Training Method of Communication Skills for Train Dispatchers in Abnormal Situations

Naoki HATAKEYAMA  Yasunori OKADA  Kazunori HAYAMA
Safety Analysis Laboratory, Human Science Division

Toshiaki KABURAGI  Yumeko MIYACHI
Safety Analysis Laboratory, Human Science Division

It is necessary for train dispatchers to share risk-related information with their team members or superiors in order to deal with abnormal train traffic control situations. A training method was therefore developed to give train dispatchers communication skills. The training included risk scenarios, points to remember in terms of communication skills and a training program. A list of 45 key communication points to remember was also developed, which was designed to promote understanding about communication skills through regular use. This training method can easily be introduced into actual train traffic control fields. Trial experiments were conducted with actual train dispatchers which confirmed the effectiveness of the method.

Keywords: dispatcher, abnormal situation, communication, training method, scenario

1. Introduction

In an abnormal situation, such as a disaster or major traffic disruption, certain staff, for example dispatchers, train crews, etc., are required to share information accurately and smoothly and to cooperate. Therefore, each dispatcher is required to understand the importance of communication and have the necessary skills to communicate.

Generally there are role playing methods in order to improve communication skills, which are applied to the CRM – Crew Resource Management – and are particularly popular in the fields of safety [1-4]. In CRM, trainees are exposed to abnormal scenarios, and then participate in a debriefing sessions, which promotes awareness of communication problems in these circumstances. Some Japanese train companies have already conducted CRM training. However, the degree of improvement in performance through this training depends on the types of scenarios chosen; also, studies on how to conduct debriefings and how to evaluate their effectiveness have not been sufficiently conducted.

This paper therefore describes a set of scenarios selected to focus on communication between train dispatchers in abnormal situations, specific communication points to remember and a communication training method designed using these scenarios and points to remember. The effectiveness of this method was then evaluated.

2. Communication training method

2.1 Scenarios

The selected scenarios were composed of “communication procedures and actions taken by dispatchers” and “possible human errors” which occurred in one of the “abnormal situations” in Fig.1. The “abnormal situation” category and “communication procedures and actions taken by dispatchers” were drafted with reference to the train company’s rulebook. The “possible human errors” were extracted from references to previous research [5] and train accident data. As a result, about 300 “possible human error” patterns were extracted for 70 types of “abnormal situation”.

The scenario began with the presentation of an “instruction sheet” shown in Fig. 2 to trainees. An “instruction sheet” contained a description of the situation and instructions. The trainee read it to understand the situation and followed the instructions. This made it possible to conduct the training in a meeting room without large equipment, such as a simulator. Scenarios were combined to shorten the time of training. “Instruction sheets” included intentional omissions or incorrect information in order to create situations where errors occurred in communication, to check if the trainees could handle these situations appropriately.

2.2 Points to remember in terms of communication skills

Key points to remember in communication were listed for dispatchers to motivate trainees at the beginning of the training and as a tool to focus their attention after training or help them have the critical points in mind when reviewing their skills in ordinary working situations. We named it “points to remember in terms of communication skills”. The “points to remember in terms of communication skills” were also used to evaluate the effectiveness of the training.

Dispatcher communication errors were taken from a previous study [5] and classified into three categories of error patterns, shown in Tables 1 to 3 [1, 4, 6-10].

- Proper timing: 8 items
- Accurate information: 25 items
- Appropriate response: 12 items
2.3.1  Motivation at the introduction of training

Trainees were first given an introduction which explained what the training was for. They were then given the "points to remember in terms of communication skills" to read, and asked to rate each point by degree of importance, to enhance the effectiveness of the training. This rating process drew their attention to certain points they should be considering during the scenario training sessions and also gave them insight into the types of key points that would be discussed during the review session.

### 2.3.2  Scenario training session and review session

The second part of the training introduced participants to the abnormal situation scenarios. The roles of the trainees and the facilitator were as follows.

- The trainees took on the role of a traffic controller, a vice-chief traffic controller, a member of a vehicle dispatcher, and a train driver/conductor. Their positions were set similarly to those in an actual traffic control room.
- The facilitator explained the scenario and handed out the instruction sheets shown in Fig. 2 to trainees, and proceeded with the scenario according to

### Table 1  Example of “points to remember in terms of communication skills” for “proper timing”

<table>
<thead>
<tr>
<th>Points to remember</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>In an emergency, say the most important thing first.</td>
<td>1</td>
</tr>
<tr>
<td>Give instructions in a working sequence, not in a haphazard way.</td>
<td>2</td>
</tr>
<tr>
<td>When you can predict disruption of train services, coordinate with related staff before disruption actually occurs.</td>
<td>3</td>
</tr>
<tr>
<td>Instruct one by one as much as possible.</td>
<td>4</td>
</tr>
<tr>
<td>In an emergency, use a strong voice.</td>
<td>5</td>
</tr>
<tr>
<td>When you find hard-pressed dispatchers, offer your help.</td>
<td>6</td>
</tr>
</tbody>
</table>

The number of the right column corresponds to that in the following Fig.4

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![Crew and Vehicle Dispatcher 6](Fig. 2 Example of instruction sheet)

The dispatcher presented with this sheet is asked to purposely give the incorrect or incomplete information shown in red.

