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COMMITTEE OF EXPERTS ON THE TRANSPORT  
OF DANGEROUS GOODS

GROUP OF EXPERTS ON EXPLOSIVES

REPORT OF THE GROUP OF EXPERTS ON ITS TWENTY-SEVENTH SESSION

(17-21 August 1987)

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REPORT

ATTENDANCE

1. Experts from the following countries participated: Canada; France; Germany, Federal Republic of; Japan; the Netherlands; Norway; Sweden; United Kingdom; United States of America. Observers were present from: China; Denmark; Finland; Spain. Two specialized agencies were represented: International Maritime Organization (IMO); International Civil Aviation Organization (ICAO). Also represented were the European Council of Chemical Manufacturers' Federations (CEFIC) and Hazardous Materials Advisory Council (HMAC).

Participation of China in the work of the Group of Experts

2. The presence of a Chinese delegation for the second year running, was welcomed. In this respect the Deputy Director informed the Group of Experts that he had been approached by the head of the Chinese delegation who had expressed the desire of his country to participate as a full member in the activities of the Group of Experts; the possibility of participation also in the Committee of Experts and the Group of Rapporteurs was under consideration. The Chinese delegation had been advised as to the procedure to be followed in order to formalize this request.

3. The observer from China in confirming the above information stated that becoming a full member of the Group would enable his country to make a better contribution to its work on the one hand and on the other it would help it to introduce national standards and testing methods in accordance with the United Nations recommendations. Furthermore China's experience as well as its economic and geographical position would widen the scope of the Group's activities.

4. The experts from the United Kingdom, the United States, Canada, the Netherlands and the Federal Republic of Germany all said they welcomed the participation of China and would hope it would also participate in the Group of Rapporteurs. In view of the invitation in resolution 1986/66, paragraph 2, they were sure China would also be able to become a valuable member of the Committee.

ADOPTION OF THE AGENDA

5. The session was opened by the Deputy Director who also in his position as head of the section responsible for work in this field provided information about the current situation concerning staff and documentation. He indicated in particular that a preliminary revised version of the "Recommendations" was now available in English and French and that the official publication (ST/SG/AC.10/1/Rev.5) was expected to be issued before the end of the year. He added that an addendum (Part III) to the volume "Tests and Criteria" (ST/SG/AC.10/11/Add.1) would also be issued in the same time-scale.

6. The provisional agenda (ST/SG/AC.10/C.1/17) was adopted without change.

#### ELECTION OF OFFICERS

7. Mr. R. Watson (United Kingdom) and Mr. M. Mariat (France) were unanimously elected Chairman and Vice-Chairman respectively.

#### EXAMINATION OF RESULTS OF THE TEST MANUAL AND DEVELOPMENT OF A TEST METHOD TO BETTER CLASSIFY 1.4S GOODS AND DISTINGUISH THEM FROM 1.4C

8. France had produced a document (ST/SG/AC.10/C.1/R.219) which contained certain information and suggestions concerning tests with which difficulties had been encountered. After a description of the trough test, the expert from France said he would look forward to receiving details from other experts of their experiences and he would then present a detailed and formal proposal. It was said that a visual presentation (film or video) of different effects i.e. disruption/violent scattering of the packaging would be helpful in order to identify criteria in these tests.

9. The fact that a trough test had been linked with Division 5.1 substances by the Group of Rapporteurs, prompted the discussion of duplication between Part I of the tests manual for explosives and the new Part III for organic peroxides. This had been considered when Part III was drafted, but it was felt that harmonization could not be undertaken until both texts were completed. The expert from the United Kingdom said this had already been recognized and he was prepared to undertake a preliminary survey of similar tests in the two Parts and make suggestions as to how, and what, test methods could be combined.

10. The expert from the United States made a statement concerning the testing of articles, especially small arms ammunition, for classification purposes and he described laboratory experiments to determine the relation between energy and depth of penetration. He asked for comments and other experts' experience which he would use to help develop a proposal document. The expert from the United Kingdom said their laboratories were engaged in similar trials and he also would hope to produce a paper.

#### REVISION OF CHAPTER 10, PARTICULARLY THE REPLACEMENT OF REFERENCES TO COMPETENT AUTHORITIES BY SUITABLE PACKING METHODS

11. Inconsistencies in references to natural wood, plywood and reconstituted wood were the basis of document ST/SG/AC.10/C.1/R.201 (ICAO). It was recognized that the introduction of different amendments over the years had led to some confusion in interpretation. It was agreed therefore to adopt the proposal of ICAO, and that whenever in table 10.1 "natural wood" was mentioned (ordinary or siftproof), "plywood (4D)" and "reconstituted wood (4F)" should be added and 10.2.5 should be deleted.

