HSE

Health and Safety Executive

A consultative document on legislation to implement the Physical Agents (Artificial Optical Radiation) Directive

This consultative document is issued by the Health and Safety Executive in compliance with its duty to consult under section 50(3) of the Health and Safety at Work etc Act 1974.

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Internet responses to: http://www.hse.gov.uk/consult/condocs/cd227.htm

to reach there no later than **5 February 2010**

The Executive tries to make its consultation procedure as thorough and open as possible. Responses to this consultative document will be lodged with the Health and Safety Executive's Knowledge Centre after the close of the consultation period where they can be inspected by members of the public or be copied to them on payment of the appropriate fee to cover costs.

Responses to this consultative document are invited on the basis that anyone submitting them agrees to their response being dealt with in this way. Responses, or part of them, will be withheld from the Knowledge Centre only at the express request of the person making them. In such cases, a note will be put in the index to the responses identifying those who have commented and have asked that their views, or part of them, be treated as confidential.

Many business e-mail systems now automatically append a paragraph stating the message is confidential. If you are responding to this CD by e-mail and you are content for your responses to be made publicly available, please make clear in the body of your response that you do not wish any standard confidentiality statement to apply.

CD227
Consultative Document

A consultative document on legislation to implement the Physical Agents (Artificial Optical Radiation) Directive

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How consultations are handled

The Health and Safety Executive has a statutory duty to consult stakeholders to seek their views on its proposals. It believes that public consultation provides an open and transparent approach to decision-making, which it believes is essential if policies and decisions are to have widespread support and to reflect the needs and aspirations of the people they will affect. Following consultation, the Health and Safety Executive will decide on the best way forward based on careful consideration of all the views expressed.

Responses to CDs are normally made publicly available unless respondents request confidentially. If you reply to this CD in a personal capacity, rather than as the post holder of an organization, you should be aware that the information you provide may constitute 'personal data' in terms of the Data Protection Act 1998. For the purposes of this Act, HSE is the data controller and will process the data for health, safety and environmental purposes. HSE may disclose the data to any person or organization for the purposes for which it is collected, or where the Act allows disclosure. You have a right to ask for a copy of the data and to ask for inaccurate data to be corrected.

How your responses will be handled

We will acknowledge all responses and give full consideration to the substance of arguments in the development of proposals. We may also contact you again if necessary to clarify any points. The Health and Safety Executive will then decide on how best to take the regulations forward based on an interpretation and analysis of the consultation responses.

We may then revise the draft regulations, guidance and impact assessment and put the regulations before Parliament. Once Parliament has agreed the regulations, we will publish them together with the guidance. We expect this to happen by March 2010. The regulations will then come into force by 27 April 2010.

Queries and complaints

If you are not satisfied with the way this consultation exercise has been conducted, please either:

Write to Garry Knight at the above address

Or send an email to opticaldirective@hse.gsi.gov.uk

We aim to reply to all correspondence within 10 working days. If you are not satisfied with the outcome, you can raise the matter with HSE's chief executive, Geoffrey Podger, at Health and Safety Executive, Redgrave Court, Merton Road, Bootle, Merseyside, L20 7HS. You can also write and ask your MP to take up your case with us or with Ministers. Your MP may also ask the independent Parliamentary Commissioner for Administration (the Ombudsman) to review your complaint.

Summary

1. The Health and Safety Executive (HSE) is proposing new regulations – the *Control of Artificial Optical Radiation at Work Regulations* – to protect workers from hazardous sources of light in the workplace.

This Consultation Document seeks views on:

- whether the guidance enables businesses to identify what they need to do
- the initial impact assessment
- whether there are unintended consequences or other issues not covered

2. Specific questions are set out in Paragraph 17.

Introduction

3. New legislation is being introduced across Europe to protect workers from hazardous sources of intense light in the workplace. Further information on this European Directive can be found at: http://www.hse.gov.uk/aboutus/europe/euronews/dossiers/aor.htm

4. In order to comply with this Directive, HSE has developed the *Control of Artificial Optical Radiation at Work Regulations* – a draft of the AOR Regulations is at **Annex A**. Separate regulations will be introduced in Northern Ireland, Gibraltar and to cover sea transport.

5. In order to help businesses identify whether they will be affected and what they need to do, HSE has developed the guidance at **Annex B.**

6. In order to estimate the possible impact of the proposed AOR Regulations, an initial Impact Assessment is set out in **Annex C**.

Why are new Regulations needed?

7. A small number of intense sources of light at work can damage your eyes and skin and need to be managed properly. These Regulations will complement the Management of Health and Safety at Work Regulations 1999 to ensure that all workers at risk are protected.

What work activities are likely to be affected by the Regulations?

8. The vast majority of light sources are known to be safe and businesses with only these sources need take no special measures.

9. Businesses with hazardous sources who are not already managing the risks will be affected by the Regulations.

10. The guidance in **Annex B** should help businesses decide if they are likely to be affected and if so, what they need to do.

What will businesses need to do differently under the Regulations?

11. The key requirement is to ensure that the eyes and skin of workers are properly protected.

12. Businesses with only safe sources need do nothing different.

13. Businesses with hazardous sources will need to assure themselves that workers are protected.

14. The guidance in **Annex B** lists some of the sensible control measures businesses should already be taking to protect the eyes and skin of workers. Other sources of information which could be used includes local rules, sector specific guides, manufacturers data etc and the guide produced by the European Commission:- http://www.hse.gov.uk/radiation/nonionising/aor-guide.pdf

What is the likely impact of the proposed new Regulations?

15. The impact assessment in **Annex C** describes the underpinning assumptions. This estimates the total first year costs to range from £1.07m to £5.14m rising to £4.01m to £18.89m at 10 year present value.

