INTERMODAL TRANSPORT AND STANDARDISATION

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Abstract: *Almost gone unnoticed, a new era started in rail freight transport. Whereas the conventional "wagonload" rail freight transport stagnates, road-rail Combined Transport (CT) was able to register high growth rates. Direct trains link big cities at competitive costs and speeds compared to road. The share of CT in the performance of freight transport (t/km) of European railway undertakings represents 25-40%. More than 1200 freight trains per working day, each with an average transport capacity of 25 truck loads, travel 500 km on national and 950 km on cross-border relations, which in comparison with road freight transport results in a 75% reduction of CO2 emissions.*

Keywords: intermodal, combined transport, freight containers, BIC-code, ILU-code

1. INTRODUCTION

The introduction of containers and their worldwide standardization based on International Organization for Standardization (ISO) standards has resulted in increased efficiency of deep sea shipping which in turn brought about a significant expansion of world trade and created the basis for globalization. In continental transport, intermodality enables to combine the advantages of two or more transport modes, for instance the high transport capacity, security and environmental performance of rail or inland navigation with the flexibility of road over short distances and in dense urban settings.

Intermodal transport is economically attractive and efficient in two different cases:

- Transport chains to and from overseas destinations involve a section on water and several sections overland. Intermodal transport technology, with its easy transfers from one transport system to another, is particularly efficient in this case. Transshipment of an intermodal transport unit, a 40-foot container for example, enables a load of almost 80 m3 to be transferred from a ship to an HGV or rail wagon in a single operation lasting 3 minutes. Conventional transshipment as it was carried out in the past, with each package being lifted from the ship and loaded onto another vehicle, would take several hours.
- Over long distances, especially in land transport, the numerous individual consignments can be gathered together into a large consignment at the beginning of the journey, divided once again in the destination area and distributed to the consignees. For example, loading units are carried by road to a transshipment facility where they are transshipped onto a block train and transported to a destination terminal. They are then transshipped onto road vehicles and sent onwards. A block train can transport some 80 seven-meter swap bodies on most European railways, which means it can carry the same load as 40 trailer trains to a destination area in a more cost-effective and energy-saving fashion.

These two different forms of intermodal traffic also have their different business models:

- The major players retain their traditional role when intermodal traffic is used to organize transport chains to overseas destinations rationally and efficiently. Shipping companies organize sea transport, port transshipment companies take care of container transshipment in the sea port, and haulers and land transport companies carry the container from the port to its hinterland destination. However, in the course of containerization, the companies involved have organized themselves into worldwide businesses, especially in terms of sea transport and transshipment in ports [1]. The intermodal traffic system has been successful mainly through cost regression and increased operational scale. Correspondingly, the size of the companies involved has increased dramatically. Medium-sized service providers only exists alongside major railways and their subsidiaries in container transport from sea ports to the hinterland [1].
- The second intermodal traffic model, which involves grouping many individual loads together into large transport units, created a new type of business, the combined transport operator, which in a sense works as a consolidator company. In the past, many railways in the USA and Europe also carried out intermodal traffic through their own subsidiaries. At the same time, freight forwarders and road freight companies founded their own businesses together to organize combined transport. These companies would purchase the capacity of an entire block train from a rail company and sell it on to haulers and goods transport companies space by space. They usually also assumed the risk in terms of train capacity utilization in these intermodal operations. As the railway leading operations made a significant contribution to the success (or failure) of an intermodal transport service through the quality (or distinct lack of quality) of its performance, operators try to ensure, as much as their market power allows them, that their contracts with railway companies make sure the latter would strive towards transport quality.

The new EN 13044 standard for the marking of intermodal loading units simplifies the access to Combined Transport and brings efficiency improvements for all for all those involved. The initiative embodied in EN 13044 and the Intermodal Loading Units (ILU) – Code is a prime example for industry voluntarily regulating itself: a solution which the European Commission much prefers, especially when it embraces important security-related considerations, while also enhancing operational efficiency, all without the intervention of the legislator.

ISO containers are shipped on road, by inland waterway or rail mainly in seaport hinterland traffic; in continental transport easy-to-transship loading units, standardized European Committee for Standardization (ECS) swap-bodies and semi-trailers are used. These are better adapted to the dimensions of road vehicles and are also lighter and easier to load. Due to common technical characteristics, many road vehicles, wagons and transshipment devices are suitable for use with every type of loading unit. Also the owner identification of European loading units and ISO-Containers will develop in a compatible way in the coming years.

2. AUTHORISATION AND CODIFICATION

The forwarding of loading units on rail wagons almost always exceeds the normal loading gauge of average railway lines and can therefore only run on sections of the rail network which have been specifically measured and certified for an increased loading gauge.

A gauge code is allocated to these railway lines, which indicates the maximum dimension of loading units that may use the route referring to standard CT wagon.

