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Items 5 (a) and 6 of the provisional agenda
Proposals of amendments to the ATP: Pending proposals
ATP Handbook

Two proposals to amend the ATP Handbook

Transmitted by the Government of France

I. Mandatory procedure for the efficiency testing of independent, multi-temperature, mechanically refrigerated equipment

Background

1. ATP was amended in 2013 to cover multi-compartment, multi-temperature equipment.

2. The Agreement explains the test and dimensioning procedures for multi-temperature equipment. It also provides a model for test reports and ATP certificates for such equipment, but not for renewal of certificates or the relevant tests for equipment in service, although that information is given for mono-temperature equipment.

3. A test method is required for equipment in service at 6 and 9 years for each type.

4. Most multi-temperature equipment in use is independent mechanically refrigerated equipment. The test method for multi-temperature independent mechanically refrigerated equipment should be developed first. It should be in line with the other test methods for equipment in service given in ATP, and specifically the method for mono-temperature independent mechanically refrigerated equipment. Another proposal relates to dependent multi-temperature equipment.

5. In 2012, France presented the test method that had been developed for such equipment and used since 2002 for over 2,000 units each year.

6. The present document proposes a formal amendment to include this modification in ATP and a proposal to include additional explanations and models in the ATP handbook.

Proposal

7. The proposed procedure is given below.

Principle

8. The purpose of the test is to obtain a recording of a temperature cool-down that is representative of the equipment's refrigeration performance. It will thus verify that, when the outside temperature is not lower than +15.0° C, and the deviation between the highest and lowest instantaneous outside temperatures during the duration of the temperature-holding period does not exceed 5.0° C, the inside temperature of each compartment in the empty equipment can be brought to the relevant class temperature within a maximum period of (… minutes), as prescribed in the table below:

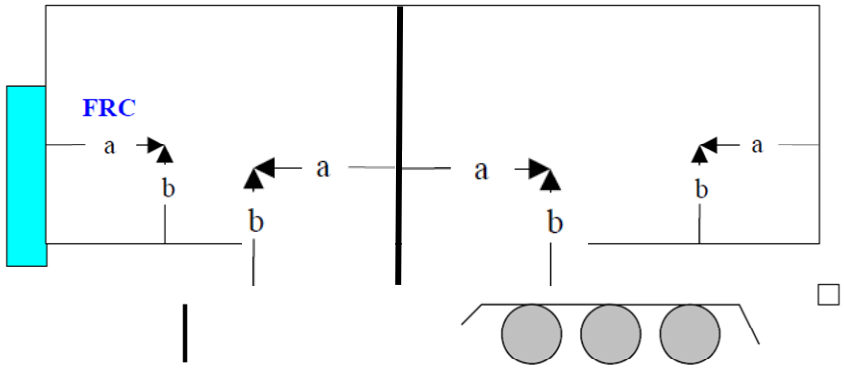
Outside temperature (ºC)	*30*	*29*	*28*	*27*	*26*	*25*	*24*	*23*	*22*	*21*	*20*	*19*	*18*	*17*	*16*	*15*
Class C	360	350	340	330	320	310	300	290	280	270	260	250	240	230	220	210
Class B	270	262	253	245	236	228	219	211	202	194	185	177	168	160	151	143
Class A	180	173	166	159	152	145	138	131	124	117	110	103	96	89	82	75

9. The inside temperature of each compartment in the empty equipment must previously be brought to the outside temperature.

Placing of temperature sensors

10. Temperature measuring sensors that are protected from heat radiation should be placed on the inside and outside of each compartment in the equipment, as for mono-temperature equipment.

11. In order to measure the temperature inside each compartment in the equipment, at least two temperature measuring points should be selected inside each compartment at a maximum distance of 50 cm from the front wall and 50 cm from the rear door or wall and at a height of between 15 cm and 20 cm above the floor, as shown in the diagram below:



a = maximum 50 cm from the front wall and the rear door
b = minimum 15 cm and maximum 20 cm above the floor

12. In order to measure the temperature outside the body, two temperature measuring sensors should be placed at a distance of at least 10 cm from an outer wall of the body, along the vertical centreline and as high as possible. The first sensor should be placed close to a side wall of the tank, while the second should be placed at the rear of the equipment. The external sensors, which verify the outside temperature, should be protected from sunlight and any extraneous heat sources, while allowing the ambient air to circulate around them.

Equalizing the inside and outside temperatures

13. The inside temperature of each compartment in the empty equipment must previously be brought to the outside temperature. The purpose of achieving this equilibrium is to ensure that the amount of thermal energy stored in the walls is minimal.

