



Combe Mill Society - Risk Assessment

Activity: Operation of the Historic Clocks

Risk Assessment undertaken by: CB, NRE and PH

Assessment Date 9 October 2022
Next review date: 1 March 2024
Date of last review: 27 March 2023
Assessment Ref: RA05_clocks

Certification The contents of and conclusions drawn in this Assessment are the responsibility of the HTA and have been certified by the DRS as meeting the requirements of the Combe Mill Society for display on the web site.

Abbreviations used in this risk assessment

Where an action or reference applies to a specific person that person is referred to by his or her initials. These persons are:

- CB, Clive Brimson; NRE, Nigel Evans; PH, Philip Hawtin

Where an action devolves on a post holder the following abbreviations are used:

Abbreviation	Post
Clock keeper	Persons approved by the HTA as qualified to carry out all the procedures necessary to operate the clocks. Their formal status within the Mill is that of a Proficient Person.
H P and RR	(H) Hazard’s Severity of Harm; (P) Probability of Hazard’s occurrence; (RR) Residual Risk after all controls have been applied
HTA	Generally the Head of a Technical Area: in the present context the Head of the Historic Clocks Technical Area or an approved deputy.
Proficient Person	A person approved by the HTA as qualified to take charge of the clocks (aka locally clock keepers)
RCD	Residual Current Device

*Residual Risk (RR) =H x P



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Hazard (1)	Who might be harmed (2)	Consequence of Hazard (H) and the associated uncontrolled Risk. (3)	Risk from matrix* (4)			Control Measures adopted or required to make the Residual Risk Rating acceptable (5)	Residual Risk
			H	P	Risk		RR*
1 Finger entrapment -Trapping fingers in the clock mechanisms	Clock keepers, Members under training, volunteers & visitors	Moderate Harm: trapped fingers could require medical help and the underlying Probability is Possible The basic Risk is Moderate	3	3	3 X 3 = 9	The clock mechanisms are not accessible to visitors. In addition most of the mechanisms are behind a frame and are too high for children to reach. Clock keepers regularly have to place their hands adjacent to the mechanisms. Only appropriately trained and experienced persons are allowed to access the mechanisms. They are aware of the hazard and have over the last few years justified a Probability of Unlikely. Leading to an RR of Tolerable which is justified on the grounds that there are no cost effective additional control measures available.	3 X 2 = 6

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2 Eynsham Clock -Hand injury when winding clock	Clock keepers, Members under training	The winding mechanism is at the rear of the clock. If the strike mechanism is exhausted, when winding is started, its fly will rotate until the part finished strike is complete. Incorrect winding technique could lead to a Minor hand injury requiring first aid the Probability is formally possible. The associated Risk is Moderate.	2	3	2 X 3 = 6	Only clock keepers and supervised members under training are allowed to wind this clock Correct winding technique reduces the probability of injury to Very Unlikely. Leaving a residual risk of Trivial.	2 X 1 = 2

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3 All clocks -clicker failure	The person winding the clock	Clickers are ratchet devices that allow the go and strike trains to be safely rewind. If, at the end of winding, the clicker fails to re-engage, the winding handle will rotate as the weight rapidly falls to the ground. The rotating handle could cause a Moderate (painful) blow to the hand at a Probability of Possible. The Risk is formally Moderate.	3	3	3 X 3 = 9	Only clock keepers and supervised members under training are allowed to wind clocks. A trained clock keeper will hear the clicker sounding as the winding proceeds. This proves that the clicker is engaged at the time. At the end of the winding the clock keeper should gently reduce the pressure he/she is applying to the winding handle to prove that the clicker is holding the weight. If so the winding handle may be safely removed. If the clicker does not re-engage properly, carefully manually lower the weight and take the clock out of service. Use of the correct winding technique reduces the Probability of injury to Very Unlikely. Leaving a Trivial Residual Risk.	3 X 1 = 3

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			H	P	Risk		RR*
4 Slips, trips and falls	Clock keepers. volunteers & visitors	Minor Injuries requiring first aid are Possible. The Risk is Tolerable	2	3	2 X 3 = 6	The clock keepers are required to keep the Area around clocks clear of rubbish and move or remove items that could be a trip hazard. An inspection before the premises are opened to the public helps achieve the objective. These actions confirm the RR as Tolerable.	6