12. The Group of Experts agreed to the proposals in document ST/SG/AC.10/C.1/R.207 (Federal Republic of Germany). It was nevertheless, noted that the minor changes envisaged, as those in other documents if adopted, would be a complication for the RID/ADR, the Joint Meeting being on the point of adopting a revised text for class 1. The Federal Republic of Germany undertook to present a consolidated proposal to that body covering minor changes of this nature.

13. The Group of Experts agreed to a request of the expert from the Federal Republic of Germany that his documents ST/SG/AC.10/C.1/R.208 and -/R.214 should be considered together, since the latter, if adopted would affect the former. The Group found the arguments in document -/R.214 convincing. Furthermore, since paragraph 10.1.1 covered the problem adequately it was agreed that by deleting PPR 16 document -/R.208 also would have been dealt with effectively.

14. The proposal in document ST/SG/AC.10/C.1/R.210 (Federal Republic of Germany) was adopted.

15. There was some uncertainty about the proposal in document ST/SG/AC.10/C.1/R.211 (Federal Republic of Germany). The different packing methods for the two entries United Nations Nos. 0219 and 0394 were believed to be necessary to retain the correct percentage of phlegmatizing liquid during transport and therefore the proposal was not adopted.

16. The proposal in document ST/SG/AC.10/C.1/R.213 (Federal Republic of Germany) was felt to be similar to that in document -/R.214, namely that the PPRs concerned were already covered by paragraph 10.1.3 and could be deleted. It was agreed however that this was valid for PPR 6, 14 and 15 but PPR 36 referred to prevention of contact and this was a specific requirement. Therefore PPR 36 was retained but modified to refer to articles and prevention of contact.

#### DEVELOPMENT OF A TEST SERIES 7 AND CRITERIA FOR DIVISION 1.5

17. The Group of Experts had a general discussion on this topic which had resulted from the Committee's decision to include articles in division 1.5 and consequently change its title in 1.12 and subdivide it into (a) and (b).

18. There was a considerable divergence of opinions as to the best approach, some of which went back to the fundamentals of the existing classification system. There was criticism of a new division 1.6, particularly if it implied a new label and the introduction of a new compatibility group was suggested. It was stressed that whatever was introduced must be very clear and logical, in order to avoid confusion.

19. It was decided first to consider the Test Series 7 on the basis of the only full proposal in document ST/SG/AC.10/C.1/R.205 (United States) and an addendum to it introducing some minor changes and corrections. A comment paper from France that proposed four modifications of form to the United States proposal was also taken into account.

20. This proposal for a new Test Series 7 with the modifications proposed by France was found generally acceptable by the Group of Experts with the provision that the alternative figures proposed for the Gap tests should be placed in square brackets, in order that further testing might confirm which should be retained.

21. A whole series of specific questions from different experts revealed the fact that many of the differences, both of terminology and of physical details (e.g. lengths, diameters), were a result only of custom rather than of substance and the United States Expert agreed that the whole document (R.205) could be edited to harmonize it with the existing test manual.

22. With a Test Series 7 agreed in principle, the Group of Experts went on to discuss classification of those new articles containing extremely insensitive detonating substances, on the basis of documents ST/SG/AC.10/R.167 and Add.1 (Netherlands) and ST/SG/AC.10/C.1/R.202 (United States). The first document proposed a new division 1.6 and the second a new compatibility group N.

23. It was decided to proceed towards establishing a new compatibility group, certain experts arguing that although there was some theoretical justification for a new division that would avoid having in the same division substances that have a mass explosion hazard and articles that do not, the disadvantages of introducing it at this stage far outweighed any advantages. Even those experts who preferred a new division gave their support to the new compatibility group since everyone agreed that it was essential to introduce some device to cope with these new articles.

24. There was a long discussion of the proposal in document ST/SG/AC.10/C.1/R.202 and the related proposal in document -/R.203 (also United States) and it became evident that a great deal of detailed changes would be necessary before they could be adopted.

25. Further discussion within the Group of Experts and by a working group, on the basis of documents ST/SG/AC.10/C.1/R.202 -/R.203 and -/R.205 (all from the United States), as well as suggested modifications to these texts, led to considerable progress.

26. Changes to the proposed text for Test Series 7 were agreed and the United States undertook to prepared a revised consolidated text incorporating all the agreed changes and comments. This would be circulated to experts for comments by the autumn, revised again if desirable and then presented to the next session of the Group of Experts.

