

# CHIEF DIRECTORATE OF OCCUPATIONAL HEALTH & SAFETY

## Draft Physical Agents Regulations

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**employment & labour**

Department:  
Employment and Labour  
**REPUBLIC OF SOUTH AFRICA**



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- **Publish Draft for 90 day period in the Government Gazette**

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# ERW vs PAR (2/2)



| ERW                                 | PAR                                          |
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# Definitions (1/3)

**“action level”** means the level of a physical agent at which specified actions or counter measures which must to be taken;

**“competent person”** means

a) has, in respect of the work or task to be performed, the required knowledge, training and experience in the physical agent and, where applicable, the relevant qualifications specific to the physical agent: provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualifications Framework Act, 2008 (Act No. 67 of 2008), those qualifications and that training must be regarded as the required qualifications and training; and

b) is familiar with the Act and the applicable regulations made under the Act;

- is used in the regulations for risk assessment and exposure monitoring
- Not necessary the same person



# Definitions (2/3)

“**exposure**” means the condition of being affected by a physical agent at the workplace, and includes potential, accidental or possible exposure, and exposed has a derivative meaning;

“**exposure monitoring**” means the systematic process of measuring the magnitude, frequency and duration of exposure to a physical agent;

“**hand-arm vibration**” means the mechanical vibration which is transmitted into the hands and arms during a work activity;

“**lighting**” means the application of light to a scene, objects or their surroundings so that they may be seen, and illumination has a corresponding meaning;

“**non-ionising radiation**” means the series of energy waves composed of oscillating electric and magnetic fields traveling at the speed of light, and includes the spectrum of ultraviolet, visible light, infrared, microwave, radio frequency, and extremely low frequency;

# Definitions (3/3)

“**occupational exposure limit**” means the limit value set by the Minister for a physical agent in the workplace;

“**physical agents**” means a source of energy which may result in injury or disease after exposure, and includes, but not limited to cold stress, heat stress, vibration, non- ionising radiation and illumination;

“**vibration**” means the mechanical oscillations of an object about an equilibrium point;

“**vulnerable employee**” means an employee who is at a higher risk of injury, disease or complications;

“**whole body vibration**” means mechanical vibration which is transmitted into the body, when seated or standing, through the supporting surface, during a work activity;



# Scope of Application

- 2. (1) These Regulations will apply to:
  - (a) any employer or self-employed person who carries out work at a workplace, which may expose any person to a physical agent in that workplace; and
  - (b) a designer, manufacturer, importer or supplier of machinery or plant for use at a workplace.
- (2) The provision of regulation 3 shall not apply to a self-employed person.

# Information, Instruction and Training (1/4)

3. (1) An employer who undertakes work which exposes an employee to a physical agent must inform and consult the relevant health and safety representatives or health and safety committee for that workplace of the intention to conduct:

(a) a physical agents risk assessment contemplated in regulation 6;

(b) physical agents exposure monitoring contemplated in regulation 7;  
and

(c) a training programme contemplated in sub-regulation (4).

(2) An employer who undertakes work which exposes an employee to a physical agent must inform the relevant health and safety representatives or health and safety committee for that workplace of the intention to conduct medical surveillance contemplated in regulation 8;

# Information, Instruction and Training (2/4)

(3) An employer must inform the relevant health and safety representatives or health and safety committee for that workplace of the documented outcomes of the:

- (a) physical agents risk assessment contemplated in regulation 6;
  - (b) physical agents exposure monitoring contemplated in regulation 7;  
and
  - (c) medical surveillance contemplated in regulation 8.
- (4) Every employer who undertakes work which is liable to expose an employee to a physical agent risks must, before any employee is exposed or may be exposed, after consultation with the health and safety committee established for that section of the workplace, establish a training programme, which incorporates the following:

# Information, Instruction and Training (3/4)

- (a) the content and scope of these Regulations;
- (b) the potential sources of exposure to a physical agent;
- (c) the nature of the physical agent;
- (d) the potential risk to health and safety associated with physical agent;
- (e) the differing effects of exposure to physical agents to men, women, young employees and vulnerable employees, where such difference may exist;
- (f) the control measures that are in place to prevent exposure to a physical agent;
- (g) the necessity, correct use, maintenance and limitations of such control measures;
- (h) the procedure for reporting physical agent risks to the health and safety representative or employer;
- (i) the precautions to be taken by an employee to protect himself against physical agent risks;

# Information, Instruction and Training (4/4)

- (j) the reason for and the outcomes of the physical risk assessment and monitoring of exposure, the necessity for medical surveillance and the long-term benefits of undergoing such surveillance;
  - (k) the occupational exposure limit for the physical agent and its meaning; and
  - (l) access to records of physical risk assessment, physical agents exposure monitoring and personal medical records.
- (5) The employer must conduct refresher training at intervals that may be recommended by the health and safety committee or the health and safety representative.

