Facilities at Deutsche Plasser’s training centre in Bingen am Rhein are helping to dramatically reduce the time it takes to train track machine engineers, as Kevin Smith discovered during a visit to Germany’s Rhine valley.

Simulation speeds up track machine engineer training

SITUATED at the confluence of the Nahe and Rhine rivers, and flanked by the Bingen Forest low mountain range, Bingen am Rhein is pierced by a busy railway line carrying passenger and railfreight traffic east to Mainz and Frankfurt and northwest towards Koblenz and Bonn.

Bingen’s railway is also home to Deutsche Plasser’s training centre, which opened in 2008 at Bingen Stadt station, and has become increasingly popular and important to the company’s activities. This is reflected in its expansion from just two upstairs rooms to now occupying most of the station building, with an array of state-of-the-art training simulators and equipment available to trainees and existing operators of Plasser & Theurer machines across the 650m² facility.

The first course was offered in January 2009 and offerings now range from four-hour refreshers for existing staff to six-week intensive sessions for new recruits. Combined with three months of on-track training, these provide sufficient understanding to allow trainees to operate machinery effectively, and compares with a training process of up to two years for some machines if engineers only learn on the job.

“The aim of the facility is to provide qualified and highly-motivated staff and customers which will add to the reliability and availability of the machines in the marketplace,” says Mr Antonio Intini, head of the Bingen training centre. “Track can only make money if it is in use. Better qualified staff will result in better repairs and better maintained track, and with operators expecting availability of 97-98% of the machines, qualified staff can deliver that.”

Intini is one of the centre’s three full-time trainers following the addition of a third in January. They are often supported by additional trainers from Plasser subsidiaries who can deliver the course in their native language or other Deutsche Plasser staff who speak English. Courses available include introductory sessions on machinery, superstructures, track geometry, measurement methods, machine engineering and controls, operating safety, brake maintenance and track position with each adaptable to the student’s experience and knowledge.

A variety of replica equipment and simulators are available as part of these courses to help students to use the company’s equipment more effectively. These include a hydraulic simulator, multi channel record (MKS) equipment, digital recording system (DRP/DAS), and Plasser Intelligent Control 2.0.

However, the stars of the show are the 09-3D track tamping simulator based on the 093X machine, which was introduced in 2011, and the Unimat-3D, a simulator of the Unimat 09-4x4/4S, the first joint track and turnout simulator in the world, which officially began operating on January 14.

Both of the simulators were developed by Plasser & Theurer in cooperation with Enova, Austria. Unimat-3D utilises five computers to simulate the operations of three work stations responsible for tamping, operating the lifting and lining unit,
and operating the front wagon. The operator’s work station and working environment are realistically reproduced using 3D visual technology the results of which can be displayed across 12 individual displays in 2D or 3D using the appropriate glasses with around 17 million pixels calculated in real-time. Diverse operating scenarios are available including plain line tamping to more complex tasks such as turnout tamping. Trainees are also able to switch to an external view of the machine during operations to learn more about how it works. Similarly the 09-3D simulates operations at the machine’s two workstations and is usable by a maximum of two people at one time with practical use backed up by theoretical sessions in the classroom. During the first week of a course a student will operate the simulator for 1.5 hours a day culminating at the end of the two-week course with a full eight-hour shift. Like the Unimat-3D, at the end of each scenario the simulator analyses the operator’s performance, including the number of sleepers that were damaged and tamped effectively, in order to optimise operation in subsequent runs.

Advantage

Intini says the advantage of using simulators over on-track training is the greater flexibility available to meet the needs of the individual student by presenting a range of different but relevant challenges that can be repeated all within the same setting. Operating track equipment for eight hours at a time is a physically and mentally-demanding job and Intini argues that the more time engineers have using the simulation equipment the more comfortable they will be when it comes to the real thing.

In addition, three tracks are available at the main station in Bingen for students to observe all conditions. Here they are able take measurement instruments and go through the basics of track maintenance so when it comes to using the machines in the simulator and for real they better understand what the machine is telling them.

Intini says the courses available at the centre are certified to Germany’s Industry and Commercial Trade Chamber (IHK) and since November 2011 Union of European Railway Engineering Association (UEEIV) standards, which provides infrastructure owners and managers with the reassurance that upon completion, the individual is up to the demands of the job, with this certification accepted across Europe.

Following the completion of training the students are able to begin work unsupervised, with Intini stating that experience has shown that this works. “You wouldn’t put an entire gang of new recruits on to a machine,” he says, “but one or two might be new and the rest experienced operators.”

Initially the centre was intended solely for Deutsche Plasser staff, with Plasser & Theurer staff and its customers’ employees mainly trained at its facility in Linz. However, with Plasser & Theurer, its partner companies’, and customers, including clients from India, east Asia and the Middle East, increasingly using the Bingen facility in recent years along with some agencies, demand is expected to continue to grow.

Specifically in Germany government investment in rail infrastructure is stoking demand for new track machine engineers while in other countries an impending skills gap as experienced engineers retire is forcing some companies into a recruitment drive. Indeed demand is currently such that Intini says Deutsche Plasser could currently sell out its courses “three times over” during the winter months when track work is quiet.

However, Intini says the facility is not only about making money but helping operators to use its machines to their full potential. “If we have better operators who are trained to use the machines properly, there will be less damage to the machines and less guarantee repair and service work, which will benefit all sides involved,” he says.

As a result the centre is well-placed to play a key role in training the track machine operators of tomorrow while meeting the needs of existing engineers as their roles continue to evolve.