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Scope of ATP

The ATP and the future

Transmitted by the Vice-Chair of WP.11

Summary

Executive summary:	Due to environmental reasons major developments may be expected in the near future. To prepare the ATP for this the regulation may require significant changes. This document intends to start discussion and gives suggestions for possible directions of change.
Decision to be taken:	The authorities decide what actions are necessary for the future of the ATP.
Related documents:	None

Introduction

1. The measures coming into force to reduce the carbon footprint of transport are expected to change the ATP as well. Was it possible to continue with small adjustments, new developments may require a change on the way equipment is classified and used.

2. The traditional equipment with one source of thermal energy to provide refrigeration may change in insulated equipment with several sources, charging overnight helping the traditional system. The current classification as mechanical refrigerated may no longer be satisfactory. Higher ambient temperatures and further energy saving may result in the use of better or thicker insulation and changes in trade and transport policies may render the ATP beyond it “best before date”.

3. When comparing the ATP with the Agreement for the carriage of Dangerous goods by Road (ADR), the ADR has undergone 2 major revisions since coming into force in 1968. The first revisions in 1978 and a second in 2001, both completely overturned the system to keep up with globalization and technical developments.

I. Where are we now and where are we coming from?

4. To understand what to change for the future one needs to understand what we have today and where it is coming from in the past. Below we look back to the origins of the ATP.

5. At the end of the nineteen-century production of food and its consumption was a local affair. With the exception of dried or salted food it could not be stored that long. The industrial development found a way to reduce temperature in large machines. They formed blocks of Ice that could be used to keep temperature down during storage and transport. The equipment used had integrated Ice compartments inside that cooled the air inside. A new technique called “deep-freeze” revolutionized food preservation making it possible to freeze at harvest time and supply food year-round. This new technique developed in the United States and spread around the world. Only at the end of the 1930’s truck refrigeration was possible by downsizing the equipment, very rare and very expensive at that time. The second world war saw an acceleration of technical development including in the field of refrigerated transport. However, it took until the 1950’s for mechanical refrigerated equipment to become more widespread for commercial business. Even in the early 1950’s trucks with Ice compartments were still being constructed.

6. In this light the development of the ATP has to be seen. The early treaties at the UNECE, aimed at an increased economic recovery after the second world war and were initiated around 1948. The ATP proved a though challenge and it took a redraft and signing in 1970 and finally coming into force when the first 5 countries had implemented it in national legislation in 1977. In fact ATP leaned heavily on the state of art of technology of the 1950’s while coming into force in the 1970’s. Taking the cooling capacity of the 1960’s machines, multiplying it by 1.35 and with the equipment size of that day and you will find the origins of the K value of 0.4 K/(w/m2). Another example is the global containerization really taking off in the mid 1960’s, the use of Maritime containers being squeezed in the ATP at the last moment before the treaty was signed, taking into account all the problems ATP equipment on board of ferries faced. Since coming into force several corrections are introduced such as the minimum wall thickness of 45 mm after the thin wall (2 cm) FRC equipment incident (to be able to load 33 Euro pallets with a vehicle width of 250 cm). The acceptance of the insulation tests done in one country, and the separate type approval certificates of mechanical thermal appliances. Some contracting parties applied ATP for national transport, while most did not.

7. Recent discussions show that the current regulation has become complex without the additional complexity improving food safety and use. It is also found that clarity of the regulation is compromised by the inconsistent use of terms. So here we are today….

II. What will be in the future?

A. 2050 - The dot on the horizon

8. The year 2050 is the dot on the horizon for the reduction of emission of carbon dioxide. The current expectation is that combustion engines are replaced by electrical motors. The electricity will come from renewable sources such as wind and solar origin and hydrogen is to be the fuel of the future. It is expected that Diesel will still be around coming from renewable sources like Algae. It depends on development of technology if heavy goods vehicles will run on Diesel, but if this is the case it will not be the current system driving the wheels but the Diesel powering a generator to drive an electric motor. It is very likely that the mechanical refrigeration unit will be electrified to the same effect.