# Duties of persons exposure

- (1) Any person who is exposed or may be exposed to a physical agent must obey any lawful instruction issued by the employer or self-employed person or by anyone authorised by the employer or self-employed person, regarding:
  - (a) the use and failure of measures adopted to control physical agents;
  - (b) cooperation with the employer in determining the employee's exposure to physical agents;
  - (c) the reporting of potential physical agent risks to the health and safety representative or the employer;
  - (d) reporting for medical surveillance as required by regulation 8; and
  - (e) information, instruction and training received as contemplated in regulation 3.



# Duties of designers, manufacturers, importers and suppliers

- (1) Any designer, manufacturer, importer or supplier of machinery or plant for use at work must:
- (a) as far as is reasonably practicable, ensure that machinery or plant minimises the exposure to a physical agent;
  - (b) as far as is reasonably practicable, supply machinery or plant that can be transported, received, stored and handled in a manner that minimise the exposure to a physical agent;
  - (c) provide information, instruction and training as deemed necessary to minimise the exposure to a physical agent during use of machinery or plant;
  - (d) as far as is reasonably practicable, install machinery or plant in a manner that minimise the exposure to a physical agent; and
  - (e) provide information to potential users on the appropriate maintenance of machinery or plant to ensure safe operation and use.

# Physical agents risk assessment (1/3)

- (1) An employer or self-employed person must carry out a documented physical agents risk assessment, as far as is reasonably practicable, immediately, by a competent person.
- (2) The physical agents risk assessment contemplated in sub-regulation (1) must:
  - (a) be conducted at intervals not exceeding 24-months; and
  - (b) include:
    - (i) a complete hazard identification;
    - (ii) the identification of all persons who may be affected by the physical agents risks;
    - (iii) how employees may be affected by the physical agents risks;
    - (iv) the analysis and evaluation of the physical agents risks; and
    - (v) the prioritisation of physical agents risks.

# Physical agents risk assessment (2/3)

- (3) The risk assessment conducted in terms of sub-regulation (1) must take into account specific effects of exposure to men, women, young employees and vulnerable employees, where applicable;
- (4) An employer must, in terms of the physical agents risk assessment;
  - (a) consider the recommendations identified by the competent person in the physical agents risk assessment; and
  - (b) develop a documented action plan for the implementation of the recommendations.

# Physical agents risk assessment (3/3)

- (5) An employer must review the relevant physical agents risk assessment made in accordance with sub-regulation (1) if:
  - (a) such assessment is no longer valid;
  - (b) control measures are no longer effective;
  - (c) technological or scientific advances allow for more effective control methods;
  - (d) there has been a change in—
    - (i) the workplace or work methods;
    - (ii) the type of work carried out; or
    - (iii) the type of machinery, plant or personal protective equipment used to control the exposure;
  - (e) an incident occurs;
  - (f) medical surveillance reveals an adverse health effect, where a physical agent risk is identified as a contributing factor.

# Exposure monitoring for physical agent

- (1) Where a physical agent risk assessment or a review of such assessment indicates that any employee may be exposed to a physical agent at or above the occupational exposure limit, an employer must ensure that a physical agents exposure monitoring programme implemented at that workplace is:
  - (a) representative of the employees' exposure to a physical agent; and
  - (b) conducted by a competent person in the identified physical agent;
- (2) The physical agents exposure monitoring programme referred to in sub-regulation (1) must include the quantification of exposure levels and comparison to occupational exposure limits for the particular physical agent;
- (3) An employer must conduct the physical agents exposure monitoring, referred to in sub-regulation (1), at a frequency determined by the physical agents risk assessment, or at intervals not exceeding 24-months;
- (4) An employer must, in terms of physical agents exposure monitoring:
  - (a) consider the recommendations identified by the competent person in the physical agents exposure monitoring report; and
  - (b) develop a documented action plan for the implementation of the recommendations.



# Medical surveillance (1/3)

- (1) An employer must establish, implement and maintain a documented system of medical surveillance, which is overseen and approved by an occupational medicine practitioner, if;
  - (a) the physical agents risk assessment or the physical agents exposure monitoring indicates; or
  - (b) in the opinion of an occupational health practitioner the relevant employees must be under medical surveillance; and
  - (c) there are techniques to identify the disease or adverse health effect, as far as is reasonably practicable;



# Medical surveillance (2/3)

- (2) Medical surveillance includes at least the following:
  - (a) an initial health evaluation carried out by an OHP immediately before a person commences employment or placement, and consists of;
    - (i) an evaluation of the employee's medical, occupational and exposure history;
    - (ii) an appropriate clinical examination; and
    - (iii) any other medical test which in the opinion of the OHP is necessary;
  - (b) a periodic health evaluation, must be performed at intervals corresponding with the health risks and the health status of the employee, but which must not exceed intervals of 24-months, and consists of (2) (a) (i & ii):
  - (c) an analysis of the health data to identify trends;
  - (d) an exit health evaluation, which consists of (2) (a) (i & ii)

# Medical surveillance (3/3)



- (3) The documented system of medical surveillance must be approved by an occupational medicine practitioner; and
- (4) After concluding the initial or periodic health evaluation, the occupational health practitioner must ensure that the employer is informed, in writing, of the outcome of an employee's health evaluation.

