

Suggested Best Practices Static Suppression Procedures for PE pipe transporting fuel gas

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I have been asked to recommend static suppression procedures since there are none officially promulgated by any trade association or specified under Part 192 and 195. However, Part 192.751 requires you to minimize the danger of an ignition. All of these recommendations come from my 15 years of experience being called on by gas transporters after numerous similar static ignition incidents have occurred.

I believe these five recommendations should be the minimum static suppression procedures your organization should have in your standards. You can implement them to any degree you see fit. However, I sincerely believe based on my field experience that Recommendation #1 should be, at the minimum, adopted by all companies. I also make two optional recommendations for you to consider for your company. However, I would not recommend adopting the optional standards without first adopting all five recommended procedures.

This paper IS NOT our Manufacturer's Procedures for Use that are required by state pipeline safety program managers to audit operator's compliance. These are SUGGESTED procedures. There is a separate Procedures for Use for Part 192 and 195 compliance.

Finally, all my recommendations are based upon the use of a Topical Antistat to dissipate static. Wet rags/soapy burlap were recommended over 40 years ago because there was no other technology available. The versatility, ease of use and effectiveness of today's topical antistats make the use of wet rags obsolete and unsafe. Therefore I presume the use of a topical antistat in these procedures.

Recommended static suppression procedure #1

Static suppression during O&M operations

Rationale:

Static builds up inside the pipe and especially where there are flow obstacles. Friction in the inside edge of opened pipe builds up at the edge. Since it is exposed to gaseous atmosphere, that charge can build up to the point it arcs to ground igniting the mixture. In the class I teach on static electricity, I showed a NewsChannel 9 video of a gas leak ignite on camera while gas crews are working on it.

Procedure:

If the gas flow has been squeezed off, prior to allowing anyone to enter the excavation, while standing outside the excavation, spray the outside of the pipe with IGT Aerosol Static Suppressor using our IGT Aerosol Reach Tool. From outside the excavation, visually inspect the pipe to make sure the exposed pipe surface is blue. Next, from outside the excavation, apply IGT Aerosol inside the open end of the pipe. Approach the open end on the pipe sideways using the IGT Reach Tool and when no closer than 12" begin spraying into the center of the open end of the pipe end as you move the Aerosol spray closer.

Continue spraying as you move the Aerosol closer to the open pipe end making sure the open exposed pipe edges (inside and outside) are blue from the IGT Aerosol spray. Remember that static will only be dissipated as far as the IGT Aerosol Spray reaches inside the pipe.

If the gas flow has NOT been squeezed off or will not be squeezed off, attempt to follow the above procedure as closely as practicably possible. Since it will not be possible to spray IGT Aerosol into the opening of a blowing pipe, to the best of your ability, repeatedly spray IGT as close to the open end of the pipe as the blowing gas will permit.

Recommended static suppression procedure #2

Static Suppression of gas purging pipe

Rationale:

It is really the same as the rationale for static suppression of 3rd party damage stated above. In 2006 in Connecticut, while purging a gas pipe during construction of the Kleen Energy gas turbine plant, the gas exploded killing 6 and injuring 50. There have been at least 5 documented gas explosions during purging at industrial operations.

Procedure:

After gas purging has stopped, attach our IGT Aerosol to our IGT Reach Tool and from a distance of at least 3', spray the entire outside of the pipe from 12" below the connection of the plastic pipe to the open end of the grounded metal purging pipe outlet. If there is no metal grounding purge pipe, begin spraying 12" from the pipe end and stopping at the end of the open purge pipe end. Next, again using the IGT Reach Tool from a distance of 3', apply IGT Aerosol inside the open end of the purge pipe. Using the IGT Reach Tool, approach the open end on the pipe and when no closer than 12" begin spraying into the center of the open end of the pipe end as you move the Aerosol spray closer. Continue spraying as you approach making sure the open exposed pipe edges (inside and outside) are blue from the IGT Aerosol spray. Remember that static will only be dissipated as far into the pipe as the spray reaches.