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5 Model of the Westminster Clock's escapement -flying electrical lead	Clock keepers. volunteers & visitors	The model is powered by a low voltage motor operating from a small transformer. The model itself poses no significant hazards. The transformer is connected to the mains via a flying lead. In the wrong place the cable could constitute a trip hazard and if damaged provide an electrical shock. Such flying leads are justifiable for this type of duty. No further general analysis is attempted here but see control measures.				To minimise risk: 1 The cable is fed round the wall behind the Eynsham clock stand; It is -securely anchored to the model at one end and -connected to a 13A plug fused at 3A or less at the other. The lead must be registered as a portable appliance and subjected to regular PAT testing (Action CJB). 2 The plug top is inserted into a switchable socket in a supply circuit protected by an RCD. 3 The socket switch must be turned off whenever the model is not being displayed. With these constraints the level of harm is assessed as no more than moderate (H=3) and the probability that it will arise is estimated as unlikely (P=2); leading to a Residual Risk (RR) of 6. This Risk is at the top end of the tolerable range and is justifiable on the grounds that there are no further cost effective controls available.	3 X 2 = 6

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6 Failure of weight suspension - weights fall through the floor	Any person who had the misfortune to be at the critical position on the ground floor at the wrong time	The go and strike train driver weights are suspended by wires or ropes. The potential Harm is Extreme but the Probability of the suspension failing and the weight penetrating the floor is Unlikely. The associated Risk is Moderate.	5	1	5 X 2 = 10	The floor under each clock has been protected by stout oak planks forming a timber pad spreading any impact load. This in effect removes the hazard. The planks are loose fitted but, although removable, are not readily accidentally displaced. Because of the short weight drop available, the clocks have to be rewound at the start of each operating day. The clock keeper making this wind is required to confirm that the planks are in place. This requirement needs to be added to the relevant Method statement; when next it is reviewed. A broken suspension still has the potential to cause harm and the relevant hazard is covered in item 7.	see Item 7

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			H	P	Risk		RR*
7 Rope breaks and weights fall to the floor injuring a nearby person.	Clock keepers and visitors to the area.	The construction of the clock stands acts to prevent a dropped weight from impacting on a person. The potential Harm is Moderate and the Probability of occurrence 2. The associated risk is Tolerable.	3	2	3 X 2 = 6	Only clock keepers are allowed to wind clocks. They are trained to keep their feet away from the area where a weight might drop. The clock keepers inspect the weight suspension before the clocks are run and if weaknesses are found; the clock is taken out of service until repaired. These additional measures ensure the Residual Risk is as low as is practicable and confirms that it is formally Tolerable.	3 X 2 = 6

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Risk Rating Matrix

		Probability of Occurrence (P)				
		Very Unlikely	Unlikely	Possible	Likely	Very likely
Consequence of Incident expressed as the resulting "Severity of Harm" (H)	Negligible	Trivial (1)	Trivial (2)	Trivial(3)	Tolerable(4)	Tolerable(5)
	Minor	Trivial(2)	Tolerable(4)	Tolerable(6)	Moderate(8)	Moderate(10)
	Moderate	Tolerable(3)	Tolerable(6)	Moderate(9)	Moderate(12)	Substantial(15)
	Major	Tolerable(4)	Moderate(8)	Moderate(12)	Substantial(16)	Very serious(20)
	Extreme	Moderate(5)	Moderate(10)	Substantial(15)	Very serious(20)	Very serious(25)

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Guidance on Interpretation

Parameter Level	HSE Descriptor	Meaning
Severity of Harm (H)		
1	Negligible	Postulated event not expected to lead to noticeable harm.
2	Minor	Level of harm that could lead to an injury that needs first aid treatment at the Mill
3	Moderate	Level of harm that could lead to an injury that requires professional help
4	Major	Serious medical injuries: for example broken limbs or a period of unconsciousness or the need to report the incident to a Regulatory Body
5	Extreme	Harm that could lead to death or life changing permanent injuries
Probability of Occurrence (P)		
1	Very Unlikely	Not more than once in 10 years
2	Unlikely	Not more than once a year
3	Possible	Over 1 but not more than twice a year
4	Likely	Over 2 but not more than 4 in a year
5	Very likely	Almost certain to appear: the occurrence often overlooked as being a 'normal everyday event'.

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Further Typical Measures that may be required to make the Residual Risk Acceptable

Risk R	Trivial	Tolerable	Moderate	Substantial	Very serious
Comment	Residual Risk (RR= 1 to 3) The risk is effectively non-existent and is acceptable as it stands.	RR = 4 to 6 The risk is adequately controlled but consider any justifiable minor additional measures	RR = 5-12 Additional controls should be considered where possible. The risk may or may not be adequately controlled.	RR=15-16 The risk is not adequately controlled: set out steps that must be taken before execution of operation can be approved	RR=20-25 The risk is not adequately controlled: the operation is unacceptable. Rigorous control methods are essential. Find an alternative if practicable.

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