

## PSIV-9 RECENT SOME TYPICAL EXAMPLES IN THE FIELD OF SURVEYING

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### 1. Introduction

Recently in addition to remote sensing techniques, the computer-aided Geo-information system( GIS ) and computer-aided design( CAD ) have been recognized to be effective and utilized to prepare basic data for decision making in administration and policy control in the field of civil engineering using photogrammetric method. This paper describes on the several typical examples in the field of surveying based on GIS and CAD system.

### 2. A Example of Automatic Road Selection using GIS System from LANDSAT DATA

As for traffic policies, when a road is designed, (1) natural conditions (2) society and culture, (3) geographical environment, etc. are comprehensively investigated in the initial stage with a wide view. the labor, cost and time spent for the investigation are enormous. If the GIS system by use of personal computer is used for it, time and cost can be remarkably saved. Papers published hitherto deal with how to establish condition for designing a road route by overlaying various data required for route setting, and few papers refer to automatic setting of road route. This report describes a topographical recognition system based on the altitude data of land numerical information and also the automatic design of road routes by use of various overlaid pieces of information such as development regulation data and by use of personal computer rapidly developing of late. Furthermore, the designed results are discussed to compare the respective routes in reference to topographical sectional and slope.

( T. Oshima: Hosei University, Y. Emori and Y. Yasuda: Chiba University )

### 3. A Example of 3-D Controlling Technique using CAD System for Cenotaph Restoration in Hiroshima Peace Memorial Park by Close-range Photogrammetry

The cenotaph built in 1952 in the Hiroshima Peace Memorial Park as a symbol of Hiroshima's prayer for world peace has been damaged by years of outdoors exposure and City of Hiroshima decided to rebuild it in granite. In this restoration project, special consideration were needed the following : In the first place, because of the basic concept of restoration of the existing shape of the cenotaph, the existing shape must be measured accurately and efficiently by means of some non-contact method. To meet these requirements, the use of photogrammetry was decided. In the second place, because the structure will be changed from the present reinforced concrete to granite masonry, the original sectional areas must be modified to compensate for the reduced strength and the shape of the interior wall must be modified. In addition, since the visual exterior wall shape must fully represent the designer's concept, the utilization of the CAD system capable of 3-dimensional representation was decided. The investigation and analysis were executed in accordance with these requirements mentioned above. Here are discussed how the CAD system were used for the restoration of the cenotaph based on the 3-D data by precise close-range photogrammetry.

( T. Oshima: Hosei University, S. Nishimura: Keisoku Research Consultant Co. Ltd. )

### 3. ISO and Precise Industrial Photogrammetry

Since 1969, when we had an application for complex of LNG which was first imported to Japan from Alaska, the NKKK have been enjoying high reputation as fair and independent single surveying organization in Japan who is surveying LNG. NKKK, as a competent impartial organization has been endeavoring positively for study and development of new technology in various fields, on the basis of our abundant experience to meet the present requirement, which continues a remarkable progress. Among them, NKKK has been qualified as a member of the survey firms in Japan to participate in the Japan Committee of ISO ( International Organization for Standardization ) and has been contributing especially in the field of tank calibration, introducing our calibration methods. The NKKK is in charge of undertaking the secretariate of the ISO/TCA 28/SC 5 ( Measurement of Light Hydrocarbon fluids ) and Dr. Oshima has also been nominated as the convenor of Working Group 1, Calibration of LNG tanks in carrier, of the sub-committee. PACS is a practical application of the technology of the analytical aerial photogrammetry. However, with the fact that it uses the Planicom c-100, which is the most advanced analytical photogrammetric system, it is a most accurate calibration method with approval by Japan Customs Authorities. Here are discussed methodology and result of the LNG tank calibration by the precise close-range photogrammetry which are now discussed within the frame of ISO Committee. ( T. Oshima: Hosei University, K. Harada: NKKK( Nihon Kaiji Kentei Kyokai )

### 5. Traffic Accident Site and Photogrammetry

The first technique for measuring the traffic sites was adopted on a small scale by the police department at Zurich, Switzerland in 193, Germany in 1935 and Italy followed in part. In Japan, the Police Headquarter in Saitama Prefecture adopted this technique in 1967, followed by Kanagawa, Osaka, Hiroshima, & Okayama. In 1967, the Saitama Police Headquarter sent three police men for training of photogrammetric technique to Tokyo University, Inst. of Industrial Science. This training continued for six months with practical experiment at actual traffic accident sites. The application of this photogrammetric method for analysis of traffic accident sites has proven to be effective. The National Police Agency in Japan formally adopted this method and established an organization in each Prefecture Police Headquarter. At the same time, they allocated the necessary fund for the program and offered a training course in Tokyo twice a year for leaders in 47 prefectures. The course continued for about 10 days including lectures and practical applications. In 1971, all Prefecture Police Headquarters adopted this method at the actual traffic accident sites and executed the program in all Japan. As of 1987, there are 303 stereocameras, 68 stereo-plotters and several analytical plotters for measuring at the traffic accident sites and also specific police cars in which the necessary instruments are set up. The photogrammetric method is superior to the conventional one, using the direct measurement. The main reason for adopting this photogrammetry is that traffic accidents are increasing every year and the bureau needs to save the time at the accident sites and to maintain the reasonable accuracy in making the cause of accident clear, especially for the court judgement. Here are discussed present status of organization and photogrammetric techniques using in the police circle of Japan. ( T. Oshima, Hosei University and K. Oyamada, National Police Agency )