamp requirement. As representatives of sovereign nations, they could not allow the imposition of what was effectively seen as an enforcement body which grants the U-stamp qualification to manufacturers from another country on their territory.

This debate raged on for the three years of the portable tanks working group. It was discussed many times during all its sessions. I heard all the debates and also took part in further informal discussions about the USA's entrenched position. The USA did make one small concession in that for portable tanks intended for non-TIH products they would be prepared on application to the DOT to allow the use of an alternative pressure vessel code but this was to no avail. The impasse remained.

It is worth considering why the DOT was so entrenched in its position. As mentioned above, the requirement was a long-standing requirement for first generation portable tanks of the last century i.e. USA DOT specification 51 portable tanks. Then the terrible incident in Bhopal at the Union Carbide plant occurred on 2nd December 1984 where approximately 45 tonnes of the chemical Methyl Isocyanate was released. 45 tonnes is the equivalent of approximately two tank containers. Various sources put the immediate death toll at between 2500 and 3500. Sources say that 17000 or more died from the prolonged effects of exposure to this chemical with deaths from exposure possibly still happening today.

I was informed by Mr. Richards that Capitol Hill in Washington had instructed all government departments to do what they could to prevent a similar incident happening anywhere in the world, USA or elsewhere, involving a USA corporation. It was in carrying out this policy of the USA government that Mr. Richards tried so hard to get the working group and eventually the UNCoETDG to accept ASME VIII + U-stamp as the requirement which would be inserted into the United Nations Recommendations on the Transport of Dangerous Goods for TIH chemicals for the design etc. of what we may term the second version of portable tanks i.e. UN portable tanks.

When the time came to insert the requirements drawn up by the working group on which I served in the 1990s the USA DOT did as all governments and international bodies are under an obligation to the UN to do, they amended the CFR 49 of the day to incorporate the revised rules for design etc. BUT RETAINED the U-stamp requirement for any portable tank to be used on the territory of the USA for the transport of gases and TIH liquids.

The Internal Memorandum of Burr Forman LLP Precedence of the IMDG Code?

I have been given a 15-page internal memorandum from Burr Forman LLP to study concerning this U-stamp issue.

Before I review that memorandum, I would like to address the issue of whether the provisions of the International Maritime Dangerous Goods Code (IMDG Code) takes precedence over the CFR 49 rules for portable tanks used in international commerce for the transport of dangerous goods, particularly TIH liquids. Were this to be the case, the USA DOT could say this quite openly and straightforwardly. But this is not the case. The USA DOT in CFR 49 do not say this. Rather at §171.25 of CFR 49 onwards the USA DOT embarks on a series of additional requirements to be complied with in the USA over and above the requirements of the IMDG Code. I quote from §171 (b) "Any person who offers for transport or transports a hazardous material in accordance with the IMDG Code must also conform to the following additional conditions and requirements....". It should be noted that the text does not mention whether these additional requirements apply to exports from the USA or imports into the USA so that anyone offering hazardous materials in either direction is obliged to follow these requirements. That statement makes it clear that whilst transport under the provisions by any mode of transport covered by CFR 49 in the USA using the provisions of the IMDG Code, an offeror may only do so providing the additional provisions of CFR 49 are followed. The statement is helpful overall in carrying out multimodal transport operations involving the territory of the USA. The USA DOT could have quite simply said "comply with CFR 49 at all stages for imports and exports".

It is unfortunate in my opinion that all the relevant provisions for the transport of hazardous materials (the USA DOT uses the term hazardous materials but the UN uses the term dangerous goods. They are tantamount to the same thing.) concerning the interface between the international regulations such as the IMDG Code and CFR 49 are not grouped together all in one place.

In connection with the U-stamp requirement I would firstly point to §171.2 (b) (1) and (2) dealing with the limitations of use of international standards and regulations, the IMDG Code being mentioned as one of these. (2) of this subparagraph states that the hazardous material "must conform to all the applicable requirements of this subpart", the subpart being subpart C

extending where relevant from §171 to §180. For me this means that the U-stamp requirement of §178.273 (b) (iv) is applicable to UN portable tanks (second generation portable tanks). These requirements override the IMDG Code and, as just mentioned are brought into play by §172 (b) (2). This is one way CFR 49 can be used to justify my position that the U-stamp requirement is there in all cases where goods are moved in accordance with the IMDG Code. This is the override for UN portable tanks.

