

1977

EC77-719 Safety with Center Pivot Irrigation

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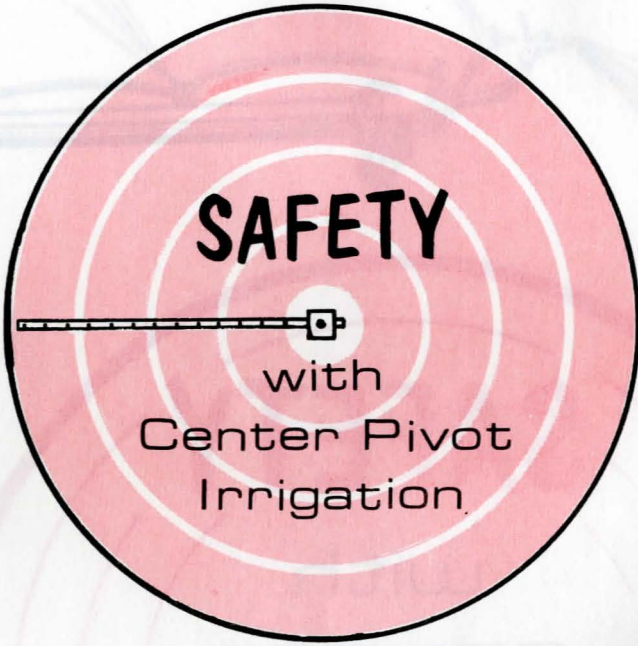
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SAFETY
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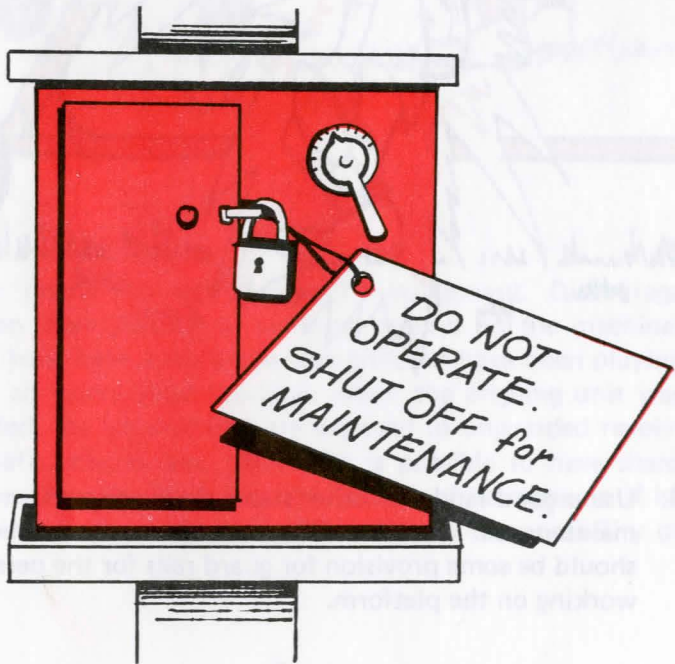
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Leo E. Lucas, Director



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One of the newer methods of applying water that has opened up new lands to irrigation is the center pivot system. This method of irrigation introduces some new safety problems that irrigators should be made aware of. The following suggestions are made relative to assuring safe operation of the machine.