How to get involved – what does HSE want from you?

16. HSE values feedback on any aspect, but in particular:

- whether the guidance allows you to identify if you are likely to be affected by the regulations and what you need to do
- if you have any comments on the impact assessment
- whether there are any unintended consequences or other issues not covered

17. Questions
    a) Does the guidance in Annex B help you identify those sources of light in your workplace that are safe and require no further assessment? [If no, what additional sources should be listed as safe or what sources are you unclear/concerned about?].

    b) Does the guidance in Annex B help you identify those particularly intense sources of light in your workplace that are hazardous? [If no, what additional sources should be listed as potentially hazardous or what sources are you unclear/concerned about?]

c) Is the filter in Regulation 3 clear in helping you decide whether or not you will need to do more? [If no, what extra would you like to see?]

d) Does the guidance in Annex B help you understand what you should already be doing to protect workers' eyes and skin? [if no, what areas would you like to see covered in additional guidance?]

e) Does the guidance in Annex B help you understand what more you need to do if you are not already protecting your workers' eyes and skin? [if no, what areas would you like to see covered in additional guidance?]

f) Do you think the assumptions used to calculate the costs for familiarisation, risk assessment and control in the impact assessment in Annex C look reasonable? [if no please give further details]

g) Are there any costs or benefits which are not detailed in the impact assessment in Annex C which you think we need to consider? [if yes please give further details]

h) Are there any further comments you would like to make on the issues raised in this consultation that you have not already responded to in this questionnaire?

i) Is there anything you particularly liked or disliked about this questionnaire? Please provide your comments below.

DRAFT STATUTORY INSTRUMENTS

2010 No.

HEALTH AND SAFETY

Control of Artificial Optical Radiation at Work Regulations 2010

Made - - - -	***
Laid before Parliament	***
Coming into force - -	*27 April 2010*

The Secretary of State makes these Regulations—

(a) in exercise of the powers conferred by sections 15(1), (2), (4)(b) and (8), and 82(3)(a) of, and paragraphs 1(1)(a) to (c), 8(1) and (2), 9, 11, 12, 13(2) and (3), 14, 15(1) and 16 of Schedule 3 to, the Health and Safety at Work etc. Act 1974(**a**)("the 1974 Act"), as read with paragraph 1A of Schedule 2 to the European Communities Act 1972(**b**); and

(b) for the purpose of giving effect without modifications to proposals submitted by the Health and Safety Executive under section 11(3)(**c**) of the 1974 Act after carrying out consultations in accordance with section 50(3) of that Act.

These Regulations make provision for a purpose mentioned in section 2(2) of the European Communities Act 1972 and it appears to the Secretary of State that it is expedient for references in these Regulations to Annexes to Directive 2006/25/EC of the European Parliament and of the Council on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation) (19th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)(**d**) to be construed as including references to those Annexes as they are amended from time to time.

Citation, commencement and interpretation

1.—(1) These Regulations may be cited as the Control of Artificial Optical Radiation at Work Regulations 2010 and shall come into force on 27 April 2010.

(2) In these Regulations—

(**a**) 1974 c.37 as amended by S.I. 2008/960. There are other amending instruments but none is relevant.
(**b**) 1972 c.68, paragraph 1A of Schedule 2 of which is amended by the Legislative and Regulatory Reform Act 2006 (c.51), section 28. There are other amendments but none is relevant.
(**c**) Section 11(3) is substituted by S.I. 2008/960.
(**d**) O.J. L114, 27.4.2006 p.38.

"the 1999 Regulations" means the Management of Health and Safety at Work Regulations 1999(**a**);

"artificial optical radiation" means any electromagnetic radiation in the wavelength range between 100nm and 1mm which is emitted by non-natural sources;

"the Directive" means Directive 2006/25/EC of the European Parliament and of the Council on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation) (19^{th} individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC), the Annexes of which are as amended from time to time;

"enforcing authority" means the Executive, local authority or Office of Rail Regulation, determined in accordance with the provisions of the Health and Safety (Enforcing Authority) Regulations 1998(**b**) and the Health and Safety (Enforcing Authority for Railways and Other Guided Transport Systems) Regulations 2006(**c**);

"the Executive" means the Health and Safety Executive;

"the exposure limit values" means—

(a) for non-coherent radiation, those exposure limit values set out in Annex I of the Directive; and

(b) for laser radiation those exposure limit values set out in Annex II of the Directive.

"health surveillance" means assessment of the state of health of an employee, as related to exposure to artificial optical radiation and its effects on the skin.

"irradiance" means the radiant power incident per unit area upon a surface expressed in watts per square metre ($W\ m^{-2}$);

"laser" means any device which can be made to produce or amplify electromagnetic radiation in the optical radiation wavelength range primarily by the process of controlled stimulated emission;

"laser radiation" means artificial optical radiation from a laser;

"non-coherent radiation" means any artificial optical radiation other than laser radiation;

"radiance" means the radiant flux or power output per unit solid angle per unit area expressed in watts per square metre per steradian ($W\ m^{-2}\ sr^{-1}$); and

"radiant exposure" means the time integral of the irradiance, expressed in joules per square metre ($J\ m^{-2}$).

(3) Other expressions used in these Regulations which are used in the Directive have the same meaning as they have in the Directive.

(**a**) S.I. 1999/3242, to which there are amendments not relevant to these Regulations.

(**b**) S.I. 1998/494, as amended by S.I. 1999/2024; S.I. 1999/3232; S.I. 2005/1082; S.I. 2005/1541; S.I. 2005/2060; S.I. 2006/557; S.I. 2007/320 and S.I. 2007/2598. There are other amendments not relevant to these Regulations.

