

Metallic Service Renewal and Abandonment

Advancements in Gas-Free Tools to Enhance Worker Safety

Safe T Stopper Tool



Presentation Outline

- Background that helped lead to the need for Gas-Free service tools.
- Tool implementation challenges and benefits.
- Examples of technology.

History



“The American Gas Association (AGA) and its member companies are committed to promoting positive safety cultures among their employees throughout the natural gas distribution industry. All employees, as well as contractors and suppliers providing services to AGA members, are expected to place the highest priority on employee, customer, public and pipeline safety”

- Safe work practices - Limit operators exposure to working on live uncontrolled gas.
- Early 2000s, many distribution companies introduce new regulations prohibiting pinning off a service tee with a steel pin or wooden dowel.
- Leads to mandatory use of line stoppers. However, this dramatically increases the cost for service renewals and abandonment projects.
- In 2008 – PLCS introduce Gas-Free service tools in the US.
- From 2009 to Present – Through evolution and numerous enhancements Gas-Free tools have broadened capabilities for use.
- Today – There are many of these types of tools being used in the US.

Challenges



1. Over the years many different tee styles, sizes and fitting configurations have been installed making replacement or retirement difficult using standard equipment.
2. Many tees do not have an internal stopper to shut down the service branch and so an expensive line stopper must be used.
3. Increases to pipeline pressures due to population growth causes leaks on outdated service tees that need renewal.
4. Merger and acquisition activity has increased among LDCs, making it difficult for gas operators to identify problem tees in their newly acquired areas.
5. Changing work practices from “pinning tees” to using specialized tools can be difficult to overcome due to the deep rooted established work culture.
6. Tool implementation perceived as expensive rather than an investment in safety.

Benefits



1. No blowing gas providing a safe work environment.
2. Reduces fitting and labor cost by eliminating stopple and by-pass procedure.
3. Reduce excavation cost by only uncovering the working area of the service and branch.
4. Fast, efficient operation.
5. No blowing gas means no wasted service call man hours from reports of gas odors. Maintains good public relations with the public.
6. Eliminates the need for personal air supply, saving the cost of bottled air as well as the time it takes to suit up and periodic OQ.
7. Reduces greenhouse emissions.

List of Users

Over 200+ tools in use all over the USA today, and growing.

AGL Resources

Amerin

Atmos Energy

Black Hills Energy

Centerpoint Energy

Citizen Energy

Columbia Gas (Nisource)

Hawkeye Construction

KS Energy Service

Maddison Gas & Electric

Meade Electric

MJ Sheridan

Montana Dakota Utility

National Grid

New Mexico Gas Company

North Shore Gas

North West Energy

Ohio Valley Gas

Pacific Gas and Electric

Public Service Electric & Gas

Superior Light

Texas Gas Service

Vectren

WE Energies

Safe-T-Stopper Tool Platform

The **Safe-T-Stopper** is specifically designed for Gas-Free* open gut service tee renewal or abandonment.

Increases Worker Safety: Eliminating the dangers of uncontrolled blowing gas when renewing or removing service tees...

Stop Doing This!



How does it work?

1. Attaches a ball valve on top of the tee. Creates a seal under a **cap** or around a **plug**.
2. Remove cap or plug.
3. To stop the gas:
 - Insert rubber stopper below branch
or
 - Screw in self tapping plug into the main at the base of the tee.

The tee can then be abandoned or renewed according to company procedures.

Handles Two Major Types of Tees

Tees with Caps



Tees with Plugs



Capabilities



Tool kits are structured according to service tee and customer needs.

Tool Quotes

Base Tool + Adapter Tee Package

Adapter Packages:

- 3/4" – 2" Pipe Type "Homemade" Tees
- 3/4" – 1 1/4" Mueller H 17500 Tees missing completion plug
- 3/4" – 1 1/4" Street Tees on a welded coupling / threadolet
- 3/4" – 2" Street Tees on a service saddle.
- 1/2" – 1 1/4" Continental / Dresser / Mueller Punch Tees
- Adaptable for custom applications

Safe T Stopper: Pressure Ratings

1. Contingent on tee style and configuration
2. Abandonment / Renewal procedure

60 PSI – Street Tees on a Coupling where the tee is removed and replaced with a plug.

80 PSI – Homemade / Manufactured Tee with a cap or a plug. A detachable rubber stopper or self tapping plug stops the gas. The tee is then cut and capped or removed. (Most Common)

100 PSI – Homemade / Manufactured Tee with a cap or a plug. The Safe-T-Stopper platform is required for 100psi applications. The platform is secured over the tee and onto the main using two chains. O-rings are used to provide gas-tight seals.