27. After deciding to limit their consideration to only the simplest case of an article containing an extremely insensitive detonating substance, the Group of Experts was able to decide on: a new entry, a new special provision, two new definitions for the glossary, a description for the new compatibility group N and a modified flow chart.

28. The expert from the Federal Republic of Germany, supported by the expert from the Netherlands, entered a reservation stating that these amendments to the Recommendations could only be considered as part of a complete package concerning the question of articles containing extremely insensitive detonating substances and when the whole package was presented to the Group, a review of the recently adopted text might prove necessary.

29. The expert from France said that after the revised consolidated text had been circulated for initial comments; the meeting of a working group to exchange technical views and assess consequential changes such as rules for mixed packing that might become necessary (e.g. amendments to 4.2.2 and 4.2.3 as already suggested in document -/R.203), would be very helpful and he was prepared to host such a working group.

30. The suggestion was strongly supported and the majority of delegations present said that they would be likely to send participants. Some days in the weeks of 11 to 15 or 18 to 22 January 1988 were suggested as suitable.

GENERAL REVIEW OF CHAPTER 4

31. Proposals for amendments, in the main to table 4.1, and related changes submitted by the Netherlands in an addendum to document ST/SG/AC.10/C.1/R.181 were adopted with some minor modifications and additions.

32. The Group of Experts agreed that these changes should be brought to the attention of the Joint Meeting as soon as possible. The expert from the Federal Republic of Germany, undertook this responsibility, the expert from France accepting to supply the French version, and the expert from the United Kingdom promising his support.

33. The principle of the proposal in document ST/SG/AC.10/C.1/R.204 (United States) was accepted but the terminology was considered not to be in accordance with the international practice and its scope too restrictive. It was decided therefore to introduce a sentence referring to "shot-gun cartridges of any calibre".

34. In document ST/SG/AC.10/C.1/R.215 the Netherlands described a possible course of action to harmonize Parts I and III of the Test Manual and to replace some of the initial testing procedures for explosives by those for organic peroxides. The expert for the United States was critical and felt there would be great problems in trying to use the same tests for two types of substances which are fundamentally different. However, if it could be demonstrated that the same test could be applied to both peroxides and explosives, then this possibility could be considered.

35. The expert from the United Kingdom fully supported the proposed action and felt it could be split into two parts: the first would be an additional exercise of harmonizing description of identical tests and the second a more fundamental review of how the different schemes for explosives, peroxides and even self-reactive substances etc. overlapped or could be unified.

36. Other experts spoke in support of this work and the Netherlands was encouraged to prepare a complete proposal so that the Group of Experts could better discuss and consider the details.

37. Document ST/SG/AC.10/C.1/R.218 (CEFIC) referred to the necessity for an exudation test for blasting explosives type A containing more than 40 per cent liquid nitric esters, which had arisen from the preparation of the revised text for Class 1 by the Joint Meeting. It was agreed that such a test was needed and that should form part of the Test Series 3. However, the expert from the United Kingdom offered to revise the text in document -/R.218 and make a proposal in due form including test data. The Federal Republic of Germany also offered to supply data. The United States will submit a proposal for the inclusion of the United States version of the exudation test.

OTHER BUSINESS

38. The expert from the Netherlands had noted an inconsistency in the listing of "barrels" in table 10.1 i.e. the lack of the word "wooden". The Group of Experts felt that it was possible that barrels had fallen into disuse. It agreed that the whole matter should be investigated and be the subject of a proposal, perhaps to delete the term.

39. While agreeing with the reasoning in document ST/SG/AC.10/C.1/R.206 (Federal Republic of Germany) the Group of Experts decided to achieve the same result by deleting the special provisions concerned.

40. Document ST/SG/AC.10/C.1/R.209 (Federal Republic of Germany) was withdrawn in favour of document -/R.220 (United Kingdom). The proposals in this latter document were adopted.

41. The amendments proposed in document ST/SG/AC.10/C.1/R.212 (Federal Republic of Germany) were adopted.

42. The principle of document ST/SG/AC.10/C.1/R.216 (Canada) was agreed and the proposed solution was adopted with some minor changes.

43. The proposal in document ST/SG/AC.10/C.1/R.217 (CEFIC) was considered as being more the responsibility of the Group of Rapporteurs; the expert of the United Kingdom undertook therefore to draft a more consistent proposal, for submission possibly to that body.

