

## Chapter 4 Railway accident and serious incident investigations

### 1 Railway accidents and serious incidents to be investigated

#### < Railway accidents to be investigated >

#### **◎Paragraph 3, Article 2 of the Act for Establishment of the Japan Transport Safety Board**

(Definition of railway accident)

The term "Railway Accident" as used in this Act shall mean a serious accident prescribed by the Ordinance of Ministry of Land, Infrastructure, Transport and Tourism among those of the following kinds of accidents; an accident that occurs during the operation of trains or vehicles as provided in Article 19 of the Railway Business Act, collision or fire involving trains or any other accidents that occur during the operation of trains or vehicles on a dedicated railway, collision or fire involving vehicles or any other accidents that occur during the operation of vehicles on a tramway.

#### **◎Article 1 of Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board**

(Serious accidents prescribed by the Ordinance of Ministry of Land, Infrastructure, Transport and Tourism, stipulated in paragraph 3, Article 2 of the Act for Establishment of the Japan Transport Safety Board)

- 1 The accidents specified in items 1 to 3 inclusive of paragraph 1 of Article 3 of the Ordinance on Report on Railway Accidents, etc. (the Ordinance) (except for accidents that involve working snowplows that specified in item 2 of the above paragraph);
- 2 From among the accidents specified in items 4 to 6 inclusive of paragraph 1 of Article 3 of the Ordinance, that which falls under any of the following sub-items:
  - (a) an accident involving any passenger, crew, etc. killed;
  - (b) an accident involving five or more persons killed or injured;
  - (c) a fatal accident that occurred at a level crossing with no automatic barrier machine;
  - (d) an accident found to be likely to have been caused owing to a railway officer's error in handling or owing to malfunction, damage, destruction, etc. of the vehicles or railway facilities, which resulted in the death of any person;
- 3 The accidents specified in items 4 to 7 inclusive of paragraph 1, Article 3 of the Ordinance which are found to be particularly rare and exceptional;
- 4 The accidents equivalent to those specified in items 1 to 7 inclusive of paragraph 1, Article 3 of the Ordinance which have occurred relevant to dedicated railways and which are found to be particularly rare and exceptional; and
- 5 The accidents equivalent to those specified in items 1 to 3 inclusive which have occurred relevant to a tramway, as specified by a public notice issued by the Japan Transport Safety Board.

[Reference] The accidents listed in each of the items of paragraph 1, Article 3 of the Ordinance on Reporting on Railway Accidents, etc.

- Item 1: Train collision
- Item 2: Train derailment
- Item 3: Train fire
- Item 4: Level crossing accident
- Item 5: Accident against road traffic
- Item 6: Other accidents with casualties
- Item 7: Heavy property loss without casualties

**◎Article 1 of the Public Notice of the Japan Transport Safety Board** (Accidents specified by the public notice stipulated in item 5, Article 1 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board)

- 1 From among the accidents specified in items 1 to 6 inclusive of paragraph 1 of Article 1 of the Ordinance on Reporting on Tramway Accidents, etc. (the Ordinance), that which falls under any of the following sub-items:
  - (a) an accident that causes the death of a passenger, crewmember, etc.;
  - (b) an accident involving five or more casualties (with at least one of the casualties dead);
  - (c) a fatal accident that occurs at a level crossing with no automatic barrier machine;
- 2 The accidents specified in items 1 to 7 inclusive of paragraph 1 Article 1 of the Ordinance which are found to be particularly rare and exceptional; and
- 3 From among the accidents occurring on a tramway operated under the application of the Ministerial Ordinances to provide Technical Regulatory Standards on Railways *mutatis mutandis* as specified in paragraph 1 of Article 3 of the Ordinance on Tramway Operations, the accidents equivalent to those specified in items 1 to 3 of Article 1 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board.

[Reference] The accidents specified in the items of paragraph 1, Article 1 of the Ordinance on Reporting on Tramway Accidents, etc.

- Item 1: Vehicle collision
- Item 2: Vehicle derailment
- Item 3: Vehicle fire
- Item 4: Level crossing accident
- Item 5: Accidents against road traffic
- Item 6: Other accidents with casualties
- Item 7: Heavy property loss without casualties

**Railway accidents to be investigated**

Category	Train collision *2)	Train derailment *2)	Train fire *2)	Level crossing accident	Accident against road traffic	Other accidents with casualties	Heavy property loss without casualties
Railway (including tramway operated as equivalent to railway) [Notice 1-3]	All accidents *1) [Ordinance 1-1]			<ul style="list-style-type: none"> <li>• Accidents involving the death of a passenger, crew member, etc.</li> <li>• Accidents involving five or more casualties with at least one of the casualties dead</li> <li>• Fatal accidents that occur at level crossings with no automatic barrier machines</li> <li>• Accidents found to have likely been caused by a railway worker's error in procedure or due to the malfunction, damage, destruction, etc., of vehicles or railway facilities, which resulted in the death of a person [Ordinance 1-2]</li> </ul>			
				Accidents that are particularly rare and exceptional [Ordinance 1-3]			
Dedicated railway	Accidents that are particularly rare and exceptional [Ordinance 1-4]						
Tramway [Ordinance 1-5]				<ul style="list-style-type: none"> <li>• Accidents involving the death of a passenger, crewmember, etc.</li> <li>• Accidents involving five or more casualties with at least one of the casualties dead</li> <li>• Fatal accidents that occur at level crossings with no automatic barrier machines. [Notice 1-1]</li> </ul>			
				Accidents that are particularly rare and exceptional [Notice 1-2]			

\*1 Except for derailment accidents of working snowplows. [Ordinance 1-1]

However, accidents that are particularly rare and exceptional are to be investigated. [Ordinance 1-3]

\*2 If these categories occur on a tramway, the accident types shall each be renamed to “vehicle collision”, “vehicle derailment”, or “vehicle fire”.

(Note) “Ordinance” refers to the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board; “Notice” refers to the Public Notice by the Japan Transport Safety Board; and the numbers refer to the Article and paragraph numbers.

< Railway serious incidents to be investigated >

**◎Item 2, paragraph 4, Article 2 of the Act for Establishment of the Japan Transport Safety Board** (Definition of railway serious incident)

A situation, prescribed by the Ordinance of the Ministry of Land, Infrastructure, Transport and Tourism (Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board), deemed to bear a risk of accident occurrence.

**◎Article 2 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board** (A situation prescribed by the Ordinance of the Ministry of Land, Infrastructure, Transport and Tourism, stipulated in item 2, paragraph 4, Article 2 of the Act for Establishment of the Japan Transport Safety Board)

1 The situation specified in item 1 of paragraph 1 of Article 4 of the Ordinance on Reporting on Railway Accidents, etc. (the Ordinance), wherein another train or vehicle had existed in the zone specified in said item;

[A situation where a train starts moving for the purpose of operating in the relevant block section before completion of the block procedure: Referred to as “Incorrect management of safety block.”]

2 The situation specified in item 2 of paragraph 1 of Article 4 of the Ordinance, wherein a train had entered into the route as specified in said item;

[A situation where a signal indicates that a train should proceed even though there is an obstacle in the route of the train, or the route of the train is obstructed while the signal indicates that the train should proceed: Referred to as “Incorrect indication of signal.”]

3 The situation specified in item 3 of paragraph 1 of Article 4 of the Ordinance, wherein another train or vehicle had entered into the protected area of the signal which protects the zone of the route as specified in said item;

[A situation where a train proceeds regardless of a stop signal, thereby obstructing the route of another train or vehicle: Referred to as “Violating red signal.”]

4 The situation specified in item 7 of paragraph 1 of Article 4 of the Ordinance, which caused malfunction, damage, destruction, etc. bearing particularly serious risk of collision or derailment of or fire in a train;

[A situation that causes a malfunction, etc., of facilities: Referred to as “Dangerous damage in facilities.”]

5 The situation specified in item 8 of paragraph 1 of Article 4 the Ordinance, which caused malfunction, damage, destruction, etc. bearing particularly serious risk of collision or derailment of or fire in a train;

[A situation that causes a malfunction, etc., of a vehicle: Referred to as “Dangerous trouble in vehicle.”]

6 The situation specified in items 1 to 10 inclusive of paragraph 1 of Article 4 of the Ordinance which is found to be particularly rare and exceptional; and

[These are referred to as: item 4 “Main track overrun”; item 5 “Violating closure section for

construction”; item 6 “vehicle derailment”; item 9 “Heavy leakage of dangerous object”; and item 10 “others,” respectively.]

