

정비규정의 국내 원전 적용 첫 타당성 연구
**The First Feasibility Study of Maintenance Rule Application in
Korean NPP**

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요약

국내 영광 3,4 호기 비상디젤발전기를 미국 정비 규정에 맞게 운영할 수 있는지를 검토하여 보았다. 영광 3,4호기 비상디젤발전기는 Risk Significant 계통으로 신뢰도는 0.95, 정비이용불능도는 0.006의 성능기준을 설정하였다. 또, 신뢰도 값에서의 Trigger 값은 NUMARC 87-00의 값을 사용하여도 별 무리가 없으며 정비이용불능도에서는 1차 Trigger 값을 성능 기준치의 75%인 0.0045로 정하였다. 연구 결과 영광 3,4 호기는 미국 정비 규정으로 충분히 운영할 수 있음을 밝혔고 어떻게 정비 규정을 이행해야 할 것인지 제시하였다.

Abstract

U.S. Maintenance Rule (MRule), which was effective July 1996 in U.S.A., was not officially adopted in Korea by Korean nuclear regulatory agency. However, since many Probabilistic Safety Assessments and Individual Plant Examinations(IPE) have been performed for Korean Nuclear Power Plants (NPPs), the philosophy and usefulness of the MRule as well as performance-based regulation are being acceptable. The first feasibility study to apply U.S. MRule to Korea NPPs was performed at YGN 3,4 Emergency Diesel Generator (EDG). The MRule was applied to the EDG of YGN 3,4 with the following NUMARC 93-01 procedure. Since the Station Blackout (SBO) accident is an important accident sequence in the NPPs risk point of view and the reliability of EDG plays very important role in the SBO accident, the SDG should be one of risk significant SSCs which should be under MRule. The reliability 0.95 of EDG was selected as a performance criterion according to USA SBO rule. Unavailability 0.006 was selected as another performance criterion reflecting IPE data. Also, trigger values were selected for reliability and availability, respectively. Actual performance values were compared with the performance criteria. If the performance is not good, then the EDG is moved from MRule (a)(2) to (a)(1) items. The performance of the EDG in (a)(1) should be monitored to keep the performance goals. The MRule approach can be smoothly applied to the test and maintenance of EDG of YGN 3,4. The corrective action recommended in NUMARC 87-00 can be well used as a corrective action in (a)(1) of MRule.