

Water Hammer – Water Main Breaks

Water hammer happens when you turn on or turn off a hydrant too quickly. Turning on or turning off the water flow sends a pressure or shock wave down the water lines shocking the pipes and creating a “hammer” noise. These shock waves travel very fast and can exert great instantaneous pressures, even when someone opens and closes a hydrant slowly. The shock waves can cause water pressure to increase 3 or 4 times, and more, than the normal pressure. All pressure spikes, even small ones, must be avoided in the LWD water system since normal operating pressures are 150 to 160 psi in many parts of the system. Thus, even a small pressure spike can cause a water main break.

To avoid pressure spikes and water hammer, the operator must open and close a hydrant very slowly during all 17.5 turns (Mueller hydrants). Taking 2 or 3 minutes or more is wise and time well spent - it is not being too cautious. In addition to slow turning at all times, the operator must realize the first three to five turns when opening and the last three to five turns when closing are especially critical. The operator should pause for 10 seconds or so between each of these initial and final turns. The pauses are necessary because the early turns during opening and late turns during closing are when the biggest changes in flow volumes, velocities, and pressures occur. Remember, a good “rule of thumb” is that 10% open equals 90% flow.

Water main breaks are often costly and difficult to repair. Extensive damages to streets, sidewalks, curbs, structures, and properties can and do occur. The loss of water service and fire protection may cause businesses and schools to close. Streets may have to be closed and traffic rerouted. All other utilities have to be called to locate their lines and facilities. Sometimes their services are interrupted too. The potential for accidents and incidents caused by or related to the water main break increases greatly. Lack of adequate flow for fighting a fire can occur too. Such problems can be avoided through careful and proper operation of fire hydrants. Supervision and training of all hydrant operators is most important.