

## PROPANE RESPONSE MYTHS, FOLK LORE AND MISCONCEPTIONS

By Ron Huffman, President, Responder Training Enterprises, LLC: Copyright 2026

It's interesting to me that I keep hearing that a 1-inch propane flare is too "big". The belief is that it will force auto-refrigeration causing liquid to run down the flare stack or even rain down on the ground around the flare, or it will increase on-scene times due to low internal pressures.

They're correct, if you've not been properly trained, or are inexperienced in proper propane incident management, those are potential problems. That's not a flare problem; that's a tactics problem. That's a training problem.

A flare is like any other tool. If you operate it the same on every incident, the results will not always get you what you need.

For example: have you ever compared your flaring operation to the Vaporization Rate chart on page 7 in the REGO Serviceman's Handbook? The chart identifies the available BTUs Per Hour at Various Temperatures. You can view it at:

[https://www.regoproducts.com/content/dam/pes/pdfs/L-545\\_Servicemans\\_Manual.pdf](https://www.regoproducts.com/content/dam/pes/pdfs/L-545_Servicemans_Manual.pdf)



Go look, I'll wait right here....

Glad you're back. As you looked through the information you saw that it uses temperature and liquid volume to illustrate BTU output. With just a small loss in product temperature there is a significant reduction in available BTU output. So, the question is, during your flaring operation, are you allowing the tank to get "TOO COLD"?

That's not a "flare problem" that's a tactics problem. The flare is only doing what you are allowing it to do. Just like

a computer, garbage in, garbage out. Your tactics and training dictate the flow and, ultimately, how the incident is resolved. Is your tactical plan to use a 1-inch flare to quickly reduce the liquid level in the tank? Or is your plan to rapidly auto-refrigerate the liquid in the tank to reduce stress or pressure so you can change out a broken or defective device? Both are great options for a flare with larger flow volumes. If all you have is a smaller flare, neither option may be possible. The larger the tank's volume, the more vapor production is possible.

Another question that I regularly get asked is what's the maximum GPM (Gallons Per Minute) that our 1-inch propane flare can provide? I can honestly confirm that I have pumped 60 GPM through it on more than one occasion. Can it provide enough flow to prevent liquids from running down? YES, it can if the system can provide the volume and pressure to sustain a good full pressure burn. Every system will have a different flow characteristic from every other. Some could have a flow rate of only 1 GPM and another could have an excess flow rate at 250 GPM or more. One will absolutely cause liquid to rain down if it is not managed properly, the other most likely will not. But both could if the

Here's another example:	TANK SIZE:		
	500 GWC	1,000 GWC	1,800 GWC
TEMPERATURE:	Btu/hr	Btu/hr	Btu/hr
+60° F	700,000	1,400,000	2,200,000
+50° F	630,000	1,300,000	1,850,000
+40° F	550,000	1,000,000	1,700,000
+30° F	465,000	850,000	1,450,000
+20° F	380,000	700,000	1,350,000
+10° F	300,000	550,000	925,000
0° F	240,000	400,000	650,000
-10° F	130,000	250,000	430,000
-20° F	60,000	127,000	180,000

(GWC = Gallons Water Capacity)

temperature of the propane is allowed to auto-refrigerate to a LOW temperature causing low pressure before it's flared.

Rather than simply reacting to the flare, ask yourself these critical questions to determine if your tactics match the physics of the tank or the tactics being used during the incident:

- **Does it matter if the propane burns on the ground?**  
Generally, no—provided your equipment is up to the task. If your flare stack is designed to keep the flame front away from your supply hoses, a ground fire is a manageable condition. Ask yourself: *Is this fire actually hurting anything, or am I just afraid of how it looks?*
- **Is liquid "raining down" a pressure or temperature problem?**  
It is usually both. If the tank auto-refrigerates, the internal pressure drops, and the velocity at the flare tip decreases. Without enough pressure to atomize the liquid, it falls to the ground.
- **Can I change where auto-refrigeration occurs?**  
Yes. By adding a **system restriction** (such as a smaller orifice or a partially closed valve) further downstream toward the flare, you can shift the pressure drop away from the tank.
- **What is the benefit of a restriction?**  
Adding a restriction helps maintain higher internal tank pressure and temperature. This prevents the "garbage in, garbage out" scenario where the tank gets too cold to provide the volume needed for a clean, sustained burn.
- **How do I know the tactic is working?**  
You will see a stabilized flame at the tip and a decrease in liquid "dropout." If the tank is no longer frosting aggressively and the pressure holds steady, your restriction is effectively managing the vaporization rate.

