



GAS EXPLOSION LEVELS MANSION OUTSIDE OF PHILADELPHIA

206 Springdale Lane, in Millersville, Pennsylvania

MECHANICAL TAP TEE INSTALLATION

- Richard Boudier was killed on July 2, 2017 while responding to a gas leak at a home on the
- 200 block of Springdale Lane in Millersville. It was alleged his death is "a direct result of
- defendants' defective product and/or defendants' negligence and recklessness.

REPORTED GAS LEAK

54-year-old Richard Boudier, was killed in the blast, and three other people were injured when a home on the 200 block of Springdale Lane in Manor Township exploded.

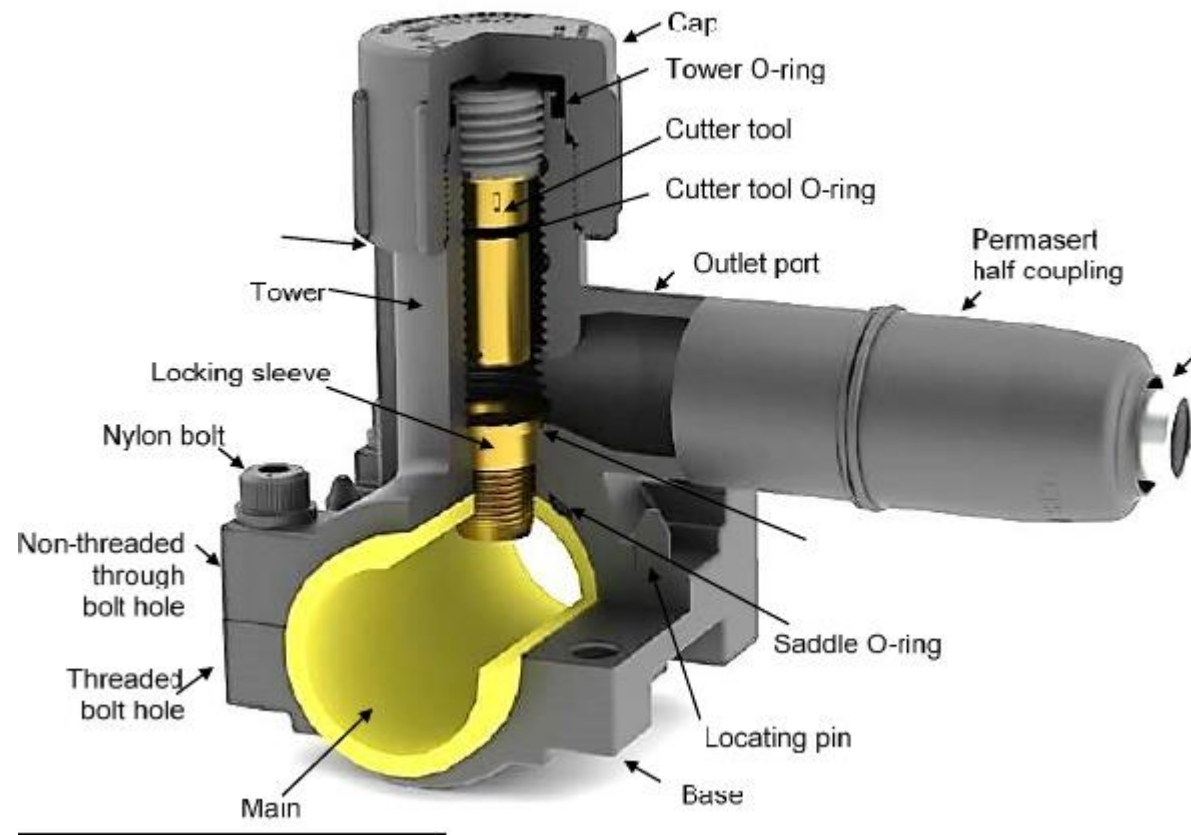
Technicians were responding to reports of a natural gas leak and excavating a location near the Manor Township home before it exploded,

