

GUIDELINES

to Health and Safety in Windmills and Watermills including Food Hygiene



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The advice given is based upon what the Mills Section of the SPAB believes to be sound and satisfactory practice for the repair and preservation of mills generally. This advice is offered in good faith only as a guide.

Due to widely differing circumstances from one mill to another, it cannot be ensured that the practices and methods advised will necessarily be directly applicable or appropriate.

It is therefore the responsibility of those using this document to ensure that the advice given is appropriate to the particular application and for controlling the quality of workmanship and materials. The Society does not accept responsibility for the satisfactory nature of any work carried out.

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1. Introduction

Windmills and watermills are increasingly being opened to the public so that their working parts can be viewed. This is a positive development, as much of interest lies within a mill that both the lay person and expert will find fascinating.

Often, grants to assist in the repair of a mill will be conditional on regular openings; so most mills tend to be opened, if only occasionally. However, mills were not designed for public viewing, and were built long before modern safety standards were thought of. Thus, there is the potential conflict of the desire to keep a mill as original as possible, perhaps even to have it working, and the need to comply with modern legislation and safety expectations. It is a difficult balance to strike, but it is hoped that this Guide will assist the mill owner or custodian in identifying the dangers, and suggest some solutions.

Considerable care has been taken in the preparation of this Guide to include those safety precautions that are likely to be required in mills. Mills, however, differ greatly, and each presents its own risks. Those in charge of mills need to consider which measures are necessary, and probably add some of their own.

THE MILLS SECTION CANNOT ACCEPT RESPONSIBILITY FOR ANY OMISSIONS FROM THIS GUIDE.

Where a legal position has been mentioned, every effort has been made to ensure the accuracy of any advice. However, in a general guide of this nature only a brief outline is possible, and again the Mills Section cannot accept any responsibility for inaccurate statements. Those in charge of mills need to familiarise themselves with current laws that affect their particular mills and undertakings and advice specific to the mill or undertaking where necessary.

2. The Law

The opening of mills is subject to the law of the land just like any other operation, but it is important to know which part of the law is involved.

An important test to apply is to ask whether the mill could be classified as a place of work, as places of work are highly regulated by the law. In some cases, where, for example, the mill is producing flour for sale, the answer is obvious. In others, where volunteers are working for a charitable Mill Trust, it may not be so clear. Unpaid volunteers are not employees nor are they self-employed, therefore the undertaking may not be covered by work legislation. However, if an admission charge is made, or souvenirs are sold, the situation would be altered. Similarly, if the Trust engaged a paid secretary, the whole undertaking could be classified as a business or place of entertainment, and the work legislation would apply to all persons involved.

Common Law

If a mill undertaking cannot be classified as work, it is still covered by common law, which requires a duty of care towards all those that may be affected, such as visitors. Although there may not be specific legislation involved, Common Law expects equivalent standards of health and safety to be maintained, although there will be no official inspections. Should there be an accident, there could be no criminal prosecution, the injured party having to pursue a civil claim for damages. However, the lack of detailed legislation should not be taken as an excuse for lax safety attitudes, as these days people are more likely than ever to sue for damages.

It should also be borne in mind that a mill accident might have wide repercussions, affecting not only the mill in question, but many others as well.

3. Risk Assessment

One of the mainstays of the present Health and Safety Legislation is risk assessment. Employers are required to make a suitable and sufficient assessment of the risks to the health and safety of employees at work, and to others affected by the undertaking. The results of these risk assessments must be recorded, and steps taken to reduce risks to a minimum. The exercise must be reviewed at regular intervals, particularly if any change has taken place to the circumstances of an activity.

Although there is no requirement for formal risk assessments to be made in mills that are not "places of work", it is a good exercise to go through, and might prevent a previously unforeseen accident from taking place.

Hazards, and those at risk from them, need to be identified, and appropriate control measures put in place (these may vary from installing guard rails to just doing something in a slightly different way). The remaining risk should be assessed, and consideration given to whether the control measures are adequate. It is advisable to write down the findings, and to review them from time to time at appropriate intervals.

Risk assessments should be made by a "competent person", and the best person is probably someone who knows the mill well, and has perhaps spotted potential hazards already. Such a person will also know what activities and processes are likely to be carried out, and what their consequences might be.

A useful guide is "Five Steps to Risk Assessment" obtainable from HSE Books (see appendix) or via the HSE website.

4. Writing A Code Of Practice

Even if the mill is not a "place of work" (where it is a legal requirement), once the risk assessments have been made, and avoidable risks eliminated, it is advised that the means of controlling the remaining risks should be written down. This may be called a "Code of Practice" or some other name, and should be required reading for all those involved in the undertaking.

Such a Code may include:

- General hazards, controls and risks in the mill
- Operating instructions for the mill, including a procedure to stop the mill in an emergency (for example the procedure to stop a windmill in the event of the brake failing)

- Hazard reporting system
- Accident reporting system
- Accident procedure, arrangements for calling medical assistance
- Lone working arrangements
- Safe use of ladders and access equipment
- Instructions for management of visitors i.e. maximum number of visitors in the mill, level of supervision, behaviour code, visitor footwear policy, etc.
- Pre-opening checks
- High level working procedures
- Evacuation procedures in the event of fire
- Maintenance/inspection requirements of the mill and buildings, and work equipment
- Designation of maintenance tasks to competent authorised staff only
- Management of contractors
- Induction training checklist for volunteers/mill guides
- Safe working procedures for hazardous equipment and substances in use
- Safe manual handling instructions
- Duties of each member of staff

A copy of the Code should be given to each guide or volunteer and a copy should be kept in the mill for reference.

