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Technical Bulletin 060200

Mechanical Leak Detector and Problems Associated with Manifolded Piping
June 2nd, 2000

The following addresses problems typically associated with piping systems that consist of single wall piping, multiple turbines manifolded together, and the use of mechanical line leak detectors.

Manifolded piping systems present unique problems that affect mechanical line leak detection. These problems are associated with the ability of the mechanical leak detector or leak detectors to detect a 3 gallon per hour leak rate as per EPA guidelines.

The attached drawing illustrates three configurations of single wall piping systems and how mechanical leak detectors are often used.

Configuration # 1
Two Pumps/ Two Leak Detectors

This configuration illustrates two tanks, each with one turbine. Each turbine has one leak detector, piping is tee'd together to a single line.

Problem: Each leak detector, when in the leak search position, allows 3 gallons per hour to pass to line. If both pumps come on at the same time, each leak detector will be testing for a leak at the same time. This results in 6 gallons per hour line leak detection, not 3 GPH as per EPA guidelines.

One proposed solution is to delay one of the pumps long enough for the primary pump / leak detector to search for a leak and then activate the second pump. This solution has a similar 6 GPH problem. Even though one turbine starts and performs line leak detection, the second turbine is not prevented from coming on if the leak detector in turbine # 1 detects a leak. If pump # 2 does start when there is a leak in the line, the combined volume passed by both leak detectors is 6 GPH, exceeding the 3 GPH threshold.

Configuration # 2
Two Pumps/ One Leak Detector

This configuration illustrates a two turbine installation with one turbine/ leak detector and one turbine/ check valve.

Problem: The installation of a leak detector in the pump that is activated first (pump # 1) and the installation of a check valve at the discharge of pump # 2 results in virtually no leak detection. Unless pump # 2 is prevented from turning on when the leak detector in pump # 1 is in slow flow, no leak detection occurs. This cannot be achieved without additional sensing and control equipment.

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Configuration # 3
Two Pumps/ One Leak Detector
At Tee Manifold

This illustration shows two turbines piped to a tee connection where the leak detector is installed and a single pipe continues to the dispensing area.

Problem: Without double wall piping and sump containment, any leak between the pumps and the leak detector will go undetected.

This configuration is acceptable only if both turbines and the leak detector are in the same sump, or if double wall piping, sump containment, and sensors are used up to the discharge of the leak detector.

Additionally, in this configuration the leak detection equipment needs to be sized to handle the flow capacity of both turbines combined.

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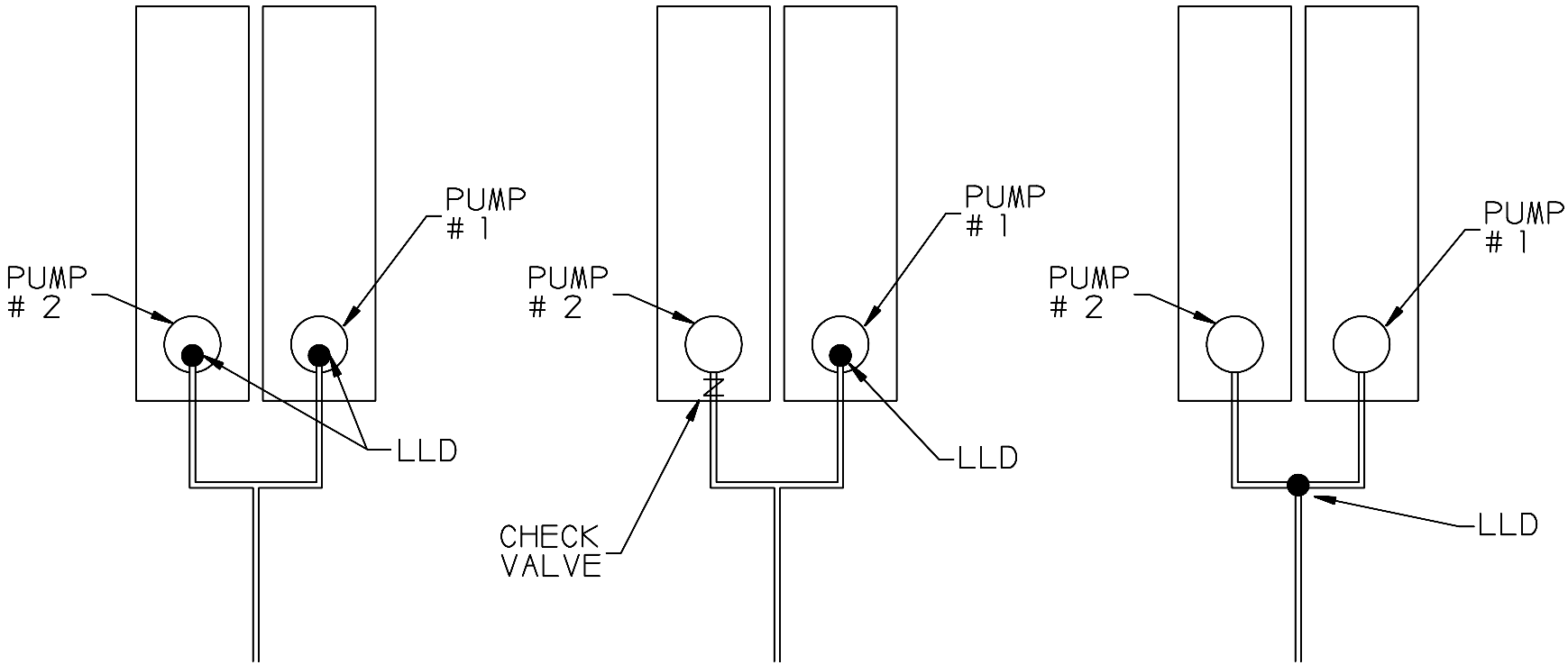

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