With respect to first generation portable tanks, I take a different position. Here I would draw attention to the requirements at §171.25 (c) (3) dealing with the interface between the IMDG Code and CFR 49 “*Except as specified in this subpart for a material poisonous (toxic) by inhalation, the T-codes specified in Column (15) of the Dangerous Goods List of the IMDG Code may be applied to the transportation of these materials [TIH] in IM, IMO and DOT Specification 51 portable tanks when these portable tanks are authorised in accordance with the requirements of this subchapter.*” What this paragraph does is to deal with first generation portable tanks in requiring any additional requirements for these tanks contained in Subpart C of the CFR 49 including the U-stamp requirement.

I hope to have shown that for both first generation and second generation portable tanks intended for the transport of TIH substances, the U-stamp requirement stands and overrides any IMDG Code provision.

Analysis of Burr Forman – Page 2, 4 and 5

Burr Forman argue on page 2 of the memorandum that §171.22 et sq. that these parts of CFR 49 “In short must transport goods in compliance and conformity to only the IMDG Code.” In my opinion this is a mis-reading of this part of CFR 49. §171.22 is stating that the IMDG Code must be followed but this subparagraph is modified by the additional requirements of §171.23 and §171.25. The three subparagraphs must be taken together. For similar reasons, I cannot agree with the statement on page four “We believe hazardous materials arriving in the United States by vessel falls outside of 49 CFR §171.23 entirely.” either. I believe this also to be a mis-reading of CFR 49. In any case, these statements in the memorandum need to be taken in conjunction with §171.22 (b) (2) whereby goods transported under the IMDG Code provisions must also “...conform to all applicable requirements of this subpart” i.e. Subpart C, §171 to 189.

Similarly it seems to me that the statement made in the memorandum at §171.25 (c) is also a mis-reading of this at (3), as already pointed out. (3) deals with the situation with first generation portable tanks intended for the transport of TIH substances which allows their continued use even though these specification tanks have effectively been withdrawn from CFR 49 – new first generation portable tanks not allowed to be authorised from 01.01.2003 onward. They continue to be subject to U-stamp (and R-stamp) requirements.

R-stamp Requirements

It should be noted that anyone making a repair or a modification to a first generation or second generation portable tank needs to hold an ASME R-stamp qualification.

Transport v. Transportation

In this report I use the term “transport” rather than “transportation”. The UN uses the term “transport” rather than “transportation”. I follow the UN practice. It should be recalled that in the English language the word “transportation” can also mean the punishment imposed on felons commonplace in the 18th and 19th century where they were permanently exiled to e.g. Van Diemen’s Land.

Official Interpretations of the USA Hazmat Regulations

It is open to anyone to apply to the USA Department for Transportation for an official interpretation of the USA CFR 49. Should my conclusions not be acceptable (based on many years of experience in all this), the website mentioned below should be consulted.

<https://phmsa.dot.gov/hazmat/regs/interps>

Roy Boneham,
Principal Consultant
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22nd March 2017

Issue No. 1
Revision No. 0

R P Boneham

Curriculum Vitae Synopsis

Roy Boneham was born in 1946 and grew up in the City of Coventry in the West Midlands region of England. He attended Bishop Ullathorne Grammar School where, in his final year he was appointed the head boy. He attended the University of Bradford in Yorkshire, England between 1966 and 1968 from where he graduated with a Bachelor of Science degree with Honours.

He joined the major UK-based chemical manufacturer Albright & Wilson for whom he worked for eight years mainly in posts concerned with distribution logistics. This company, at the location where he worked, produced some extremely hazardous chemicals such as elemental phosphorus and/or its compounds. It was here that he began to learn the proper 'Responsible Care' of hazardous materials in transport.

In 1977 he joined the European short-sea integrated Lift-on/Lift-off container shipping line Bell Lines Ltd where he headed up their tank container operations. He was responsible for marketing policy, sales, operations, maintenance and repairs policy and the bottom line of the tank container business centre. Eventually he was appointed the safety officer for the company with particular responsibilities for crew safety at sea when hazardous cargoes were on board. As an example of the responsibilities he had to discharge, he had to organise a middle-of-the-night rescue of two ship's crew members while making its passage to Waterford where the crew had been overcome by chemical fumes. He also conducted several in-house training courses for this employer and became involved for the first time directly in negotiations with government officials on dangerous goods matters.

