

UTILITY AND HIGHWAY COORDINATION TO IMPROVE SAFETY

George Kaston, Consumers Power Company, Royal Oak, Michigan

Most utility facilities are buried in public rights-of-way and are vulnerable to damage during road improvements and construction. Utility companies in southeastern Michigan have begun a joint damage prevention program among utilities, local governmental agencies, state transportation agencies, and construction contractors. To communicate their needs and wants for work-site safety and damage prevention, the utilities must establish a workable communication system that involves obtaining knowledge of future road improvement projects, developing a consistent reciprocal information exchange between utilities and roadway design groups, attending and participating in prebid and preconstruction meetings, providing a 1-number telephone communication system for use in locating underground facilities, and launching a vigorous promotional program among governmental agencies and construction contractors on the theme that damage prevention is everyone's business. The American Public Works Association is promoting national acceptance of 1-number communication systems.

●ALL OF US in the gas utility business are concerned with the preservation of our underground systems because we are interested in the continuity of service to our customers and we are concerned with the hazards presented by our product when it is not contained safely within the pipes that carry it. This concern is also great with those in the electric and communications utilities.

Most utility facilities are buried in public rights-of-way. Each year road improvements in the form of drainage, paving, road widening, and expressway construction give construction contractors many opportunities to damage underground facilities. The utility companies in southeastern Michigan have begun a joint damage prevention program.

Communication among utilities, local governmental agencies, state transportation agencies, and construction contractors is the prime factor in coordinating safe conditions for construction workers and the public in proximity to construction sites and in providing less inconvenience to public use of rights-of-way.

To gain the attention and to earn the cooperation of roadway designers and construction contractors, the utilities must communicate constantly their needs and wants for work-site safety and damage prevention. Methods to accomplish a workable communications system are obtain knowledge of future road improvements projects, develop a consistent information exchange between utilities and roadway design groups, attend and participate in prebid and preconstruction meetings, provide a 1-number telephone system for use in providing information on the location of underground facilities, and promote the idea among governmental agencies and construction contractors that damage prevention is everyone's business. The American Public Works Association is promoting a national formula to encourage national acceptance of 1-number communication systems.

The gas distribution network of Consumers Power Company in the lower peninsula of Michigan has 17,000 miles of gas mains. There are 910,000 gas customers, about half located in the 3 counties surrounding the city of Detroit. In many of the suburbs, the first utilities are water wells and tile fields for sanitary purposes. Generally the next utilities are electric service and gas main extensions. Some years later water mains and sanitary sewerage facilities are installed. Roads must then be widened to

keep pace with population expansion, and the excavation for these roadbeds gives opportunities for construction equipment to damage buried utility facilities.

In the greater metropolitan area of Detroit, there are more than 2,500 excavating contractors, all able to locate our facilities the "instant way" by using the fastest facility locator—backhoe, trenching machine, or dozer. How do we work with the contractor to prevent "dig-ups"? We must make it convenient for him to communicate his wants in the area of underground facility location. In the spring of 1970 a committee of enthusiastic utility people formed a Damage Prevention Committee as a joint venture to attack the problem of contractor damages.

In many areas of Michigan, ordinances have driven the electric and telephone companies underground. As they have jointly used poles, they will now jointly use trenches. Many miles of electric and telephone cable have been placed underground, and interest in damage prevention has risen sharply in these vital utility organizations. It has become apparent that all utilities have a common denominator called "underground damage prevention."

In November 1970 we formed the Utility Location and Protection Service on a trial basis in the South Oakland Division of Consumers Power Company. This area contains 138 square miles and has electric service by Detroit Edison, telephone service by Michigan Bell, some miles of transmission facilities of Michigan Consolidated Gas, and gas utility service by Consumers Power Company. Because the gas utility has the most to gain through a positive damage prevention program, Consumers Power Company felt that it should stimulate a joint venture.

The committee members from the 4 utilities who were engaged in this program thought that all the intricate details should be confined to a small and controllable area. At the outset, we wanted to make certain that our degree of success could be carefully measured and our program could be developed with positive results before we expanded to a larger area.

In February 1971, after 3½ months of successful experience, we held several open houses for municipal government people, contractors, and consulting engineering firms to acquaint them with our joint-utility Damage Prevention Program. People who attended realized that the southeastern Michigan utilities were sincerely asking for assistance in making the communication program successful.

Estimating costs of damages caused by dig-ups of underground facilities of the 4 utilities is difficult. Estimates can be made for costs of gas main and service repairs to damage caused by outside contractors, but are difficult to make for continuity of service, real or potential hazards, and public image.

