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Inland Transport Committee

Working Party on the Transport of Dangerous Goods **8 July 2013**

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Item 7 of the provisional agenda
Reports of informal working groups

Working documents discussed by the informal working group on flexible bulk containers

Transmitted by IDGCA

The papers prepared by IDGCA and Germany and discussed by the informal working group are reproduced hereafter

Comments from Germany

Related documents: ECE/TRANS/WP.15/AC.1/2012/29 (IDGCA) +
ECE/TRANS/WP.15/AC.1/2011/30, paragraphs 43 and 44 +
ECE/TRANS/WP.15/AC.1/2011/30/Add.1, amendments to 1.2.1 (Definition of flexible bulk containers), Chapter 6.11 and Chapters 7.1, 7.3 and 7.5 + Informal document INF.7 (IDGCA)

The procedure for the inspection and testing of dangerous goods containments guarantees the worldwide minimum harmonized safety standard. Despite the decision taken at UN, the testing requirements described in the IDGCA proposal still require discussion.

In general, there is a degree of similarity between the Flexible Intermediate Bulk Container FIBC and the Flexible Bulk Container FBC (BK3) whose use for transport by road, rail and inland navigation is applied for here. Therefore, it seems natural that the inspection, testing, operation and monitoring requirements to be met by FIBC also need to be considered as minimum requirements for the "new" containment type. Thus, at least all test criteria applicable to FIBC must apply to FBCs and the relevant tests and inspections must be carried out, each in the corresponding relation. In the IDGCA proposal, this relation is established by "simply" multiplying the requirements to be met by FIBC based on the relevant mass of the FBCs. The technical and scientific derivation of the requirements is not apparent. IDGCA should comment on why a linear approach regarding the test criteria is possible in view of the large masses.

It would, thus, have to be demonstrated that the requirements mentioned above also meet the general safety standards of ADR/RID/ADN and that the use for transport with these modes of transport is possible.

6.5.5.2.9 of ADR/RID stipulates for FIBCs that the ratio of height to width of the filled container shall be not more than 2:1. This cannot be applied to FBCs as in Germany and Western Europe the customary clearance heights are limited to a maximum of 4 m. This is the reason why the possible maximum dimensions and weights that are required to make transport of such large packagings possible in the first place should be stated in detail in the regulations. Besides the maximum volume of 15 m^3 mentioned in the definition (6.11.1), the maximum width of 2.4 m, the maximum height of 2.5 m (in this case the height of the loading floor may not exceed 1.5 m) and the maximum gross weight of 14 t as indicated in Inf. 7 of GT 2/2012 should also be defined.

It is worth noting that the substances permitted for transport generally have a higher density and that a fully laden FBC would normally exceed the weight limit; this should also be discussed again.

In the case of carriage in bulk in load compartments/containers, the cargo is secured by form-locking. When FBCs are used, it can no longer automatically be assumed that this is the case. The calculated solution shown in INF.7, which consists of lashing the FBC with one lashing device over the sidewalls, is not the general technical standard and is thus to be considered insufficient. Furthermore, the assumption that FBCs are homogeneous cargo units must be proved. The question regarding the securing of several FBCs on one transport unit remains unanswered. And also the great forces a side, front or back wall of approx. 1.7 m (2/3 of the height of a FBC) would have to absorb need to be discussed and should be mentioned in ADR and RID as a requirement.

As the centre of gravity will be higher than usual when 1 or 2 FBCs are used on one loading area, this should be considered separately in ADR.

It would make sense to demand that proof be furnished for the used vehicles/transport units as regards rollover stability in analogy to ECE Regulation No. 111. Germany will try to present a model calculation in accordance with Annex $ on this issue in the WG in St Petersburg. A compensation achieved by means of a considerable reduction of the maximum permissible speed (50 km/h) of these transport units is not in conformity with the usual speeds in Western Europe e.g. on roads outside built-up areas and on motorways. Moreover, in the case of a very high centre of gravity, malfunctions of the electronic stability programmes installed in modern vehicles can occur.

For intermodal transport of the transport units, such as IMO 4 vehicles, the vehicles are to be equipped with lashing rings.

Concerning the issues mentioned at the beginning in connection with the testing/inspection/approval of FBCs, we would like to make the following remarks, which may also need to be discussed again at UN:

Inspections and tests

The test facilities must be standardized to ensure the comparability of the test results in the case of retests.

For the individual tests to be carried out, the following issues need to be clarified:

Lift test:
The real test mass (in the case of simple multiplication) for the lift test required for FBCs is at least 84 t (six times the maximum gross mass).

Drop test:
The drop test must be carried out using a non-resilient target. Non-resilient generally means a ratio of test mass to target of 1:10. Such a target is also determined by the dimensions L – W – H in relation to the mass; it is thus not sufficient to provide a target with a large surface area and a mass of 140 t.

Topple test:
The test facility necessary for carrying out the topple test needs to be many times larger than that for FIBCs.

