

Packaging with used material for the transport of dangerous goods

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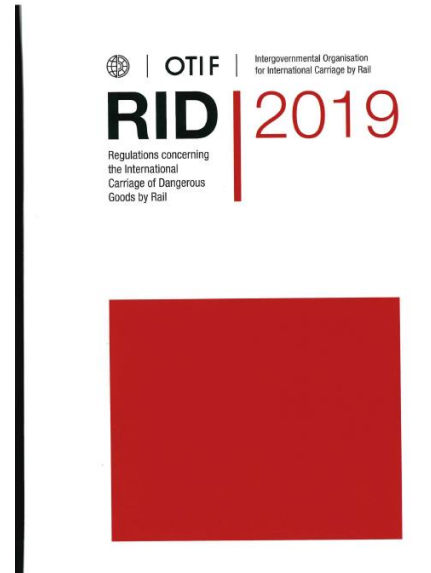
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Introduction

- Regulatory Background
- Current regulatory position regarding used material UK interpretation
- UK use of current regulations to gain experience with re-used plastics
- Current initiatives to revise/replace ISO 16103
- Conclusion

Regulatory Background

- Regulations concerning the International Carriage of Dangerous Goods by Rail



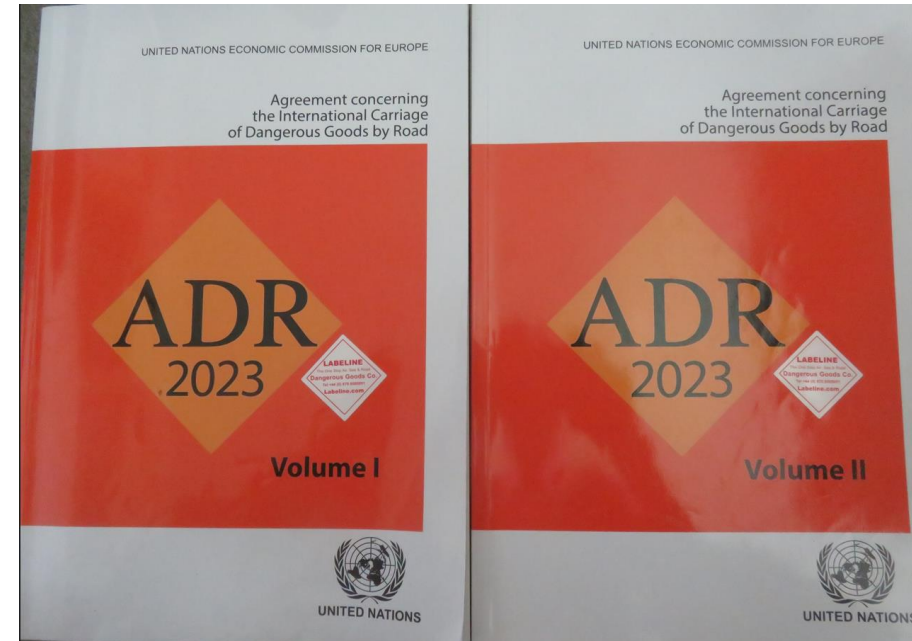
Regulatory Background

- International Maritime Dangerous Goods Code



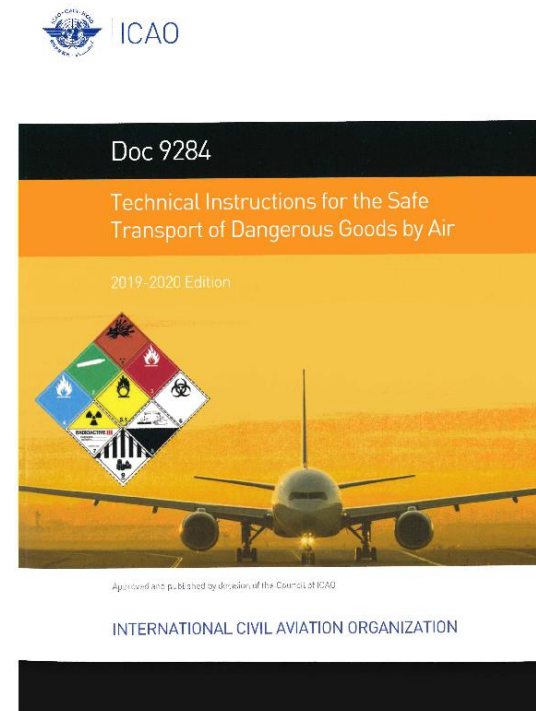
Regulatory Background

- Agreement concerning the International Carriage of Dangerous Goods by Road



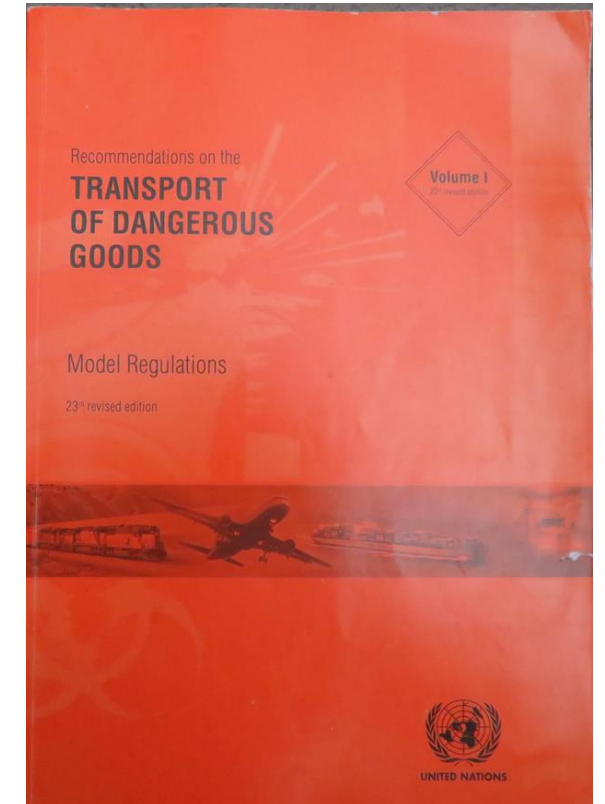
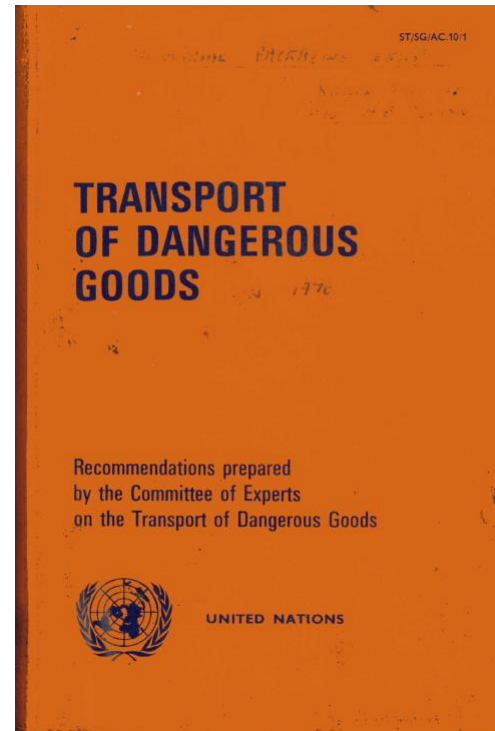
Regulatory Background

- Technical instructions for the Safe transport of Dangerous Goods by Air



Regulatory background

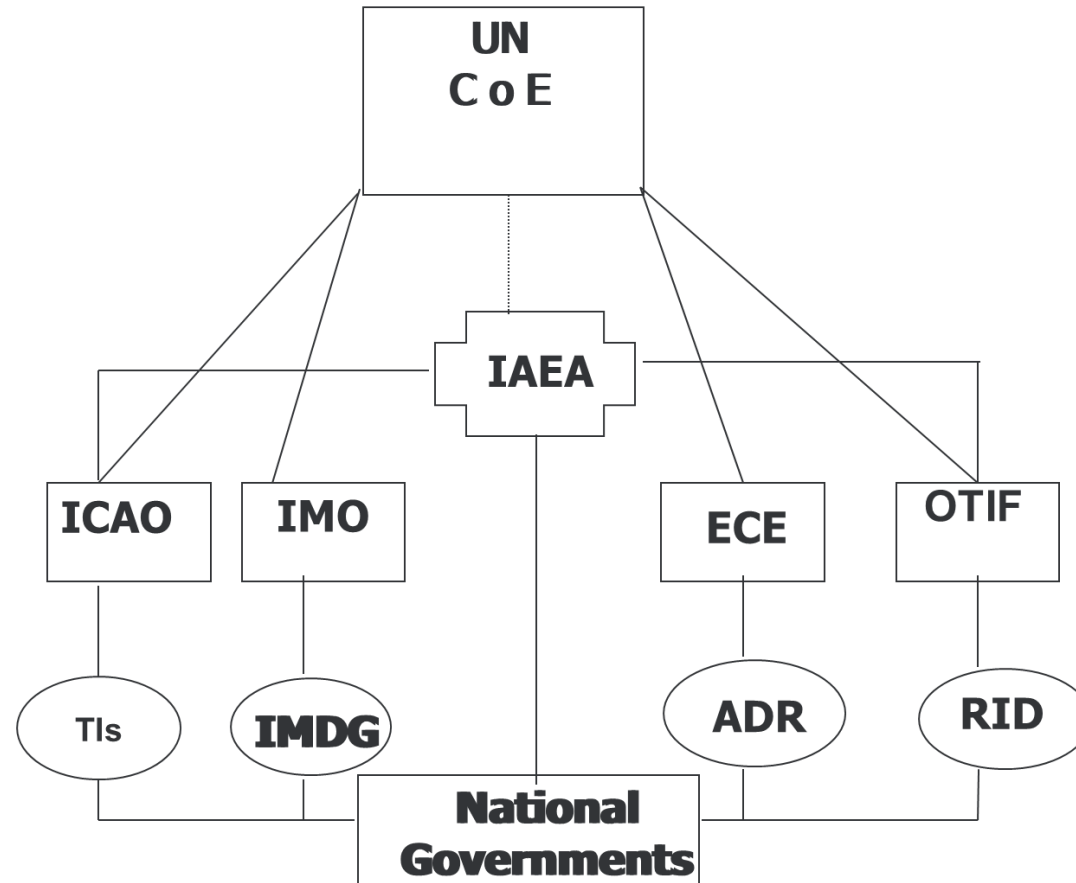
- United Nations Recommendations on the transport of Dangerous Goods
- (Now model regulations)



