



Work at Height Guidance Note WAH 001 rev 1

Inspection of Permanent Elevated Working Platforms

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1 Introduction

The Working at Height (WAH) Regulations 2005 came into force in April 2005 and cover **all** industry, including the types of site STA members work on. The Regulations cover elevated work platforms (scaffolding and permanent platforms), fragile surfaces (e.g. roofs), and any ladders, gangways and stairways used to get to the elevated workplace. They put a number of duties on employers (in most cases the Process Operator) to ensure that work at height is properly planned, appropriately supervised and carried out in a safe manner. The Regulations contain provisions and schedules on the inspections and checking of work platforms and their associated work equipment, and on the competence of people engaged in such activities.

This Platform Inspection Guidance (PIG) gives advice to STA Members and their clients on the safety inspection of **permanent** elevated work platforms (i.e. not scaffolding) used for emissions monitoring. It draws on an STA survey¹ of current practices and comments from key institutional stakeholders* in site safety, namely the Health & Safety Executive (HSE). This guidance note will be accompanied in due course by other STA guidance covering:

- Working on permanent and temporary elevated work platforms
- Working on stacks penetrating roof structures

2 The status of this guidance

The STA has issued this guidance to advise Members and their clients on what the Association considers is best practice for our industry on inspection of permanent elevated work platforms, taking into account the Regulations, the survey and comments from our Members and the HSE. In forming our view of what we consider is best practice for stack monitoring, we have taken the view that some requirements in the Regulations that apply specifically to work at height with platforms during construction should also apply to stack monitoring due to the demanding physical nature of the work. Examples are the “before use” inspection and the positioning of guard rails and toe boards.

This guidance may be revised from time to time in the light of developments or increases in current knowledge and understanding. So far as the HSE is concerned, the STA’s Platform Inspection Guidance will become the de-facto good-practice standard for platform inspection in our industry (and perhaps beyond).

Although great care has been taken in the preparation of this guidance to ensure accuracy, the STA cannot in any circumstances accept responsibilities for errors, omissions or advice given in this publication. Readers should be aware that only Acts of Parliament and Statutory Instruments have the force of law and only the courts can authoritatively interpret the law.

3 Why a platform inspection system is needed

All scaffolding is inspected after it is erected and certified as being constructed to an acceptable standard before it is used. The “Scaff-Tag” system of labelling inspected

¹ *Inspection of Permanent Elevated Working Platforms – A Survey of Current UK Practice, Attitudes and Needs*, STA, February 2004.

* The Association of British Insurers (ABI) was also invited to comment but no response was received.

scaffolding together with ample HSE guidance, has led to great improvements in safe working at heights across industry in general. However, a large proportion of stack emissions monitoring is carried out *not* from scaffolding, but from permanent working platforms. There appears to be a perception that permanent platforms are inherently safer than scaffold, but this is not the case. There have been several deaths by falls from permanent platforms and many STA members are at risk: monitoring teams, engineers installing and servicing monitoring equipment, UKAS auditors, Environment Agency Inspectors and EHOs. Clearly, a permanent platform is safe only if firstly, it was designed initially to be fit as a working platform for stack monitoring; and secondly, if it continues to be fit for this purpose. Permanent platforms must be checked to ascertain if this is so. However strong a steel platform is, if it is attached to a chimney stack by a few rusty bolts that have never been checked it will be unsafe!

4 The scope of this guidance

The Regulations contain a number of provisions and schedules describing the specific requirements for existing places of work (encompassing some permanent access to ducts), working platforms, scaffolding, guard rails etc., ladders, and inspection.

The Regulations define “*working platform*” as meaning any platform used as a place of work or as a means of access or egress from a place of work. It includes any scaffold, suspended scaffold, cradle, mobile platform, trestle, gangway, gantry and stairway which is so used. This STA Platform Inspection Guidance is restricted however to inspection of **permanent** working platforms used for stack monitoring – it does not cover scaffolding. We have used the term “*permanent elevated working platform*” to describe this.