- 7 The situations occurred relevant to the tramway as specified by a public notice of the Japan Transport Safety Board as being equivalent to the situations specified in the preceding items.

○**Article 2 of the Public Notice of the Japan Transport Safety Board** (A situation prescribed by the public notice stipulated in item 7, Article 2 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board (Serious incident on a tramway))

- 1 The situation specified in item 1 of Article 2 of the Ordinance on Reporting on Tramway Accidents, etc. (the Ordinance), wherein another vehicle operating on the main track had existed in the zone specified in said item;

[A situation where a vehicle is operating on the main track for the purpose of operating in the relevant safety zone before the completion of safety system procedures: Referred to as “Incorrect management of safety block.”]

- 2 The situation specified in item 4 of Article 2 of the Ordinance, which caused malfunction, damage, destruction, etc., bearing a particularly serious risk of collision, derailment or fire in a vehicle operating on the main track;

[A situation that causes a malfunction, etc., of facilities: Referred to as “Dangerous damage in facilities.”]

- 3 The situation specified in item 5 of Article 2 of the Ordinance, which caused malfunction, damage, destruction, etc., bearing a particularly serious risk of collision, derailment or fire in a vehicle operating on the main track;

[A situation that causes a malfunction, etc., of a vehicle: Referred to as “Dangerous trouble in vehicle.”]

- 4 The situation specified in items 1 to 7 inclusive of Article 2 of the Ordinance which is found to be particularly rare and exceptional; and

[These are referred to as: item 2 “Violating red signal;” item 3 “Main track overrun;” item 6 “Heavy leakage of dangerous object;” and item 7 “others,” respectively.]

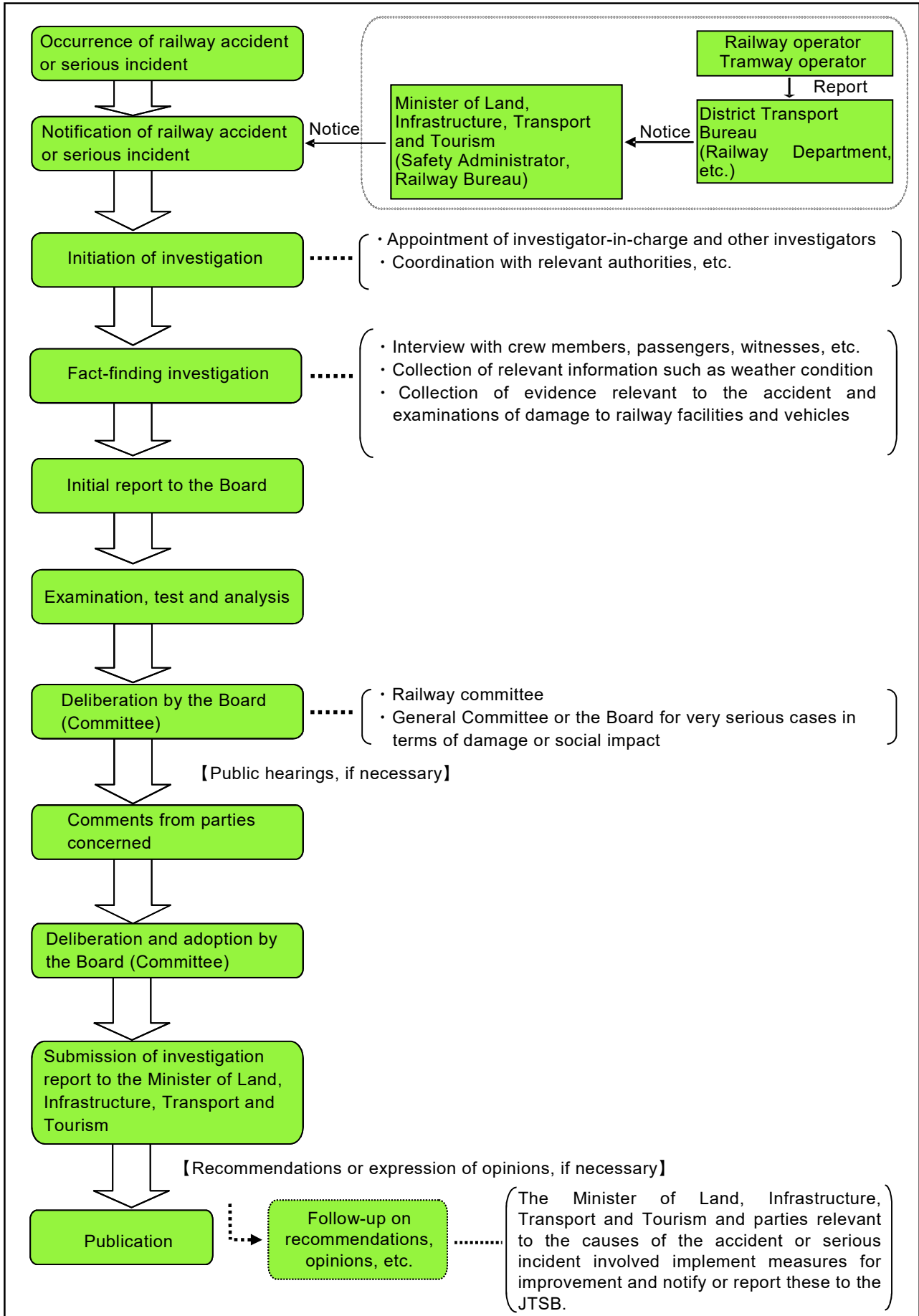
- 5 From among the situations occurring on a tramway operated under the application of the Ministerial Ordinances to provide Technical Regulatory Standards on Railways *mutatis mutandis* as specified in paragraph 1 of Article 3 of the Ordinance on Tramway Operations, the situations equivalent to those specified in items 1 to 6 of Article 2 of the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board.

**Serious incidents to be investigated**

Category	<ul style="list-style-type: none"> <li>Incorrect management of safety block</li> </ul>	<ul style="list-style-type: none"> <li>Incorrect indication of signal</li> <li>Violating red signal</li> </ul>	<ul style="list-style-type: none"> <li>Dangerous damage in facilities</li> </ul>	<ul style="list-style-type: none"> <li>Dangerous trouble in vehicle</li> </ul>	<ul style="list-style-type: none"> <li>Main track overrun</li> <li>Violating closure section for construction</li> <li>Vehicle derailment</li> <li>Heavy leakage of dangerous object</li> <li>Others</li> </ul>
Railway (including tramway operated as equivalent to railway) [Notice 2-5]	Certain conditions such as the presence of another train [Ordinances 2-1, 2-2, and 2-3]		Risk of collision, derailment or fire [Ordinances 2-4 and 2-5]		
	Incidents that are particularly rare and exceptional [Ordinance 2-6]				
	<ul style="list-style-type: none"> <li>Incorrect management of safety block</li> </ul>	<ul style="list-style-type: none"> <li>Violating red signal</li> </ul>	<ul style="list-style-type: none"> <li>Dangerous damage in facilities</li> </ul>	<ul style="list-style-type: none"> <li>Dangerous trouble in vehicle</li> </ul>	<ul style="list-style-type: none"> <li>Main track overrun</li> <li>Heavy leakage of dangerous object</li> <li>Others</li> </ul>
Tramway [Ordinance 2-7]	Certain conditions such as the presence of a vehicle [Notice 2-1]		Risk of collision, derailment or fire [Notices 2-2 and 2-3]		
	Incidents that are particularly rare and exceptional [Notice 2-4]				

(Note) “Ordinance” refers to the Ordinance for Enforcement of the Act for Establishment of the Japan Transport Safety Board; “Notice” refers to the Public Notice by the Japan Transport Safety Board; and the numbers refer to the Article and paragraph numbers.

2 Procedure of railway accident/incident investigation



### 3 Statistics of investigations of railway accidents and serious incidents

The JTSB carried out investigations of railway accidents and serious incidents in 2018 as follows:

15 accident investigations had been carried over from 2017, and 11 accident investigations were newly launched in 2018. 15 investigation reports were published in 2018, and thereby 11 accident investigations were carried over to 2019.

One serious incident investigation had been carried over from 2017, and two serious incident investigations were newly launched in 2018. No investigation reports was published in 2018, and thereby three serious incident investigations were carried over to 2019.

