JOIFF

Rotterdam 2023

STRATEGIES AND TACTICS

for STORAGE TANK FIRES

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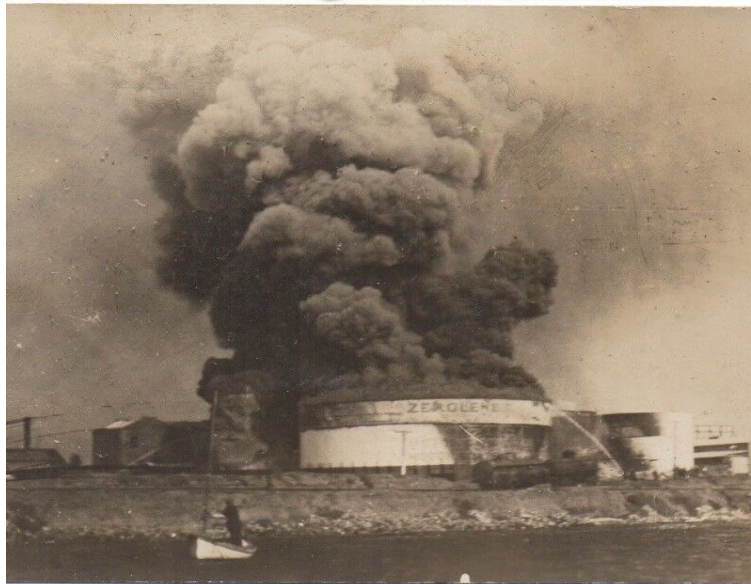
POG and Special Risk Technical Advisor

BRISTOL

Orion Refinery, Norco – Louisiana
June 2001
Not a credible scenario?
Photo in memory of David White
1945 - 2023

