

**Committee of Experts on the Transport of Dangerous Goods  
and on the Globally Harmonized System of Classification  
and Labelling of Chemicals**

23 November 2015

**Sub-Committee of Experts on the  
Transport of Dangerous Goods**

**Forty-eighth session**

Geneva, 30 November – 9 December 2015

Item 3 of the provisional agenda

**Listing, classification and packing**

**Sub-Committee of Experts on the Globally Harmonized  
System of Classification and Labelling of Chemicals**

**Thirtieth session**

Geneva, 9 – 11 December 2015

Item 8 of the provisional agenda

**Other business**

**Information regarding on-going work on possible revision of  
the UN classification of ammonium nitrate based fertilizers**

**Transmitted by the expert from Sweden**

1. The Working group on Energetic and Oxidizing Substances (EOS) under the International Group of experts on the explosion risks of Unstable Substances (IGUS) decided to work on a possible revision of the current provisions for classification of ammonium nitrate (AN) based fertilizers. The aim is to, where possible, clarify and simplify the provisions in order to reduce the possibilities for misunderstandings in how AN-based fertilizers should be classified for transport. It is not the intention to change the current classification for AN-based fertilizers.
2. IGUS is a voluntary group of experts from around the world that has been active in the field of hazardous chemicals since 1962, and has been the engine behind much work regarding e.g. many of the test methods in the UN Manual. However, the group does not have any official status in either of the Sub-Committees SCEGHS or SCETDG, and therefore this paper is presented by the expert from Sweden. The expert from Sweden has indeed also participated in this work, together with experts from the Netherlands, the United Kingdom, France and Germany in an *ad hoc* working group set up for this purpose. It needs to be stressed that all experts have participated in their capacity of experts, and not necessarily on behalf of their respective countries. This is indeed one of the key principles of IGUS.
3. The aim of this informal paper is to inform both Sub-Committees on the current status of the work on classification of AN-based fertilizers. The goal is to present a working document before the end of the current biennium, with proposals for amendments to the UN Model Regulations. It may also be considered to propose amendments to the GHS in order to harmonise the classification procedures, although no such proposal has yet been conceived by the *ad hoc* working group.
4. Solid AN-based fertilizers may be transported as Division 5.1 (oxidizing substances) under UN-number 2067, provided the Special Provisions (SP) 186, 306 and 307 are met. While this is the most common UN-number for transport of such fertilizers, products that consist of virtually pure AN are sometimes transported as “Ammonium nitrate” under UN-number 1942 (also in Division 5.1), to which only SP 306 applies. This UN-number is generally designated for porous ‘technical’ AN used for making blasting explosives. In addition, UN-number 2071, which belongs to Class 9, may be used for transport at sea or in air of AN-based fertilizers, under the provisions of SP 186 and 193.

5. Upon reading SP 307, it is clear that its application may not always be easy for non-experts, and even experts may find themselves struggling with the proper classification of AN-containing fertilizers. Apart from some very fertilizer-specific terms that are not defined in the UN- publications, there is quite entangled wording, and even what could be read as some inconsistency. Furthermore, it is not clear how some AN-fertilizers that do not meet any of the descriptions of SP 307 (a)-(c) because of too high AN-content should actually be classified. In addition to this, the fertilizer industry is constantly evolving and a wide variety of AN-fertilizers have appeared on the market that did not exist when SP 307 was introduced. The composition of these 'new' fertilizers is sometimes not covered by the current wording of SP 307 nor any other SP, which may render them being transported as non-dangerous goods even though they contain high amounts of AN.

