

The evaluation index for transport disruption

2 May, 2016

12th Florence Rail Forum

“How to define, measure, and improve the performance of the European railway system?”

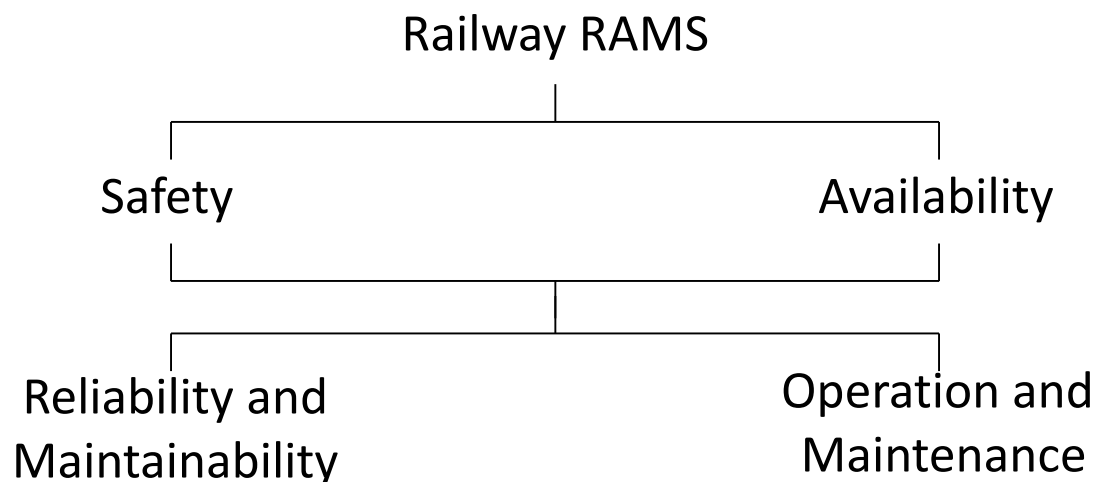
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1. Description of “Railway RAMS” in IEC 62278
2. What is “POINT”?