These are all conversations that I have addressed with my students.

After creating my 1/2" flare I conducted a test to see just how long it would take to flare vapor and empty a 20-pound cylinder with it. During the test it was 30 degrees that night. I flared a 20-pound cylinder for 4 hours and still did not have it empty! The problem was I flared it too fast; I forced the tank into auto refrigeration. The flare size was not the problem; my tactic was the problem.

If I wanted the tank to go empty quickly, that was a tactics problem. That was a flow problem. That was a, I released vapor way too fast with a 1/2-inch flare problem.

Another issue that we address in class is using water to warm up a propane tank to increase vapor output. How many have been taught through the years that this works? That might be a tactical error; too early, it's not needed; too late, and it doesn't help!!! During the practical portion of class, I'll explain why that might not work every time.

Also, how many students have been taught through the years that you should, "NEVER" extinguish a gas fire without shutting off the fuel source? That's wrong! And a possible BLEVE is the reason why..... There are times that we should extinguish the fire and there are times we should not. Where is the most dangerous place that you can have a fire on a propane tank? On the tank where the liquid



absorbs the heat, increasing vapor pressure and most likely causing the pressure relief device to operate, protecting the tank metal? Or on top where the steel absorbs the heat, the heat weakens the steel, allowing the tank to continue towards a BLEVE.

If you have a fire under the dome? Extinguish the fire and manage the vapor leak from as far away as possible.

This will STOP the possibility of a BLEVE due to heated and weakened metal where internal pressure can stretch, tear and cause a failure of the tank.

If you came around a house and saw a vapor leak under the dome, would you treat it the same as a fire under the dome. I hope not. A vapor leak is much easier and a lot safer to manage.

For years many of us have taught firefighters to use two fog lines, two teams, and an officer in the middle. We would walk up, push the fire down, gain access to the dome, open it and shut off the valve if it was still operational. This is a holdover from the old Ranger Insurance Schools of the 80s and 90s.

Have you ever had it work that way?

How often is the valve still operational when you lift the dome? You might as well extinguish the fire, cool the metal, eliminate the BLEVE potential and manage the vapor leak starting from a safe distance. Then figure out how you will bring the incident to a safe and favorable conclusion.



I've taught this same tactical response for years because that's what I was taught as a young firefighter. Most of us were taught this tactic either through our fire school or we attended one of the "OLD Ranger Insurance schools that used to be taught around the country.

I conducted an AI search, and this is what I got back:

Question: When did the OLD Ranger Insurance propane response schools that used to be taught around the country end?

***The AI answer: "The Ranger Insurance traveling propane response program, which was a fixture of firefighter training across the country for many years, officially ended in the early 1990s.***

***The school was famous for its "live burn" exercises, including a pressurized tank prop that would "pop" the relief valve to simulate real-world emergency conditions. While the specific Ranger program is no longer active, its legacy continues through modern training:***

***Successor Programs: Many instructors from the original era, such as Ron Huffman of Responder Training Enterprises (RTE), developed their own systems based on the Ranger model but with updated safety protocols, such as using non-pressurized tanks to eliminate the risk of a BLEVE (Boiling Liquid Expanding Vapor Explosion) during drills."***

How many times have we heard, "That's the way we've always done it?"

I'm changing that or at least giving you other options to think about.

Contact me and let's talk about tactics and response options. I want to help you get your response personnel up to speed so that they manage your next incident quickly, efficiently and most of all safely.

Be safe brothers and sisters!!!!

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