# Cold Stress (1/2)

9. (1) Subject to the provisions of sub-regulation (2), no employer must require or permit an employee to work in an environment in which the average environmental equivalent chill temperature taken over a period of four-hours is below 10 degrees Celsius, unless the employer takes reasonable measures to protect such employee against the cold and further takes all precautions necessary for the health and safety of such employee;
- (2) No employer must require or permit an employee to work in an environment in which the average environmental equivalent chill temperature is below 10 degrees Celsius provided that:
- (a) the maximum exposure of the employee does not exceed the periods as indicated in table 3;
  - (b) the employee is provided with dry, whole body personal protective clothing and equipment, with adequate insulation;
- (3) The physical agents exposure monitoring programme referred to in regulation 7 (1), must:
- (a) take into account both dry-bulb temperature and air velocity, when determining the average environmental equivalent chill temperature;
  - (b) taken over a period of at least four hours, during the coldest period of an employee's shift; and
  - (c) is conducted during the coldest quarter of the year, as determined by the physical agents risk assessment.

# Cold Stress (2/2)

Table 3: Cold Stress Exposure period.

| Temperature °C                                  | Maximum exposure                                                                                                                                                                                       |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <10° to -18°                                    | No limit.                                                                                                                                                                                              |
| Lower than -18° but not lower than -34° degrees | Maximum continuous exposure during each hour = 50 minutes.<br>After every exposure in a low-temperature area at least 10 minutes must be spent, under supervisions, in a comfortably warm environment. |

1

|                                                          |                                                                                                         |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Lower than -34° but not lower <del>lower</del> than -57° | Two periods of 30 minutes each, at least 4 hours apart. Total low-temperature exposure: 1 hour per day. |
| Lower than -57°                                          | Maximum permissible exposure = 5 minutes during any 8-hour period.                                      |

# Heat Stress (1/2)

- 10. (1) Subject to the provisions of sub-regulation (2), no employer must require or permit an employee to work in an environment in which the time-weighted average WBGT Index, determined over a period of one hour, does not exceed 30;
- (2) An employer must, where the time-weighted average WBGT exceeds the action level of 27:
  - (a) provide training to exposed employees on adverse health effects relating to heat stress exposure and the precautionary measures to be taken; and
  - (b) subject exposed employees to a heat acclimatisation programme.

# Heat Stress (1/2)

- (3) No employer must require or permit an employee to work in an environment in which the time-weighted average WBGT Index is above 30, provided that:
  - (a) appropriate means of ventilation systems are implemented;
  - (b) a work rest cycle is established and implemented for that workplace;
  - (c) sufficient amounts of potable water is available at the place of work, in relation to the number of employees exposed;
  - (d) prompt first aid treatment, specific to adverse health effects from heat stress, is made available; and
  - (e) the employee is provided with the appropriate personal protective clothing and equipment, taking into account clothing adjustment factor, according to SANS 7243.
- (4) The physical agents exposure monitoring programme referred to in regulation 7 (1), must:
  - (a) be conducted in accordance with the latest version of SANS 7243;



# Table 1: OELS and Action levels

Table 1: Occupational exposure limits and action levels for physical agents.

| Physical Agent | Action Level | Occupational Exposure Limit | Unit | Duration | Target organ |
|----------------|--------------|-----------------------------|------|----------|--------------|
| Cold Stress    | -            | 10                          | °C   | 1-hour   | -            |
| Heat Stress    | 27           | 30                          | WBGT | 4-hours  | -            |
| Vibration      | 0.5          | 5                           | m/s² | 8-h      | -            |

# Lighting (1/5)

11. (1) An employer must provide illumination in the workplace in the form of either natural light, artificial light or a combination thereof;
- (2) An employer must ensure that, as far as reasonably practicable, illumination be provided in the workplace to carry out work, without risk to health and safety by taking into account:
  - (a) illuminance levels;
  - (b) glare;
  - (c) uniformity;
  - (d) flicker;
  - (e) hazardous or specialised workplaces; and
  - (f) hazardous or specialised operations;
- (3) With respect to the illumination to be provided in terms of sub-regulation (1), the employers must ensure that:
  - (a) illuminance provided for the workplace is in accordance with the minimum illuminance values specified:
    - (i) in table 5 for interior workplaces: Provided that where a workplace is not referenced in table 5, the minimum illuminance levels in table 6 will apply; and

