Accident Sequence Precursor Analyses of Taiwan Nuclear Power Plants

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Abstract: Since the Reactor Safety Report (WASH-1400) was published in the United States in 1975, the technology and application of Probabilistic Risk Assessment (PRA) have been developed in many countries for over twenty years. Accident Sequence Precursor (ASP) analysis is one of the important applications of PRA techniques. The ASP program was established by the U.S. Nuclear Regulatory Commission (NRC) in 1979. This program systematically evaluates U.S. nuclear plant operating experience to identify, document and rank those operating events that were most likely to lead to inadequate core cooling and severe core damage, if additional failures had occurred. The primary objective of this study is trying to establish indigenous ASP analysis procedures in Taiwan by referring the methodologies developed by NRC. The Report Event Reports (RER) and other operational event documentation of domestic nuclear power plants (NPP) were examined to determine the impact that operational events have on potential core damage sequences. Events determined to be potentially significant were then be subjected to a thorough and detailed analysis. This analysis was intended to identify those events considered to be precursors to potential severe core damage accidents. Quantification of ASP significance was performed by using a domestically developed tool with name of "PRiSE". The resulted conditional core damage probabilities (CCDP) were used to check the importance of ASPs.

Keywords: Accident Sequence Precursor (ASP), Probabilistic Risk Assessment (PRA), Conditional Core Damage Probability (CCDP), Nuclear Power Safety

1. Introduction

Since the Reactor Safety Report (WASH-1400) was published in the United States in 1975, the technology and application of Probabilistic Risk Assessment (PRA) have been developed in many countries for over twenty years. Accident Sequence Precursor (ASP) analysis is one of the important applications of PRA techniques. On behalf of the Office

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