(**c**) S.I. 2006/577, as amended by S.I. 2006/2739; S.I. 2007/1573 and S.I. 2008/2323. There are other amendments not relevant to these Regulations.

(4) A reference to an employee being exposed to artificial optical radiation is a reference to that exposure which arises while the employee is at work, or arises out of, or in connection with, the employee's work.

Application of these Regulations

2.—(1) Where a duty is placed by these Regulations on an employer in respect of its employees, the employer must, so far as is reasonably practicable, be under a like duty in respect of any other person at work who may be affected by the work carried out by the employer except that the duties of the employer—

(a) under regulation 6 (information and training) do not extend to persons who are not its employees, unless those persons are present in the workplace where the work is being carried out; and

(b) under regulation 7 (health surveillance) do not extend to persons who are not its employees.

(2) These Regulations do not apply to the master of a crew of a ship or the employer of such persons in respect of the normal shipboard activities of a ship's crew which are carried out solely by the crew under the direction of the master, and for the purposes of this paragraph "ship" includes every description of vessel used in navigation, other than a ship forming part of Her Majesty's Navy.

Initial risk analysis

3. An employer must, in accordance with regulation 4, revise the risk assessment which the employer is obliged to carry out under the 1999 Regulations if—

(a) the employer carries out work which could expose any of its employees to artificial optical radiation that could create a reasonably foreseeable risk of adverse health effects to the eyes or skin of the employee; and

(b) that employer has not implemented measures to eliminate or reduce to a minimum the risk referred to at paragraph (a) based on the general principles of prevention set out in Schedule 1 to the 1999 Regulations.

Revision of risk assessment under the 1999 Regulations

4.—(1) Where, pursuant to regulation 3 of these Regulations, an employer is obliged to revise the risk assessment under the 1999 Regulations, the employer must as part of that revised risk assessment assess, and if necessary, measure or calculate, the levels of artificial optical radiation to which employees are likely to be exposed, applying the following standards or recommendations—

(a) for laser radiation, the standards of the IEC; or

(b) for non-coherent radiation, the recommendations of the CIE and the CEN.

(2) In exposure situations which are not covered by those standards or recommendations, the assessment, measurement or calculations must follow national or international science-based guidelines.

(3) The revised risk assessment must also include consideration of—

(a) the level, wavelength and duration of exposure;

(b) the exposure limit values;

(c) the effects of exposure on employees or groups of employees whose health is at particular risk from exposure;

(d) any possible effects on the health and safety of employees resulting from interactions between artificial optical radiation and photosensitising chemical substances;

(e) any indirect effects of exposure on the health and safety of employees such as temporary blinding, explosion or fire;

(f) the availability of alternative equipment designed to reduce levels of exposure;

(g) appropriate information obtained from health surveillance, including where possible published information;

(h) multiple sources of exposure;

(i) any class 3B or 4 laser that is classified in accordance with the relevant IEC standard that is in use by the employer and any artificial optical radiation source that is capable of presenting the same level of hazard; and

(j) information provided by the manufacturers of artificial optical radiation sources and associated work equipment in accordance with Community legislation.

(4) The revised risk assessment may include a justification by the employer that the nature and extent of the risk of adverse health effects to the eyes and skin of employees as a result of exposure to artificial optical radiation is such that any further risk assessment in accordance with this regulation is not likely to be necessary unless there is significant change which could render the revised risk assessment out of date.

(5) In paragraphs (1) and (2)—

(a) a reference to standards or recommendations is a reference to standards or recommendations as revised or re-issued from time to time;

(b) "CEN" means the European Committee for Standardisation(**a**);

(c) "CIE" means the International Commission for Illumination(**b**); and

(d) "IEC" means the International Electrotechnical Commission(**c**).

(6) In paragraph (3)(a) "level" means the combination of irradiance, radiant exposure and radiance to which a worker is exposed.

Obligations to eliminate or reduce risks

5.—(1) An employer must ensure that any risk of adverse health effects to the eyes or skin of employees as a result of exposure to artificial optical radiation which is identified in the revised risk assessment is eliminated or reduced to a minimum.

(2) For the purposes of paragraph (1) measures to eliminate or reduce the risk must be based on the general principles of prevention set out in Schedule 1 to the 1999 Regulations.

(3) If the revised risk assessment indicates that employees are exposed to levels of artificial optical radiation which exceed the exposure limit values, the employer must devise and implement an action plan comprising technical and organisational measures designed to prevent exposure exceeding the exposure limit values.

(4) The action plan must take into account—

(a) other working methods;

(b) choice of appropriate work equipment emitting less artificial optical radiation;

(c) technical measures to reduce the emission of artificial optical radiation including, where necessary, the use of interlocks, shielding or similar health protection mechanisms;

(d) appropriate maintenance programmes for work equipment, workplaces and workstation systems;

(e) the design and layout of workplaces and workstations;

(f) limitation of the duration and level of the exposure;

(g) the availability of personal protective equipment;

(h) the instructions of the manufacturer of the equipment where it is covered by relevant Community legislation.

(**a**)
(**b**)
(**c**) IEC 60825-1 (2007-03).

(5) If, despite the measures taken under paragraphs (1) and (3), employees are still exposed to levels of artificial optical radiation that exceed the exposure limit values, the employer must take immediate action to—

(i) reduce exposure to below the exposure limit values;

(ii) identify the reasons why employees have been exposed to levels which exceed the exposure limit values; and

(iii) modify the measures taken in accordance with paragraph (3) to prevent employees being exposed again to levels which exceed the exposure limit values.

(6) Paragraph (7) applies if the risk assessment indicates that in any of the areas of the workplace under the control of the employer, employees could be exposed to levels of artificial optical radiation which exceed the exposure limit values.

