The Psychological Factors concerning Human Errors as the Cause of Labour Accidents in Japan

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1 Introduction

In order to prevent the accidents, human errors is one of the most important issues in the almost all industries, such as the construction, aviation, space, medical, nuclear, and so on. The proverb, “To err is human”, is widely recognized today, but human errors as the cause of accidents may be realized vaguely in many work fields. It is easy to say “Be careful!” or “Watch!” or “Caution!”, but these seem to be much more difficult to practice in real, and actual effect can not be almost expected. Therefore, it is important to develop the methods to grasp human errors concretely. And it is necessary to understand how human errors are related to the cause of the accidents and what type of errors has more influences to the accidents.

2 Procedures

In this study, the relations between the psychological factors which were related with human errors and the labour accidents were analysed.

Among many human factors, the major 13 factors, such as “unawareness”, “misconception”, “oversight”, “omission” and so on, were selected from the recent studies to analyse the accident cases. The analysed accident cases selected from the survey reports of labour accident were totalled 191 cases in mainly construction works that occurred in 2000 in Japan. The kinds of these accidents were distributed among; by the Construction-machineries, by the Cranes, by the Automobiles, by the Electrical shock, by the Loading and Unloading, by the Fallen object, and the Others.

The analysis of adequacy whether the selected psychological factors are identified as the main contributors to human errors that resulted in accident occurrences or not
was carried out based on the thorough reading on accident situation in descriptions of survey reports. It was difficult to identify the factors, because the survey reports attached importance to the violation and responsibility of the persons or companies concerned, and there were little information about mental perspective of the workers. Therefore, the identification was made through two ways; on the one hand these factors were identified with certainty, since the psychological factors as the cause of the accident were obvious from the description of the reports. On the other hand they were with supposition, since the descriptions about the psychological factors were not clear, but these factors seemed to be concerned with the accidents. It was seldom that the cause or the factor of an accident was just a single, so that at most four certainty-factors and at most four supposition-factors (totally at most eight factors) were extracted from each accident case.

3 Results

From the result of analysis, 80 out of 191 cases (41.9%) were identified to be the accidents which were connected to the psychological factor(s).

3.1 Psychological factors as the cause of the accidents

The analysis based on the descriptions of the accident investigation reports showed that human errors and related psychological factors were the vital important cause of the accidents. It was also found that some factors cited larger percentage (see Figure 1).

The factor "unawareness" was found in the description of the survey reports comparatively frequently, and it was identified easily. The concept of the risk perception was widely interpreted, so this factor was also applied in the case that the worker did not take account of the possibility of the accidents. Therefore, this factor was found by 72.5% of the 80 identified cases and showed the large percentage compared with other factors.

The factor "misconception" (47.5%) and "omission" (38.8%) were easily supposed from the descriptions in the survey reports. Some behaviors such as "doing mistakes" and "operation mistakes" were often judged to be "misconception". On the other hand, it was difficult to distinguish whether the worker intentionally omitted his procedure though he knew a correct way to operate, he did not correctly recognize the risk of his work and was convinced that it was safe, or the worker happened to forget safer procedure. About the factor "misconception", it was difficult to understand what and how the worker was convinced from the description of the survey report.

The factor "biased attention" (37.5%) and "attentional loss/gain" (25.0%) were closely related. The worker who was not able to obtain risk information was often in the accident. If the risk of his work has been announced beforehand, the worker might have been able to pay attention. That is, these factors tend to relate the communication and risk management on site.

The factor "haste/impatience/panic" (27.5%) seemed to relate closely to the factor "mental workload". However there was little description in the survey reports, the relation between these factors were just supposed.