44. The representative of IMO drew attention to an anomaly in S.P. 22. It was decided to change the text.

#### PROGRAMME OF WORK

45. It was agreed that work should continue along the lines laid down by the Committee in document ST/SG/AC.10/13, paragraph 109 especially regarding the results of the test manual, the new Test Series 7 and the criteria for division 1.5. It was noted that chapter 10 still needed some revision and the question of "competent authorities" had not been broached. It was recognized that the alignment of Parts I and III of the manual was a complex assignment and demanded both editorial harmonizing as well as the elimination of duplicating tests and the possible fusion of some initial steps in the flow chart.

#### ADOPTION OF THE REPORT

46. The Group of Experts adopted the report on its twenty-seventh session together with its annex.

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Annex

Adopted Texts

Chapter 2

Add new UN No. 0485 "SUBSTANCES, EXPLOSIVE, N.O.S. 1.4G S.P.178 ... E103"

Add new UN No. 0486 "ARTICLES CONTAINING AN EXTREMELY INSENSITIVE DETONATING SUBSTANCE; (ARTICLES, EIDS) 1.5N S.P.189 ... E106"

UN No. 0077, delete S.P.4

UN No. 0132, delete S.P.11

UN Nos. 0237 and 0288, delete the words "metal clad"

UN No. 0012 should read CARTRIDGES FOR WEAPONS, INERT PROJECTILE;  
(CARTRIDGES, SMALL ARMS) ...

UN Nos. 0006 and 0321 delete the words "(projectiles with propelling charges)".

UN Nos. 0072 and 0226 under Packing Method, for E 6 read E 6(a)

Delete from UN Nos. 0009, 0010, 0015, 0016, 0300, and 0303, the part of the description: "(other than water-activated ammunition) without white phosphorus or phosphides".

Delete from UN Nos. 0020, 0021, 0092, 0194, 0195, 0245 and 0246 the phrase: "(other than water-activated contrivances)".

UN No. 0301 add subsidiary risks "6.1" and "8".

The proper shipping name of UN Nos. 0250 and 0322 should read: "ROCKET MOTORS WITH HYPERGOLIC LIQUIDS, with or without expelling charge".

Chapter 3

Delete Special Provisions 4 and 11.

S.P.22 should read: "... 'AGENT' ... 'EXPLOSIVE' ..."

Add a new Special Provision 189 "This designation should be used only with the approval of the competent authority of the country of origin."

Chapter 4

Glossary of terms, 4.8 - amend the description of Cartridges, small arms by adding a sentence as follows:

"... charge and a solid projectile. They are designed to be fired in weapons of calibre not larger than 19.1 mm. Shot-gun cartridges of any calibre are included in this description. The term excludes: Cartridges, small ..." from the entry for Charges, shaped, flexible, linear delete "metal clad".

Under "Ammunition incendiary" and "Ammunition, smoke" delete "(other than water-activated ammunition), without white phosphorus or phosphides".

Under "Signals" delete "(other than water-activated contrivances)" twice.

Under "Rocket motors" underline "with hypergolic liquids".

Add two new definitions:

"Articles, EIDS

Articles that are filled exclusively with extremely insensitive detonating substance and have passed Test Series 7. Explosive, extremely insensitive detonating substance (EIDS).

A substance which, although capable of sustaining a detonation, has demonstrated through tests that it is so insensitive that there is very little probability of accidental initiation."

Table 4.1 Add the following new entry:

<u>Description of Substance or article to be classified</u>	<u>Compatibility Group</u>	<u>Classification Code</u>
Article containing an extremely insensitive detonating substance	N	1.5N

The text in parentheses in compatibility groups E and F should read: "(other than one containing a flammable liquid or gel or hypergolic liquids)".

In compatibility group G amend the word "lachrymatory" to read "tear-".

Amend the text of compatibility group G in parentheses after "phosphorus" as follows "phosphides, a pyrophoric substance, a flammable liquid or gel, or hypergolic liquids".

For compatibility group L the text should read: "Explosive substance or article containing an explosive substance and presenting a special risk (e.g. due to water-activation or presence of hypergolic liquids, phosphides or a pyrophoric substance) and needing isolation of each type (see 4.6.6.)".

Table 4.3. from the entry for Charges, shaped, flexible, linear delete "metal clad".

Add the following new entry: "Articles, EIDS 0486"

Chapter 10

Delete paragraph 10.2.5.

