Present Conditions and Challenges of Railway Facilities against Tsunami Disaster in Osaka Bay Area

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ABSTRACT

In Osaka bay area in Japan, several railways have been built along the coastline. The facilities of railway companies such as high station buildings and railway embankments are useful against tsunami disaster. In this study, to grasp the present conditions of railway facilities in Osaka bay area, the availability of those facilities against tsunami disaster by earthquake in the Nankai Trough was examined. Moreover, the countermeasures against tsunami disaster by railway companies were clarified.

KEY WORDS: Osaka bay area; railway facilities; countermeasure against tsunami; earthquake in the Nankai Trough

INTRODUCTION

Tsunami in the Tohoku region Pacific Ocean earthquake that occurred on March 11, 2011, exceeds the maximum height 20m and brought a big damage at coastal areas of Tohoku region. At soma bypass (whole length : 9km) which connects between Soma city and Shinchi town in Fukushima prefecture, the elevated highway with 1 km long like embankment road prevented inundation or and hindered tsunami rushing (MLIT, 2011a). The damaged bypass required to repair; however, it recovered early and contributed to transport relief supplies to affected area and take out debris disposal from there. At Sendai-tobu road, (whole length = 24.8 km) which runs through Sendai plain, it was also reported that tsunami and debris disposal was blocked due to embankment like structure. In this limited highway, the section between Sendai-Wakabayashi Exit and Natori Exit was used as elevated evacuation area for about 230 neighborhood residents (MLIT, 2011b).

Table 1. Summary of railway route

<table>
<thead>
<tr>
<th>line</th>
<th>Investigation zone</th>
<th>Line length (km)</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanshin Electric Railway Main line &amp; Namisu line</td>
<td>Kobe-Sannomiya Osaka-Namba</td>
<td>32.4</td>
<td>34</td>
</tr>
<tr>
<td>Nankai Electric Railway Main line</td>
<td>Namba Wakayamashi</td>
<td>64.2</td>
<td>41</td>
</tr>
<tr>
<td>JR West Hanwa line</td>
<td>Tennoji Wakayama</td>
<td>61.3</td>
<td>35</td>
</tr>
<tr>
<td>JR West Kisei line</td>
<td>Wakayama Kushimoto</td>
<td>162.4</td>
<td>40</td>
</tr>
</tbody>
</table>

Fig. 1. Study area