5. Safety Awareness

It is a prudent for those in charge of a mill to adopt a responsible attitude to safety, and to take a lead to ensure that all others involved do the same. In a non-working mill, hazards to visitors are likely to be those associated with falling, tripping, and head hazards from low beams. Most of these can be dealt with fairly easily by warnings and simple guard-rails. Guides can help by keeping an eye on what is happening and intervening if necessary.

Some kind of control must be exercised to keep visitors moving so that certain areas do not become overcrowded. Steep steps can cause hold-ups as some visitors may not be agile, and others may "freeze" with fear. Guides must be prepared to give advice, and perhaps to discourage those who appear unable to cope with the stairs from climbing them.

Working mills have all the hazards mentioned above plus those associated with the operating machinery. A choice has to be made between stopping the mill for internal viewing or allowing visitors to see milling in progress. The choice is different at each mill according to the layout and viewing space available.

If members of the public are admitted to a working mill, it is advisable to have nominated guides responsible for the visitors, and others to operate the machinery. There must be liaison between the two so that the visitors can be prevented from blocking areas where the miller might need to move quickly. The guides should be able to answer questions, and thus prevent the miller from being distracted from the job of controlling the mill.

In the event of some kind of emergency, all mill helpers should be trained to evacuate the mill, if needs be, in an orderly manner and as quickly as possible. Everyone involved should have a clear knowledge of what to do and where to go, such as an outside assembly point.

Mill operators should be trained to stop the machinery in as short a time as possible, should this be necessary in an emergency situation. A clear signal should be agreed for an emergency stop.

6. Accidents

Keeping an Accident Book is a legal requirement where the mill is a "place of work", but such a book is also strongly recommended in mills run by volunteers. Pre-printed accident books can be purchased from stationers and should record the time, location, name of the injured persons(s) and contact details and nature of the accident, its severity, who was present, witnesses, who was in charge, and other relevant details. Ideally the entry should be signed as correct by the person(s) injured, but this might not be possible due to the nature of the injury. Even in the case of an apparently minor accident, the injured party should be recommended to see a doctor and an ambulance may be required even for apparently relatively minor injuries. The facts recorded in the book could form vital evidence if any legal action were to be taken by an injured person. Although an accident may seem to be trivial at the time, some more serious damage may have been done, or the injured person(s) may be tempted to make a claim for compensation some time later. The book entry would provide facts about the incident, including the identity and contact details of any independent witnesses who could be called if legal action were to be taken.

Steps should be taken to ensure that there is some means to summon help in event of emergency. Some mills are in remote places, and a mobile telephone (with a fully charged or spare battery) would satisfy this requirement, assuming that the site is covered by the mobile phone system. If a phone is not available, there should be sufficient personnel present to allow someone to fetch help without leaving the injured person alone.

A First Aid Box should be maintained at the mill, with contents sufficient for the expected maximum number of visitors (most boxes specify this). The box should be of a recognised standard (e.g. St John Ambulance Brigade), contents used should be checked monthly and any items used replaced before the next open day. It is strongly recommended that one of the guides be trained as a "First Aider", and where the mill is a business this is mandatory in some circumstances. Staff may be encouraged to read the St John Handbook to raise their awareness of problems and procedures, but it is not advisable for unqualified people to give first aid, as it puts both themselves and the mill at risk of litigation in the event of complications. First aid materials can safely be offered for the patient (or another member of a visitor's party) to use on the clear understanding that this is entirely at their own risk.

7. Managing Visitors

People visiting a mill will be a cross-section of society, and many will not be familiar with old buildings and machinery. In today's world, many dangers are eliminated, so visitors may assume that the whole mill is as safe as anywhere else. Dangerous areas in the mill need to be identified and made as safe as possible. When this has been done, visitors must be made aware of the remaining hazards, and assisted in dealing with them.

If large numbers of visitors are expected, a system should be introduced to control the number of people in the mill at one time, ensuring that it does not rise above the safe number established by risk assessment. It is also wise to avoid large numbers accumulating in one place, e.g. on the top floor of a windmill which can be very cramped. Some guides issue numbered tickets to people waiting, which are then called when there is space. A guide needs to be at the door(s) to welcome visitors and to limit entry to numbers that can be accommodated.

Once inside, it is useful to have a guide on each floor or in each area to describe what is there, and answer questions is there, and send the party on to the next area when space allows. An alternative is for a guide to take charge of a party, which then progresses through the mill with him/her until they leave.

If numbers are small, it may be appropriate to leave the visitors to make their own way through areas that

are safe and without moving machinery. Suitable barriers should be provided to prevent visitors, with consideration for both adults and children, straying into danger zones.

Young children should always be accompanied by an adult when visiting a mill unless a staff member is available for this duty. Even when accompanied, some children can put themselves into harm's way, and guides should be alert to this. In certain circumstances, small children may be carried, but this is not usually a good idea, as it can raise them above normal head height where there may be projecting metal components, machinery or low beams.

Every opportunity should be taken to encourage young visitors, who may become the mill enthusiasts of tomorrow and possibly join the Section or the "Young Millers."

Dogs (excluding guide dogs) should not normally be admitted to a mill. This is because they not only pose a hygiene risk but also a potential trip hazard. Additionally, they might stray into danger, encouraging people to follow. A means of tethering dogs should be provided near the entrance, and, perhaps a bowl of water in hot weather.

8. Fire And Emergencies

Compared to many buildings, mills are not particularly likely to catch fire. However, if they do, their construction and means of access are such that a fire is likely to spread rapidly, and escape for those inside may be difficult. Serious consideration should be given to the numbers to be allowed in the mill or in parts of the mill at one time, based on a risk assessment.

