Need a Check Up?

One of the best investments a greenkeeper can make is the investment of time - time to review the performance of the golf course's existing irrigation system. By taking time to inspect and evaluate the irrigation equipment, a greenkeeper can learn what works and what doesn't, and what needs repair or adjustment. Necessary repairs or replacement - preventive maintenance - can be carried out and the irrigation system should perform to its full potential.

Preventive maintenance consists of improvements that can be made to any course at any time. The goal is to maximise what you have and minimise (or prevent) what could go wrong. What follows is a review of the equipment and what to look for when inspecting each element.

SPRINKLERS

Sprinklers, which have numerous items to be checked, are extremely important as they must operate at their peak to provide the best performance and results. Look for sprinklers that:

1. Are too low (they have sunk below grade)
2. Are tilted (and should be raised and made flush)
3. Are not popping up all the way
4. Have leaks
5. Have bad or inconsistent rotation (which means the sprinkler should be disassembled, checked for damaged parts or excessive debris, then cleaned or repaired)
6. Have nozzle problems. These can include plugged or worn nozzles, or broken stream straighteners that cause visibly poor nozzle performance and should be examined, cleaned and, if necessary, repaired.

Poor nozzle performance may lead you to find other system issues that require repair, such as low pressure or pump problems. Sprinklers are the items that most commonly require maintenance.

Check the items listed above every three months during the watering season, and at the beginning and end of the season if your climate includes a winter season. Conduct a visual check and watch a sprinkler complete a full rotation.

VALVES

If control valves don't work, then sprinklers cannot apply water. Fortunately valves are simpler than sprinklers. They must open, close and not leak.

To inspect a valve, first remove the lid from the valve box and do a visual inspection for static leaks. Next, operate the valve manually and automatically to check for leaks. Then, check for proper operation and closure in both manual and automatic modes.

Any existing problems are usually visible during these simple observations, and the steps to resolve an issue are: disassembly, cleaning, repair or replacement of any failed components. Check valves at the same intervals as sprinklers.

FIELD CONTROLLERS OR SATELLITES

First perform a visual inspection for external physical damage, water damage inside any compartments or to any exposed components. Next, do a functional test by verifying the operation of each feature and each station or zone of sprinklers.

For these items, you may need to contact a product manufacturer for assistance in resolving issues. These may require you to troubleshoot whether it is a controller, wiring or valve/sprinkler issue, in terms of turning on and off.

Then check the electrical connections. First, look for anything 'not normal', then, with power off, ensure each wire is tightly connected. Any worn or frayed wires or wires with degrading insulation should be replaced or repaired.

GROUNDING EQUIPMENT

Most semi- and fully-automatic systems have specifications regarding the level of grounding required for the system to be safe and to maximise lightning and surge protection. Grounding and its connections to the system will degrade over time.

First verify that the 'earth ground resistance' of your grounding system still meets the manufacturer's specifications and has not degraded since the last check. Correct any problems immediately. Depending on the type of system, there could be several grounding points or just a few.

Once the earth ground resistance has been tested and approved, all connections and wiring back to the controller should be checked. Loose, frayed or corroded elements should be replaced. Grounding equipment should be checked at the same intervals as controller elements.

WIRE AND WIRE SPLICES

Realistically, wire buried underground either works or it doesn't. When it stops working, employ normal troubleshooting techniques to locate and repair problems. Also conduct basic system tests for voltage drop and resistance on A) power, and B) communication cables. With the power on, test available voltage at the farthest point of the system to learn whether the load or resistance is increasing. If it is, a failure condition may be developing, even if it is not yet evident.

With power off, measure the same points for resistance. If annual records are kept, you will identify the start of a trend toward a potential failure. Look for voltage declines or increases in resistance.

PIPE

You should always stock an adequate supply of repair couplings and a few lengths of pipe in each size used on your golf course. One test that you can perform is a pressure leak-down test. Place a gauge on the system (preferably at the highest point) and pressurise the system.

You'll be able to read any drop in pressure hourly. While one data point may not be significant, this information, accumulated year after year, may help you locate and repair a problem before catastrophic failure.

Kenne James explains what to look for when closely inspecting an irrigation system.