THESE FIRES ARE AS OLD AS THE O&G INDUSTRY



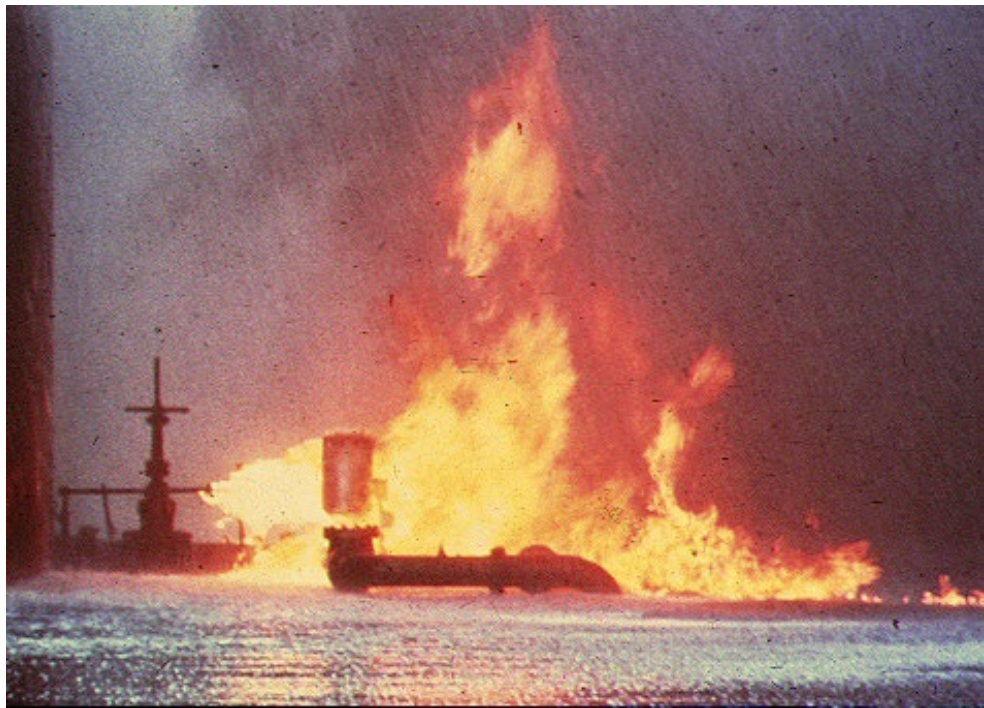
JUST THESE FEW HAPPENED IN 2022

THESE FIRES OCCUR OVER THE WHOLE CROSS-SECTION OF THE O&G INDUSTRY

HOPEFULLY YOU HAVE ONLY ONE BURNING

BUT SOMETIMES YOU GET MORE THAN ONE

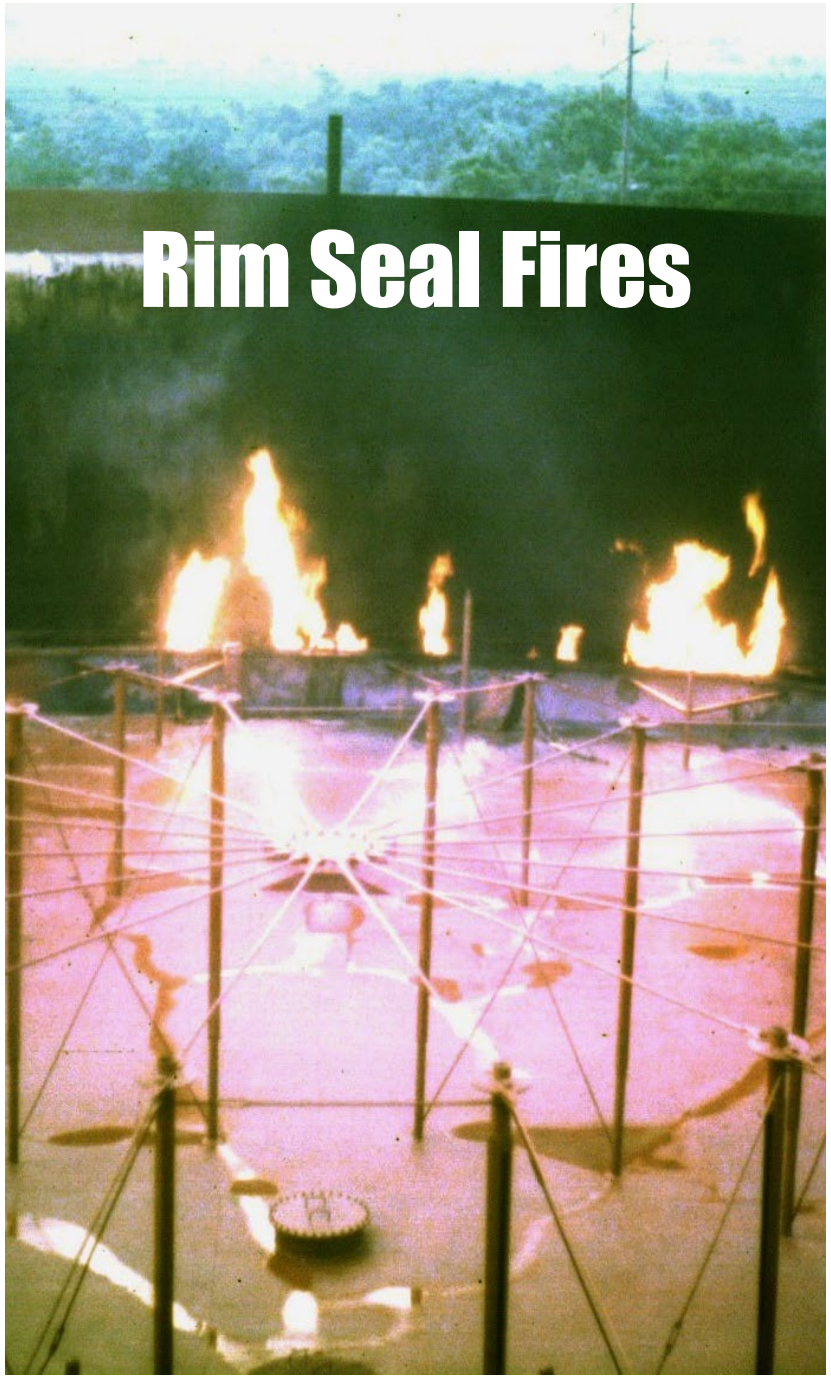
FIRE IN THE TANK IS A FIRE MOST PROBABLY A FIRE IN THE BUND



FIRE EXTENSION OUTSIDE THE BUND AND FENCELINE

HAZARDOUS PHENOMENA

FIXED SYSTEM FAILURE


Rim Seal Fires

Fish Mouth Fires

Full Surface Fires

Pressure-fed Fires

Vent Fires

FULL SURFACE FIRES

The gold standard of full surface firefighting is still a Big Flow attack using the FootPrint methodology

