

# COMMISSION OF THE EUROPEAN COMMUNITIES

COM(80) 340 final

Brussels, 19 June 1980

~~SECRET~~

Proposal for a  
COUNCIL DIRECTIVE

laying down basic standards for the health  
protection of workers and the general public  
against the dangers of microwave radiation

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(submitted to the Council by the Commission)

COM(80) 340 final

1. The attention of the Commission has been drawn to the particular dangers arising from the use of certain non-ionizing radiations and especially from systems emitting microwave radiations. Taking into account the increasing number of apparatuses on the one hand and their even wider utilisation and application on the other, the Commission estimates that not only for workers but also for individual members of the public it might be possible to observe not only any health effects but also the various damages resulting from the use of such an apparatus.
2. The Commission has adopted and recommended various provisions on occupational medicine and specially on the medical supervision of workers exposed to special hazards (\*). The Council of Ministers of Euratom adopted a directive on 2.2.1959 (O.J. No 11 of 20.2.1959) partly revised on 5.3.1962 (O.J. No 57 of 9.7.1962), on 27.10.1966 (O.J. No 216 of 26.11.1966) and on 1.6.1976 (O.J. No L 187 of 12 July 1976) laying down Basic Safety Standards for the health protection of the general public and of workers against ionizing radiations. Actually a new revision procedure is under way.
3. The principles and values embodied in the Basic Safety Standards were easily incorporated into the various national legislations. The subsequent application of the recommendations of the Commission devoted to the risks of occupational diseases was successful. The knowledge on these diseases was amplified by exchange of information on these diseases through the Commission, principally by the publication of medical surveys on occupa-

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(\*) See O.J. of E.C. of 31.8.1962 and 17.8.1966

- recommendations of the Commission to Member States on occupational medicine at places of work; approved the 23.7.1962
- recommendations on medical supervision of workers exposed to special hazards; approved the 27.7.1966

tional diseases recorded in the European list of occupational diseases (\*), a publication which was addressed to all those in charge of medical supervision, compensation or assessment.

Consequently, improved precautions against these diseases and also a better compensation of the damages were implemented in the Member States.

4. In their own ways, all Member States introduced into their legislations on health protection the basic principles of medical supervision of workers exposed to special risks, and particularly special provisions both for a pre-employment medical examination and routine medical examinations.

In addition, today, the legislation of radiological protection is such that both prevention of diseases that could be induced by ionizing radiations and prevention of acute accidents of irradiation at the place of work are ensured.

5. During the last years new systems and apparatuses emitting microwave radiations have appeared and new technologies using these kinds of electromagnetic but non-ionizing radiation have proliferated. For these new hazards it has been possible to collect sufficient data in order to ensure the prevention of damages that could be observed as a consequence of work - or in some cases that could be induced within the population at large by the availability of apparatuses and devices.
6. The biological effects of microwave radiation derive from an absorption of energy into the organism and increasing internal body temperature. Similarly it is recognized that microwave exposure is able to induce a cataract. The values proposed in the following provisions are fixed on the notion of acceptable, reversible and harmless effects.

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(\*) See O.J. of E.C. of 31.8.1962

- recommendation for the adoption of a European list of occupational diseases; approved the 23.7.1962

7. The Commission feels that a certain degree of harmonization in this particular field is necessary and urgent and that it is necessary to request governments of Member States to ensure the same level of protection for all exposed workers and for the population at large.
  
8. Conscious of these dangers, the European Parliament in the resolution of the sixth general report on the activity of the Commission in 1973 - resolution adopted at the session of 9.5.1973 - invited the Commission to establish basic standards for health protection against microwave radiation.

The opinion of the Economic and Social Committee on the "draft directive modifying the Basic Safety Standards establishing the principles for health protection of the population and workers against the dangers of ionizing radiations" - adopted at the session of 24 May 1973 - recommended that the experience of the Commission in the field of radiological protection should be extended to other types of dangers.

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THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100 thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the Economic and Social Committee,

Whereas Article 117 of the Treaty establishing the European Economic Community expresses the desire of the Member States to promote improved working conditions and an improved standard of living for workers; whereas Article 118 of that Treaty provides for close cooperation between Member States in the social field, particularly in matters relating to the prevention of occupational accidents and diseases and in matters relating to occupational hygiene,

Whereas the manufacture and use of apparatus emitting microwave radiation are governed by provisions laid down by law, regulation or administrative action in the Member States; whereas such provisions present differences as regards conditions of manufacture and use, which differences directly affect the establishment and functioning of the common market; whereas it is accordingly appropriate to eliminate them by measures for the approximation of such provisions,

Whereas this Directive is applicable without prejudice to the Community provisions already in force in this area and, in particular, to Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits,

Whereas the ever-increasing use of apparatus emitting microwave radiation and the rapid development of techniques involving such radiation will result in increased health hazards for workers and the general public,

Whereas the European Parliament, in its resolution on the Sixth General Report for 1972, invited the Commission to establish safety standards for health protection against the hazards arising from microwave radiation,

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<sup>1</sup> OJ No L 77, 26.3.1973, p. 29

Whereas action by the European Communities has led to the adoption of a certain number of principles relating in particular to the medical surveillance of workers exposed to specific risks and of Council Directive 76/579/Euratom of 1 June 1976 laying down the revised basic safety standards for the health protection of the general public and workers against the dangers of ionizing radiation,

Whereas on this occasion the Economic and Social Committee recommended that the experience gained by the Commission in the field of radiation protection should be extended to other fields of environmental health protection,

Whereas Article 100 of the Treaty stipulates that the Council shall issue directives for the approximation of such provisions laid down by law, regulation or administrative action in Member States as directly affect the establishment or functioning of the common market,

Whereas disparities between the legal provisions of the Member States regulating the manufacture, use and maintenance of apparatus emitting microwave radiation are in fact liable to affect directly the free circulation of these apparatus within the Community,

Whereas the protection of workers and of other members of the public against the dangers of microwave radiation demands that the prevention of exposure be organized on a systematic basis and that adequate medical surveillance be provided,

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<sup>2</sup> OJ No L 187, 12.7.1976.