(7) The employer must ensure that the areas in question are—

(a) demarcated and access by the employees to those areas is limited where this is technically possible; and

(b) identified by means of the appropriate signs as specified in the Health and Safety (Signs and Signals) Regulations 1996(**a**).

Information and training

6. Without prejudice to the requirements of the 1999 Regulations and the Provision and Use of Work Equipment Regulations 1998(**b**), if the revised risk assessment indicates that employees could be exposed to artificial optical radiation which could cause adverse health effects to the eyes or skin of employees, the employer must provide its employees and/or representatives with suitable and sufficient information and training relating to the outcome of the revised risk assessment and this must include the following—

(a) entitlement to appropriate health surveillance; and

(b) safe working practices to minimise the risk of adverse health effects to the eyes or skin from exposure to artificial optical radiation.

Health surveillance and medical examinations

7.—(1) If the revised risk assessment indicates that there is a risk of adverse health effects to the skin of employees as a result of exposure to artificial optical radiation, the employer must ensure that such employees are placed under suitable health surveillance.

(2) Health surveillance pursuant to paragraph (1) must be carried out by a doctor or occupational health professional and the revised risk assessment must be made available to that doctor or occupational health professional.

(3) The employer must ensure that a health record of each of its employees who undergoes health surveillance pursuant to paragraph (1) is made and maintained and that the record or copy of it is kept available in a suitable form.

(4) The health record must contain a summary of the results of the health surveillance carried out.

(5) The employer must—

(a) on reasonable notice being given, allow an employee access to his or her personal health record; and

(b) provide the enforcing authority with copies of such health records as it may require.

(6) An employer must ensure that a medical examination is made available to an employee if—

(**a**) S.I. 1996/341, to which there are amendments not relevant to these Regulations.
(**b**) S.I. 1998/2306, to which there are amendments not relevant to these Regulations.

(a) the revised risk assessment indicates that the employee has been exposed to levels of artificial optical radiation which exceed the exposure limit values; or

(b) as a result of health surveillance the employee is found to have an identifiable disease or adverse health effects to the skin which is considered by a doctor or occupational health professional to be the result of exposure to artificial optical radiation.

(7) Where an examination is carried out under paragraph (6), the employer must—

(a) ensure that a doctor or suitably qualified person—

(i) informs the employee of the result of the examination which relates to the employee; and

(ii) provides advice on whether health surveillance may be appropriate;

(b) ensure that it is informed of any significant findings from any further health surveillance of the employee taking into account any medical confidentiality;

(c) review the revised risk assessment;

(d) review any measures taken to comply with regulation 5 taking into account any advice given by a doctor or other suitably qualified person or the enforcing authority; and

(e) provide continued health surveillance if appropriate.

Extension outside Great Britain

8. These Regulations shall apply to and in relation to any activity outside Great Britain to which sections 1 to 59 and 80 to 82 of the 1974 Act apply by virtue of the Health and Safety at Work etc. Act 1974 (Application Outside Great Britain) Order 2001(**a**) as those provisions apply within Great Britain.

Signed by authority of the Secretary of State for Work and Pensions

William D McKenzie
Parliamentary Under Secretary of State
Department for Work and Pensions

Address
Date

(**a**) S.I. 2001/2127 as amended by S.I. 2009/1750.

Annex B

Intense Light at Work

Guidance for employers on the proposed Control of Artificial Optical Radiation at Work Regulations 2010

What is this leaflet about?

A small number of intense sources of light at work can damage the eyes and skin of workers and need to be managed properly.

Many employers already manage these risks under the Management of Health and Safety at Work Regulations 1999. These will be supplemented by the Control of Artificial Optical Radiation at Work Regulations in April 2010.

HSE has produced this guidance to help businesses satisfy themselves that they are protecting their workers from harm associated with very intense light. This is what the law requires.

This leaflet:

- gives examples of the sources of light that can cause harm and the activities where these are used
- outlines what businesses with these sources should be doing to manage the risks

Hazardous light sources

Examples of hazardous sources of very intense light that pose a 'reasonably foreseeable' risk of harming the eyes and skin of workers and where control measures are needed include:

- Metal working – welding (both arc and oxy-fuel) and plasma cutting – mainly eye damage
- Pharmaceutical and research - UV fluorescence and sterilisation systems – mainly skin burn
- Hot industries – furnaces – eye and skin damage
- Printing – UV curing of inks – mainly skin burn
- Motor vehicle repairs – UV curing of paints - mainly skin burn
- Medical and cosmetic treatments – laser surgery, blue light and UV therapies – eye and skin damage
- Research and education - all use of Class 3B and Class 4 lasers – potentially permanent eye and skin damage

Less common hazardous sources can be associated with specialist activities – for example companies manufacturing or repairing equipment containing lasers which would otherwise be hidden.

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Safe light sources

This includes the vast majority used in the workplace such as:

- All forms of ceiling-mounted lighting used in offices etc with diffusers over the bulb. This includes compact fluorescent floodlighting; ceiling-mounted tungsten halogen spotlights; and ceiling-mounted tungsten lamps.
- compact fluorescent lamps and tungsten halogen lamps when situated at distances more than 60cm from the user.
- All forms of task lighting. This includes desk lamps, including tungsten task lighting.
- Photocopiers.
- Computer or similar display equipment, including personal digital assistants.
- Photographic flashlamps.
- Gas-fired overhead heaters.
- Vehicle indicator, brake reversing and fog lamps.