After spraying continue your operation as company procedures dictate.

Recommended static suppression procedure #3

Static Suppression during squeeze off.

Rationale:

Even before AGA recommended static suppression of plastic pipes, there were reports of electrostatic pinholes after squeeze off. In addition, during my classes I've had field operators tell me of receiving shocks when touching pipe after squeeze off. Remember – there's a reason squeeze off tool manufacturers tell you to ground the tool.

Procedure:

Before beginning squeeze off compression, spray exposed pipe completely with IGT Aerosol Static Suppressor. Wipe off the pipe to remove any debris that might embed during squeeze-off.

After squeeze off, spray the exposed squeezed off pipe surface one additional time after squeeze tool release before any operator contact. If spraying the squeeze off cannot be reached by hand, use our IGT Aerosol Reach Tool to spray the surfaces.

Recommended static suppression procedure #4

Static Suppression during hot taps.

Rationale:

When you do a hot tap you run the risk of exposing an interior “hot spot” of static inside the pipe to gaseous mixture during tapping. I’ve had several field operators tell of an ignition of escaping gas igniting during hot taps.

Procedure:

When performing hot taps (metal or plastic), spray IGT Aerosol Spray inside the tapping fixture completely wetting and coating all inside parts and areas.

Before beginning to tap, spray inside the affixed tap and tool ends that will enter tapping fixture with IGT Aerosol. Any IGT Aerosol entering the gas stream will be carried off and burned with the gas. There is NO hazard if IGT Aerosol enters your gas stream.

Wipe tool off after tapping is complete using an iso wipe or wet rag.

Recommended static suppression procedure #5

Static Suppression of interior of pipe previously under pressure removed from service.

Rationale:

Industry research has shown all static in PE pipe begins inside the pipe. When that pipe is removed from service the static inside the pipe remains along with any residual gas. I’ve been told of numerous instances where field operators have reached inside cut pipe and ignited residual gas.

Procedure:

Any PE pipe that was under pressure and then cut and removed from service and which will be handled within 24 hours should be remotely sprayed INSIDE the pipe with Aerosol Static Suppressor as soon as practicable before handling. DO NOT reach inside the pipe. Spray sideways starting about 12” away and spray into the pipe as you come closer to the edge without allowing your hand or arm to pass inside the pipe. Do this on both ends of the pipe. Try to direct the spray as far into each end of the pipe as possible

without putting your hand inside the pipe. If you desire to spray further into the pipe, do not reach inside the pipe. Use the IGT Aerosol Reach Tool to spray inside the pipe.

Here are my two optional suggestions for static suppression:

Static Suppression Optional Suggestion One

Whenever cutting into a plastic pipe that has been under pressure, spray IGT Aerosol into the cut and on the cutting tool blade as you are cutting. While this cannot guarantee there will not be a spark, to the extent IGT Aerosol gets carried and disbursed inside the pipe during cutting it will dissipate any interior static charge. This is not a substitute for following your company's procedures, grounding (or not grounding your tools) or other established static suppression procedures. You can also follow this procedure for metal pipe but it is more important to follow this procedure for plastic pipe.

Static Suppression Optional Suggestion Two

Anytime it is anticipated a plastic pipe will be opened exposing the pipe interior, prior to opening the pipe, spray the outside in an area 1" from each side of the opening. You can also follow this procedure for metal pipe but it is more important to follow this procedure for plastic pipe.

This is not an exhaustive list of suggested procedures. You must review your company's operations for other procedures that might require static suppression. Every gas transport operation is different and therefore each must be individually evaluated for static ignition risks and the appropriate static suppression procedures.

However, from my field experience, implementing these 5 recommendations will go far to prevent a static ignition. The other two suggestions will also increase your margin of safety. If you have any questions about these recommendations do not hesitate to call me at 800-246-1784 or email me at dsmith@ionixgastechologies.com