Investigations of railway accidents and serious incidents in 2018

(Cases)

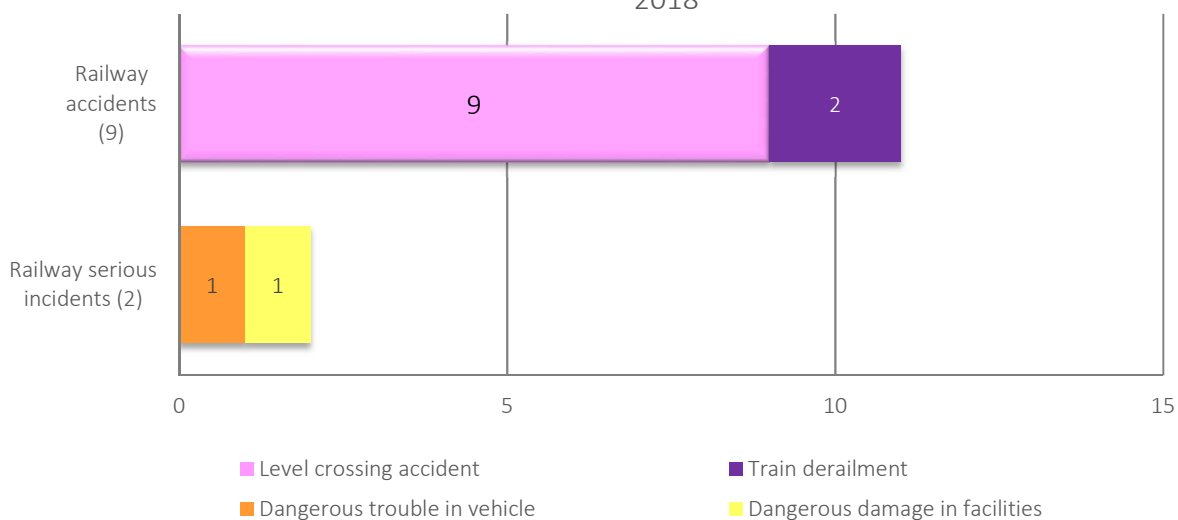
Category	Carried over from 2017	Launched in 2018	Total	Published investigation reports	(Recommendations)	(Opinions)	Carried over to 2019	(Interim report)
Railway accident	15	11	26	15	(0)	(1)	11	(0)
Railway serious incident	1	2	3	0	(0)	(1)	3	(1)

### 4 Statistics of investigations launched in 2018

The railway accidents and serious incidents that were newly investigated in 2018 consisted of 11 railway accidents, down by eight from 19 for the previous year, and two railway serious incidents, up by one from one for the previous year.

The breakdown by type of accidents and serious incidents is as follows: The railway accidents included nine level crossing accidents and two train derailments. The railway serious incidents included one vehicle damage and one facility damage.

Number of investigated railway accidents and serious incidents by type in 2018





In the 11 railway accidents, the number of casualties was nine, consisting of nine death and no injured person.

The number of casualties (in railway accidents)

(Persons)

2018							
Category	Dead			Injured			Total
	Crew	Passenger	Others	Crew	Passenger	Others	
Casualties	0	0	9	0	0	0	9
Total	9			0			

\*The above statistics include incidents under investigation so may change depending on the status of the investigation and deliberation.

5 Summaries of railway accidents and serious incidents which occurred in 2018

The railway accidents and railway serious incidents which occurred in 2018 are summarized as follows. The summaries are based on information available at the start of the investigations and therefore are subject to change depending on the course of investigations and deliberations.

(Railway accidents)

1	Date and accident type	Railway operator	Line section (location)
	January 16, 2018 Level crossing accident	Central Japan Railway Company	Bozuyama level crossing, class 4 level crossing without automatic barrier machine nor road warning device, between Idagawa station and Kasado station, Kansai Line, Mie Prefecture
	Summary	See “6 Publication of investigation reports” (Page 147, No.13)	
2	Date and accident type	Railway operator	Line section (location)
	February 24, 2018 Train derailment	Japan Freight Railway Company	On the premises of Tomamu Station, Sekisho Line (Hokkaido)
	Summary	While a railway maintenance officer was checking the site where a point machine at Tomamu Station did not operate, the officer discovered signs that a train had temporarily derailed. When the train that had passed the location was checked, it was verified that the wheels on the 1 <sup>st</sup> axle of the 3 <sup>rd</sup> vehicle of the train were damaged.	
3	Date and accident type	Railway operator	Line section (location)
	February 27, 2018 Level crossing accident	East Japan Railway Company	Renkouji level crossing, class 4 level crossing without automatic barrier machine nor road warning device, between Tateyama Station and Kokonoe Station, Uchibo Line, Chiba Prefecture
	Summary	The train driver used the emergency brake on discovering a pedestrian entering Renkouji level crossing, class 4 level crossing, while the train was traveling at a speed of 77 km/h between Tateyama Station and Kokonoe Station. However, the train hit the pedestrian. The pedestrian died in the accident.	
4	Date and accident type	Railway operator	Line section (location)
	April 11, 2018 Level crossing accident	Shikoku Railway Company	Takabayashi level crossing, class 3 level crossing equipped with road warning device but without automatic barrier machine, between Iyo-Sakurai Station and Iyo-Miyoshi Station, Yoson Line, Ehime Prefecture

	Summary	See “6 Publication of investigation reports” (Page 148, No.14)	
5	Date and accident type	Railway operator	Line section (location)
	June 16, 2018 Level crossing accident	Kyushu Railway Company	Oho level crossing, class 4 level crossing without automatic barrier machine nor road warning device, on the premises of Kubota Station, Nagasaki Line, Saga Prefecture
	Summary	The train driver used the emergency brake and sounded a whistle on discovering a vehicle entering Oho level crossing, class 4 level crossing, while the train was traveling at a speed of 84 km/h between Nabeshima Station and Kubota Station. However, the train hit the vehicle. The driver of the vehicle died in the accident.	
6	Date and accident type	Railway operator	Line section (location)
	June 16, 2018 Train derailment	Keiyorinkai Co., Ltd.	On the premises of Soga Station, Rinkai Main Line, Chiba Prefecture
	Summary	The train driver felt the train dragging from the rear after departing from Soga Station and checked the rear of the train. While doing so, he discovered that the freight wagon was shaking so stopped the train. While checking the situation after this, the 4 <sup>th</sup> freight wagon from the front of the train had derailed to the left side in the direction of travel.	
7	Date and accident type	Railway operator	Line section (location)
	July 30, 2018 Level crossing accident	East Japan Railway Company	Daisan Ota level crossing, class 4 level crossing without automatic barrier machine nor road warning device, between Ashikaga Station and Yamamae Station, Ryomo Line, Tochigi Prefecture
	Summary	The train driver sounded a whistle and then immediately used the emergency brake on discovering a pedestrian pushing a bicycle over the Daisan Ota level crossing,(class 4 level crossing), while the train was traveling at an approximate speed of 83 km/h between Ashikaga Station and Yamamae Station. However, the train hit the pedestrian. The pedestrian die in the accident.	
8	Date and accident type	Railway operator	Line section (location)
	September 27, 2018 Level crossing accident	West Japan Railway Company	Iwasakinoichi level crossing, class 4 level crossing without automatic barrier machine nor road warning device, between Michinoue Station and Managura Station, Fukuen Line, Hiroshima Prefecture
	Summary	The train driver resorted to emergency braking action on discovering a person entering the level crossing from the left side of the direction of travel but the train hit the person. The rider of the bicycle involved in the accident was later confirmed to be dead.	
9	Date and accident type	Railway operator	Line section (location)
	October 3, 2018 Level crossing accident	Central Japan Railway Company	Miyamae level crossing, class 4 level crossing without automatic barrier machine nor road warning device, between Motozenkoji Station and Ina-Kamisato Station, Iida Line, Nagano Prefecture
	Summary	The train driver used the emergency brake and continued to sound a whistle on discovering a pedestrian entering Miyamae level crossing, class 4 level crossing, while the train was traveling at an approximate speed of 53 km/h between Motozenkoji Station and Ina-Kamisato Station. However, the train hit the pedestrian. The pedestrian died in the accident.	
10	Date and accident type	Railway operator	Line section (location)
	December 12, 2018 Level crossing accident	Shikoku Railway Company	Nakatsuchi level crossing, class 4 level crossing without automatic barrier machine nor road warning device, between Iyo-Tomita Station and Iyo-Sakurai Station, Yoson Line, Ehime Prefecture

	<b>Summary</b>	The train driver sounded a whistle and resorted to emergency brake action on discovering a motorized bicycle entering the level crossing from the left side of the direction of travel but the train hit the motorized bicycle. The rider of the motorized bicycle involved in the accident was later confirmed to be dead.	
11	<b>Date and accident type</b>	<b>Railway operator</b>	<b>Line section (location)</b>
	December 19, 2018 Level crossing accident	Chichibu Railway Co., Ltd.	Hanyu No.22 level crossing, class 4 level crossing without automatic barrier machine nor road warning device, on the premises of Shingo Station, Chichibu Main Line, Saitama Prefecture
	<b>Summary</b>	The train driver resorted to emergency brake action on discovering a pedestrian entering the level crossing from the right side of the direction of travel but the train hit the person. The pedestrian involved in the accident was later confirmed to be dead.	