“*Work equipment*” for work at height includes relevant machinery, tools, appliances, apparatus, installations, guard rails, barriers, working platforms, collective fall arrestment devices (e.g. net or airbag), and personal fall protection systems (e.g. ropes, harnesses, fall arrestors). This STA Platform Inspection Guidance covers work equipment directly forming part of the platform (e.g. guard rails, toe boards, barriers). Other work equipment (e.g. ladders, fall arrestors, ropes, harnesses) is outside the scope of this guidance. A useful reference for the inspection of lanyards, etc. is INDG367 - available from HSE’s website

This guidance focuses solely on inspection of permanent elevated working platforms that are already in place and does *not* address the issue of where the platform is to be located. It is assumed that an assessment has already been made on the most suitable position of the platform from a safety and technical point of view*.

5 The inspection process

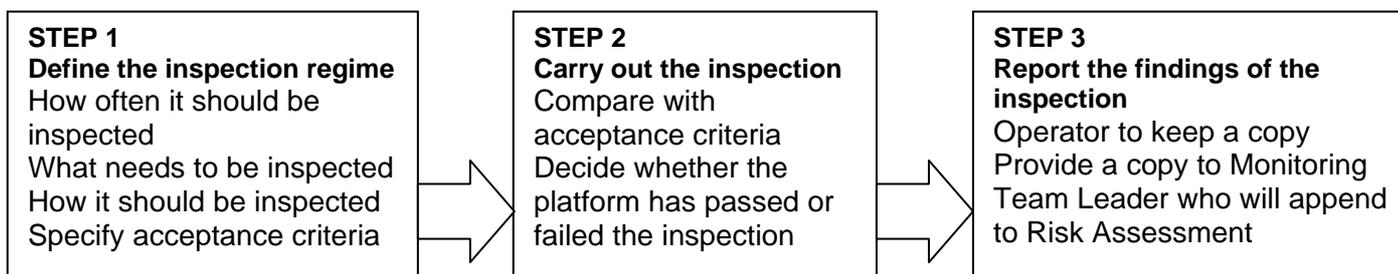


Figure 1 An overview of the inspection process for permanent working platforms

* The technical requirements for location of a sampling position are given in Environment Agency Technical Guidance Note M1, *Sampling and Safety Requirements for Monitoring Stack Releases to Atmosphere*.

Each of the above steps should be carried out by an appropriate competent person – see Appendix 1.

5.1 Step 1 - Define the inspection regime

Although the WAH Regulations have underlying principles to ensure the strength and stability of work platforms, and to inspect at regular intervals, they do not specify actual design strengths and they do not state in detail what should be inspected, how and by whom.

Appendix 2 lists some specifications on permanent platform design drawn from the WAH Regulations and relevant European standards^{2,3,4}. These can be used as a starting point for developing criteria specific to an individual platform.

5.1.1 How often it should be inspected

To ensure that health and safety conditions are maintained and that any deterioration can be detected and remedied in good time, permanent elevated working platforms and associated work equipment (guard rails, barriers, toe-boards) should be inspected at the following frequencies:

- i. After assembly installation but before use. This is, in effect, a **commissioning inspection**. If a platform hasn't been built to a recognised design standard then the first step should be to have a **baseline survey** carried out by a suitably competent person (e.g. a structural engineer) who can report on its current condition and whether it meets the appropriate specification (see Appendix 2). This should be carried out even if (especially if!) the platform is not new but has been in use for some time. The commissioning inspection or baseline survey should also state what benchmark values (acceptance criteria) should be used for checking that the basic specification is met on future inspections.
- ii. At suitable intervals where there has been exposure to conditions causing deterioration which is liable to result in a dangerous situation. The frequency of such **periodic inspections for deterioration** should be risk-based, taking into account the current condition and the deterioration risk-factors. Some further guidance is given in Appendix 3.
- iii. At each time an **exceptional circumstance** has occurred which is liable to jeopardise its safety, e.g. impact with a vehicle, shock loading.
- iv. Furthermore, **on each occasion** before the elevated permanent workplace is used the employer must check the surface, and every parapet, permanent rail or other such fall protection measure.

Note: Regulation 13 of the Work at Height Regulations (2005) stipulates that every employer shall so far as is reasonably practicable ensure that the surface and every parapet, permanent rail or other such fall protection measure of every place of work at height are checked on each occasion before that place is used.

The STA recommends that this check/inspection should be recorded. The STA **Stack TAG** system has been devised for this purpose.

