

TRACKING AND TRACEABILITY

A PRIMER

Distribution Integrity Management Program (DIMP)

The "Pipeline Inspection, Protection, Enforcement and Safety Act of 2006" required the Department of Transportation (DOT) to establish a regulation prescribing standards for integrity management programs for distribution pipeline operators. The Pipeline and Hazardous Materials Safety Administration (PHMSA) published the final rule establishing integrity management requirements for gas distribution pipeline systems on December 4, 2009. The regulation requires operators, such as natural gas distribution companies to develop, write, and implement a distribution integrity management program (DIMP). The heart of DIMP is for the operators to know what is in their pipeline systems. Changes can occur over time, whether they are changes in corporate ownership and structure, or whether they are product changes. These changes can make maintaining records of the gas distribution components in the utility company's pipeline system challenging. To aid in the utility operators, there are two interrelated initiatives to aid in tracking and tracing gas pipeline system components.

Registry of Gas Pipe and Component Manufacturers

One recent industry-encompassing initiative undertaken by the Plastic Pipe Institute (PPI) and still in development is the establishment of a new website www.componentid.org that acts as a clearinghouse for the registration of all polyethylene (PE) gas pipe and component manufacturers' identification codes.

"This is a critical part of the tracking and traceability system which provides a standardized approach to marking all gas distribution system components," stated Stephen Boros, technical director, PPI. "It was developed so manufacturers could easily provide product traceability information that gas utilities can use in the implementation of their own Distribution Integrity Management Program (DIMP)". PPI will operate and maintain this registry." The registry will establish a 2 character identification that is unique to each manufacturer.

ASTM F2897

A group of utility members developed an ASTM standard specification, ASTM F2897, that was approved in 2011 titled 'Tracking and Traceability Encoding System of Natural Gas Distribution Components (Pipe, Tubing, Fittings, Valves, and Appurtenances)'. The standard provides an encoding mechanism to identify the piping system components through the use of a 16 character code.

16 Character Code

The 16 character code generated by the ASTM F2897 provides information that identifies the manufacturer, production lot number, date, pipe or fitting type, and material grade. The following table explains the content of the code.

Input Data	Description	Conversion	Example	Output Code
Component Manufacturer	2 Characters assigned by PPI	None		2 Characters
Manufacturers Lot Code	7 digits assigned by the manufacturer to uniquely represent the product.	Use Base 62 to convert the 7 digits to 4 Characters	'1234567' converts to '5ban'	4 Characters
Production Date	5 digits representing the day of the year (3 numbers) and the year (2 numbers)	Use Base 62 to convert the 5 digits to 3 Characters	September 1, 2012 = '24512' converts to '6nm'	3 Characters
Component Material	1 letter representing the material designation	None	B = PE2708 E = PE4710	1 letter
Component Type	Select from Table 4 of ASTM F2897	None	Coiled Pipe = '12', Weld End Transition Fitting = 'T1'	2 characters
Component Size	Calculate using Equation 1 and Tables 5-7 from ASTM F2897 to obtain 5 digits.	Use Base 62 to convert the 5 digits to 3 Characters	4" IPS DR 11 x 2" IPS SDR 11 = '12345' = '3Kp'	3 characters
Currently Unused	'0'	None	'0'	1 number

Bar Code Representation of 16 Character Code

With a few exceptions, the 16 character code cannot be read directly and must be decoded. Additionally since the code contains both upper case and lower case letters (as well as numbers) it can be difficult to transcribe the code correctly to company records. Therefore ASTM F2897 provides that the code should also be presented by a Code128 bar code. The following is an example of a Code 128 bar code.



This allows the utilities to capture the code accurately and efficiently. The bar code should be present on the pipe wall. For fittings and other appurtenances, the bar code should be present on the shipping bag, box, or label. Some manufacturers have indicated a desire to use a more compact form of bar code, such as a DataMatrix or a QR code. The following is an example of a QR code for the same 16 character code.



The standard allows these more compact bar code representations (often called 2D bar codes) provided that the Code 128 bar code is also present.

Using This Information

Manufacturers are beginning to print the 16 character code on their products in human legible and bar code. As the products are received by the utility, the number can be used to accept the product into inventory. It can also be used to track which products have been sent on different field work orders. The 16 character code can also be used in conjunction with GPS or field mapping to identify where specific parts are installed.

If a manufacturer becomes aware of a quality concern, they can provide the 16 character code to the utilities. The utility can then identify when and where they received the product, on which work order it was used, and if field mapping is used, they can identify specifically where the part is installed.

Summary

Implementation of the Tracking and Traceability program through ASTM, PPI and AGA members has resulted in an important first step in improving the tools utilities have to better manage and better understand their pipeline systems.

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