More intense sources could be a problem if they are stared at for long periods or if they are in very close proximity to workers. It is our natural instinct to look away from these before harm can occur and in addition, they are often used at a safe distance from workers. These measures continue to be acceptable and no special conditions are required. Examples include:

- Ceiling-mounted fluorescent lighting without diffusers over the bulb.
- High-pressure mercury floodlighting.
- Desktop projectors.
- Interactive whiteboard presentation equipment.
- Vehicle headlights.
- Non-laser medical applications such as: theatre and task lighting; diagnostic lighting such as foetal transilluminators and X-ray viewing boxes
- UV insect traps.
- Art and entertainment applications such as illuminating by spotlights, effect lights and flashlamps.
- Any Class 1, 1M, 2, 2M & 3R laser devices where not used in combination with magnifying aids. Examples include laser printers; CD/DVD recorders; materials processing lasers; disconnected fibre-optic systems; bar code scanners; level and alignment devices in civil engineering and surveying; and laser pointers.

This list is not exhaustive. If you have sources not on this list but which you know have not caused harm in the past and you have no reason to suspect that they pose a risk in the way that you use them, it would be reasonable for you to assume that no special control measures are required.

How will you be affected?

The key requirement is to ensure that the eyes and skin of workers are protected.

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Many employers with hazardous sources already take the sensible control measures outlined below to protect their workers. Where these measures are already taken and the risk is properly managed, we consider this sufficient to protect workers and nothing different needs to be done.

It is only those businesses that use hazardous sources that are not doing enough to manage the risks that will need to do more.

What should you already be doing?

You should have in place sensible control measures following the principles below:

- Use an alternative, safer light source which can achieve the same result
- Prevent access of the light source to the skin and eyes of workers by engineering controls eg screening, interlocks, clamping (rather than holding) work pieces
- Organise work to reduce exposure of workers and others– restrict access to hazardous areas by non-essential staff (eg use dedicated room; screening/barriers; display warning signs), increase distance between staff and source (eg remote control, time delays)
- Issue appropriate personal protective equipment – eg goggles and face shields

The information in Table 2 summarises the work activities using common hazardous sources of AOR and the industries where these are used. It also lists the sensible control measures businesses need to have considered to ensure that the eyes and skin of their workers are properly protected. The information in Annex 1 covers the key safety signs to be considered and Annex 2 covers less common issues that may be relevant.

Your staff will have been involved so that you can be sure that what you propose to do will work in practice and won't introduce new hazards. You will have provided them with information and training on what they need to do to protect themselves and others and you will have assured yourself that your local rules are being complied with.

You will also have in place a system so that if an employee is exposed to potentially harmful levels of AOR, for example as the result of an accident, they receive a medical examination and you follow any further advice as directed by a doctor or occupational health professional.

You will have documented your decisions in a risk assessment alongside other important hazards in your workplace and may well have followed HSE's simplified risk assessment procedure and used the blank risk assessment template: www.hse.gov.uk/risk/fivesteps.htm.

If these simple measures have been taken, you should be able to demonstrate to both staff and inspectors that you are protecting the eyes and skin of your workers from harm associated with very intense light.

If you are not doing this, you will need to do more and will need to read this guidance in combination with that produced by the European Commission http://www.hse.gov.uk/radiation/nonionising/aor-guide.pdf

This is summarised in Table 1 below.

Table 1: Additional action required by businesses affected by the proposed Control of Artificial Optical Radiation at Work Regulations

Light sources used at work	Action already taken under the Management Regulations	What additional action is required by the proposed AOR Regulations
Safe	None	None
Hazardous – can cause harm to eyes and skin of workers	Appropriate control measures in place – exposure to AOR will not cause harm to workers. Measures recorded and staff informed.	None – should already be doing enough.
	Some control measures in place – uncertain whether exposure to AOR could cause harm to workers.	Some - assure yourself that workers are protected. Ensure that measures recorded and staff informed.
	Key control measures not in place – exposure to AOR likely to cause harm to workers.	Full – need to comply fully to ensure workers are protected. Ensure that measures recorded and staff informed.

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Table 2: Work activities which generate hazardous levels of intense light and which may be covered by the proposed Control of AOR regulations

What industries use hazardous sources of intense light?	What are the hazardous activities?	How might workers be harmed by the intense light?	What key measures do you need to consider?
Metal working	• Welding (arc and oxyfuel) • Plasma cutting	• Damage to eyes – photokeratitis & photoconjuctivitis (‘arc eye’; ‘snow blindness), cataracts, photoretinal damage (blue light hazard), retinal burn, cataracts, corneal burn • Damage to skin – UV burning	• Provide face shield, coveralls and gloves • Protect others using screens/ curtains/restricted access • Provide information and training • Display appropriate warning signs • Monitor & enforce use of control measures • If any staff over-exposed, provide medical examination and consider whether health surveillance is appropriate
Pharmaceuticals and research	• Ultraviolet sterilisation and induced fluorescence	• Damage to skin	• Provide face shield and ensure other areas of skin not exposed (eg lab coats and gloves) • Protect others using screens/ curtains/restricted access • Provide information and training • Display appropriate warning signs • Monitor & enforce use of control measures • If any staff over-exposed, provide medical examination and consider whether health surveillance is appropriate
‘Hot industries’	• proximity to furnaces, burners and hot metals/glass	• Damage to eyes and skin • Thermal discomfort	• Engineering measures – remote controls; screening, interlocks, clamps to hold material • Provide face shield, coveralls and gloves - full body PPE may be required • Enforced max working periods - routine change of activity • Protect others using screens/ curtains/restricted access • Provide information and training • Display appropriate warning signs • Monitor & enforce use of control measures • If any staff over-exposed, provide medical examination and consider whether health surveillance is appropriate
Printing and Paint (motor vehicle repairs)	• Ultraviolet curing of inks and paints	• Damage to skin	• Engineering measures – screening, automation • Provide face shield and ensure other areas of skin not exposed by providing coveralls and gloves • Protect others using screens/ curtains/restricted access • Provide information and training • Display appropriate warning signs • Monitor & enforce use of control measures • If any staff over-exposed, provide medical examination and