SUPPLY CHAIN MANAGEMENT

SUPPLY CHAIN MANAGEMENT

The Foam Package

Bulk Foam Logistics

Foam Proportioning

Front-end Devices

The Water Package

Open-water Sources

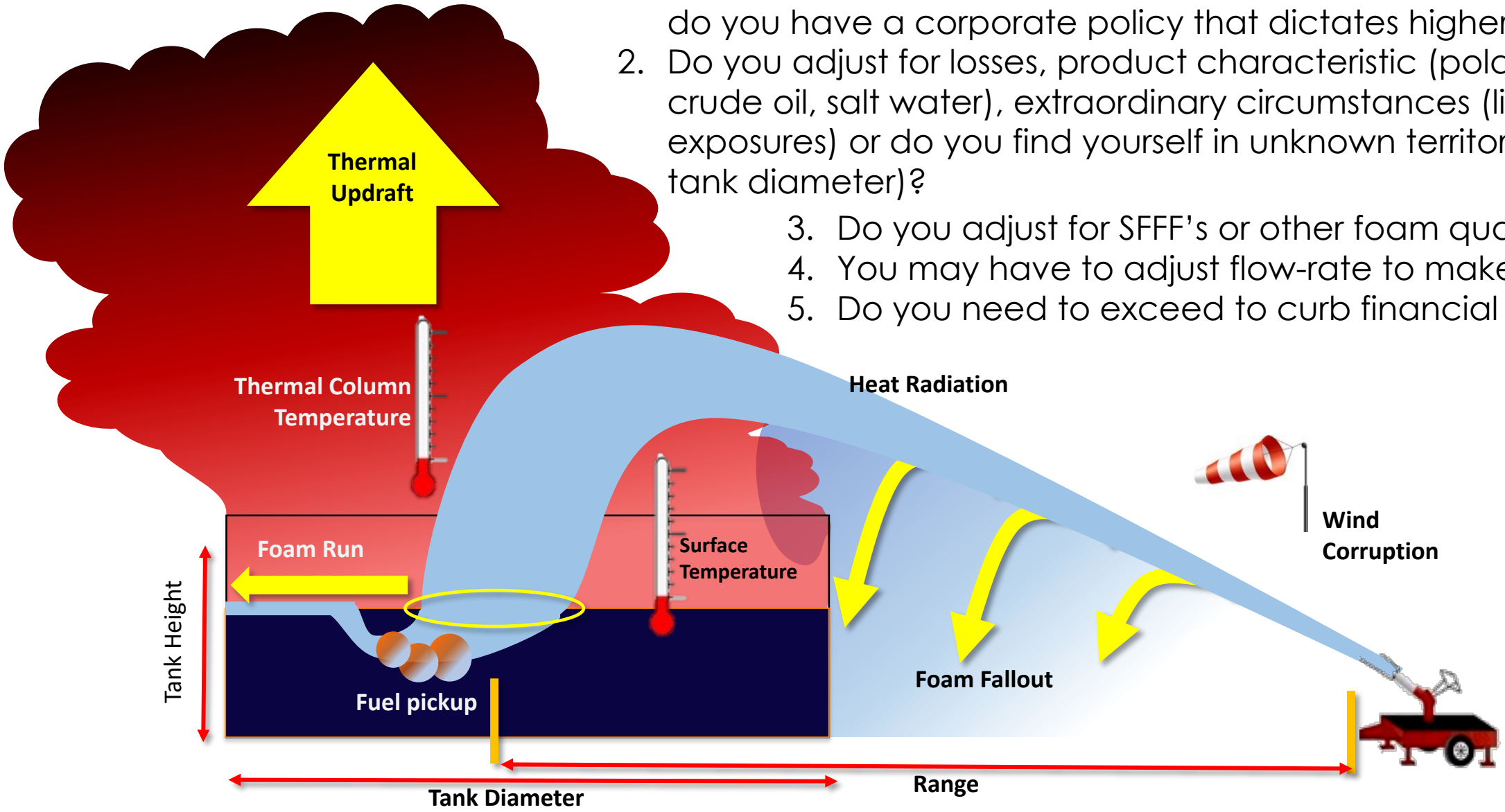
Long Distance Transmission

High-flow Mains

Bulk Dry Chemical

FLOW-RATE

1. What is your application rate: NFPA, EN, Williams, Lastfire, API? Or do you have a corporate policy that dictates higher rates?
2. Do you adjust for losses, product characteristic (polar solvents, crude oil, salt water), extraordinary circumstances (life threat, exposures) or do you find yourself in unknown territory (90+ meter tank diameter)?
3. Do you adjust for SFFF's or other foam qualities?
4. You may have to adjust flow-rate to make reach?
5. Do you need to exceed to curb financial losses?



