



Safety evaluation method of ground subsidence using the image data

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Recently, there have been many studies on the safety evaluation method of important facilities due to natural disasters (caused by earthquakes, volcanoes, typhoons etc.) and artificial disasters (caused by poor construction, insufficient maintenance etc.). In particular, research should be conducted on safety assessment methods at higher levels than those of nuclear facilities. In addition, since nuclear facilities have limited access during operation, it is difficult to evaluate the stability of the ground subsidence. To overcome these problems, it is necessary to study the stability evaluation technique using image data. In this study, we propose a technique that can evaluate the stability of facilities by collecting image data for a specific range of nuclear facilities and analyzing settlement amount of the ground in the short term and long term.

Image data that can be used for ground settlement analysis include GPS data, 30m GDEM data, SAR data and optical data. These image data can be obtained free of charge both domestically and abroad. Recently, since the image data can be easily acquired using the drone, the stability evaluation technique is highly utilized. In this study, the settlement amount of the surrounding ground is calculated primarily using image data. It can be said that there is a possibility of subsidence when the calculated result value is a negative value. As a result of analyzing the displacement amount of the facility secondarily using the settlement calculation result, there was a case that the displacement amount was high at a specific position. The reliability of the evaluation technique should be verified by comparing the image data analysis results with the actual measurement values. In addition, it is necessary to present the results of the facility stability evaluation according to the analysis result as a risk grade.

The facility safety assessment method proposed in this study can be applied not only to nuclear facilities but also to the stability evaluation of important facilities such as radioactive waste repositories. It is also expected that this evaluation technique will be useful for long-term ground subsidence risk assessment before, during and after construction step of important facilities.

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