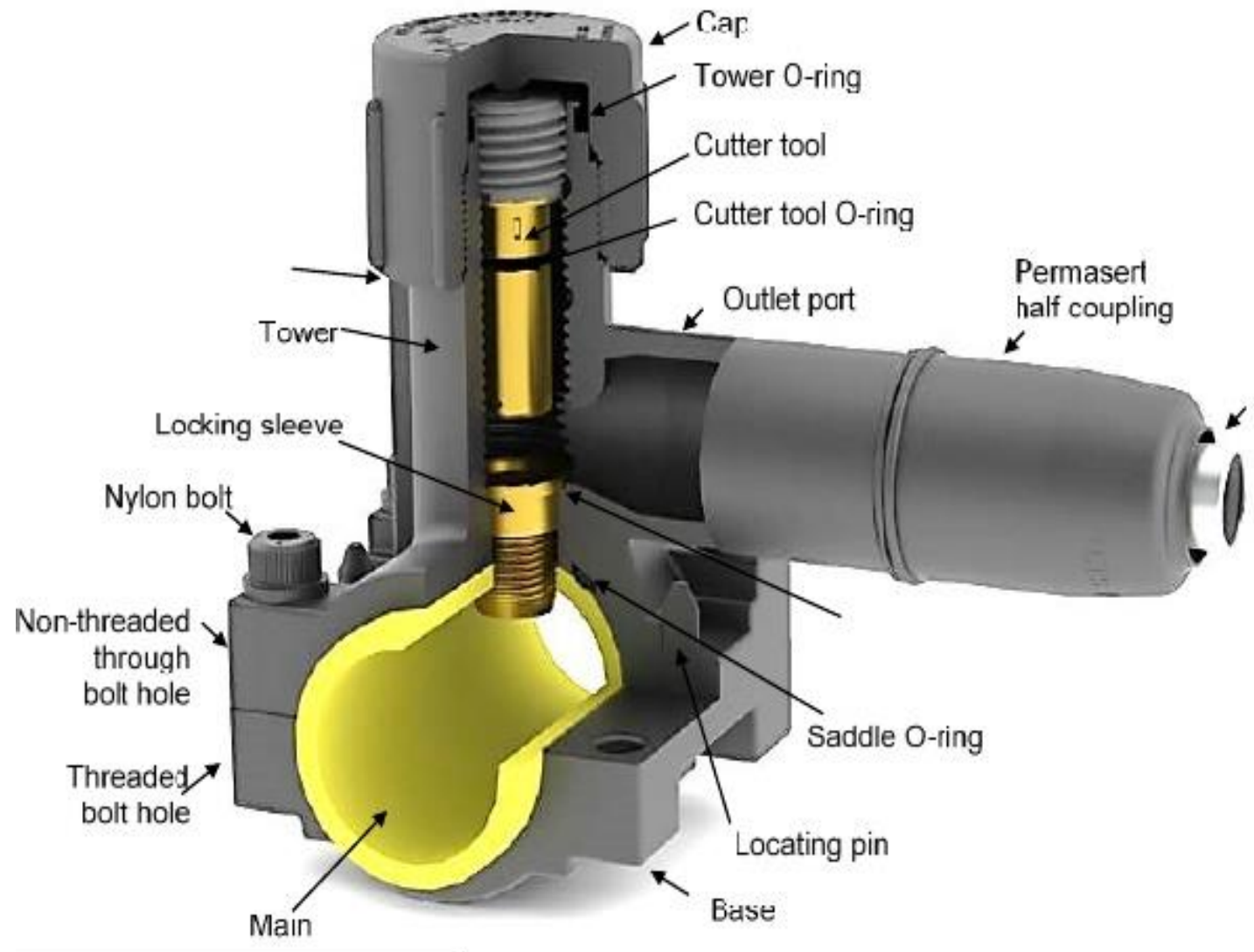


PERMALOCK

After the explosion, investigators pressure tested the main and service lines at the accident site and determined that the PermaLock mechanical tapping tee assembly was leaking gas at the connection of the tee assembly to the main in front of the destroyed home.

An NTSB examination of that PermaLock tee revealed the tee assembly was incorrectly installed. According to the report, UGI installed the tee assembly in June of 1998 and it had been in service for 19 years when the accident occurred.