Early in 1970 we appointed Division Construction Coordination Supervisors whose mission is to carry an appeal to various municipalities, contractor organizations, consulting engineering firms, and to whoever else might have occasion to excavate. We found that a positive and enthusiastic appeal to excavators to call before they dug was well received. Converted to numbers, MISS DIG becomes 647-7344, the phone number used. The convenience of a 1-call system to obtain the locations of facilities of all participating members was met with enthusiasm by contractors.

The telephone call is received on one of 7 private lines to the call center at the service center of the South Oakland Division of Consumers Power Company. These calls come in by private circuitry and not through the company switchboard. Teletype equipment at 55 individual sites is used to dispatch contractor excavation information selectively to the southeastern area of Michigan so that not only do utilities have information of pending excavation but many municipal public works departments as well receive the information on teletype terminals. Trained personnel can receive as many as 7 calls at once and transmit, within minutes, the excavation contractor's request for locating and staking underground facilities (Fig. 1).

Located in the call center is an 8-track tamper-proof tape recorder to maintain accurate information on the request. It is very easy for a caller to say that he is putting in a sewer lateral on North Alexander Street when he really meant South Alexander Street.

Each call is given a serial number for record purposes. The information obtained is the extent, location, and time of the work to be performed. When the order has been dispatched to the participating utilities and municipalities, the time is again noted by

use of a time stamp machine (Fig. 2). In this manner we can exercise management controls relevant to rapid information transmission. High-speed teletype tape preparation machines are used to transcribe the contractor information for all program participants. The teletype tape machine prepares a tape that runs at the rate of 100 words per minute (Fig. 3). In the near future, computerized selection of member utility underground facilities will allow more rapid transmittal of information and will aid in further expansion of the system.

In designing the teletype network, the joint utility committee decided that the receiving units at the various participating headquarters would be able to receive but not to send messages to prevent the equipment from being used for purposes other than contractor damage prevention.

The next step in the communication system is to get the word of proposed excavation out to locating and staking crews. All 4 utilities, and most of the participating municipal groups, are in a position to locate their underground facilities if given a 24-hour notice.

Early in the program, we found it necessary to equip locating and staking crews with "instant" information. We also found it wise to select top-notch people from our Operating Group to do the locating and staking of gas facilities. The radio-equipped van type of vehicle, we have found, is the most flexible for our locating and staking program. These vehicles are equipped with the latest pipe-locating devices, microfilm records of all service leads into buildings, and all gas main record maps, including abandoned facilities. The 24-power viewer that is used in the locating and staking vans has been invaluable for instant information (Fig. 4).

We have felt for many years that the combination of good facility records and pipe-locating devices and training in the use of locating equipment has given us excellent pipe-locating abilities. Some of our sister utilities have taken the same approach as we have: The locating and staking personnel should not be selected from the "walking wounded." The sharp operator, given good tools, equipment, and encouragement, soon learns that he is the vital link in the Damage Prevention Program.

Field records of gas service lines, gas mains, and abandoned gas facilities are recorded on microfilm (Fig. 5). We have the ability to update changes of our field records on a weekly basis. In this manner our field crews have up-to-date knowledge of all gas facilities.

A very significant segment of our total damage prevention picture is the engineering function of preplanning and coordinating well in advance of paving, sewer construction, and water construction. In our division we have a civil engineer who devotes most of his time visiting consulting engineering firms, the state highway department, and municipal engineering departments to obtain information on forthcoming excavation work. Many times in the preplanning stages of municipal engineering work, we have been able to eliminate expensive relocation of our facilities and also to acquaint the design people with the location of our facilities so they can be inserted into the various civic construction plans.

Although we spend a considerable amount of time and effort on engineering planning coordination with the state highway department and the various county road commissions, we too often find ourselves running only 2 jumps ahead of a paving contractor who was awarded work not known to the utilities until almost the last hour. We realize that occasionally funding allocations are changed and priorities reassigned among civic improvement jobs, but we make an appeal to be given an opportunity to work ahead of roadway improvements in a coordinated fashion so that delays and economic losses can be minimized. Utility poles, underground cables, and gas facilities serve the same public for whom roadway improvements are constructed.

Since November 1970, when the MISS DIG program was launched, we have been constantly promoting the interest of various contracting agencies and municipal agencies in southeastern Michigan. We have had many meetings to discuss mutual problems in the prevention of damage to buried facilities. Communication is the key to a good damage prevention program, and MISS DIG is a communications method (Fig. 6).

The toughest hurdle in the development of our 1-call Damage Prevention Program was the preparation of an acceptable contractual agreement among the 4 primary parties.

Figure 1.



Figure 2.