(Railway serious incidents)

1	<b>Date and incident type</b>	<b>Railway operator</b>	<b>Line section (location)</b>
	May 15, 2018 Dangerous trouble in vehicle	Nishi-Nippon Railroad Co., Ltd.	Between Kasugabaru Station and Zasshonokuma Station, Tenjin Omuta Line, Fukuoka Prefecture
	<b>Summary</b>	Immediately after the train departed from Kasugabaru Station, a commuter on the platform informed the conductor that the door was open. After this, the conductor patrolled around inside the train to check the situation and confirmed that the last left side door on the 3 <sup>rd</sup> vehicle from the front of the direction of travel was open.	
2	<b>Date and incident type</b>	<b>Railway operator</b>	<b>Line section (location)</b>
	November 9, 2018 Dangerous damage in facilities	Hokkaido Railway Company	On the premises of Shin-Sapporo Station, Chitose Line, Hokkaido Close to 8,509 meters from the starting point of Naebo Station
	<b>Summary</b>	The train driver discovered an obstacle extending across the track from the outbound line to the inbound line in front of the train while the train was traveling. He applied the brakes and stopped the train 15 meters in front of the obstacle, and then used the protective radio to signal an alarm. When checking the obstacle, it was found that the 1st outbound departure signal had collapsed onto the tracks.	

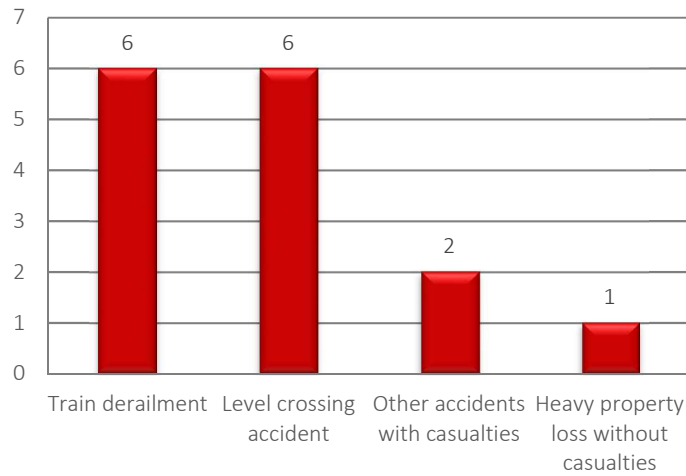
## 6 Publication of investigation reports

The number of investigation reports of railway accidents and serious incidents published in 2018 was 15, consisting of 15 railway accidents and no serious incident.

Breaking them down by type, the railway accidents contained six train derailment accidents, six level crossing accidents, two other accidents with casualties, and one heavy property loss without casualties. There were no railway serious incidents.

In the 15 accidents, the number of casualties was 12, consisting of nine death and three injured persons.

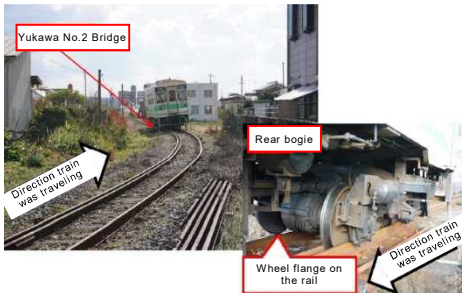
Railway accident reports (15 cases) published in 2018



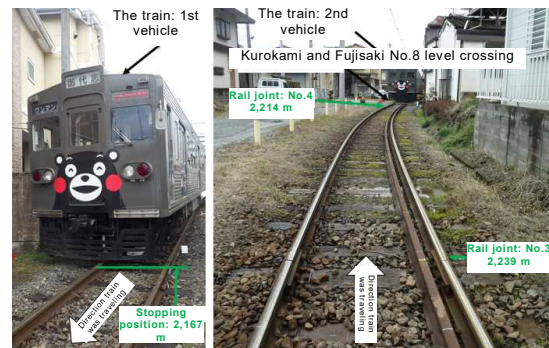
The investigation reports of railway accidents and serious incidents published in 2018 are summarized as follows.


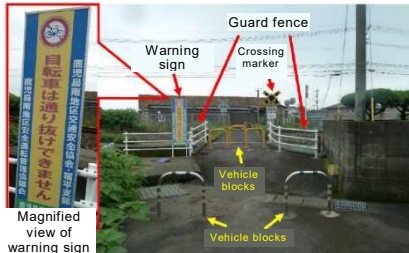
Railway accident and serious incident reports published in 2018

1	Date of Publication	Date and accident type	Railway operator	Line section (location)
	January 25, 2018	May 18, 2016 Train derailment	Tobu Railway Company	In the premises of Naka-itabashi station, Tojo Main Line, Itabashi-ku, Tokyo
	Summary	<p>The train departed from Naka-itabashi station on schedule. After the train had operated in powering operation, the driver of the train shifted the notch off at about 30 km/h to operate in coasting operation until the rearmost vehicle passed the No.12 turnout in the premises of Naka-itabashi station, where the speed limit was 35 km/h.</p> <p>When the train driver accelerated the train in powering operation again, after the train had passed the turnout, he noticed that the emergency button in the cabin was operated, then applied the emergency brake to stop the train.</p> <p>After that, the conductor checked the status of outside train and found that all two axles in the rear bogie of the 5th vehicle were derailed to right.</p> <p>There were about 400 passengers, the train driver and the conductor onboard the train, but no one was injured.</p>		
		<p>Bogie of the same type as the bogie in question</p> <p>(Schematic drawing of bogie)</p> <p>Crack occurrence location</p> <p>Crack occurrence location on the bogie</p> <p>Outer beam</p> <p>Bottom surface of side beam</p> <p>Assumed crack starting point</p> <p>State of the crack immediately after the derailment (provided by the Tobu Railway Company)</p>		