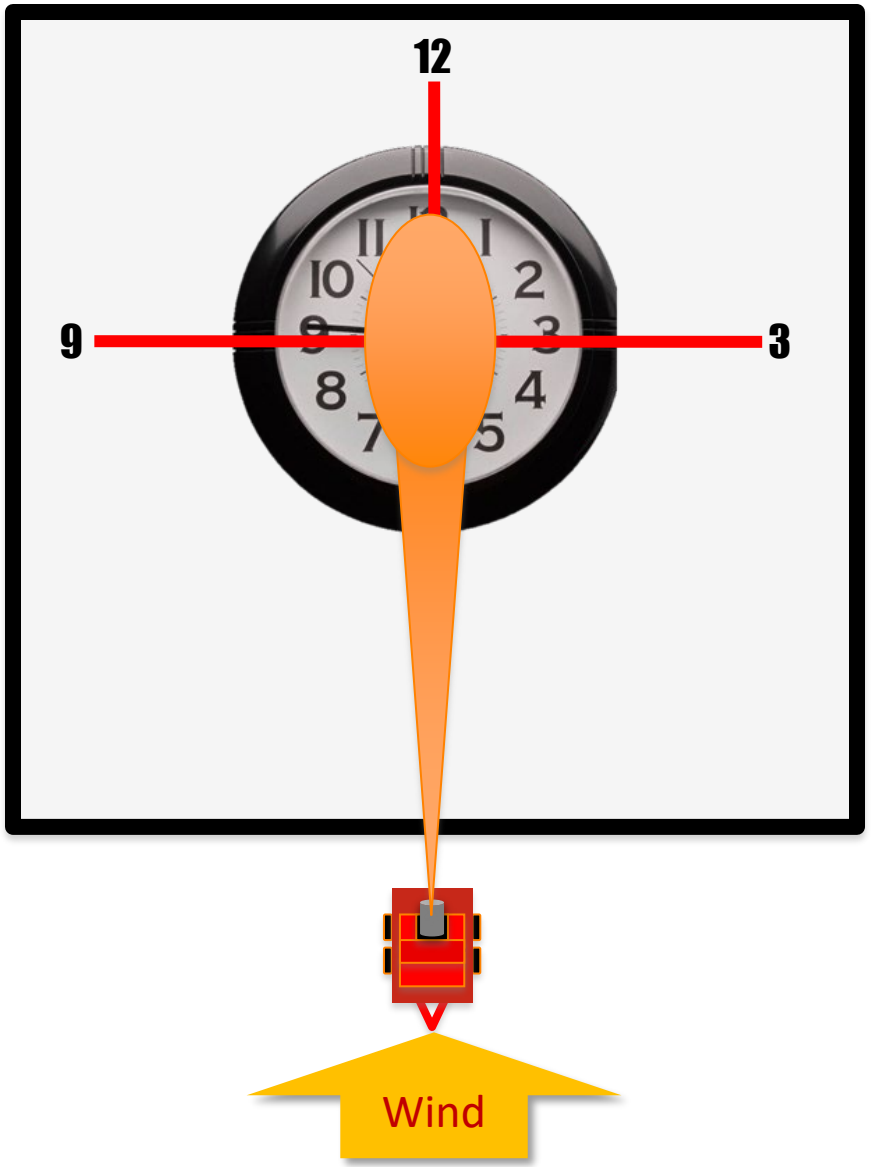
THE PUMPER DILEMMA

Why we recommend against the use pumpers on tank fires

HOT WO
CLASS

THE FOOTPRINT METHODOLOGY

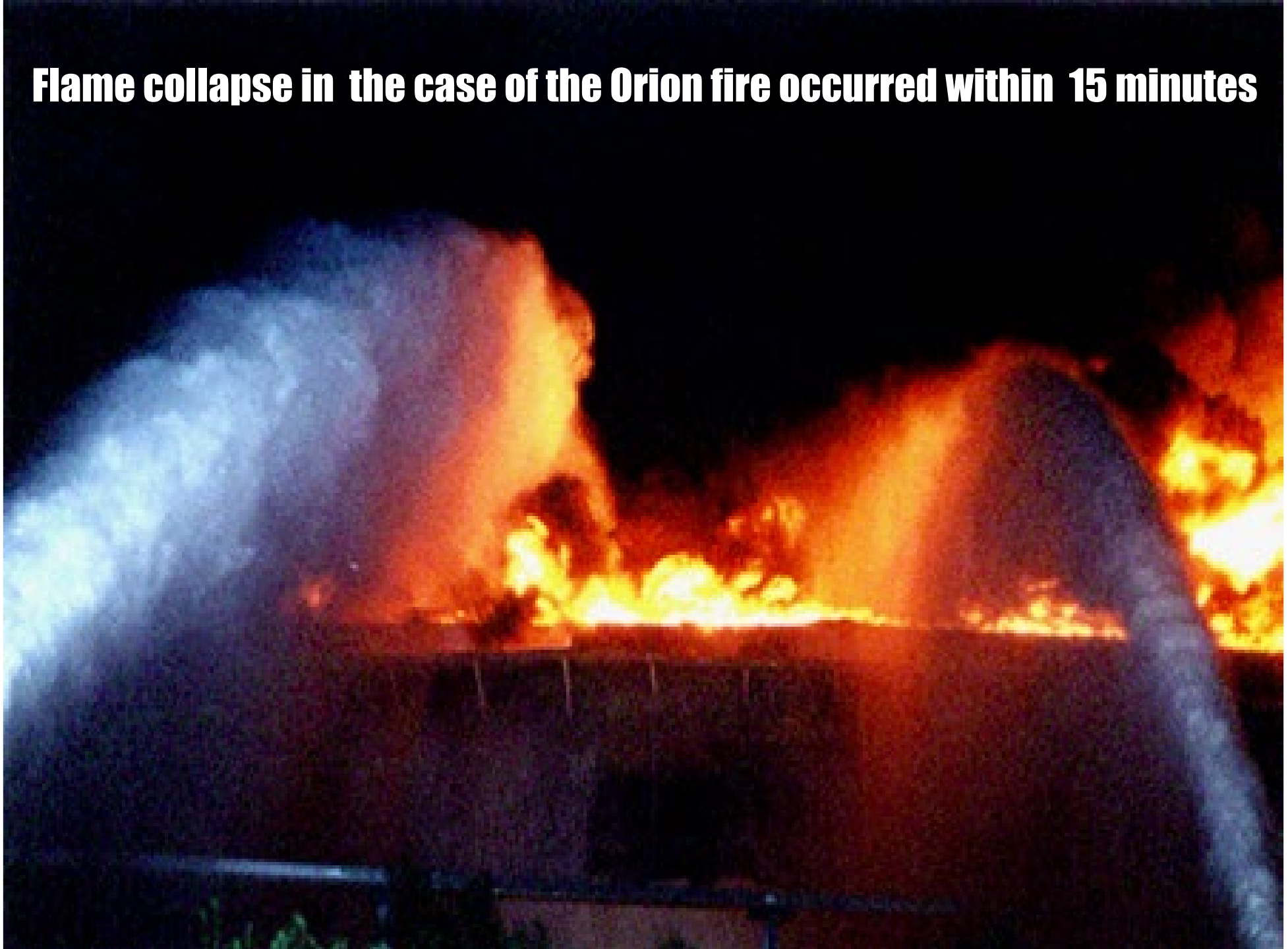
Basic Set-up



React Line in Ready Position

React Line in Ready Position

Flame collapse in the case of the Orion fire occurred within 15 minutes

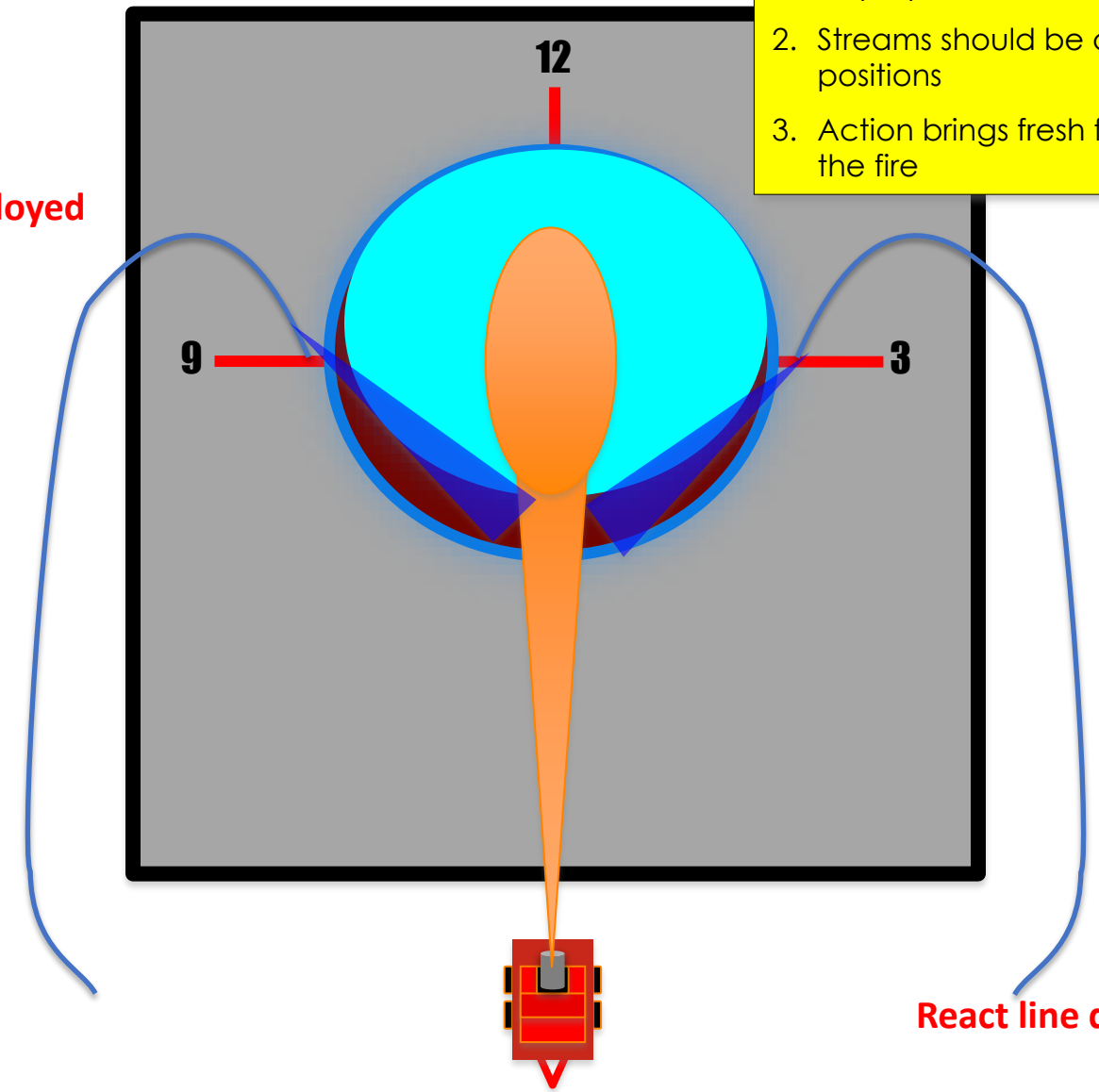


THE FOOTPRINT METHODOLOGY

Flame Collapse

1. Deploy react line immediately after flame collapse
2. Streams should be applied from the 3 o'clock or 9'o'clock positions
3. Action brings fresh foam into the most tenacious part of the fire

React lines deployed



React line deployed

Using ”the swirl” as alternative to React Lines

High-angle tease

CONE ROOF FISHMOUTH's

DEALING WITH RIM-SEAL FIRES

The Rim-seal Two-step

The combination of the Foam Wand and the Daspit Tool is to date still the best portable solution in combatting rim-seal events.

They are cheap, robust and extremely effective.

The critical challenge in this methodology is coming to grips with the fact that to manage the event, a crew will need to go up the ladder.

The good news is that this methodology is tried, tested and has been used on literally dozens of fires.

DEALING WITH RIM-SEAL FIRES

Hanging the Wand

Assemble and hang the Foam Wand from the ladder or wind girder

Start flowing foam. This will create a safe zone under the location where the monitor will be set up

