

3 Knowledge

3.1 General.

- (a) Information, such as the materials and type of construction, the operating conditions of the pipe or facility, and other relevant factors within the surroundings in which the system operates, is referred to as the “knowledge of the distribution system.”
- (b) General knowledge of the system will assist the operator to identify threats and establish which facilities or groups of facilities (Note i), if desired, should be subject to risk evaluation (see Sections 4 and 5).
- (c) Records of the distribution systems may exist in many forms (e.g., paper, electronically) and in the knowledge and experience of operations, maintenance, or engineering personnel. Information from these sources may be evaluated to assist in developing an operator’s DIMP.
- (d) If practical, the operator should use the best information available to make decisions about what is in the existing system. In some cases, an operator may be unable to determine the materials or characteristics of some of the components in the system. This may be due to lost records, systems gained through mergers or acquisitions without complete records, or other reasons. For example, the year of installation might be used to make such decisions about piping material, joint type, coating type, or repair methods used.
- (e) Information about an existing system should be updated when new or better information becomes available. This information should be gathered during existing operating or maintenance activities and installation of new facilities on an existing infrastructure. Note proposed §192.1007(a)(5) that states: The data must include, at a minimum, the location where the new piping and appurtenances are installed and the material of which they are constructed.
- (f) Operators may not have all desired records initially, but can still develop a DIMP. An operator would not have to dig up its system just to collect information, but when an operator inspects the pipe wherever it is exposed, the operator should use the occasion to record and evaluate any distribution system unknowns that are available at that location.
- (g) To the extent possible, the operator should use information collection procedures that are already in place. New collection activities should be developed only if the existing procedures are not adequate for the operator’s DIMP. If the information is adequate, the manner in which it is compiled and organized may need modification to make it more usable.

3.2 DOT Annual Report information.

- (a) Basic knowledge of what is in the distribution system is contained in the operator’s annual report to DOT (PHMSA Form F 7100.1-1). All past report data is available for download from the PHMSA-OPS On-Line Library website <http://ops.dot.gov/library/libindex.htm>. The operator should review the source and accuracy of the most recent annual report information and take actions to ensure that the information is current and accurate. Report forms and instructions are available for download at the PHMSA-OPS website <http://ops.dot.gov/library/forms/forms.htm>.
- (b) “Part B - System Description” of the Annual Report provides a breakdown of the mains and service lines in the distribution system by material, diameter, and installation decade.
 - (1) Section 1 of Part B – System Description specifically provides the total miles of main and number of service lines in the following material categories:

PART B - SYSTEM DESCRIPTION

Report miles of main and number of services in system at end of year.

1. GENERAL

MILES OF MAIN NO. OF SERVICES	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON			
	UNPROTECTED		CATHODICALLY PROTECTED				COPPER	OTHER	OTHER	OTHER
	BARE	COATED	BARE	COATED						

(2) Sections 2 and 3 of Part B require the operator to break down the total miles of main and the total number of services by diameter ranges. The diameter ranges for steel mains and service lines are not separated by the presence of cathodic protection or coating.

2. MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"
STEEL						
DUCTILE IRON						
COPPER						
CAST/WROUGHT IRON						
PLASTIC						
1. PVC						
2. PE						
3. ABS						
OTHER						
OTHER						
SYSTEM TOTALS						

3. NUMBER OF SERVICES IN SYSTEM AT END OF YEAR AVERAGE SERVICE LENGTH FEET

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"
STEEL						
DUCTILE IRON						
COPPER						
CAST/WROUGHT IRON						
PLASTIC						
1. PVC						
2. PE						
3. ABS						
OTHER						
OTHER						
SYSTEM TOTALS						

(3) The Annual Report form requires operators to provide the miles of main and number of

service lines by decade of installation in Section 4 of Part B.

4. MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UN-KNOWN	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	TOTAL
MILES OF MAIN									
NUMBER OF SERVICES									

- (c) "Part C – Total Leaks Eliminated/Repaired During Year" provides a breakdown of eliminated/repaired leaks by leak cause for mains and for service lines, and the number of known system leaks scheduled for repair. See 3.4 below.