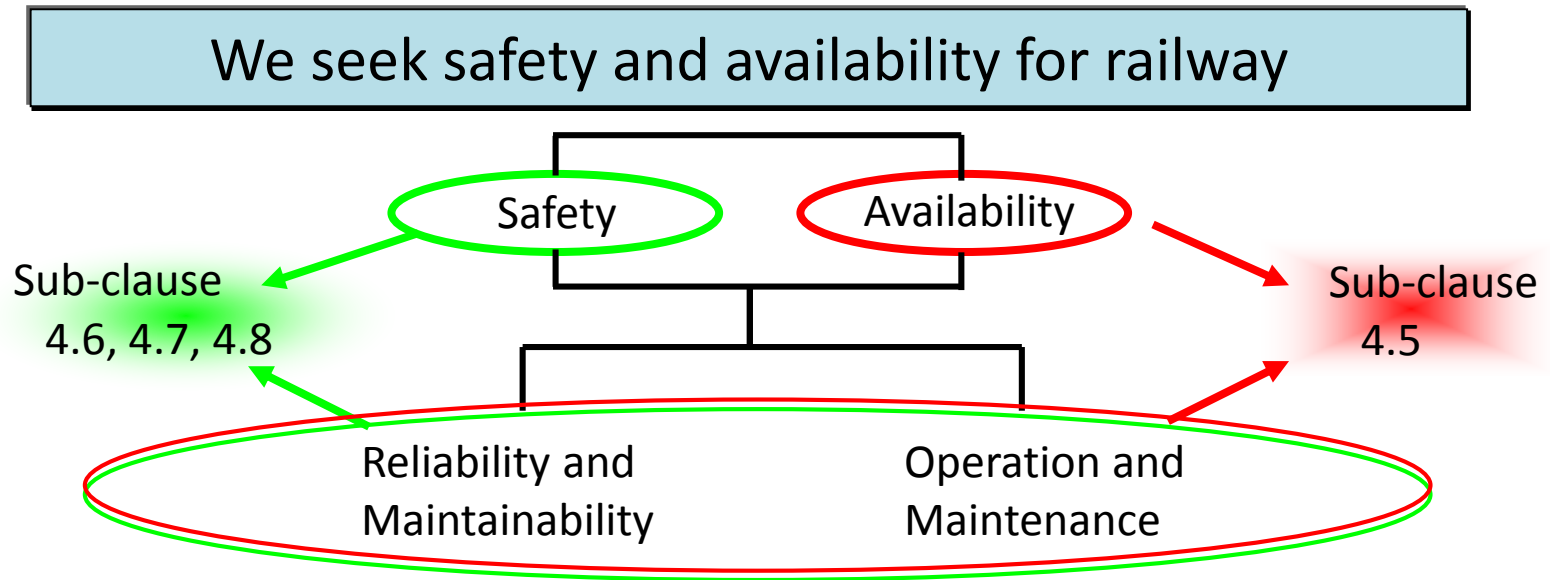
4.3.3

Attainment of in-service safety and availability targets can only be achieved by meeting all reliability and maintainability requirements and controlling the ongoing, long-term, maintenance and operational activities and the system environment.

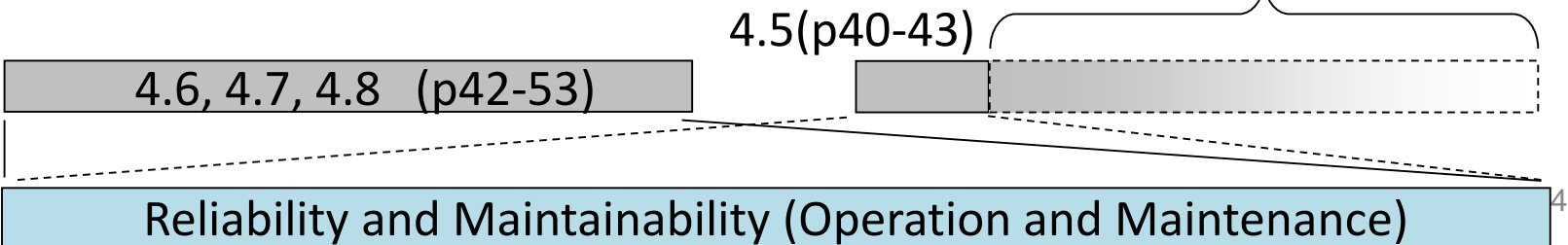


4.3.4 Figure2; Inter-relation of railway RAMS elements

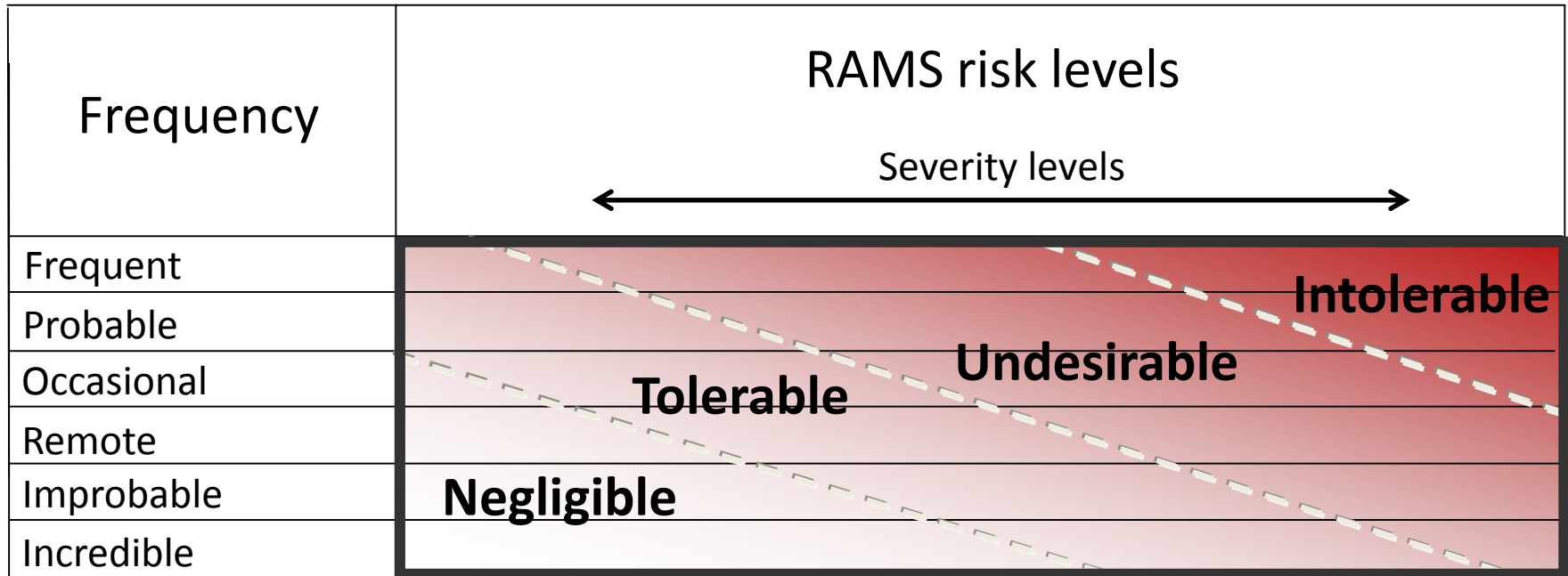
1. Description of “Railway RAMS” in IEC 62278