While at Bell Lines, Roy was instrumental in founding the Association of Tank Container Operators (ATCO), becoming its first Secretary in 1980. Later this association became the European Portable Tank Association (EPTA) which subsequently merged with a North American similar organisation to become the International Tank Container Organisation (ITCO).

At the same time as founding his training and consultancy practice in 1987, his services as Secretary of the ATCO were confirmed when this role was taken over on a part-time basis. When in 1994 ATCO became the EPTA he was appointed to be its Executive Officer. When ITCO was formed he acted for a period as its consultant.

Later, from 1985 to 1987 he spent two years with the UK daughter company of the Hoyer group with wide ranging responsibilities including for the transport of cryogenic gases, project team member for the group with respect to the transport of granular and powdery materials in bulk, managing a tanker cleaning station.

For a number of years during the 1990s he represented the tank container industry on:

- The United Nations Committee of Experts on the Transport of Dangerous Goods (UNCoETDG)
- The United Nations Joint Committee on the RID/ADR/ADN
- The United Nations WP.15 Committee on the ADR
- The European Commission's Technical Committee on the transport of dangerous goods

In this work he has played an influential part in the development of global and European regional regulations concerning the transport of dangerous goods, often piloting proposals generated by himself for regulatory improvement through to a conclusion.

He founded his own training and consultancy practice in the transport of dangerous goods and related subjects in 1987 called New Alchemy which he has been running ever since then. Clients for whom he has worked include:

- The UK's Department for Transport
- The UK's Health and Safety Executive
- The British Army
- The British Navy
- The British Royal Air Force
- AKZONobel Decorative Coatings
- AKZONobel International Paints
- AMG
- Arizona Chemical
- Albright and Wilson
- Dead Sea Bromine Group
- Esso
- GlaxoSmithKline
- Hoechst
- ICI
- Merck, Sharpe and Dohme
- Rhodia
- Schering Plough
- Shell
- The South African Tank Container Association
- Warner Lambert Group
- And a wide variety of smaller speciality chemical manufacturers and distributors.

He has appeared several times as an expert witness in both criminal and civil court cases concerning the transport of dangerous chemicals.

While the industry representative on the prestigious UNCoETDG he served on a working party of the developing a new regime for the design, construction, inspection, testing and use worldwide of portable tanks (tank containers) which began to become law in the latter part of 2000. The results of this work can be seen, for example, in Chapters 4.2 and 6.7 of the IMDG Code which regulates international transport of dangerous goods by sea.

Roy developed a five-day training course for tank container operators in 1987. He continues to present this course today. It has been attended by nationals from Australia, Belgium, Brasil, Bulgaria, China, France, Germany, Hong Kong, India, Indonesia, Ireland, Israel, Mexico, Netherlands, Philippines, Poland, Singapore, South Africa, South Korea, Saudi Arabia, United Kingdom and the United States.

Courses have been presented 'in-house' to several tank container operators including Bulkhaul, Goodrich Maritime, Hoyer Global, Interbulk, NRS-Interflow, Stolt Nielsen.

He has also been involved with the activities of relevant Directorates within the European Commission in Brussels and with the drafting of international ISO standards for containers. Although Roy no longer represents the tank container industry on the international committees concerned with the transport of dangerous goods he remains an adviser to the UK

Department for Transport (DfT) and one of its agencies, the Maritime and Coastguard Agency (MCA) on the transport of dangerous goods. Through his position as an adviser he maintains an active involvement in the development of dangerous goods regulations world-wide.

In 1998 he was appointed one of the UK's Chief Examiners for the Dangerous Goods Safety Adviser qualification with specialisations in explosives, gases, petroleum products and the inland waterway mode of transport which is an important mode of transport on the mainland of Europe and is also the Chief Examiner for this qualification in the Republic of Ireland. In the latter capacity he is totally responsible for setting the exam papers, marking them and making recommendations as to who should be awarded this new prestigious qualification in Ireland.

