

Railway serious incident investigation report

Railway operator: Hokkaido Railway Company.
Accident type: Facilities damage, railway serious incident related with malfunction, damage, destruction; etc., effecting to the safe train operation in the railway track, train protection facility, etc., prescribed in Number 7, Clause 1, Article 4, of the Ordinance on Report on Railway Accidents, etc.
Date and time: The first incident occurred at about 20:50, on June 14, 2011, the second incident occurred at about 21:48, on June 14, 2011, the third incident occurred at about 08:43, June 15, 2013, and the fourth incident occurred at about 11:12, June 16, 2011.
Location: In the premises of Oiwake station, single line, Sekisho Line, Abira Town, Yufutsu County, Hokkaido.

SUMMARY

The first incident:

The outbound local 2647D train, composed of one vehicle, starting from Oiwake station bound for Yubari station of Hokkaido Railway Company, departed from the No.1 track of Oiwake station on schedule, 20:50, Tuesday, June 14, 2011.

A signaler in the signal cabin of Oiwake station, noticed that even though the train departed from Track No. 1, the indicator lamp of the No.1 track starting signal on the display panel, kept lighting in green and did not light off to show the stop indication.

According to the records of the interlocking device, the No.1 track starting signal did not indicate the stop signal at this time.

The second incident:

The 39D train, outbound limited express "Super Tokachi No.9" composed of 4 vehicles, starting from Sapporo station bound for Obihiro station of the Company, departed from the No.1 track of Oiwake station on schedule, 21:46, June 14, 2011.

The same signaler involved in the first incident noticed that even though the train departed from Track No. 1, the indicator lamp of the No.1 track starting signal on the display panel, kept lighting in green and did not light off to show the stop indication. According to the records of the interlocking device, the No.1 track starting signal did not indicate the stop signal at this time.

The third incident:

The 31D train, outbound limited express "Super Tokachi No.1" composed of 5 vehicles, starting from Sapporo station bound for Obihiro station of the Company, departed from the No.1 track of Oiwake station on schedule, 08:40, Wednesday, June 15, 2011.

A signaler, different from the one involving the first and the second incidents, noticed that even though the train departed from No.1 track, the indicator lamp of the No.1 track starting signal on the display panel, kept lighting in green and did not light off to show the stop indication. An employee in charge of construction confirmed that the No.1 track starting signal did not indicate the stop signal at this time.

The fourth incident:

The 2633D train, outbound local train composed of one vehicle, starting from Chitose station bound for Yubari station of the Company, departed from the No.4 track of Oiwake station on 11:11, two minutes behind the schedule, Thursday, June 16, 2011.

A signaler, different from the one involving the first to the third incidents, noticed that even though the train departed from No.4 track, the indicator lamp of the No.4 track starting signal on the display panel, kept lighting in green and did not light off to show the stop indication. According to the records of the interlocking device, the No.4 track starting signal did not indicate the stop signal at this time.

PROBABLE CAUSES

It is considered probable that the starting signal for the down track of Sekisho Line did not change from the proceed signal to the stop signal when the departed train entered

into the protection area of the starting signal, for the plural times, because the wiring works in the existing signal control circuit was mistaken, so that the signal current flows into the signal control circuit for the down track starting signal indicating the proceed signal when the down track starting signals of Sekisho Line and Muroran Line are routed at the same time, in the construction works to introduce the CTC and PRC system in the future.

It is considered probable that the signal current flowed into the relays in the signal control circuit of the starting signal in the routed track through the cathodes of the new relays connected with each other, when the routes of Sekisho Line and Muroran Line are set at the same time, considering the following situations.

- (1) The anodes of the new relays were connected directly to the existing facilities, without using any switching plug.
- (2) The cathodes of the new relays were connected with each other.
- (3) New relay devices had been inserted into the electric circuit in the relay rack.

It is considered probable that the followings were related to induce the above situations.

- (1) The Company's regulation that a switching plug should be inserted into both the positive and the negative terminals of the existing facilities when the switching plugs are used to replace the existing facility by the new one, did not be obeyed.
- (2) It is not enough informed to the related staffs that the wiring works connected to the existing facilities should be treated as the work to effect the train operation, in the improving works of the interlocking device that is a signaling system.
- (3) The prior check for the wiring works were not performed using the wiring diagrams in which the switching plugs are indicated, even though the electric connection diagrams were double-checked.
- (4) The wiring works were performed before the wiring diagram had been approved.
- (5) The management of the progress of the wiring works was not properly performed.

It is considered somewhat likely that both the supervisor and the subcontractor of the wiring work were too busy with other construction work performed at the same time, then the prior check was performed for only a part of them due to their overcrowded jobs. It is considered probable that the plural incidents occurred in relation with that the phenomena were not recognized as the incident, the communication network for an emergency were not organized, and the information was not transferred properly between the related employees, when the stop signal did not indicated by the signal device which should indicate the stop signal.

RECOMMENDATIONS

It is considered probable that the serious incident was induced in relation with that the company's rule to insert the switching plugs connecting with the existing facility and the improved facility were not obeyed, the check of the wiring diagrams produced by the subcontract company were not preformed sufficiently, and management of the progress of the wiring works did not performed properly, in the construction works to improve the interlocking device that is the signaling systems supporting the fundamental safety.

In addition, it is considered probable that the plural incidents occurred in relation with that the phenomena were not recognized as the incident, the communication network for an emergency was not organized, and the information was not transferred properly between the related employees, when the stop signal was not indicated by the signal device which should indicate the stop signal.

In view of the results of this accident investigation, the Japan Transport Safety Board recommends Hokkaido Railway Company pursuant to Article 27 of the Act for Establishment of the Japan Transport Safety Board as follows:

- (1) Hokkaido Railway Company has defined the preventive measures that would not effect safety operation of the existing signaling system during the construction works, such as to determine the appropriate position where the switching plug should be inserted, and the checking rules for the various wiring diagrams or electric connection diagrams, furthermore, the company defined clearly the procedures to be performed when a staff

recognized that the indicator lamp to be changed to the stop signal did not light off to indicate stop signal in the operation manual. These measures are considered effective for the prevention of reoccurrence. However, it is essential to educate the company's employees continuously so that they fully understand the points of these measures and can take the appropriate measures against malfunctions.

- (2) The company experienced a serious incident, i.e., a block signal that should have indicated a stop signal did not change to the stop signal in the Hakodate Line on January 15, 2009, and the company had taken the preventive measures after the serious incident. However, the same kind of serious incident occurred this time, then the company should examine again about the system for construction and the management methods, and train the staffs engaged in the construction works, including subcontractors, so that they can acquire the basic operations for construction related to the signaling system, and should discuss about safety measures and take all necessary measures to prevent any more serious events.