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Feature article

Managing Broiler House Backup Systems to Avoid Catastrophic Losses

Last week an Alabama broiler grower experienced an electrical power outage and subsequent generator failure which resulted in a loss of ten thousand 6½-pound birds just two days before market. Reports of failures of backup systems are common this time of year and will no doubt be even more frequent in the future as we shift to more sophisticated broiler housing. The seriousness of the problem merits a close look at the state of the art in backup technologies.

In the bad old days when ventilation control simply meant adjusting window openings, you couldn't do a great deal for bird comfort. But if you didn't get it quite right nothing drastic was likely to go wrong. Adoption of power ventilation, progressing with development of the different ventilation modes for different weather – minimum, transitional and tunnel ventilation – has yielded vast improvements in our ability to control the in-house environment. Being able to keep temperature and other air quality factors more consistently within the birds' "comfort zone" has enabled growers to achieve a much higher level of performance on a year-round basis. Generally, less day to day adjustment of controls is required with environmentally controlled housing; but the need to monitor the house environment, the birds, and the desired target setting becomes an even more important daily task. And the risk of a catastrophic loss from power or equipment failure becomes even greater. If the primary in-house environmental control system in one of our larger, often totally enclosed houses with higher bird density fails for any reason, the entire flock can be put at risk unless backup systems are in place and work properly.

Current electronic ventilation controls can keep in-house conditions much closer to optimum for bird performance.

If the primary environmental control system fails for any reason in one of today's houses, the entire flock can be put at risk unless backup systems are in place and work properly.

It is important to understand that such systems cannot be part of the primary control system. All backups must be independent, and the more independent the backup system, the better. Following is a brief rundown on the major categories of backup systems:

Controls backup. This independent backup is a necessity for any integrated electronic controller. It allows the controller to operate within a window. For instance, if the desired electronic controller target temperature is 75 degrees F, you can set a high limit for cooling with the independent backup system. Most people agree that this setting should be about 10 degrees above target temperature. In this case, it would be about 85 degrees F.

Remember, the target temperature should never be set too close to the "point of disaster." It's the grower's responsibility to keep this system adjusted every 2-3 days to reflect the changing lower temperature need for growing birds. After setting the high limit for cooling, a low limit for heating must be set. Most people also agree that this setting can be about 10 degrees below target temperature. As with the high temperature setting, the grower is responsible for adjusting this temperature lower as birds grow. This backup system can be 99.9 percent effective against electronic controller failure, but only if it is adjusted on a daily basis. Electronic backups have their own sensor, which is placed mid-house and must be totally independent from the electronic controller.

Controller backups must have their own independent sensor.

Alarms. Most alarms monitor power failures and high and low temperatures. Other functions, such as water, curtain-drop activation, timer fans, etc., can be monitored. Alarms signal a problem by the use of a siren on the outside of the building. Some operations also connect phone dialers or remote beeper systems to the alarms.

As with backup controls, it is imperative that high- and low-temperature settings be adjusted downward as birds mature.

One very useful recently developed cycle or high- and/or low-pressure alarm is built into the software of an electronic vent controller that adjusts vent opening to maintain static pressure according to the number of fans running. This is made possible through the use of a microprocessor and specially-designed software. Since the electronic vent controller is independent of the electronic controller, it is capable of acting as a watchdog for the primary system.

All backup thermostats must be adjusted every two to three days as broilers grow and the target temperature changes.

Curtain Drop. This is one of the oldest forms of backup, and its basic function is to drop the curtains if power fails. They can also work in conjunction with high-temperature thermostats. Again, it is imperative that for this thermostat to be effective, it must be adjusted downward as birds grow. A new feature on some curtain drops is a switch that can signal the alarm that the drop has released. This feature is almost a necessity for fully automated curtain-sided houses.

Release winches that let curtains drop must be kept lubricated and in working order. These systems must be checked periodically during growout. To prevent a curtain from dropping open too much during cold weather, chain limits should be put in place to limit the amount of curtain opening.

All fan-ventilated houses should have backup generators – they are an absolute necessity for totally enclosed houses.

Generators. All houses need to have backup generators, but totally enclosed houses *must* have them, since there is no other means of cooling. Curtain-sided houses can drop the curtain and eliminate or greatly limit losses from heat stress. Totally enclosed houses need to have generators that automatically start up seconds after the power fails and then transfer power to the house. It is important that the selected electronic controllers have the ability to stage in the fans to reduce the surge load on the generator. As with the other systems, it is important that these systems be checked periodically.

Regardless of how good the backup system is, if it's not properly maintained, losses will continue to occur. These systems must be managed, and failure to do so will result in loss. Once these systems are installed, it is important that the integrator establish a periodic program to be carried out by service people to see that the systems are adequately managed by growers.

If backup systems are not managed almost daily, their proper operation cannot be assured and their settings can go outside the window of safety – and then a catastrophe can take place.

The ultimate responsibility for utilization and operation of backup systems lies with the grower. If these systems are not managed almost daily, their proper operation cannot be assured and their settings can go outside the window of safety – and then a catastrophe can take place.

The bottom line on the importance of backups can easily be seen in the case of the grower mentioned at the beginning of this article. The immediate cost of catastrophe to this grower can computed to be 10,000 X 6.5 X $.045, or nearly $3,000. In addition, the grower will most likely receive less than average pay for the entire farm because of the loss of so much weight. This could be another one-half cent per pound on the weight of the entire flock. The company's loss can be estimated to be more than $15,000. However, additional losses were experienced by both the grower and the company. The grower had to pick up and quickly dispose of over 32 tons of mortalities, had to put other work aside in order to troubleshoot, repair, and test his backup systems, and he and his family continue to experience severe mental anguish because of this loss. Doing everything possible to help prevent losses is very important – and, according to this example, well worth the time.

ALABAMA COOPERATIVE Extension SYSTEM

The Alabama Poultry Engineering and Economics Newsletter provides up-to-date information on topics of interest to poultry production personnel, focusing on most effective and efficient uses of modern technology and equipment, with a special emphasis on economic implications. The Newsletter is published six times a year, or as needed to address emerging or special issues. Contact: Jim Donald, Extension Biosystems Engineering, 228 Corley Bldg., Auburn University, AL 36849-5626, (334) 844-4181, fax (334)-844-3548, jdonald@acesag.auburn.edu. Published by:

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