9. Food is a first necessity of life that cannot be done without. As given above the refrigeration remains essential to feed the world year-round and will remain at a cost of a significant amount of energy. This is to say that refrigerated transport will remain important, costing a lot of energy as well. Certainly efficiency will be approved over the coming 3 decades.

B. 2030 - Development years

10. 2030 is nearly in 10 years, we will be in transition by then. There will be older vehicles and ATP equipment in service, but new developments will continue to emerge. As it will be a transition time several developments and options will run in parallel with each other. The differences will be most apparent in distribution transport in urban areas or so-called low emission zones. For long distance transport changes are expected to be limited.

11. For distribution transport electrification will certainly be a fact. It is possible that the refrigeration unit could be driven by batteries, or in hybrid configuration with a combustion engine running outside urban built up areas. Possible they will be powered by the truck. There are options for solar charging of the batteries on the roof of the equipment and regeneration of braking energy of the vehicle.

12. For long distance transport changes will be limited. Certainly, there will be pressure on emissions of new combustion engines driving the refrigerating unit, and new type approvals for refrigeration units may be expected but Diesel will still be around. Also, the start of a change to electric drive may be seen. This depends on developments such as overhead power lines on certain stretches of roads and availability of electricity at parking places overnight.

13. Already today delivery of food, including perishable food, is arranged by internet shopping. Generally deliveries are done by the trading companies themselves, nationally orientated, so outside the scope of the ATP and reasonably under control. Future developments may see an increase in post-order deliveries that may be on an international scale.

C. 2040 - In transition

14. In 2040 it may become clearer which systems prove the best value for money in 2050. Old equipment will be replaced by transitional ones and electric drive will become more prominent. Pure Diesel run refrigeration units may be exit already and it may be found that for frozen transports and chilled transport over long distances differently insulated equipment will be used, depending on the cost of energizing.

15. Above off-course is all fiction, as no one will know for sure what happens. A sudden new radical development may come forward and change everything again. But based on this fictional wording above it may become clear how to prepare ATP for the future?

III. Discussions on how to prepare the ATP for the future

A. New emission laws limiting pollution and emissions of carbon dioxide of internal combustion engines

16. Emissions from internal combustion engines driving refrigerating units will be further limited in the coming years. Also, the use of more environmentally friendly refrigerants may be expected. So far, we managed to convert existing systems but for the refrigerants of the future more redesign is expected as future refrigerants may require higher pressures in the systems. In ATP we made a start dealing with this issue by introducing a system to adapt existing type approvals with one refrigerant with another based on experience of the effects with other, similar, test and results. We also allowed for certain drop-in in existing systems as a short-term solution. We should keep in mind that this is a transition issue in which developments will flatten out.

17. It may be discussed if more flexibility in the description of “type” of mechanically refrigerated units is possible and testing a worst case allowing for better components to be used without reflecting this better performance in the report.

B. Using more than one system of refrigeration and heating

18. It may be expected that the main drive system of refrigerating units will become electric in the coming 10 years. Supply of electricity is an issue, will it come from the equipment itself by a generator set or from the towing vehicle. To making certain that the electrical energy is present during carriage is one of the issues that needs to solved.

19. It may be expected that overnight when the vehicle with the equipment is parked that heat /cooling energy generated by the grid may be stored. One may think about Eutectic plates containing a brine that absorbs energy and supplies cold by melting during transport. This helps the mechanical unit over the day and lessens the electrical energy required on the equipment itself. Also replenishing of electric energy may come from solar cells on the roof of the equipment, reducing solar radiation on the roof in the process. The amount of energy opens the discussion how to see this supply of energy in the light of being an independent operation unit.

20. The current system of ATP is based on the state of art of technology of the 1950/1960's. A type of equipment was tested together with the thermal appliance that was to be used. This was based on the equipment with integrated Ice boxes that were still used up to the 1950's. Choosing another brand or new type refrigeration unit it required a new test of each type of equipment .This led to the current system of separate type approval testing of mechanical refrigeration units and later refrigerated liquefied gas systems. However, changes were not completely done, such as a "type description" and a dimensioning provision, like it is done for multi-temp-multi compartment units, is still missing.

