

Executive Summary

On March 23, 2023, a commercial freight tractor of Miao Feng Transportation Co., Ltd. carrying a semi-trailer tanker (hereinafter referred to as the "occurrence vehicle") was transporting methanol from Taichung Port to the Miaoli Factory of Chang Chun Petrochemical Co., Ltd. The occurrence vehicle passed 111K + 522 on the inner lane of Provincial Highway No. 61 with the speed of 104 km/hr at about 09:31 local time. At 09:31:55, it veered to the inner shoulder and gradually approached the median barrier for unknown reasons. The tractor suddenly turned right and then immediately turned left, causing the occurrence vehicle to become unstable and tilt to the right. At 09:31:56, the left front wheel pressed against the median barrier and hit the glare screen. The tractor veered to the right at 09:31:57, and the rear left of the semi-trailer tank also hit the glare screen. The tractor was pulled to the left by the semi-trailer and the entire vehicle overturned to the left. While the occurrence vehicle was rolling, the tank was damaged causing methanol to leak and burn. The driver was found lying on the outer shoulder at the accident site. He died after being sent to hospital for treatment.

In accordance with the Transportation Occurrence Investigation Act, the TTSB is an independent transportation occurrence investigation agency, and responsible for conducting the investigation. The investigation team also included members from the Ministry of Transportation and Communications (MOTC), the Highway Bureau, MOTC, Daimler Trucks Asia Taiwan Ltd. and Miao Feng Transportation Co. Ltd.

The final report was reviewed and approved by the 60th Board Meeting on March 15, 2024. Based on comprehensive investigation and analysis of the factual data, the final report presents 9 findings along with 5 safety recommendations issued to the relevant organizations.

Investigation Findings

Findings Related to Probable Causes

1. While the driver was speeding, the occurrence vehicle veered to the inner shoulder of the road for unknown reasons. Subsequently, due to the excessive turning of the tractor to the right then left, the occurrence vehicle became unstable and tilted. The left front wheel pressed against the median barrier. When the occurrence vehicle

returned to the lane, the tractor veered excessively to the right and caused the semi-trailer tank to tilt to the left side. The tractor was subjected to the pulling force exerted by the semi-trailer tank, resulting in the entire vehicle overturning to the left.

Findings Related to Risks

1. Although Miao Feng and Chang Chun had relevant management systems and regulations, and were aware of the driver's regular speeding, they still failed to implement or improve their control mechanisms to curb the driver's inappropriate behavior. The driver's driving concepts could not be corrected and increased the risk of occurrences.
2. Although Miao Feng was not responsible for schedule arrangement, it was still aware of the trip time and the driver's working pattern. When it discovered that Chang Chun's dispatch may cause the driver to work overtime, it should have fulfilled its management responsibilities and coordinated with Chang Chun to arrange appropriate trips and working hours to avoid overtime work.
3. The current safety assessment operation directions for the three freight transportation enterprises do not mandate that drivers' working hours be checked during safety assessments. When the labor administration unit and Highway Bureau conduct labour standards inspection, it is difficult to conduct labor inspections on all freight operators. The Highway Bureau also has not used the dangerous goods vehicle information management platform (dCar) to monitor the working hours of drivers transporting dangerous goods. The above shows that the driving time of drivers transporting dangerous goods is not strictly controlled.

Other Findings

1. The driver might not have been wearing a seat belt during the accident, so his body was not fixed to the seat by the seat belt. When the vehicle tilted, the driver could not maintain a normal driving posture, which would affect subsequent control. The

driver might not have been wearing a seat belt and was thrown out of the vehicle when the vehicle overturned and hit the outer guardrail, resulting in traumatic brain injury and multiple fractures of the limbs. The cause of death was traumatic hemorrhagic shock.

2. When the occurrence vehicle was overturning, the force to the tank was greater than the standard value it could withstand, causing the shell to rupture and the methanol contained in the tank to leak. And the friction between the tank and the ground caused sparks to ignite the leaked methanol.
3. Even though the occurrence vehicle went over the speed limit every day, it did not speed for 5 or 10 consecutive minutes. It is difficult for the Highway Bureau to detect the occurrence vehicle occasionally going over the speed limit through the current mechanisms.
4. When the road connects from a downhill section with a higher design speed to a turning section with a lower design speed, vehicles that travel through the section will have the risk of losing control when the superelevation rate is insufficient, especially large and heavy vehicles.
5. The Highway Bureau inspected the lanes through visual inspections, which was unable to effectively detect the extent of damage to the pavement, so as to determine the extent of the damage and the maintenance measures that should be taken.

Safety Recommendations

To Miao Feng Transportation Co., Ltd.

1. Implement the driver management system and indeed require drivers to improve their unsafe behaviors. And establish a record-keeping mechanism for driver management to effectively understand the driver's safety improvements.
2. Work with Chang Chun Petrochemical Co., Ltd. to confirm the actual driving time required to transport the goods, and avoid scheduling trips that will cause drivers to work overtime.

To the Highway Bureau, MOTC

1. Supervise transportation enterprises transporting dangerous goods to implement management of driver driving speed, driving time and seat belt use, in order to reduce the risk of occurrences involving vehicles carrying dangerous goods.
2. Inspect the geometric conditions of each road section of Provisional Highway No. 61, and ensure that the superelevation rate meet standards from downhill sections with a higher design speed to a turning section with a lower design speed.
3. Strengthen the road maintenance inspection methods, evaluate the feasibility of using instruments to detect pavement damage, and implement the grading standards and corresponding maintenance measures set out in the maintenance manual.

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