VENT FIRES

PRESSURE-FED FIRES IN THE BUND

PRESSURE-FED TECHNIQUES

PRESSURE-FED EVOLUTIONS

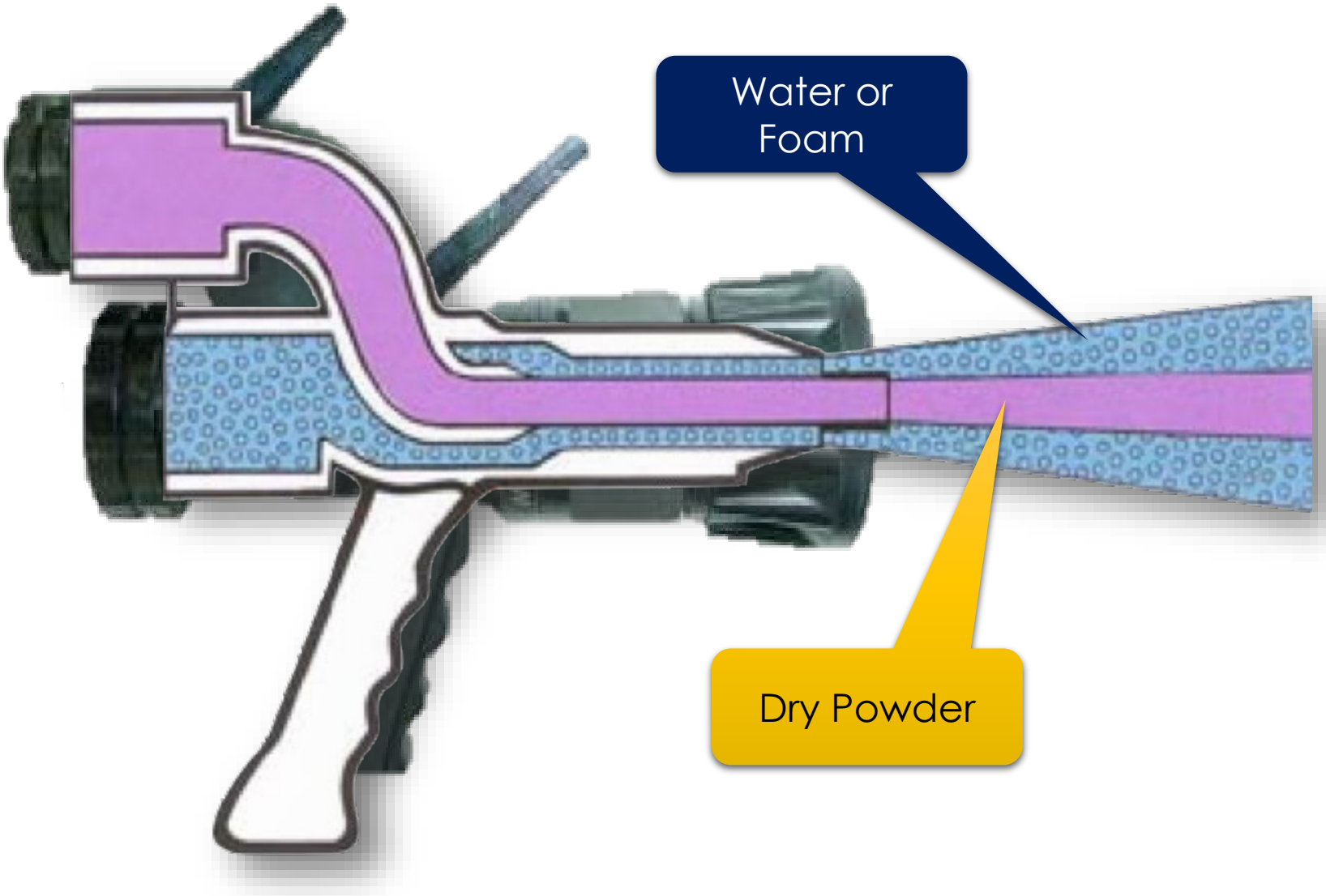
Hydro-chem operating principle:

1. Water or foam patterns are used to capture and manipulate the fire mass.

2. Class B dry chemical is used to disrupt the chemical chain-reaction of the combustion process.

3. Dry powder will travel two-thirds further in a water/foam stream than what it would achieve in clear air.

4. The dry agent needs to be a hydro-phobic siliconized powder like Purple-K. PKW is specifically recommended due to the addition of a bright purple pigment to the powder making it visible inside foam streams.



PRESSURE-FED EVOLUTIONS

Commence attack using the water/foam stream to:

1. Confine the fire in the pattern's hollow core.
2. Reduce the fire volume.
3. Redirect the flame into the direction of our choosing.
4. Simultaneously cool hot surfaces.
5. If you are dealing with a flammable liquid fire - use the foam drainage to control the ground fire.

PRESSURE-FED EVOLUTIONS

1. Once the flame mass is “formatted” to our need the dry chemical is releases.
2. The dry chemical is transported through the core of the stream.
3. It knocks out the fire by interrupting the chemical chain-reaction.
4. Dry chemical releases can be in bursts of 5 – 30 seconds.
5. Once knockdown is achieved the streams can be set to perform vapour dispersion.

PRESSURE-FED EVOLUTIONS

SO.... WHAT ABOUT THE FUTURE?
IS THERE SCOPE FOR DOING THINGS DIFFERENTLY?

Triple-phase fire tactics?

or
Multiple Rocket Launchers?

END