

# **Ordinance on the Protection of Persons Attending Organised Events Against Health Hazards Resulting from Noise and Laser Beams**

(Noise and Laser Ordinance)

**Please note that this version is a translation of the german edition and  
is not to be considered as a legal reference**

28 February 2007

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*The Swiss Federal Council,*

having due regard to Article 13, § 1 and Article 39, § 1 of the Environmental  
Protection Act of 7 October 1983<sup>1</sup>,

*herewith adopts the following Ordinance:*

## **Section 1: General Provisions**

### **Article 1** Purpose

This Ordinance is intended to protect persons attending organised events against health hazards resulting from noise and laser beams.

### **Article 2** Scope

<sup>1</sup> This Ordinance shall apply to events organised both inside buildings and in the open air at which attendees are exposed to electro-acoustically generated or amplified sound or at which laser beams are produced.

<sup>2</sup> It shall not apply to infra or ultra sound.

<sup>3</sup> For events organised by the military to which the general public has access, the Act on the Administration of the Armed Forces of 3 February 1995 shall apply<sup>2</sup>.

### **Article 3** Information

<sup>1</sup> The Federal Office of Public Health (FOPH) shall provide information about the harmful effects of noise and laser radiation and shall recommend appropriate measures for reducing the health risks.

<sup>2</sup> The Cantons shall support the Federal Office in this task.

## Section 2: Harmful Effects of Noise

### Article 4 Sound level

The sound level is considered to be the mean  $L_{eq}$  level in dB(A) measured over a period of 60 minutes.

### Article 5 Emission limits

<sup>1</sup> Any person responsible for an organised event shall ensure that audio emissions are limited in such a way that the mean sound immission level caused by the event does not exceed 93 dB(A) at any time during the event.

<sup>2</sup> Events with higher immission levels are permitted subject to compliance with the requirements of Article 6 or 7.

<sup>3</sup> Immission levels at events intended exclusively for children or juveniles under 16 years of age must not exceed 93 dB(A).

### Article 6 Events with sound levels between 93 dB(A) and 96 dB(A)

Any person staging an event with a sound level between 93 dB(A) and 96 dB(A) must ensure that:

- a. the audio emissions are limited in such a way that the sound immission level does not exceed 96 dB(A);
- b. the maximum  $L_{AFmax}$  value of 125 dB(A) is not exceeded at any time during the event;
- c. clearly visible notices are displayed in the entrance area to the event informing the audience about:
  1. the maximum sound level of 96 dB(A),
  2. the hearing damage that may result from high noise levels and the increase in this risk that is associated with an increasing period of exposure;
- d. persons attending the event are offered, free of charge, appropriate hearing protection that complies with standard EN<sup>3</sup> 24869-1:1992-10<sup>4</sup>; and
- e. the noise level is monitored during the event with sound measuring equipment in accordance with the Annex, section 2.1.

<sup>3</sup> European Committee for Standardisation

<sup>4</sup> EN 24869-1, 1992 (ISO 4869-1:1990), Acoustics – Hearing protectors. Part 1: Subjective method for the measurement of sound attenuation This standard is available for consultation, free of charge, at the Federal Office of Public Health, CH-3003 Berne, or at the Swiss Information Centre for Technical Rules (switec), Bürglistrasse 29, 8400 Winterthur or may be purchased via the website [www.snv.ch](http://www.snv.ch)

**Article 7** Events with sound levels between 96 dB(A) and 100 dB(A)

<sup>1</sup> Any person staging an event lasting a maximum of 3 hours and with sound levels between 96 dB(A) and 100 dB(A) must ensure that:

- a. the audio emissions are limited in such a way that the sound immission level does not exceed 100 dB(A);
- b. clearly visible notices are displayed in the entrance area to the event informing the audience about the maximum sound level of 100 dB(A); and
- c. the requirements of Articles 6b, 6c clause 2, 6d and 6e are fulfilled.

<sup>2</sup> Any person staging an event lasting longer than 3 hours and with sound levels between 96 dB(A) and 100 dB(A) must ensure that:

- a. the requirements of § 1 are satisfied;
- b. the noise level is recorded throughout the event with electronic noise measuring equipment in accordance with section 1.3 of the Annex;
- c. the recorded noise monitoring data and details of the measuring position, determination position and sound level difference in accordance with section 1.1, § 2 of the Annex shall be kept for 30 days and submitted to the executive authority on request and
- d. a sound recovery zone is made available to the audience and that the location of this zone is described in clearly visible notices displayed in the entrance area.

<sup>3</sup> Sound recovery zones must satisfy the following requirements:

- a. The sound level must not exceed 85 dB(A).
- b. They must comprise at least 10 percent of the event surface area intended for the audience.
- c. They must be clearly marked and freely accessible to the audience throughout the event.