From 1987 to 1999 he was intimately involved in the arrangements in the United Kingdom for the training of dangerous goods vehicle drivers through the National (Dangerous Substances) Driver Training Scheme. In particular, he helped to develop the training material used by some 30 training establishments in the UK.

In 2001 he took over the Dangerous Goods Agency upon the retirement of a colleague (in his early 80s) and now leads this respected team of consultant Dangerous Goods Safety Advisers in the UK and Ireland.

In his consultancy work he has become actively involved in the transport of dangerous waste, the relationship between the transport regulations, the UK's national regulations for the disposal of hazardous waste, its international transport within Europe and in aspects of the Basle Convention.

He has written many articles for publications associated with the transport of dangerous goods.

Projects concluded by Roy include:

- assisting non-European company to acquire re-assessment of its gas bottles under new European legislation called the Transportable Pressure Equipment Directive
- assisting a small multi-national company to understand the complexities of the classification system for aquatic pollutants
- delivering what was probably the first training course in Ireland on the separate system of law for the classification and labelling of dangerous substances for 'supply'
- preparing Dangerous Goods Safety Adviser annual reports both for his own clients and as surrogate for other DGSAs
- preparing a missing set of transitional regulations for inclusion in the IMDG Code
- assisting a major multi-national company to revise the rules for the transport of a substance liable to dangerous polymerisation
- preparing a lengthy report for the UK Health and Safety Executive on the dangers associated with tipping bulk containers for discharge along with a

colleague from the Health and Safety Laboratory – see
www.hse.gov.uk/research/rrpdf/rr822.pdf

Roy has also been a practitioner in the field of quality assurance.

Roy Boneham.

07 May 2002

Rev 4 11 April 2010

Rev 5 09 September 2016



Internal Memorandum

DE

To: To Whom it May Concern
From: Chet Hosch/Anna Browning
Date: May 2, 2017

FACTS

A manufacturer is transporting multiple foreign-made United Nations (UN) standard portable tanks ("UN portable tanks") of phosphorus trichloride (PCL₃) and phosphorus oxichloride (POCL₃) (collectively, the "Products") in shipment from Europe by vessel to the United States. The Products are in liquid state and are a material poisonous by inhalation as defined in 49 CFR §171.8. The Products in T20 portable tanks, after being held in freight at a United States port pending delivery to the customer, are then transported by motor carrier across public highway to a nearby state to the customer.

49 CFR §178.273(b)(6) addresses the need for owners and manufacturers of portable tanks to obtain approval of the appropriate agency, the process for that approval, recourse for denial, re-approval after modification and termination of approval. Part of this approval process is ensuring that packagings, such as UN portable tanks, are compliant with all engineering, marking, labeling, and placarding requirements under Title 49, Parts 171-180. However, certain of these requirements are excepted where UN portable tanks are manufactured according to the

International Maritime Dangerous Goods Code (IMDG Code) and other accepted international standards.

ISSUES

The threshold question presented is whether a manufacturer, as lessee of UN portable tanks, must use U Stamp marked UN portable tanks to transport a qualifying Product to port in the United States and on to its customer by roadway carrier even if the Product has been transported by vessel in part in its passage pursuant to the IMDG Code and if the UN portable tanks fully conform to applicable provisions in the UN Recommendations and applicable requirements of Hazardous Materials Regulations at 49 CFR Parts 171-180, Subchapter C ("HMR") and are capable of passing the prescribed tests in applicable standards of the HMR.

CONCLUSION

We have reviewed Subchapter C of Title 49, Subtitle B, Chapter I, Parts 171 through 180, addressing authorization and requirements for the use of international transport standards and regulations for hazardous materials. **We conclude the Products described above are not required to be shipped by U Stamp marked UN portable tanks pursuant to 49 CFR §178.273 or 274, because the tanks meet those standards of the IMDG Code and because these UN portable tanks manufactured outside the United States in accordance with national or international regulations based on UN Recommendations are considered to be authorized packagings under the applicable provisions of the HMR.**

ANALYSIS

49 CFR §171.22. Section 171.22 authorizes, subject to certain conditions and limitations, the transportation in commerce of hazardous materials in accordance with the IMDG Code. In addition to compliance with and conformity to the requirements of the IMDG, a

hazardous material offered for transportation in the United States must conform to all applicable requirements of this subpart. In short, shipping companies must transport their goods in compliance with and conformity to only the IMDG and Subpart C of Section 171 of Subchapter C. This includes the requirements applicable to the Products at issue as set forth in 49 CFR §§171.22 through 171.27.