LATERAL AND MAINLINE ISOLATION VALVES

These are specialty valves that must open, close and not leak. First, inspect them visually for leaks. Each valve should then be closed completely, checked to ensure that flow has stopped, then opened. It is extremely important that valves undergo this testing at least twice a year because they spend 99.9 per cent of their lives in the 'open' position, and may become prone to not closing properly.

Finally, the correct position for a valve left 'open' is actually about a half-turn from full open. Take the valve to 100 per cent open, then turn back slightly. This will help prevent the valve from getting 'stuck' in the 'open' position.

An example of good wire splices made using waterproof splice kits. Now they need to be placed in a valve box for protection and so they can be easily located later for troubleshooting if necessary

PUMP STATIONS

These are probably the single most complicated pieces of equipment on a golf course and among the most expensive. They require attention commensurate with their importance and expense. Here are some basic thoughts regarding pump station maintenance - as provided by ITT-Flowtronex International:

- Pump stations last longer in a building with proper ventilation.
- Heat kills and is a problem in a pump station when the building is not properly ventilated, motors are not positioned to receive cooling air flow and electrical connections are not maintained.
- A pump station's vibration will cause electrical connections to loosen and burn, which can cause catastrophic panel failures, VFD failures and single-phase motor damage.
- Debris entering the pumping system can create premature wear on the pumps. Sand or silt build up in the lake, and will show up in the pump head area. Whatever you pump will be deposited in the pump head reservoir. Keep it clean and when you start moving silt, it will show up.
- Through daily visits to the pump house a greenkeeper becomes familiar with 'normal' sounds and smells. Once any unusual smells or sounds are noted, take action at once.
- Extensive service visits should take six to eight hours on a four-pump station, not including filter replacement. Filters are hard-working elements and must be maintained properly.
- Regular maintenance can extend the life of a pump station by 30 percent.

An example of how a small leak left untreated can turn into a larger problem later. Now the fitting, pipe and valve must all be replaced

BENEFITS OF PREVENTIVE MAINTENANCE

A good preventive maintenance programme will help you minimise resource costs and repair and replacement expenses. Preventive maintenance also results in improved playing conditions, less ground under repair, more efficient sprinkler performance, fewer wet and dry spots, fewer customer complaints, healthier and more beautiful turfgrass and a more efficient use of your resources - both staff and financial.

Think 'preventive maintenance' rather than 'reactive' maintenance.

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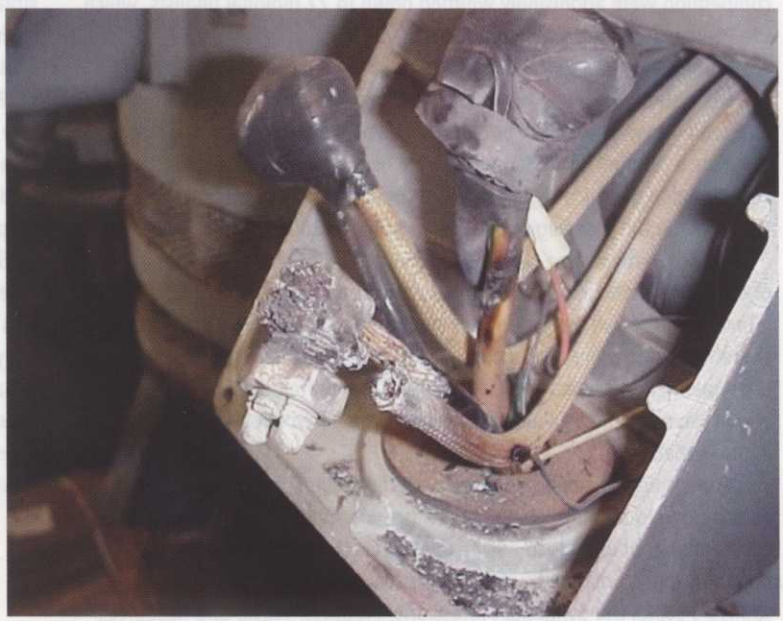

A loose wire connection can lead to failure, a safety hazard or expensive fire damage if not repaired. This one caused the failure and destruction of a pump motor, a very serious issue