² EN ISO 14122-1; 2001, *Safety of Machinery – Permanent means of access to machinery – Part 1: Choice of fixed means of access between two levels.*

³ EN ISO 14122-2; 2001, *Safety of Machinery – Permanent means of access to machinery – Part 2: Working platforms and walkways.*

⁴ EN ISO 14122-3; 2001, *Safety of Machinery – Permanent means of access to machinery – Part 3: Stairs, stepladders and guard-rails.*

5.1.2 What needs inspecting

- Different features of the permanent working platform and associated work equipment may be covered at different inspections.
- Some features of the permanent working platform and associated work equipment **always** need to be checked, at every inspection. These are the platform surface, and every parapet, permanent rail or other such fall protection measure.
- Other features of the permanent working platform and its associated work equipment may need to be inspected and checked against the acceptance criteria, based on the likely risk of failure or deterioration leading to a dangerous situation. Some guidance on risk-based inspections is given in Appendix 3.

5.1.3 How it should be inspected

- The WAH Regulations define Inspection as meaning “*such visual or more rigorous inspection by a competent person as to be appropriate for safety purposes. This includes any testing appropriate for those purposes*”. There is a spectrum of techniques for assessing the structural integrity of the platform, ranging from visual inspection by a competent person, through routine checking of bolt tightness, to specialised non-destructive testing (NDT) of welds and joints.
- Different inspection techniques may be appropriate for different features of the permanent working platform and associated work equipment, and at different inspections.
- A visual inspection should be carried out on every inspection occasion.
- The other appropriate techniques to be used on any particular feature and on any particular inspection will depend on the design of the platform and on the risk factors involved (It should be noted here that the corrosion of the floor grating that led to the US fatality would not have been detected by a cursory visual inspection alone). Some guidance on risk-based inspections is given in Appendix 3.

5.1.4 Specify acceptance criteria

- The acceptance criteria for the inspection checks should be clearly and unambiguously stated.
- Where a platform has been constructed to a generally accepted design standard, the design criteria can be used to develop acceptance criteria for inspections.
- Where the platform hasn't been built to a recognised design standard then a baseline assessment of the platform will need to recommend the benchmark for structural integrity and the techniques that should be used for checking compliance.

The summary of the inspection regime should be produced showing the main points. An example is given in Table 1.

5.2 Step 2 – Carry out the inspection

The inspection of the relevant features of the permanent working platform and associated work equipment should be carried out by a competent person at the frequency defined in the Inspection Regime using the techniques specified.

Where a thorough inspection is required using a quantitative measurement technique (e.g. NDT), the organisation carrying out that test should hold the appropriate UKAS accreditation to ISO 17025 for that test.

5.3 Step 3 - Report the findings of the inspection

The WAH Regulations put specific duties on the reporting of inspections, which must be complied with. In the context of permanent elevated working platforms for stack monitoring the Operator should ensure that:

- The result of the inspection is recorded (referred to hereon as “*the report*”). The WAH Regulations require the report or copy of the report to be kept in a form which is capable of being reproduced as a printed copy when required and which is secure from loss or unauthorised interference.
- Schedule 7 of the WAH Regulations lists the particulars to be included in the report of inspection. The report should also state what the purpose of this inspection was (i.e. Commissioning inspection, Periodic Inspections for Deterioration, Exceptional Circumstance Inspection or Before Use Inspection).
- The results of the inspection should be compared with the acceptance criteria defined in the Inspection Regime to show whether the platform has passed or failed the inspection. The main report may be accompanied by an abbreviated form such as a certificate of compliance (along the lines of an MoT certificate).
- The report is kept at the site where the permanent elevated working platform is located, at least until the next inspection is recorded subject to a minimum retention period of 3 months. (However the STA recommends such reports are kept as long as practicable to aid reviews of the results to assess whether the Inspection Regime needs modifying or fine tuning.)

STA Members working on permanent elevated working platforms – whether carrying out monitoring, instrument service, repair and calibration, or audits – will require to see the relevant Working at Height Regulation Report(s) of Inspection, or the accompanying certificate of compliance, *before* they start work. (See Section 6.) The Operator should therefore provide the STA member organisation with the following:

Table 1 Type of inspection report to be provided to STA Members before work starts

Inspection report to be provided	Circumstances
The <i>commissioning inspection</i> report or The <i>baseline survey</i> report (if commissioning inspection report was ever carried out)	If this inspection has only recently been carried out and no subsequent periodic inspections have yet been performed
The <i>periodic inspections for deterioration</i> report	The most recent report
The <i>exceptional circumstance</i> inspection	The most recent report unless it has been

	superseded by the most recent periodic inspection report
The <i>before use check/inspection</i> report	In all circumstances

6 Making use of the inspection report

The Team Leader of the organisation that will be working on the permanent elevated working platform (e.g. a monitoring organisation) should review the result (i.e. pass/fail) of the relevant inspection report(s) or certificate of compliance to enable the on-site risk assessment to be completed. For teams carrying out stack monitoring, this is a specific requirement of MCERTS.