Section 171.22(e) expressly provides for transportation of forbidden materials. "Forbidden materials" generally include those designated as forbidden in column 3 of the Hazardous Material Table reproduced in Section 172.101 (the "Table"). They also include certain other materials: (i) designated explosives, (ii) materials in shared packaging, the mixing of which is likely to cause a dangerous evolution of heat, or flammable or poisonous gases or vapors, (iii) materials in packages which give off a flammable gas or vapor, (iv) materials in packages containing materials which will detonate in a fire, and (v) certain oxygen generators. The Table extract below confirms the Products offered are not forbidden materials.

Symbol s	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special Provisions (§ 172.102)	(8)			(9)		(10)	
							Packaging (§ 173.***)			Quantity Limitations (see §§ 173.27 and 175.75)		Vessel Stowage	
							Exceptio ns	Non- bulk	Bulk	Passenger aircraft/ra il	Cargo aircraft only	Location	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Phosphorus trichloride	6.1	UN1809	I	6.1, 8	2, B9, B14, B15, B32, B77, N34, T20, TP2, TP13, TP38, TP45	None	227	244	Forbidden	Forbidden	C	40
+	Phosphorus oxychloride	6.1	UN1810	I	6.1, 8	2, B9, B14, B32, B77, N34, T20, TP2, TP13, TP38, TP45	None	227	244	Forbidden	Forbidden	D	40

Section 171.22(f) expressly provides for transportation of hazardous material with complete information and certifications regarding classification, packaging, marking and labeling/placarding in accordance with IMDG. Section 171.22(g) expressly provides for transportation of hazardous material with proper emergency response information, training requirements, security requirements, and incident reporting requirements under 49 CFR §§171 and 172. Thus, a company which transports hazardous material in compliance with the IMDG, as here described, will be compliance with Section 171.22(f) as well as Section 171.22(g), provided, the company complies with the training, security, and incident reporting requirements under 49 CFR §§171 and 172.

We could find no express provision for application of Hazardous Materials Regulations at 49 CFR Parts 171-180, Subchapter C ("HMR") generally to products in transport under the IMDG Code not classified as a forbidden material. In fact, it is only in such cases where a material is designated as a hazardous material under HMR, but excepted from or not subject to the IMDG or other international transport standards and regulations, that such hazardous material must expressly be transported in accordance with all applicable requirements of HMR pursuant to 49 CFR §171.22(c). Had Congress or the Department of Transportation intended otherwise, it could have plainly said so.

Section 171.25. We have examined the additional requirements for the use of the IMDG Code under 49 CFR §171.25 that hazardous materials may be offered for transportation within the United States by motor carrier in accordance with the IMDG Code provided at least part of the movement is by vessel provided such shipments conform to the requirements in 49 CFR §171.22 as applicable and 49 CFR §171.25, as applicable. It does not require such shipments conform to requirements under 49 CFR §171.23. Thus, we believe a hazardous material arriving

in the United States by vessel, falls outside of 49 CFR §171.23 entirely. Had Congress or the Department of Transportation intended otherwise, it could have plainly said so.

Any person who offers for transportation hazardous materials by highway subsequent to transportation by vessel pursuant to the IMDG Code, must ensure that the shipment conforms to the requirements of Part 177. Part 177 provides for general requirements for shipping by highway, including but not limited to unacceptable hazardous materials, inspection requirements, certain Federal Motor Carrier Safety Regulations, tunnel use regulations, training requirements for portable tanks, shipping papers, and emergency movement rules. We could find no provision in Part 177 requiring the "U Stamp" marking or marking requirements for portable tanks.

Any person who offers for transportation of hazardous materials by highway in accordance with the IMDG Code, must comply with placard rules in accordance with Subpart F of Part 172. This Subpart F of Part 172 does not provide any guidance or requirements regarding "U-Stamps". Finally, when a hazardous material is transported by motor vehicle on a public highway the segregation requirements of Part 7, Chapter 7.2 of the IMDG Code are authorized.

