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Track 1: Plant Operations and Maintenance

**A Study of Adopting Maintenance Rule under the Periodic Safety Review and Reliability
Centered Maintenance Program**

Kilyoo Kim (1)

(1) Integrated Safety Assessment Team, Korea Atomic Energy Research Institute, Yusung P.O. Box 105,
Taejon, South Korea, E-mail: kykim@kaeri.re.kr

Summary

U.S Maintenance Rule (MR) has three main functions. One is to monitor the performance changes of SSCs (Structure, System, and Component) caused by risk informed applications. The another positive function of MR is to eagerly collect data about the MR SSCs. The other function is to assess and manage risk before maintenance activities. These three functions all are necessary functions for risk-informed regulation.

Periodic Safety Review (PSR) program is widely adopted in Europe while it is not adopted in U. S. A where MR and new oversight program are instead used. Recently, in Korea, it was determined to adopt PSR, and the first PSR program has started this year for Kori unit 1 as a pilot plant.

Also, a traditional Reliability Centered Maintenance (RCM) has been performed for 4 systems of YGN unit 1 & 2 and it will be applied to the other nuclear power plants in Korea. However, since MR is adopting many useful concept of RCM, traditional RCM could not be further performed without being associated with MR.

Thus, MR, RCM and PSR have recently become hot issue policies which should be well associated each other in Korea, and this paper suggests a desirable new maintenance process which would embrace the concepts of the three policies, and also discusses whether U.S. MR is necessary even though a PSR program is already adopted, and if necessary, then how cost-effectively it can be introduced to.

If PSR is already adopted, then it is not necessary to apply MR for the broader scope of SSC as currently adopted in USA. Instead, a stepwise approach would be more cost-effective to decide the MR

scope. The first step would be to apply MR only for the SSCs whose risk related characters are changed by risk-informed applications. For example, if the AOT and STI of RPS/ESFAS were relaxed , then RPS/ESFAS belongs to MR scope. The more risk-informed applications are approved by the regulatory body, the more SSCs are included in MR scope. The second step would be to apply MR only for the risk significant SSCs which are modeled in PSA. The third possible MR scope would be the SSCs for which RCM was performed. The fourth possible MR scope would be aged SSCs which were really concerned during PSR, and so on.