The CT loading units (swap-bodies, non-ISO containers and semi-trailers) also need to have a corresponding codification. To be able to run on a given rail route, the gauge code of the loading unit cannot exceeds the codes of the railway lines making up the route. Moreover, some wagons with very low loading platforms may have correction digits – differentiated from country to country – which permit the passage of loading units that are higher by a few centimeters. Over the years, rail gauges (especially limited in rail tunnels) have continually improved on several important railway lines in order to allow the passage on rail by almost any loading unit transported on road.

Intermodal loading units require certification to be transported by rail and must be fitted with a gauge code. In accordance with EN 13044, this "codification" for swap-bodies and semi-trailers will be carried out directly by the manufacturer. He will submit the design plans and related calculations to the competent authorities (railway undertaking, CT operators or certification instances) followed by, if necessary, a resistance test to ensure that the design the ECS standards or UIC leaflets. The loading units then will receive a codification plate which certifies rail compliance and contains all the essential information to operations: for swap-bodies the gauge, length, width code and the resistance category, while for semi-trailers: important information for the quick and safe loading (carriage height, compatibility code for pocket wagons).

The manufacturer has to guarantee towards the buyer and third party that the delivered units comply with the certified design.

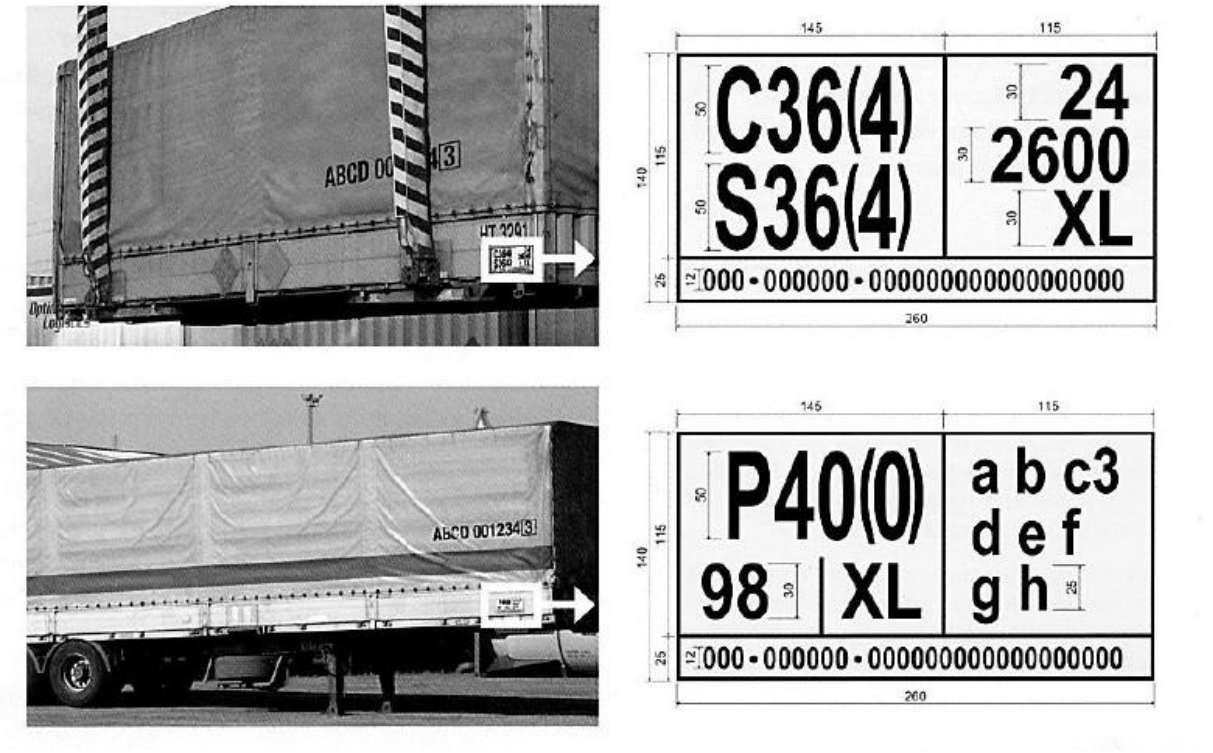

Figure 1 *New codification plates compliant with the EN 13044 standard for swap-bodies and semi-trailers (for each and according to preference: horizontal or vertical)*

3. IDENTIFICATION AND STANDARDISED OWNER CODES

The current standard for a maritime container is the worldwide ISO 6346 standard which describes the BIC-Code allocated by the "*Bureau International de Containers*". Nearly 2000 BIC owner code have been issued up to now, thus enabling the owners of ISO-containers (ship owners, carriers or leasing companies) to effectively identify the ownership of more than 20 million freight containers worldwide.

The capacity of the BIC-Code, with a "U" for "freight containers" in the 4th place, permits the allocation of nearly 17000 codes. This would not be sufficient if all European entities owning loading units wanted to obtain such a code. For the loading units being mainly used within Europe (swap-bodies and semi-trailers), a technically compatible "ILU-Code" is introduced by the European EN 13044 standard, which will be administered by the International Union of Combined Road-Rail Transport Companies (UIRR).