If the mill or undertaking employs more than 5 persons, under the Regulatory Reform (Fire Safety) Order 2005, a "responsible person" must be appointed who is responsible for undertaking and maintaining a fire risk assessment. This person is obligated to take steps to ensure people and the premises are kept safe from fire. A fire risk assessment must be undertaken and updated at regular intervals which provide a thorough evaluation of fire hazards and people at risk and where necessary identifies actions to remove hazards or to reduce risks. Effective methods of reducing such risks include emergency lighting, fire alarm systems, fire extinguishers and sprinkler systems.

Your local fire prevention officer will confirm whether the regulations apply to the mill.

The best method of dealing with the fire risk is to make sure that sources of ignition are kept to a minimum. Since July 2007, smoking in enclosed public spaces and places of work has been banned, but it is sensible to reinforce the 'no smoking' message and provide somewhere for smokers to dispose of burning cigarettes safely before entering. A bucket of sand at the door should suffice, and 'no smoking' signs are now a legal requirement on public access entrances.

Electrical installations should be checked regularly, perhaps annually, or at least every five years, by a competent person. The wiring should be of a type unlikely to be damaged by rodents, sheathed in metal or with a metal outer covering. "Plug-in" apparatus should be checked for electrical safety every year by a competent person. Records of all inspections should be kept. The apparatus should be checked visually each time it is used.

Inflammable materials should not be stored in the mill in large quantities, or for longer than they need to be. Such materials might include spirit-based wood preservatives or paint and solvents, petrol for mowers, oils and greases. If the mill has an auxiliary engine, its fuel, oil and greases should be stored safely in a closed metal chest or tank and any spillages mopped up and disposed of. Oily rags should not be left lying around.

In the case of a windmill or a high watermill, the fitting of a lightning conductor, might prevent a disastrous fire or other damage should the building be struck. The conductor system should be installed by a

competent company in consultation with a millwright, and should comply with the appropriate British Standard where possible. A good conductor system can be effective without being obtrusive, or affecting the free movement and performance of the mill. The conductor should be tested annually by a competent person, as the effectiveness of moving joints and earth electrodes can reduce over time.

Smoke detectors and even a fire alarm system may be considered appropriate according to the requirements of each particular mill. At the very least, it is advised that all mills have a written emergency evacuation procedure and means of alerting workers, voluntary guides and visitors in the event of an emergency such as a bell, claxon or hooter.

The advice of the local Fire Prevention Officer, or a reputable supplier should be sought when choosing and siting fire extinguishers. Fire extinguishers should be provided near exit points which should be clearly signposted from floors or rooms

The type of extinguisher should match the risk, powder being appropriate for electrical fires, and water for wood fires, etc. Note that a water extinguisher must not be used on an electrical fire, as to do so would put the operator at risk of electrocution via the water jet

Guides should know how to operate the extinguishers, and should be given clear instructions on emergency procedure in the event of fire.

In order of importance, these should be:

- (1) Evacuate
- (2) Call Fire Brigade
- (3) Fight fire if appropriate.

DO NOT TAKE PERSONAL RISKS

Extinguishers must be serviced annually by a competent firm, and record labels displayed on each extinguisher.

9. Making The Mill Safe

Whilst no mill or other object can be perfectly safe, much can be done to eliminate danger by applying common sense to the problem. The modifications required to reduce the level of risk may involve making changes to the fabric of the mill. Care should be taken to ensure such changes do not affect the historic integrity of the mill and infringe listing requirements.

Lighting

Some mills have enough windows of sufficient size to provide adequate lighting, but many are dark inside, particularly on a dull day. The obvious answer is to install electric lighting where necessary, paying attention to stairs and restricted areas where danger may lurk. If mains electricity is not available, a generator may be needed. Traditional lighting methods such as candles or oil lamps are considered to be inappropriate due to their fire risk.

Emergency lighting along with escape route signage is considered a proven method of reducing risks on escape routes in the case of fire and is likely to be mandatory if the Regulatory Reform (Fire Safety) Order 2005 applies to the premises in order that fire risks are managed effectively.

Floors

Floors should be in good condition with sound boarding and supports. It is not necessary to renew all old boards automatically, providing that they are strong enough to bear the necessary weight. Rather, it is better to be selective and just renew those boards that are weak. This was often done in the past, as can be seen in mills.

Sack hoist trapdoors should be kept in good condition, but could become a hazard if opened by visitors. This fact was recently noted when a mill was inspected by an officer of the Health and Safety Executive. In response to this, it is suggested that some form of locking device should be fitted. This could be in the form of Chubb-type window security locks, set into the thickness of the floorboards and registering with holes bored in the trapdoors. These are fairly unobtrusive, and can easily be locked and unlocked using the key provided, inserting it through a small hole in the floor boarding.

Attention should be paid to beams and joists, particularly where they enter walls, as these can rot in damp brickwork, and may become weak without obvious signs. The ends of the timbers may be tested with a knife or probe, or a special decay-detecting drill. Repair may be effected by scarfing on new ends, adding metal shoes or similar.

Ladders

The strings and treads should be checked at least once a year, for strength, and repaired as necessary. Once again, it is only the weak parts that need to be replaced or strengthened. Old ladders often have much character and are worth keeping. Ladders need to be fastened in place so that they do not slip or fall down, but it must be possible to undo the fastenings for future maintenance. Loose ladders for access to caps etc. should also be checked, and if the mill is a business, a register kept recording the checks. Ladder treads may become slippery due to rain or ice outside, or flour inside. As well as keeping the ladders clean, non-slip paint or surfacing can be used.

Handrails

Some mills were provided with handrails, but most were not. Rails should be fitted to ladders, stairwells etc. to help people steady themselves, and to prevent them falling into voids, which could happen if pushed. Rails are probably best made from wood if no pattern exists, and should be strong without being too bulky. Simple designs are best, without the decorative mouldings used in domestic banister rails. A middle rail is often needed, and a toe board should be provided as well. Handrails should be one metre high, but old rails were often lower, and hence may need to be added to.

