

IRRIGATION

WATER WISELY: QUICK TIPS TO READY FOR THE IRRIGATION SEASON

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The irrigation season is just around the corner and preparing your system for what lies ahead can help put you in the best possible position for irrigation success. There are several components of the irrigation system that can be easily checked and adjusted to ensure proper performance. There are also a few steps that can be taken to fine tune areas that can make the system more serviceable.

Central controls are the brains of the irrigation system. A best practice to ensure you are ready for the irrigation season is to perform the following simple maintenance procedures:



Active sprinkler

- **Back-up** all programs and databases. Some manufacturers offer an online service or you can easily backup yourself onto a flash drive. Keep the flash drive stored in a safe place in the event it is needed and consider doing a weekly update to include new programs that you create throughout the year.
- **Renew** or ensure you are current with your control system service plan so that you have the support from your irrigation equipment manufacturer for online or on phone technical support and next-day replacement components.
- **Grounding** and surge protection devices should be checked to ensure that your electronic equipment is protected going into lightning season. This service is typically offered by the manufacturers authorized distributor for the equipment or a qualified golf course irrigation contractor.

Sprinklers are probably the most important component of the irrigation system and because they are responsible for distributing water across your golf course, they need to be checked on a routine basis. Some simple maintenance procedures will ensure that they are ready to perform when needed:

- **Level** sprinklers will distribute water more evenly. A field level (electronic or mechanical) or app on a cellular phone can be placed on top of a sprinkler to determine if a sprinkler is level or tilted. One field test showed that two sprinklers in a pattern that had a 3-degree tilt affected distribution uniformity by 10 percent, which can cause increased runtimes and exaggerated wet and dry spots due to the less uniform distribution of water. Upon leveling, the sprinklers uniformity increased from 71 percent to 81 percent. Level sprinklers so that they are no more than 2 degrees from level.
- **Visually** inspect sprinklers to ensure that they are rotating properly, nozzles are not clogged or obstructed, and part circle sprinklers are properly adjusted.
- **Replace** defective internal assemblies or drive assemblies with new ones.



Sprinkler level check



Water distribution audit

Water distribution audits should be conducted on irrigation systems that are five years or older to ensure that expected uniformity is being achieved as nozzles can wear over time and change water distribution patterns and uniformity.

Valves and valve boxes are often overlooked but they are key components of a properly functioning and serviceable irrigation system. For instance:

- **Air release valves** are an important part of any irrigation system. An air release valve will continually vent air from the system. Air can be a very destructive force as it is compressible and can violently exit the irrigation system through sprinklers. When this happens, water accelerates at high speed to replace the air which creates water hammer. Make sure air release valves are open and operating correctly.
- **Drain valves** should be closed and visually inspected to determine they are not leaking. For systems that have been winterized, an overlooked open drain valve is not uncommon and can be the reason for the pump station cycling.
- **Isolation valves** or mainline gate valves should be checked to see that they are open and that they are accessible if needed through the season. They should be clearly marked on the record drawing. Being able to quickly locate and access

an isolation valve in the middle of the season, if needed, is very important to help facilitate system maintenance or repair. Consider using a different color valve box cover to help easily identify them on the golf course.

- **Quick coupler valves** can easily get lost over the winter months. Locate and test quick coupler valves so they are ready for action when needed. It won't be long before hose-end watering is needed, so it is best to be prepared. Consider installing additional quick couplers in areas that require regular hand watering to help reduce the labor to get hose-end water to those areas on the golf course.
- **Valve boxes and valve box covers** protect components and help ensure easy access and service as needed. Replace any broken boxes and have some spare covers available so they can be replaced as needed.

Controllers are often overlooked. They should be checked and tested before the main irrigation season begins. Here's what you can do:

- **Test each station** to ensure that each station output circuit and solenoid is operational. Winter lightning and surge can blow fuses or damage solenoids so be prepared to make those replacements if needed. Leave a spare fuse or two in each controller in the event one is needed during the year.
- **Infestations** of mice, insects and other pests are quite common during the winter as they look for a warm place to nest. Pedestal controllers are an attractive location so take a portable vacuum cleaner with you to clean out any pedestal that has some new visitors. Plug any conduits that are providing an entry path with duct seal.
- **Communication** tests should be conducted to make sure all controllers are "online" and check to ensure that controller ID's are properly programmed into each faceplate and that communication cards are properly plugged in and functioning.



Controller check



Grounding verification

- **Grounding** and surge protection devices should be checked to ensure that controllers have the maximum protection against surge resistance heading into the season. This service can be provided by your irrigation distributor or contractor.

Two-Wire systems require routine system maintenance. For instance:

- **Diagnostic tests** should be completed at the central control system. Conduct pass/fail tests, operational tests, check voltages and determine if the amp draw on each wire path is correct. If you are not familiar with all of the test procedures with a two-wire system, contact your distributor and schedule a service call for them to conduct a tutorial for you and your team.
- **Grounding** and surge protection devices should be checked. Because there are more grounding locations on a two-wire system, courses should contact their distributor or contractor to come in and test six holes every year to ensure that the grounding system is maintaining the level of protection required.

Pumping stations are often referred to as the "heart of the irrigation system." The pumping station must be well cared for so that it is ready to perform when needed.

Consider these points:

- **Pump Service Companies** can provide an extensive pre-season check of station components. Checking items like oil, grease, pump rotation, pump packing, and amp draw at the beginning of the year can help identify potential problems before the pump station is required to operate at full load. Give yourself time to complete any service items before the season begins.
- **Slowly fill** the piping system if the system was drained. An empty piping system on a typical 18-hole golf course can hold 25,000-30,000 gallons or more. When water is drained and replaced with air, there is a significant potential for damaging pipelines and fittings when air is evacuated as water fills the lines. If water is introduced too quickly, air can be compressed and when valves or sprinklers are activated, the air is quickly replaced with water that is coming behind it to fill the void. This is when water hammer occurs. A good rule of thumb is to introduce water at a rate of 1 foot per second or less which equates to no more than 150-300 GPM of flow for most irrigation systems. If you do not have a written procedure, contact your irrigation system designer or consultant for more information. Keep in mind, while you are filling the pipelines, air should be released through air release valves, drains, quick couplers and sprinkler heads. On most courses, the start-up process should take three or more crew members up to two days or more.
- **Alarms and safeties** should be checked to ensure they are working properly and ready to protect the pump station and irrigation system if needed.
- **Flow meter and flow logs** should be updated

and prior year data should be recorded and stored. Check to ensure that the flow meter is properly calibrated. This is essential for pump station operation and to comply with flow reporting requirements.

- **Screens** should be checked and cleaned. Check the screen on the source intake as well as any screens on the pump station. Make sure they are properly cleaned and clear of debris.
- **Pressure maintenance pump** should be checked to see if it is working properly and not cycling too often. A good rule of thumb for most courses is the pressure maintenance pump should not cycle more than 3-6 times an hour when there is no irrigation running or system flow demand, although this can vary greatly due to the size and age of the irrigation system. If your pump station is cycling more than that then search for a leak(s) that may be causing the cycling.

Follow these procedures to help put your irrigation system in a position for success before the irrigation season begins. Develop a maintenance check list that you can follow throughout the year that includes daily/weekly/monthly checks of key components. Utilize your distributor, manufacturer and authorized pump service provider for technical support and contact an experienced irrigation system designer or consultant for help when needed.

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