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The Establishment of the On-Line Real Time ERM System

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1. Introduction

An environmental radiation monitoring (ERM) process has been accomplished from the nuclear safety aspect by tracing the environmental changes due to the operation of a nuclear installation all over the world [1-3]. Korea Atomic Energy Research Institute (KAERI) has three research reactors in Daejeon and Seoul as seen in Figure. 1. It has a statutory obligation by the Atomic Energy Act to monitor the environmental radiation around them [4]. It has established the continuous monitoring system for environmental radiation to meet this obligation [5, 6]. The system gives real time environmental radiation data from the research reactors where are remotely placed each other. As a result, KAERI has carried out a comprehensive system for monitoring the environmental radiation in the research reactors of Korea.

Figure. 1. The research reactors in Korea

2. The Constitution of the ERM Network

Daejeon and Seoul sites have, respectively, seven and three monitoring posts with their radiation measurement instrument. Those posts transmit the measured data to a main computer placed in Daejeon. The method of data transmission depends upon a few factors such as a distance and communication compatibility. First of all, in Daejeon site, a radio communication method with the radiofrequency of 468.8 MHz is used between the main computer and 6 posts of the inside of Daejeon research reactor site. A general telephone communication method by dial modem is applied between the main computer and a comparison point with 1 post of the outside of Daejeon research reactor site. In Seoul sites, a null modem communication method is employed between a sub computer and 3 posts of the inside of Seoul research reactor site, and a high speed communication network such as ADSL is used between the sub computer in Seoul site and the main computer in Daejeon site. Consequently, the real time data from total 10 places are on-line displayed in the screen. Figure. 2 shows a schematic of the integrated on-line ERM system for the environmental radiation around the research reactors. On the other hand, environmental radiation data are collected to a database of the main computer and statistically treated and regularly reported to the authority. Statistics includes minutely, hourly, monthly and yearly averages, and corresponding minimum and maximum values as seen in Figure. 3.

3. Conclusion

The establishment of the continuous on-line monitoring system for the environmental radiation will assure that the information flow between the monitoring agency and agencies which are in charge of the evaluation of the situation will be consistent and complete for introducing measures suitable to the situation.

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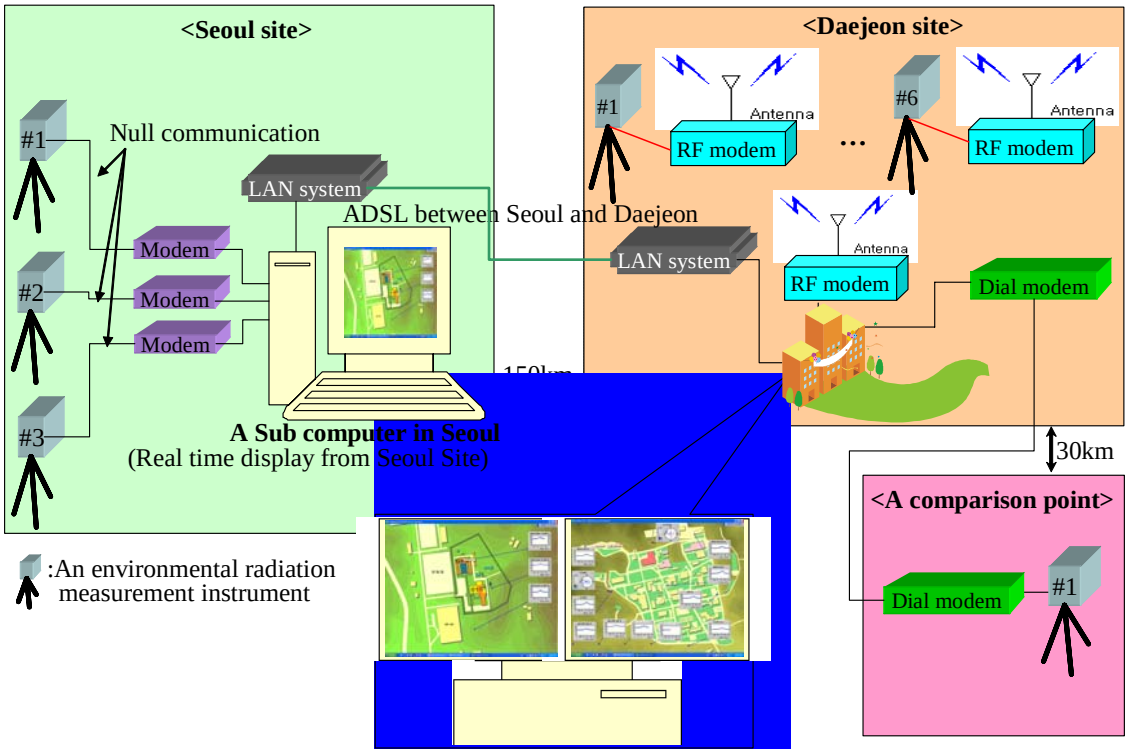

Figure. 2. The Integrated on-line monitoring system for the environmental radiation around the research reactors

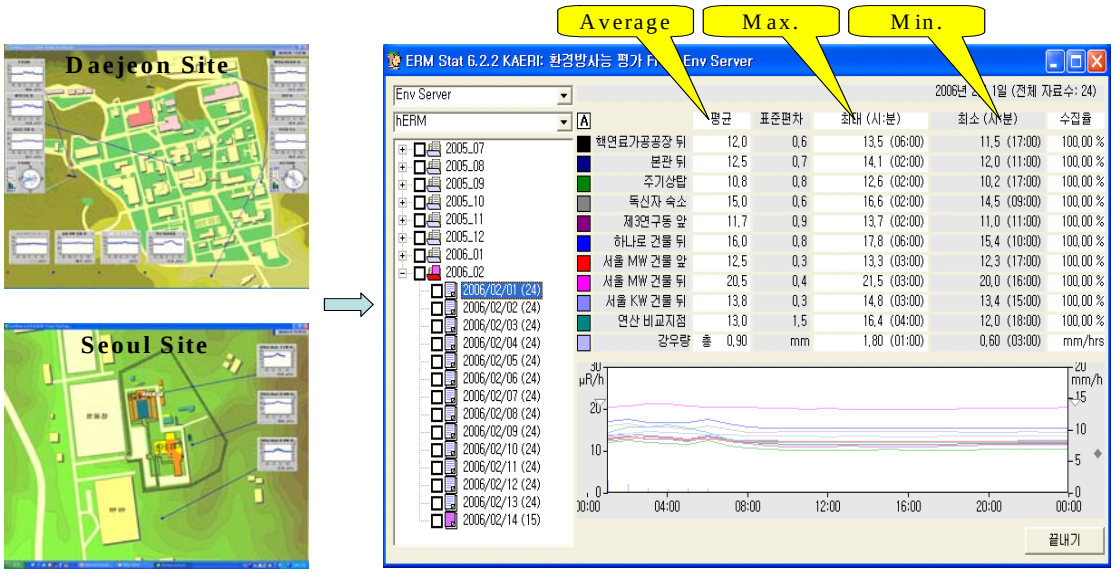

Figure. 3. The statistics for the collected environmental radiation data