

A Comparative Study on the Quality of Domestic and Overseas Nuclear Power OE Reports: Focusing on Quality Factors

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1. Introduction

During the operation of nuclear power plants, problems and areas requiring improvement are identified and systematically managed through an e-Corrective Action Program (e-CAP). Root causes of operational issues and necessary enhancements discovered via the e-CAP are analyzed, followed by corrective actions. Based on this process, operational experience reports are compiled into the KHNP Nuclear Information System (KONIS), selectively shared with domestic nuclear power plants and the World Association of Nuclear Operators (WANO), enabling global exchange of technical insights among nuclear operators. This study examines the WANO Quality Assessment Indexes of domestic and international Operating Experience (OE) Reports from 2025, analyzes high-scoring ones, and proposes guidelines for effective reporting practices.[1]

2. Methods and Results

The Operating Experience Report comprises Summary, Description, Consequences, Analysis/Comments, Corrective Actions, Attachments and Coded fields. To ensure proper OE Report preparation, WANO provides guidelines, templates, and examples. The WANO Operating Experience Central Team (OECT) evaluates all submitted OE Reports against four Quality Factors. Four Quality Factors are Acronyms, Cause, Consequences, and Event Easily Understood. And OECT assigns scores based on predefined standards. Each item is scored from 0 to 4 points, with a maximum total of 16 points. These evaluations are stored in a dedicated database system, enabling information sharing among member organizations, while also offering feedback on assessments. In this study, we examine the Quality Factors of domestic Nuclear Power Plant OE Reports submitted to WANO in 2025 as well as those from Overseas Nuclear Power Plants, analyze high-quality reports, and propose guidelines that can be referenced when preparing such reports.

2.1 OE Reports of Domestic Nuclear Power Plants

In 2025, a total of 1,966 domestic OE Reports were prepared, and among them, 210 OE Reports were submitted to WANO. The scores for the four Quality Factors of these reports were reviewed, and the analysis

was divided into three categories—high, medium, and low—based on report Quality scores. The high range is 15~16 scores, the medium range is 12~14 scores, and the low range is 10~11 scores. Most OE Reports fell in the medium category, with a share rate of 93.8%.



Fig 1. Quality Evaluation Distribution of Domestic OE Reports

Reports with high WANO Quality Evaluation Indices accounted for 1%, and they were thoroughly prepared according to all four elements of the WANO specified report Quality criteria:

- ① Acronyms were not used or used only minimally.
- ② The Direct cause and Root/Apparent causes were clearly described.
- ③ Results were explicitly defined, with additional descriptions of both actual and potential impacts.
- ④ In terms of Event Easily Understood, the OE Reports were written concisely without unnecessary details to facilitate easy comprehension of event content. In contrast, low-quality OE Reports accounted for 5%.
 - ① The use of Acronyms made it difficult to understand the events.
 - ② Direct causes and Root/Apparent causes were sufficiently described.
 - ③ Results were described adequately.
 - ④ Although the overall event was understandable, some information was conflicting or missing.

2.2 OE Reports of Overseas Nuclear Power Plants

A total of 4,700 overseas OE Reports were written in 2025, and the scores for 4 Quality Factors of these reports were examined. The analysis was divided into three categories based on report quality element scores:

high (15~16 scores), medium (12~14 scores), and low (6~11 scores). Similar to domestic OE Reports, most overseas OE Reports fell in the medium range with an occupancy rate of 91.5%. The occupancy rate for reports with a high WANO quality evaluation index was 2.9%, indicating that these were thoroughly prepared according to the four report quality elements outlined by WANO.