Typical Safe T Stopper Operation Examples

These 4 examples highlight the tool's current capabilities.

1. Stopping off homemade pipe tees (most common)
2. Street-Tee threaded into a welded coupling: Remove tee and replace with a plug (2nd most common)
3. Remove a clamp-on saddle punch tee.
4. Stopping off a tee with a burn hole.

3/4" - 2" "Pipe Type" Tee Identification



Do you have tees with caps or plugs?

If caps, then do they look like two nipples welded together with a malleable cap?

If yes, then the tool uses a set of half collars and beveled o-seals with a special housing to create a compression seal under the cap.

Other questions to ask...

- What are the tee sizes?
- How are the tees abandoned or renewed now?
- What are the operating pressures (psi)?
- Is the service tee's main hole drilled, burned or punched?
- If it is drilled then what is the typical size hole?
- If burned or punched, what is the typical size hole?

3/4" -2" Pipe Type Tees (Homemade or Manufactured)

Begin by cleaning the work area and loosening the cap with a pipe wrench to break the initial seal.

Fit the two beveled gaskets over the cap; one gasket beveled side up against the cap and the other facing down against the two half collars.

Attach the aluminum housing adapter by tightening the nuts onto the threaded studs and attach the ball valve.



3/4"-2" Pipe Type Tees (Homemade or Manufactured)

Cap is removed from the tee.



Plug adapter with integrated magnet.



Attach and lower the adapter onto the cap. Rotate the handle counterclockwise loosening the cap.



Pull up the handle to remove the cap and close the ball valve. The cap is held secure with an imbedded magnet.

3/4"-2" Pipe Type Tees (Homemade or Manufactured)

Fit sight glass and open ball valve to check for any possible obstructions in the tee.

Sight glass attachment



Over head view of sight glass attachment.

Pipe Type Tees: Insert Rubber Stopper

Insert expansion stopper below the branch stopping the flow of gas. Tee can now be renewed or abandoned.



Expansion stoppers available sizes: 1/2" – 2"



Expansion stopper tool (Inserts and removes expansion plug).



Expansion stopper inserted and expanded below the branch stopping off the flow of gas. The cap is replaced and the service line cut and terminated.

Pipe Type Tees: Insert Self Tapping Plug

Insert Self Tapping Plug into main. Hole must be round.



Socket Adapter



Self Tapping Plug available in various sizes



Push down and tighten plug into main to stop the flow of gas.

Pipe Type Tees: Inserting Rubber Stopper

Assembly is removed, operation is complete.



Street-Tee on a Coupling or Saddle Standard Tee on a TOE Nipple



Street-Tee on a Coupling or Saddle Standard Tee on a TOE Nipple

Loosen the plug with a pipe wrench to break the initial seal.

Place sealing disc on the boss of the tee.



Housing adapter and ball valve are fitted onto the sealing disc and clamped to the main using the chains.



Street-Tee on a Coupling or Saddle Standard Tee on a TOE Nipple

Plug is removed from the tee.



Plug adapter with integrated magnet.



With the valve open push the plug adapter down onto the square head of the plug. Unscrew plug and retract it above the ball valve. Close valve.



Plug removed. Held captive by the magnet.

Street-Tee on a Coupling or Saddle Standard Tee on a TOE Nipple

What if the plug cannot be removed?

Optional plug drill assembly is available.



Rubber plug shown in nipple.

Street-Tee on a Coupling or Saddle Standard Tee on a TOE Nipple

Insert Self Tapping Plug into main to complete the operation.
Hole must be round.



Socket Adapter



Push down and tighten plug into main to stop the flow of gas. Now the tee / saddle can be removed and abandoned.



Self Tapping Plug available in various sizes



Remove tee and complete the operation.

Street-Tee on a Coupling or Saddle Standard Tee on a TOE Nipple

Remove Street-Tee plug and insert rubber expansion plug into the throat of the tee and expand to stop the flow of gas.