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			consider whether health surveillance is appropriate
Medical and cosmetic treatments	• laser surgery (Class 3B and 4 lasers) • UV and blue light therapy	• Potentially permanent damage to eyes from lasers, including blindness • Laser burns to skin • Other damage to eyes and skin	• specialist input likely to be required for laser work • Provide face shield/goggles and coveralls • Provide gloves where appropriate (it is recognised that thin nitrile gloves are likely to be needed for dexterity and that these will offer limited protection against laser burns) • Designated treatment rooms with restricted access • Curtains around equipment • Staff distant whilst patient exposed. • Provide information and training • Display appropriate warning signs • Monitor & enforce use of control measures • If any staff over-exposed, provide medical examination and consider whether health surveillance is appropriate
Research and Education	• Class 3B and 4 lasers	• Potentially permanent damage to eyes, including blindness • Laser burns to skin • Potential ignition source	• specialist input likely to be required • Engineering measures – enclosed, controlled area, interlocks, remote controls, screening, clamps to hold material • Designated laboratories with restricted access • Provide face shield/goggles and coveralls • Provide gloves where appropriate (it is recognised that thin nitrile gloves are likely to be needed for dexterity and that these will offer limited protection against laser burns) • Include laser sources as part of fire assessment • Provide information and training • Display appropriate warning signs • Monitor & enforce use of control measures • If any staff over-exposed, provide medical examination and consider whether health surveillance is appropriate

Annex B

Annex 1: Key safety signs to consider for all activities with hazardous sources of AOR (as listed in the Health and Safety (Safety Signs and Signals) Regulations 1996)

Prohibitory sign: restricts access of untrained staff to areas where hazardous sources of AOR are used

Warning signs: tells staff of the AOR hazards they may find

Non-ionising radiation

Mandatory signs: tells staff what they need to do to protect themselves from AOR

Annex B

Annex 2: Less common issues that may be relevant to your business

- Whether you have employees whose health is at particular risk (eg those with pre-existing medical conditions made worse by light)

- Whether you use any chemicals (eg skin creams) which could react with light to make the symptoms worse

- Whether you have employees who are exposed to multiple sources of bright light at the same time

- Whether exposure to bright light could pose unrelated risks (eg temporary blindness leads to mistakes in a hazardous task)

Summary: Intervention & Options

Department /Agency:	Title:	
Health and Safety Executive	Impact Assessment of the proposed Control of Artificial Optical Radiation at Work Regulations	
Stage: Draft	**Version:** 10	**Date:** 6 November 2009
Related Publications:		

Available to view or download at:

http://www.hse.gov.uk/consult/condocs/cd227.htm

Contact for enquiries: opticaldirective@hse.gsi.gov.uk **Telephone:** 0151 951 4074

What is the problem under consideration? Why is government intervention necessary?

Intense sources of artificial light in the workplace can harm the eyes and skin of workers and need to be properly managed. The Physical Agents (Artificial Optical Radiation) Directive (2006/25/EC) was adopted by European Member States in April 2006 to ensure that all workers across Europe are protected. The Control of Artificial Optical Radiation at Work Regulations are proposed to ensure that British workers benefit from this harmonised level of protection.

What are the policy objectives and the intended effects?

There are three policy objectives: (a) ensuring the eyes and skin of workers are protected from hazardous light sources in the workplace (b) meeting the government's responsibilities to properly implement the Directive (c) to meet these requirements in a proportionate way which minimises unnecessary burdens on business

What policy options have been considered? Please justify any preferred option.

Three options were considered: (1) do nothing and continue to rely on existing regulatory provisions; (2) new regulations limited to the minimum required to meet the additional requirements of the Directive; (3) a full set of new regulatory provisions.

Option 1 would have zero costs and benefits but would not meet the Government's legal test for proper transposition. Option 3 duplicates some requirements enshrined in other regulations and is not in line with better regulation. Option 2 is the only one that meets all three policy objectives and has an impact assessment.

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?

The impact assessment will be reviewed in light of the stakeholder consultation exercise undertaken in Autumn 2009.

Ministerial Sign-off For consultation stage Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:

..... Date:

Summary: Analysis & Evidence

Policy Option: 2	Description: New Regulations limited to the minimum required by the Directive

COSTS

ANNUAL COSTS	
One-off (Transition)	**Yrs**
£ 0.56 - 1.12 m	10
Average Annual Cost (excluding one-off)	
£ 0.4 - 0.83 m	

Description and scale of **key monetised costs** by 'main affected groups' Costs will be incurred by businesses familiarising themselves with the new Regulations. Additional costs will be incurred by businesses with hazardous sources of intense light that need to make changes to better manage the risks.

Total Cost (PV) **£ 4.01-18.89 m**

Other **key non-monetised costs** by 'main affected groups'

BENEFITS

ANNUAL BENEFITS	
One-off	**Yrs**
£ 0	
Average Annual Benefit (excluding one-off)	
£ 1,750 - 70,000	

Description and scale of **key monetised benefits** by 'main affected groups' The Regulations will ensure that a proportion of businesses not already managing the risks associated with hazardous sources do so, resulting in the prevention of 5-200 minor injuries per year. There will also be unquantifiable benefits due to the harmonisation of control regimes across Member States.

Total Benefit (PV) **£ 15,000 - 603,000**

Other **key non-monetised benefits** by 'main affected groups'

Key Assumptions/Sensitivities/Risks That there are 80,000 businesses using hazardous sources of light and that 8-15% will review their risk assessments, control measures and their staff training. Uncertainty surrounds these numbers as well as how many businesses will use consultants to advise them.

