

FEASIBILITY PROJECT FOR THE IMPLEMENTATION OF AN INTERMODAL CLEANING STATION ON THE CIM PREMISES – NOVARA

SHORT OVERVIEW OF THE CIM TERMINAL ACTIVITY

Every week at CIM more than 150 trains are loaded for the round trip journey to Rotterdam, Genk, Antwerp, Zeebrugge, Le Havre, Noisy, Lomme, Duisburg, Ronet, Valenton, Oostende, Hams Hall.

Furthermore, 10 trains per week connect Novara with Central (Pomezia) and Southern Italy (Bari).

As a result, significant “ gateway “ traffic is created.

Every day over 500 lorries drive through the hub, transporting containers, semi-trailers and tanks.

About 436,000 TEU passed through the terminal in 2006.

Handling is currently performed using 15 stakers and 3 engines.

[The] internal road traffic, which is strictly one-way, uses one of 3 different entrances and a checked exit connected to the motorway system.

The rail internal structure is made up of 7 rail tracks, each 600 m. long, which are connected to the national rail network.

At the beginning of this decade, many terminal customers requested to build a cleaning station inside the hub premises, as the trend in traffic to /from Novara continued to grow .

This growth will increase exponentially due to the opening of Alpine transit tunnels (Simplon, Loetschberg and Gotthard),

so we believe that a feasibility project regarding the implementation of a local cleaning station is absolutely timely and welcome for most current customers .

OVERALL PROJECT SUMMARY

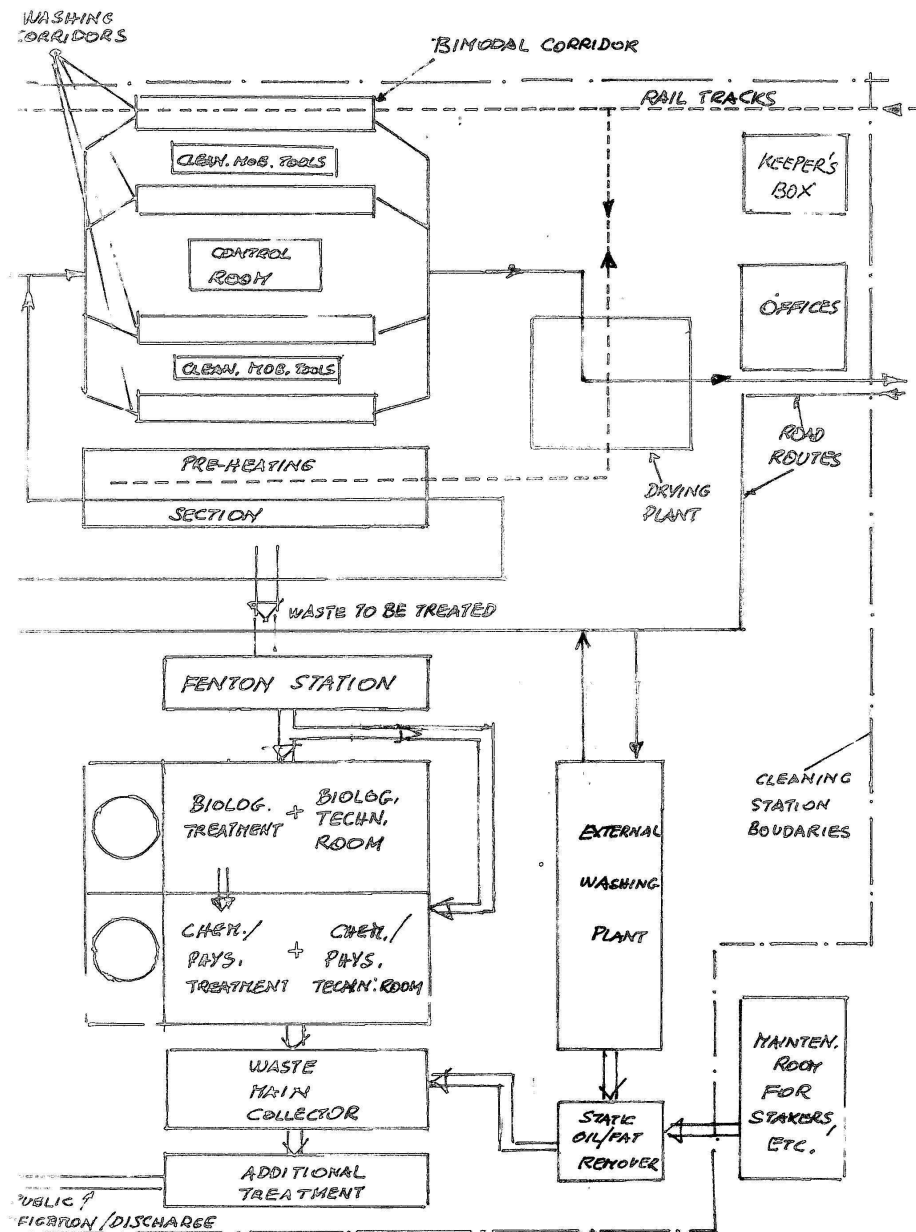
The project foresees the implementation of a cleaning station for tanks/tank containers and relevant transportation vehicles, and of the consequent waste management system, both being positioned inside the CIM hub borders.

