

(page.12-13)

The Commissioning

– In Case of a Project in Manila –

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Though some readers may have already heard the word “commissioning,” I fear that the business referred to by this word may not be clear to most people, with the exception of those involved in it. In plain terms, the commissioning business refers to the process from the delivery of vehicles to a customer (or to an object area) to the acceptance of the vehicles after the completion of all tests.

How Finished Vehicles Are Shipped

While the process from the completion of vehicles at our site to the acceptance of them after an official trial operation varies according to project, it can be classified as follows:

When vehicles move directly from our railroad for departure to the site of official trial run

When vehicles are transported from our railroad for departure to the customer’s site, using Japan Freight Railway’s line, go through various tests, and undergo an official trial run

When vehicles, in a disassembled state, are transported by car or ship to the customer’s factory or depot, at which vehicle bodies, including bogies, are assembled for various tests; then undergo an official trial run

When vehicles, in a disassembled state, are transported by car to a harbor, at which vehicle bodies, including bogies, are assembled; are transported further by ship, then by rail to the customer’s site; and go through various tests and undergo an official trial run.

With regard to commissioning in recent vehicle export projects, the projects in Hong Kong (the Ma On Shan Rail) and Egypt (the Cairo 1st Line) fall into the case , and the project in Manila (to be discussed in this chapter) into the case .

From Bogie Assembly to a Commissioning Test

Vehicle bodies, including bogies, are assembled on a local site using jacks or truck cranes. Two truck cranes were employed in the above-mentioned project in Manila. After on-site vehicle assembly, a commissioning test is generally conducted according to the following procedures:

A type test to verify the performance as described in specifications

A routine test after the type test

Some parts of the type test (including the testing of in-vehicle noise and vibration at rest or in a low-speed

run, and that of in-vehicle light luminance) are conducted, prior to the official type test, on Kinki Sharyo’s test track extending about 400 m; as far as such parts can be executed on the track. On the other hand, tests involving vehicle runs at high speeds (about 30 km/h or more) that cannot be performed on the test track are conducted as part of a commissioning test.

Details of Commissioning

Now, I will describe the details of commissioning conducted in Manila.

From early in the morning (6:00 a.m.), bogie assembly was performed using two truck cranes. Four vehicles (or eight body units) constituted one train. The assembly was performed for two days, with two vehicles (or four body units) as one segment of work. The work took about four hours per day. The bogie assembly was followed by the installation of articulated section bellows and interior furnishings; and the reinstallation of parts that had been removed for transportation. Next, vehicles were connected via coupler to form each train.

Subsequently, inspections to prepare for post delivery inspection (an item of routine test) were conducted. After confirming that all results were faultless, vehicles underwent inspection by official inspectors. Prior to this inspection, vehicles had been checked for damages suffered during transportation, and cleaned sufficiently; this also represents an important part of commissioning.

After checking the vehicle condition, a test (the rest-functional test) was begun to check vehicle functions at rest. Since all parts of this test had already been finished on Kinki Sharyo’s site, the test basically amounted to the confirmation of results of the previous test. After no faults were indicated for all items of a checklist, vehicles underwent another inspection with the attendance of the inspectors.

Then, a test run on a full-scale line started. The maximum vehicle speed during testing in Osaka had been about 30 km/h, and the vehicles had yet to be tested to confirm that a maximum speed of 60 km/h could be attained on a full-scale line. The type test began after confirming that this speed had been reached. Main items of the type test comprised the following:

Acceleration and deceleration test under no load, and under a condition equivalent to loading by passengers to capacity

Test involving the sliding and slipping of wheels
 Confirmation that a train can be run even when the main controller (VVVF) of a vehicle has failed, with passengers loaded to capacity
 Measurement of noise inside and outside a vehicle at the maximum speed (60 km/h); and that of vehicle vibration at the same speed
 Demonstration that a train can haul another train in an emergency, under various conditions
 Demonstration of the startup and braking (to a full stop) performance on a road with a 4% grade, under various conditions

To secure a loading equivalent to that by passengers to capacity, a number of sandbags were loaded on each vehicle of a train. Since a vehicle had to be packed closely with sandbags, part of this work required manual labor by about 30 local workers over two days. To have wheels slide or slip, rails had to be sprinkled with water. A pump and a water tank were loaded on a vehicle for that purpose. In addition, many instruments and measuring lines were placed on sandbags. This left hardly any space to put one's feet in the vehicle.

In the Manila project, we delivered additional vehicles for an existing line, which was commercially operated in the daytime. Accordingly, test runs on the actual line were conducted at night, from 11 p.m. to 3 a.m. Since Manila was in a rainy season (September) at the time of testing, some scheduled tests had to be cancelled due to unfavorable time and weather conditions. We had encountered similar difficulties involved in test runs at night on the Cairo 1st Line and the Ma On Shan Rail in Hong Kong, as well as in an earlier project in Boston.

Winding up Work

The commissioning for the first train ended without any problems about one month after the on-site bogie assembly. For three days in this period, a typhoon of an unprecedented scale prevented us from conducting any kind of tests. After this round of commissioning, we needed to conduct only routine tests for the remaining trains (from the second to the 12th). For these trains, test runs at night took only two days in general.

Basically, commissioning procedures similar to those described above apply to all overseas projects, though details of these projects vary widely.

