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MODIFYING AN EXISTING SYSTEM? BEWARE OF LURKING IRON OXIDE!

I have seen over the years a consistent problem occurring when an existing piping system is modified with new equipment and new pumps. Anytime an existing piping system is modified, the dynamic of the flow in the piping changes. For the many years of operation, the existing piping system had reached a steady state so minimal iron oxide was being eroded from the pipe interior. However, when a system is modified, the internal flow dynamic changes. Flushing of the system will remove any loose material. But, material will not be removed from the piping walls until the system finds its new happy place. Basically, this means that iron oxide in certain areas of the pipe will be scoured off as the piping adjusts to the new flow dynamic.

No amount of flushing would make a difference as the system needs to get to a new steady state condition. System flushing will clean out any loose debris and scale, but only the operation of the system will provide for the new system to reach its new steady state condition. Thus iron oxide particulate will end up moving around the system and ultimately getting into the seals, on control valves seats and into terminal equipment.

There are a number of means to deal with this problem. One is to install some filters on the system. The problem with this solution is there is a pressure drop through the filters and the engineer probably will need to account for this additional pressure drop in his pump selection. Also, the pressure drop through such filters will vary as the bag or filter media gets dirty. Such pressure variations will cause flow variations in the system. The flow variations could be handled by using variable speed drives on the pump motors.

Another means is to install centrifugal or cartridge filter type separators on the seal flushing lines of the pumps. The use of these devices will protect the seals from seeing the particulate that has been freed from the piping walls. A Preventive Maintenance Program should be set up to clean any filters on a regular basis or the potential for losing seal flush water exists. The downside is that these devices protect only the pump seals.

A third means is to use a combination air/dirt air separator such as the Taco 4900 series units. These coalescing type air/dirt separator are relatively new to the market and are offered by a variety of manufacturers. They have been proven to effectively work to get both air and debris from the system water. Use of one of these as the main air separator will remove the dirt/particulate that will loosen from the piping system. By cleaning the entire system, the pumps seals as well as control valves and terminal equipment are protected from the debris that occurs as the system ages.

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