

A Study on the Leakage Diagnosis Method for Preventing Leakage of Plant Facilities

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Recently, the importance of leak detection of facilities and piping systems of Korean power plants is emphasized as the facilities and pipes of the power plant are more than 20 years old. Acoustic and vibration sensors can monitor leakage remotely, and can be used as leakage detection sensors. However, in case of a power plant, lots of machinery is installed and continuously operated without a break. The measured signals obtained from the sensors may contain background noise and machinery noise components as well as a leakage signal component. In order to improve the reliability of leak monitoring and diagnosis, it is very important to develop a technique capable of efficiently extracting leak components from sensor signals measured in the field. Korea Atomic Energy Research Institute (KAERI) is continuously conducting research to monitor and diagnose leaks in plant facilities and piping. The objective of this research is to develop a leak feature extraction technique that can detect leakage components effectively in a noisy environment. For this purpose, a leak feature extraction algorithm is developed by applying time-frequency analysis of the measured signal. The validity of the developed technique is verified by experiments. The experimental results demonstrate that even in a noisy environment, the proposed technique can provide more reliable means for detection of leak.