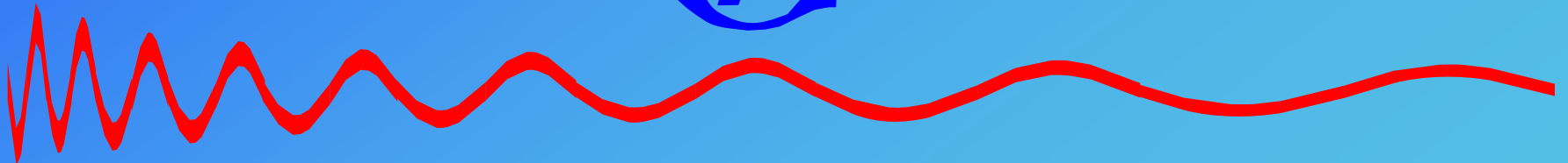


# Who should get training and education?

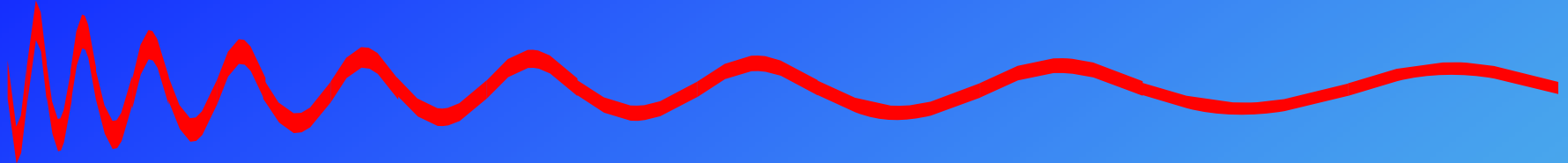
Eric van Rongen

Health Council of the Netherlands, The Hague

Occupational Exposure to Electromagnetic Fields: paving the way for a future EU initiative  
6–8 October 2009, Umeå, Sweden



# Short and simple answer



- Everbody who can be occupationally exposed
- But:  
For practical purposes differentiation needs to be made

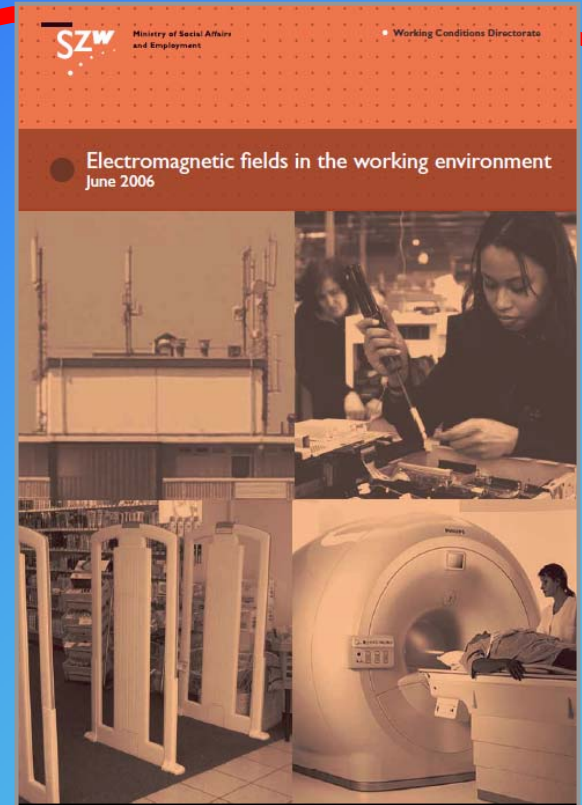


# Dutch report

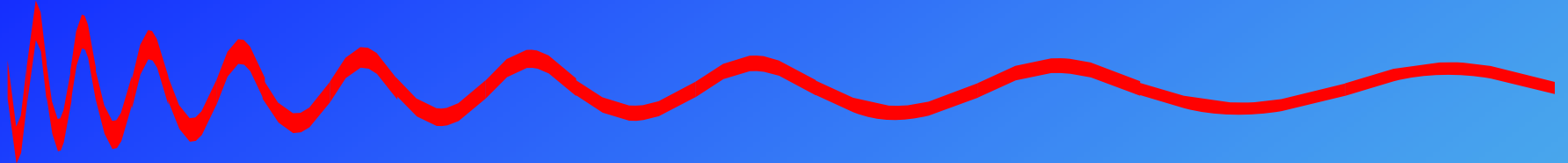
- Report Ministry of Social Affairs and Employment (2006), drafted by Bolte & Pruppers (RIVM):