Table 10.1, for the packing methods indicated below, make the following changes to column 3, outer packagings:

(a) Packing methods:	E 2	E 104	E 120	E 138
	E 6 (a) (i)	E 105	E 121	E 139
	E 8	E 105A	E 122	E 140
	E 10	E 106	E 124	E 141
	E 11	E 107 (a)	E 125	E 142
	E 12	E 107 (b)	E 126	E 143
	E 13 (a)	E 108	E 127	E 145
	E 13 (b)	E 109	E 128	E 147
	E 15 (b)	E 112	E 129	E 149
	E 17	E 113	E 133	E 150
	E 18	E 114	E 134	E 151
	E 19	E 115	E 135	E 153
	E 20	E 116	E 136	E 156
	E 26	E 117	E 137	E 157:

For "natural wood, ordinary (4C1)" read:

"natural wood, ordinary (4C1)

plywood (4D) reconstituted wood (4F)"

(b) Packing methods: E 4 E 22 (a)  
E 5 E 22 (b)  
E 21 E 119:

For "natural wood, sift-proof walls (4C2)" read:

"natural wood, sift-proof walls (4C2)

plywood (4D)

reconstituted wood (4F)"

(c) Packing methods: E 1 (b), E 9

Following "plywood (4D)" add "reconstituted wood (4F)"

(d) Packing method: E 102

Following "natural wood, ordinary (4C1), with liner" add:

"plywood (4D)

reconstituted wood (4F)".

(e) Packing method: E 123

Following "natural wood, ordinary (4C1), with metal liner, add:  
"plywood (4D),  
with metal liner  
reconstituted wood (4F), with metal liner".

(f) Packing method: E 130

For "natural wood, ordinary (4C1), with metal liner" read:  
"natural wood, ordinary (4C1)  
plywood (4D)  
reconstituted wood (4F)"

Under column 4 of packing method E 2 the text should read:

"1 for all entries  
2 for 0004, 0076, 0077, 0078, 0132, 0154, 0216, 0219, 0234, 0235,  
0236, 0386 and 0394"

To column 4 of packing method E 21 add "2".

In column 4, delete the particular packing requirement 16 from packing methods E 102, E 104, E 105, E 105A, E 106, E 108, E 109, E 123, E 128, E 129, E 137, E 138, E 139, E 143, E 146, E 149 and E 157.

Delete reference in column 4 to:

PPR 6 against PM E 3

PPR 14 against PM E 102, E 106, E 108, E 112, E 113, E 114, E 117, E 118,  
E 122, E 124, E 127, E 129, E 130, E 133, E 134, E 137,  
E 138, E 139, E 140, E 141, E 143, E 146, E 157

PPR 15 against PM E 123, E 149, E 150, E 156.

Table 10,2, amend PPR 36 to read: "Articles must be cushioned to prevent contact between them".

Delete PPRs 6, 14 and 15.

### Chapter 13

13.8.4 add "0485" to entry for SUBSTANCES, EXPLOSIVE.

Index

To the entry: CARTRIDGES FOR WEAPONS with bursting charge add

"1.1E 0006"

"1.2E 0321"

Delete the whole of the entry: "CARTRIDGES FOR WEAPONS with bursting charge (projectiles with propelling charge) ...

1.1E 0006

1.2E 0321"

From the entry CHARGES, SHAPED, FLEXIBLE, LINEAR delete "metal clad"

delete the entry "CARTRIDGES for WEAPONS, other than blank"

to the entry: CARTRIDGES FOR WEAPONS, INERT PROJECTILE add "1.4S 0012".

From entries:

AMMUNITION, INCENDIARY (0009)

AMMUNITION, INCENDIARY (0010)

AMMUNITION, SMOKE (0015)

AMMUNITION, SMOKE (0016)

AMMUNITION, INCENDIARY (0300)

AMMUNITION, SMOKE (0303)

Delete: "(other than water-activated ammunition) without white phosphorus or phosphides".

From entries:

AMMUNITION, TOXIC (0020)

AMMUNITION, TOXIC (0021)

FLARES, SURFACE (0092)

SIGNALS, DISTRESS (0194)

SIGNALS, DISTRESS (0195)

AMMUNITION, SMOKE, WHITE PHOSPHORUS (0245)

AMMUNITION, SMOKE, WHITE PHOSPHORUS (0246)

Delete the phrase "(other than water-activated contrivances)".

The entry ROCKET MOTORS with hypergolic liquids, with or without ... should read: "ROCKET MOTORS WITH HYPERGOLIC LIQUIDS, with or without ..."

To the entry SUBSTANCES EXPLOSIVE, N.O.S. add "1.4G 0485"

Add two new entries:

"ARTICLES CONTAINING AN EXTREMELY INSENSITIVE DETONATING SUBSTANCE	1.5N	0486
ARTICLES, EIDS, see .....	1.5N	0486".