STA members should not ascend to the work area to carry out work of any kind (including reconnaissance visits or risk assessments) until they have satisfied themselves that the report states that the platform has passed the necessary inspection.

The on-site risk assessment carried out by the monitoring team under MCERTS is **not** a substitute for the operator's platform inspection. It is unlikely that monitoring teams will have the necessary understanding of the structural engineering issues involved and structural test methods.

Table 2 Summary of Inspection Regime for Permanent Elevated Working Platform and Associated Work Equipment

Platform reference:

Site identity:

Type of inspection	Inspection frequency	What needs inspecting[#]	Inspection technique[*]	Acceptance criteria for pass/fail	Comments
i) Commissioning inspection	<i>After assembly/installation but before use</i>				
ii) Periodic inspections for deterioration	<i>To be specified by competent person. Commensurate with risk.</i>				
iii) Exceptional circumstance inspection	<i>On every occurrence</i>				
iv) Before use check/inspection	<i>Before each use of the platform</i>				

Inspection regime designed by:

(Name of competent person, qualification and affiliation)

Date:

[#] The platform surface, and every parapet, permanent rail or other such fall protection measure must be inspected before every use. Other features to be included in the various inspections according to risk.

^{*} Visual inspection as absolute minimum. More thorough inspection to be commensurate with risk.

Appendix 1 - Competent Person

The WAH Regulations state that *“Every employer shall ensure that no person engages in any activity, including organisation, planning and supervision, in relation to work at height or work equipment unless he is competent to do so or, if being trained, is being supervised by a competent person”*.

The HSE has provided the STA with a basic definition of a competent person that they believe works for virtually every situation and has been included successfully in a number of documents including British Standards:

“A competent person is a person who can demonstrate that they have sufficient professional or technical training, knowledge, actual experience, and authority to enable them to:

- Carry out their assigned duties at the level of responsibility allocated to them;*
- Understand any potential hazards related to the work (or equipment) under consideration;*
- Detect any technical defects or omissions in that work (or equipment), recognise any implications for health and safety caused by those defects, and be able to specify a remedial action to mitigate those implications”*.

This is the core definition and is never altered. It is then expanded to cover what is required for the particular application. For inspection of a permanent elevated working platform the HSE has suggested adding the following. A competent person shall have:

- Sufficient knowledge of the mechanical and physical properties of the materials and assemblies involved;*
- Practical experience of installation of the platform, its usage, behaviour and failure modes in service;*
- An understanding of the structural engineering issues involved and structural test methods and checks;*
- Adequate training in the use of any safety equipment required for, and to deal with, the hazards associated with the inspection;*
- An understanding of the need for and the ability to check the adequacy of the safety equipment allocated to them; and*
- An ability to state the correct procedure for the task and the emergency procedures in place for the work.*

In practice, there may be more than one competent person, each specialising in one or more of these steps. For instance, the HSE has advised the STA that for stacks/platforms that have not been built to a recognised design standard (there is not one!), or that have not had a previous assessment of strength and stability (e.g. under the Construction Design and Management Regulations 1994), the operator will need to have their stack/platform surveyed by a competent structural engineer to establish its current integrity and condition. This baseline assessment would then recommend the extent and frequency of subsequent periodic and routine inspections. The assessment would include but not be limited to the effects of stress, fatigue, weathering, corrosion and damage. The routine inspections might then be carried out by a different competent person, for example an engineer surveyor.

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Such structural engineers and engineering surveyors will need to be trained to work at heights (by for example, the STA course). The STA may decide to forge links with a structural engineering organisation and/or keep a list of approved structural engineers.

The before use check/inspection is carried out by the process operator/ plant owner representative who has the knowledge of the regulations and purpose of use of the platform.

