

Assessment of Time-variant Work Stress for Human Error Prevention

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Abstract : For an operator in a nuclear power plant, human error is one of the most dreaded factors that may result in unexpected accidents. The possibility of human errors may be low, but the risk of them would be unimaginably enormous. Thus, for accident prevention, it is quite indispensable to analyze the influence of any factors which may raise the possibility of human errors. During the past decades, not a few research results showed that performance of human operators may vary over time due to lots of factors. Among them, stress is known to be an indirect factor that may cause human errors and result in mental illness. Until now, not a few assessment tools have been developed to assess stress level of human workers. However, it still is questionable to utilize them for human performance anticipation which is related with human error possibility, because they were mainly developed from the viewpoint of mental health rather than industrial safety. Stress level of a person may go up or down with work time. In that sense, if they would be applicable in the safety aspect, they should be able to assess the variation resulted from work time at least. Therefore, this study aimed to compare their applicability for safety purpose. More than 10 kinds of work stress tools were analyzed with reference to assessment items, assessment and analysis methods, and follow-up measures which are known to close related factors with work stress. The results showed that most tools mainly focused their weights on some common organizational factors such as demands, supports, and relationships, in sequence. Their weights were broadly similar. However, they failed to recommend practical solutions. Instead, they merely advised to set up overall counterplans in PDCA cycle or risk management activities which would be far from practical human error prevention. Thus, it was concluded that application of stress assessment tools mainly developed for mental health seemed to be impractical for safety purpose with respect to human performance anticipation, and that development of a new assessment tools would be inevitable if anyone wants to assess stress level in the aspect of human performance variation and accident prevention. As a consequence, as practical counterplans, this study proposed a new scheme for assessment of work stress level of a human operator that may vary over work time which is closely related with the possibility of human errors.

Keywords : human error, human performance, work stress, assessment tool, time-variant, accident prevention

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