The body should be dry and at the outside ambient temperature

The sensors should be installed inside each compartment of the tank as shown above

The equipment doors should be closed

The temperature sensors should be connected to the temperature recorder, which should be switched on

Temperatures should be recorded at least every 5 minutes

14. The following calculations should be made:

At all times and for each compartment: T_{hold}, the mean holding temperature, which is the mean of the instantaneous temperatures of the inner sensors

At the start of the recording period: $T_{out\ 0}$, the mean of the instantaneous temperatures of the two outside sensors

For each compartment, the initial deviation: $\Delta T_0 = T_{hold\ 0} - T_{out\ 0}$

15. The test may begin if for each compartment ΔT_0 is between -3° C and 3° C and if the inside temperature has not varied by more than 3.0° C over a 30-minute period.

Defrosting cycles

16. It must be ensured that defrosting does not interfere during the testing period. If defrosting does occur during testing, however, and the total time (cool-down + defrosting) is less than the times given in the chart contained in the model report, the equipment should be considered compliant.

Running the test

17. Positioning of movable partitions

For dual-temperature equipment, the partitions should be positioned so that the compartment surfaces are proportional to the individual capacities of the evaporators at 0° C for compartment A and at -20° C for compartment C.

For reversible equipment, the partitions should be positioned so that the compartment surfaces are proportional to the individual capacities of the evaporators at 0° C.

18. Starting the unit

The internal combustion engine should be set to the speed indicated in the initial test report and on the unit.

19. The thermostats should be adjusted to bring the inside temperature to the class temperature limit for each compartment:

Class C: -20.0° C

Class B: -10.0° C

Class A: 0.0° C

For dual-temperature equipment the class A compartment should be adjusted from 0.0° C to -2.0° C.

Cool-down

20. The unit should cool the different compartments simultaneously. The Class A compartment of a dual-temperature unit will typically maintain a temperature of 0º while the cooling process continues for the compartment(s) of the lowest temperature class(es).

21. Measurements should be taken until the warmest temperature measured by one of the two sensors located inside each compartment of the lowest temperature class reaches the temperature limit for that class.

22. For dual-temperature equipment, the unit may be stopped once the previous measurements have been taken, and the cool-down times for each compartment should be compared to the times listed in the table in the model report.

23. For multi-temperature reversible equipment, once the previous measurements have been taken, the following additional operating tests should be conducted:

24. The set points should subsequently be modified according to the table below, and a proper maintenance of the temperatures of the compartments set to 0.0° C should be observed for at least 10 minutes (from when the first sensor reaches the set point temperature). The set point temperature is ± 3° C. The temperature should rise with the doors closed, with the unit in use.

Set points with two compartments

Compartment 1	*Compartment 2*
-20° C	0° C
0° C	-20° C

Set points with three compartments

Compartment 1	*Compartment 2*	*Compartment 3*
0° C	-20° C	0° C
-20° C	0° C	-20° C

25. The temperatures should be recorded; there is no maximum time limit for this test. The unit may be stopped as soon as the additional tests have been completed. The sensors can then be disconnected and the defrosting system restored.

Conclusion

26. The equipment is considered compliant if:

- For each compartment, the class temperature has been reached within the time limit shown in the table in the model test report. To define this time limit, select the lowest (coldest) mean outside temperature from the two sets of measurements taken with the two outside sensors.

27. Any additional tests conducted are satisfactory.

- If one of the compartments fails to reach the class temperature within the set limits, a multi-temperature unit may be considered to qualify as a dual-temperature, non-reversible unit. The initial position of the movable partitions should remain the same if one of the compartments is downgraded.

Impact

28. This proposal is based on the test method for mono-temperature independent equipment. It adds only one test for the reversibility of compartments that will make it possible to limit the length of the test while retaining all its relevance.

29. The cost of this test is very similar to that of the test for mono-temperature equipment, although slightly higher as it requires more sensors and a longer time for instrumentation and analysis.

30. The environmental impact is significant, as servicing can be made compulsory, leading to better machine performance.

Proposed amendment to ATP

31. It is proposed to add to ATP a paragraph 6.6, as follows:

"6. VERIFYING THE EFFECTIVENESS OF THERMAL APPLIANCES OF EQUIPMENT IN SERVICE

To verify, as prescribed in appendix l, paragraphs l (b) and l (c), to this annex, the effectiveness of the thermal appliance of each item of refrigerated, mechanically refrigerated or heated equipment in service, the competent authorities may:

Apply the methods described in sections 3.1, 3.2 and 3.3 of this appendix; or

Appoint experts to apply the particulars described in sections 5.1 and 5.2 of this appendix when applicable as well as the following provisions:

6.1 Refrigerated equipment other than equipment with fixed eutectic accumulators

[…]

6.4 Temperature measuring points

Temperature measuring points protected against radiation shall be placed inside **each compartment** and outside the body.

