



How to Survive a Power Failure: Emergency Procedures for Farmers and Growers

INTRODUCTION

For the majority of electricity customers, a power interruption is a rare occurrence, and when it does happen it is normally brief. Even in rural areas, where there are long runs of exposed overhead line, a power interruption is no longer the regular problem that it once was. New engineering developments have meant that supply disturbance is kept to an absolute minimum.

Nevertheless, power interruption does happen occasionally. Extreme weather, falling branches, accidents and vandalism can cause lines to be damaged and supply to be lost.

In such situations farming customers are particularly vulnerable because they are often remote and may have to wait some time until the supply is restored. Also, they have businesses which are highly dependant on electricity. Power is essential for so many processes: milk cooling, ventilation for livestock housing and lighting to name but a few.

This guide gives advice on how best to cope with supply failure and the steps to take to have power restored as quickly as possible.

HAS THE ELECTRICITY SUPPLY FAILED?

The first thing to check is whether the fault is on your own electricity distribution system or on the mains supply coming into your farm. This means going back to your main electricity distribution point and checking the main fuses or circuit breaker. If the system is protected by fuses you must turn off the mains supply, withdraw the fuses and check them using a continuity tester.

If testing the fuses confirms that the electricity is off, then call the local electricity company immediately - do not assume that your neighbour will phone. It may be that you are the only one off supply. Keep the phone number for your electricity company handy - next to your electricity meters or telephone. Where an earth leakage trip is fitted this should be checked for operation and reset if necessary, if it continues to trip, there is probably a fault with your electricity system and a competent electrician should be called. During times of very bad weather when many customers may be off supply, telephone lines to the electricity company can be very busy.

However you should continue calling until you succeed in getting through. Alternatively fax the electricity company (if your fax machine will work) or check with your local NFU branch if they have a special number which can be used by farming customers.

It is a good idea to check equipment that had been running prior to the supply interruption and switch it off. This will prevent any danger from unexpected restarting when the supply is restored and reduce electrical starting surges.

Make a contingency plan for supply interruptions:

- What equipment needs to be switched off?
- How to deal with stock feeding and control.
- Stand-by generation.
- Important telephone numbers.
- Temporary lighting and torches.
- Resetting time switches and other equipment when the supply is restored.
- Uninterruptible power supply, supply for computer, phone or fax.

The key to doing the right thing during a supply interruption is to have the right information at hand to remind you what to do. It is therefore a good idea to keep a folder with the emergency

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procedure and telephone numbers marked for use during electricity interruption. Keep the folder near the meters or some other obvious place so it's easy to get at and not forgotten.

STAND-BY GENERATORS

Stand-by generators are very useful for farms when supply interruptions can be prolonged. In many cases stand-by power may be a mandatory requirement of animal welfare regulations to maintain the operation of fans and heaters essential for the health of livestock. It is seldom worth sizing stand-by generation to cater for the whole electrical demand of the farm. For the most economical solution, the generator should be sufficient to supply the essential services, with due regard to the power required to start any large motors.

In the case of power failure the generator can either be set up to start automatically and pick up the required emergency circuits, or it can be switched manually. This gives the user the opportunity to turn off non-essential circuits before the generator is started, and bring the essential circuits on in sequence to avoid an overload surge. As well as fixed stand-by generation, an economical solution is to drive a generator from the power take-off of a tractor. This is a good solution for loads which do not operate for the whole day, e.g. supplies to dairy parlours.

When installing a generator, it is essential that safe changeover facilities are included to prevent the generator from feeding electricity back down the mains supply and thus causing danger to anyone working on the line. Maintenance is important. These installations might be required only once or twice over a period of years, but when they are required they need to work quickly and reliably. One good discipline in the operation of generators is to test and run the generator for at least an hour each month.

ELECTRIC FENCING

Do not forget that the mains electric fencing will not work during a power cut. Consider buying a battery powered unit for stand-by if this is likely to be a major problem.

FEED PREPARATION

Feed preparation is often a heavy power consumer and it is unlikely that the stand-by generator would cope with this load. It is wise, therefore to have enough food stock (especially in the cold winter months) so that feeding over a period of supply failure could be sustained. When feed preparation equipment is eventually started, take care that conveying systems are not locked before switching on.

SPECIFIC ADVICE FOR PIG AND POULTRY FARMERS

Electricity is important for pig and poultry producers, and loss of supply can have disastrous consequences if this is not responded to quickly. An alarm system, which alerts staff when a supply interruption occurs, is a good investment. Systems are available which can either give an audible or visible alarm, or cause an automatic 'SOS' telephone call to be made.

Ventilation should be a key area of attention. When the electricity supply fails, electric fans should ideally be automatically switched to a generator which itself is capable of powering all the ventilation. Fans should be brought on in several stages to stop problems of overload during starting. Where no stand-by is available, automatic drop out flaps should be used in the building to provide enough natural ventilation for the livestock. Fully opening ventilation flaps and doors will help to provide more air circulation.

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Lighting should be considered, especially for hens, as this can have an important effect on laying performance. Enough lighting for feeding, inspection and service should be connected to the generator backup circuits.

In cold weather when young animals may suffer, provision of extra insulation for creep areas and straw for bedding will help the animals maintain their body temperature. Some vulnerable stock may be moved to temporary accommodation with bottled gas heating.