# Lighting (2/5)

- (ii) in table 7 for exterior workplaces: Provided that where a workplace is not referenced in table 7, the maximum glare values in table 8 will apply.
- (c) the average uniformity of illuminance at any working plane:
  - (i) for interior workplaces, within five meters of a working plane, is not less than one fifth of the average illuminance on that working plane and on the adjacent floors; and
  - (ii) for exterior workplaces, must be in accordance with the values listed in table 7: Provided that where a workplace is not referenced in table 7, the average uniformity in table 8 will apply;
- (d) flicker in the workplace must be eliminated;
- (e) specialised lighting must be required for use in hazardous or specialised workplaces, as identified by the physical agents risk assessment; and
- (f) specialised lighting must be required for use in hazardous or specialised operations, as identified by the physical agents risk assessment;

# Lighting (3/5)

(4) With a view to the emergency evacuation of interior workplaces, every employer must, in such workplaces, provide emergency sources of lighting which are such that, when activated, an illuminance for:

- (a) escape route lighting must not be less than 1 lux at floor level;
- (b) emergency escape lighting must not be less than 5 lux at floor level to emphasise the existence of potential workplace hazards and the location of safety equipment;
- (c) lighting at an emergency exit must not be less than 5 lux at floor level; and
- (d) workplaces or operations where it is necessary to stop machinery or shut down plant or processes before evacuating the workplace, or where dangerous materials are present or dangerous processes are carried out, the illuminance must not be less than 20 lux at floor level;

# Lighting (4/5)

(5) An employer shall ensure that the emergency sources of lighting prescribed by sub-regulation (3):

(a) are capable of being activated within:

(i) 25 seconds of the failure of the lighting prescribed by sub-regulation (3) (a), (b) and (c); and

(ii) 0,5 seconds of the failure of the lighting prescribed by sub-regulation 3 (d);

(b) will last long enough to ensure the safe evacuation of the workplace;

(c) are mounted at a height of not less than two meters above floor level and are not aimed between 10° above and 45° below the horizontal line on which they are installed; and

(d) are kept clean, in good working order and tested for efficient operation at intervals of not more than three months;

# Lighting (5/5)

(6) The lighting measurement and monitoring programme must be conducted according to;

(a) SANS 10114-1, for interior lighting;

(b) SANS 10389-1, for exterior lighting;

(c) SANS 10114-2, for emergency lighting; and

(d) the lighting measurement contemplated in sub-regulation (6)(a), (b) and (c) must be conducted by a competent person;

(7) In order to ensure that lighting levels meet the minimum illumination levels prescribed in sub-regulation (2) (a), an employer must ensure that;

(a) luminaires and lamps are maintained, kept clean, in good working order and must be replaced or repaired when defective; and

(b) windows and other sources of natural lighting are kept clean, replaced and repaired when defective;

(8) An employer engaged in building work shall cause all workplaces where danger may exist through the lack of natural light, to be illuminated such that it will be safe in terms of the physical agents risk assessment.



# Lighting - Tables

Table 5: Minimum maintained illuminance values for interior workplaces.

| Type of interior, area, task, or activity | Minimum maintained average illuminance (lux) | Maximum glare rating (UGR) |
|-------------------------------------------|----------------------------------------------|----------------------------|
| <b>General building areas</b>             |                                              |                            |
| Entrance halls                            | 100                                          | 22                         |

Table 6: Minimum maintained illuminance values for interior workplaces not listed in Table 5.

| Type of area, task or activity     | Illuminance range (lux) |
|------------------------------------|-------------------------|
| Outdoor circulation and work areas | 20 – 50                 |

# Lighting - Tables

Table 7: Minimum maintained illuminance values for exterior workplaces.

| Areas to be lit, operation performed | Minimum maintained average illuminance (lux) |                           | Minimum uniformity ratio<br><br>$\frac{E_{hmin}}{E_{hav}}$ | Minimum uniformity ratio<br><br>$\frac{E_{hmin}}{E_{hmax}}$ | Maximum glare rating<br><br>GR <sub>max</sub> . |
|--------------------------------------|----------------------------------------------|---------------------------|------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------|
|                                      | Horizontal<br><br>$E_{hav}$                  | Vertical<br><br>$E_{hav}$ |                                                            |                                                             |                                                 |
| Airports                             |                                              |                           |                                                            |                                                             |                                                 |

Table 8: Minimum maintained illuminance values for exterior workplaces not mentioned in Table 7.

