Executive Summary

TRC's Diesel-electric Locomotive No. R169 at Hualien Depot

On April 20, 2025, at 14:21, at the Hualien Depot of Taiwan Railway Corporation, Ltd. (hereinafter referred to as "TRC"), an R150-type diesel-electric locomotive, No. R169 (hereinafter referred to as the "shunting locomotive"), was performing shunting operations within the depot and was intended to couple with an EMU3000 New Tze-Chiang trainset (hereinafter referred to as the "stationary train") standing on No. 2 washing track. During the operation, the shunting locomotive collided with the stationary train, causing damage to its coupler and nose cone. No casualties resulted from this occurrence.

On the day of the occurrence, the shunting operation was carried out by four personnel: the driver responsible for operating the shunting locomotive; the shunting conductor stationed at the front end of the shunting locomotive and directing its movement by means of flag signals; the shunter standing by beside the stationary train on No. 2 washing track to carry out the subsequent coupling operation; and the switcher responsible for manually setting the turnout. Before the occurrence, the shunting locomotive had been standing on No. 1 washing track and was moved onto No. 2 washing track to carry out the coupling operation. When the shunting locomotive approached the "Stop and Proceed" sign on No. 2 washing track, the shunting conductor waved a red flag to signal the driver to stop. However, the driver did not stop and continued moving the shunting locomotive forward. Observing that the shunting locomotive was neither slowing down nor stopping, the shunter stepped back sideways and jumped onto the washing platform to avoid being struck. The shunting locomotive continued moving forward and ultimately collided with the stationary train, resulting in a rupture of the oil seal in the coupler buffer

device and damage to the nose cone of the stationary train.

In accordance with the Transportation Occurrences Investigation Act, Taiwan, and the definition of major transportation occurrences specified therein, the Taiwan Transportation Safety Board was the independent agency in charge of investigating the railway accident. The agencies (institutions) invited to participate in the investigation include the Railway Bureau of the Ministry of Transportation and Communications (MOTC), and TRC. The main areas of investigation and analysis in this report include: (1) the causes of the collision between the shunting locomotive and the stationary train; (2) defense mechanisms for abnormal situations; (3) equipment maintenance; (4) the automatic train protection system; and (5) analysis of recent shunting occurrences.

This occurrence investigation report was approved at the 83rd Board Meeting on February 13, 2026, and was published on March 25, 2026.

After comprehensive investigation and analysis of the factual data, a total of 8 findings and 4 safety recommendations were obtained.

I. Findings

Findings Related to Probable Causes

1. As the shunting locomotive approached the “Stop and Proceed” sign, the shunting conductor signaled the driver to stop by waving a red flag. However, the driver did not stop as instructed and continued moving toward the stationary train. After realizing that the driver had not responded to the stop signal, the shunting conductor was unable to stop the locomotive directly because no such equipment was available at the shunter’s position. Although the shunting conductor continued waving the signal flag, this did not effectively draw the driver’s attention in time to stop. Consequently, the shunting locomotive

collided with the stationary train at a speed of 12 km/h.

Findings Related to Risks

1. TRC's shunting signaling system relies on visual warnings, which may increase the driver's visual workload and reduce the effectiveness of timely alerts. In emergency situations, the use of auditory warnings would be more likely to ensure that alerts are effectively conveyed under varying operational conditions.
2. TRC's standard operating procedures for shunting do not explicitly specify that, in emergency situations, the shunting conductor may use the radio to warn the driver to stop. This limitation makes it more difficult to prevent collisions resulting from a driver not complying with stop instructions.
3. TRC did not promptly repair or replace damaged or fallen "Stop and Proceed" signs, which made it more difficult for both the shunting conductor and the driver to determine the appropriate stopping position and required braking distance.
4. At Hualien Depot, TRC conducted shunting operations with the Automatic Train Protection system of the shunting locomotive switched off. As a result, when the locomotive operated between Hualien Station and Hualien Depot, there was an increased risk of passing a stop signal and colliding with other trains.

Other Findings

1. TRC did not properly inspect and maintain the malfunctioning onboard video recording system of the shunting locomotive, thereby limiting the availability of video records that could have assisted in clarifying the causes of the occurrence.
2. TRC experienced several shunting-related safety occurrences within a short period, most of which were associated with personnel not

following standard operating procedures.

3. The investigation determined that adverse weather, inadequate personnel qualifications, alcohol use, and malfunction of the shunting locomotive were not contributing factors in this occurrence.

II. Transportation Safety Recommendations

To the Taiwan Railway Corporation, Ltd.

1. Evaluate and implement more effective means for shunting conductors, in emergency situations, to warn drivers or otherwise bring the shunting locomotive to an immediate stop.
2. Repair or replace damaged or fallen “Stop and Proceed” signs.
3. Re-evaluate the safety and appropriateness of conducting shunting operations at Hualien Depot with the locomotive’s Automatic Train Protection system switched off.

To the Railway Bureau, Ministry of Transportation and Communications

1. In exercising its regulatory oversight responsibilities, incorporate into regular or ad hoc inspection items the safety recommendation issued to TRC concerning the repair or replacement of damaged or fallen “Stop and Proceed” signs.

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.