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Project acronym: TRIMOTRANS

Project title: Development of new intermodal loading units and dedicated adaptors for the trimodal transport of bulk materials in Europe

Publishable executive summary

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Project Coordinator Organisation: ZAFT e.V.

Abstract

The project TRIMOTRANS applies to the development a family of new intermodal loading units including devices, capable adaptors and mobile fasteners suitable for the trimodal transport of bulk and packaged goods on road, railway and inland waterway.

All investigations are done with special respect to the strategic orientation given within the “DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Intermodal Loading Units” (final version 30. Apr. 2004) and based on the state-of-the-art standards and regulations of the authorities responsible for approval and inspection of loading units in Europe.

Background

Europe’s transport policy has been characterised by the fact of liberalisation and the effort of harmonisation over the years. This has slowly shaped the transport system into what it is today. Globalisation and the concept of wider Europe create further challenges. The fast growth of freight transport – driven to a large extent by economic decisions – contributes to growth and employment but also causes congestion, accidents, noise, pollution, increased reliance on imported fossil fuels and energy loss.

To overcome such problems, Europe’s transport system needs to be optimised by means of advanced logistics solutions. So logistics can increase the efficiency of individual modes of transport and their combinations. As a result, fewer units of transport, such as vehicles, wagons and vessels should carry more freight.

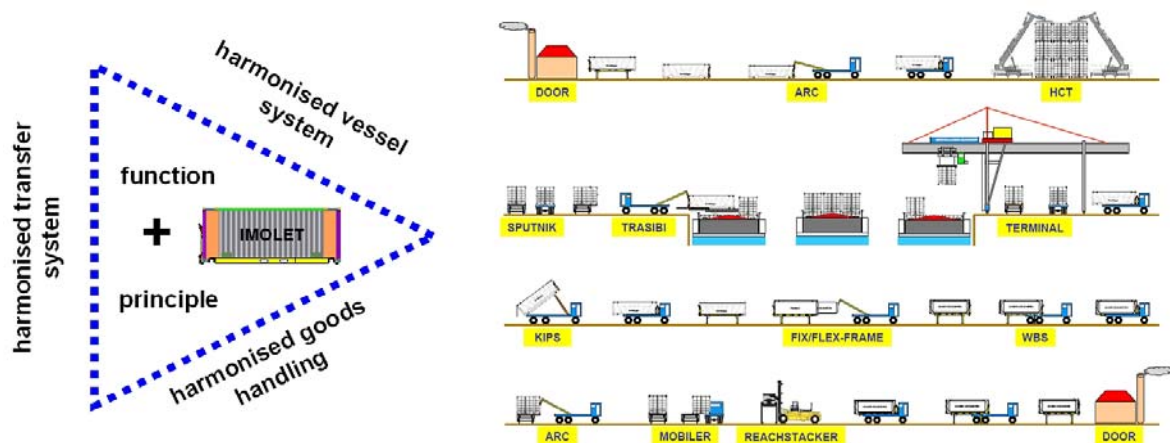


Fig. 1: Harmonised Goods Transportation Chain

Shifts to more environmentally friendly modes must be achieved where appropriate, especially on long distance, in urban areas and on congested corridors. At the same time each transport mode must be optimised. All modes must become more environmentally friendly, safer and more energy efficient. Finally, co-modality - i.e. the efficient use of different modes on their own and in combinations - will result in an optimal and sustainable utilisation of resources.

Road transportation is facing a rapidly increasing congestion. In the contrary, the available capacities in railway and inland waterway transportation are being underutilised. A redistribution of the carriage of goods is urgently needed. Up to now the most important obstacles are the incompatible interfaces between the various carriers and the diversity of loading devices being used in the EU.

Objectives

The main objective of the project is the development of new technical solutions for intermodal loading units including containers, dedicated adaptors and mobile internal fasteners in order to shift the main transportation route for goods sustainably from the road onto rail and inland water ways.

Due to the plurality of the existing loading systems and the multitude of the transported goods, the research and testing activities within the project will be realised under the following guidelines:

- The technical activities firstly will be concentrated on the development and design of universal vessel units with dimensions of 2.550 x 2.900 x 7.450 mm, according to the preferred loading units geometry recommended by the European Commission in the above mentioned directive on intermodal loading units. The alternate body length of 13.600 mm is subject of future investigations.
- The handling technologies requirements forced a subdivision of the set of implementable IMOLET vessels into two versions: the Swap Version and the Roll-off Version. The reason therefore is the incompatibility of some technical demands concerning Swap- resp. Roll-off technology.
- The optional handling capabilities of IMOLET vessels must involve hook-lifting as well as spreader technology and the horizontal transshipping via devices such as MOBILER, NETHS, ACTS, HCT or similar features in order to achieve a high compatibility to the existing transshipping technologies. So the vessel system is an uncompromising realisation of a unique “lifting – setting – rolling” philosophy.

