

**Take some time to survey your surroundings before moving equipment.**

## **SAFETY TIPS & SAFETY DEVICES FOR IRRIGATION EQUIPMENT**

**Field crop irrigation equipment today is often large and complex,** requiring a high level of management and operating skill on the part of the producer. Modern irrigation systems also introduce a number of safety problems unlike those experienced with other field equipment. We include some tips on irrigation equipment protection, power quality and safety. We also discuss irrigation and agricultural energy efficiency incentives.

For more information  
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## EQUIPMENT PROTECTION

Inland Power is responsible for protecting our system during abnormal conditions and although this protection has ancillary benefits to each member, it is the responsibility of each member to protect their own equipment during abnormal conditions.

There are several uncontrollable line conditions that may occur with varying impacts on connected irrigation equipment. A short list of the conditions you should consider when determining proper system protection are listed below. Please remember this list does not include all possible scenarios.

- **LOSS OF A PHASE** It is common during an outage for only one or two phases to be affected, resulting in less than all three phases to the pump being energized. The loss of one or two phases to a three-phase motor or pump can cause significant damage. It is the responsibility of each member to determine and install the appropriate protection for their irrigation system in the event of a loss of a phase.
- **OVER-VOLTAGE** There are many causes for over-voltage conditions on a power system including lightning and operations on the distribution or transmission system during abnormal conditions. While Inland Power does install surge arrestors on our medium voltage system, these devices are designed to protect our equipment, they are not a substitute for surge arrestors or similar devices designed to be installed on members' equipment to protect against damage. Remember that like all protective devices, surge arrestors are designed to operate under certain conditions and the number of successful operations depends on the voltage shunted to ground. Therefore, an inspection and maintenance check of surge arrestors is critical to ensure the arrestor is still functioning as intended. Not all surge arrestors are equal; a more expensive first cost unit may provide better protection and less maintenance.
- **OVER-CURRENT** Each transformer or transformer bank on our system has over-current protection (fuses). These fuses are sized to protect the transformer from damage. These fuses are not designed to protect member equipment and should not be considered a substitute for proper protection on members' equipment.
- **INSURANCE** Each member should assess the need for and appropriate levels of insurance coverage for their system. We are not able to help members assess their unique financial, operating and maintenance abilities to assist with making a decision regarding any type of abnormal condition protection.

## POWER QUALITY

Electricity is a clean, economical and dependable source of power for irrigation. Electric motors can provide years of service when properly selected, operated and maintained. It is important to make sure that your irrigation equipment meets all IEEE 519 standards. This standard can be read in its entirety at [www.ieee.org](http://www.ieee.org). Inland Power looks to this standard when determining if individual members are causing problems or harming other members' equipment. The interconnection and use of consumers' electrical facilities can occasionally cause adverse effects on the quality and/or reliability of electric service to other Inland Power members. This includes, but is not limited to, abnormal voltages, voltage fluctuations, troublesome harmonics in current or voltage and/or other disturbances or interferences. If troublesome harmonics or other disturbances are identified at the consumers' facilities, the consumer will be required to bring those facilities into compliance with applicable IEEE and ANSI standards and meet applicable state and national codes.

The purpose of the IEEE standard and Inland Power's policy is to prevent the equipment of one member from causing harm to other members, the standard does not indicate the appropriate harmonic levels for individual loads. When the pump being served represents a significant proportion of the total load on the feeder serving the pump, stricter limits may be imposed, particularly if other members are experiencing problems.

## IRRIGATION SAFETY

It is vital that workers know and follow proper safety precautions to avoid potentially deadly electrical accidents when operating and handling modern irrigation systems. Aluminum irrigation pipe, while lightweight and easy to handle, is an excellent conductor of electricity. It is best to avoid moving irrigation pipe and equipment on windy days, as a sudden gust could lift pipes into overhead power line. This power line contact could prove fatal to a person holding the pipe. Take some time to survey your surroundings before moving equipment. Look up and around you, note any power lines that could be close enough to

come into contact with equipment – and stay away. To ensure safe operation of irrigation equipment please remember the following tips:

- Make sure that irrigation system wiring is properly grounded. Before the start of each irrigation season, have a qualified electrician check the pump and wiring.
- Store unused irrigation pipes far away from power lines or electrical equipment.
- Position the water jet streams so that there is no chance of them spraying onto power lines – if this happens, the entire system could become energized, creating a danger for anyone nearby.
- Stay away from all irrigation equipment during any lightning activity. Install lightning arrestors to protect your equipment from damage caused by lightning strikes.
- If fuses continually blow or circuit breakers repeatedly trip, have a professional check the wiring. This could indicate a potential electrical hazard.
- Always shut off and lock the master electrical control switch before servicing the machine.
- Keep pipes horizontal to the ground rather than vertical to minimize the risk of contact with power lines.

**Make sure that irrigation equipment meets all IEEE 519 standards.**

## IEEE 519 STANDARDS OVERVIEW

When installing a variable frequency drive (VFD), the installation must comply with the most current version of IEEE 519 - Recommended Practice and Requirements for Harmonic Control in Electric Power Systems. The company selling the pump and/or the VFD supplier should be aware of the current standards.

## ENERGY EFFICIENCY INCENTIVES

Inland Power has incentives available for a wide variety of energy efficiency upgrades for new and existing irrigation systems, water management improvements and on-farm shop lighting. Please visit [www.inlandpower.com](http://www.inlandpower.com) for current energy efficiency incentives.