“Availability” is not fully described. This gap should be filled.



1. Description of “Railway RAMS” in IEC 62278



JR East's idea

During the evaluation, the following aspects should be taken into account:

- Customers' influence
- Cancellations due to rescheduling for early schedule recovery
- Delay after resumption of operation

2. What is “POINT”?

Existing evaluation methods for transport disruption are as follows;

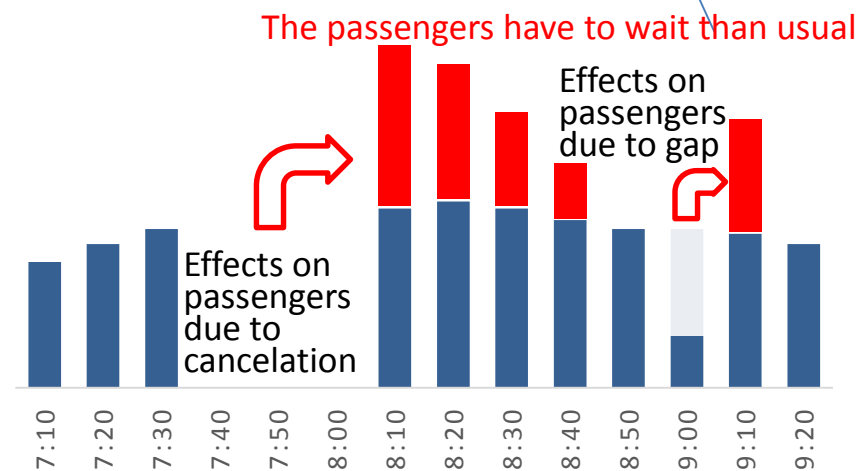
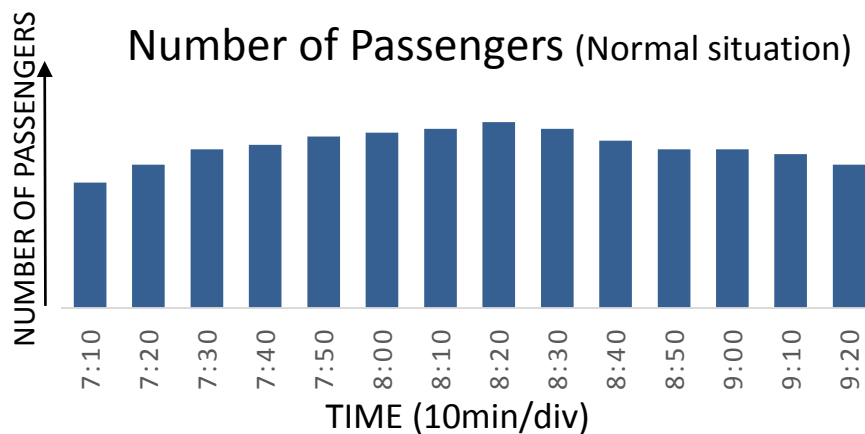
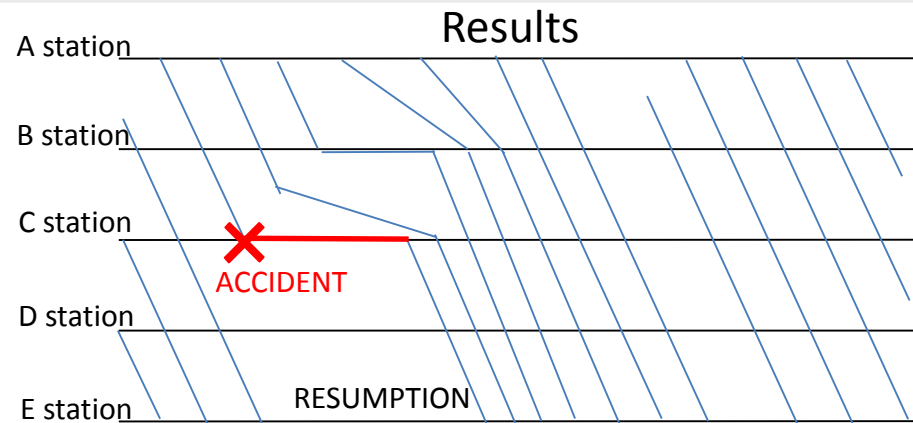
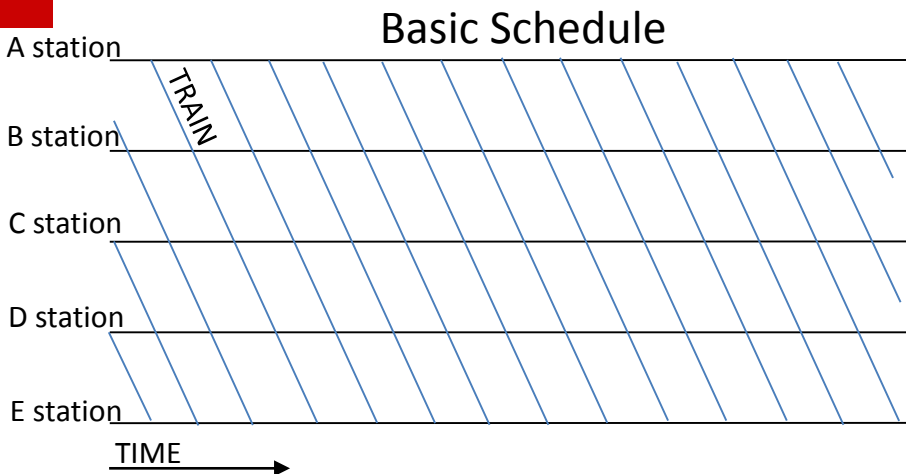
- (1) Number of train service cancellation
- (2) Number of delayed trains
- (3) Train delay time
- (4) Number of passengers affected by transport disruption

