Development of Environmental Qualification Component List Web-based Database for Wolsong Nuclear Power Plant Unit 1

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1. Introduction

Fundamental to the safe operation of commercial nuclear plants and to the protection of public health and safety through regulation is the need to ensure that safety systems and equipment can perform their intended functions during normal operation, earthquakes, and postulated accidents. Demonstration that safety systems and equipment can perform as required is called "Environment qualification" (EQ), which is applied to electrical and mechanical equipment.

The Wolsong Nuclear Power Plant (NPP) Unit 1 has been operated since 1983. It is also prospected continued operation after design life time. The EQ would be required as a mandatory procedure for that. "Wolsong NPP Unit 1 Environmental Qualification Phase Ⅰ" project is going on by Korea Electric Power Research Institute (KEPRI). This web database site is established for this project and it will be used for Wolsong NPP Unit 1 EQ maintenance program.

2. Web Database Establishment

The Uniform Resource Locator (URL) of this web site is "http://eqms.khnp.re.kr/ws1". The hardware for this system is Compaq Pentium IV 2.0 GHz and well-known software such as Windows 2000 Server, IIS, SQL Server 2000, and Namo Deepserch4 are employed. DHTML, JavaScript, ASP, Crystal reports, and Macromedia Visual Studio are also used as development tools.

2.1 Web Database Structure

The main menu of this site is composed of EQCL, EQ System, SCEW, Cable, Environment Condition, Data, and Board (Figure 1). The EQCL is divided by 4 menus - EQ component, non-metal parts, status of component list, and qualification method.

2.2 EQCL Menu

EQCL contains Tag number, BSI, Name of Equipment, Type, Environmental Condition, Manufacturer, Model number, Installed Room number, and Applied Design Basis Accident (DBA). Figure 2 shows the EQCL page. We can see more detail information if we just click any equipment name (Figure 3). Equipment grouping can be done by

searching with its own database index which is referred to table title.

Figure 1. The main page of the web database site.

Figure 2. The EQCL page

Figure 3. A sample of EQCL detail information

2.3 EQ System Menu

EQ System Menu is made for the point of view from system wised list. It shows the list of system code, system name, P&ID, safety related function, safety effect, post accident monitoring function, etc (Figure 4).

Figure 4. The EQ system Menu page

2.4 SCEW Menu

SCEW Menu is built for showing the system function evaluation report. It represents the information of equipment and plant specific environment and qualification method (Figure 5).

Figure 5. A sample of the SCEW

2.5 Environment Condition Menu

Environment Condition Menu is made for showing the room-wised environment condition. It represents condition decision parameter and predicted value. We can also see the temperature and pressure envelope curve for the applied DBA.

3. Database table structure

Figure 7 shows hierarchy structure and relationship between the database tables. Each table has its own index which is searched for grouping list.

Figure 6. A sample of the Environment Condition

Figure 7. Structure of the database table

4. Conclusion

The web database for EQCL is established for Wolsong NPP unit 1 EQ maintenance program. The Uniform Resource Locator (URL) of this web site is http://eqms.khnp.re.kr/ws1 and the main menu of this site is composed of EQCL, EQ System, SCEW, Cable, Environment Condition, Data, and Board. This web based database will be applicable to Wolsong NPP Unit 1 EQ maintenance program.

REFERENCES

1. EPRI TR-100516 : "Equipment Qualification Reference Manual" 1992.