Group Steam Trapping in Process Applications

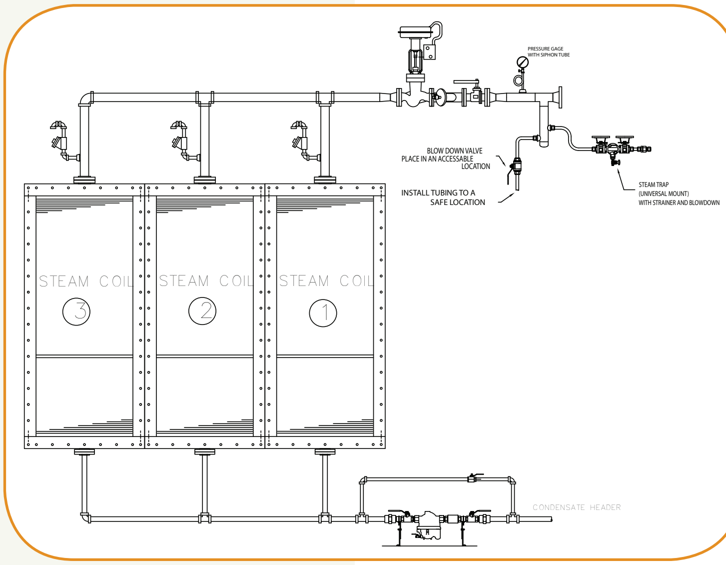
Process Applications - Group Steam Trapping Practices

Similar steam units (unit heaters, tracers, steam coils, heat exchangers, etc.) in close proximity can not be grouped steam trapped in most cases, which means using one steam trap for all similar units. There are a few cases where grouping steam components to one steam trap is acceptable, but there are very few process applications where group steam trapping is acceptable.

Example: Three steam heated coils; the steam coils are separate units, or three separate parts of one air heating system. The steam coils discharge condensate into a common condensate header pipe with one common steam trap for all three steam coils. The steam coil installation may cause "steam blanketing", which means condensate will back up into the steam coils. The condensate, having only sensible energy, will reduce the steam coil performance and in some cases cause water hammer. In colder weather conditions, the steam coils can freeze and fail.

Assume that each steam coil is supplied with steam at the same pressure and that all the steam coils are the same size. Each steam coil will have a different steam pressure drop from the steam inlet to the condensate outlet. The pressure drop results from:

1. Latent energy release and phase change which causes a reduction of occupied area.
2. Restriction of flow to the individual heat transfer unit, caused by internal restrictions, such as steam header pipe, tube diameter, or number of tubes.
3. Air flow differences entering the steam coils.
4. Different fouling factors on the outside of the heat transfer.



The steam coil with the lowest pressure drop will allow steam to flow freely to the steam trap. The steam trap, sensing steam, will go into the closed position.

Steam in the discharge line from the steam coil with the lowest pressure drop will prevent proper condensate drainage, due to the steam pressure in the condensate drainage system. The other steam coils condensate will not be able to evacuate the condensate because the condensate can't overcome the steam pressure in the condensate drainage line. This issue is termed "steam blanketing".

"Steam blanketing" is not typically a permanent situation, but a temporary condition. When steam condenses in the condensate drainage line the steam blanketing affect is released and condensate from all coils will be