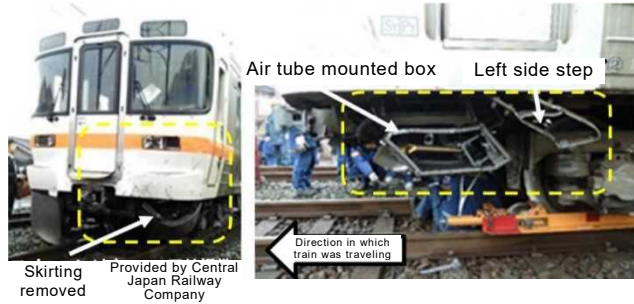
	<p><b>Probable Causes</b></p>	<p>It is probable that the right wheel of the front axle in the rear bogie in the 5th vehicle of the train climbed up the right rail and derailed to right, because the wheel load unbalance had been enlarged as the wheel load of the right wheel of the front axle had decreased due to the crack, existing from the bottom plate to upper part of the side surface of the side beam in right side of the rear bogie, and the lateral force of the right wheel of the front axle had increased when the rear bogie had entered the left curved track of 178 m radius, in the accident.</p> <p>It is probable that the wheel load of the right wheel of the front axle in the rear bogie had decreased because the wheel could not support the vertical load required to the wheel as the strength of the side beam had decreased due to the crack.</p> <p>It is somewhat likely that the existence of the welding defects, in the welded portion of the reinforcing plate at inside of the side beam, caused the generation of the crack in the side beam. However, it could not be determined the reason why the side beam was cracked because the precise evaluation by the observation of the broken surface could not be implemented due to the damages etc., of the broken surface of the crack.</p>		
	<p><b>Report</b></p>	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-1.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-1.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-1-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-1-p.pdf</a> (Explanatory material)                  See “Feature 2: Summaries of major railway accident and serious incident investigation reports (case studies)”, page 43</p>		
<p>2</p>	<p><b>Date of Publication</b></p> <p>January 25, 2018</p> <p><b>Summary</b></p> <p><b>Probable Causes</b></p>	<p><b>Date and accident type</b></p> <p>January 22, 2017 Train derailment</p> <p>When the train proceeded about 500 m from Gobo station, the driver of the train noticed abnormal sounds several times from under floor, then applied the emergency brake and stopped the train.</p> <p>The driver got off the train to check the situation, and found that all axles in the rear bogie of the vehicle had been derailed to right.</p> <p>There were 5 passengers and the driver onboard the train, but no one was injured.</p> <p>It is probable that the left wheels of the 1st and 2nd axles in the rear bogie derailed to the inside of the gauge, i.e., right side of the left inner rail, because the gauge was widened largely while the train was passing through the 160 m radius left curved track, in the accident.</p> <p>As for the large gauge widening, it is somewhat likely that the gauge was widened dynamically by the rail tilting and deflection of rail due to the lateral force caused by the train running, because the rail fastening forces by the spikes had been deteriorated as there had been continuous decays and cracks in the sleepers in the left curved track.</p> <p>It is somewhat likely that the deterioration of the rail fastening forces, due to the existence of continuous decays and cracks in the sleepers, were related with that the company had not comprehended sufficiently the dangerousness against derailment by the dynamic gauge widening due to the continuous defects of sleepers and rail fasteners, in the inspection for composed materials of railway track etc., and had not implemented the track maintenance corresponding to the inspected results promptly.</p> <p>In addition, it is somewhat likely that the following (1) to (3) also related to the occurrence of the accident.</p> <ol style="list-style-type: none"> <li>(1) The margin against derailment to the inside of the gauge had become small due to relatively large slack being existed in the curved track.</li> <li>(2) The repetitive generation of remarkably large lateral forces accompanied with train running had promoted gauge widening because there was large alignment due to the angular rotation in the rail joints in the section just before the accident site, for a long term.</li> <li>(3) The guard rail did not demonstrate its function to prevent derailment sufficiently because the width of the flange way was widened dynamically due to the rail tilting and the rail deflection by the lateral force acting on backside of wheel from the left wheel, as the rail fastening forces of the guard rail had deteriorated by the defects in the sleepers and the rail fastening devices, and the guard rail which had not been fastened to each sleeper.</li> </ol>	<p><b>Railway operator</b></p> <p>Kishu Railway Company</p>	<p><b>Line section (location)</b></p> <p>Between Gobo station and Gakumon station, Kishu Railway Line, Gobo City, Wakayama Prefecture</p> 

	Report	<a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-2.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-2.pdf</a> <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-2-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-2-p.pdf</a> (Explanatory material)		
3	Date of Publication	Date and accident type	Railway operator	Line section (location)
	January 25, 2018	February 11, 2017 Other accidents with casualties	West Japan Railway Company	In the premises of Itozaki station, San-yo Line, Mihara City, Hiroshima Prefecture
	Summary	<p>The leader of the construction work noticed an abnormal sound when the train had passed by the place for refuge, and then he checked the situation and found that the train watchman had been fallen on the track.</p> <p>On the other hand, the driver of the train noticed the staffs working ahead while the train had passed Itozaki station at about 68 km/h on schedule at 01:46, but he continued train operation as he thought that the staffs had finished evacuation because he had confirmed the white light waving laterally. After that, he stopped the train obeying the instruction from the train dispatcher after the train had passed Onomichi station.</p> <p>The train watchman was dead in the accident.</p>		
	Probable Causes	<p>It is highly probable that the train watchman in charge of the construction work to replace insulators contacted with the approaching train because he had been standing to watch trains at the position too close to the neighboring track where the railway track was not closed in the accident.</p> <p>It is somewhat likely that the train watchman was standing to watch trains at the position too close to the neighboring track because he was sure that the watching position was in the safe place.</p> <p>It is somewhat likely that this situation was related with the complex track shape in around the accident site because the accident had occurred on the turnout. However, it could not be determined the reason because the train watchman was dead in the accident.</p>		
	Report	<a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-5.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-5.pdf</a> <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-5-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-5-p.pdf</a> (Explanatory material)		
4	Date of Publication	Date and accident type	Railway operator	Line section (location)
	January 25, 2018	February 22, 2017 Train Derailment	Kumamoto Electric Railway	Between Fujisakigumae station and Kurokami-machi station, Fujisaki Line, Kumamoto City, Kumamoto Prefecture
	Summary	<p>The train departed from Fujisakigumae station in one-man operation. Immediately after that, while the train was operated at about 20 km/h in around the Between Kurokami and Fujisaki No.8 level crossing, the driver of the train felt a shock and applied the emergency brake to stop the train.</p> <p>All axles in the front bogie in the 1st vehicle were derailed to right when the train stopped. The investigation implemented after the accident showed that all axles in the rear bogie of the 1st vehicle had derailed to right once and restored to the track after that.</p> <p>There were about 50 passengers and the driver onboard the train, but no one was injured.</p>		
	Probable Causes	<p>It is probable that left wheels of the 1st axle in the front bogie and all axles in the rear bogie of the 1st vehicle fell to the inside of the gauge, due to the large gauge widening by the passing train in the 200 m radius right curved track, and ran as spreading the gauge, and then the 1st axle in the front bogie derailed to right and the 2nd axle in the front bogie followed to derail, as all axles in the rear bogie had restored to the track by the guardrail, in the accident.</p> <p>As for the large gauge widening, it is somewhat likely that the gauge was widened dynamically due to the rail tilting etc., caused by the lateral force accompanied with the train running, because the defects of the rail fastening devices had been existed continuously in the curved rack.</p> <p>Here, it is somewhat likely that the following (1) and (2) related to the occurrence of large</p>		



		<p>gauge widening which caused derailment.</p> <p>(1) The continuous defects of the rail fastening devices as dangerous as to cause derailment and the dangerousness of gauge widening enlarged dynamically could not be found definitely in the periodic inspections etc., and the track maintenance had not been implemented based on the results of the inspection.</p> <p>(2) The margin against derailment to the inside of the gauge had decreased due to the relatively large slack in the curved track.</p>		
	Report	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-6.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-6.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-6-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-6-p.pdf</a> (Explanatory material)</p>		
5	Date of Publication	Date and accident type	Railway operator	Line section (location)
	January 25, 2018	March 6, 2017 Level crossing accident	West Japan Railway Company	Senzoku No.1 level crossing, class 4 level crossing without automatic barrier machine nor road warning device, between Kuga station and Suo-Takamori station, Gantoku Line, Iwakuni City, Yamaguchi Prefecture
	Summary	<p>While the train was running between Kuga station and Suo-Takamori station, the driver of the train noticed a passerby riding bicycle just before reaching Senzoku No.1 level crossing, class 4 level crossing, then applied the emergency brake, but the train collided with the passerby.</p> <p>The passerby was dead in the accident.</p>		
	Probable Causes	<p>It is highly probable that the accident occurred as the train collided with a passerby riding bicycle in Senzoku No.1 level crossing, class 4 level crossing without automatic barrier machine nor road warning device, because the passerby riding bicycle had entered the level crossing in the situation that the train was approaching.</p> <p>It is probable that the passerby did not come to a stop just in front of the level crossing and entered the level crossing without confirming the approaching train well, in the situation that the train was approaching. However, it could not be determined the reason why the passerby had entered the level crossing, because the passerby was dead in the accident.</p>		
	Report	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-3.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-3.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-3-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-3-p.pdf</a> (Explanatory material)</p>		
6	Date of Publication	Date and accident type	Railway operator	Line section (location)
	January 25, 2018	June 27, 2017 Level crossing accident	Kyushu Railway Company	Between Sakanoue Station and Goino Station on the Ibusuki Makurazaki Line (Kagoshima Prefecture) Mukaihara No.2 level crossing (Class 4 level crossing without automatic barrier machine or road warning device)
	Summary	<p>The train driver immediately sounded a whistle and used the emergency brake on discovering a pedestrian entering Mukaihara No.2 level crossing (Class 4 level crossing) while traveling between Sakanoue Station and Goino Station. However, the train hit the pedestrian. The pedestrian died in the accident.</p>		
	Probable Causes	<p>It is highly probable that the accident occurred as the train collided with a pedestrian entering the level crossing while the train was approaching Mukaihara No.2 level crossing, which is a class 4 level crossing without an automatic barrier machine or road warning device setup at the level crossing.</p> <p>It was not possible to clarify the reason the pedestrian entered the level crossing while the train was approaching because the pedestrian died in the accident.</p>		
				