Electromagnetic fields in the working environment

- Aid to the practical application of the directive



# Working environment

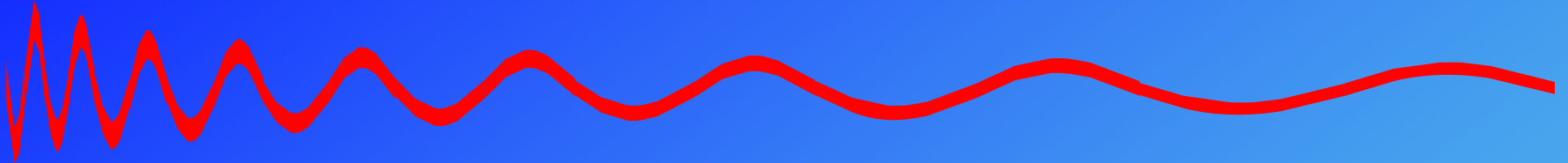


- Definition here:

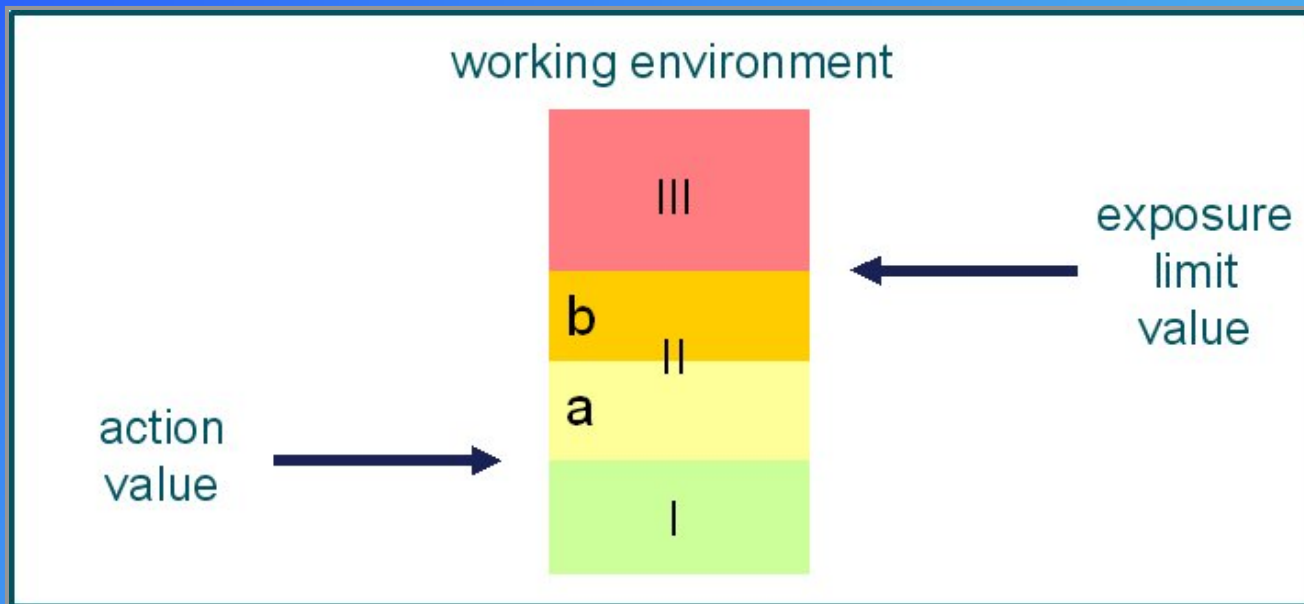
Equipment at the workplace combined with its use



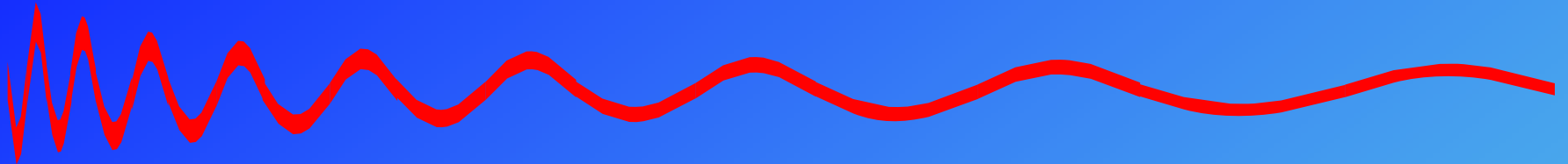
# Different working environments



- Different categories of working environments
- Based on (estimated) exposure level



