Staff Training at Taiwan High Speed Rail Corporation (THSRC)

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The Big Day Finally Arrives

Taiwan High Speed Rail Corporation (THRSC) started service of its 700T shinkansen on 5 January 2007, making Taiwan a member of the exclusive club of railways with a high-speed train network. The first 300-km/h trip covered the distance between the island's two main cities and was covered extensively by the media with many reporters onboard.

It goes without saying that Taiwan's geography boosted the need for a high-speed network because the two most populous cities are at opposite ends of this stretched-out island—Taipei in the north and Kaohsiung in the south. The High Speed Rail train will revolutionize transportation on this densely populated island and will compete strongly with all existing transportation methods, including the significant and modern highway infrastructure served by frequent, comfortable, long-distance buses. The conventional railway network is very widespread and already connects Taipei in the north with the south of the island. However, the new High Speed line crosses the western parts of Taiwan, which are the most populous, and time will be a deciding factor because the train will make the same trip in half the time—and perhaps even a quarter the time—of the conventional service. Even air services will be challenged, because experience shows that high-speed trains can easily beat planes over the medium 300-km distance range.

The Workforce—A Completely New Mixture of Skills

The successful completion of this High Speed Rail Project is due mainly to an extraordinary collaboration between various parties and a very large investment in human resources.

The THSRC called on many specialists from both foreign networks and also had many local Taiwanese experts coming from the TMRT (Taiwanese Mass Rapid Transit) subway, the conventional government railway network (TRA), and the airline industry. But since a team of experts and consultants is not sufficient to operate a full network, THRSC also had to train people to operate the system currently and to assure that in the future it could be taken to the next level. Training and qualifying the staff required to successfully launch the 700T—while assuring real efficiency in future operations—was a major challenge.

Despite many obstacles and delays, THSRC was able to meet this challenge by laying a foundation comprised of a very proactive training structure coupled with proactive training and recruitment policies.

Training at THSRC

Organization

Long before the high-speed service was launched, THSRC established a genuine internal training organization called the Training and Certification Office (TCO), which was given the following, very precise, functions and objectives:

i) Implement training strategy and structure that could handle short- (pre-launch) and long-term (post-launch) goals, as well as training needs in operations, maintenance, safety, etc.

ii) Design and coordinate training programmes by taking specific steps

iii) Work closely with management team to determine needs in terms of skills and priorities

iv) Ensure sufficient trained staff to meet needs specific to launch

v) Identify requirements for implementing training programmes, including maintenance and operation rules, various regulations, premises, etc.

vi) Integrate training for manufacturers and component manufacturers into general training programme

vii) Coordinate maintenance training to ensure workers have skills and knowledge to operate safely and maintain railway efficiently

viii) Set needs and standards of training programme

ix) Supervise and increase efficiency of training activities

x) Establish qualifications and skills system, including implementing functions connected to creating qualification and evaluation process with objective of providing periodically renewed certifications

Targets

The training aim is to provide all new employees with everything they need to achieve a high level of skill in their jobs. The key training objectives include:

i) Strengthening knowledge and skill at all corporate levels

ii) Creating a true background for continuous learning

iii) Developing training for the sake of productivity without challenging safety, customer satisfaction or commercial aspects

iv) Improving practices compromising through

v) Continuous evaluations of workplace, upgrading training materials, and improving training evaluation methods

vi) Developing internal training offer within THSRC by covering all aspects from techniques and management to monitoring

vii) Strengthening links in training areas with other high-speed train operators

Modern railway operators must operate safely while remaining focussed on the client. A key to achieving this objective is to develop a true learning culture within THSRC right from the start that will support true employee versatility in the future. However, training cannot exist without structure or objectives and the fact remains that THRSC has had to overcome many difficulties when training staff for their future jobs, especially with regard to infrastructure.

Difficulties

Once objectives have been clearly identified in a mission statement, training usually takes place according to the following principles and steps:

i) Developing training materials

ii) Providing training

iii) Qualifying trainees

The first step—writing training materials for this project—was the most difficult and least ordinary of the objectives. Commonsense would dictate that training materials can only be written by persons who are familiar with the subject matter and who are also familiar with the physical characteristics of the equipment on which the training will be carried out. This is normally the basis of all legitimate training so it is easy to see the difficulties we faced by imagining the difficulties of an instructor who is asked to write a manual for a lawn mower, but who can't touch or try or even look at the lawn mower. This somewhat unique situation faced most of our experts while writing the training materials. Due to delays in delivering the trains and infrastructure, our specialists were forced to start writing the training materials before access was possible. This was a difficult task because although they were trained in high-speed technology, it was different from Japanese shinkansen technology. As access became possible, the training

High-speed train crew—Train master and four train attendants (Author)

materials were reviewed and validated little by little. The task was something like walking a tightrope, and affected all drivers, train masters, track workers, and train station staff.