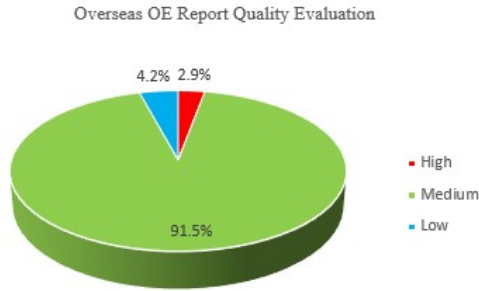


Fig 2. Quality Evaluation Distribution of Overseas OE Reports

When examining the characteristics of the Quality Factor for overseas OE Reports, it was found that the number and occupancy rate of 16 scored reports were higher than those of domestic reports. Moreover, there is a noticeable difference among regional centers in terms of the distribution of 16 scores. Currently, WANO operates 4 regional centers, with nuclear power plant operators joining under each center's jurisdiction. One particular regional center accounted for 83.7% of 16 scored reports, while another had not received any 16 score at all. This highlights a clear difference in report quality among the regional centers.

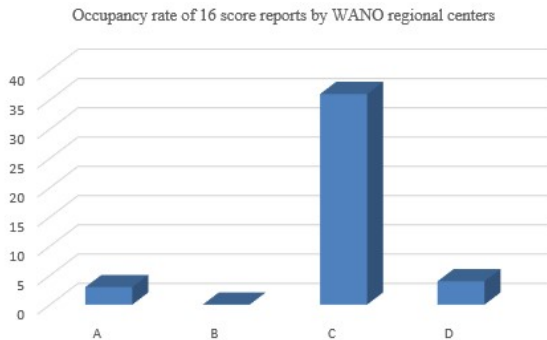


Fig 3. Occupancy rate of 16 score reports by WANO regional centers

2.3 Comparative Study on the Quality of OE Reports

A quality comparison was conducted between domestic and overseas OE Reports submitted to WANO in 2025, focusing on the four report Quality Factors. The four Quality Factors are Acronyms, Cause, Consequences, and Event Easily Understood with evaluations performed by the WANO OECT. OE Reports were similarly categorized into high, medium, and low ranges based on their scores for these Quality Factors. The quality evaluation results of domestic OE

Reports are shown in Figure 1, while those of overseas OE Reports are presented in Figure 2. Both domestic and overseas OE Reports show over 90% occupancy in the medium range, indicating that most reports meet a standard or better level of writing. In the high range, there is a noticeable difference between domestic and overseas OE Report numbers and occupancy rates. It can be observed that overseas OE Reports are generally written to fulfill all four Quality Factors outlined by WANO at an adequate level. However, for domestic OE Reports, the number and occupancy rate in the high range are relatively low, suggesting that improvements may be necessary to meet WANO's evaluation criteria more fully. In the low range, the occupancy rates of both domestic and overseas OE Reports are similar. Nevertheless, when examining the actual scores, the lowest score among domestic OE Reports is 10 points, while a significant number of overseas OE Reports were scored below 10 points. This indicates that despite the higher volume of overseas OE Reports, some have relatively low quality levels as well.

3. Conclusions

This study conducted a comparative analysis of the quality of domestic and overseas OE Reports written in 2025, focusing on four report Quality Factors. Both domestic and overseas OE Reports showed over 90% occupancy in the medium range, indicating that most reports were written at an average or better level. While comparing the quality between domestic and overseas OE Reports, it became evident that efforts to improve the quality of domestic OE Reports are necessary. The evaluation criteria for the four Quality Factors outlined by WANO must be thoroughly analyzed and applied to ensure compliance with required standards. To enhance the quality of domestic OE Reports, the report writing interface in KONIS was revised in August 2025. This improvement aimed to enable clear and concise reporting of event descriptions, root cause analysis, corrective actions, and other elements according to WANO's guidelines for report preparation[2]. It is also important to identify and analyze high-quality overseas OE Reports as best practices and incorporate these insights into the domestic reporting process.

REFERENCES

- [1] WORLD ASSOCIATION OF NUCLEAR OPERATORS, MN 01 Rev.12 Operating Experience, WANO, London, 2025.
- [2] WORLD ASSOCIATION OF NUCLEAR OPERATORS, Guidelines for Operating Experience at Nuclear Power Plants, WANO, London, 2003.