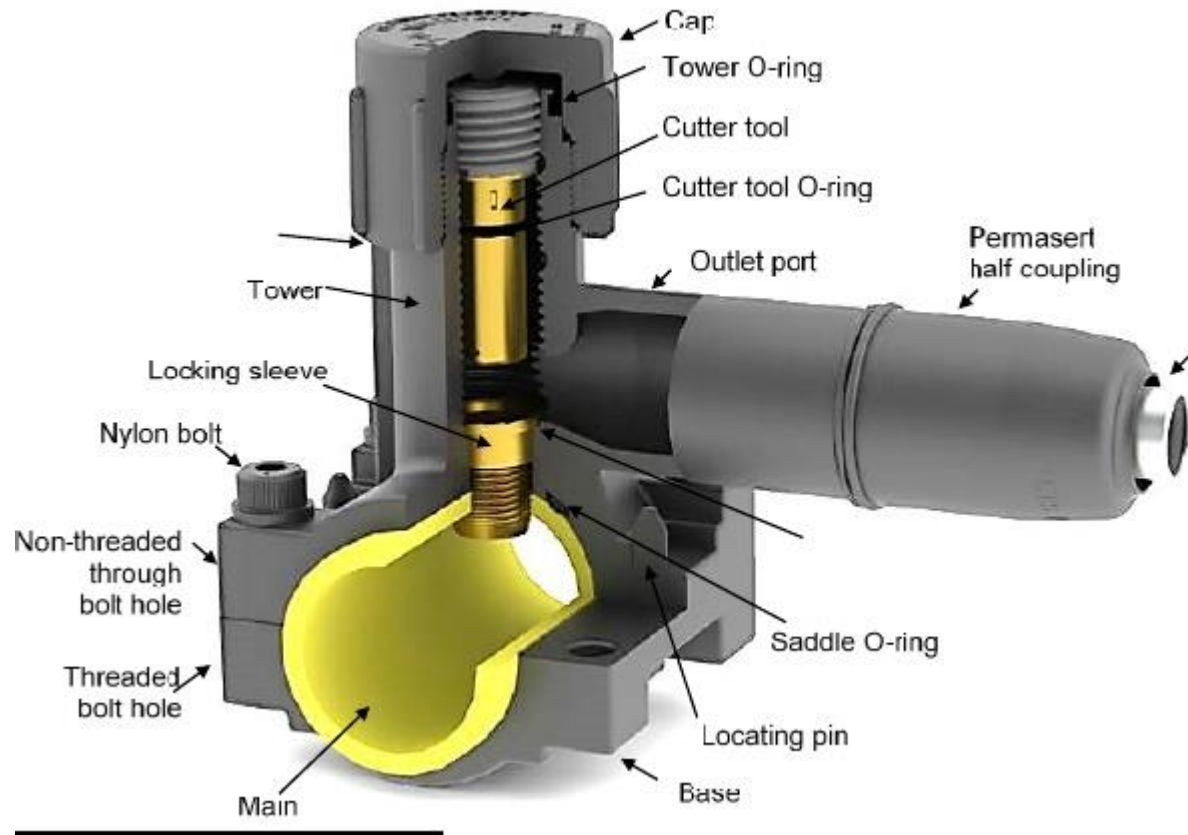





MECHANICAL TAP TEE

Since 1987, three versions of the PermaLock tee assembly have been manufactured, and millions of the tee assemblies have been sold worldwide

Each of the three versions has a different cutter tool design and method of attaching the tower to the main