External rails to windmill galleries, etc. may look disproportionate if raised to modern standards. It may be possible to add to the original railing using well designed thin (but strong) additional steel rails, painted black. Steel mesh may also be used below to avoid adding middle rails and toe boards. Such additions may be barely visible from a distance, and will allow the retention of the original proportions of the old rails.

Guards to machinery

If the mill is a business, the machinery must be guarded adequately (See PUWER 1998 in appendix). Even if not a business, a working mill's machinery is one of the greatest dangers to visitors and operatives, and must be guarded. An accident caused by unguarded machinery may have dire consequences for those responsible.

Any moving part of the machinery should be considered hazardous unless it is well out of reach. Obvious dangers are unprotected gear and belt drives. Less obvious are rotating shafts, which although smooth,

may entangle clothing or hair, and reciprocating apparatus or levers which may move and trap fingers, etc. against a fixed part of the structure. Risks should be assessed, and danger points identified. Guards should be designed to be effective for children as well as adults. It is also important that the guards are not hazardous in themselves, for example, a wire mesh guard placed too close to machinery could endanger fingers poked through the mesh. All guards should be fastened in such a way that a tool is needed to take them off. Wing nuts or hooks are not acceptable.

Few mills had guards during their working days, and it would be inappropriate to obscure the machinery completely with them. The challenge is to design adequate guards that tackle the problem without being too obtrusive. New guards should be well designed, and made of good materials that do not look out of place in a mill.

Barriers

Barriers are an alternative to guards, and may be used to prevent access to a dangerous area, making some guarding unnecessary. The barriers should be far enough away from machinery to prevent accidental contact, and should be effective not only for adults but also for children (See previous comments on handrails). Some barriers may need to be movable, such as those to prevent access into the path of revolving windmill sails on the ground or on a gallery. These must be as substantial as possible, and may incorporate a warning sign to those tempted to enter the area.

Fire and Emergency equipment

Fire extinguishers have already been mentioned, as have First Aid boxes. At a watermill, it may be appropriate to have lifebuoys available in case someone falls into a watercourse.

If volunteers work at the mill, protective equipment may need to be provided. This could include goggles, respirators, hard hats and protective clothing. For high level work, a climbing harness, ropes and clips will be necessary. All such equipment should be regularly inspected, recorded and well maintained.

Protective equipment is no substitute for safe practices, and hazards should be eliminated some other way if feasible. For example, if it is practical to install dust extraction systems or maintain ventilation by opening windows, this is preferable to just relying on respirators to protect workers from flour dust.

Notices

It should not be necessary to fill the mill with notices, but a few notices at certain points can be very useful.

A conspicuous notice at the entrance can set the scene, and hopefully engender caution, for example.

FOR YOUR SAFE ENJOYMENT OF THIS MILL

PLEASE READ THE FOLLOWING SAFETY NOTES BEFORE ENTERING THE MILL:

BEWARE OF LOW BEAMS AND MACHINERY

FACE THE STEPS WHEN CLIMBING OR DESCENDING.

NO SMOKING IN OR NEAR THE MILL.

NO DOGS IN THE MILL, EXCEPT GUIDE DOGS.

CHILDREN MUST BE IN THE CARE OF A RESPONSIBLE ADULT.

DO NOT TOUCH THE MACHINERY OR TRAP DOORS, OR PULL ON ROPES OR CHAINS.

DO NOT CLIMB ON ANY PART OF THE MILL WHERE AN ACCESS LADDER IS NOT PROVIDED.

KEEP OUTSIDE ANY BARRIERS AND OBEY WARNING SIGNS.

Other brief notices inside the mill might warn, for example, of head hazards from low beams, etc.

10. Maintaining The Mill

It is very important that mills are well maintained in good structural condition. All parts should be inspected at appropriate intervals by competent persons, and any necessary repairs carried out. An inspection regime should be drawn up, and the results recorded (mandatory in the case of a business).

Windmills are particularly vulnerable to decay in timber components, which may become unsafe and cause accidents. Weak sails can be very dangerous, as can fantails, galleries and many other parts of the mill, whether working or not. The watercourses of a watermill present a danger from drowning, and all bridges and handrails need to be inspected regularly and kept in sound condition.

Flooring, ladders, handrails and guards need to be maintained in good condition. The mill should be kept clean by regular sweeping and disposal of waste. Plant, exhibits and similar should be kept tidy.

Mills that are capable of working will need regular maintenance to keep them in good mechanical order. A schedule should be drawn up setting out the various duties, whether required daily, weekly, monthly or otherwise. It is recommended that a Log Book is instigated to record when checks, lubrication and other maintenance are carried out, signed for by those responsible. The Log Book may also record when the mill was worked, for how long and by whom. Any defects or problems should be recorded, and a system put in place to make sure that these are addressed.

An annual inspection and report by an experienced millwright is recommended for all mills.

If volunteers carry out repairs, safe practices should be employed at all times. Equipment should be used correctly, inspected regularly, and maintained in good condition.

When a mill is under repair, a decision must be taken about admitting visitors to the site or into the mill. Risks should be assessed and a policy formulated. Any millwright or other firm involved should be invited to comment.

Testing Lifting Gear, Sack Hoist chains etc.

It is a requirement of the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) that chains, ropes and all other gear involved in lifting (including harnesses) should be tested on a yearly basis to demonstrate they are safe to lift loads with an adequate safety margin. Records must be kept and be available for inspection. Companies offering such testing services in your local area can be found in the Yellow Pages.