				


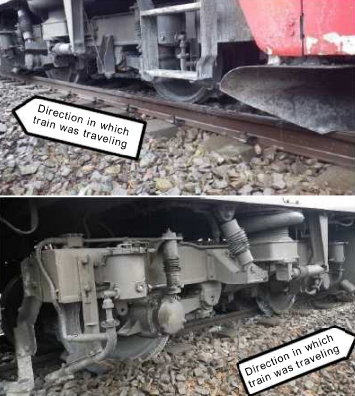
	Report	<a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-4.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-1-4.pdf</a> <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-4-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-1-4-p.pdf</a> (Explanatory material)		
7	Date of Publication	Date and accident type	Railway operator	Line section (location)
	February 22, 2018	March 2, 2017 Train derailment accompanied with level crossing accident	Central Japan Railway Company	Koyabu level crossing, class 1 level crossing with automatic barrier machine and road warning device, between Nishi-Okazaki station and Anjo station, Tokaido Line, Anjo City, Aichi Prefecture
	Summary	<p>While the train was running between Nishi-Okazaki station and Anjo station at about 120 km/h, the driver of the train noticed a sedan entering Koyabu level crossing, class 1 level crossing, and applied emergency brake immediately but it was too late. The train collided with the sedan and all two axles in the front bogie of the 1st vehicle derailed to right of the track.</p> <p>The sedan completely demolished and burnt after colliding with the train, poles planted along the track side etc.</p> <p>The driver of the sedan was dead, and 3 passengers boarded on the train were injured, in the accident.</p>		
	Probable Causes	<p>It is probable that the accident occurred as the train collided with a sedan entering the Koyabu level crossing, class 1 level crossing, where the automatic barrier machine had completed its operation, in the situation just before the train passed, and derailed to right caused by the lateral force in right direction acted on left under part of front head of the 1st vehicle of the train.</p> <p>It is probable that the forces in right direction had acted to the left under part of front head of the 1st vehicle of the train because the train had been running through as that the sedan collided with the train in the level crossing had been crashed being sandwiched by the train and poles planted in the left side of the train.</p> <p>It could not be determined the reason why the sedan had entered the level crossing where the automatic barrier machine had completed its operation, because the driver of the sedan was dead in the accident.</p>		
	Report	<a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-2-1.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-2-1.pdf</a> <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-2-1-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-2-1-p.pdf</a> (Explanatory material)		
8	Date of Publication	Date and accident type	Railway operator	Line section (location)
	March 29, 2018	September 7, 2017 Level crossing accident	West Japan Railway Company	Iwasakinoichi level crossing, class 4 level crossing without automatic barrier machine nor road warning device, between Michinoue station and Managura station, Fukuen Line, Fukuyama City, Hiroshima Prefecture
	Summary	<p>While the train was running between Michinoue station and Managura station, the driver of the train noticed a motorized bicycle entering Iwasakinoichi level crossing, class 4 level crossing, then sounded a whistle and applied the emergency brake immediately, but the train collided with the motorized bicycle.</p> <p>The driver of the motorized bicycle was dead in the accident.</p>		
	Probable Causes	<p>It is highly probable that the accident occurred as the train collided with the motorized bicycle at Iwasakinoichi level crossing, class 4 level crossing without automatic barrier</p>		





		<p>machine nor road warning device, because the motorized bicycle had entered the level crossing in the situation that the train was approaching.</p> <p>It is probable that the driver of the motorized bicycle had not come to a stop just in front of the level crossing and had entered the level crossing in the situation that the train was approaching, without confirming the approaching train well. However, it could not be determined the reason why the motorized bicycle had entered the level crossing, because the driver of the motorized bicycle was dead in the accident.</p>		
	Report	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-3-1.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-3-1.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-3-1-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-3-1-p.pdf</a> (Explanatory material)</p>		
9	Date of Publication	Date and accident type	Railway operator	Line section (location)
	March 29, 2018	September 18, 2017 Level crossing accident	Kyushu Railway Company	Ebe level crossing, class 3 level crossing equipped with road warning device but without automatic barrier machine, between Uto station and Midorikawa station, Misumi Line, Uto City, Kumamoto Prefecture
	Summary	<p>While the train was running between Uto station and Midorikawa station, the driver of the train noticed a bicycle entering Ebe level crossing, class 3 level crossing, then applied the emergency brake and sounded a whistle immediately, but the train collided with the bicycle.</p> <p>The rider of the bicycle was dead in the accident.</p>		
	Probable Causes	<p>It is highly probable that the accident occurred as the train collided with a bicycle at Ebe level crossing, class 3 level crossing equipped with the road warning device but without the automatic barrier machine, because the rider of the bicycle had entered the level crossing in the situation that the road warning device was operating according to the approaching train.</p> <p>It could not be determined the reason why the rider of the bicycle had entered the level crossing, in the situation that the approaching train could be noticed by the operation of the road warning device according to the approaching train, because the rider of the bicycle was dead in the accident, even though it is somewhat likely that the certain confirmation of safety had not been implemented in relation with that the rider of the bicycle had not had a margin in the required time to go to the destination.</p>		
	Report	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-3-2.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-3-2.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-3-2-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-3-2-p.pdf</a>(Explanatory material)</p>		
10	Date of Publication	Date and accident type	Railway operator	Line section (location)
	June 28, 2018	May 22, 2017 Train derailment	Watarase Keikoku Railway Co., Ltd.	Between Hanawa station and Mizunuma station, Watarase Keikoku Line, Kiryu City, Gunma Prefecture
	Summary	<p>The driver of the train felt a shock just after the train had passed through the 160 m radius right curved track, between Hanawa station and Mizunuma station, at about 36 km/h at about 14:59, then applied an emergency brake to stop the train.</p> <p>After the train had stopped, the driver checked the situation and found that all axles in the front bogie of the 2nd vehicle had derailed to left.</p> <p>There were 7 persons, i.e., the train crews and the staff in charge of railway facilities etc., onboard the train, but no one was injured.</p>		

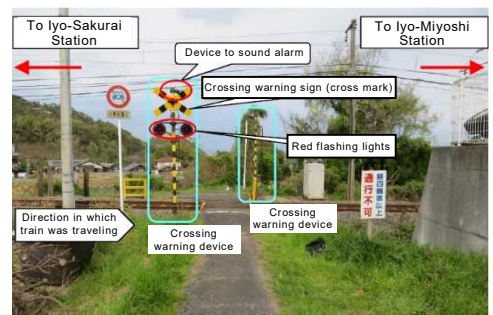
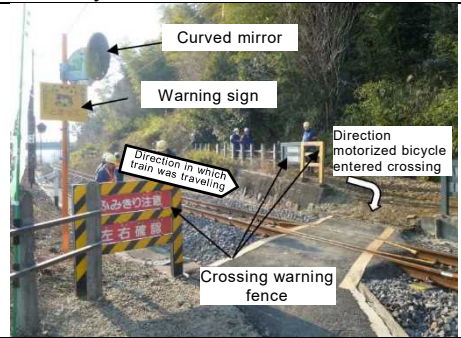