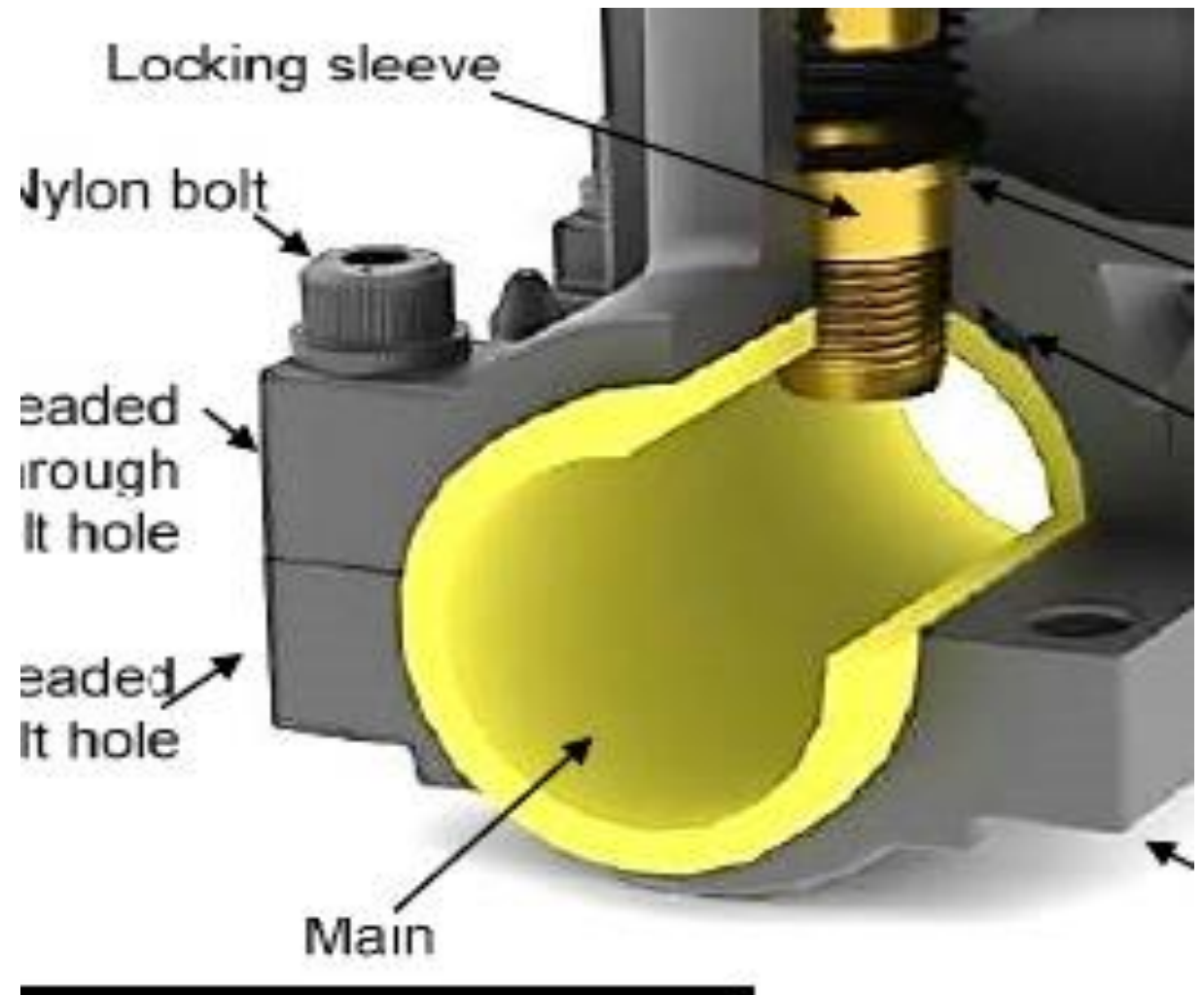
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- NTSB examination of the PermaLock tee assembly involved in the accident has revealed that the tee assembly was incorrectly installed.
 - Although the cutter tool pierced a hole in the main, the locking sleeve did not progress down far enough into the tower to form threads in that hole.
 - As a result, the locking sleeve was not attached to the main.
 - The NTSB also found that two of the four Nylon bolts on the tee assembly were fractured in a manner consistent with *slow crack growth*


LOCKING SLEEVE

NYLON BOLTS

For tee assemblies with a locking sleeve, such instructions must specify

- (1) the exact tools that are most effective for attaching a locking sleeve to a main and
- (2) the use of a depth tube to verify that attachment
- (3) not-to-exceed torque limit for Nylon bolts and have that value checked and adjusted with a torque wrench immediately after installation..



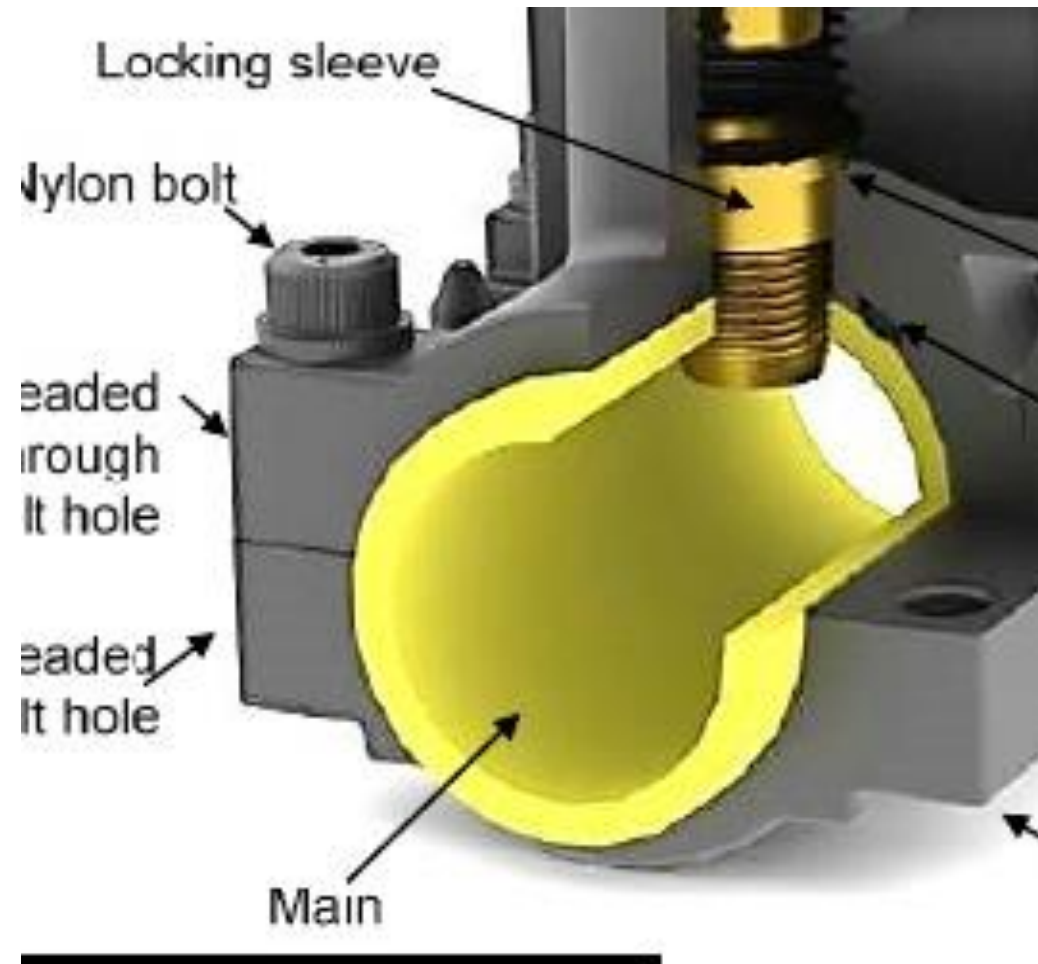
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- An incorrectly installed tee assembly can leak gas several months, years, or decades after installation.
 - ADB-08-02 in 2008