| Work | Minimum average illuminance<br>$E_{hav}$ (lux) | maintained horizontal | Minimum uniformity ratio  |                           | Glare limit<br>GR <sub>max</sub> |
|------|------------------------------------------------|-----------------------|---------------------------|---------------------------|----------------------------------|
|      |                                                |                       | $\frac{E_{min}}{E_{hav}}$ | $\frac{E_{min}}{E_{max}}$ |                                  |
|      |                                                |                       |                           |                           |                                  |

# Indoor Air Quality (1/3)



12. (1) An employer must ensure good indoor air quality for a workplace, by:

- (a) introducing and distributing the ventilation of air;
- (b) controlling airborne contaminants; and
- (c) maintaining air temperature, air velocity and relative humidity;

(2) The employer shall ensure that risk from the exposure of employees to hazardous biological, chemical and physical agents impacting indoor air quality is, as far is reasonably practicable, either eliminated at source, diluted through either natural ventilation or an artificial ventilation system or filtered through the use of a filtration system;

# Indoor Air Quality (2/3)



- (3) The employer must ensure that the artificial ventilation system referred to in sub-regulation (2) complies with the air requirements for different types of occupancies, listed in Part-O of the National Building Regulations, SANS 10400;
- (4) The employer must ensure that the artificial ventilation system referred to in sub-regulation (2) is tested, by a competent person, at intervals as per the original manufacturer specifications but not exceeding 24 months;
- (5) The employer must ensure that the artificial ventilation system is maintained as per the original manufacturer specifications: Provided that in the absence of the original manufacturer specifications, a risk based approach is undertaken;

# Indoor Air Quality (3/3)

(6) The physical agents exposure monitoring referred to in regulation 7(1), must take into account the following parameters:

(a) thermal comfort, including:

- (i) Air temperature;
- (ii) Air velocity; and
- (iii) Relative humidity;

(b) airborne contaminants, including:

- (i) carbon monoxide;
- (ii) carbon dioxide;
- (iii) other applicable hazardous chemical agents;
- (iv) mould; and
- (v) other applicable hazardous biological agents;

(c) air changes per type of occupancy.

# Indoor Air Quality – exposure levels

Table 4: Guideline levels for indoor air quality parameters.

| IAQ Parameter     | Level                                                    | Unit                    |
|-------------------|----------------------------------------------------------|-------------------------|
| Air temperature   | 20 to 28 (dry bulb temperature)                          | Degrees Celsius         |
| Air velocity      | 0.1 to 0.8                                               | meters per second (m/s) |
| Relative humidity | 30 to 60                                                 | %                       |
| Carbon Dioxide    | Not exceed the outdoor concentration by more than 600ppm | Parts per million (ppm) |
| Carbon Monoxide   | 10                                                       | mg/m <sup>3</sup>       |



# Vibration (1/3)

13. (1) Subject to the provisions of sub-regulation (2), no employer must require or permit an employee to work in an environment in which the time-weighted average occupational exposure limit, determined over a period of eight hours, does not exceed OEL for hand-arm vibration or whole body vibration, stipulated in table 1;

(2) An employer shall ensure that risk from the exposure of employees to vibration is either eliminated at source or, where this is not reasonably practicable, reduced to as low a level as is reasonably practicable, provided that:

(a) Where it is not reasonably practicable to eliminate risk referred to in sub-regulation (2), and an action level for hand arm vibration or whole body vibration, as stipulated in table 1, is likely to be reached or exceeded, the employer must reduce exposure to as low a level as is reasonably practicable by establishing and implementing:

- (i) other working methods which eliminate or reduce exposure to vibration;
- (ii) choice of plant and machinery designed to produce the least possible vibration;
- (iii) maintenance programmes for plant and machinery, the workplace and workplace systems;

# Vibration (2/3)

- (iv) the design and layout of workplaces, workstations and rest facilities;
  - (v) provide training to exposed employees on adverse health effects relating to vibration exposure and the precautionary measures to be taken;
  - (vi) review medical surveillance, physical agents exposure monitoring program and physical agents risk assessment;
  - (vii) limitation of the duration and magnitude of exposure to vibration;
  - (viii) appropriate work schedules with adequate rest periods; and
  - (ix) the provision of clothing to protect employees from cold and damp.
- (b) Subject to sub-regulation 2(a), the employer must ensure that employees are not exposed to vibration above an occupational exposure limit, and where such limit is exceeded, must:
- (i) reduce exposure to vibration to below the occupational exposure limit;
  - (ii) identify the reason for that limit being exceeded; and
  - (iii) modify the control measures taken in accordance with sub-regulation (2)(a) to prevent it being exceeded again;

# Vibration (3/3)

(3) The physical agents exposure monitoring programme referred to in regulation 7 (1), must:

- (a) for whole body vibration, be conducted in accordance with the latest version of SANS 2631;
- (b) for hand-arm vibration, for monitoring to be representative of an employee's exposure, it must;
- (c) be conducted along each axis for roll, pitch and yaw;
- (d) be a minimum of one exposure cycle, normalised to an eight-hour time weighed average. Provided: for the event of multiple sources of vibration, the partial exposure values are combined and normalised to an eight-hour time weighed average;
- (e) in the case of plant or machinery which need to be held with both hands, monitoring must be conducted on each hand, whereby the exposure is determined by reference to the higher value of the two; and
- (f) be conducted during the coldest period of an employee's shift.