Regulatory Background

- Time line
 - 1893 International rail rules
 - 1956 International Air Transport Association – Restricted Articles
 - 1957 ADR
 - 1965 IMDG Code
 - 1977 UN Recommendations on the transport of Dangerous Goods
 - 1982 ICAO Technical Instructions
- 1991 UN Recommendations in respect of packaging adopted by regulatory texts

Regulatory Background



Regulatory background

- UN packaging text developed mostly in the 1960's
- Moved away from written specifications of packaging
- Developed performance tested packaging with marking system
- Packagings had to meet general specification requirements but manufacturers were required to indicate exactly what had been tested to ensure subsequent manufacture was identical.
- Text was prepared based on knowledge and practices at the time, with some later amendments to steel drums, the addition of IBCs and Large packagings and reconditioning of steel and plastics drums.

Current regulatory position regarding used material UK interpretation

- Regulatory text in respect of packaging is generally over 50 years old (20 years to adopt and 30 years in regulation)
- Very few (if any) of the people who developed the text are alive today and there are no background notes or explanations
- Changing attitudes and regulations particularly to do with the environment and waste have resulted in questions about packaging to relatively inexperienced regulators particularly in regard to using packagings with recycled material

Current regulatory position regarding used material UK interpretation

- Steel drums and jerrican, drums and jerricans of metal other than steel and aluminium
- Aluminium drums and jerricans
- Suitable type and adequate thickness. No reference to source material but quality standards are given
- 99% pure or of an aluminium base alloy, suitable type and adequate thickness. No reference to source material.

Current regulatory position regarding used material UK interpretation

- Plywood drums and boxes, wooden boxes
- Fibre drums
- Reconstituted wood boxes
- Well seasoned, commercially dry without defects, minimum number of plies for plywood. No reference to source
- Multiple plies of heavy paper or fibreboard. No reference to source
- Including hardboard, particle board or other suitable type of appropriate strength, name implies used or created material. No reference to source material

Current regulatory position regarding used material UK interpretation

- Fibreboard boxes
 - Strong and good quality solid or double faced corrugated fibreboard appropriate to capacity and intended use.
- Plastics drums and jerricans
 - Suitable material of adequate strength but specific ban on used material except for production regrind and recycled plastics as defined in 1.2.1 (of the UN Recommendations)

Current regulatory position regarding used material UK interpretation

- UN definitions 1.2.1.

Recycled plastics material means material recovered from used industrial packagings that has been cleaned and prepared for processing into new packagings. The specific properties of the recycled material used for production of new packagings shall be assured and documented regularly as part of a quality assurance programme recognized by the competent authority. The quality assurance programme shall include a record of proper pre-sorting and verification that each batch of recycled plastics material has the proper melt flow rate, density, and tensile yield strength, consistent with that of the design type manufactured from such recycled material. This necessarily includes knowledge about the packaging material from which the recycled plastics have been derived, as well as awareness of the prior contents of those packagings if those prior contents might reduce the capability of new packagings produced using that material. In addition, the packaging manufacturer's quality assurance programme under 6.1.1.4 shall include performance of the mechanical design type test in 6.1.5 on packagings manufactured from each batch of recycled plastics material. In this testing, stacking performance may be verified by appropriate dynamic compression testing rather than static load testing;