11. Working The Mill

When opening a working mill to the public, a decision needs to be made about admitting visitors when the mill is in action. The interior of a working mill is fascinating and most people would like to enjoy the experience of being there, but safety must be paramount.

The size and design of the individual mill will often decide whether it is appropriate to allow public entry when working. Some mills are very cramped with moving machinery reaching down almost to the floor on some levels. Others have much more space, with the machinery high up, or semi-enclosed. Risk assessments should be carried out to decide which areas are safe.

Particular care should be taken in circumstances where the mill is not in continuous motion, for example a windmill on a day with little wind. Visitors, and even millers, may be tempted to touch machinery or venture into potentially dangerous areas while the mill is at rest, only for it to start moving again at the next gust of wind or trickle of water.

The number of visitors admitted needs to be carefully considered when working. The miller(s) will need to move around easily so that the mill is under proper control, and could be hampered by excessive numbers of people.

The mill should only be operated by those who have the necessary knowledge or training to do so. Mills are extremely powerful, and misuse can be dangerous to all concerned. Some system should be set up to designate those with sufficient experience to work the mill, and a training programme organised to educate others in the skills necessary.

When the mill is in operation, it is essential that one person be in overall charge, issuing clear instructions to the other helpers.

12. Food Hygiene

Introduction:

If a mill is producing flour for human consumption, there are a number of key considerations that must be taken into account and acted upon relating to Food Hygiene. These cover:

- Compliance with the laws relating to Food Safety
- Complying with best practice relating to Food Hygiene
- Operating a safe working environment for volunteers and employees
- Ensuring the public are not put at undue risk when visiting the mill

Anyone operating a mill to produce product for human consumption should make themselves familiar with the legislation. The information which follows in this section provides guidance on the implementation of

the legislation as it affects the production of flour and other products milled in a wind or water mill using horizontal millstones. This information is provided as a general guide and should be supplemented by specific advice relating to the activity of the mill to ensure the key considerations above are addressed and compliance with relevant legislation is achieved.

Anyone operating a mill to produce product for human consumption should ensure they have:

- Registered with the relevant Local Authority Environmental Health Department
- Registered with the relevant Trading Standards Authority

Environmental Health will typically assess the food production process for compliance with legislation and good practice, review basic health and safety and hygiene / cleaning procedures at the mill and check produce to be sold.

Trading Standards will typically check weights and measures used at the establishment and review compliance with labelling legislation (see below).

Environmental Health and Trading Standards teams are generally helpful and willing to provide advice and guidance. Different teams may interpret the rules and regulations in different ways, so it is strongly recommended that you contact them early, seek their advice and work with them to achieve or modify any requirements they stipulate.

Lastly, it is important to note that even if mills are not producing meal for human consumption, for example for demonstration purposes only, some legislation may apply in the area of Health and Safety. See the section below on Face Masks & Respiratory Protection.

Food Safety Law

The main pieces of legislation relevant to mills producing flour and other products for human consumption are as follows:

- Food Safety Act 1990 – covers the production, processing, storage, distribution and sale of food
- Food Labelling Regulations 1996 – covers the labelling of food stuffs for sale
- Bread and Flour Regulations 1998 – covers the compositional standards for all breads and flours sold in the UK
- Organic Products Regulations 1992 - for those mills wishing to label their products including flour as “Organic”

These pieces of legislation impact all stages of production, from storage of wheat (or other grains) through the processes involved in grinding meal, storing meal, bagging and labelling meal and selling meal to the end consumer (for meal read flour or other food products being made in the mill)

The Food Safety Act 1990 also covers mills with catering facilities. This topic is not covered in these guidance notes.

Underpinning the Food Safety Act is a process of risk analysis known as HACCP or Hazard Analysis and Critical Control Points. All foodstuffs produced at the mill must be covered by a HACCP Plan by law. Environmental Health officers will provide some guidance, but millers are advised to undertake training (available through commercial food safety training organisations) to become familiar with the process of hazard analysis, identifying the control points relevant to the product and the various forms and statements that must be produced and made available to any purchaser of the product who requests it.

Food hygiene best practice is based on risk analysis and associated procedures to a) minimise the risk of contamination in the first place and, b) if it does occur, to trace product back, recall any product which may be affected, identify what went wrong and take action to prevent it happening again.

The section below provides guidance on the general controls millers must put in place if a mill is to produce flour for human consumption and highlights some of the key risk areas in the stoneground milling process, common to both wind and water mills. This list is not exhaustive and mill-specific advice should be sought before entering production:

HACCP Plan Pre-requisites – General Controls

The following general controls need to be in place for the effective operation of a HACCP Plan:

- I. Pest control – all mills should ensure they have a pest control schedule to monitor for the presence of rats, mice, mill moth and other insect infestations. When required, mills should engage a pest control company to ensure that pro-active steps are taken to prevent an infestation. Controls should include regular inspections to identify evidence of pests, log sheets to record anything found and procedures to escalate issues and eradicate the pest.
- II. Appropriately clean walls, floors and ceilings – all mills should be regularly cleaned to an agreed schedule, the frequency of which will depend on the activity of the mill. Walls and floors should be vacuum cleaned to prevent accumulations of dirt, dust and flour etc. An commercial vacuum cleaner with a fine dust filter is recommended, one which is light weight enough to move round the mill, but which will cope with significant quantities of flour dust. Walls should be checked for mildew or other fungal infestations. Ceilings should be vacuum cleaned to remove objects that may fall into food production areas. Care should be taken when using lime wash based wall coverings if the area is close to food production. Cleaning schedules should be visible in the mill and cleaners should sign to indicate cleaning has taken place.
- III. Staff trained in food hygiene principles – staff or volunteers involved in food production (including flour) should be trained in basic food hygiene principles. Training courses are available often run by local council Environmental Health teams.
- IV. Control of all food contact glass and hard surfaces – all surfaces that come into contact with food should be well maintained. Glass in food production areas should be shatter proof (including light bulbs). Wooden, metal and plastic surfaces should be well maintained, free of holes or splinters. Wooden surfaces that come into contact with flour should be coated with a Shellac based sealer and not left bare.
- V. Suitably maintained machinery – all machinery used in the mill should be regularly maintained and where appropriate certificates of maintenance should be kept and logged. Employees and volunteers should be trained to use equipment and for machinery where improper use could lead to injury, measures should be taken to ensure that only trained personnel can use the machines.