# Vibration OEL and action levels

Table 1: Occupational exposure limits and action levels for physical agents.

| Physical Agent       | Action Level | Occupational Exposure Limit | Unit                            | Duration | Target organ |
|----------------------|--------------|-----------------------------|---------------------------------|----------|--------------|
| Cold Stress          | -            | 10                          | °C                              | 1-hour   | -            |
| Heat Stress          | 27           | 30                          | WBGT                            | 4-hours  | -            |
| Hand-arm vibration   | 2,5          | 5                           | m/s <sup>2</sup>                | 8-hours  | -            |
| Whole-body vibration | 0,5          | 1,15                        | m/s <sup>2</sup>                | 8-hours  | -            |
| UV-C<br>(Wavelength  | -            | 0.1                         | microwatt per square centimetre | 8-hours  | Skin and eye |

# Non-ionising radiation (1/2)

14. (1) Subject to the provisions of sub-regulation (2), no employer must require or permit an employee to work in an environment in which the time-weighted average occupational exposure limit, does not exceed the occupational exposure limit for the type of non-ionising radiation, stipulated in tables 1 and 2;
- (2) An employer must ensure that risk from the exposure of employees to non-ionising radiation is either eliminated at source or, where this is not reasonably practicable, reduced to as low a level as is reasonably practicable;
- (3) An employer must ensure that employees are not exposed to non-ionising radiation above an occupational exposure limit, and where such limit is exceeded, must:
  - (a) reduce exposure to non-ionising radiation to below the occupational exposure limit;
  - (b) identify the reason for that limit being exceeded; and
  - (c) modify the control measures taken in to prevent the limit from being exceeded again;



# Non-ionising radiation (2/2)

(4) The physical agents exposure monitoring referred to in regulation 7(1), must take into account:

(a) the source of the non-ionising radiation;

(b) the type of non-ionising radiation:

(i) optical radiation; and

(ii) electromagnetic fields

(c) a methodology that is conducted according to an internationally recognised standard for the type of non-ionising radiation;

(5) Signage must be;

(a) provided for:

(i) identified source of the non-ionising radiation; and

(ii) the effect of electromagnetic interference on heart pacemakers;

b) in the form specified in Annexure 1, which:

(i) is clearly visible; and

(ii) with the number of labels, based on the physical agents risk assessment, serving as a warning of exposure.