Appendix 2

Table 3 Basic specification for a permanent elevated work platform relevant to stack monitoring

Aspect	Basic specification from WAH Regulations	Detailed criteria
Strength rigidity and stability of working platform and supporting structure	A working platform and any structure used to support a working platform shall be suitable and of sufficient strength and rigidity for the purpose for which it is intended to be or is being used	<p>EN ISO 14122-2: 2001 states:</p> <p>Dimensioning and selection of components (including fixings, supports and foundations) to ensure sufficient rigidity and stability.</p> <p>Resistance of all parts to environmental effects (e.g. climate, chemical agents, corrosive gases) by for example the use of corrosion resistant material or a suitable protective coating.</p> <p>Positioning of constructional elements so that water cannot accumulate, e.g. in joints.</p> <p>Use of compatible material e.g. to minimise galvanic action or differential thermal expansion.</p>
	Shall, when altered or modified, be so altered or modified as to ensure that it remains stable.	
	Shall be so erected and used as to ensure that its components do not become accidentally displaced so as to endanger any person.	

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	Any structure used to support a working platform shall be prevented from slipping by secure attachment to the bearing surface or to another structure, provision of an effective anti-slip device or by other means of equivalent effectiveness.	
	Any structure used to support a working platform shall be stable while being used	
Loading	A working platform and any supporting structure shall not be loaded so as to give rise to a risk of collapse or any deformation which could affect its safe use.	<p>EA TGN M1 states:</p> <p>All platforms must meet the minimum weight criterion required for sampling defined in BS EN 13284-1:2002 as 400 kg point load. The STA Risk Assessment Guide <i>Industrial-Emission Monitoring</i> recommends that platforms must be capable of bearing this as a minimum.</p> <p>EN ISO 14122-2: 2001 states:</p> <p>The schedule of specification for the working platforms and walkways shall state the load for which it is designed.</p> <p>The <u>minimum</u> operating loads to take into account for the landing, walkway and working platforms are: 2 kN/m² under distributed load for the structure; and 1.5 kN concentrated load applied in the most unfavourable position over a concentrated load area of 200 mm x 200 mm for the flooring. (EN ISO 14122-2: 2001 states the unfactored load may be up to 5 kN/m² for low density pedestrian traffic with load or for high density pedestrian traffic.)</p> <p>When loaded with the design load, the deflection of the flooring shall not exceed 1/200th of the span and the difference between the loaded and a neighbouring unloaded flooring shall not exceed 4 mm in height. The safe strength of the working platforms and walkways shall be verified either by calculation or by test.</p>
Dimensions of working	Sufficient dimensions to permit the safe passage of persons and the safe use of	Detailed requirements for dimensions of platforms for stack monitoring are laid down in Environment Agency Technical Guidance Note M1.

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platform	any plant or materials required and to provide a safe working area having regard to the work being carried out there.	
Surface of working platform	Shall possess a suitable surface and in particular be so constructed that the surface of the working platform has no gap: (i) through which a person could fall; (ii) through which any material or object could fall and injure a person; or (iii) giving rise to other risk of injury to any person unless measures have been taken to protect persons against such risk	<p>EN ISO 14122-2: 2001 states:</p> <p>Walkways and working platforms shall be designed and constructed to prevent the hazards due to falling objects.</p> <p>The flooring of a working platform or walkway shall only have such maximum openings that a ball with a diameter of 35 mm cannot fall through. Floorings above a place where people are working, as opposed to occasional passage, shall have such maximum openings that a ball with a diameter of 20 mm cannot fall through unless the safety is guaranteed by other suitable means.</p>

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	<p>Shall be erected, used and maintained in such condition as to prevent (i) the risk of slipping or tripping; or (ii) any person being caught between the working platform and any adjacent structure.</p>	<p>EN ISO 14122-2: 2001 states</p> <p>Floorings shall have a surface finish which is designed to reduce the risk of slipping.</p> <p>Floorings shall be designed such that any liquids spilled on them are drained away. If this requirement is not possible to fulfil for some special reasons, slipping and other hazards caused by the liquid shall be prevented and minimised in some other suitable way.</p> <p>Floorings shall be made in such a way that neither dirt, snow, ice, etc, nor other substances may accumulate. Therefore, permeable floorings such as gratings or cold-formed planks are an advantage. If this is not possible and permeable floorings are not used, facilities for removing the accumulated substances shall be provided where necessary.</p> <p>To avoid trip hazards, the greatest difference between the tops of neighbouring flooring surfaces shall not exceed 4 mm in height.</p> <p>If the flooring is made up of detachable (removable) elements e.g. where required for maintenance of equipment mounted below flooring, then any hazardous movement of these elements shall be prevented (e.g. by fasteners), and it shall be possible to inspect fixings in order to detect any corrosion or any loosening or change of position of clamps.</p>
Resting surface	<p>Any surface on which any supporting structure rests shall be stable, of sufficient strength and of suitable composition safely to support the supporting structure, the working platform and any load intended to be placed on the working platform.</p>	