For measuring the inside temperature of the body (T_i), at least two temperature measuring points shall be placed inside the body at a maximum distance of 50 cm from the front wall, 50 cm from the rear door at a height of a minimum of 15 cm and a maximum of 20 cm above the floor area.

[…]

6.6 Multi-compartment, multi-temperature equipment

For multi-temperature equipment, if the partitions are movable, they should be positioned so that the compartment surfaces are proportional to the individual capacities of the evaporators at 0° C.

The test prescribed in paragraph 6.2 is conducted simultaneously for all the compartments.

Measurements should be taken until the warmest temperature measured by one of the two sensors located inside each compartment reaches the temperature limit for that class:

- **Once the previous measurements have been taken, the following additional operating tests should be conducted: the set points should be modified in turn according to the table below, and a proper maintenance of the temperatures of the compartments set to 0.0° C should be observed for at least 10 minutes (from when the first sensor reaches the set point temperature). The set point temperature is ± 3° C. The temperature should rise with the doors closed, with the unit in use.**

Set points with two compartments

Compartment 1	*Compartment 2*
-20° C	**0° C**
0° C	**-20° C**

Set points with three compartments

Compartment 1	*Compartment 2*	*Compartment 3*
0° C	**-20° C**	**0° C**
-20° C	**0° C**	**-20° C**

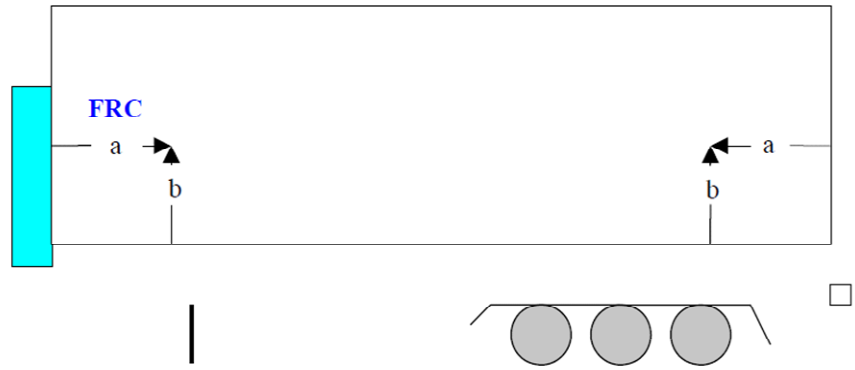
The temperatures should be recorded; there is no maximum time limit for this test. The unit may be stopped as soon as the additional tests have been completed. The sensors can then be disconnected and the defrosting system restored.

The equipment is considered compliant if:

- **For each compartment, the class temperature has been reached within the time limit shown in the table in 6.2. To define this time limit, select the lowest (coldest) mean outside temperature from the two sets of measurements taken with the two outside sensors.**
- **Any additional tests conducted are satisfactory.”**

Proposed addition to the ATP handbook

32. Add the diagram showing the placing of multi-temperature sensors to paragraph 6.4:



a = maximum 50 cm from the front wall and the rear door
b = minimum 15 cm and maximum 20 cm above the floor

33. Add the test report example to paragraph 6.6:

TEST REPORT FOR CERTIFICATE RENEWAL APPLICATION TEMPERATURE EFFICIENCY TESTING Page 1/1			
Name:		**Authorization No.:**	
File No.:		**Date:**	
INDEPENDENT MULTI-TEMPERATURE EQUIPMENT Recorder No.:			
	Outside temperatures		
Instantaneous T	Minimum	Maximum	Deviation
Mean T	Side wall	Rear of the body	Selected mean T (lowest/coldest)

Time (in minutes) required to reach the temperature of the class in question:

Outside temperature (°C)	**30**	**29**	**28**	**27**	**26**	**25**	**24**	**23**	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**
Class C	360	350	340	330	320	310	300	290	280	270	260	250	240	230	220	210
Class B	270	262	253	245	236	228	219	211	202	194	185	177	168	160	151	143
Class A	180	173	166	159	152	145	138	131	124	117	110	103	96	89	82	75