But the existing evaluation methods do not always provide a clear picture on how much transport disruption affected the passengers.

Therefore, JR East has developed a new index. It enables us to make the evaluation more realistic one. We call it “**POINT**”.

POINT is an acronym that stands for **P**ersonage **O**f **I**nfluence on **T**ransportation. **POINT** is basically the number of passengers who wait longer than usual.


2. What is "POINT"?



The schedule on the right side indicates an accident at C station and there is a 30-minute delay on the schedule. The cancellation due to the accident affects the passengers on D station and so on. Since the passengers cannot get on the train on time due to the accident, there is a build-up of passengers until the train resumes from the delayed schedule. This is shown by the red bars on the right chart.

2. What is “POINT”?

Accidents	Affected passengers × Delayed minutes	Calculated POINT
The passenger falls to the track at regional station (Suspended 55 min)	68.000	4,8
The passenger falls to the track at sub-urban station (Suspended 43 min)	1.100.000	6,0
The vehicle breakdown at urban station (Internal cause → x3)	11.000.000 →33.000.000	7,5
The track breakdown on urban line (Internal cause → x3)	170.000.000 →510.000.000	8,7


 \log_{10}

$$\text{POINT} = \log \Sigma (\text{Number of affected passengers} \times \text{Delayed time})$$

*In the case of internal causes, we multiply the result of calculation by 3, considering the public relation influences. Because, our previous study suggested that the level of complaint from passengers was three times higher for delays caused by internal causes than external causes.

2. What is “POINT”?

Level	Indication of “POINT”	Management value of “POINT”
POINT 8	Effect of 100 million; Several hours suspension in Tokyo metropolitan area	The accident must be reviewed to clarify the solutions by the members of the board. We make it a rule to allocate special budget to execute the effective measures and trace the progress every quarter.
POINT 7	Effect of 10 million; Huge dissatisfaction of passengers in rush hours	
POINT 6	Effect of 1 million; Large dissatisfaction	In the case of internal causes, we clarify the solutions. If necessary, we carry out the effective measures.
POINT 5	Effect of 0,1 million; Medium dissatisfaction	

It can be said that safety is already a prerequisite for the sustainable railway business. Now, availability should be focused in light of customer satisfaction. “POINT” enables us to evaluate the level of transport disruption from this point of view and identify the required investment to make railways more attractive.

Thank you for your kind attention

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