	<p><b>Probable Causes</b></p>	<p>It is probable that the accident occurred as the right wheel in the 1st axle of the front bogie of the 2nd vehicle fell off to the inside of the gauge and continued running being spread gauge, and then the left wheel flange in the front bogie climbed up to outer left rail and derailed to left, because the gauge was widened while the train, the electric and track inspection cars, was passing in the 160 m radius right curved track.</p> <p>It is probable that the gauge widening was caused by the rail tilting etc., due to lateral forces accompanied with train running in the curved track where the continuous defective sleepers and rail fastening devices were existed.</p> <p>It is somewhat likely that the existence of significantly large gauge widening to cause derailment was related with that the proper track maintenance had not been implemented because the danger against gauge widening by the continuous defective sleepers and rail fastening devices had not been recognized in the periodic inspection etc., and the proper operation control and the track maintenance had not been implemented even though the remarkably large irregularity of gauge had been detected in the measurement by the track inspection cars just before the accident.</p>	 <p>1<sup>st</sup> axle of the front bogie of the 2<sup>nd</sup> vehicle Left wheel</p>	
	<p><b>Report</b></p>	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-4-1.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-4-1.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-4-1-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-4-1-p.pdf</a> (Explanatory material)                  See “Feature 2: Summaries of major railway accident and serious incident investigation reports (case studies)”, page 44</p>		
<p>11</p>	<p><b>Date of Publication</b></p>	<p><b>Date and accident type</b></p>	<p><b>Railway operator</b></p>	<p><b>Line section (location)</b></p>
	<p>July 26, 2018</p>	<p>February 23, 2017 Train Derailment</p>	<p>Japan Freight Railway Company</p>	<p>In the premises of Kita-Irie signal station, Muroran Line, Toyako Town, Abuta District, Hokkaido</p>
	<p><b>Summary</b></p> <p>While the train was running in the premises of Kita-Irie signal station at about 54 km/h, the driver of the train stopped the train by the emergency brake as he felt abnormal vibration, and operated the train protection radio. After he had reported the situation to the train dispatcher, he checked the vehicles and found that the 5th and 6th axles in total six axles of the front, middle and rear bogies of the 1st vehicle, i.e., the locomotive, had derailed to right side of the direction of the train. Then, he reported the situation to the train dispatcher.</p> <p>There was the driver onboard the train, but he was not injured.</p>			
	<p><b>Probable Causes</b></p> <p>It is probable that the accident occurred as all axles, i.e., the 5th and 6th axles, in the rear bogie in the 1st vehicle, i.e., the locomotive, of the freight train derailed because the traction device had hung down due to the removal of two fitting bolts fastening the center pin and the traction device in the rear bogie during running operation, following the process described in below.</p> <ol style="list-style-type: none"> <li>(1) The left traction link broke when the traction device hit the left guard rail in the Iriechou level crossing.</li> <li>(2) The wheels in all axles, i.e., the 5th and 6th axles, in the rear bogie derailed to right due to the lateral force in right direction acted on the traction device, as the traction device, hanging more after broken, hit the lead rail of the turnout in the premises of Kita-Irie signal station.</li> </ol> <p>It is somewhat likely that the fitting bolts of the traction device fell away because the fitting bolts had come looser due to vibration etc., during train running after finished the important parts inspection, in which the work to connect bogie and vehicle body had finished in the status that the fitting bolts had fastened temporarily, i.e., the fitting bolts had not been fastened with the determined fastening torque.</p>	 <p>5th axle and 6th axle derailed</p>		

		<p>It is somewhat likely that the work connecting bogie and vehicle body finished as the fitting bolts had not been fastened by the determined fastening torque, because the works to fasten bolts had been implemented without using the torque wrench and the confirmation of the fastened status had not been implemented, as the assigned role for each worker and the procedures of each work for the bolt fastening works, had not been clearly prescribed.</p>		
	Report	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-5-1.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-5-1.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-5-1-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-5-1-p.pdf</a> (Explanatory material)                  See “Feature 2: Summaries of major railway accident and serious incident investigation reports (case studies)”, page 45</p>		
12	Date of Publication	Date and accident type	Railway operator	Line section (location)
	July 26, 2018	September 18, 2017 Heavy property loss without casualties	Kyushu Railway Company	In the premises of Nogata station, Chikuho Line, Nogata City, Fukuoka Prefecture
	Summary	<p>The train started the shunting operation in the route from track 25 to the east lead track No.1 via track 15 in the premises of Nogata station, at about 05:15. After that, the vehicles collided with the car stop installed in the end edge of the east lead track No.1 and destroyed it, furthermore, all two axles in the front bogie of the front vehicle derailed to right by the shock and the vehicle body of the front vehicle disturbed the main line in the up track.</p> <p>As the measures such as train protection etc., accompanied with disturbing main line in the up track had not been implemented, the inbound Electric 6520H train, composed of 3 vehicles, and the shunting vehicles for outbound Deadhead Diesel 1533D train, shunting vehicles composed of four vehicles scheduled to be operated as the outbound Deadhead Diesel 1533D train, were passing through the disturbed track, and the car side pilot lamp of the shunting vehicle of the outbound Deadhead Diesel 1533D train contacted with the right edge of the front head of the shunting vehicle of the inbound Electric 6620M train and both vehicles were damaged.</p> <p>There was a driver boarded on the shunting vehicles for the inbound Electric 6620M train and the shunting vehicles of the outbound Deadhead Diesel 1533D train, each, but no one was injured.</p>		
	Probable Causes	<p>It is highly probable that the heavy property loss was induced in the railway facilities and the vehicles in the accident, as the vehicle collided with the car stop installed in the end edge of the track because the driver operating vehicles in shunting operation in the premises of Nogata station missed the timing of the braking operation, and the vehicle passing in the main line in the up track contacted with the vehicle derailed by the shock of the collision with the car stop and disturbed the main line in the up track.</p> <p>It is somewhat likely that the driver missed the timing of the braking operation related with temporary misunderstanding of the shunting route for the other vehicles as the route for his vehicles as he did not concentrate awareness to confirm safety of his route in the shunting operation.</p> <p>It is probable that the derailed vehicle contacted with the vehicle passing the main line in the up track in relation with that the procedure of train protection was not implemented promptly after the derailment had occurred.</p> <p>It is somewhat likely that the train protection procedure was not implemented promptly even though the derailed vehicle had disturbed the main line in the up track after the derailment, because the driver of the derailed vehicle had considered that the derailed vehicle was not in the situation as to disturb the neighboring main line in the up track as the deviation was not so large, although he had noticed the fact of the derailment.</p>		
	Report	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-5-2.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-5-2.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-5-2-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-5-2-p.pdf</a> (Explanatory material)</p>		



		See “Feature 2: Summaries of major railway accident and serious incident investigation reports (case studies)”, page 46		
13	<b>Date of Publication</b>	<b>Date and accident type</b>	<b>Railway operator</b>	<b>Line section (location)</b>
	September 27, 2018	January 16, 2018 Level crossing accident	Central Japan Railway Company	Bozuyama level crossing, class 4 level crossing without automatic barrier machine nor road warning device, between Idagawa station and Kasado station, Kansai Line, Suzuka City, Mie Prefecture
	<b>Summary</b>	<p>While the train was running at about 82 km/h between Idagawa station and Kasado station, the driver of the train noticed the motorized bicycle entering Bozuyama level crossing, class 4 level crossing, then applied emergency brake and sounded a whistle, but the train collided with the motorized bicycle.</p> <p>The driver of the motorized bicycle was dead in the accident.</p>		
	<b>Probable Causes</b>	<p>It is probable that the accident occurred as the train collided with the motorized bicycle at Bozuyama level crossing, class 4 level crossing without automatic barrier machine nor road warning device, because the motorized vehicle had entered the level crossing in the situation that the train was approaching.</p> <p>It could not be determined the reason why the motorized bicycle had entered the level crossing in the situation that the train was approaching, because the driver of the motorized bicycle was dead in the accident.</p>		
<b>Report</b>	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-6-1.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-6-1.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-6-1-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-6-1-p.pdf</a> (Explanatory material)                  See “Feature 2: Summaries of major railway accident and serious incident investigation reports (case studies)”, page 47</p>			
14	<b>Date of Publication</b>	<b>Date and accident type</b>	<b>Railway operator</b>	<b>Line section (location)</b>
	September 27, 2018	April 11, 2018 Level crossing accident	Shikoku Railway Company	Takabayashi level crossing, class 3 level crossing equipped with road warning device but without automatic barrier machine, between Iyo-Sakurai station and Iyo-Miyoshi station, Yosan Line, Saijo City, Ehime Prefecture
	<b>Summary</b>	<p>While the train was running at about 81 km/h between Iyo-Sakurai station and Iyo-Miyoshi station, the driver of the train noticed a public person lying down in Takabayashi level crossing, class 3 level crossing, then applied the emergency brake immediately, but the train hit the public person.</p> <p>The public person was dead in the accident.</p>		
	<b>Probable Causes</b>	<p>It is probable that the accident occurred as the train hit the public person at Takabayashi level crossing, class 3 level crossing equipped with road warning device, because the public person was lying down in the level crossing in the situation that the road warning device was operating according to the approaching train.</p> <p>It could not be determined the reason why the public person was lying down in the level crossing because the public person was dead in the accident.</p>		
<b>Report</b>	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-6-2.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-6-2.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-6-2-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-6-2-p.pdf</a> (Explanatory material)</p>			
15	<b>Date of</b>	<b>Date and accident</b>	<b>Railway operator</b>	<b>Line section (location)</b>