Equipment cool-down time: test results						
Starting the unit		time				
Procedure		**Compartment 1**		**Compartment 2**		**Compartment 3**
		time	duration (in minutes)	time	duration (in minutes)	time	duration (in minutes)
Time at which the temperature measured by the warmest internal sensor is brought to the class limit:	-20.0° C (Class C)						
	-10.0° C (Class B)						
	0.0° C (Class A)						

Additional tests			
In conformity ☐		**Not in conformity** ☐	
Position of the partition(s) (*Draw a sketch showing the distances*)			
Test result (delete as appropriate)			
Class-compliant	☐		
Non-compliant	☐		
	Signature of testing centre manager		
Comments			

II. Marking of Multi-Temperature Equipment

Background

34. ATP was amended in 2013 to include multi-compartment, multi-temperature equipment. The Agreement explains the test and dimensioning procedures for multi-temperature equipment. It also provides a model for test reports and ATP certificates for such equipment, but makes no provision for the marking of the equipment.

35. Clear procedures are needed for marking the equipment to make it easily identifiable from outside.

36. The marking must allow the control authorities to check easily that the equipment is appropriate for the goods transported. In particular, it must show clearly the number of compartments in the equipment and their respective classes to ascertain whether the goods may be transported in the compartment concerned.

Proposal

37. This proposal introduces:

- Marking for multi-compartment, multi-temperature equipment;
- Procedures for identifying compartments on the basis of their position in the equipment.

Marking procedure

38. It is proposed that each compartment should be marked in line with the rules for marking mono-temperature equipment.

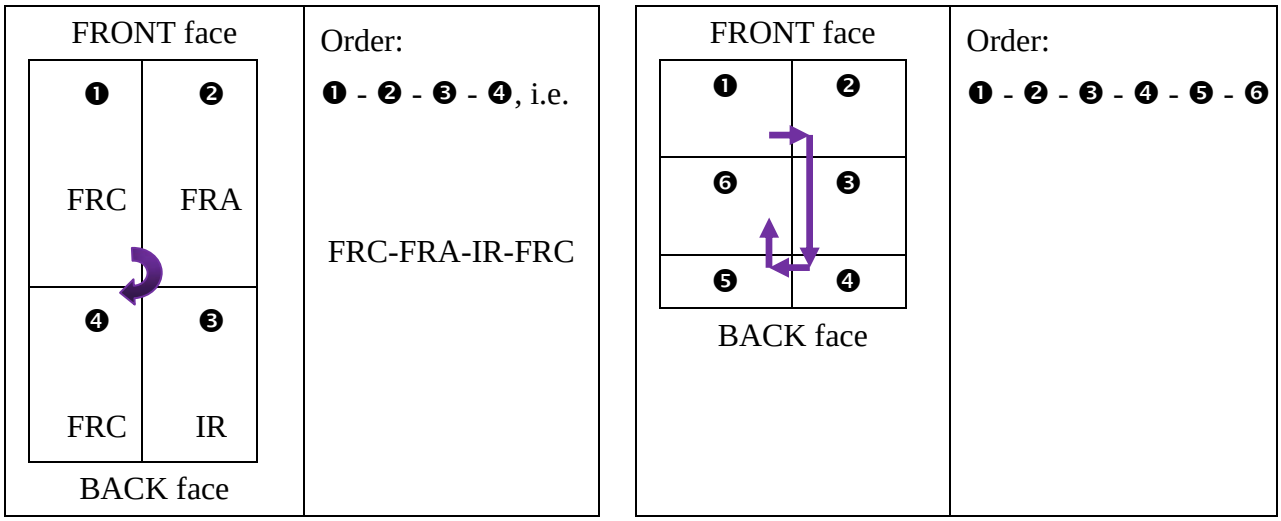
39. For equipment with three compartments, for example, the marking would be FRC-FRC-FRC if the performance of the three compartments is identical. If the performance is not identical, the compartments will have different markings, for example FRC-FRA, or RRC-IR.

Example of marking

Identification procedure

40. The compartments must be identified unambiguously. It is proposed that the compartments be identified and the classification marks on the distinguishing marks should be ordered as follows:

- First the front left compartment or compartments;
- Then the other compartments rotating clockwise.



Example of classification of compartments

Impact

41. The proposal provides a simple marking scheme for the control authority and customers who may wish to check the performance of equipment that is loading or delivering their goods.

42. The cost of marking is the same as at present. All the markings can be printed in A4 format.

43. Since 2009, France has issued or renewed more than 30,000 certificates for multi-compartment equipment following this principle, to the satisfaction of all the users: bodybuilders, users, the administration and the control authorities. The markings correspond to over 100 possible combinations of lettering, all printed in A4 format.