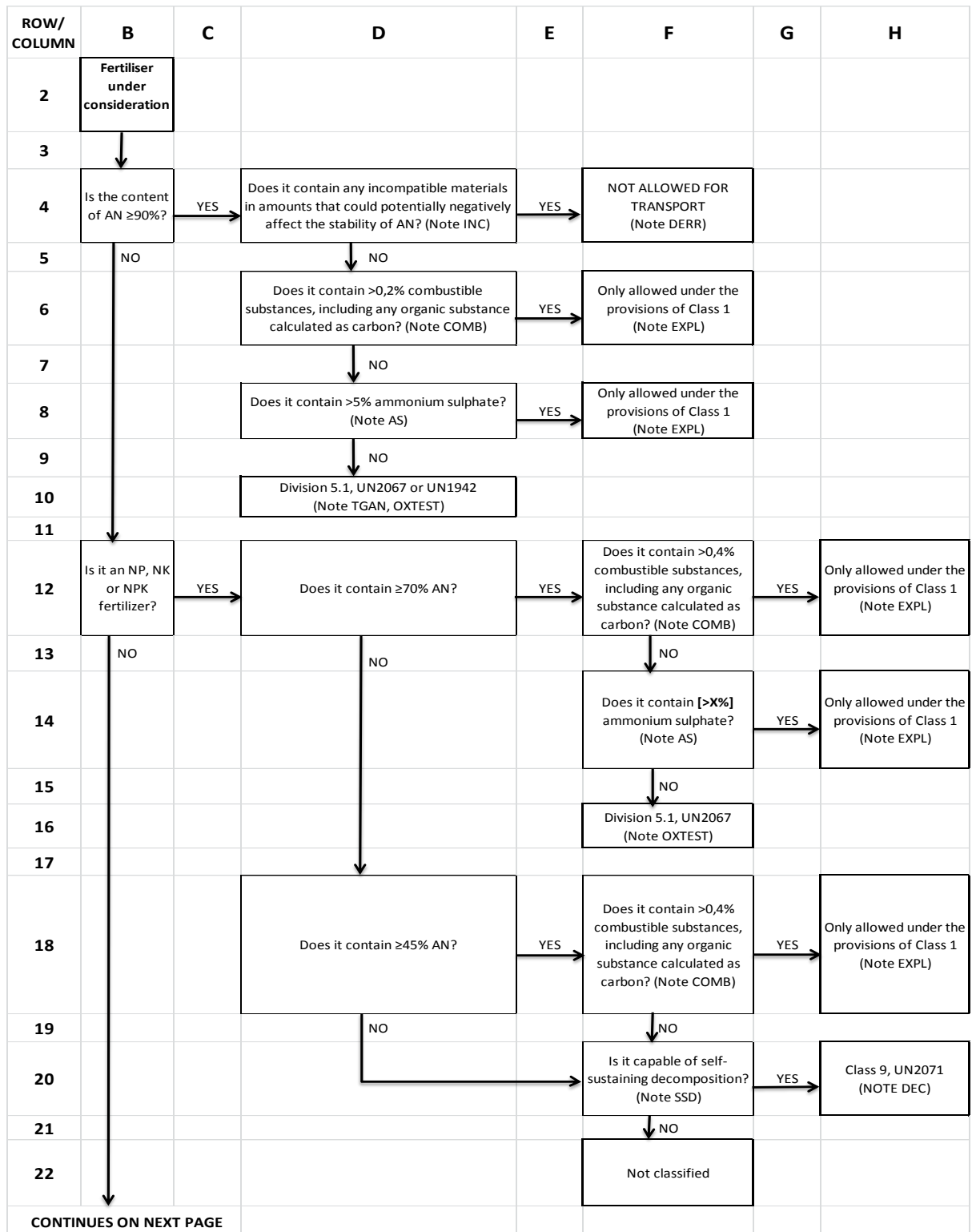
6. The approach taken by the *ad hoc* working group was to first of all decipher the current classification provisions for the aforementioned UN-numbers, in particular SP 307 assigned to UN-number 2067, and other provisions that apply to AN-based fertilizers according to the UN Model Regulations. This was done by turning the provisions into a flow-chart, to get a clearer overview. The flow-chart was then inspected for possibilities to clarify and simplify, and for existing unintended gaps and dead-ends. Discussions with representatives from the fertilizer industry have taken place on multiple occasions.

7. The current draft version of the flow-chart is included in the Annex to this paper. It can be seen that there is still an open issue as regards the amount of ammonium sulphate that can be allowed for NP, NK and NPK-fertilizers with more than 70% AN (see box F14 in the flow-chart). This issue is currently under discussion and input, especially on basis of experimental studies, is welcome.