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![Scenario](Fig. 1 Framework of scenario)
Table 2  Example of “points to remember in terms of communication skills” for “accurate information”

<table>
<thead>
<tr>
<th>Points to remember</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t indicate an object only by using pronouns such as “that” or “this”, even when you think the indicated object is obvious.</td>
<td>7</td>
</tr>
<tr>
<td>Convey all information correctly even in an emergency.</td>
<td>8</td>
</tr>
<tr>
<td>Don’t use abbreviated and slang words because not everyone may know them.</td>
<td>9</td>
</tr>
<tr>
<td>Speak with the appropriate loudness of voice and check whether others can hear your voice.</td>
<td>10</td>
</tr>
<tr>
<td>When you refer to numbers, clarify the unit of measurement.</td>
<td>11</td>
</tr>
<tr>
<td>Talk face to face as much as possible.</td>
<td>12</td>
</tr>
<tr>
<td>Distinguish between asking and instructing.</td>
<td>13</td>
</tr>
<tr>
<td>Convey your intention clearly, even if it seems obvious.</td>
<td>14</td>
</tr>
<tr>
<td>Instruct what operators should do and by when.</td>
<td>15</td>
</tr>
<tr>
<td>In case of a sudden change, suitable instructions should be conveyed carefully and in detail.</td>
<td>16</td>
</tr>
<tr>
<td>Speak clearly from the other person’s perspective.</td>
<td>17</td>
</tr>
<tr>
<td>Ask for confirmation of understanding in case of ambiguity or if in doubt.</td>
<td>18</td>
</tr>
<tr>
<td>Repeat important information.</td>
<td>19</td>
</tr>
<tr>
<td>Pronounce each important word clearly.</td>
<td>20</td>
</tr>
<tr>
<td>Give advice rather than blame.</td>
<td>21</td>
</tr>
<tr>
<td>When you disagree or refute another’s opinion, give reasons why the opinion is wrong.</td>
<td>22</td>
</tr>
<tr>
<td>Even if you receive an easy question, don’t make fun of the questioner.</td>
<td>23</td>
</tr>
</tbody>
</table>

The number of the right column corresponds to that in the following Fig.4.

Table 3  Example of “points to remember in terms of communication skills” for “appropriate response”

<table>
<thead>
<tr>
<th>Points to remember</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeat back certainly when you receive directions or reports.</td>
<td>24</td>
</tr>
<tr>
<td>Listen to directions or reports until the end.</td>
<td>25</td>
</tr>
<tr>
<td>When you find a lack of information, confirm the information without imagination even if it is trivial.</td>
<td>26</td>
</tr>
</tbody>
</table>

The number of the right column corresponds to that in the following Fig.4.

The trainees had information about the abnormal situation through the instruction sheets, and had to think about what to do and what information to deliver by themselves. They then acted on their decisions.

The facilitator recorded the training session with video cameras and checked if the communication corresponded to the “points to remember in terms of communication skills.”

The trainees discussed what they noticed about their communication or ways to improve it, after watching the video recording of their performance.

The facilitator stimulated the discussion by presenting check points to the trainees.

2.3.3 Motivation after review session

After the review session, the trainees rated the “points to remember in terms of communication skills” by degree of importance again. This helps participants gradually understand the importance of each communication skill.
2.3.4 Review of the ordinary working situation and rating the degree of practice

One to two months after training, the trainees re-read the “points to remember in terms of communication skills” and were asked to evaluate their behavior in their day-to-day work, and rate the degree to which they applied the key points in practice.

2.3.5 Feedback of the training results

Trainees were then ultimately presented with the results of the training, as described above. This led them to consider what points they should be considering in their day-to-day work.

3. Confirmation of the effectiveness

3.1 Purpose & contents for the examination

The effectiveness of the proposed “training method of communication skills for train dispatchers in abnormal situations” for dispatchers in the field was evaluated, confirming the following 5 points:

- Training can be conducted on the basis of scenarios and guided by the use of “instruction sheets” in a meeting room without large devices such as simulators.
- The training sessions can be very short, held less than half a day, and composed of three parts, awareness raising, scenario session and a review session.
- The trainees discuss what they have noticed and what can be improved in terms of communication skills by watching the recording of the scenario session.
- The trainees recognize more the importance of communication skills, after the training.
- The trainees learn to pay attention to the “points to remember in terms of communication skills” in their daily work practices.

3.2 Examination method

3.2.1 Motivation and scenario training

The effectiveness of this training method was examined ten times from July to September in 2014, in a Japanese railway company. The training sessions from start to the review session lasted 2.5 hours including breaks. 40 train dispatchers took part in the training for the study and their roles were divided into the 4 roles shown in Table 5.