Vibration test:
Given the size/mass and use of the FBCs, a safety-related analysis within the framework of a vibration test is advisable.

It would be helpful if available documentation (pictures, videos) on the tests already performed could be submitted, or if a test programme could be completed successfully prior to the decision of ECE WP 15, the RID Committee of Experts and the ADN Administrative Committee.

Operation

Effects resulting from penetration of other substances, temperature changes, changes in humidity or pressure need to be clarified again with regard to the substances permitted for transport.

Due to the large masses and considerable potential for damage, FBCs should generally only be used as a “disposable packaging”. However, if repeated use is intended, a QM system and routine maintenance in analogy to FIBCs would need to be prescribed. As proposed,

the period of use should generally be limited to a maximum of 2 years from the date of manufacture.

In order to detect defects hidden by creases in good time, a complete visual inspection must be performed prior to the filling. This and other particularities in connection with filling and handling should be re-examined.

IDGCA: Answer on Discussion paper of the German Delegation for the BK3 Working Group on May 28th, 2013 in St. Petersburg

The answer is given in chronological sequence. Our answer is not categoric, and we propose to discuss all the aspects of FBC transport.

1. In the calculation that are known to us, a mass is usually present in the first degree that is why it is logical to suppose a linear dependence between FBC mass and acting load at testing. We would be grateful to you for your proposal on this subject.

2. The ratio of FBC height to diameter amounts to 2.5/2.4=1.042, i.e. it is almost one that is why flexible bulk container is steady and stable. Circular strips of netting provide it with stability. Concerning FBC height and its influence on the vehicle's stability, it is quite logical to restrain FBC height to the safe requirement of the road transport of Germany and other European countries. Concerning the railway and river transport, FBC dimensions can remain unchanged. By the way, FBC volume is not mandatory equal to 15 cubic meters. It is no more than 15 cubic meters, i.e. it can be 5, 10 and 13 cubic meters.

3. If FBC carries the cargo with high bulk weight, this does not mean that FBC will be loaded up to its total capacity. Restriction to this is FBC's loading capacity but not its volume. For example, when we transport the concrete in FBC, we load approximately 70% of the volume, so that there will be 14 tones in the container. If we transport the concentrate of various metals then the container is loaded till 50% of its volume and FBC will contain 14 tones of the cargo.

4. Obviously, during transportation of FBC, the railway cars and auto-trucks experience lateral pressure on walls at radial sections and front pressure at abrupt braking. Singular slings seen on photos, which fix FBC to the motor vehicle, are not used by us in the long hauls, but they are used in the interplant and intra-port transport. On our sites you will find the photos of FBC which are unfixed on the motor vehicles. As the experience of application shows, the wall height 2/3 from FBC height is quite sufficient for accident free transport of FBCs. However, for the ADR Rules could have been established the requirements with higher walls, for example, by type of the railway cars.

5. In general it is known that various modes of transport (vessels of internal navigation, railway cars, auto-trucks) have various maneuverability, the cargoes transported in them impact variously on the transport means. From the expert society, the most concern arise the road transport in part of the safe FBC transport, that is why we support consideration of the requirements for the FBC transport separately from ADR.

6. We also support the proposal on equipping of the transport means with unified stopping equipment for intermodal transport, in case if this does not contradict the principle of use of a flexible container.

7. We agree that testing equipment shall be standardized. However, we think that the arising questions should not be brought to the UN Subcommittee. The questions, which are arising here, have been mainly considered at the UN Subcommittee. For example, according to the remark of German Delegation at the UN Subcommittee we did the repeated drop test of FBC in the Central Scientific Research Institute under the name of Krylov A.N., whose laboratories have accreditation of German certifying society. Protocol and video of testing were published. FBC was dropped on the plate of mass 3225 tones. The plate was based on concrete foundation walls. For maximum rigidity of testing we dropped FBC on the plate at the foundation walls' intersection point. These tests were taken into consideration by the UN Subcommittee. It should be mentioned that our initial

proposals included the vibration test and water-proof test. However, the working group, in particular representatives of the U.S.A. and U.K. delegations considered these tests as redundant and excluded them from final edition.

8. Reconsideration of substances admitted for the FBC transport by the UN Subcommittee is also unreasonable in our opinion, because for the list's base were taken the substances admitted by the UN Recommendations for the transport in containers with the code BK1, i.e. in the containers without a hard top, covered by water-repellent cloth, which as FBC are subject to penetration of foreign substances, change in temperature, moisture or pressure. Besides, by recommendation of several experts from the UN Subcommittee, the list of substances was reduced: from the list were excluded the substances of packaging group II, several substances of packaging group III, including contagious substances.

9. Our initial proposals included methods of the FBC residual strength determination, these were express methods permitted to determine residual strength in the conditions of ports and plants. These methods were also excluded by the UN Subcommittee working group and were replaced by a limiting two-year age of FBC operation.

