WATER ONLINE

Article | June 6, 2019

7 Strategies for Avoiding 'Boil-Water' Emergencies

Source: JCM Industries, Inc.

It's every water distribution manager's worst nightmare — the dreaded boil-water advisory. Even when faced with aging infrastructure, there are ways to alleviate timing and complexity concerns about emergency pipeline repairs in advance. Use this seven-step checklist to become better prepared to deal with water main break emergencies and to forestall the need to issue a boil-water advisory.

Don't Let Lack of Preparation Raise the Risk of Failure

In order to maintain pipeline operation continuity, it is important to have a good understanding of utility infrastructure and repair history well before a pipeline break or equipment failure becomes evident. Having a well-thought-out strategy and a written action plan for each major type of pipeline emergency can prepare the personnel involved and improve response before a problem gets completely out of hand.

Here are seven action steps that can go a long way toward helping water distribution utilities be emergency-ready and avoid the need for boil-water advisories.

1.) Advance Planning

Contingency planning can save a lot of time and money in the long run by quantifying the likelihood of breaks based on past history and the complexity of repairs, and identifying steps needed to return systems to normal operations. Finding a way to squeeze planning time into today's busy workday will pay dividends in the long run if it can hasten response to prevent the loss-of-pressure conditions that can lead to boil-water advisories (Figure 1). As is true in so many cases, planning for the future requires understanding the past.

Figure 1. *There is more than one way to repair leaks in large pipelines without shutting down operations, losing pressure, or risking the need to issue a boil-water advisory — including temporary clamps, line stop and bypass strategies, and permanent encapsulation.*

2.) Good Recordkeeping

Maintaining up-to-date records of pipeline infrastructure is an important step in building good contingency plans. Knowing key factors enables utilities to inventory appropriate parts according to the predominant patterns of past repair events.

Some utilities make it a practice to measure and document pipeline conditions for every hole they dig. This can include classifying areas of the system by installation age, material type, pipe/fitting size, operating-pressure profile (e.g., 60 psi vs 300 psi), soil conditions, recent break history, etc. This tracking can be recorded on a wall map, in hard-file copies organized by the district metered area (DMA), on a homegrown spreadsheet, or with cloud-based software services designed specifically for utility asset management. Having such information readily available makes it easier to contact the right suppliers and service personnel even as the location is being excavated.

Concrete steel-cylinder pipe characteristics are a good example of the level of detail needed — the dimensions of the steel cylinder's outside diameter, the concrete outside diameter, and any specialty characteristics. Likewise, utilities with old cast-iron pipes should be prepared to deal with oversized or undersized dimensions, as identified by street or DMA.

3.) Specialty Design

The needs for specialty-part fabrication and rush shipments tend to become a bigger concern as water distribution pipelines grow larger in diameter. Consider keeping spare key components for critical-need pipelines, such as major transfer lines bringing water into a treatment plant or distribution system. It might not be practical to inventory custom encapsulation sleeves (Figure 2) for every potential repair, but it is possible to use stock fittings to create a bypass as a stopgap solution while a custom encapsulation sleeve is being fabricated.

Photo courtesy of JCM

Figure 2. *A custom encapsulation sleeve can be used to create a permanent solution for the repair of cast iron bells, split or leaking couplings and weld joints, or straight runs of pipe — including the ability to seal over temporary fixes — without costly shutdown or disruption to critical service.*

4.) Clear Communication

Whatever the physical problem that might have triggered the emergency event, being prepared for all aspects of its resolution is critical. This includes maintaining good lines of communication with all influences that will be needed to resolve the problem, such as:

- Appropriate suppliers for all types of pipe and fittings involved.
- Internal and external engineering services.
- Appropriately experienced and equipped maintenance and repair personnel.
- Neighboring local utilities that can help with technical insight, spare parts, and emergency support.

Be sure to include non-utility influences as well, such as public safety personnel who might be involved with public notifications, traffic control, or emergency services — especially when the location is in a heavily populated or heavily traveled area. When even the best efforts cannot prevent a loss-of-pressure event, consider these guidelines on how to handle resulting boil-water advisories.

5.) Supply Chain Awareness

The more that is known about pipeline infrastructure, the greater the chances of quickly sourcing the right repair materials from the right suppliers when an emergency arises. Supply chain research should support both ready access to stock fittings for the most likely repair occurrences, as well as predefined resources and contact information for more specialized components.

6.) Additional Logistics

Locating and ordering physical pipe fittings is not the end of emergency repair concerns. Knowing how to get those critical parts delivered to the right location in a timely manner can be as critical as the manufacturing process in terms of timely turnaround and cost control. Because this can often be the case with exceptionally large fittings, include investigating shipping logistics as part of the procurement planning process.

7.) Two-Step Solutions

Finally, recognize that not every repair emergency needs to be addressed by immediate full-system shutdown and replacement. Major problems can often be addressed as a two-step process: 1.) Use a line stop and a bypass loop as an immediate, temporary repair; 2.) Buy valuable time to manufacture and install the most appropriate permanent custom solution without rush surcharges. This approach can use standard parts readily available from stock to minimize the disruption of the original problem — without losing line pressure, without requiring a system shutdown, and without incurring a boil-water advisory.