TIME TO BLOW OFF SOME STEAM,
WELL, MAYBE AMMONIA

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Prior to IIAR2-2014, previous editions of IIAR2 recommended that atmospheric relief discharges be directed upwards. With the publication of the 2014 edition in 2015, the language was changed to be a normative requirement.

15.5.1.5 *The termination of the discharge shall be directed upward and arranged to avoid spraying ammonia on persons in the vicinity.

While it seems to be a straightforward requirement, it does offer multiple challenges, not the least of which is, "How do we keep rain and/or snow from entering the discharge piping?"

In Picture 1, while the discharge is directed upwards, there is no guard in place to prevent rainwater from running down the inside of the discharge piping, and while there is a drip leg installed, it is of minimal length and will fill up frequently, particularly during heacy rain.

Another requirement of IIAR2 is that atmospheric relief discharges be located a minimum distance from air intakes to the facility.

15.5.1.2 The termination of discharge piping relieving to atmosphere shall be not less than 15 ft (4.6 m) above grade and not less than 20 ft (6.1 m) from windows, doors, and ventilation intakes.

In Picture 2, we see that the relief discharge is not more than 20 ft from the air intake, as required by IIAR2.

Picture 1

The truck flapper style discharge as shown in Picture 2 is a popular choice for preventing rain and snow from entering the discharge piping, it is a poor choice in areas prone to freezing rain and sleet. When the flapper and the discharge pipe become coated in ice, it will fail to open, thus failing to relieve an overpressure situation, possibly resulting in equipment damage, an ammonia release, and injury, possibly even death of an employee.

Some facilities choose to use a "sock" style cover on the upward discharge to prevent rain and snow from entering the piping. An example of this style is shown **in Picture 3**.

There are a couple of problems inherent with this style of discharge cover. First, the majority of them are made of coated nylon that is designed to shed water, but is not waterproof. If this style of cover is used on large diameter discharge pipes, water will pool on the

Picture 2

Picture 3

top of the sock where is suspended over the end of the pipe. This pooling water will eventually soak through into the discharge pipe, thus causing it to fail in its primary purpose. Another potential issue is if this sort of discharge cover is installed on discharge headers that are over 7-1/4 feet high, it will be difficult to reinstall the sock should it pop off of the pipe, and if the discharge header is not equipped with an ammonia detector, it may be days before the sock is observed to be off of the header. **Pictures 4 & 5** highlight this scenario.

Another issue that often rears its ugly head is the placement of the discharge relative to a working platform, such as a condenser. IIAR2 states:

15.5.l.4 Discharge piping shall terminate at not less than 7.25 ft (2.2 m) above platform surfaces, such as upper condenser catwalks, when the discharge is within 20 ft. (6.1 m) horizontal distance to the platform surface.

In Picture 6, The discharge header is exactly 7-1/4 ft above the condenser

Picture 4

Picture 5

catwalk, but the forced draft condenser is several feet higher than the catwalk. While IIAR2, specifically mentions the condenser catwalks as an example of a working platform, some regulatory officials consider the top of the condenser to be the working platform height. When the water distribution nozzles are services, the mist eliminators are removed and boards are typically laid across the top of the condenser, thus creating a "working platform." Keep this in mind when installing or upgrading relief headers. The cost of an extra few feet of pipe is small compared to regulatory fines.

Another requirement for discharge height is found in Section 15.5.1.3 of IIAR2.

15.5.1.3 The discharge termination from piping relieving to atmosphere shall not be less than 7.25 ft (2.2 m) above a roof Where a higher adjacent roof level is within 20 ft (6.1 m) horizontal distance from the relief discharge, the discharge tem1ination shall not be less than 7 .25 ft (2.2 m) above the height of the higher adjacent roof.

Pictures 7 & 8 show some instances where this requirement is not met. In Picture 7, the downward discharge is less than 2 feet above the roof. In Picture 8, the relief discharge is only a few feet above grade, and is well below the adjacent roofline.

Moving on to maintenance of the relief valves. IIAR6-2019 states:

13.1.1 All pressure relief valves (PRYs) that relieve to atmosphere shall be recertified or replaced on

the 5-year time-based frequency.

While there are many ways to track the replacement dates, the most commonly used method is to punch the appropriate month and year on the attached install/replace tag on the SRV when it is installed.

Picture 9: No Punches

Note that IIAR6 does address a lack of punches:

Picture 6

Picture 9: No Punches

13.1.1.1 The service life of the PRV shall not exceed 5 years of service after it is installed on the system.

13.1.1.1.1 Where the PRV Date Tag was not punched during installation, and PRV records do not indicate the installation date, then the worst-case installation date on the PRY Date Tag is assumed and shall be punched upon inspection.

However, as in the case of **Picture 10**, if no tags are on the relief valve and there is no additional record of installation, then the PRV must be assumed to be overdue for replacement.

Picture 7

Picture 8

Picture 10: No Tags

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