Where automatic feeding is usually carried out a contingency plan for manual feeding should be made. Again it may be necessary to consider a stand-by tractor pump for emptying slurry channels or stores.

SPECIFIC ADVICE FOR DAIRY UNITS

Best practice for the welfare of dairy cattle is to have a stand-by generator which will maintain the operation of the lighting, vacuum pump, bulk tank and small ancillary services.

By careful switching, the water heating system can also be catered for without additional capacity, as this can be operated during non-milking times.

Consider the possibility of roads being blocked during times of bad weather. Extra milk storage such as a spare tank or milk bag should be considered.

Do not open bulk milk tank lids - this will help to keep the milk cool. Also, ventilating the tank room at night helps to keep the temperatures low and slows the milk temperature rise.

Do not forget the slurry system which may need power for pumping. It is unlikely that the generator will have capacity to handle this, so a tractor powered pump might be considered.

CROP STORAGE

Grains and Combinable Crops

These can be at risk if power failure occurs in the initial drying stage of bulk storage drying. The wetter and hotter the crop, the more it is at risk. Oilseed rape is particularly vulnerable to spoilage from spontaneous heating. This can build up in a matter of hours, so the ability to ventilate or at least turn the crop is vital.

Beyond the initial drying and cooling phase, crops in bulk storage are reasonably safe if a supply failure occurs. During this stage power is only required for the blowing of cooling air through the crop, but this is a relatively small and infrequent demand.

Vegetables

Vegetables in store fall into two main categories - refrigerated and ambient cooled crops. These categories are again split into long and short term storage.

For all types of crop the main requirement is to maintain a cool stable environment. All crops will tend to heat spontaneously through their own respiration. The rate of respiration will vary widely with crop type and the temperature of storage. Details of each crop's storage like time, temperature and respiration rate should be acquired and their implications appreciated.

In general, hard, dense vegetables, like potatoes, that are near their final storage temperature will not suffer unduly through prolonged periods of supply interruption. Leafy vegetables and

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soft fruit are much more vulnerable.

For large storage buildings suffering a long supply interruption, problems are most likely to be caused by high humidity and condensation. To avoid this, the roof of the building should be ventilated for periods during cool, ambient conditions. Doors and vents can be opened during these times to allow natural air circulation. During a power failure, traffic and entry to the store should be kept to a minimum.

Horticultural Crops

Greenhouse crops are very dependent on the maintenance of correct air and root temperatures. Excessively cold conditions can ruin a crop in a very short time. It is therefore worth considering a stand-by generator big enough to operate the electrical services to allow the boiler to work. Alternatively a small independently heated area can be used for the protection of the more vulnerable plants.

Where automatic watering systems are in use a contingency plan for staff to water crops manually should be in place.

ELECTRICAL SYSTEMS PROTECTION

Power failures are not just a nuisance. They can lead to damage to equipment and danger to people, and so facilities must be installed to cover these eventualities. Also it's important not to forget partial power failures. Sometimes unusually low voltage conditions may occur, or one phase of the supply may be lost. These conditions can cause even more problems than complete failures and lead to damage to electrical equipment.

Various devices are available to protect electrical equipment and systems from the effects of power failure. Some of these are as follows:

- No voltage relays on motor starters. These devices ensure that a motor cannot restart automatically following an interruption in supply. Manual reset would be required.
- Phase failure relays. These disconnect motors from the supply in the event of a failure of one phase or a low voltage condition. Manual reset is normally required.
- Mains failure alarms. These can range from simple audio/visual systems to sophisticated telephone pager systems.
- Uninterruptible power supplies. For sensitive equipment like computers these units provide a buffer from the mains supply, filtering out small voltage disturbances and providing a backup supply if the mains should fail completely. The batteries which are used in these units charge from the mains and they can be selected to give either short term back-up cover, so that the user has time to save important files, or long term cover to allow the equipment to be used for a number of hours after mains failure.

EMERGENCY MESSAGE REPORTS

Telephone or faxed messages about supply interruptions are welcomed by electricity companies. More detail helps engineers decide the best course of action to restore the supply and assists repair crews in poor weather or at remote sites.

Useful points include:

- Location of supply failure.
- Ordnance Survey Grid reference.
- Extent of any damage caused.

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- Number of poles broken or lines down.
- Local problems e.g. livestock at risk, milk pump failures, etc.

ADDITIONAL ADVICE FOR FARMERS

- Do not interfere with any damaged electricity supply equipment, particularly overhead wires hanging down on or the ground – they may still be live.
- Please re-report supply failure if not restored or a visit not made by electricity company staff within 2-3 hours.
- Switch off all equipment other than storage heating, water heating, refrigerators and freezers.
- Protect vulnerable livestock or produce and maintain desired temperature by opening or closing ventilators or for small areas constructing heat retaining enclosures.
- Refrigeration cabinets or freezers may be covered with insulating material or blankets to prevent defrosting. Doors to cabinets should be opened only when essential. Do not add fresh unfrozen contents to cabinets until the supply is restored. Normal domestic freezer contents should usually be safe for at least 8 hours.
- Leave at least one light on to indicate when supply is restored.
- If further damage to electricity supply is discovered please report it to the electricity company.
- Do not attempt to connect small portable generators to your internal electrical system. This can be highly dangerous and is illegal.

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