3.3 *Additional information.*

In addition to the Annual Report information, an operator should review other records for additional information to evaluate significant threats.

Local system personnel may provide additional information about the system. For example, field personnel may know of construction techniques that were not recorded. When developing knowledge of its distribution system, an operator should consider the following.

- (a) Pipe specifications and component information, including diameter, grade or yield strength, and wall thickness for steel pipe; manufacturer and Standard Dimension Ratio (SDR) for plastic pipe; size, location, and type for valves and pressure regulators.
- (b) Construction specifics, such as year installed, joining method (e.g., type of coupling, welded, fusion) and installation method (e.g., open trench, plow, boring, directional drilling, casings, cast iron on concrete blocks).
- (c) Corrosion control systems, which may be composed of coating (e.g., coal tar, fusion bond epoxy, wax), cathodic protection (e.g., galvanic or impressed current), electrical isolation devices, year of installation (e.g., years without cathodic protection), stray current mitigation (e.g., diodes, bonds), and aboveground corrosion control practices.

3.4 *Knowledge of what is physically happening in the system.*

The records containing important information may include leak records, repair work orders, corrosion inspection and work records, incident reports, third-party damage reports, material failure reports, pipe condition reports, equipment maintenance records, inspection records, maintenance records, or others for appropriate historical time frames.

- (a) To determine what is happening in and to the distribution system, the operator should consider information gathered through routine operations and maintenance activities, as well as any special field surveys or patrols (e.g., as-needed post-flooding or winter (frost) patrols). Note proposed §192.1007(b) that states: An operator must gather data from the following sources to identify existing and potential threats: incident and leak history, corrosion control records, continuing surveillance records, patrolling records, maintenance history, and "one call" and excavation damage experience. The information may come from the following.
 - (1) Results of inspections and surveys.
 - (i) Leak surveys.
 - (ii) Corrosion inspections.

- (iii) Patrols.
- (iv) Liquids removal.
- (2) Documentation of leaks and other maintenance performed.
 - (i) Repairs.
 - (ii) Corrosion control systems.
 - (iii) Equipment or component replacements.
 - (iv) Material failure reports.
 - (v) Incident reports.
 - (vi) Part C of the Annual Report, which provides the number of leaks eliminated/repaired by cause of leak category. These categories are the minimum threats that need to be evaluated in an operator's DIMP. See Section 4.

PART C - TOTAL LEAKS ELIMINATED/REPAIRED DURING YEAR
CAUSE OF LEAK

	Mains	Services
CORROSION		
NATURAL FORCES		
EXCAVATION		
OTHER OUTSIDE FORCE DAMAGE		
MATERIAL OR WELDS		
EQUIPMENT		
OPERATIONS		
OTHER		

NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR

- (3) Excavation activity.
 - (i) Damage records.
 - (ii) The number of underground locate requests received.
 - (iii) Proposed significant construction activities.
- (4) Geologic conditions.
 - (i) Frost areas.
 - (ii) Earthquake zone (e.g., soil liquefaction areas).
 - (iii) Known washout areas.
 - (iv) Land subsidence areas.
- (5) Operating pressure (e.g., maximum actual operating pressure).
- (b) Local system knowledge can also be key to understanding what is happening in and to the

system. For example, field personnel are probably the best source of information about areas prone to flooding or washouts, or local corrosion technicians may know where interference currents are possible. The operator should consider interviewing personnel most familiar with the facilities to determine valuable information that may not appear in routine maintenance documentation and to evaluate existing forms (electronic or paper) for gaps in documentation.

3.5 *Documentation.*

The operator should have a way to gather and retain information about the distribution system. The operator's procedures should be updated as necessary to ensure that the appropriate information is being gathered for future use.

Methods to document the physical components of the distribution system may include the following.

- (a) Identifying relevant system components on maps.
- (b) Maintaining electronic records.
- (c) Maintaining hard copy files.
- (d) Any combination of the above.