21. ATP may be discussed to come to an agreed process where the insulated body is always approved on its own and the system or systems for cooling or heating should be added based on energy demand by the body and foreseen use of the equipment. In such cases the familiar classifications as "refrigerated", "mechanically refrigerated" or "mechanically refrigerated and heated" and their classifications no longer can be used. As part of this attention should be given to the supply of energy at public truck parking places so that refrigeration during overnight stop may precool for the coming day. This is outside the scope of the ATP agreement but attention should be given to appropriate parties in the UNECE.

C. Use of better insulated equipment

22. Significant reduction of effective refrigerating capacity / limitation of energy consumption (and pollution) can be achieved by increased wall thicknesses. In particular if the side wall of road going equipment would be increased to say 10 cm.

23. At this moment the internal width of road going equipment in the European Union is limited to 260 cm if the side walls are at least 4,5 cm each. This increase is only possible if the vehicle width is increased, the Euro pallets are no longer used for refrigerated cargo or if more dedicated vehicles are used for the lower temperatures.

D. Changes in climate and accession of new contracting parties in new climatic zones

24. Equipment is based on a maximum ambient temperature of 30 C when calculating capacity based on its insulation. As maximum temperatures, and duration of warm periods increase it should be discussed if this will affect the ATP. The principle is that equipment approved by one contracting party must be accepted by the other contracting parties performing international transport is then in jeopardy. Also, the accession of new contracting parties more "south" makes a discussion necessary. However, it should be recalled that ATP does not prescribe equipment to be used, it is left to the consigner or transporter to determine what is the suitable equipment for a specific carriage.

25. However, introduction of climatic zones would help in having more (energy) efficient equipment available for specific climatic zone. The decision to use increased insulation, that

may decrease load capacity is up to carriers in warmer countries. This would be driven by cost of refrigeration but also due to vehicle dimension limitations in the European Union.

26. Classification system and markings may be discussed. Other marking could be envisaged such as “E” for -20/+20 C, “F” for -20/+30 C “G”-20/+40 C. However, transporters can better select what equipment to use. For lower temperature zones like Scandinavia and Northern Europe this may lead to lighter systems and more efficiency while considering global warming and new contracting parties.

E. Use of maritime Reefer containers for inland transport

27. To save the environment modal shift will be used where possible. There are ATP approved containers, mainly regional containers, but most are globally circulating containers and are not ATP approved. These containers carry goods around the world and if looked after properly aboard of a ship gives no health issues. Yet they are not allowed by the ATP for inland transport.

28. As described above when ATP was signed containerization just emerged on a global scale and effects could not yet been overseen. To save the environment the best way of carriage needs to be chosen, and sometimes a modal shift from road to rail of short sea shipping could be the most efficient. Container ships (but also ferries) are prepared for Reefer containers with power supply to maintain the temperature. For rail this is more complicated but modern monitoring of containers may be a help here. To facilitate modal shift we could use these globally circulating reefer containers on conditions that temperature could be maintained by a power supply. As more ATP equipment will become electrically driven this may become less of a problem.

29. It may be discussed to accept globally used Reefer containers and on which conditions.

F. Developments in supply of foods production and supply systems

30. The ATP is intended for international transport, which is in principle long haul with one load. A change is said to have taken place in recent years that the long-haul international transport is reduced to less and shorter journeys. On the other hand, supermarket chains once operating within a country become more and more international and supply of the supermarkets may cross borders. In distribution transport other issues arise than in long haul transport.

31. It may be discussed in which way we will deal with this, take distribution transport into account?

G. International post order deliveries and packaging used in that transport

32. In ATP there is no lower limit for equipment. Only the placing of temperature sensors during the test for insulation capacity will result indirectly in an under limit. Packages containing perishable foodstuffs carried internationally by companies are not exempted from the ATP. We cannot issue a certificate on compliance to every box.

33. It may be discussed if we include or exclude this shipping in packages. If we decide to include it, we need a new system of type approval a type marking and use provisions.