

Executive Summary

TRA's Train No. 3231 and 129 at Sankuaicuo Station

On August 6, 2019, local train 3231 of Taiwan Railways Administration (TRA), MOTC, departed at 3:50 p.m. from Douliu Station, bound for Chaozhou Station. The train was scheduled to stop at Sankuaicuo Station at 6:37 p.m., however, the train skipped stop and kept going to Kaohsiung Station passing the home signal and stopped (not yet entered the station platform area). Then train 3231 reversed to Sankuaicuo Station, at the same time Tze-Chiang Limited Express 129 entered into the same block section. The driver of 129 saw train 3231 and applied the brake immediately. Both train 3231 and 129 were safe. No one on board was injured.

According to the Transportation Occurrences Investigation Act, the Taiwan Transportation Safety Board is responsible for investigating major transportation occurrences that arise in the R.O.C. territory. This accident is considered as a major transportation occurrence within the scope of investigation. The Railway Bureau and TRA were invited to participate in the investigation.

The investigation report was approved by the 20th Board Meeting on December 4, 2020, and published on January 14, 2021.

After comprehensive investigation and analysis of the factual data, a total of twenty findings and five safety recommendations were obtained, which are detailed as follows:

Findings

Findings related to probable causes

1. Before the train approached Sankuaicuo station, an ineligible person invited by the driver to be in the driver's cabin probably seriously distracted the driver while the train was in operation, resulting in the train non-stopped at the station.
2. The driver's dangerous behavior in reversing the train in the central traffic control area without receiving a dispatching command from the General Dispatch Office shows a severe lack of safety awareness.
3. The driver in this case canceling the onboard radio registration code, and then isolating the Automatic Train Protection (ATP) would not result in a warning being sent to the General Dispatch Office; only by isolating the ATP could the driver reverse the train without the General Dispatch Office knowing, showing that the driver in this case deliberately reversed the train and covered up the operating record. After the dispatch registration code was canceled, no warning would be sent to the General Dispatch Office, leaving the dispatcher unaware the train was reversing.
4. If the direction a train travels is different from the direction of the route, the control panel of Kaohsiung Station and the General Dispatch Office cannot display a warning to staff.

Findings related to risk

1. TRA has no regulations prohibiting drivers from canceling the onboard radio registration code, allowing drivers to cancel registration code at will, increasing operating risk.
2. If the dispatch system computer in General Dispatch Office malfunctions, before the malfunction is fixed, local control is the only option, and the computer of the Senior dispatcher's dispatch computer cannot intervene and provide backup support.
3. Due to manpower shortage, some positions in the operation office at

Kaohsiung Station are vacant, increasing the workload of the other stand-in personnel; while the traffic control area covers multiple stations, it is not easy for abnormal train operations to be discovered, and inability to fully implement the operation control regulations drawn up by the TRA.

4. The setting of the deceleration curve of the ATP at Sankuaicuo Station was inadequate and an approach signal for Kaohsiung Station signals has been set within the platform area, both of which could increase the risk of non-stopping at the station.
5. TRA regulations have no clear procedure to be followed when a train nonstop at a simple commuter station, leaving personnel with no clear procedure to follow.
6. TRA has not drawn up operating manuals according to positions, such as drivers, conductors, and dispatchers with no complete SOP to follow when there is an abnormal situation, which is not favorable for allowing train crew to make the correct decision promptly.
7. The display pane for indicating train between stations on the display panel in the General Dispatch Office is not able to simultaneously display two train services in the section between Kaohsiung Museum of Fine Arts and Kaohsiung Station, therefore, the dispatcher has no way of effectively knowing the relative positions of the trains.
8. During the accident, the General Dispatch Office transferred the control to Kaohsiung Station without issuing a dispatch command; also, the TRA 's dispatch command was not double-confirmed or subject to a checking mechanism in advance; the issuing timing and content of the command were completely decided by the dispatcher alone which is unfavorable for manager management and follow up.
9. TRA has not established a mechanism for supervision of his/her subordinate dispatchers by the Chief Dispatcher, which is unfavorable

for Chief Dispatcher instantly knowing the train operation situation, making it difficult to achieve the objectives of hierarchical management and reducing the risk of human error.

10. TRA has not stipulated that drivers or conductors should immediately report to the duty station master or General Dispatch Office when an abnormal incident occurs. As it was not reported, this accident did not appear on TRA's operating security information system, with the result that senior managers were unaware of it. This shows that TRA's abnormal situation reporting system is not fully effective.
11. TRA has not established regulations for a mechanism to check and balance driver and conductor when they are on duty, providing the conductor with the authority to report rule violations or unsafe train operations by the driver to protect train operating safety.
12. Although there are regulations restricting entry to the driver's cabin, related regulations are not implemented, leading to employees being unable to fully adhere to the regulations.

Other findings

1. The cabin of the train in the accident had equipped the MMI screen of ATP system, station name display and monitor speaker that can provide information on stopping stations; there were also an operating timetable, station name plate call-reply mechanism, platform warning lights and other appliances, all of which could provide the driver with correct stopping station information.
2. The position of the wayside signs and reflective design between Gushan Station and Sankuaicuo Station and the stop signs at Sankuaicuo platform all meet requirements.
3. During the period of local control, the reversing of train No. 3231 caused the route to be released automatically; this is the logical design

of the station's signals. Staff in the Kaohsiung Station operation office became aware the route had been released and reset the route again.

4. TRA management and the safety management department were unable to know about the accident in a timely way, resulting in the data of the operating recorder of train NO. 129 not being preserved in time.

Safety Recommendations

To TRA

1. Stipulate or enhance safety management related regulations such as management regulations for riding in the driver's cabin, restricting train reverse operation, restricting canceling the onboard radio registration code, restricting isolation of the ATP, procedure for nonstop at a station, dispatch command issue, review and checking procedure, supervision by the chief dispatcher and dispatcher reporting mechanism, duty of train crew to report abnormal incidents and authority of conductor to report rule violations by the driver; revise related training materials and provide reward and punishment measures, implementing the spirit of just culture of clear reward and punishment and consistent standards
2. Enhance or add General Dispatch Office instant monitoring equipment such as warning for canceled the onboard radio registration code, warning for driving direction inconsistent with the route set, senior dispatcher's dispatch computer backup monitoring, and a display panel that can show two or more trains to instantly track train position and direction of travel.
3. According to train operation jurisdiction scope and duty load proportion, review the suitability of staff allocation at Kaoshiung Station to avoid key operation positions filled by stand-ins.
4. Review the deceleration curve of the ATP, providing a compulsory

stopping function.

5. Establish operating manuals according to the function of each position, stipulating operating guidelines as the standards for an operation to follow, allocate to staff such as drivers, conductors, and dispatchers and digitalize the manual for timely reference.

Note: The language used in the occurrence investigation Final Report is in Chinese. To provide a general understanding of this investigation for the non-Chinese reader, the Executive Summary of the Final Report was translated into English. Although efforts are made to translate it as accurately as possible, discrepancies may occur. In this case, the Chinese version will be the official version.