Expansion plug insertion tool



Expansion plug is secured into throat of tee.



Assembly is removed.



Rubber expansion stopper is inserted into throat of tee and plug is replace.



Expansion stoppers available sizes 1/2"-2"

Method to Remove 3/4"-1 1/4" Street Tees on a Coupling when a Self Tapping Plug cannot be inserted in the Main

Once expansion stopper is secure in the throat of the tee completely remove Safe-T-Stopper assembly.

Reinstall the malleable plug and tighten the plug. Loosen (crack) the tee to break the initial seal. (Plug must be tighter than tee)

Cut service branch close to the body of tee and re-build ball valve assembly on top of the tee using the base adapter.



Plug tighter than tee



Cut branch.



Base adapter: Half collars that seal around coupling.

Method to Remove 3/4"-1 1/4" Street Tees on a Coupling when a Self Tapping Plug cannot be inserted in the Main

Clamp onto the coupling with a custom rubber gasket and half collars. The complete assembly is attached to the main using the chains.



Rubber gasket.



Half Collars



Hex wrench tightens collar.

Gasket and half collars fitted around the coupling.

Shown without tee for illustration only.



Method to Remove 3/4"-1 1/4" Street Tees on a Coupling when a Self Tapping Plug cannot be inserted in the Main

Remove tee with plug removal adapter.



Magnetic plug removal adapter.



Open valve and push down on plug removal shaft locating it onto the plug square.



Unscrew and lift tee into the stuffing box and close valve. Tee removed.

Method to Remove 3/4"-1 1/4" Street Tees on a Coupling when a Self Tapping Plug cannot be inserted in the Main

Tighten plug into coupling. Remove assembly and further tighten plug with a pipe wrench to complete the operation.



Plug insertion adapter



Completed operation

Tees with a Burn Hole



Optional components allow the following operations Gas-Free.

1. Cap/Plug removal
2. Over-drilling the burn hole to create a concentric hole.
3. Insert self tapping plug stopping the gas flow at the main.
4. Abandon or renew tee according to company procedures

Tees with a Burn Hole



Platform is secured over tee.



Tees with a Burn Hole

Drill assembly with a controlled feed.
Annular Cutters available in various sizes.



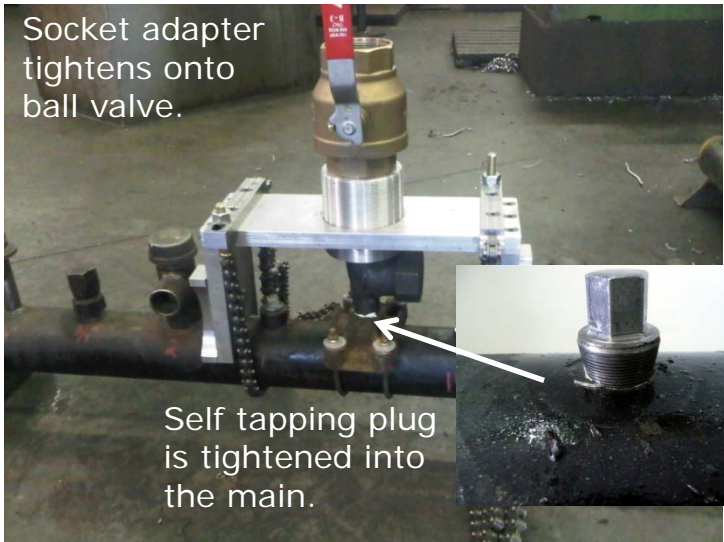
Platform with integral swivel that mechanically lines up equipment when tees are welded at an angle.

Drill assembly is fitted onto ball valve.

Burn hole is over-drilled to accept self tapping plug.

Tees with a Burn Hole

After drilling a self tapping plug is tightened into drilled main hole using the socket adapter.



Low profile self-tapping plugs available in various sizes.

Fine thread made from 4140 steel and nitride hardened.

