SECTOR:
ROCKETS AND MISSILES

OFFERINGS:
BUILD TO SPECIFICATIONS

TECHNOLOGY:
STRUCTURES

DESIGN, DEVELOPMENT AND FABRICATION OF ROCKET LOADER

Our customer is a defence research laboratory involved in the design and development of rockets. This particular rocket is loaded into the rocket pod after completion of assembly including the filling of propellant. Previous loading process was manual and sometimes caused the slipping of rockets causing damage to the propellant grain. The lab wanted a loader to be developed where the loading operation would be semi-automatic and risk free. Due to the presence of propellant, it was required that rocket be loaded by the human power and not machine.

The major design challenge was to design and fabricate a machine that can take care of small clearance of 0.5 mm in 5 m length of the rocket. The rocket must also be oriented such that the guide studs present on the rocket slide into the slots provided in the pod. The loader required modular construction to enable loading of both the rows and three columns.

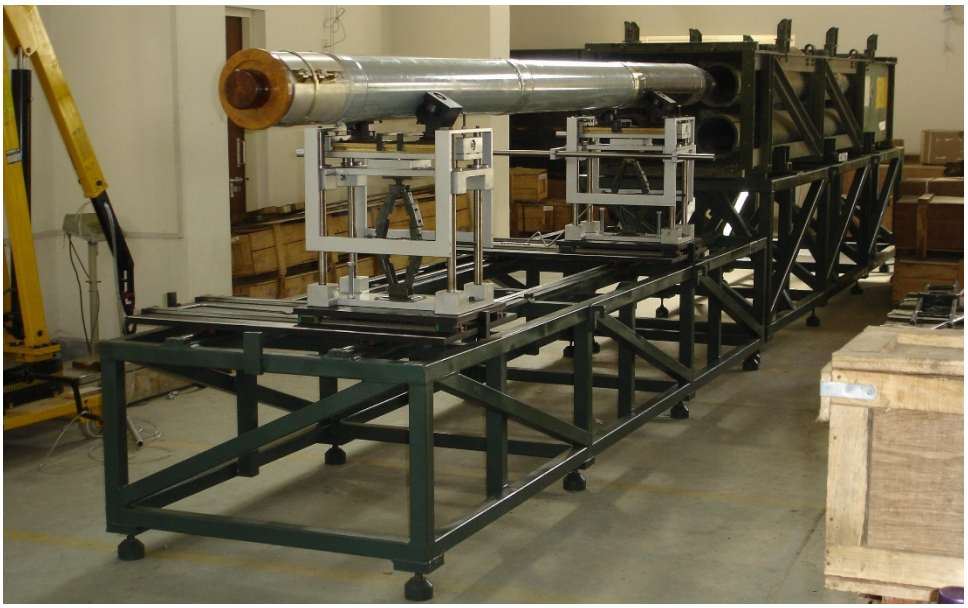

Figure 39: Loader structure with rocket being loaded

Kinematic design of entire structure was done. Trolley for support of pod and rocket loading trays were designed. The trays were made to be height adjustable and were free to have lateral motion. FEM analysis was done to see the deflections and fine tune the places where strengthening was needed. After the design review, manufacturing was done for the both trolleys, trays, and other paraphernalia. The loader has been successfully fabricated and tested for loading of all six pods. The system is saving time to load and is safer with substantially reduced manual effort.

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