# Non-ionising radiation - signage



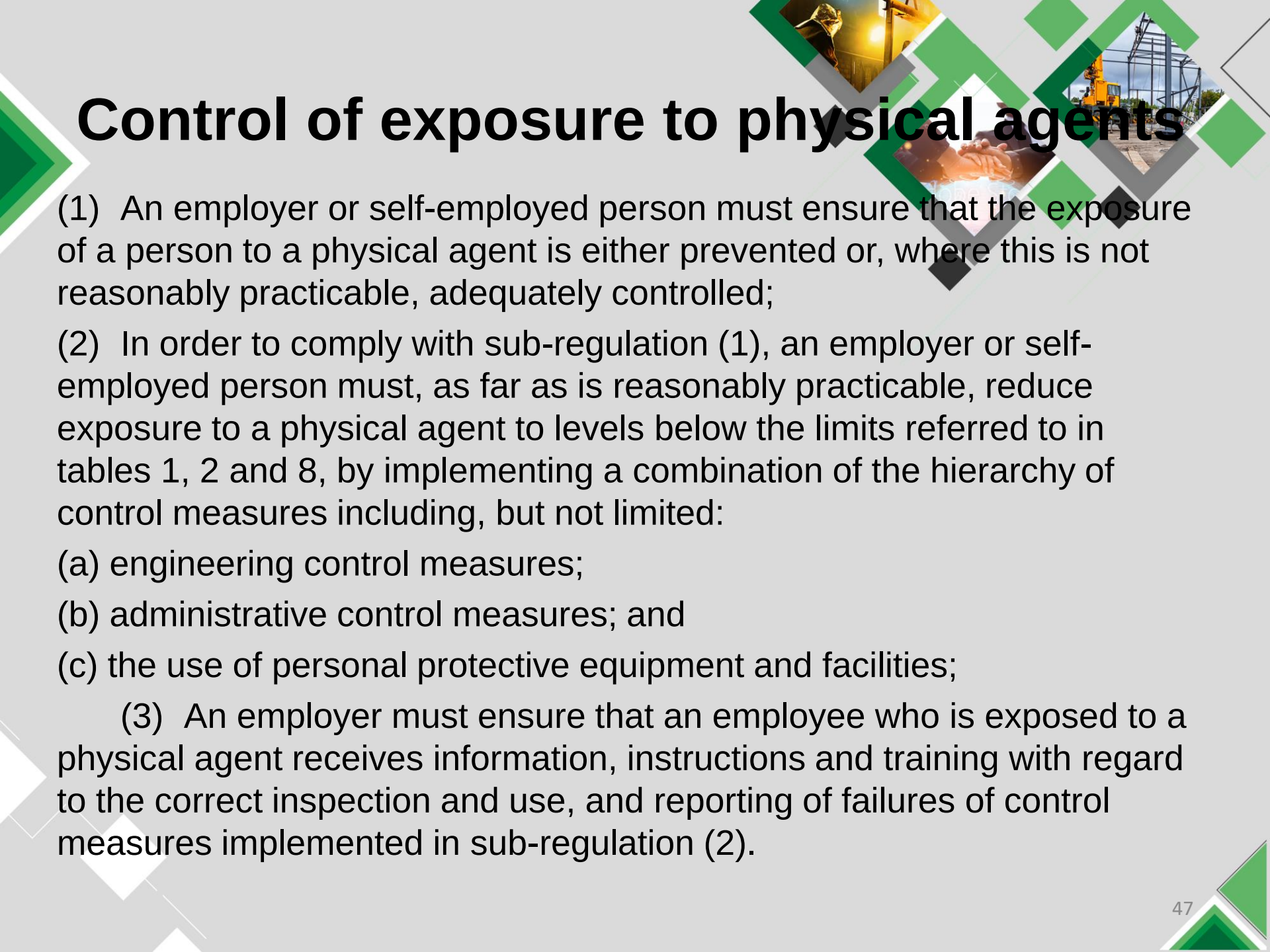
# Non-ionising radiation - OELs

Table 1: Occupational exposure limits and action levels for physical agents.

| Physical Agent                           | Action Level | Occupational Exposure Limit | Unit                                                                    | Duration     | Target organ    |
|------------------------------------------|--------------|-----------------------------|-------------------------------------------------------------------------|--------------|-----------------|
| UV-C<br>(Wavelength 270nm)               | -            | 0.1                         | microwatt per square centimetre<br>( $\mu\text{W}/\text{cm}^2$ )        | 8-hours      | Skin and eye    |
| Infrared<br>(Wavelength 770nm – 3000 nm) | -            | 10                          | <u>milliwatt</u> per square centimetre<br>( <u>mW</u> / $\text{cm}^2$ ) | 1000 seconds | Cornea and lens |

Table 2: Occupational exposure limits for electromagnetic fields.

| Frequency range | E-field strength<br>( $\text{V}/\text{m}^{-1}$ ) | H-field strength<br>( $\text{A}/\text{m}^{-1}$ ) | B-field strength<br>( $\mu\text{T}$ ) | Equivalent plane wave power density<br>( $\text{W}/\text{m}^{-2}$ ) |
|-----------------|--------------------------------------------------|--------------------------------------------------|---------------------------------------|---------------------------------------------------------------------|
| Up to 1 Hz      | -                                                | $1.63 \times 10^5$                               | $2 \times 10^5$                       | -                                                                   |
| 1 to 8 Hz       | 20 000                                           | $1.63 \times 10^5 / f^2$                         | $2 \times 10^5 / f^2$                 | -                                                                   |
| 8 to 25 Hz      | 20 000                                           | $2 \times 10^4 / f$                              | $2.5 \times 10^4 / f$                 | -                                                                   |



# Control of exposure to physical agents

- (1) An employer or self-employed person must ensure that the exposure of a person to a physical agent is either prevented or, where this is not reasonably practicable, adequately controlled;
- (2) In order to comply with sub-regulation (1), an employer or self-employed person must, as far as is reasonably practicable, reduce exposure to a physical agent to levels below the limits referred to in tables 1, 2 and 8, by implementing a combination of the hierarchy of control measures including, but not limited:
  - (a) engineering control measures;
  - (b) administrative control measures; and
  - (c) the use of personal protective equipment and facilities;
- (3) An employer must ensure that an employee who is exposed to a physical agent receives information, instructions and training with regard to the correct inspection and use, and reporting of failures of control measures implemented in sub-regulation (2).