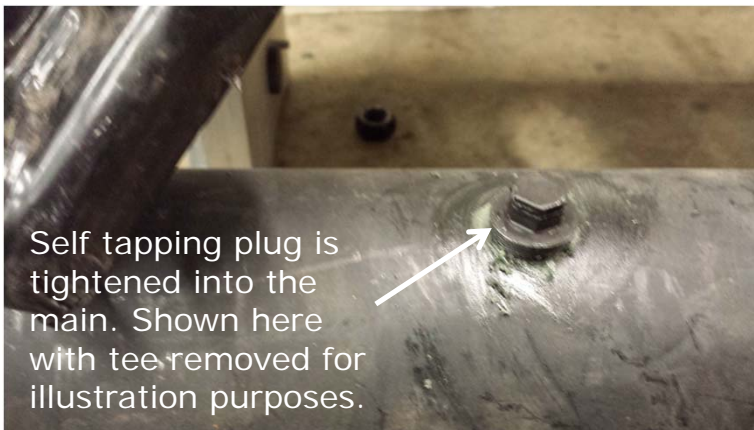
PLCS Threadseal mastic is applied to self tapping plug for a leak free seal.



Tees with a Burn Hole



Tee can be removed or cut to a stub leaving the self tapping plug in place.



Self tapping plug is tightened into the main. Shown here with tee removed for illustration purposes.

Saddle Punch Tee Removal



Remove cap.



Fit adapter.



Remove punch, then
insert Self Tapping Plug
into main



Remove tee.

Punch Removal Adapter

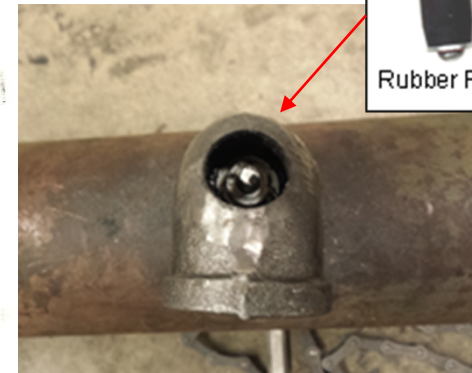


Safe T L Stopper: Elbow Service Abandonment

1. Drill through the backside of the elbow.
2. Insert rubber stopper into nipple or elbow to stop the flow of gas.
3. Abandon service.



Annular Cutting Bit



Rubber Plug

Basement Tee Replacement Tool



1. The tool seals on the tee.
2. The cap or plug is removed.
3. A stopper is inserted into the service pipe, stopping the flow of gas.
4. Fittings are renewed, stopper is retrieved and the service is back online.



- *Works on caps or plugs.*
- *Insert disc stopper, cylinder stopper or inflatable bladder.*



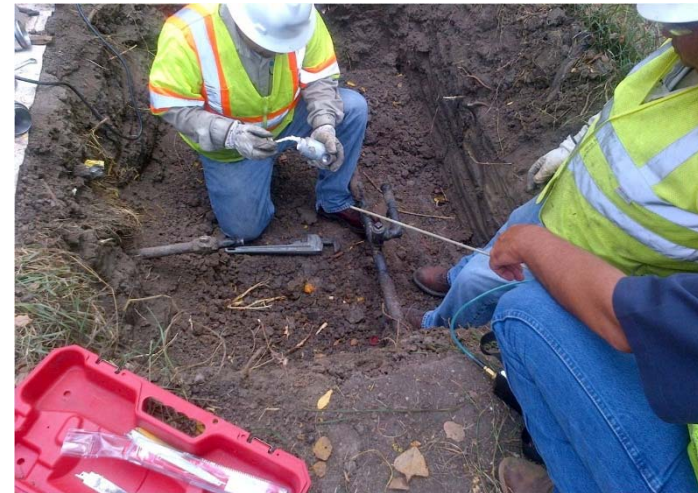
Field Pictures: Welded Homemade Pipe Type Tee



Field Pictures: Welded Pipe Type with Plug



Field Pictures: Street Tee on a Coupling



Summary



1. Gas-Free tools provide a safer work environment.
2. The technology available accommodate tee and fitting variation using semi-standard equipment while employing an efficient operation.
3. Service projects do not require expensive stopple and by-pass procedures.
4. Reduces excavation cost.
5. No blowing gas saves on service calls for gas odors and maintains good public relations with the public.
6. Cost savings on bottled air as well as the time it takes to suit up.
7. Reduces carbon footprint.

Contact

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