Price Base Year 2008	Time Period Years 10	**Net Benefit Range** (NPV) **£ - 3.4 to - 18.8 million**	**NET BENEFIT** (NPV Best estimate) **£ - 9.5 million**

What is the geographic coverage of the policy/option?			Great Britain	
On what date will the policy be implemented?			by 27 April 2010	
Which organisation(s) will enforce the policy?			HSE	
What is the total annual cost of enforcement for these organisations?			£ 0	
Does enforcement comply with Hampton principles?			Yes	
Will implementation go beyond minimum EU requirements?			No	
What is the value of the proposed offsetting measure per year?			£	
What is the value of changes in greenhouse gas emissions?			£ n/a	
Will the proposal have a significant impact on competition?			No	
Annual cost (£-£) per organisation (excluding one-off)	Micro	Small	Medium	Large
Are any of these organisations exempt?	No	No	N/A	N/A

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £ Decrease of £ **Net Impact** £

Key: **Annual costs and benefits: Constant Prices**

Evidence Base (for summary sheets)

[Use this space (with a recommended maximum of 30 pages) to set out the evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Ensure that the information is organised in such a way as to explain clearly the summary information on the preceding pages of this form.]

Proposed Control of Artificial Optical Radiation at Work Regulations

Aim of the proposal

1. To introduce new regulations to implement a Directive of the European Parliament and of the Council: the Physical Agents (Artificial Optical Radiation) Directive (2006/25/EC – 'the Directive').

Background

2. Optical radiation is another term for light. Artificial sources can produce ultraviolet, infrared and laser radiation which at high levels can be hazardous. A small number of very intense sources of light in the workplace have the potential to damage the eyes and skin of workers.
3. The Directive sets minimum health and safety requirements regarding the exposure of workers to risks arising from artificial optical radiation (AOR) in the workplace. It has been introduced to afford all workers in Europe the same minimum level of protection.
4. It was adopted in 2006 and must be implemented by the UK by 27 April 2010.

Reason for Government action

5. The majority of businesses in Great Britain know how to manage the risks posed by AOR and workers are generally well protected. The Directive ensures that all workers across Europe are protected.

6. There are three policy objectives for this work (a) ensuring the eyes and skin of workers are protected from hazardous light sources in the workplace (b) meeting the government's responsibilities to properly implement the Directive (c) to meet these requirements in a proportionate way which minimises unnecessary burdens on business.

7. Three options were considered to meet these objectives: (1) do nothing and continue to rely on existing regulatory provisions; (2) new regulations limited to the minimum required to meet the additional requirements of the Directive; (3) a full set of new regulatory provisions.

8. Whilst Option 1 would have zero costs and benefits, it would not meet the Government's legal test for proper transposition and as such was not viable. Some of the requirements of the Directive are already enshrined in existing health and safety legislation. Option 3 would have duplicated these and would not be in line with the principles of better regulation. Option 2 is considered the best fit to meet all three policy objectives.

9. New regulations – *The Control of Artificial Optical Radiation at Work Regulations* – the 'AOR Regulations' will complement the Management of Health and Safety at Work Regulations 1999 to ensure that workers at risk are protected and are the subject of this impact assessment.

Data sources and general assumptions

10. The AOR Regulations are directed only at those businesses that use hazardous sources of intense light in the workplace. Only those that are not already managing the risks will need to take further action to reduce the risks. In order to estimate the number of businesses potentially affected, HSE has used information from several sources, viz:

    Work commissioned by HSE:

    - Review of occupational exposure to optical radiation and electric and magnetic fields with regard to the proposed CEC Physical Agents Directive, NRPB R265, 1994;
    - Occupational exposure to optical radiation in the context of a possible EU Proposal for a Directive on optical radiation NRPB-W35, 2003.

    European Commission information:

    - a practical guide produced by the Health Protection Agency under contract to the European Commission: http://www.hse.gov.uk/radiation/nonionising/aor-guide.pdf

    UK information

    - Data supplied by EEF Ltd and
    - data obtained from the Office of National Statistics on the Annual Business Inquiry – workplace analysis.

    Unless otherwise stated, all other assumptions are based on judgements applied by HSE's technical specialists. Costs have been discounted at an annual rate of 3.5% (in line with Treasury guidance). Prices are expressed in 2008 values.

Work activities likely to be affected by the Regulations

11. Those involving very intense sources of light that could pose a reasonably foreseeable risk of harming the eyes and skin of workers. Only those businesses where appropriate control measures are not already in place will need to do more. Examples of activities include:

    - Metal working – welding (both arc and oxy-fuel) and plasma cutting
    - Pharmaceutical and research - UV fluorescence and sterilisation systems
    - Hot industries – proximity to furnaces
    - Printing – UV curing of inks
    - Motor vehicle repairs – UV curing of paints
    - Medical and cosmetic treatments – laser surgery, blue light and UV therapies
    - Research and education - all use of Class 3B and Class 4 lasers

Number of businesses likely to be affected by the Regulations

12. Using the data sources listed above, HSE estimate the number of businesses using hazardous sources of intense light to be **80,000.**

Benefits

Health and safety benefits

13. There are very few cases of ill health or major injury arising from exposure to artificial optical radiation officially reported to HSE under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995. However HSE is aware of anecdotal evidence of exposures resulting in short term, acute eye conditions (for example arc eye in welders) as well as skin burns (for example from UV fluorescence in research). There will also be a number of near misses where harmful exposures are narrowly avoided.

14. The new Regulations will introduce specific regulatory provisions for this workplace hazard and will ensure that businesses review their approach to take proper account of the risks posed. We assume that this will result in the prevention of between 5-200 cases of minor injury each year. We do not believe benefits are likely to exceed £602,538 and recognise that they will be outweighed by the costs in economic terms. However HSE wants to ensure that all workers benefit from the Directive and receive an appropriate level of protection.