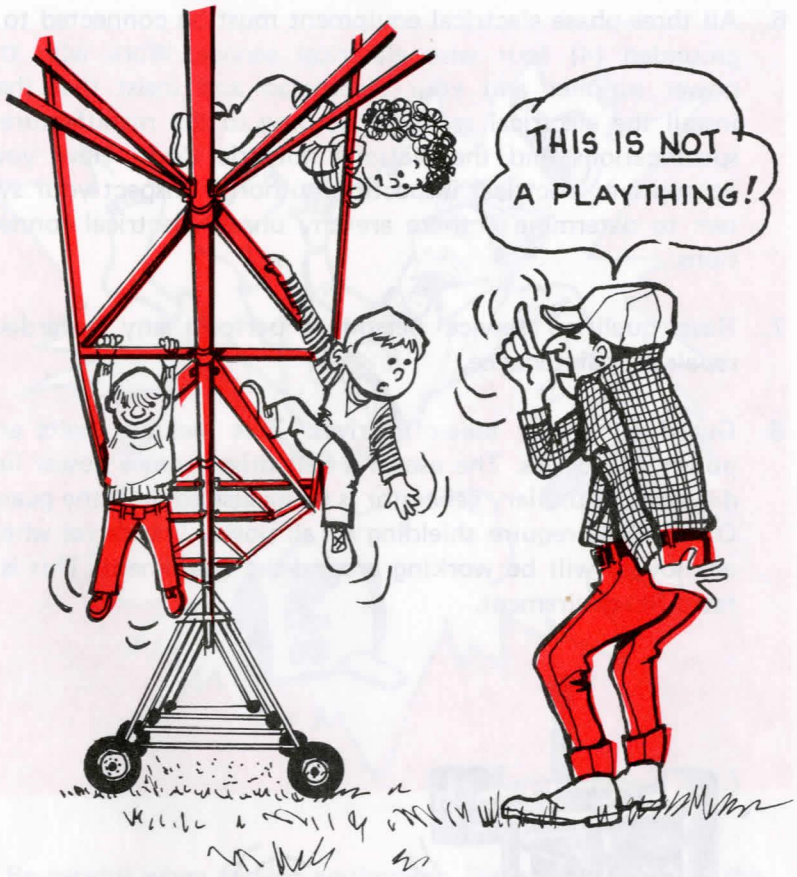
1. Read and follow the directions in the owners manual. Pay particular attention to the safety precautions listed.
2. Always disconnect electric power before servicing the machine. On October 25, 1976, an OSHA standard took effect which requires employers to ensure that electrical power cannot be applied to a location not under immediate and exclusive control of an employee who is maintaining or servicing equipment. This means that there should be a means on the main switch which can be operated only by the person performing the maintenance or service. An automatic restarting motor is all right if a disconnect switch is within 15 feet of the motor and if it is properly labeled. Under the OSHA safety color code, blue is the color for tagging the lockout. Information should be included on the tag on whom to see before turning the equipment back on. Shut off and lock the master control yourself. Don't trust the other guy. Also make sure that everyone is in the clear before the machine is turned back on. Irrigation pumps and systems should be turned off before throwing the main power disconnect.



3. Stay away from the machine during an electrical storm. The center pivot makes a good path to earth. Also, it is probably the highest object in the field, which makes it a good lightning receptor.

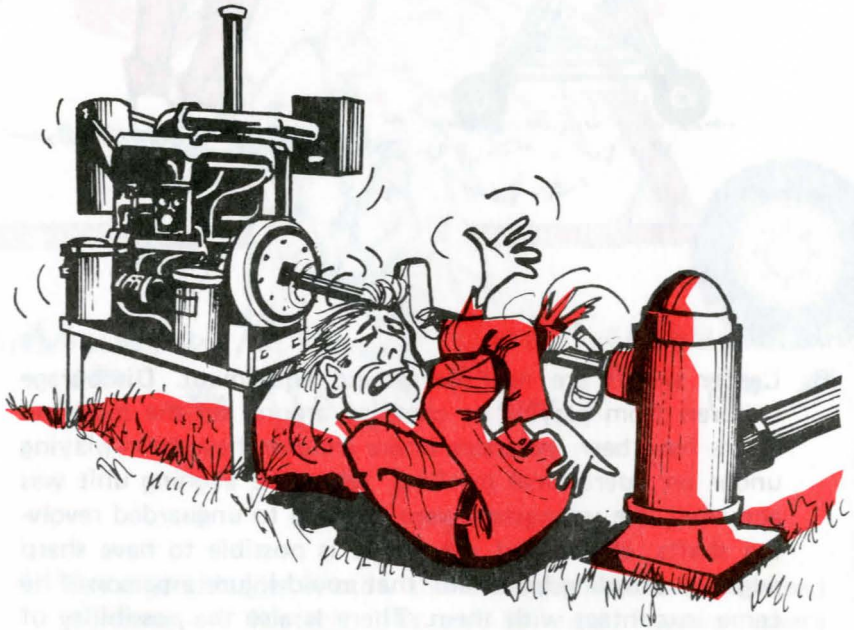


4. Use a good ladder or other stable device to perform overhead maintenance. Portable lifts can be used, however, there should be some provision for guard rails for the person who is working on the platform.



5. Center pivots are not playground equipment. Discourage children from playing or climbing around on the machine. There have been instances where children have been playing under an operational machine. When the aligning unit was activated, the youngsters were exposed to unguarded revolving shafts, chains and wheels. It is possible to have sharp edges, protruding bolts, etc. that could injure a person if he came in contact with them. There is also the possibility of falls.