**Article 8** Duty of notification

<sup>1</sup> The organiser must give the executive authority written notification that it is staging an event in accordance with Articles 6 and 7 at least 14 days prior to the event. The notification must include details of the:

- a. location and type of event;
- b. maximum sound level;
- c. date, start and duration of the event;
- d. name and address of the organiser;
- e. name and contact details of the responsible person at the event;

- f. if applicable, the application of the special measuring and calculation procedure described in section 1.4 of the Annex.

<sup>2</sup> For events subject to Article 7, § 2, a plan of the event site showing the location, size and identification of the sound recovery zone must be submitted.

#### **Article 9** Determination of immission values

<sup>1</sup> The measuring and calculation procedures for determining immission values are set out in the Annex.

<sup>2</sup> The organiser's measuring instruments must satisfy the requirements of section 2.1 of the Annex.

### **Section 3: Laser beams**

#### **Article 10** Basic principle

<sup>1</sup> Any person responsible for an organised event at which laser equipment is used shall ensure that it is set up and operated in such a way that:

- a. the requirements of Technical Report IEC<sup>5</sup> 60825-3:1995-12 on the safety of laser products<sup>6</sup> are observed;
- b. no harmful immissions affect persons attending the event.

<sup>2</sup> In particular:

- a. laser products in classes 1M, 2M, 3R, 3B and 4 must be fitted with an easy-to-operate emergency shut-off control that terminates the laser radiation immediately;
- b. laser products must be secured in such a way that they cannot be dislodged by crowd movements, vibrations or gusts of wind;
- c. no repairs or other tasks such as readjustment or correction of the beam path must be carried out on the laser products during the event.

<sup>3</sup> A laser immission shall be considered harmful if it exceeds the maximum permissible values for direct corneal exposure to laser beams as laid down in standard IEC 60825-1:2001-08 on the safety of laser products<sup>7</sup>.

<sup>4</sup> Laser immissions shall be considered harmless if the beams do not pass directly or indirectly within the spectator zone, i.e. the space up to 3 m above and 2.5 m to the side of areas reserved for the audience.

<sup>5</sup>

<sup>6</sup> IEC 60825-3, 1995, Safety of laser products Part 3:Guidance for laser displays and shows (French/Engl. only)

<sup>7</sup> 2001: Equipment classification, requirements and user's guide. These standards are available for consultation, free of charge, at the Federal Office of Public Health, CH-3003 Berne, or at Electrosuisse, Luppmenstrasse 1, 8320 Fehraltdorf, or may be purchased via the website [www.electrosuisse.ch](http://www.electrosuisse.ch)

**Article 11** Duty of notification

<sup>1</sup> The organiser must give the executive authority written notification that it is staging an event involving class 1M, 2M, 3R, 3B and 4 laser products at least 14 days prior to the event.

<sup>2</sup> The notification must include the following details and documents in particular:

- a. location and type of event;
- b. date, start and duration of the event;
- c. name and address of the organiser;
- d. location and time of use of the laser products;
- e. classification of the laser products used;
- f. information on whether laser beams pass directly or indirectly within the spectator zone during the event;
- g. plan of the event site showing the spectator zone and all safety margins;
- h. name and contact details of the responsible person at the event.

**Section 4: Implementation****Article 12** Executive authority

This Ordinance will be implemented by the Cantons.

**Article 13** Review of notifications

The executive authority shall review notifications to ensure they are complete. If any information is missing, the authority shall request the organiser to provide it without delay.

**Article 14** Measurements and inspections

<sup>1</sup> The executive authority conducts spot checks at events to verify compliance with the duty of notification, the applicable sound levels and other requirements stated in Articles 5, 6, 7 and 10.

<sup>2</sup> The executive authority's measuring instruments must satisfy the requirements of the Annex, section 2.2.

**Article 15** Measures

<sup>1</sup> If it is apparent from the advance notification that the requirements of this Ordinance will not be fulfilled, the executive authority shall take the necessary action or prohibit the event.

<sup>2</sup> If measurements or inspections during the event show that the applicable sound levels are being exceeded, or that the duty to protect the audience is not being

fulfilled, the executive authority shall instruct the person responsible for the event to limit the audio emissions or implement the necessary measures.

<sup>3</sup> In the event of repeated violations of this Ordinance, the executive authority may issue instructions for the installation of electronic noise-monitoring or noise-limiting equipment.

**Article 16**      Costs

Event organisers shall bear the costs of measurements, inspections and other services provided by the executive authorities.

**Section 5: Final provisions**

**Article 17**      Revocation of existing legislation

The Noise and Laser Ordinance of 24 January 1996<sup>8</sup> is revoked.