Publication	type		
October 25, 2018	December 16, 2017 Other accidents with casualties	Japan Freight Railway Company	In the premises of Chihaya yard, Kagoshima Line, Fukuoka City, Fukuoka Prefecture
Summary	<p>The company staff in charge of signal engaged in the work to ignite snow melting device for switches installed in the turnouts, contacted with the inbound 2352M train composed of 6 vehicles started from Kurume station bound for Kokura station of Kyushu Railway Company.</p> <p>On the other hand, the driver of the train applied the emergency brake to stop the train as he had noticed an abnormal sound. The driver checked the situation and found that the staff in charge of signal had been fallen down.</p> <p>The staff in charge of signal was dead in the accident.</p>		
Probable Causes	<p>It is highly probable that the accident occurred as the staff in charge of signal had entered the up track of Kagoshima Line where the train was running, when the staff in charge of signal and the switchman had been working to ignite the snow melting devices for switches, individually, without staff in charge of watching train.</p> <p>It is probable that the staffs were working to ignite snow melting devices individually without the watchman, as the training about safety for the company staffs in charge of the work had been insufficient, and their understanding about the importance of watching duties was poor.</p> <p>It could not be determined the reason why the staff in charge of signal had entered the up track of Kagoshima Line, because the staff in charge of signal was dead in the accident.</p>		
Report	<p><a href="http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-7-1.pdf">http://www.mlit.go.jp/jtsb/railway/rep-acci/RA2018-7-1.pdf</a>  <a href="http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-7-1-p.pdf">http://www.mlit.go.jp/jtsb/railway/p-pdf/RA2018-7-1-p.pdf</a> (Explanatory material)</p>		



Railway serious incidents reports published in 2018

There were no railway serious incidents reports published in 2018.

**7 Actions taken in response to opinions in 2018 (railway accidents and serious incident)**

A summary of the actions taken in response to opinions in 2018 is as follows.

<p><b>(1) Opinions on the prevention of train derailments caused by gauge widening</b>  (Opinions on June 28, 2018)</p>
<p>See “Chapter 1: Summary of recommendations and opinions issued in 2018 – 2 Opinions” (Page 62 (2))</p>

**(2) Opinions on the railway serious incident (Dangerous trouble in vehicle) for trains operated by the West Japan Railway Company that occurred on the Tokaido Shinkansen Line**

(Opinions on June 28, 2018)

See “Chapter 1: Summary of recommendations and opinions issued in 2018 – 2 Opinions” (Page 77 (3))

**8 Provision of factual information in 2018 (railway accidents and serious incidents)**

The JTSB provided factual information for 1 case in 2018. The content is as follows.

**(1) Provision of information relating to the railway serious incident that occurred at Shin-Sapporo Station on the JR Hokkaido Chitose Line**

(Provided information on November 14, 2018)

The Japan Transport Safety Board provided information to the Railway Bureau of MLIT on November 14, 2018 relating to the railway serious incident that occurred on the premises of Shin-Sapporo Station on the JR Hokkaido Chitose Line on November 9, 2018.

**(Summary of railway serious incidents)**


On November 9, 2018 (Friday), the 1st outbound departure signal had collapsed onto the tracks and was lying across the inbound and outbound lines. The outbound local train stopped approximately 15 m in front of the collapsed signal after the driver discovered the obstacle (signal) was on the track.

**(Provided information)**

The collapsed signal pole was installed onto an elevated bridge and anchors and bolts were used to secure it to the concrete frame of the elevated bridge. However, all 8 anchors driven into the concrete frame had come loose and the cone (wedge) had remained inside the hole of the frame.

Furthermore, the anchors were made so that their slitted sections would spread out due to the cone when driven into the concrete. However, none of the anchors that had come loose were spread out at the slitted sections.

A detailed investigation is scheduled in the near future for the cause of this serious incident.



Stand of collapsed signal (bottom surface)

Anchor (bottom surface)

Anchor (side)

Location where collapsed signal was standing

Cone remain inside hole

**Construction method**

- A hole is made using a drill in the concrete frame and a cone and anchor inserted
- A hammer is used to drive in the anchor so that the bottom of the anchor opens out and is secured to the concrete frame
- A bolt is inserted into the anchor to fasten it and secure the signal foundations

Bolt (new)

Anchor (new)

Cone (new)

Left: Installation after inserting cone  
Right: Before inserting cone

Left: Installation after inserting cone  
Right: Before inserting cone

Before inserting cone      Cone inserted      Installation after inserting cone

\* The information provided can be found on the JTSB website.  
<http://www.mlit.go.jp/jtsb/iken-teikyo/JRsinsapporo20181109.pdf>

## Column

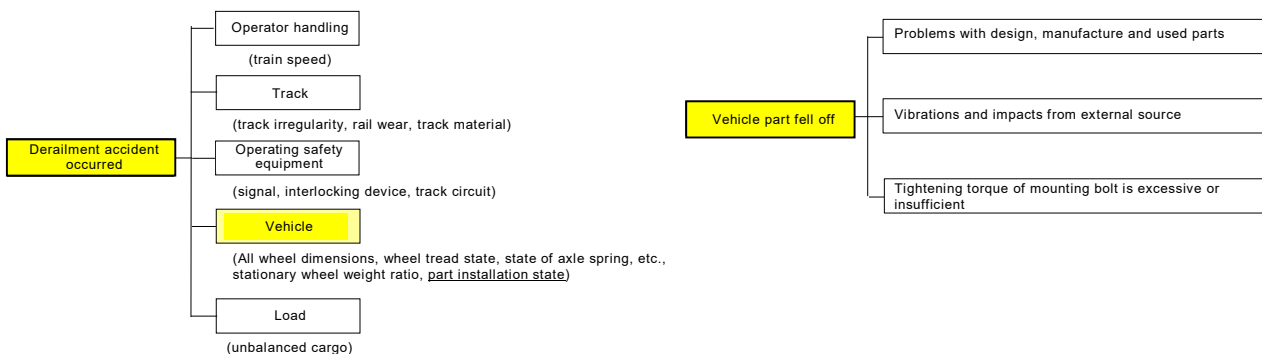
## Analyzing the cause of derailment accidents involving parts that fall off the railway vehicle

## Railway Accident Investigator

Derailment accidents caused by parts falling off railway vehicles have occurred in the past.

When a derailment accident occurs, during the initial investigation, it is important to investigate for any evidence that connects the derailment to the track and the railway vehicle bogie (axle, bearing, bogie frame, etc.), and if there is any damage. Also, these findings are separated from any evidence that occurred due to impact or similar forces that occurred after the derailment, and analysis is conducted on why the train derailed, which wheel was first to derail, and how the train progressed after the derailment while cross-referencing the track and train damage, evidence (marks on the track ballast, rail top surface and the wheel tread).

To analyze the cause of the derailment, a more detailed investigation is conducted on data from such as the operating status recording device, the track, the vehicle, and inspection records for the operating safety equipment, in addition to such things as measurement results from the track and the vehicle after the derailment accident occurred. Based on analysis conducted so far, derailment accidents occur due to the factors indicated below. However, it only shows items caused by the vehicle.



Factors involving the derailment accident occurrence (Ex.)

Factors involving the train parts falling off (Ex.)

For example, when it is discovered that a vehicle part that was attached using a mounting bolt fell off, the investigation is conducted focusing on the following items.

- The state immediately after the accident occurred  
⇒ Was the bolt broken? Did it come off? Is it in poor condition?
- When the part was installed  
⇒ When was the part installed? Was the correct torque used for the mounting bolt?
- Inspection after the part was installed  
⇒ Was a visual inspection or hammering test performed to test the installation? What was the inspection/test results? During a past investigation, we understood that it is not easy to accurately determine the fastened state during a hammering test such as when a large load is acting on the fastened point.
- Part degradation over time, presence of fatigue fractures  
⇒ Is the part worn or broken? Conduct a test such as a fracture investigation and flaw detection test.



- Presence of external factors that lead to the part falling off
  - ⇒ Does abnormal vibration occur on the train part caused by the vehicle itself or the track, or an external impact (such as flying objects). In the past, vibration generated by wheel tread detachment led to parts falling off.
- Defects when the part was manufactured
  - ⇒ Conduct an interview survey, etc., to ask the manufacturer about the part.
- Progression of the part falling off
  - ⇒ Verify the progression until the part fell off using a simulation and reproduction test that imitates the actual conditions of the vehicle when it was traveling. It is not easy to reproduce the conditions that were present at the time of the accident. However, it is effective to analyze the factors when the accident occurred.

The above are examples but all possibilities that lead to the accident should be considered and appropriate accident investigations are conducted to thoroughly investigate the cause of the accident.