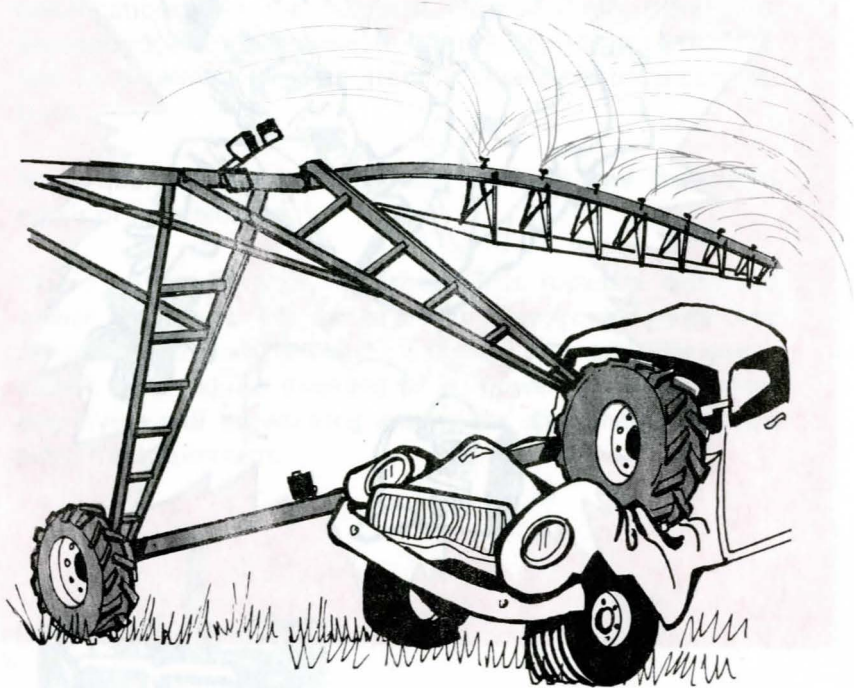
6. All three-phase electrical equipment must be connected to a grounded (4) four wire electrical service. Work with the power supplier and your electrician and insist that they install the electrical service according to the manufacturers specifications and the National Electric Code. Have your appropriate electrical inspection authority inspect your system to determine if there are any unsafe electrical connections.
7. Have qualified service personnel perform any hazardous repair or maintenance.
8. Guard all power take-off drives. This includes belts and power line drives. The use of a belt drive from a power line drive to an auxiliary generator is no excuse to omit the guard. OSHA does require shielding of all power line drives where employees will be working around the equipment. This is a retro-fit requirement.





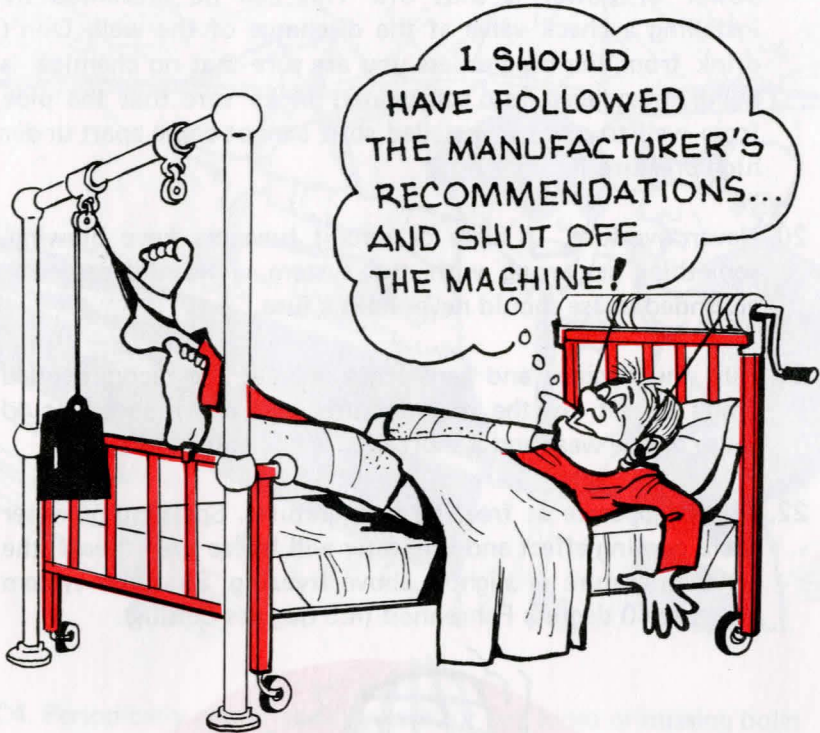
9. Be careful when fueling equipment. Diesel does not pose the problems that gas products pose. Gasoline, methane, and propane all ignite with from 2 to 15 percent vapor concentration. Never use gasoline as a cleaning agent, since it could ignite from a static or open spark.
10. Electric power units should be properly grounded and deenergized when being worked on. Capacitors on electric motors can hold a charge even though the electricity is turned off.
11. If you suspect a short circuit due to a "tingle", do not touch the machine again. Call a competent electrician and have him check out the system with a meter. Your local inspection authority should also be informed.

12. Make sure the equipment isn't parked in or near a wheel track. Center pivots have good traction. It is possible for them to climb over equipment or even buildings.



13. Be certain that the center pivot system will not contact buildings, power poles, wires, etc.
14. Avoid ditches, overhead power lines, buildings, etc. when towing from field to field.
15. Bury and guard all power lines around the pivot. It would be good to mark the area with a buried power line sign. Also, include a simple diagram and description with the land abstract to insure a permanent record of the installation.