Table 4 Basic specification for work equipment associated with a permanent elevated work platform

Aspect	Basic specification from WAH Regulations	Detailed criteria
Means of protection (guard-rail, toe-board, barrier or similar means)	Shall be of sufficient dimensions, of sufficient strength and rigidity for the purposes for which they are being used, and otherwise suitable.	<p>EN ISO 14122-2: 2001 states:</p> <p>The materials and dimensions of constituent elements and construction mode used shall meet the safety objectives of this standard.</p> <p>The materials used shall be, themselves, by their nature or by a complementary treatment, able to resist corrosion provoked by the surrounding atmosphere.</p> <p>The guard rail shall support, without any perceivable permanent deformation, an unfactored horizontally applied point load equal to the service load, applied first to the top of the stanchion, then at the least favourable point along the handrail. In both cases, the maximum loaded deflection shall not exceed 30 mm. The minimum service load $F_{min} = 300 \text{ N/m} \times \text{max distance in metres between the axes of two successive stanchions}$. It is essential to test the strength of the guard rail under factored loads should it be required to verify the absence of any perceivable permanent deformation.</p> <p>The safety requirements may be verified by measurements, inspection, calculation and/or testing. When testing is chosen, the testing procedure described in Clause 8.2. of EN ISO 14122-2: 2001 shall be used.</p>
	Shall be so placed, secured and used as to ensure...that they do not become accidentally displaced.	
	Shall be so placed as to prevent...the fall of any person, or of any material or object, from any place of work.	

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	There shall not be a lateral opening in means of protection save at a point of access to a ladder or stairway where an opening is necessary (and then it shall be removed only to the extent necessary to gain access or egress and then shall be replaced	<p>EN ISO 14122-2: 2001 states:</p> <p>Any part of the guard rail which is intended to be opened (gate) shall be designed to open onto the platform and to close automatically when released using, e.g. the effect of gravity or a spring.</p> <p>Opening and closing of moving parts (gates) shall not cause further hazards (for example by shearing or by falling) to users and other persons in the vicinity.</p>
Guard rails	The top guard rail or similar means of protection shall be at least 950 mm or, in the case of such means of protection already fixed in place at the coming into force of the WAH Regulations, at least 910 mm above the edge from which any person is liable to fall. Any intermediate guard-rail or similar means of protection shall be positioned so that any gap between it and other means of protection does not exceed 470 mm.	<p>EN ISO 14122-2: 2001 states:</p> <p>The minimum height of the guard-rail shall be 1100 mm.</p> <p>The guard-rail shall include at least one intermediate knee-rail or any other equivalent protection. The clear space between the handrail and the knee-rail, as well as between the knee-rail and the toe plate (toe board) shall not exceed 500 mm.</p>
Toes boards	Toe-board shall be suitable and sufficient to prevent the fall of any person, or any material or object, from any place of work.	<p>EN ISO 14122-2: 2001 states:</p> <p>The toe board shall have a minimum height of 100 mm. The gap between the toe board and the floor surface should not exceed 10 mm.</p>
Structures supporting means of protection	Any structure or part of a structure which supports means of protection or to which means of protection are attached shall be of sufficient strength and suitable protection for the purpose of such support or attachment.	

Appendix 3. The risk-based approach to periodic inspections for deterioration

The HSE has advised the STA that periodic inspections of platforms for deterioration should be risk based. A competent person (defined in the Appendix 1) should consider the current condition of the platform and its associated work components, take into account the deterioration-risk factors for the platform in question, and develop an inspection regime that is fit for purpose in dealing with the likely risk of failure leading to a dangerous situation.