Hazards and Critical Control points in a typical stoneground milling process:

Buying Grain

Grain purchased for milling into flour for human consumption should be cleaned to remove “foreign bodies” (a food hygiene term for anything that should not be present). In grain, foreign bodies could include rodent droppings, dust, grit, stones, nuts & bolts or other metallic objects (dropped into the grain during the harvesting process), human hair and other seeds including ergot which is poisonous in large concentrations. Careful visual inspections should be made to ensure the grain has not been contaminated by rodents whilst in storage, or other insects or mite infestations. Any grain which has evidence of contamination must be rejected.

If grain is purchased in sacks, it is recommended that one in every ten sacks are opened and inspected

before the grain is accepted and brought into the mill. Should samples of grain be kept in case of problems i.e. out of the 1 in 10 opened?

Storing Grain

Grain should be stored in sacks or in grain bins which are clean, dry and which have air circulation. For long term storage (anything above 8 weeks) grain bins are advised. Before filling grain bins, bin surfaces should be vacuum cleaned and when not in frequent use, washed or sprayed down with a pesticide solution suitable for food production environments (pyrethrum based organic products are available). In any event, it is advised to spray out storage bins at least twice per year (spring and autumn) to minimise the risk of infestation. NOTE – sprays or liquid based cleaning should only be undertaken when surfaces have been thoroughly brushed and vacuum cleaned.

When filling grain bins, a wide gauge sieve should be employed to catch any objects larger than the grains themselves falling out of sacks or augers. Care should also be taken to remove packaging including sacking and stitching thread to prevent it falling into the bin. Surfaces above the grain bin should be cleaned to prevent foreign bodies falling into the bin whilst hatches are removed.

Stone Furniture & Spouting

Stone furniture and associated spouting should be regularly maintained and cleaned. Before milling, a visual inspection should be made of the runner stone, hopper and open sections of the stone tun to ensure no foreign bodies have or can enter the mill when milling commences.

Where the mill is not in daily use, it is advised that surfaces should be vacuum cleaned weekly and stone tuns cleaned out quarterly or more regularly if the mill has problems with insect infestations or damp. Where the mill is shut over winter, it is strongly advised that all grain and flour should be removed from the mill and all spouting, bins, hoppers and stone tuns be vacuum cleaned and sprayed to prevent infestation while the mill is not in use.

Where grain is to remain in the hopper for any length of time, care should be taken to ensure that foreign bodies cannot fall into the hopper whilst the mill is not in use. Measures should also be employed to ensure the public cannot gain access to the hopper area so as to prevent contamination of the grain.

Where mills are not regular use, the stone furniture can be covered to prevent foreign bodies entering the stone tun or eye of the stones. Care should be taken however to ensure that good ventilation remains, especially when the mill has finished working – moisture due to heat from the milling process can cause fungal infestations including mildew if not allowed to breathe.

Sacks & Spouting

Empty sacks should be stored to ensure they are free from foreign bodies before being filled with flour. Hessian or Paper sacks are recommended for the storage of flour.

Before milling commences, visual inspections should be made of spouts and where any evidence of foreign bodies is found should be cleaned with either spout brushes and / or vacuum cleaning.

Where sacks are filled with flour, they should be left to cool before being sealed to avoid a build up of moisture. Sacks to be stored for any length of time should be sealed with stitching or twine to prevent foreign bodies getting into the flour. Note – certain types of twine in particular bailer twine can abrade causing small strands to get into the flour, try to avoid these types.

It is good practice to take samples of flour at regular intervals to check for quality of the flour and to

ensure no foreign bodies have entered the flour.

Storage of Flour

Flour should be stored in cool, dry, clean areas. If flour is to be stored for more than a few days, it is advised to store the flour in sacks on wooden floors or racking as stone or concrete floors transmit moisture which will be taken up by the flour. Stored flour should be regularly checked for insect and fungal infestation. Flour that is stored in damp conditions or is decaying will start to smell musty. Discard any such flour and prevent contamination with other flour. Flour that is coagulating into lumps in a sack will typically have a higher moisture content and should not be sold. Mill moths are a common problem where flour is milled or stored – they lay eggs in cracks and crevices (eg between floorboards, in wooden flour chutes and spouts) and require regular treatment and/or installation of an electronic insect control device.

Bagging Flour

Areas where bagging flour takes place should be clean, well lit and well ventilated. It is strongly recommended that tables with stainless steel surfaces be used for bagging flour so that they can be vacuumed and washed down with ease. All lights should be fitted with protective covers to prevent glass shards entering the flour in the event of a breakage. Particular care should be taken to clean ceiling areas above bagging tables to reduce the risk of foreign bodies falling from above.

Paper and Cellophane flour bags should be stored in clean environments to prevent foreign bodies entering the bags before being filled with flour.

Food grade flour scoops only should be used for transferring flour into bags.

See notes below on clothing used when working in a mill. Particular care must be taken when bagging up to prevent human hairs etc. entering the product. It is recommended that persons bagging up wear dust masks manufactured to the FFP2 standard to prevent inhalation of flour dust.