16. Never attempt to clear vegetation or other material from moving parts while the machine is operating. Always shut down the machine for maintenance.

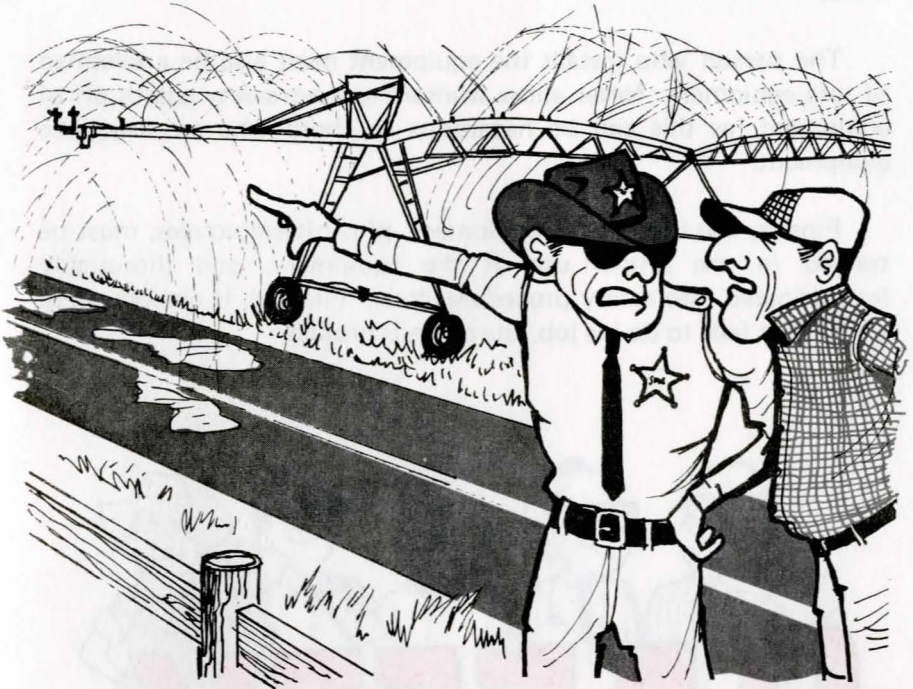


17. Avoid getting hands or clothing caught in moving parts such as wheel spokes, oil or water cylinders and linkages, chains and sprockets, V-belts, pulleys, etc. The entry point to sprockets and pulleys is referred to as a nip point. Improperly guarded equipment is dangerous for the unwary human, or even livestock which might be grazing on irrigated pasture.
18. Avoid getting any portion of your body in contact with high pressure water streams, such as the end guns. Be careful of fast return end guns.

19. Avoid exposure to system spray while chemicals are being injected into the water. Make sure the spray does not blow or drift past the area of intended operation. Make sure that the water cannot back-siphon into the well if the pump loses power or power is shut off. This can be prevented by installing a check valve at the discharge of the well. Don't drink from the pipe unless you are sure that no chemical is being introduced into the water. Make sure that the pipe from well to pivot is installed so it cannot come apart under high pressure.
20. Never overfuse. If fuses or circuit breakers keep blowing, something is wrong with the system. Find the cause. A grounded phase should never have a fuse.
21. Run the engines and generators only at the recommended limits as set by the manufacturer. Excessive speed could cause undue wear and a short life for the equipment.
22. Do not operate at freezing temperatures. Spraying of water has a cooling effect and the water will freeze even though the air temperature is slightly above freezing. Shut the system down at 40 degrees Fahrenheit (4.5 degrees Celsius).



23. It is against the law to allow any water to spray on state and county roadways in most states. This is a serious hazard and should not be allowed. If you have part circle sprinklers, make sure the reversing or stopping devices work properly.



24. Periodically check your system for any loose or missing bolts or other signs of possible structural collapse.
25. Finally, instruct your employees on the safe use of the equipment at the time of their initial assignment and at least annually thereafter.

A safety program is much like a chain. It is only as strong as its weakest link. A breakdown of good safety procedures can cause the center pivot safety program to fail.

The safety program does not hinge on one person. It starts with the manufacturer of the equipment. Next, the supplier of the

equipment gets involved. When he sells the equipment, he must keep safety in mind. In fact, he should include safety equipment in his bid. A good retailer will point out that he has his customers safety in mind.

The person who installs the equipment must also be a salesman of safe equipment. Never allow workers to leave safety guards off of equipment, as this can be hazardous to those who are using the equipment.

Finally, the user of the equipment, plus his employees, must be trained in the proper use of the equipment, and thoroughly indoctrinated into safety procedures to be followed. If one person in the system fails to do his job, the chain is broken.



The author appreciates the contribution of information and guidance from members of the center pivot committee of the Irrigation Association.

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