The approach can be simplified into the following steps:

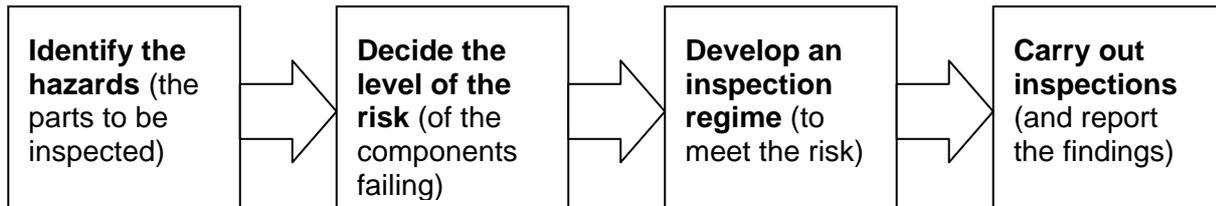


Figure 2 The general risk-based approach

In a general health and safety context, the hazard is the working at height and the risk is the likelihood that a worker could fall and its consequence (death or injury). However in the context of this document, we are being more specific and treat as hazards those parts of the platform that could fail and the risk as the likelihood that they will fail and its consequence.

Identify the hazards - the parts to be inspected

EN ISO 14122-2: 2001 states (in Section 4.1.1) that working platform components, fixings, connections, joints, supports and foundations must have sufficient rigidity, stability, resistance to environmental effects and accumulation of water. A competent person should identify what parts of the platform are at risk from deterioration that could lead to falls or even collapse. Some further specific examples are:

- Supporting legs, struts, floors, grilles and their associated bolts and welds.
- If the platform is not free-standing/self-supporting, the structure (e.g. stack) that the platform is attached to;
- Ancillary features to prevent falls, such as handrails, ladders and steps - there have been cases when handrails in corrosive environments have broken free completely when leaned on by STA members.
- Lightning conductor strips must also be checked - there has been an instance of an STA member being struck by lightning.

Decide the level of risk

Height

To some extent, the height at which the stack monitoring work is to be carried out is a risk factor determining the likelihood of death and injury in the event of structural failure*. The type of surface

* Remember that the Working at Height Regulations apply to work in *any* place, including a place above or below ground level, where if measures required by those regulations were not taken a

or objects onto which a person could fall also influences the consequence of a fall. However, the HSE has advised the STA against ranking the risk based on height - in practice, a fall from as little as 2 m can kill and most stack emissions monitoring platforms are at least this height. We therefore assume monitoring platforms have a high “height risk” associated with them and that the main variable affecting risk is the likelihood that the components of the working platform will fail.

Deterioration risk factors

We need to consider if the platform was designed in the first place to cope with the rigors of stack monitoring. As mentioned previously, in many cases this will require a baseline assessment by a competent structural engineer to establish its current integrity and condition. If it doesn't meet an acceptable benchmark for integrity and condition, (plus any requirements given in EA Technical Guidance Note M1 and monitoring standards such as BS EN 13284 and BS EN 1911) then it falls at the first hurdle and the platform needs to be redesigned.

Assuming for the moment that the platform was fit for purpose when new and still is, we now have to consider to what extent its structural integrity is likely to be affected in the future by risk factors. These may include:

- Stress and metal fatigue due to physical forces.
- Vibration – as well as causing metal to fatigue, vibration may cause bolts to loosen. This may be from plant/process vibrations and also from the effect of wind on the platform.
- Resistance to environmental effects, such as climate, chemical agents, corrosive gases. There may be “normal” corrosion or there may be accelerated corrosion in especially aggressive atmospheres, whether that is due to the climate (e.g. coastal-marine environment) or sector specific pollutant emissions (e.g. SO₂).
- Likelihood of accumulation of water and condensed vapours, e.g. it is known that some designs of handrail are prone to internal condensation of corrosive atmospheres leading to corrosion at their base.

Develop a periodic inspection regime that is commensurate with the risk

There are two points to be considered:

1. What the inspection will consist of; and
2. How often to carry out periodic inspections for deterioration.

The HSE has advised the STA that periodic inspections for deterioration should be risk based. In other words, where the risk is high the inspection should be more detailed/in more depth and more frequent than when the risk is low.

How to inspect the platform and its components

Process operators will then need to carry out appropriate inspections, which may be visual or more rigorous (including testing) by a competent person.

person could fall a distance liable to cause personal injury. However, special provisions apply to workplaces higher than 2 metres.

