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Emergency Simulation Workshop for Railway Rolling Stock Managers

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Background

Resilience engineering is attracting the attention of safety specialists and practitioners as well as top management of safety-critical organizations. A new view of resilience engineering is the recognition that systems should keep functioning under dynamically varying environments. Systems should cope with disturbances, small or large, expected or unexpected, rapid or gradual, and keep functioning.

As illustrated in Figure 1, practitioners at the sharp end are successfully trying to keep system performance at the required level by responding to disturbances and variations. Especially in case of emergency, resilient reaction by the sharp end is indispensable. They possibly must act without order from their manager when situation is urgent. They should assess the situation and decide what to do.

Purpose

Since severe railway accident rarely happen in Japan now, most of the rolling stock managers have not experienced rescue and recovery operation after major accidents. However there remains the possibility of accidents in spite of as many as preventive measures. An accident can happen in various unexpected forms in reality, so standard operation manuals or procedures are not enough for managers to take lead the operation.

The purpose of this study is to develop a table-top simulation program to enhance resilience ability for local managers working for the Rolling Stock Department of a railway company.

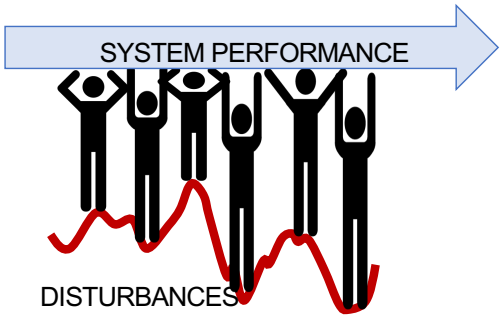

Figure 1 People at the sharp end protect the system by responding to disturbance and keep the system functioning

Scenarios of Simulation

The first slide of Scenario A

You are a manager of Nanakodai branch on duty.
Today is Monday, August 7, and the temperature is 37 degrees Celsius. At 14:00 the dispatcher called you and told that the 850A train hit a car at the #62 level at 13:56 and the first car of the train derailed.
Write down (1) to whom you tell what?, (2) what information you need and who you ask for it or how you look it up?, (3) list all the tools and devices necessary to recover a derailment.

The last slide of Scenario A

A staff member called the manager and told that the truck carrying derailment recovery devices was involved in a traffic accident at a crossing.
What should you consider and do at this moment. Write down as many as possible.

In Scenario B, a derailment occurs in an underground tunnel Sunday night while snowing. In Scenario C, a derailment occurs near the river with swelling water due to a typhoon.

Participants

Sixty-three local managers participated in total and they randomly assigned to one of 10 groups.

Results

A questionnaire containing 12 Likert scales asking about the workshop was given to the participants. The result showed that they answered the questions positively: the workshop was useful, the discussion was active, all the team members took part in the discussion, the workshop was enjoyable, I will deal with emergency better than before, etc.