

Effectiveness evaluation of the internal OE process change in KHNP

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1. Introduction

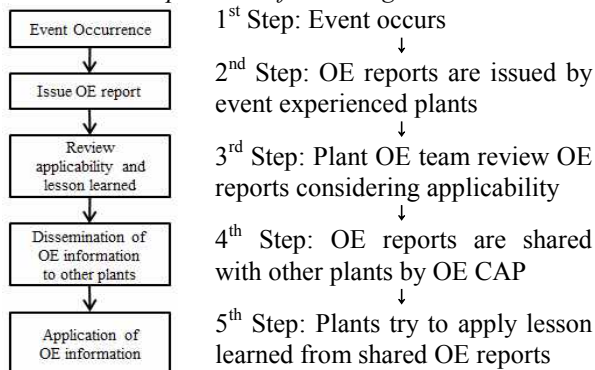
Operating Experience (OE) is effective and valuable source of information for improving the safety and reliability of nuclear power plants. It is essential to collect OE information in a systematic way based on the IAEA[1], WANO[2] and INPO[3] guidelines. KHNP, operating organization in Korea also adopts and is operating OE program and feedback process which are based on WANO recommendation[4] to meet IAEA safety standards[5]. KHNP has adopted significance criteria to strengthen screening process of internal OE program from April, 2017.

In this paper we review the changes of OE trends before and after adopting significance criteria in internal OE process. We compare the status of issuance number of OE reports, OE CAP and practical application rate of OE information during the specified period. We conclude this paper by evaluating effectiveness and meaning of these changes.

2. Change of internal OE process in KHNP

In this section change of the internal OE process in KHNP is described. Main change is application of selective dissemination of OE information according to the significance level. Significance levels for internal OE in KHNP are divided into 4 as 'Reported event for regulatory body', 'Event for 1 grade of CAP', 'E&I' (Event and Issue) and 'General level'. Among them, operating experience reports or information which significant level is 'Reported event for regulatory body' or 'Event for 1 grade of CAP' should be disseminated to other plants mandatorily.

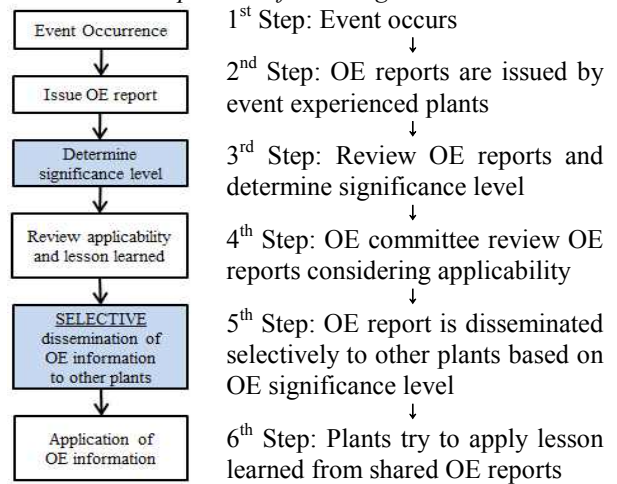
2.1 Internal OE process before change



Above work flow chart shows internal OE process before adopting significance criteria. According to this

process, almost all OE reports are disseminated to other plants by OE CAP without the classification of significant level. This causes the tendency of cheapening OE information as well as work burden to the plants workers who should complete OE CAP.

2.2 Internal OE process after change

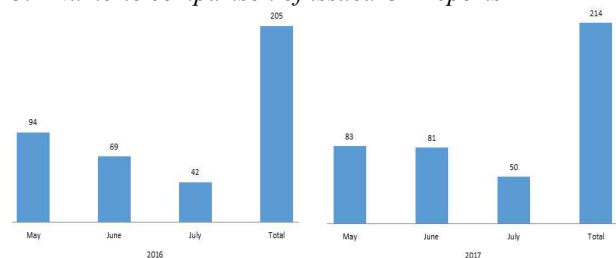


Above work flow chart shows changed internal OE process. Main difference compare with previous OE process is selective dissemination of OE reports to other plants based on OE significance level. Benefits of this change are dissemination of important and applicable OE information. Changed process also reduces the work load of plant employees for completing OE CAP.