Any person who offers for transportation of hazardous materials by vessel in accordance with the IMDG Code must conform to the requirements in Part 176 of HMR. For transportation by rail subsequent to transportation by vessel in accordance with the IMDG Code, a shipment must conform to the requirements of Part 174.

Section 171.25(c) plainly states "[e]xcept for IBCs and UN portable tanks used for the transportation of liquids or solids, bulk packagings must conform to the requirements of this subchapter." We do not believe, therefore, that the Products, a liquid, to be shipped by UN portable tank, are otherwise subject to the bulk packaging requirements of the HMR. If

Congress or the Department of Transportation sought otherwise, it would not have expressly provided to the contrary.

Section 171.25(c) further states "[a]dditionally, the following requirements apply. We believe a plain reading of the provision means the exception for UN portable tanks used for the transportation of liquids or solids still falls outside the bulk packaging requirements of 49 CFR §171.25(c). We do not believe the requirements that follow the Products; these requirements apply to gases offered for transport by UN portable tanks, not liquids.

Our conclusions have been confirmed by the Pipeline and Hazardous Materials Safety Administration ("PHMSA") of Department of Transportation in PHMSA Interpretation #13-0151 dated April 8, 2014. The letter is attached at Exhibit A. There, the distributor requested clarification of the HMR applicable to UN portable tanks. The PHMSA states with finality "when transported to, from or within the United States, §171.25(c) requires UN portable tanks used to transport gases to comply with the HMR."

A contradictory, but flawed position to this is that a manufacturer and distributor of the Products described is subject to 49 CFR §178.273(b)(6). Such position stands as follows:

§ 178.273 Approval of Specification UN portable tanks.

(a) Application for approval.

(1) An owner or manufacturer of a portable tank shall apply for approval to a designated approval agency authorized to approve the portable tank in accordance with the procedures in subpart E, part 107 of this subchapter.

(b) Action by approval agency. The approval agency must perform the following activities:

(6) For UN portable tanks intended for non-refrigerated and refrigerated liquefied gases and Division 6.1 liquids which meet the inhalation toxicity criteria (Zone A or B) as defined in § 173.132 of this subchapter, or that are designated as toxic by inhalation materials in the § 172.101 Table of this subchapter, the approval agency must ensure that:

(i) The portable tank has been designed, constructed, certified, and stamped in accordance with the requirements in Division 1 of Section VIII of the ASME Code (IBR, see § 171.7 of this subchapter). Other design codes may be used if approved by the Associate Administrator (see § 178.274(b)(1));

(ii) All applicable provisions of the design and construction have been met to the satisfaction of the designated approval agency in accordance with the rules established in the ASME Code and that the portable tank meets the requirements of the ASME Code and all the applicable requirements specified in this subchapter;

(iii) The inspector has carried out all the inspections specified by the rules established in the ASME Code; and

(iv) The portable tank is marked with a U stamp code symbol under the authority of the authorized independent inspector.

Section 273 is made applicable to UN portable tanks used for Division 6.1 liquids, Hazard Zone A and B, pursuant to 49 CFR §173.244(c). Section 173.244 states, in relevant part:

§ 173.244 Bulk packaging for certain pyrophoric liquids (Division 4.2), dangerous when wet (Division 4.3) materials, and poisonous liquids with inhalation hazards (Division 6.1).

When § 172.101 of this subchapter specifies that a hazardous material be packaged under this section, only the following bulk packagings are authorized, **subject to the requirements of subparts A and B of part 173 of this subchapter** and the special provisions specified in column 7 of the § 172.101 table. [Emphasis added.]

(c) Portable tanks: DOT 51 portable tanks and UN portable tanks that meet the requirements of this subchapter, when a T code is specified in Column (7) of the § 172.101 Table of this subchapter for the specific hazardous material, are authorized. Additionally, a DOT 51 or UN portable tank used for Division 6.1 liquids, Hazard Zone A or B, must be certified and stamped to the ASME Code as specified in § 178.273(b)(6) of this subchapter.

