Joint Research on the Application/Utilization of X-Band MP Radar Data		
Year of Research	2012・2013	Implementation of anti-inundation measures

(Purpose)

The X-band MP radar can acquire rainfall data with higher accuracy and resolution than conventional rainfall radars and is thus expected to be utilized for higher-precision precipitation/inflow forecasts and a wide range of other applications. We conducted a questionnaire survey with local governments regarding the use of X-band MP radar data made available on the website of the Ministry of Land, Infrastructure, Transport and Tourism. The result revealed that while 60% of the local governments responded that they were using image data, a much smaller percentage was using numerical data. On the other hand, 95% of the governments said that they were in need of numerical data.

In light of the above, this study was conducted for the purpose of promoting the use of rainfall information captured by the X-band MP radar in the sewage sector by providing information on its main applications, operating procedures, important points, etc.

(Results)

We decided to compile a technical document describing X-band MP radar according to the flow of information, and organized the following:

(1) Outline of X-Band MP Radar and its Data

We sorted out the descriptions of X-band MP radar, including its functions, operating principles, characteristics, contents of transmitted information, and data management method.

(2) Data Search and Extraction

Due to its data structure, it is not easy to randomly extract rainfall data on an arbitrary mesh from the currently distributed information. Thus, we decided to show an example of extraction method in the technical document.

(3) Data Calibration and Compensation

X-band MP radar data is highly accurate but not to the extent to exactly match the measurements of actual rain gauges. For this reason, we organized the methods to calibrate the radar using a ground rain gauge and compensate for missing data.

(4) Application to Rainfall-Runoff Analysis

We sorted out matters related to the improvement of calibration accuracy when using rainfall data generated by X-band MP radar in rainfall-runoff analyses. In addition, we proposed ways to utilize past data in: (i) formulation of rainwater plans against localized torrential downpour, (ii) development and design of effective hardware projects, and (iii) scenario analyses on the operations of sewage facilities; and stated that (i) improvement of forecast accuracy and (ii) expansion of applications due to accumulated data, could be expected in real-time analyses.

(5) Application to Knowledge Analysis

Adding X-band MP radar information to knowledge data will enable a detailed knowledge analysis that takes into account the correlation to rainfall. We organized its various uses into: (i) analysis of rainfall patterns, (ii) inundation analysis, (iii) analysis of untreated discharge, (iv) application to equipment operations, (v) increase of consistency probability of forecasts, and (vi) analysis of infiltrated water during rain.

(Future subject)

During FY 2012, we sorted out matters related to the primary use of X-band MP radar. In FY 2013, we plan to sort out its secondary use and new applications and compile the outcome in a technical document.

※ Original Engineering Consultants Co., Ltd., Chuo Sekkei Engineering, Tokyo Engineering Consultants Co., Ltd., Toshiba Corporation, Nihon Suido Consultants Co., Ltd., NEWJEC Inc., Nakanihon Engineering Consultants Co., Ltd., Nippon Jogesuido Sekkei Co., Ltd., Mitsubishi Electric Corporation, METAWATER Co., Ltd., Japan Institute of Wastewater Engineering and Technology

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