Additionally, the period that THSRC could access the facilities and equipment was reduced gradually between July 2006 and the start of revenue service—initially expected in late October of the same year—because this Trial Operations Period was used to verify operating procedures and train staff competence.

The delayed training of Taiwanese drivers is an example of the difficulties experienced in trying to establish quality training in a brand-new network with limited access to facilities. Let's be quite clear, driver training requires about 8 months of testing and training to be conducted by THSRC prior to applying for a license to be issued by the Ministry of Transport (MOTC) who conducted their own testing, qualification and licensing regime. THSRC decided to call temporarily on the services of expatriate high-speed train drivers. These drivers from France and Germany and who already have many years of active service in driving high-speed trains could be trained to drive the 700T shinkansen in a shorter time than their Taiwanese counterparts. This choice has been made first due to safety concerns and second to bring a wealth of experience to the project. This creates a good training environment which is beneficial for the training and mentoring of the local drivers. But this is only a temporary situation and the first Taiwanese drivers have been licensed and are now operating revenue service trains since 1 June 2007.

Another difficulty overcome by the THSRC was out of the ordinary—the choice of which language to use for training and for communicating during everyday work. How can a German driver communicate with a Taiwanese train master, a French switchman, or an Australian stationmaster? This mixture of employees of different nationalities who need to give orders and talk in a common language is a completely unique aspect of this project. From the beginning, THSRC chose English as its working language, so people in positions requiring constant interaction, like switchmen, train crews and some station staff, must be able to communicate in English at a sufficient level to understand the training and then communicate efficiently with colleagues for service needs. This is an interesting parallel with the first early days in Japanese railway history when the tracks, trains, and infrastructure were built, operated and managed by British-railwaymen!

Train master verifying door opening (Author)

Train attendant wheeling sales cart through carriages (Author)

Training THSRC Train Masters

The train masters followed a slightly different path than drivers and is in itself unique. They were trained during the 'trial operations period' using the empty trains that were running before revenue service started. Of course, it is difficult to train train masters in charge of passenger safety when there are no passengers, so most of the time THSRC staff were delighted to be the first 700T passengers and participated in an impressive number of exercises in order that their colleagues' training needs could be met. train masters are responsible for passenger safety and there are only three or four train attendants on each train (carrying about 950 passengers) to help.

Given these conditions, it is very important to ensure quality recruitment and advanced training, especially in safety emergency management including evacuation procedures. The recruitment strategy looked for people able to remain calm in a crisis, and able to implement procedures while having a real feel for business. Consequently, a high percentage of our 700T staff came from airlines, which have similar crew recruitment criteria.

Since it was not possible to pair new THSRC train masters with experienced train masters so that they could benefit from a transfer of veterans' skills and knowledge, our new train masters needed advanced training that would allow them to react effectively to any dangerous situation occurring on the line from the first day of service. Dangers do exist, in part due to aspects of this high-speed line built on an elevated viaduct with many tunnels. One critical point was the need to be very focussed on emergency evacuations. Other problems can be caused by the potentially very high temperatures in Taiwan, which can turn a train stopped without power on a line in direct sunlight into a greenhouse with deadly temperatures in a very short time period. In addition, in a country with frequent typhoons and earthquakes, it was essential to develop simple and fast evacuation methods. This is why the train's designers equipped each car with a light aluminium ladder that can be set to the ground by one person in less than 1 minute. Each front car also includes a similar light gate allowing speedy transfer of passengers from a stopped train to a rescue train parked on an adjacent track.

All passenger evacuation procedures have been practiced proactively under extreme conditions with intensive crew training. The consistency and efficiency of these real-life exercises were constantly monitored and validated by government bodies or external organizations. This training extended the skills and confidence of the THSRC train masters since they may have to take temporary charge of a rescue in a severe accident. Finally, due to local regulations that restrict rescue teams helping at an electrified site, all train masters have been trained as overhead line technicians who can ground the 25,000-V trolley wire, using protective gear and telescopic grounding rods that are carried onboard.

Training and knowledge maintenance are truly big issues for any railway company and require constant financial and human investment in technical jobs specific to railway transport where safety is an endless priority. The THSRC has already overcome many difficulties in training its staff despite severe time restrictions, and will certainly invest more time, money and effort in training to maintain the high skill levels required to operate its new High Speed Rail network safely and effectively.

* All pictures taken during training.

Train crew practising evacuation drill (Author)

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