Weighing Flour

Weighing machines used for trade must be approved by Trading Standards. This will be a Crown stamp on older machines but recently a sticker is applied to the machine. Most meals reduce in weight as they dry out, so it is strongly advised that all flour is over-weighted to ensure that during the shelf life of the product, the product remains at or above the weight displayed on the label. Test this by weighing a bag of flour and re-weighing the product each month for six months or the shelf life of the product. Calculate the largest weight reduction and add this amount to the original bagged weight for all future bags.

Labelling of Product

To comply with the Food Labelling Regulations 1996, products must be labelled correctly. The requirements for labelling varies between products so specific advice should be obtained for each product sold by the mill. The following are required for all types of flour:

- Weight of the package
- Best before date (typically no more than 6 months from the date of milling)
- Comprehensive Ingredient List
- Any special storage condition or condition of use
- Name and address of manufacturer, packer or seller
- Particulars of place of origin if failure to give it would be likely to mislead consumers
- Stamp or other marking for tracing the product to the batch of grain and milling date (to ensure traceability of product in the event of a product recall)

It is advised that product which has come into contact with nuts or surfaces used to process nut based products (for example muesli) must be labelled stating “This product (may) contain(s) nuts”.

Under the Organic Products Regulations 1992, it is an offence to label a product as “organic” unless the mill is registered as an organic processor with one of the organic registration bodies (Soil Association, Organic Farmers & Growers for example).

Clothing worn whilst working in a Mill

Protective clothing is critical in a number of ways, it reduces the risk of injury, protects personal possessions and prevents contamination of the flour with human hair, skin flakes etc.

Head – tie or pin back long hair and cover with a cap, hat or hair net – this reduces the likelihood of hair entering the food production process.

Apron or Overall – wear a clean overall at all times free of straps which could get caught in moving machinery. Ensure overalls are washed regularly.

Footwear – ensure strong boots preferably with steel toe caps are worn to protect feet. Ensure laces are kept tight to prevent them getting caught in moving machinery. Prevent dirty footwear entering the milling and bagging up areas.

Face Masks & Respiratory Protection

Flour is listed as a substance hazardous to health in the Control of Substances Hazardous to Health (COSHH) literature. It is therefore strongly advised that all persons working in a mill wear respiratory masks manufactured to the FFP2 standard to remove small particulate matter including flour dust, especially in areas where flour dust is airborne. Employers have a duty of care under the Health and Safety at Work Act and may be liable in future years if employees contract respiratory illnesses that can be traced back to milling if proper precautions have not been taken by the employer. Contact suppliers of work health and safety consumables and ensure that masks suitable for their application are purchased.

Whilst the Health and Safety Executive has not prepared guidance specific to Mills, it has produced guidance for Craft Bakeries, an environment akin to flour mills, especially bagging up areas and the stone floor itself. The relevant “Topic Inspection Pack” can be found at <http://www.hse.gov.uk/foi/internalops/fod/inspect/craftbakery.pdf>.

The HSE guidance recommends the use of FFP2 standard dust masks where air filtration equipment cannot be installed or processes changed to reduce the presence of flour dust in the air.

Washing and Toilet Facilities

All persons working in mills should have access to washing and toilet facilities which are separated from the milling area. All persons handling grain or flour should be required to wash hands with antibacterial handwash before and after milling and bagging up.

Documenting Controls in Action

Once controls have been put in place, schedules should be put in place to ensure hazards and critical control points are monitored. Control sheets should include:

- The date and time the control is checked
- A record of anything found
- A note of the action taken

For example, a cleaning schedule:

Date	Time	Observed	Action Taken
01/05/08	12pm	Stone floor walls, ceiling and floor cleaned, infestation of ants found on window sill.	Vacuum cleaned ants, laid ant poison

The frequency of monitoring will depend on the control. Record sheets should be kept and logged.

Bread and Flour Regulations 1998

All flour manufactured in the UK must by law comply with the Bread and Flour Regulations 1998. The regulations lay down labelling and compositional standards – a long standing national requirement to restore certain vitamins and minerals to flour which are lost in the manufacturing process (typically when whole meals are dressed into white flour and other derivatives). They apply to flour which is derived from the milling or grinding of cleaned cereal (wheat, barley, oats, rye and maize), however the compositional requirements apply to flour made from wheat only.

In practice, this means that all wheat based flours other than wholemeal flour should have small amounts of the following minerals and vitamins added to them so that the product achieves certain minimum levels for each element:

- Iron
- Thiamin (Vitamin B1)
- Nicotinic acid or nicotinamide and
- Calcium carbonate (not required to be added to self raising flour which has a calcium content of not less than 0.2%)

Full details on the required minimum quantities of the above elements can be found at <http://www.food.gov.uk/multimedia/pdfs/breadflourguide.pdf>, Annex 1.

The regulations are enforced by Trading Standards authorities and mills can expect to have samples taken by the authorities for testing. Authorities have the legal power to prosecute mills that do not adhere to the regulations.

It is recognised that meeting the regulations is very difficult for small, artisan mills. Indeed, the quantities of minerals and vitamins required to be added are so small that it is easy to exceed the required amount. Commercial millers use batch mixing processes to ensure an even addition of the elements utilising a preparation called Creta Preparata which contains the minerals and vitamins to the required proportions for white flour. This preparation can be purchased from commercial millers.

Whilst groups including the Traditional Cornmillers Guild are campaigning to modify the Regulations to obtain some form of opt-out for artisan millers, it is important that those involved in flour milling understand the law and take an informed position taking all factors into account. Millers are advised to consult other local millers to understand how local Trading Standards bodies apply the legislation in their area.

Summary

The information presented above is intended as a guide to raise awareness of some of the key hazards and critical control points in the stoneground milling process. It is not an exhaustive list. The guidance may appear burdensome and difficult to implement for mills, especially those producing small amounts of flour.