8. Once finished, the aim is to turn the flow-chart presented in the Annex into a corresponding flow-chart that suits the UN Model Regulations. It will then be formally presented to the Sub-Committees as a proposal for amendments to the UN Model Regulations (and possibly also to the GHS). The expert from Sweden welcomes any comments to the work, which can preferably be sent via email to him at: [lorens.van.dam@msb.se](mailto:lorens.van.dam@msb.se).

Annex

Draft flow-chart for classification of AN-based fertilizers



ROW/ COLUMN	B	C	D	E	F	G	H
	FROM PREVIOUS PAGE						
	↓						
26	Is the content of AN ≥80%?	YES	Does it contain any incompatible materials in amounts that could potentially negatively affect the stability of AN? (Note INC)	YES	NOT ALLOWED FOR TRANSPORT (Note DERR)		
27	NO		↓ NO				
28			Does it contain >0,4% combustible substances, including any organic substance calculated as carbon? (Note COMB)	YES	Only allowed under the provisions of Class 1 (Note EXPL)		
29			↓ NO				
30			Does it contain >5% ammonium sulphate? (Note AS)	YES	Only allowed under the provisions of Class 1 (Note EXPL)		
31			↓ NO				
32			Division 5.1, UN2067 (Note OXTEST)				
33			↓				
34	Is the content of AN >70%	YES	Does it contain >0,4% combustible substances, including any organic substance calculated as carbon? (Note COMB)	YES	Only allowed under the provisions of Class 1 (Note EXPL)		
35	NO		↓ NO				
36			Does it contain >5% ammonium sulphate (Note AS)?	YES	Only allowed under the provisions of Class 1 (Note EXPL)		
37			↓ NO				
38			Does it contain at least 20% of calcium carbonate and/or dolomite and/or mineral calcium sulfate and not more than 10% other inert materials?	YES	Not classified		
39			↓ NO				
40			Division 5.1, UN2067 (Note OXTEST)				
41			↓				
42	Is the content of AN ≥45%?	YES	Does it contain >0,4% combustible substances, including any organic substance calculated as carbon? (Note COMB)	YES	Only allowed under the provisions of Class 1 (Note EXPL)		
43	NO		↓ NO				
44			Does it contain >5% ammonium sulfate (Note AS)?	YES	Is the sum of ammonium nitrate and ammonium sulfate >70%?	YES	Division 5.1, UN2067 (Note OXTEST)
45			↓ NO		NO		
46			Not classified				

## Notes to the flow-chart

**Note INC:** Incompatible materials include urea, acids, superphosphates with free acid, elemental sulphur and transition metals (including heavy metals) e.g. copper. For  $\geq 90\%$  AN chlorides are also considered incompatible. Note however that this listing is not exhaustive. Deliberate addition of incompatible materials is not allowed.

**Note DERR:** Derogations may be given by the Competent Authority in case of accidents or other events where inadvert contamination may have occurred.

**Note AS:** Additives such as ammonium sulphate, magnesium nitrate and aluminium sulphate are sometimes added to give anti-caking properties or for stability against thermal cycling. The 5% limit only applies to ammonium sulphate, and is based on industrial practice.

**Note EXPL:** This material is only allowed to be transported under the provisions of Class 1 (Explosives), regardless of test results.

**Note COMB:** Combustible substances include also non-organic substances that can be oxidized, e.g. sulphur. For organic substances the limit refers to the content of carbon.

**Note TGAN:** It is recommended that porous industrial or technical grade AN is transported under UN1942 in order to distinguish it from non-porous fertilizer grade AN.

**Note OXTEST:** Ammonium nitrate mixtures and ammonium nitrate based fertilizers are classified into Division 5.1 by virtue of their composition and on basis of past experience and knowledge. They cannot be exempted from Division 5.1 on the basis of testing according to tests O.1 and/or O.3 of the Manual of Tests and Criteria.

**Note SSD:** As determined by the Through Test, UN Manual of Tests & Criteria, Part III, Sub-section 38.2.

**Note DEC:** Applies to sea and air transport only.

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