**Article 18**      Transitional provisions

Legally valid relief arising from the existing legislation shall continue to apply for two years at most after this Ordinance comes into force.

**Article 19**      Entry into force

This Ordinance shall enter into force on 1 May 2007.

28 February 2007

On behalf of the Swiss Federal Council

Federal President: Micheline Calmy-Rey

Federal Chancellor: Annemarie Huber-Hotz

## **Measuring and calculation procedures and requirements for measuring equipment**

### **1 Measuring and calculation procedures**

#### **1.1 Basic principle**

<sup>1</sup> Sound immissions are determined at ear level at the point at which the audience is exposed to the loudest noise (determination position).

<sup>2</sup> If the measuring position is not the same as the determination position, the immission values must be corrected accordingly. The measuring position, the determination position and the sound level difference between the two must be recorded in writing.

<sup>3</sup> The sound level is determined over a period of one hour (equivalent continuous sound level). The period for determining the mean level starts at any time during the event and lasts for a continuous 60 minutes. The equivalent continuous sound level may not exceed the sound level limit at any point during the event.

#### **1.2 Measuring procedure**

The measuring equipment used to measure the sound level is operated with the following settings:

- a. Frequency weighting A;
- b. Time weighting Fast (F) (time constant  $t_{on} = 125$  ms).

#### **1.3 Sound level recording**

The sound level recording pursuant to Article 7, § 2b must satisfy the following requirements:

- a. The  $L_{eq}$  level during the event must be recorded at least every 5 minutes.
- b. The sound monitoring data must be recorded in electronic form.

## **1.4 Special measuring and calculation procedure**

<sup>1</sup> The sound level must be measured at the mixing desk if the following preconditions are satisfied:

- a. The mixing desk is located within the spectator zone exposed to the sound.
- b. The high- and mid-frequency loudspeakers are positioned in such a way that the audience is uniformly exposed to the sound.
- c. The microphone for monitoring the sound level is in a fixed position at ear level on the mixing desk.
- d. The difference in sound levels between the mixing desk (measuring position) and the determination position according to section 1.1 § 1 is determined by a defined broadband signal (pink noise/program-simulated noise according to IEC-60268-1<sup>9</sup>) or another equivalent method.
- e. The determination position, sound level difference and method should be recorded in writing.
- f. The special measuring and calculation procedure was notified in accordance with Article 8.

<sup>2</sup> The applicable limit for the event is deemed to have been observed if the total of the value measured at the mixing desk plus the sound level difference is lower than or equal to the limit.

## **2 Requirements to be satisfied by the measuring equipment**

### **2.1 Organisers' measuring equipment**

The organisers' measuring equipment must satisfy the following requirements:

- a. it must be capable of measuring the A-weighted sound level  $L_A$ ;
- b. it must be capable of determining the mean level  $L_{eq}$  directly or indirectly.

### **2.2 Executive authorities' measuring equipment**

<sup>1</sup> The measuring and calibration equipment used by the executive authorities (Art. 14 § 2) to measure the sound immission levels must be approved by the Federal Office of Metrology (METAS) in accordance with section 1 of Annex 5 to the Measuring Instruments Ordinance of 15 February 2006<sup>10</sup> and calibrated by an agency authorised by METAS.

<sup>2</sup> Measuring equipment is approved if:

- a. it is capable of measuring the A-weighted sound level  $L_A$ ;

<sup>9</sup> IEC 60268-1, 1985, Sound system equipment. Part 1: General (French/Engl. only) These standards are available for consultation, free of charge, at the Federal Office of Public Health, CH-3003 Berne, or at Electrosuisse, Luppmenstrasse 1, 8320 Fehraltorf, or may be purchased via the website [www.electrosuisse.ch](http://www.electrosuisse.ch)

<sup>10</sup>



- b. it is capable of determining the mean level  $L_{eq}$  directly or indirectly.
- c. its design and technical properties match the state of the art, in particular as described in the recommendations of the International Electrotechnical Commission (IEC)<sup>11</sup> for class 1 equipment.

<sup>3</sup> Calibration equipment is approved if its design and technical properties match the state of the art, in particular the recommendations of the IEC.

<sup>4</sup> Measuring and calibration equipment must be calibrated before first use and at least every two years thereafter by METAS or by an agency authorised by METAS.

<sup>5</sup> Measuring equipment must be calibrated before each series of measurements.

<sup>11</sup> 2002, Electroacoustics - Sound level meters. Part 1: Specifications (French/Engl. only).  
IEC 61260, 1995, Electroacoustics - Octave-band and fractional-octave-band filters (French/Engl. only)  
IEC 60942, 2003, Electroacoustics - Sound calibrators (French/Engl. only)