The cleaning station, when implementation is completed, will include a plant consisting of 4 lines dedicated to the cleaning and sanitizing process for tanks/tank containers (one of these will allow cleaning of tanks/tank containers arriving either on road or rail vehicles), a plant with a single line specifically dedicated to external cleaning of vehicles and containers and a plant for the purification of all waste fluids coming from all the cleaning facilities.

This last plant will be furnished with collecting basins that are only partially under the ground surface because the aquifer runs almost on the surface; these basins will be suitably camouflaged for the sake of aesthetics .

PLANT FOR EXTERNAL CLEANING OF VEHICLES AND CONTAINERS

The washing line, (placed as shown in the attached figure 1), includes a concrete plateau, 25 cm. high, at the level of the entrance ground pavement, and consists of a mobile, portal



SCHEMATIC BLOCK DIAGRAM
OF THE CLEANING STATION

Figure 1

structure, running on specially designed tracks, with 5 high pressure cleaning brushes, equipped with different washing programs. The structure is designed to clean both standard and special shaped vehicles.

The plateau has a central open air drain suitably sloping towards a pit where waste fluids are collected, and which is, in turn, connected to the output fluids management plant .

The portal is made of a steel structure, of variable thickness (from 20 to 5/10 mm), entirely zinc coated and then treated with epoxy- and other protecting varnishes.

This structure is provided with sliding, vertical rotary brushes, thanks to mobile motorized supports, and horizontal brushes dedicated to cleaning vehicles' front-, rear- and top sections.

Dimensions of the structures are:

- max. width: 5.4 m.
- max. height: 4.6 m.
- tracks gauge 4.2 m.
- washing height: 4.2 m.
- length of the tracks: 27.0 m.
- plant installed power: 7 KW
- voltage: 380/400 V, 3 phase, 50 Hz

The washing corridor also includes a suitable structure section specifically designed to clean the vehicles' chassis, using high pressure water.

All the connections, whether for waste fluids, or for water, or for electrical power supply, use ad hoc underground tubes which are controllable by means of inspection pits.

A technical section is located in an appropriate structure contiguous to the plants, where feeding pumps for all

downstream uses, compressors, and electric equipment/panels are stored.

The dimensions of this structure will be approximately: base = 30 m² , height = 2.7 m

PLANT FOR INTERNAL CLEANING OF TANKS/TANK CONTAINERS

This plant foresees 4 access corridors, one of which can be used both by road and rail vehicles, and washes and sanitizes tank/tank containers by means of specific devices using either hot water or high pressure steam.

It includes a technical room, suitably designed to contain boilers and other necessary equipment, and office space: the total area of both tech. room and office will be approximately 700 m².

Essentially, the plant is constituted by a couple of high efficiency boilers to produce steam used either directly in the tank internal cleaning and sanitizing process or, through heat exchangers, to supply hot water.

Each boiler produces 3000 kg/h steam at a temperature of 180 degrees Celsius. The steam exiting from the boilers will be sent to a collector, from which all user lines will depart, in particular the direct line for the internal steam cleaning of the tanks, the line for preheating the tanks and the lines feeding the heat exchangers for producing hot water.

Each heat exchanger will be fed by specific pump group, capable of delivering 150 liters/min. at a 100 bar pressure.

The cleaning plant will also include high pressure dosing pumps to add the chemical substances needed for the

washing process, and rotary cleaning brushes moved by water exiting from brush holes: these brushes will be introduced into the tanks from the top openings and will ensure the tank is cleaned perfectly; moreover, they will also wash the internal side of the opening lids, aided by a specific support system.

All cleaning operations needed for an optimal washing process will be remotely performed with the help of a control panel suitably located in the operative area.

All waste fluids coming from the washing process will be initially collected in a basin placed close to the cleaning plant and, then, transferred by means of an adequate pumping system to the purification plant.

DRYING PLANT

The cleaning station includes a drying plant.

This plant injects pre-filtered, hot air internally into the tank; this air is heated by an heat exchanger fed with the steam coming from the boilers: air temperature will be 55 degrees Celsius higher than the environmental temperature.