3. Numerical trend changes of internal OE process

Changed process was applied to KONIS (KHNP Nuclear Information System – KHNP's OE reports management system) from middle of April, 2017. So we analyzed OE information data and compared the change for same duration before and after process change - 3 months: From May to July in 2016 & 2017.

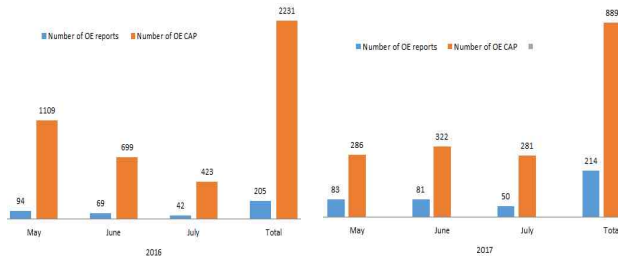
3.1 Numeric comparison of issued OE reports



< Fig. 1. Number of OE reports in 2016 / 2017 >

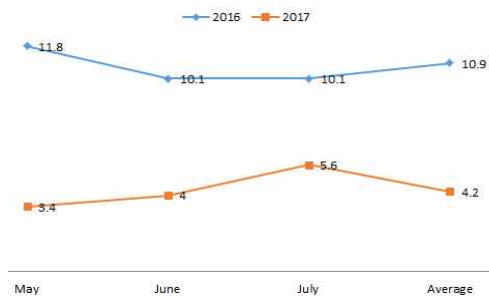
During the 3 months from May to July in 2016, 205 OE reports were issued and during the same periods in 2017, 214 OE reports were issued on KONIS system. The number of issued OE reports is increased by 4.4% in 2017 compare with in 2016.

3.2 Numeric comparison of issued OE CAP



< Fig. 2. Number of OE reports & CAP in 2016 / 2017 >

As mentioned in section 3.1 total number of OE reports was increased by 4.4% in 2017. However total issued number of OE CAP was rapidly decreased from 2231 to 889. The number OE CAP decreased by 60% in 2017 compared with in 2016.

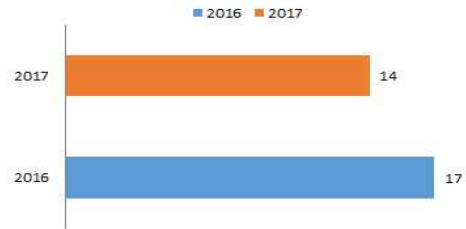


< Fig. 3. Average number of OE CAP per one OE report >

As mentioned in section 3.1 total number of OE reports was increased by 4.4% in 2017. However total issued number of OE CAP was rapidly decreased from 2231 to 889. The number OE CAP decreased by 60% in 2017 compared with in 2016. Average issuance number of CAP per one OE report dramatically decrease from 10.9 to 4.2. The main cause of this rapid decrease is selective dissemination of OE information to other plants based on the significance level.

3.3 Numeric comparison of practical application rate

Practical application rate means quantitative rate of practically adopted lessons from OE information by means of revision of plant procedure, improvement of maintenance methods and inspection or improvement of components in plants. Large portions of application methods of OE information are training employees or non-applied OE information due to the different reactor type and facilities. Due to these reasons, practical application rate is one of the important standards to evaluate how the OE information was well used in other plants.



< Fig. 4. Practical application rate of OE reports >

According to the results analysis report of practical usage of OE reports which were issued by KHNP head office indicates that practical application rate of the first half year in 2016 was 17% and 14% in 2017. This is opposite result of our expectation. The reason of this result must be that we do not consider the time delay of the application with the issuance of the OE report.

4. Conclusions

By adopting the significance criteria in internal OE process in KHNP, average issuance number of the OE CAP per one OE report was decreased by 60%. This numerical value has important meaning that more important OE reports are selectively dismissed to the plants, so site staffs can focus on more important OE information. In long-term point of view, this could reduce the work load of the workers in plants as well as the improvement of effectiveness of internal OE process.

We expect that practical application rate of internal OE reports will increase slightly. However the result does not meet our expectation, because we do not consider the time delay of the application of OE report.

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