Millers should obtain advice relevant to their particular situation, especially where volunteers, employees or members of the public are involved. See the end of this publication for further information.

Public officials, whether from Trading Standards or Environmental Health should be consulted, they are there to help and provide advice. It is in both parties interests to work together and find solutions if issues arise.

Where compliance with regulations requires the installation of new machinery or the modification of internal structures, advice should be sought from the SPAB Mills Section and your local millwright before any action is taken.

13. Insurance

Mill owners or operators are strongly advised to obtain insurance cover for the various risks involved in the undertaking. This could include accident or injury to employees, public liability for visitors, etc. Those selling flour must also have product liability insurance.

Insurance can only mitigate the consequences of a civil claim for damages due to negligence. It cannot protect against a criminal prosecution, and is no substitute for good safety practice.

Any contractors working at the mill should carry adequate insurance for the type of work they are doing. A public liability cover of £5,000,000 is required by most local authorities. Anyone carrying out design work should also be covered by insurance.

14. Appendix Of Relevant Law And Regulations

Health and Safety at Work Act 1974

If the mill can be defined as operating as a business, the above legislation will apply, and its stipulations must be complied with. Inspections may be made by officers of the Health and Safety Executive, who have powers to close down or prosecute, as they think fit. Alternatively, and more likely, the mill may be designated as a museum or place of entertainment, and inspected by the local Environmental Health Department. Operators or owners of mills that fall within its scope should take time to read and understand the Act, and take appropriate steps to comply.

The Regulations listed below form part of the Act, and may be relevant to a mill undertaking.

The Management of Health and Safety at Work Regulations 1992 covers management, and requires *Risks to be Assessed* and the findings recorded. It requires arrangements to be made to minimise risks where possible. Other topics addressed are *Health Surveillance*, *Health and Safety Assistance*, but some of these regulations do not apply to small undertakings.

The Provision and Use of Work Equipment Regulations 1998 (PUWER) was introduced "to ensure that work equipment should not result in health and safety risks, regardless of its age, condition or origin." This is likely to apply to mill machinery or maintenance equipment and, once again, risk assessments are required. The Regulations also cover *Maintenance*, *Keeping of Logs*, *Information to Users*, training, young people, etc.

The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)

covers lifting equipment, and will apply to sack hoists, stone cranes and other items. These must be tested and records kept.

The Workplace (Health, Safety and Welfare) Regulations 1992 covers buildings used for work, and includes building maintenance, ventilation, temperature, lighting and washing facilities.

The Manual Handling Operations Regulations 1992 will apply to the lifting or moving of sacks or other heavy objects within a mill. Risks must be assessed.

The Personal Protection Equipment at Work Regulations 1992 (PPE) will apply to the wearing of masks to protect a millworker from dust, or other forms of protection, such as goggles for stone dressing or hard hats.

The Control of Substances Hazardous to Health Regulations 1988 (COSHH) requires the assessment of risks from chemicals and other substances used in the workplace. This will apply to wood preservatives, flour dust and wood dust.

The Control of Lead at Work Regulations 1980 will apply if, for example, the mill is being painted with lead paint, or if lead paint is present on old components which are being refurbished.

The Noise at Work Regulations 1989 is unlikely to be applicable in a traditional mill, but the use of hammer mills or other noisy processes might stray into this area.

The Construction (Design and Management) Regulations 1992 (CDM) will affect many repair projects, particularly large ones. A volunteer group are likely to be exempt from these regulations, but if paid work is involved, and if the mill is used for any form of business, certain criteria must be applied to test whether these regulations apply. If they do, a competent *Planning Supervisor* must be appointed to write a *Health and Safety Plan* which will identify significant dangers in a project, which will then be adopted and extended by the contractors.

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) will apply if there is an accident or illness in a workplace. There is a requirement to report certain incidents directly to the Health and Safety Executive, and to send them completed accident forms. For example, death and major injuries must be reported immediately, followed by a form within ten days; injuries resulting in three day's absence require a form within ten days.

Other Legislation that may apply:

The Regulatory Reform (Fire Safety) Order 2005 applies to all non-domestic premises in England and Wales. If you are responsible for business premises that employ 5 or more persons or are a charity or voluntary organisation with 5 or more employees, the Order affects you and you need to act upon it. The Order requires that you undertake and maintain a fire risk assessment which identifies possible risks and take active steps to reduce them, by means such as fire precautions and equipment (emergency lighting, fire alarms, fire extinguishers etc)

Food Safety Act 1990 – covers the production, processing, storage, distribution and sale of food – if you produce food including flour, it applies to your undertaking.

Food Labelling Regulations 1996 – will apply to all mills selling foodstuffs – they cover the labelling of food stuffs for sale.

Bread and Flour Regulations 1998 – will apply to all mills selling flour – they cover the compositional standards for all breads and flours sold in the UK.

Organic Products Regulations 1992 - will apply to those mills wishing to label their products as "Organic".

The above legislation sounds daunting, but the requirements are mostly the application of common sense. It may take a while to get the gist of what is required, and it is strongly recommended that the appropriate explanatory books are obtained from the Health and Safety Executive. There are also Codes of Practice and Guidance books published that explain the regulations, and suggest ways to comply.

A list of publications and the books themselves can be obtained from:

HSE Books, PO Box 1999 SUDBURY, Suffolk, CO10 6FS.

Also the HSE has a website at www.open.gov.uk/hse, from which many free information sheets may be downloaded.

The SPAB Mills Section Organisations has contact with organisations that can provide mill specific advice on running a working mill, including compliance with Food Hygiene legislation and managing Health and Safety risks. Please contact the Section office for further details.