How often to inspect

Most large companies have a general, non-statutory, plant inspection regime. These commonly take place once every 5 years. However, inspection of exposed steelwork at sample locations requires more frequent inspections. Based on the experience of STA-member companies operating at installations with stacks, and their experience of problems of corrosion and vibration, the STA's provisional guidance is that all permanent platforms 2 meters high or greater should, as a minimum, be inspected annually by a competent person. The inspection frequency should be increased where there are more risk factors.

Bringing it all together

The flowing matrix brings together the risk factors and inspection regimes in a simple format. It is always difficult to give absolute recommendations (and indeed it would not be appropriate to do so) where risk decides the best route. The STA hopes that this guide will act as a catalyst for getting the whole process started, and that more precise guidance can be developed as our understanding and experience of the issues grow.

The example shown in the risk matrix is based on a platform in a normal working environment above a flat surface. The height risk would be greater if the platform was above tools or machinery for example. It would be less if the fall were into water (provided you could swim!).

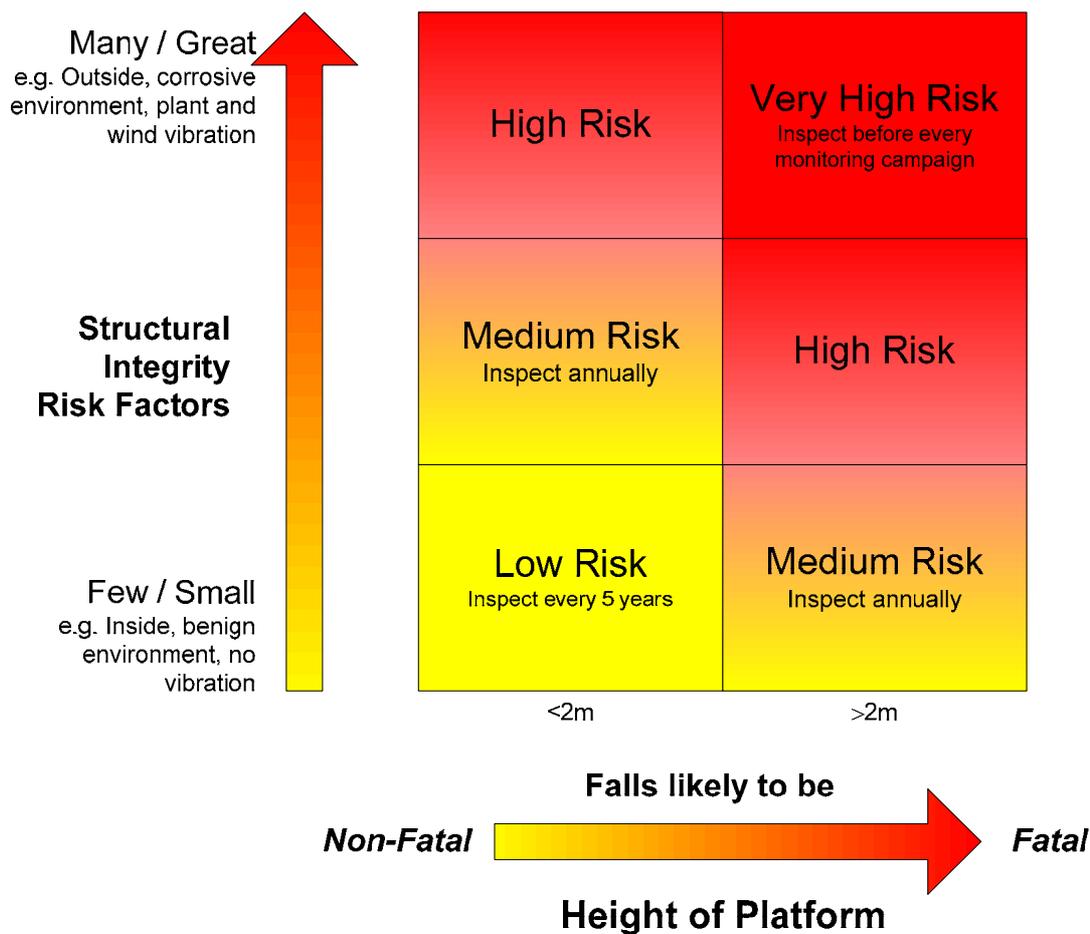


Figure 3 Example risk matrix for a platform in a normal working environment above a flat surface.