Version 1 manufactured 1987 to 1990 has a flat cap and one-piece cutter

Version 2 manufactured 1990 to 1996

Has a dome cap with a cutter tool and retractable center piece

Version 3 has a flat cap, cutter tool and a locking sleeve and is shipped with a depth tube.



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- There are multiple modes of failure for this assembly.
 - Locking sleeve not positioned correctly
 - Crack upon Nylon bolt
 - Failed (fractured) Nylon bolt
 - Multiple Nylon bolts fractured

ALSO remember that if the assembly is found to be leaking, this now is a Mechanical Fitting Failure, must be tracked and reported as a mechanical fitting failure.

NTSB RECOMMENDATION

Going forward: Your DIMP should contain information upon the use of PermaLock mechanical tap tees

- **To the Pipeline and Hazardous Materials Safety Administration:**
- Work with state pipeline regulators to incorporate into their inspection programs, a review to ensure that gas distribution pipeline operators are using best practices recommended by the manufacturer in their distribution integrity management programs, including using the specified tools and methods, to correctly install PermaLock mechanical tapping tee assemblies. (P-18-1)
- Reference the use of external sources of information for threat identification in your frequently asked questions for preparation of distribution integrity management programs. (P-18-2)

WHAT TO DO NEXT

Consideration must be made when a previously installed PermaLock tap tee is exposed.

- When discovered that these tap tee assemblies are within the distribution system. You must; identify them as a THREAT, determine and assign RISK and determine consequence and assign Remediation actions.
- Retraining on installation of PermaLock Tap Tees
- Make sure you have a torque wrench.
- Establish/revise installation procedures.
- Consider installation of electrofusion tap tee
- Upon exposure, inspect and/remediate existing PermaLock tap tee assemblies.
- Have procedures in-place, that direct actions when an existing PermaLock tap tee is exposed (for any reason)

WHAT COMES NEXT

INTEGRITY MANAGEMENT

- If you are installing these devices
- Make sure procedures are current
- Establish/revise installation procedures
- Re-enforce training methods
- Qualify to the procedures
- Provide proper tools
- Document location of the tap tee
- Establish/revise DIMP considerations


When you find a PermaLock mechanical tap tee with your system.

Document a visual inspection of the tap tee inspect and/remediate existing PermaLock tap tee assemblies.

For now it would be advised that the PermaLock mechanical tap tee is identified as a potential threat within DIMP so you can demonstrate that you have considered this “Threat”.

Accelerated gas leak survey

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- Now would be a good time to install an EFV.



Since 2007, this gas operator has remediated or replaced about 4,000 PermaLock tee assemblies, more than a 1,000 of which have been remediated or replaced since the July 2, 2017, Millersville accident.

Another gas operator decided to remove all PermaLock tee assemblies installed between 1997 and 2001.

The gas operator initiated a replacement program, which involved locating and replacing about 1,875 mechanical tap tees.

The gas operator excavated about 12,000 service connections to find and replace the tee assemblies.