

SURINAME: REFINERY EXPANSION PROJECT

PROJECT	EQUIPMENT	WEIGHT
PETROC	SPMTs / STRAND JACK AND TOWER / CLIMBING JACKS / PROJECT & FORWARDING	UP TO 869 TON

Fagioli were contracted for the heavy transport and project forwarding activities of general cargo material and heavy weight modules for the SURINAME refinery expansion project at Paramaribo, Suriname. The key success to the contract award was Fagioli's capacity to offer to the client a turnkey project solution involving all of our capabilities including in-house project forwarding, heavy transport and lifting, engineering know-how, allowing us to perform the overall timely handling of all of the different aspects of such a challenging project.



The project was made of three main activities:

- Shipment of general cargo materials
- Shipment of heavy items (weighing up to 830 t) and modules (24 PARs and PAUs modules from Italy) together with the local transport
- Lifting and installation of eleven (11) main heavy items

HEAVY TRANSPORT AND LIFTING ACTIVITY

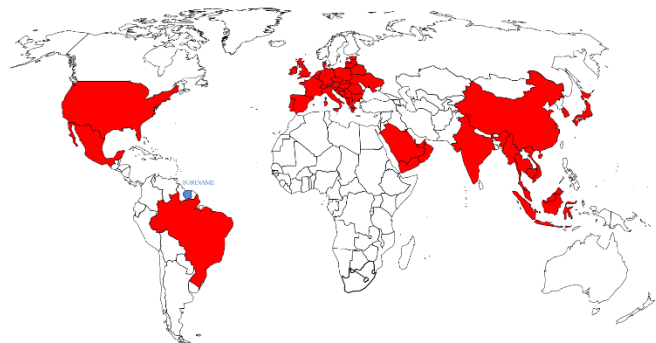
In Italy Fagioli executed the roll on vessel loading operations of 24 modules by means of 48 axle lines SPMTs. After the loading of the items onto two heavy lift ship (10 and 14 modules) and the completion of sea fastening operations provided by Fagioli, the vessels departed for their 21 day transit to reach Suriname. The site, positioned on the banks of a river, was reached by means of a barge mobilized by Fagioli from USA. The first ten modules arrived with the first H/L vessel, they could only be off loaded by ro/ro means from the vessel to the quay via a dummy barge prior to be able to reach the designated storage area.



Due to the strong current and the tide it was impossible to position the ship perpendicular to the quay for a direct roll off operation of the modules so it was decided to berth it parallel to the jetty being careful to execute safe moves, considering all of the possible contingencies related to the ballasting of the two Goating vessels. Then the modules were reloaded from the quay ro-ro by means of SPMTs onto the barge to arrive at site, after a load in operation. For the second vessel the fourteen modules were unloaded ro-ro onto the barge which was then directly moved to the site, skipping the storage activities. The whole operation took one day to be executed, from HL ship up to site. Once at site, after the load in, the PAR modules were directly positioned onto foundations whilst the PAUs' needed Fagioli climbing jacks to be settled. Within the contract for the installation of 11 main items, Fagioli used the tower lift and strand jacking system to lift and install the biggest item being a reactor 50m long and weighing 790t (excluding saddles). A crawler crane was used for the tailing operation. A 60m tall tower lift was employed, provided with 2 x 750 t capacity strand jacks. The pictures show the different activities executed, sometimes at the same time. Top left is the departure of the modules loaded onto the first vessel, while the one at the bottom is a detail of the local transport operation. The dimension of some of the modules were the biggest challenge due to the high COG. Fagioli engineering department studied the dimension and weight of all the modules and items to be installed providing the fastest and safest method to be applied with the dedicated equipment. Picture on the right is the installation by means of tower lift and strand jacking system of the biggest item



ORIGINS OF MATERIAL



PROJECT FORWARDING ACTIVITY

The project forwarding department managed the shipment and site delivery for all the materials manufactured for the Suriname project with material originating from all over the world with the delivery to site managed by Fagioli Suriname branch.



The total quantity of material to be shipped and delivered to site will be around 60.000 cubic meters of general cargo and a total of 167.000 cbm. of modular and oversize heavy items. The activities involved the sourcing of suitable liner and chartered vessels as well as dedicated H/L vessels for the transportation of the biggest modules.

The liner services to Suriname are not so regular and one of the main issues was to establish the best strategy to guarantee that the materials arrived at site in the correct sequence and on time. In compliance with the clients construction schedule requirements and urgencies, Fagioli's operational project division ensured that vessels were chartered to maximize the amount of materials that could be shipped, performing the collection and delivery to the export ports of the materials on a timely basis to guarantee their loading on the specially chartered cargo vessels. In order to guarantee a regular flow of the delivery of the materials, the general cargo was also shipped in box or special container. For what concerns the biggest items (mainly originated from Indonesia, Vietnam and India), Fagioli booked dedicated self-gear H/L ship vessels. A Dvd of the project is available on request, with a deep analysis on the heavy transport of PAU module 2604 which had peculiar dimensions (19m long , 8,5 m wide, 35 m high) with a centre of gravity at 12,4 m and a tipping angle of 4,2 degrees maximum.