Comments from IDGCA (Russian version)

Ответ на замечания Германии

Ответ дан в хронологической последовательности. Наш ответ не является категоричным, и мы предлагаем обсудить все аспекты перевозки FBC.

1. В расчетах, нам известных, масса обычно присутствует в первой степени, поэтому логично предположить линейную зависимость между массой FBC и действующей нагрузкой при испытании. Будем признательны вам за ваше предложение в этой тематике.

2. Отношение высоты к диаметру FBC составляет 2,5/2,4=1,042, т.е. почти единица, поэтому контейнер FBC устойчив и стабилен. Стабильность ему придают кольцевые ленты сетки.

Что касается высоты FBC и ее влияния на устойчивость автомобиля, то вполне логично ограничить высоту FBC до безопасного требования автомобильной перевозки в Германии и др. странах Европы. Что касается железнодорожной и речной перевозки, то там размеры FBC могут остаться прежними. Кстати, объем FBC не обязательно равен 15 куб.м. Он составляет не более 15 куб.м, т.е. может быть и 5 и 10 и 13 куб.м.

3. Если в FBC перевозят груз с высоким насыпным весом, то это не значит, что FBC будет загружен до полной вместимости. Ограничением является грузоподъемность FBC, но не его объем. Так, например, когда мы перевозим в FBC цемент, то мы загружаем примерно 70% объема, при этом в контейнере будет 14 тонн. Если перевозим концентрат различных металлов, то контейнер загружают на 50% его объема, при этом в FBC будет 14 тонн груза.

4. Безусловно, при перевозке FBC железнодорожные вагоны и грузовые автомобили испытывают на стенках боковое давление на радиусных участках и фронтальное давление при резком торможении. Единичные стропы на фотографиях, крепящих FBC к автомобилю, не применяются нами в магистральных перевозках, но применяются на внутризаводских и внутрипортовых перевозках. На наших сайтах найдете фотографии вовсе не закрепленных FBC на автомобилях. Как показывает опыт применения, высота стенки 2/3 от высоты FBC вполне достаточна для безаварийной перевозки FBC. Однако для Правил ДОПОГ можно было бы установить требования с более высокими стенками, например, по типу железнодорожных вагонов.

5. В общем, известно, что разные виды транспорта (суда для внутреннего плавания, железнодорожные вагоны, грузовые автомобили) имеют различную маневренность, перевозимые в них грузы по-разному воздействуют на транспортные средства. Самую большую озабоченность в части безопасности перевозки FBC у части экспертного сообщества вызывает автомобильный транспорт, поэтому мы поддерживаем рассмотрение требований к перевозке FBC отдельно в ДОПОГ.

6. Мы также поддерживаем предложение об оснащении транспортных средств унифицированным стопорным оборудованием для интермодальных перевозок, в случае, если это не противоречит принципу использования мягкого контейнера.

7. Мы согласны, что испытательное оборудование должно быть стандартизировано. Однако не думаем, что возникающие вопросы нужно опять выносить на Подкомитет ООН. Вопросы, возникающие здесь, в основном, уже были

рассмотрены на Подкомитете ООН. Так, например, по замечанию делегации Германии на Подкомитете ООН мы провели повторное испытание FBC на падение в Центральном НИИ им. Крылова А.Н., лаборатории которого имеют аккредитацию Германского сертификационного общества. Протокол и видео испытания опубликованы. FBC был сброшен на плиту массой 3225 тонн. Причем, плита базируется на бетонных фундаментных стенах. Для максимальной жесткости испытания мы сбрасывали FBC на плиту в точке пересечения фундаментных стен. Эти испытания Подкомитетом ООН были приняты во внимание. Должен сказать, что в наших первоначальных предложениях были включены испытания на вибрацию и водонепроницаемость. Однако рабочая группа, в частности представители делегаций США и Соединенного Королевства Великобритании сочли эти испытания излишними и исключили их из окончательной редакции.

8. Пересмотр веществ допущенных Подкомитетом ООН к перевозке в FBC также, по нашему мнению, не целесообразен, т.к. за основу перечня были приняты вещества разрешенные Рекомендациями ООН к перевозке в контейнерах с кодом ВК1, т.е. в контейнерах без жесткой крыши, покрытых водоотталкивающей тканью, которые также, как и FBC, подвержены проникновению посторонних веществ, изменению температуры, влажности или давления. Кроме того, перечень веществ по рекомендации некоторых экспертов Подкомитета ООН был сокращен: были исключены из перечня вещества группы упаковки II, некоторые вещества группы упаковки III, в том числе инфекционные вещества.

9. В наших первоначальных предложениях были включены методы определения остаточной прочности FBC, причем это были экспресс методы, позволяющие определить остаточную прочность в условиях портов и заводов. Эти методы также были рабочей группой Подкомитета ООН исключены и заменены предельным двухгодичным сроком эксплуатации FBC.