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The PACP Coding Standard helps with Data Integration

One goal of a comprehensive GIS program is to understand the underground infrastructure. CCTV inspection is an important tool to accomplish this goal.

There are many reasons why CCTV inspection of underground facilities is important.

- Determine the life of a pipe or manhole
- Determine what rehabilitation is required to extend that life
- Determine what construction defects may be causing failures

Engineers encounter problems when they try to effectively use the data collected during the inspections.

Problems encountered:

- Codes used to describe problem situations in pipes regionalized or not used correctly.
- Software programs developed for asset management and data collection allow freedom in creating codes and use different standards
- The engineers analyzing the problems and the workers describing the problems use different terminology.

Cities under edict by the EPA and the engineering consultants they employ need a more uniform method of coding the problems seen within the sewer systems. Some turned to WRc coding that had been developed in the UK in the late 70's. But not all of the codes were applicable to pipes in the US.

NASSCO, a national trade organization for the rehabilitation industry, recognized that a standard for sewer pipeline assessment was greatly needed and worked with the WRc to establish one. It is called the Pipeline Assessment and Certification Program or PACP.

A committee of industry leaders was formed to determine the codes to use within the US. Some of the WRc codes were left in tact like CL, CC, CM. Other codes for lining problems and rehabilitation were added. Parameters were determined for each code.

PACP Major Components:

- PACP Manual
- Training Course for Inspector Certification
- Standard Database
- Software Vendor Certification
- PACP Grading

The PACP manual contains all of the codes for use whether they describe the survey, location or defect. The rules used to determine how each code should be used are listed as well as reference photographs. Examples of the code in use are given. Code tables and grade or scores for each defect are listed. The manual is used during the training and is retained for reference by the inspector.

A certified instructor teaches the course with materials supplied by NASSCO. The instructors are required to teach a minimum number of classes yearly or be recertified. All students are tested upon course completion to determine their understanding and knowledge of the course. A passing grade on the test is required to receive certification.

A PACP Standard Database is used to exchange collected information between software programs. The Database is in Microsoft Access Format, which is easily created by data collection programs and interfaced into a variety of Asset Management Programs.

Software Vendors submit their program to NASSCO for verification that they comply with the coding standards. The current certification ensures that the codes are all correct and required fields are available for use by the inspectors. It also requires the software can export into the required database format. More stringent requirements will be implemented in 2006 to insure all codes are used correctly. An import of data from the Standard Database will also be required to receive certification as well. This process will be implemented on a yearly basis with the certified vendors listed on the NASSCO website.

The grading system developed by NASSCO is a simplified method of assigning severity to various defects. The inspector does not assign a subjective grade to the defect, but only reports what is seen in the pipe. For example, the inspector notes that the pipe has a blockage of rocks that occupies 10% of the pipe. The PACP code tables in the manual indicate that a rock blockage of 10% receives a grade of 2. The software vendor can then calculate from all of the listed defects the O&M or Structural Score for each pipe segment. PACP outlines how to calculate a Pipe Rating, Mean Pipe Score, and a Pipe Ratings Index to help analyze pipe conditions.

The PACP coding standard has been adopted for use in many regions of the US and is growing in popularity. Now the US has a standard method to inspect, code and analyze the infrastructure that can be shared between communities and software programs.