The plant is essentially made of a fan group with a flow rate of about 3500 m³/h at a pressure of 350 mm. water column, of a heating battery using the steam as heating fluid, and of a thermodynamic discharge system of condensate.

The drying system will be mounted atop the washing corridor and will include a device to guarantee optimal diffusion of air inside the tank.

HEATING SYSTEM FOR TANKS/TANK CONTAINERS

The cleaning station includes a system for heating full tanks/tank containers; this system is located close to the main cleaning plant in order to use the steam produced by the already-mentioned boilers: the steam, the pressure of which will be reduced to approximately 2 bar, will be distributed to the standing tank by means of specific pipes.

6 releasing heads are foreseen, each capable of reaching the required height from ground level; each of them will also be provided with a manually-operated, intercepting valve and with a time-controlled electrovalve.

HOT WATER HEATING PLANT FOR TANKS/TANK CONTAINERS

Some materials transported require that the heating will be accomplished using preheated water (max. 60 degrees Celsius) in order to prevent possible thermal shocks and ensure a mild temperature escalation.

This plant will be made of a heat exchanger, a circulation pump for heated water, an dedicated water container and different intakes and pipes to send the pre-heated water to the tanks and receive it back.

WASTE FLUIDS MANAGEMENT PLANT

All fluids coming from the cleaning station will be sent to a unique collecting station, and then pumped to the sedimentation and oil removing basins, suitably designed to accept all these wastes.

These pre-treated fluids/waters will be sent to an accumulation/homogenization collector, in order to ensure maximum efficiency in the subsequent waste treatment sections.

Thanks to pressurized air flotation that will be performed in an dedicated station, and using suitable chemical substances, the oils and fats contained in the waste fluids will be separated as a floating layer, which will be automatically drained and sent to the dehydrating and compacting section.

Because of the high quantity and variety of pollutants in the waste fluids, these will be subjected to a chemical/physical treatment (oxidization through Fenton reaction), in order to disintegrate all the inorganic substances contained in waste fluids that could be obnoxious in the next phase (biological treatment).

After the Fenton reaction, waste waters will be mixed together with those coming from the external washing of the vehicles (these last having been treated previously in a separate section), in a new accumulation and homogenization basin, in order to eliminate sand and oil residuals.

This mixture will then be sent to the biological treatment section of the plant (activated sludge and controlled aeration), where a de-nitrification process will be performed and where the activated sludge will be deposited.

Waste waters, exiting from the biological section, will then be treated using inert and active materials, in different

filtering sections, to comply with the Antipollution Norms in vigor in Italy.

The purification plant will be completed with a sludge compacting and dehydrating process, so that the resulting material can be disposed by specifically authorized companies as waste compliant with Italian regulations.

This plant, including all the basins and technical rooms, will be approximately 1000 m2 large.

ECONOMIC EVALUATIONS

An approximate calculation of the cost of the various plants was performed and a summary of the relevant results are listed below:

- building preparation works	40.000 Euro
- external washing plant	240.000 Euro
- internal washing plant (*)	480.000 Euro
- waste fluids management plant	990.000 Euro
- miscellaneous works	350.000 Euro
TOTAL	2.100.000 Euro

(*) includes drying, heating and hot water heating plants

We are studying the ways for financing the implementation of this project. At this stage, we can foresee an EU contribution, according to the development paths hint in the ChemLog project (ChemLog network, High Level Group...); the residual amount should be covered either by local contribution from public sources (Regional and National through the Cassa Depositi e Prestiti...) or from private investments (Trenitalia, CIM SpA...).

AUTHORIZATIONS

The described project above is a feasibility proposal, not a final project.

A preliminary evaluation of the necessary authorizations/certifications has been performed, including referring to the EFTCO conditions; however, only when this project will reach the definitive version, will it be submitted to the relevant Authorities , in order to receive:

- authorization to discharge resulting wastes, according to the foreseen cleaning activity;
- quality certification according to ISO 9000 series
- SQAS certification for the specific activity: “cleaning “.

Satisfying the conditions for obtaining the mentioned authorizations/certifications is “condicio sine qua non” for becoming member of ALCI, the Italian Association member of EFTCO, and for being allowed to issue the ECD (European Cleaning Document).

TIME SCHEDULE FOR THE IMPLEMENTATION OF THE CLEANING STATION.

After approval of the feasibility project, a deeper insight of the described structure will be necessary, in order to refine the project and reach its final version.

Then, time to obtain the authorizations/certifications has to be added.

Finally, the real construction work can start.

A first, approximate estimation of the total amount of time needed for a steady-state use of the cleaning station is about 5 years.