As previously stated, though, this position is flawed. Subparagraph (c) does not apply to the issue at hand because the authorized bulk packagings referenced in subparagraph (c) are **expressly qualified by the applicable provisions of subpart B of Part 173.**

Subpart B of Section 173 includes 49 CFR 173.24. This section expressly addresses the UN portable tanks used to transport the Products; UN standard packagings **manufactured outside of the United States.** It says:

(d)Specification packagings and UN standard packagings manufactured outside the U.S. -

(2) UN standard packagings **manufactured outside the United States.** A UN standard packaging manufactured outside the United States, in accordance with national or international regulations based on the UN Recommendations (IBR, see § 171.7 of this subchapter), may be imported and used and **is considered to be an authorized packaging** under the provisions of paragraph (c)(1) of this section, subject to the following conditions and limitations: **[Emphasis added.]**

(i) The packaging fully conforms to applicable provisions in the UN Recommendations and the requirements of this subpart, including reuse provisions;

(ii) The packaging is capable of passing the prescribed tests in part 178 of this subchapter applicable to that standard; and

(iii) The competent authority of the country of manufacture provides reciprocal treatment for UN standard packagings manufactured in the U.S.

These requirements applicable to UN portable tanks used transporting the Products **deliberately omits the U stamp requirement** of 49 CFR 273.244(c).

Again, this issue was definitively addressed in Interpretation #13-0151 in which the distributor requested clarification of the HMR applicable to UN portable tanks. The distributor provided extensive information about the UN portable tanks and the specification related thereto.

These UN portable tanks:

- Meet the European Standard (EN) 14025 metallic pressure tank design specification, the American Society of Mechanical Engineers (ASME) VIII, Division 1 design specification, or both;
- Meet the T1 and T22 codes under § 172.102(c)(7) of the HMR, and have a minimum wall thickness according to the pressure vessel code that is 5 or 6 mm of reference steel or equivalent in conformance with § 178.274(d);
- Are designed to transport hazardous materials meeting the following hazard classes: 3 (flammable liquid), 4 (flammable solid), 5 (oxidizer or organic peroxide), 6 (poisonous), 8 (corrosive), or 9 (miscellaneous); and
- Are manufactured by companies that have not been inspected by a representative of the United States government.

The distributor specifically asked if these UN portable tanks may be loaded and unloaded with a hazardous material authorized for that container **before and after transportation into, from, or within the United States**. The PHMSA concluded **definitively** the UN portable tanks may be loaded and unloaded with a hazardous material authorized for that container before and after transportation into, from, or within the United States.

UN standard packaging, including a UN portable tank, manufactured outside of the United States in conformance with national or international regulations based on the UN Recommendations on the Transportation of Dangerous Goods (Recommendations) is an authorized packaging, as this term is defined under § 173.24(c)(1), when: 1) the packaging fully conforms to applicable provisions in the UN Recommendations and the requirements of 49 CFR Part 173, Subpart B, including reuse provisions; 2) the packaging is capable of passing the prescribed tests in 49 CFR Part 178 applicable to that standard; and 3) the competent authority of the country of manufacture provides reciprocal treatment for UN standard packagings manufactured in the United States.

UN portable tanks transporting the Products that are in compliance and with those requirements of the IMDG, then (i) fully conform to applicable provisions in the UN Recommendations and the requirements of 49 CFR Part 173, Subpart B, including reuse provisions; (ii) are capable of passing the prescribed tests in 49 CFR Part 178 applicable to that standard; and (iii) meet the reciprocity standard if the competent authority of the country of manufacture provides reciprocal treatment for UN standard packagings manufactured in the United States.

After conducting its own due diligence, the manufacturer concludes the UN portable tanks fully conform to applicable provisions in the UN Recommendations and the applicable requirements of 49 CFR Part 173, Subpart B, including reuse provisions, and are capable of passing the prescribed tests in 49 CFR Part 178 applicable to that standard. After consultation with Michelle, a representatives of the PHMSA, the manufacturer has been advised by Michelle that there are no countries that do not provide reciprocal treatment for UN portable tanks manufactured in the United States. Both China and South Africa are included in the International List of Competent Authorities and/or Contacts for the Transport of Dangerous Goods. Appropriate representatives of these countries can be contacted at the addresses and telephone numbers provided therein.