Current regulatory position regarding used material UK interpretation

- Plastics boxes
 - Suitable plastics material adequate strength in relation to capacity and intended use
- Textile, woven plastics and plastics film bags
 - Suitable material or plastics, material or plastics material appropriate strength for capacity and intended use
- Paper bags
 - Suitable kraft or equivalent appropriate strength for capacity and intended use

Current regulatory position regarding used material UK interpretation

- Metal IBCs
- Flexible IBC
- Plastics IBCs and composite IBCs
plastics inner receptacles
- No reference to source material, minimum thickness by calculation derived from tanks
- Suitable material strength of material and construction appropriate to capacity and use. No material recovered from used receptacles to be used.
- Same conditions as plastics drums and jerricans

Current regulatory position regarding used material UK interpretation

- Large packagings, all types and flexible large packagings paper and plastics
- These reflect the requirements for boxes and bags so no references to source materials.

Current regulatory position regarding used material UK interpretation

- Good news is that for the most part the regulations are silent about the use or used or recycled material. In the UK the absence of any prohibition means that something can be done providing it is safe.
- This is supported by the data required for a UN approval which looks for physical parameters for all materials of construction except for specific polymers for plastics drums, jerricans, rigid plastics inner packagings, plastics IBCs and plastics inner receptacles of IBCs.
- We know that papers used for fibreboard have significantly more recycled content than previously, as do plastics film bags.

Current regulatory position regarding used material UK interpretation

- Interpretation Flexible IBCs – No material recovered from used receptacles shall be used in the manufacture of IBC bodies.
- Text is general in that it applies to woven plastics, plastics film, textile and paper IBCs
- More detail is provided for woven plastics in the bag section with tapes or monofilaments being of a suitable plastics material.
- For UN purposes the performance of the tape is required along with the weave count for the material.

Current regulatory position regarding used material UK interpretation

- This restriction is to prevent a piece of fabric salvaged from a used IBC to be sewn into a new one. It is not a block on base filaments using recycled plastics
- In the UK view the only packagings that cannot readily use recycled material are those subject to the requirements of UN 1.2.1. i.e. plastics drums, jerricans, IBCs and plastics inner receptacles of composite IBCs.

UK use of current regulations to gain experience with re-used plastics

- Partly a response to the EU plastics tax and a general desire of companies to improve their environmental credentials the UK formulated a policy to advance the knowledge and experience in using recycled plastics other than those covered by UN 1.2.1.
- The manufacturer of the polymer must have a quality system in place
- Be able to give a unique identity to the polymer they are producing
- Have a data sheet for the polymer at least equal in detail to those available for virgin polymers
- Manufacturers, if mixing, have to include the % of each polymer used

UK use of current regulations to gain experience with re-used plastics

- 6.1.1.2 of UN allows for different specifications of packaging based on progress in science and technology.
- The UK views the work done with recycled plastics to fall into this category
- Packagings have to be fully UN tested before they can be used for dangerous goods.
- Since these packagings do not meet the specification in 6.1.4 the UN mark has to have a W suffix in accordance with 6.1.2.4 e.g. 3H2W
- As this is all new the UK has taken a precautionary approach

UK use of current regulations to gain experience with re-used plastics

- 4.1.1.15 allows the competent authority to vary the permitted use period for plastics packagings from the 5 year norm.
- The UK is imposing a 2 year life on these packagings on initial approval
- Subject to testing appropriately aged containers an annual extension is possible until the 5 year norm is reached.

Current initiatives to revise/replace ISO 16103

- Existing 16103 was written to support the UN text
- Pre-covid the Belgian Packaging Institute convened a meeting to see if there was a desire to do anything given the coming plastics tax and other EU initiatives
- Two routes were considered, amending the UN or amending the standard
- Since there are very few plastics and or packaging experts at the UN sub-committee it was decided to go via the standards route where expertise was available

Current initiatives to revise/replace ISO 16103

- A new draft standard is close to being registered as a new work item
- The main thrust is to concentrate on the output of the recycling process rather than the current restrictive source material.
- Hopefully the new standard will be available in 2 years or so
- A competent authority will then have propose the adoption of the standard and any consequential amendments to the UN sub-committee.
- You can help this process by working with you national standards body at the review stages and then letting your competent authority know that you want to see it implemented

Conclusions

- Existing text only significantly affects plastics drums, jerricans, IBCs and plastics inner receptacles of IBCs
- This control was deliberate at the time, so was its exclusion from other types of packaging
- Attempts by some competent authorities to extend the scope of 1.2.1 to all plastics packagings are misguided and would create major issues particularly with bags and flexible IBCs
- The revised standard should significantly increase both the potential to use recycled plastics material and its availability for dangerous goods packagings

Conclusion

- Any Questions?