

Water Stories

As told by the legendary Duke Waters

An Air Error

It was late on Friday, almost 4:30, when I got the call. With Miller Time on my mind, I picked up the receiver, and strained to hear Jim Wickman tell me about his latest woe. Jim and I go way back. Jim was Project Engineer on water projects up and down the coast for Watson, Price & Woods Engineers during the 60's and 70 's. Back when a deal was a deal and a full days work was 12 hours. My job was to bail Jim out when he started up projects and created sparks and steam. Yep, we go way back.

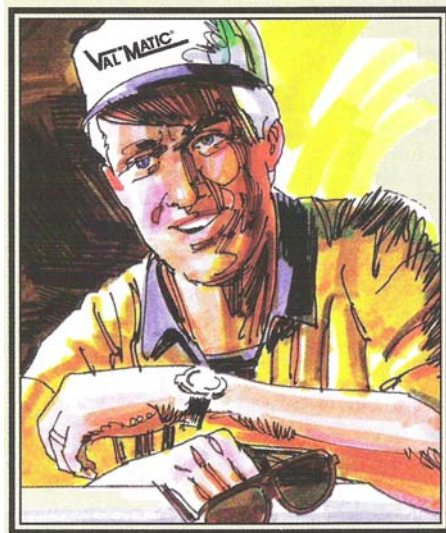


"Where's the fire this time", I said. Jim said that there was no fire but he's got clients all over his butt because his brand new pumps in Oswego are putting out 265 feet of head and generate about half of the design flow. At this point I go down the usual list of

potential problems with Jim. Jim, of course says "Duke, I've been up and down the seven miles of 16" pipeline three times. The check valve is open, all the line valves are open, the altitude valve at the tower is open. There are air valves at all the high points. Where the heck is the extra headloss coming from?" At this point I always need to assure Jim that there is a logical explanation for the problem. There always is.

Jim said, "Duke, I need you to fly up here in the morning and help me out. The owner's holding six figures on us until I can get this station to meet spec." I said, "Jim, don't sweat it; I'll call you from the airport when I land in a couple of hours."

One of the perks of being a semi-retired free-lance engineer is that I already got my 54 holes in this week (by Tuesday) so I can leave the links to



the duffers on the weekend and put in a couple of honest hours on Saturday. So I made a call to the airport and had them roll out my Cessna Citation X and gas it up. My Jag was humming smoothly on all 12. It was a ten minute drive, barely time to get a Macanudo fired up and before I knew it; there was the Cessna rolling onto the tarmac. I landed in



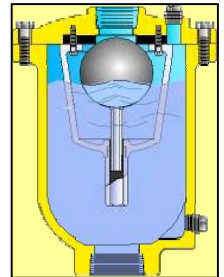
Oswego in 2 hours and 650 miles later.

Jim was waiting anxiously and said "Duke, thanks for making the trip. Let's zip over to the site and have a look." So we took the 3 flights of stairs down to the pump floor. There was the 240 horsepower Worthington Vertical Turbine Pump straining to deliver flow to the grid. Jim was right in that all the valves were properly positioned. I said "Let's take a trip out to the line and have a look at the air valve vault on that hill to the north." I had a hunch.

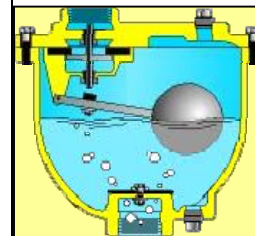
Jim was first down the manhole. He hollered up that everything appeared to be in order. The butterfly isolation valve was open and the 4" air valve was not leaking. I took one quick glance at the air valve to confirm my hunch and told Jim to come on up. "Jim", I said. "Do you know what the three types of air valves are?" Jim said, "What do you mean, an air valve is

an air valve, right?" I told Jim, "You're buying me dinner."

Over a knee high plate of spaghetti I explained to Jim the differences between Air Release, Air/Vacuum, and Combination Air Valves and asked what type of air valve he installed. Jim said a Val-Matic 104S Air Valve. I explained that a 104S is an Air/Vacuum Valve which exhausts and admits air rapidly during filling and draining of the pipeline but once the pipeline is pressurized it will not open to relieve entrapped air. Only Air Release or Combination Air Valves will relieve air while the pipeline is under pressure. The trapped air will increase headloss at the high point. The cumulative effect of several high points can be enough headloss to stop the pump all together. "Jim," I said, "you need to add



Air Vacuum Valve
Exhausts air during pipeline fill. Admits air when line is depressurized.



Combination Air Valve
Performs the functions of both Air Release and Air/Vacuum Valves.

some Air Release Valves to those Air/Vacuum Valves and your mysterious headloss will disappear. Jim, don't you know that Val-Matic has a Windows® computer program that properly locates

and selects air valves for pipelines. If you had used their program, you would have saved 2500 dollars." Jim said "What 2500 dollars?"

I left him with my invoice for a day's service (and the check) and caught a cab back to airport in time to catch SNL before bed.

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