WO 3-919

CITY SOUTHFIELD DATE 3-27-72 TIME REC 805 AM

LOCATION OF WORK NINE MILE AND INKSTER AREA WORKING ON THE E SIDE

OF INKSTER RD IN THE 1 ST BLK S OF NINE MILE AND E OF SEMINOLE

ALSO ON THE N AND S SIDE OF SEMINOLE WITHIN 300 FT OF INKSTER RD

STARTING DATE AND TIME 3-28-72 8 AM

TYPE OF WORK WATER MAIN AND SEWER

NAME MR CAVALLORE

CONTRACTOR CAVALLORE CONST CO

PHONE KE 19320 X 26 BEST TIME TO CALL 8-5

EXTENT OF WORK ATT ALL UTILITIES CONTRACTOR WOULD LIKE TO MEET WITH

YOUR REPRESENTATIVES ON JOB SITE 3-28-72 8 AM ASK FOR TONY COMPANY

SUPT PLEASE CALL IS UNABLE TO KEEP APPT

Figure 3.



Figure 4.



Figure 5.

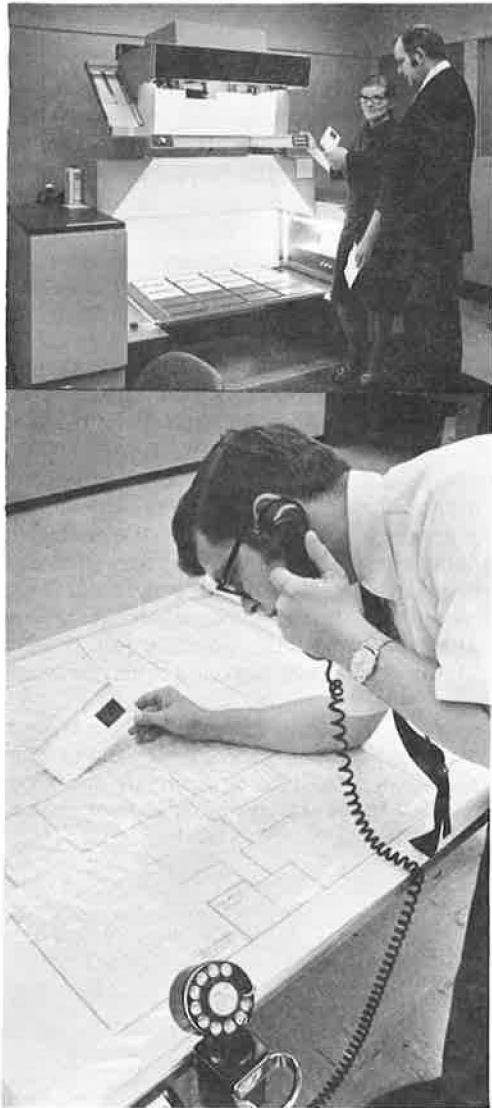


Figure 6.



Table 1. Gas lines damaged in southeast division of Consumers Powers Company in metropolitan Detroit.

Year	Units of Site Visits and Staking	Damages	Damage per 100 units ^a
1969	42,358	2,630	6.2
1970	100,389	2,065	2.1
1971	154,541	2,861	1.8
1972	212,390	1,910	0.9
1973	263,489	1,923	0.7

^aUnits of construction site visits to locate and stake (a) each main crossing or each 50 ft of parallel main and each gas service and (b) to inspect construction job in progress.

The Damage Prevention Committee of the 4 utilities found it prudent to develop the program and get a solid foundation under it before it was taken to the individual legal departments. It seemed that, for every statistic of safety and damage prevention that was given to the lawyers, they would find 3 or 4 ways to say "but the liability." After locking up a pair of attorneys for each of the participating utilities in 2 sessions, an agreement was hammered out to the satisfaction of all participants.

The MISS DIG Communication System is administered by members of each of the 4 primary participants. The committee comprises a working member from each and an alternate who is often a specialist in maintenance of plant facilities, a construction supervisor, a computer programmer, or a communication technician. The committee gives a great deal of latitude to its chairman who, for practical purposes, represents all 4 utilities under the title of Executive Secretary. The present secretary is Division Gas Supervisor of the South Oakland Division of Consumers Power Company and devotes all of his time to coordinating damage-prevention activities for all 4 utilities.

We have found it beneficial to have a knowledgeable, public-relations minded individual who can speak for all 4 utilities to contractor groups and municipal organizations and also act as a coordinator for this joint venture.

At present, the 4 utilities are sharing the expense of operating the call center. We are accepting negotiated fees from 26 secondary parties who have teletypes to receive information pertinent to their individual operating areas. A number of pipeline companies and municipal water systems have indicated an interest in participating in our 1-call system and will probably join the communication system in the near future. The negotiated fees from secondary parties help defray the expense of operating the call center.

As we increase the number of locating requests, we increase the number of locating and staking activities and construction site visits (Table 1). The refinements in staking techniques, up-to-date equipment, and an enthusiastic work force have allowed us to accept this increase in operating expenses of the Damage Prevention Program.