49 CFR §171.23. We believe the interpretation provided by the PHMSA in Interpretation #13-0151 is equally relevant to our conclusion that a hazardous material arriving in the United States by vessel, falls outside of 49 CFR §171.23 entirely. Section 173.24(d)(2) clearly provides for the packaging requirements of UN portable tanks manufactured outside of the United States to transport the Products to and within the United States.

If it was intended that 49 CFR 171.23 apply to liquid materials shipped at least in part by vessel into the United States and otherwise subject to the IMDG, then Section 171.23(b) governs the requirements for specific materials and packagings transported under the IMDG. Section 171.23(b)(10) addresses materials poisonous by inhalation. Those materials, which by our understanding include the Products, must conform to requirements regarding shipping paper descriptions, material packaging, and package markings. The key question is raised by the requirement that "the material must be packaged in accordance with the requirements of this [Subchapter C]."

"Package" is defined in 171.8 as "a packaging plus its contents." "Packaging" means a receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packing requirements of HMR. "Receptacle" means a containment vessel for receiving and holding materials, including any means of closing. "Vessel" includes every description of watercraft, used or capable of being used as a means of transportation on the water.

"Portable tank" means a bulk packaging (except a cylinder having a water capacity of 1000 pounds or less) designed primarily to be loaded onto, or on, or temporarily attached to a transport vehicle or ship and equipped with skids, mountings, or accessories to facilitate handling of the tank by mechanical means but does not include a cargo tank, tank car, multi-unit tank car tank, or trailer carrying cylinders. "Bulk packaging" means a packaging, other than a vessel, including a transport vehicle or freight container, in which hazardous materials are loaded with no intermediate form of containment. Additionally, a bulk packaging has a maximum capacity greater than 450 L (119 gallons) as a receptacle for a liquid.

49 CFR §173.24(d)(2), then, precludes the need for the U stamp marking. So long as the UN portable tanks were manufactured outside the United States, and these UN portable tanks (i) otherwise conform to applicable provisions in the UN Recommendations and the requirements of this subpart, including reuse provisions, (ii) are capable of passing the **prescribed tests** in part 178 of this subchapter applicable to that standard, and (iii) enjoy reciprocal treatment for UN standard packagings manufactured in the U.S. by the country of manufacture, then the U stamp mark requirement of 49 CFR 178.274(d) is not required.

CJH/bmc

Exhibit A

PHMSA Interpretation #13-0151



U.S. Department
of Transportation

Pipeline and Hazardous
Materials Safety
Administration

1200 New Jersey Avenue, SE
Washington, D.C. 20590

APR 08 2014

Mr. Chris Vleugels
Design Approval Department
Apragaz V.Z.W. Uw Controle Organisme
Vilvoordsesteenweg 156
B-1120 Brussels
BELGIUM

Reference No. 13-0151

Dear Mr. Vleugels:

This is in response to your October 26, 2012 letter forwarded to the Pipeline and Hazardous Materials Safety Administration (PHMSA) on July 19, 2013, by Mr. Richard Hagemeyer, Agmark Corporation, and subsequent e-mails, additional documentation, and telephone calls between you, Mr. Hagemeyer, and members of my staff in which you requested clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to foreign-made United Nations (UN) standard portable tanks, herein referred to as UN portable tanks. We have no record of receiving your original October 2012 letter, and apologize for the delay in responding and any inconvenience this may have caused.

In addition to the correspondence noted above, you and Mr. Hagemeyer also provided the following information. The foreign-made UN portable tanks:

- Meet the European Standard (EN) 14025 metallic pressure tank design specification, the American Society of Mechanical Engineers (ASME) VIII, Division 1 design specification, or both;
- Meet the T1 and T22 codes under § 172.102(c)(7) of the HMR, and have a minimum wall thickness according to the pressure vessel code that is 5 or 6 mm of reference steel or equivalent in conformance with § 178.274(d);
- Are designed to transport hazardous materials meeting the following hazard classes: 3 (flammable liquid), 4 (flammable solid), 5 (oxidizer or organic peroxide), 6 (poisonous), 8 (corrosive), or 9 (miscellaneous); and
- Are manufactured by companies that have not been inspected by a representative of the United States government.

Specifically, you ask if these portable tanks may be loaded and unloaded with a hazardous material authorized for that container before and after transportation into, from, or within the United States.