We prepared 10 scenarios which were summarized as follows; unexpected braking occurred and the train stopped, then after the dispatcher instructed the crew of the trains on the adjacent track to suspend their operation, a running gear inspection was conducted and finally suitable traffic arrangements were organized.

3.2.2 Review of the ordinary working situation

Dispatchers were asked to rate the degree to which they practiced the “points to remember in terms of communication skills” in October 2014, i.e., after 1-2 months after the training. They were given rating sheets via their workplace and the sheets which remained anonymous, were then collected. The number of responses was 106, equivalent to a collection rate of 99.1%. The data included responses from 30 dispatchers who took part in the training.

3.3 Results

It was confirmed that it was possible to proceed according to the scenarios by using “instruction sheets”. Results also confirmed that the training composed of the awareness raising and introduction, scenario training and review session could be conducted within 2.5 hours.

The review sessions included some statements which were not associated with “points to remember in terms of communication skills”, although 78% of all statements in review sessions were associated with them. This showed that the trainees easily stated their opinions about communication during the review sessions through the self-evaluation required at the introduction of the training.

Figure 4(a) shows the average rating scores of the degree of importance and that of practice of “points to remember in terms of communication skills” for the trainees before the training or non-participants, while Fig. 4(b) shows those for trainees after training. The scores of the trainees before the training or non-participants are widely distributed, although those for trainees converge towards the upper right side. This shows that the items for which the score was low before training improved considerably, while the items for which scores were already high before training did not improve significantly of the ceiling effect. Although not all points saw an improvement with significant difference in score there were no scores which fell with significant difference. In conclusion, it was felt that this training positively promoted awareness about communication skills.

<table>
<thead>
<tr>
<th>Role</th>
<th>An expected role behavior in training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispatcher A</td>
<td>Grasp the train situation and contact a staff D mainly</td>
</tr>
<tr>
<td>Dispatcher B</td>
<td>Grasp the train situation and contact dispatcher A and C for traffic control</td>
</tr>
<tr>
<td>Dispatcher C</td>
<td>Check to change a schedule of train crews or vehicles and contact staff D, dispatcher A and B for traffic control</td>
</tr>
<tr>
<td>Staff D</td>
<td>Give the information to dispatchers or vice-versa as a station stuff or a train crew</td>
</tr>
</tbody>
</table>
The effectiveness of this training method was then tested in scenarios which focused on communication between train dispatchers in abnormal situations. The training was based on certain points to remember in terms of communication skills. The training was conducted in a meeting room, simply by using instruction sheets, which instructed participants what to do, to raise, scenario training and a review session. Confirmation was also obtained from the post-training workplace survey, that the score given to the degree to which trainees put the “points to remember in terms of communication skills” into practice rose, in contrast to the score given by non-participants.

The next step in this study will be to consider how to train the training facilitator when the training program is rolled out in practice. Then, the long-term effects need to be investigated, because there is a possibility that some rating indices show no signs of improvement over a short period of time.

Fig. 4  Comparison of “points to remember in terms of communication skills” between before and after the training

4. Conclusion

This study describes the development of a training method to improve train dispatcher communication skills in abnormal situations. The training was based on certain scenarios which focused on communication between train dispatchers in abnormal situations, and included a list of “points to remember in terms of communication skills”. The effectiveness of this training method was then tested and confirmed. The results can be summarized as follows:

• The training was conducted in a meeting room, without the need for large equipment, such as a simulator, simply by using “instruction sheets” which instructed participants what to do, intentionally asking them to give insufficient or incorrect information to the other trainees in the aim of producing erroneous situations.
• The training was carried out within 2.5 hours and in three parts, namely introduction and awareness raising, scenario training and a review session.
• Confirmation was obtained that the degree of importance attached to the “points to remember in terms of communication skills” increased following the training, which encouraged exchange and discussion during the final review session.
• Confirmation was also obtained from the post-training workplace survey, that the score given to the degree to which trainees put the “points to remember in terms of communication skills” into practice rose, in contrast to the score given by non-trainees.

The next step in this study will be to consider how to train the training facilitator when the training program is rolled out in practice. Then, the long-term effects need to be investigated, because there is a possibility that some rating indices show no signs of improvement over a short period of time.

References


Authors

Naoki HATAKEYAMA, Dr. Eng.
Assistant Senior Researcher, Safety Analysis Laboratory, Human Science Division
Research Areas: Human Factors

Yasunori OKADA
Researcher, Safety Analysis Laboratory, Human Science Division
Research Areas: Social Psychology, Organizational Psychology

Kazunori HAYAMA
Assistant Senior Researcher, Safety Analysis Laboratory, Human Science Division
Research Areas: Human Factors

Toshiaki KABURAGI
Researcher, Safety Analysis Laboratory, Human Science Division
Research Areas: Safety Engineering

Yumeko MIYACHI, Dr. Eng.
Senior Chief Researcher, Laboratory Head, Safety Analysis Laboratory, Human Science Division
Research Areas: Applied Psychology, Management Engineering