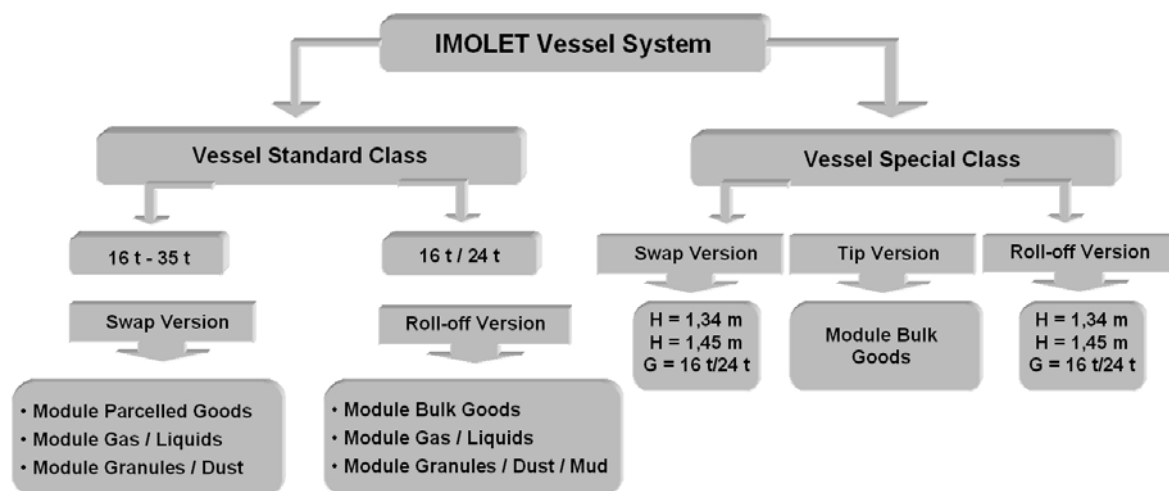


Fig. 2: IMOLET Vessel System Overview

Furthermore the newly developed systems allows specific customer solutions according to extraordinary requirements. Fig. 2 shows the actual state of development of the IMOLET vessel system.

Description of work

The main investigations concerning the design of two universal receptacles with adapter appliances should ensure maximum possible effectivity of the receptacles transporting and handling in a trimodal conveyor chain. The two vessel concepts created belong to the Swap resp. Roll-off versions of the IMOLET loading units family.

Most important was to ensure as far as possible the ability of all members of the receptacle system to be transported and handled both in the line and in the area with all conventional country and water vehicles unless they comply to the geometry suggested by the documents of European Authorities as cited above. Modifications due to the handling of conventional receptacles are possible and recommended for some transitional period to ensure the inauguration of the harmonised receptacle gauges.

The classical dominance of the ISO container and swap body in the combined road /rail traffic is complemented through this new intelligent receptacle unit innovatively. So immediately also Europe's coast and inland waterways should have the possibility to use the new system without limit and to enlarge the transport of bulk materials still more effectively. So one main feature of the

vessels to be designed, was to have the IMOLET vessels equipped with standardised corner fittings known from the conventional containers.

Results

The logistic chain should be set up without changing the loading unit throughout the whole door-to-door transport process. The following base main types of the IMOLET vessel family were designed and proved for mechanical stability due to the related standards and regulations by means of technical computation tools. The design process was carried out using INVENTOR® series CAD software and PATRAN/NASTRAN® for the technical computation. The results of this design process are illustrated in Fig. 3.

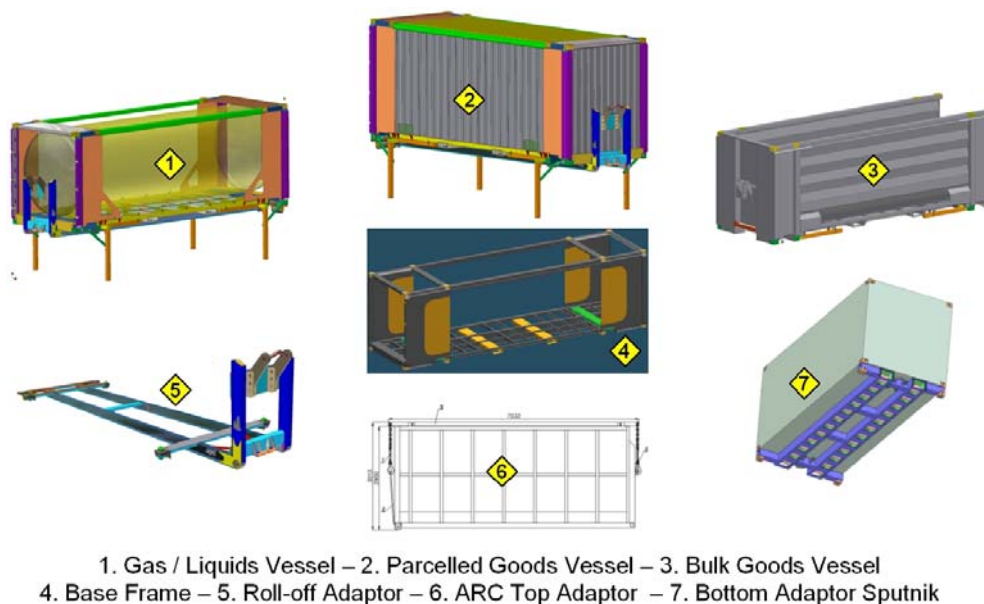


Fig. 3: IMOLET Vessel Base Main Types

Furthermore during a separate meeting at Vienna a first change of views between representatives of GL/RINA as approval/inspection authorities, the ÖBB as a global player in transport and members of the TRIMOTRANS consortium was held. As an important result of the meeting the complete conformity of the design and dimensioning principles of the TRIMOTRANS design team with the Standards and regulations valid for conventional loading units at present time could be stated.

Consortium

Order	Partner	Country
1	ZAFT e.V.	DE - Germany
2	Budapest University of Technology and Economics	HU - Hungary
3	Loxodon Machining Ltd.	HU - Hungary
4	Werner&Weber GmbH	AT - Austria
5	Kluge GmbH	DE - Germany
6	Broder AG	CH - Switzerland
7	Česko-saské přístavy s.r.o.	CZ - Czech Republic
8	G. Transport 96 KFT.	HU - Hungary
9	Moscow State University of Railway Engineering	RU - Russian Federation
10	CIDEON Engineering GmbH	DE - Germany