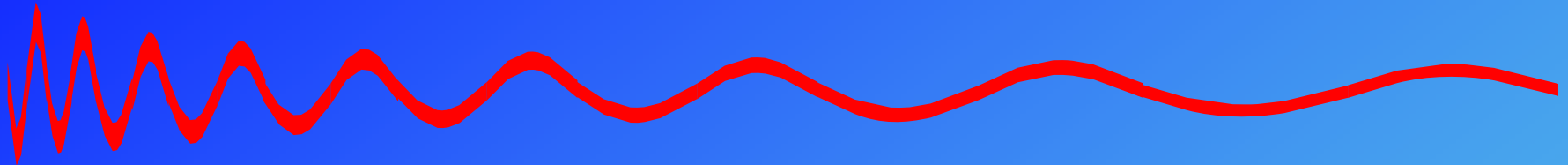
# Working environment categories



- No category: limits a priori not exceeded
- Cat. 1: likely below action levels – no measures necessary
- Cat. 2: action level can be exceeded, likely below exposure limit value
  - Cat. 2a: easy to remedy
  - Cat. 2b: less easy to remedy
- Cat. 3: exposure level can be exceeded – mitigation measures needed



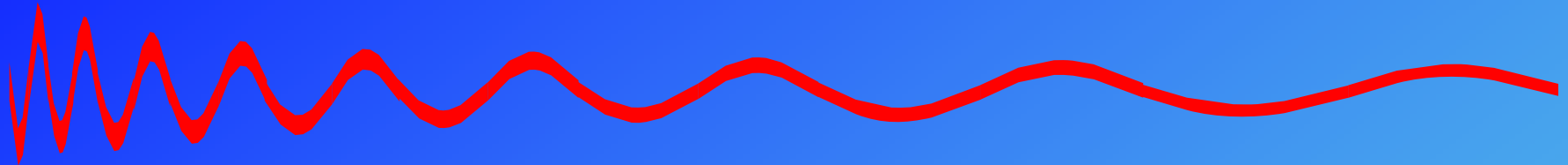
# Training and education



- No category: no measures
- Cat. 1: no measures necessary - no information, education or training
- Cat. 2a: simple instruction – some education
- Cat. 2b: technical measures – education, instruction on safe working practices
- Cat. 3: mitigation measures – training (can be part of job training)



# A priori limits not exceeded

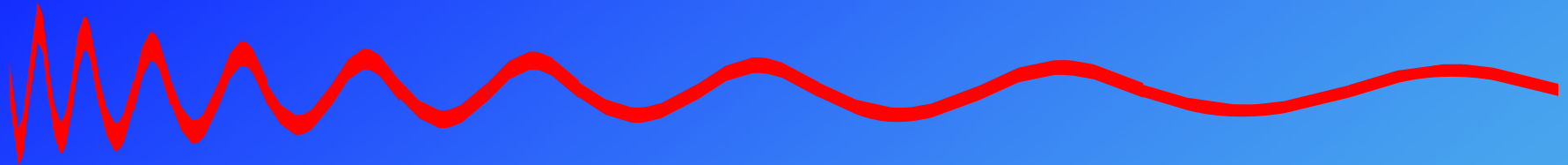


- Offices (exc. tape erasers)
- Hand-held or transportable motor-operated electric tools
- Household and similar electrical appliances
- Specific low power electrical installations
- Specific low power electric motors and electric pumps
- Mobile telephones
- Low power battery-powered radio equipment
- Audio and video equipment
- Lighting equipment

No measures



# Category 1 examples

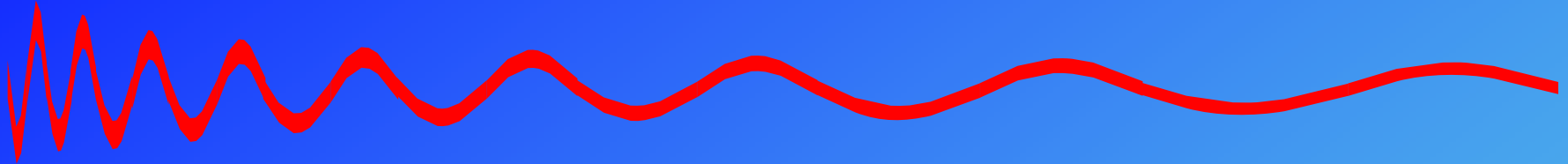


- Installation and maintenance: electrical hand-held tools (exc. welding equipment)
- Detection of articles and people (EAS, specific RFID)
- Electricity production and distribution (e.g. overhead high voltage cables, substations)
- Medical applications (e.g. superficial hyperthermia)
- Transport and DC traction systems
- Transmitters (small beam transmitters at GSM base stations; portables; speed, weather radar)
- Induction hobs in professional catering