# Personal protective equipment and facilities (1/2)

- (1) If it is not reasonably practicable to ensure that the exposure of an employee is controlled as contemplated in regulation 15, the employer must provide the employee with suitable personal protective equipment;
- (2) Where personal PPE is provided, the employer must ensure that:
  - (a) is capable of reducing the exposure to the physical agent concerned;
  - (b) selection of the relevant PPE takes into consideration:
    - (i) the nature of the physical agent;
    - (ii) the type of work to be done;
    - (iii) the physical effort required to do the work;
    - (iv) the length of time it will have to be worn;
    - (v) work for visibility, comfort and employee communication; and
    - (vi) compatibility with any other PPE;
  - (c) information, instructions, training and supervision are provided
  - (d) reusable PPE is kept in hygienic condition and efficient working order;
  - (e) is readily available to exposed persons;
  - (f) storage facilities provided when not in use; and
  - (g) is used or worn by the employee, by enforcing its use through providing adequate supervision;

# Personal protective equipment and facilities (2/2)

(3) The employee must, where there is the requirement to use personal protective equipment as contemplated in sub-regulation (1);

(a) inspect, use, wear, store and dispose of the personal protective equipment in accordance with any information, training or lawful instruction given by the employer;

(b) not intentionally misuse or damage the personal protective equipment; and

(c) immediately inform the employer of any damage, defect, or any need to clean or replace any of the personal protective equipment.

# Maintenance of control measures

(1) Every employer or self-employed person must ensure that any control measure that he provides for the benefit of employees in compliance with his duties under these regulations is:

- (a) fully and properly used;
- (b) inspected, maintained in an efficient state, in good working order, repair and cleanliness; and
- (c) reviewed for effectiveness, at intervals not exceeding 24-months.



# Records (1/2)

18. (1) An employer or self-employed person must:

(a) keep record of:

- (i) training, as contemplated in regulation 3;
- (ii) physical agents risk assessments and action plan, as contemplated in regulation 6;
- (iii) physical agents exposure monitoring and action plan, as contemplated in regulation 7;
- (iv) medical surveillance reports, as contemplated in regulation 8; and
- (v) maintenance of control measures, as contemplated in regulation 17;

(b) keep records for a minimum period of—

- (i) 40-years for records contemplated in regulations 6, 7 and 8;
- (ii) five years for records contemplated in regulations 17;
- (iii) the length of time the employee remains at the workplace for records contemplated in regulation 3;

# Records (2/2)

- (c) make available to;
  - (i) the relevant health and safety representative, health and safety committee or to an inspector, the records contemplated in regulations 3, 6, 7 and 17;
  - (ii) any person, the records contemplated in regulation 8, subject to formal written consent of the employee; and
- (d) submit all records, as contemplated in sub-regulation 1(a) to the relevant chief director: provincial operations, when they cease activity.

# Physical agents technical committee (1/2)

- (1) The council may, after consultation with the Minister, establish a physical agents technical committee which must consist of:
  - (a) a chairperson designated by the chief inspector from the employees of the Department of Employment and Labour;
  - (b) one person designated by the chief inspector from the employees of the Department of Employment and Labour;
  - (c) three persons designated by employer's organisations to represent employers;
  - (d) three persons designated by employees' organisations to represent the federation of unions;
  - (e) one person to represent a professional body recognised by the chief inspector;
  - (f) one person representing a higher educational institution;
  - (g) one person representing occupational medicine; and
  - (h) persons who are competent in respect of the matters to be dealt with by the physical agents technical committee who have been co-opted by the committee with the authorisation of the council;

# Physical agents technical committee (2/2)

(2) The council may:

- (a) appoint members of the physical agents technical committee for a period that the council may determine at the time of the appointment;
- (b) after having afforded a member a reasonable opportunity to respond, discharge such a member at any time, for reasons that are fair and just; and
- (c) appoint a new member in the place of a member who is discharged in terms of sub-regulation (2)(b).

(3) The physical agents technical committee must:

- (a) advise the council on physical agents related matters, including, but not limited to, codes, standards and training requirements;
- (b) make recommendations and submit reports to the council regarding any matter to which these regulations apply;
- (c) advise the council regarding any matter referred to the physical agents technical committee by the council;
- (d) perform any other function for the administration of a provision of these regulations that may be requested by the council; and
- (e) conduct its work in accordance with the instructions and rules of conduct framed by the council.

# Offences and penalties

20. Any person who contravenes or fails to comply with any provision of regulation 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 or 18 shall be guilty of an offence and liable on conviction to a fine or to imprisonment for a maximum of 12 months and, in the case of a continuous offence, to an additional fine of R200 for each day on which the offence continues or additional imprisonment of one day for each day on which the offence continues: Provided that the period of such additional imprisonment shall in no case exceed 90 days.

# Regulations to be shifted to GSR

- 3 regulations to General Safety regulations
  - Housekeeping
  - Precaution against flooding
  - Fire precaution and means of egress
- Closer to the time of final promulgation



# Comment Submissions

- Prescribed form
- Closing date 21 January 2023

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# Thank You...



**employment & labour**

Department:  
Employment and Labour  
**REPUBLIC OF SOUTH AFRICA**