Other benefits

15. There will also be unquantifiable benefits due to the harmonisation of control regimes across Member States with the Directive ensuring that all workers across Europe are protected. We assume that the Directive will have a larger impact in other Member States should the risks associated with AOR not be being managed as well as in Great Britain.

Costs

Costs to Business

Cost of familiarisation

16. We assume that 80,000 businesses in GB use potentially hazardous sources of AOR. We assume that between 25-50% of these will read the HSE guidance to establish whether they are already doing enough or need to do more. On average we assume this will take 30 minutes of a production manager's (or equivalent) time at a labour cost of £28 per hour.

17. We therefore assume the first year costs of familiarisation will range from £0.56 to £1.12 million**.**

Cost of revising risk assessments

18. We assume that the majority of businesses with hazardous sources are already undertaking a proper risk assessment which ensures a very low level of employee exposure to risk within the baseline for this impact assessment. We assume that 20 - 40% of those businesses that familiarise themselves with the AOR regulations (8 – 15% of total businesses with hazardous sources) will identify that they do not already have appropriate controls in place and will revise their risk assessments to ensure that they reduce the risks to their employees.

19. We assume that 75% of these businesses will revise the risk assessments themselves. We assume this will follow the approach in the HSE guidance and will,

on average take between 0.5 to 2 hours to complete. This may result in more than one risk assessment, but the total time spent per business will not exceed 2 hours. We assume these will be revised by a production manager (or equivalent) at an average labour cost of £28 per hour.

20. We assume that 25% of the businesses revising their risk assessments will employ a consultant. We assume that the consultants will charge between £500 and £1000 per day and will on average spend 0.5 days revising the risk assessment.

21. We therefore assume the one-off costs for revising risk assessments will range from £0.09 – £1.63 million.

Cost of reducing risks

22. We assume that 100% of those businesses that revise their risk assessment will change their control measures to reduce the risks to their employees. We assume that these changes will be procedural in nature and will not involve purchasing new equipment.

23. We assume that 75% of these businesses will make these changes themselves and will take between 0.5 to 2 hours to complete. We assume these will be made by a production manager (or equivalent) at an average labour cost of £28 per hour.

24. We assume that 25% of businesses making changes will employ a consultant. We assume that the consultants will charge between £500 and £1000 per day and will on average spend 0.5 days developing the changes.

25. We therefore assume the one-off costs for controlling exposure will range from £0.09 – £1.63 million.

Cost of providing information and training

26. We assume that 100% of those businesses that revise their risk assessment and make changes to their control measures will also deliver additional training to their staff to ensure they understand what they need to do to reduce the risks to themselves.

27. We assume that 20 – 30% of staff in each affected business will require additional training of 30 minutes at an average labour cost of £18 per hour. We therefore assume the costs for the trainees will range from £0.15 – 0.42 million**.**

28. We assume that this training will be delivered by a production managers (or equivalent) time at an average labour cost of £28 per hour. We assume that this will take 30 minutes to develop and 30 minutes to deliver. We therefore assume the costs for the trainers will range from £0.18 – 0.34 million.

29. We therefore assume the total costs for the first year training will range from £0.33 – 0.76 million.

Cost of providing medical examinations and appropriate health surveillance

30. The requirement to provide medical examination and support in the event of an accidental overexposure and appropriate health surveillance is already enshrined in the Management of Health and Safety at Work Regulations and can be accommodated under the existing national and occupational health provisions. We therefore assume that this places no additional duties and therefore no costs.

Costs to HSE

31. HSE envisages no change to its enforcement strategy when the AOR regulations come into force. As such the costs to HSE when the regulations come into force will be £0. There will be some costs to HSE during the period of developing the final set of regulations and guidance. These will be developed further in the final impact assessment.

Total costs to society

32. The total cost to society will consist of two main components: the cost to industry of complying with the new requirements, and the cost to the HSE. These are summarised in the table below.

	First year costs £ million (m)			**Ten year present value** £ million (m)		
Implementation costs						
Familiarisation	0.56	to	1.12	0.56	to	1.12
Worker information	0.33	to	0.76	2.84	to	6.53
Policy Costs						
Risk assessment	0.09	to	1.63	0.31	to	5.62
Action to reduce exposure	0.09	to	1.63	0.31	to	5.62
TOTAL	**1.07m**	**to**	**5.14m**	**4.01m**	**to**	**18.89m**

33. The total first year costs are therefore estimated to range from £1.07 to £5.14 million rising to £4.01 to £18.89 million at 10 year present value.

Impact on Small Businesses

34. The majority of the 80,000 businesses using hazardous sources of AOR will be SMEs, in particular those undertaking welding. As such it is likely that SMEs will be impacted on more than other business types as a result of these regulations.

Impact on Competition

35. The Directive is being implemented across European Member States. As such the AOR regulations will ensure a level playing field and have a positive impact on competition.

Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	*Results in Evidence Base?*	*Results annexed?*
Competition Assessment	Yes	No
Small Firms Impact Test	Yes	No
Legal Aid	No	No
Sustainable Development	No	No
Carbon Assessment	No	No
Other Environment	No	No
Health Impact Assessment	Yes	No
Race Equality	No	No
Disability Equality	No	No
Gender Equality	No	No
Human Rights	No	No
Rural Proofing	No	No

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HSE

Health and Safety Executive

A consultative document on legislation to implement the Physical Agents (Artificial Optical Radiation) Directive

The full text of this and other Consultative Documents can be viewed and downloaded from the Health and Safety Executive web site on the internet: **www.hse.gov.uk/consult/index.htm**

Printed and published by the Health and Safety Executive

 11/09

CD227

www.hse.gov.uk