No measures



# Category 2a examples

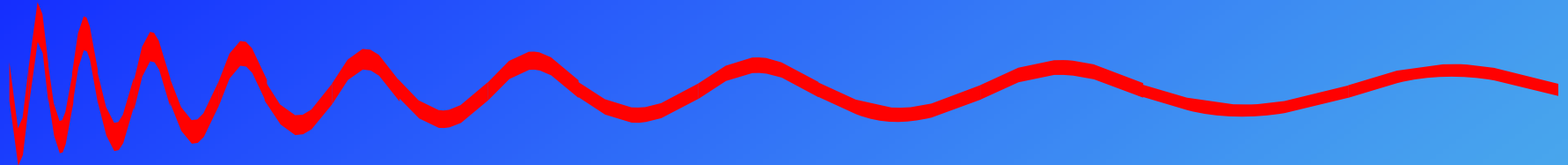


- Detection of articles and people (specific EAS, RFID systems)
- Arc welding: electrode holder
- Medical applications: deep hyperthermia, electrosurgery
- Alternating current rail transport
- Transmitters (GSM, UMTS base stations; TETRA mast, high power vehicle-mounted transmitters, WLL systems, high power beam transmitters)
- Office: tape erasers

Some education



# Category 2b examples



- Equipment being installed or maintained
- Dielectric heating (plastic sealers, wood gluing equipment)
- Induction heating (open coils, larger furnaces)
- Arc welding - cable
- Electricity power stations
- Electrochemical processes (bus bars, electrolysis hall)
- Medical: MRI, short wave and microwave diathermy
- Transmitters (small roof-mounted broadcast transmitters, amateur radio transmitters, navigational radar)

Education, instruction on safe working practices



# Information brochures: examples



## Elektromagnetische velden en optische straling bij lassen

Deze brochure is bedoeld voor alle werknemers die werken met, of in de buurt van, apparatuur voor elektrisch lassen (booglassen, weerstandlassen, hoogfrequentlassen, inductie-lassen en elektronenbundellassen), lassen met de vlam (autogeenlassen) of laserlassen. De brochure is ook bedoeld voor de werkgever van deze werknemers en zijn preventiemedewerker. De brochure gaat alleen over de risico's van elektromagnetische velden en optische straling bij het lassen, niet over andere risico's op de werkplek, zoals die van lasrook.

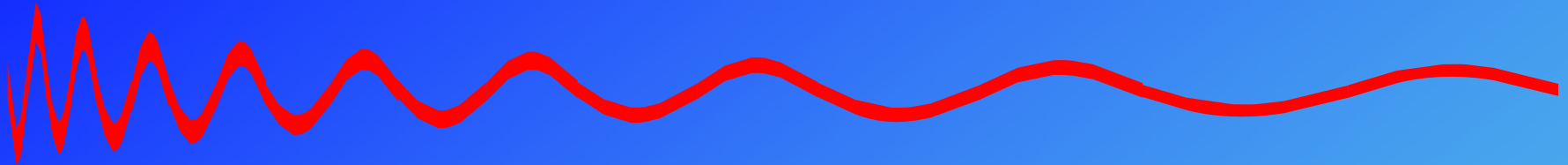


## Elektromagnetische velden bij zendinstallaties

Deze brochure is bedoeld voor alle werknemers die werkzaamheden verrichten aan, of in de buurt van, zendinstallaties (werknemers van operators en van onderaannemers van operators, werknemers van bedrijven ingeschakeld door de eigenaar van de site, bezoekers of controleurs vergezeld van bevoegde personen). De brochure is ook bedoeld voor de werkgever van deze werknemers en zijn preventiemedewerker. De brochure gaat alleen over risico's van elektromagnetische velden, niet over andere risico's op de werkplek.



# Category 3 examples



- Installation and maintenance: troubleshooting work
- Electrochemical processes: rectifiers
- Induction heating: smaller smelting furnaces (alloying)
- Welding: spot and induction welding, semi-automated
- Medical applications: interventional MRI
- Large broadcast transmitters

Training