44. The proposal does not require any change to the current marking provisions. The A4 format for markings may be retained, without any increase in the environmental impact.

Proposed amendment to ATP

45. It is proposed to add the following text in bold to the text of annex 1, appendix 4:

"**DISTINGUISHING MARKS TO BE AFFIXED TO SPECIAL EQUIPMENT**

The distinguishing marks prescribed in appendix 1, paragraph 4 to this annex shall consist of capital Latin letters in dark blue on a white ground. The height of the letters shall be at least 100 mm for the classification marks and at least 50 mm for the expiry dates. For special equipment, such as a laden vehicle with maximum mass

not exceeding 3.5 t, the height of the classification marks could likewise be 50 mm and at least 25 mm for the expiry dates.

The classification and expiry marks shall at least be affixed externally on both sides in the upper corners near the front.

In the case of multi-compartment, multi-temperature equipment, each compartment is classified as a mono-temperature unit. The classification marks that appear on the distinguishing marks are ordered starting with the front left compartment or compartments and rotating clockwise.

The marks **on each compartment** shall be as follows:

[…]

If the equipment is fitted with a removable or non-independent thermal appliance and if special conditions exist for the use of the thermal appliance, the distinguishing mark or marks shall be supplemented by the letter X in the following cases:

1. FOR REFRIGERATED EQUIPMENT **or a refrigerated compartment**:

Where the eutectic plates have to be placed in another chamber for freezing;

2. FOR MECHANICALLY REFRIGERATED EQUIPMENT **or a mechanically refrigerated compartment**:

2.1 Where the compressor is powered by the vehicle engine;

2.2 Where the refrigeration unit itself or a part is removable, which would prevent its functioning.

The date (month, year) entered under section A, item 8 in appendix 3 of this annex as the date of expiry of the certificate issued in respect of the equipment shall be quoted under the distinguishing mark or marks aforesaid."

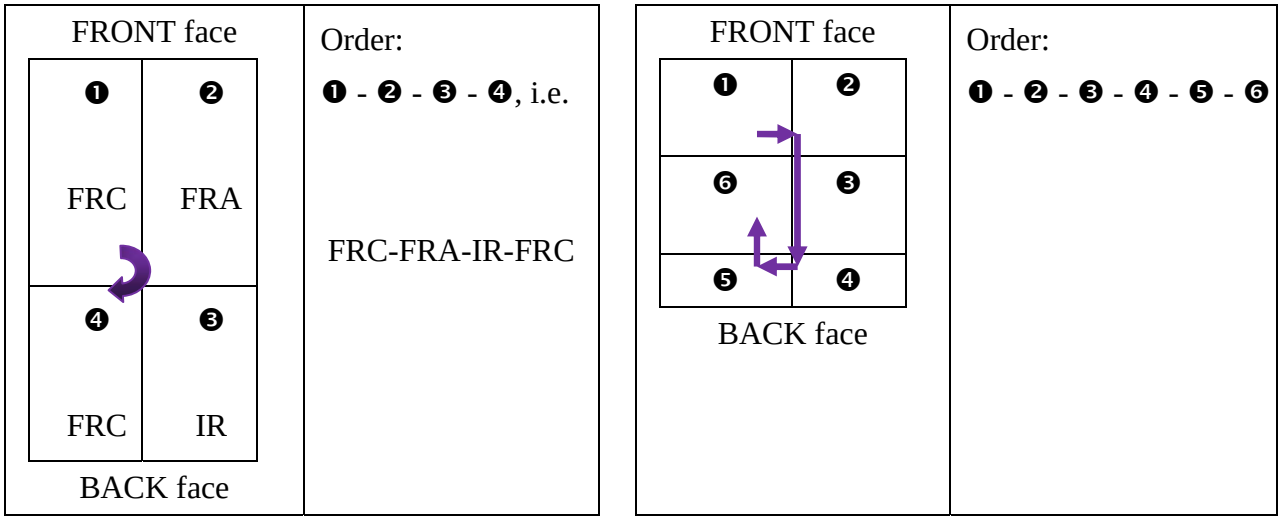
Proposed amendment to the ATP handbook

46. It is proposed that the diagram for identification of the compartments and the examples of markings given below should be added to the text of the ATP handbook:

"In the case of multi-compartment, multi-temperature equipment, each compartment is classified as mono-temperature equipment. The classification marks that appear on the distinguishing marks are ordered starting with the front left compartment or compartments and rotating clockwise.

[...]

Diagram for identification of compartments



The markings on **each compartment** are as follows:

[…]

Examples of markings


FRC-FRC-FRC
08/2017