Example. In the USA, the "National Motor Freight Traffic Association" (NMFTA) allocates the "Standard Carrier Alpha Code" (SCAC) to identify freight carriers and their loading units. Since the loading units marked with the SCAC, mostly semi-trailers, remain on the American continent, the European loading units can receive a similarly structured ILU-Code as they will be deployed exclusively within Europe. NMFTA has ensured that it would not allocate owner codes with "U", "J" or "Z", as these is reserved for the worldwide BIC-Code.

In the future, only one uniform type of owner identification will be applied on loading units: the worldwide BIC-Code for freight containers and the new compatible ILU-Code for European loading units where BIC and UIRR are the issues of the owner-key. The marking on every loading unit looks as follows:

Owner-key – Registration number – Check digit **ABCD 001234 3**	
Owner-key	Allocation by UIRR or BIC 4th alpha character for type of loading unit (ISO 6346 requires "U" on the last place for containers, "J" for equipment fitted on the container and "Z" for trailers and the chassis. The EN 13044 requires a "A", "B", "C", "D", "E" or "K" for ILUs with restricted use for Europe.)
Registration number:	Free allocation by owner
Check digit:	Given calculation procedure

3.1. BIC-Code or ILU-Code?

For companies owning European loading units, the administrative costs of codification and of the yellow plate for each individual unit will disappear in the future. Instead, they will need a BIC-Code or an ILU-Code as owner–key for the identification of all of their loading units. Every actor from the maritime sector and owner of ISO containers already having a BIC-Code may, according to the ISO 6346 standard, mark all freight containers, including swap-bodies [2].

The ILU-Code, which is compatible with the BIC-Code has been conceived for those companies who one swap-bodies and semi-trailers used in European intermodal transport on road, inland navigation and short distance sea shipping [3]. Companies already in possession

of a BIC-Code will only need to acquire an ILU-Code if they also own semi-trailers. On request, they can get an ILU-Code ending with "K" and with the first three letters matching their BIC-Code.

3.2. Launching and transition rules

The expected efficiency improvements will become visible when after a transition period only the new markings are used. UIC railway undertakings and UIRR operators have therefore decided the following deployment plan:

1. From July 2011, UIRR will start issuing the ILU-Codes, while operational marking will be carried out using the new codification plates.
2. After a three-year transition period, from July 2014, only loading units marked with a BIC-Code or an ILU-Code will be accepted.
3. After an eight-year transition period, from July 2019, every loading unit will have to be fitted with the new codification plate.

Administration of the owner code of companies based in several countries is not easy as some of them move others close, etc. and the code database must always be updated. UIRR, the administrator of the ILU-Code, is mainly financed by its member companies, which enables it to charge fees at marginal cost and hence make this step easy to accept by the transport sector [4]. The initial allocation of the ILU-Code will cost EUR 250, while the renewal, due only every second year, EUR 100.

4. ADVANTAGES

The ILU-Code allows a simplification of the electronic data processing and operational running for the actors of the transport chain. The code adapted to electronic data processing reduces the number of data capture errors as 95% of the possible typing errors are immediately spotted thanks to the check digit. The correction costs for the data capture errors and the transmissions are thus considerably reduced.

The EN 13044 standard distinguishes the owner identification from the operational marking requested for the rail operation. In future, "codification" will be directly carried out by the manufacturer. The yellow codification plate concerns characteristics of the intermodal loading unit such as the geometric dimensions and the resistance which are retained in case of a change of owner. In case of sale, a new codification is therefore not needed anymore.

All swap-bodies and crane able semi-trailers, even if purchased to be used in pure road transport only, will be usable in rail transport. Logistics companies and road haulers will only have to – as this is already the case for the containers – provide their loading units with their owner-key consisting of four letters followed by six digits, with which they can codify their rolling stock according to own criteria, to be followed by a check digit.

Every actor of the transport chain, as well as third parties, for example customs authorities, emergency services, can at any time identify the owner of a loading unit given that the owner code is published. This is important aspect for the checks at the borders but also within EU for the future reinforced requirements in the field of security and safety. For more efficient operations in ports and terminals, the custom authorities more and more check the identity of containers directly with BIC. This procedure will in the future likely be extended to all CT terminals [5]. Swap-bodies and semi-trailers fitted with an ILU-Code could then also be checked and be shipped with priority.

The BIC-/ILU-Code, written in larger characters, are OCR-readable. The systems which are already installed at sea-ports can thus also find an application in the continental terminals and contribute to their streamlining.

5. CONCLUSION

The introduction of the ILU-Code with check-digit will enable the saving of labor thanks to the reduction data capture errors at the terminals. The time saved can rather be devoted to improved customer service. The harmonized ISO 6346 an EN 13044 standards have the potential to be used for identifying intermodal loading units in the information exchange foreseen under the European regulation for freight telematics (TAF TSI) if extended to intermodal traffic [5]. With BIC and UIRR, two renowned international organizations manage the owner codes in the interest of the transport sector.

6. REFERENCES

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