HAS ADOPTED THIS DIRECTIVE :

TITLE I

Definitions

Article 1

For the purposes of this Directive, the following terms shall have the meaning hereby assigned to them :

- Controlled area: an area subject to special requirements for the purposes of protection against microwave radiation and to which access is regulated.
- Microwave radiation: electromagnetic radiation of frequency between 300 MHz and 300 GHz.
- Microwave system: an assembly of electrical, mechanical and physical components which emits microwave radiation.
- Radiant energy (R): energy emitted, transmitted or received in the form of radiation.  
The unit of radiant energy is the joule (J). A practical unit frequently used is the mWh (3.6 J).
- Energy fluence ( $\Psi$ ): quotient of dR by da, where dR is the radiant energy incident on a sphere of cross-sectional area da

$$\Psi = \frac{dR}{da}$$

The unit of energy fluence is the joule per square meter ( $J.m^{-2}$ ). A practical unit frequently used is the m.Whcm<sup>-2</sup> (10 Wh.m<sup>-2</sup> or  $3.6 \cdot 10^4 J.m^{-2}$ )

- Energy fluence rate ( $\Psi$ ): quotient of  $d\Psi$  by  $dt$ , where  $d\Psi$  is the increment of energy fluence in the time interval  $dt$

$$\Psi = \frac{d\Psi}{dt} = \frac{d^2R}{da dt}$$

The unit of energy fluence rate is the watt per square meter ( $W.m^{-2}$ ).  
A practical unit frequently used is the  $mW.cm^{-2}$  ( $10 W.m^{-2}$ ).

## TITLE II

### Scope

#### Article 2

Without prejudice to the provisions of Directive 73/23/EEC, this Directive shall apply to the manufacture, development, use, maintenance and repair of apparatus involving hazards arising from microwave radiation. It shall not apply to the exposure of patients for the purposes of medical examinations or treatments undergone by them.

## TITLE III

### Limits of exposure to microwave radiation

#### Article 3

1. The exposure of individuals to microwave radiation shall be as low as reasonably possible.
2. Without prejudice to Articles 4 and 5, for normal environmental conditions over the frequency range 300 MHz to 300 GHz, the maximum energy fluence rate shall be  $100 Wm^{-2}$  as averaged over any continuous 0.1 h period. In particular, exposure of any individual shall be kept below the limits set out in the Annex.

TITLE V

Principles of operational protection

Article 4

Where, independently of microwave exposure, working conditions are such as are liable to cause a significant increase in deep body temperature, or in the ambient environmental temperature, the appropriate medical service shall take into account the environmental factors in order, if necessary, to reduce exposure to a level lower than the limits laid down in Article 3.

Article 5

Agreed exceptional exposure of workers

1. For workers whose length and conditions of exposure are under health surveillance as provided for below, agreed exposure to levels higher than those specified in Article 3 may be authorized by the appropriate medical service referred to in Article 8.
2. For agreed exposures to continuous waves with energy fluence rates over  $1000 \text{ Wm}^{-2}$  ( $100 \text{ mWcm}^{-2}$ ) or to an equivalent pulse radiation, the radiation incident on the body shall be appropriately reduced by the wearing of protective clothing, which shall be tested periodically.

Demarcation of controlled areas

Areas in which, in normal operating conditions, the energy fluence rates may exceed the limits laid down in Article 3 shall be designated as controlled areas. Access to such areas shall be restricted to workers subject to control procedures.

Members of the public shall not normally have access to areas areas. If necessary, temporary controlled areas shall be demarcated. Appropriate warning signs shall be displayed at the boundaries of such areas.

The manufacturer or distributor of a system or apparatus emitting microwave radiation shall provide the consumer with adequate information to enable him to determine whether it is necessary to demarcate a controlled area. The boundaries of such area shall be fixed by the person responsible for security and surveillance.

Article 7

Warning signs for controlled areas

The minimum requirement for a controlled area shall be the control of access by appropriate warning signs.

Article 8

Medical surveillance of workers exposed to microwave radiation

Workers whose occupational activity involves exposure to microwave radiation shall undergo the medical surveillance normally provided for in the context of occupational medicine.

An appropriate medical service shall be available to workers exposed to levels exceeding the limits laid down in Title III.

Article 9

Information and training with a view to protecting workers

Any worker liable to be exposed to occupational microwave radiation shall be provided with adequate information on microwave radiation hazards and an appropriate training on the measures to be implemented with the view to preventing or limiting the hazards.

Article 10

Protection of the general public

In order to comply with the limits laid down in this Directive, for certain microwave systems an emission standard at certain distances from the source may be introduced. The essential characteristics which must be known and complied with if the apparatus is to be used without danger and in a manner in keeping with its intended purpose shall be indicated on the appliance emitting microwave radiation or, if this is not possible, on an accompanying label.

TITLE V

Maintenance and surveillance of appliances emitting microwave radiation

Article 11

The manufacturer or distributor shall provide adequate information to allow safe installation, maintenance and operation of the equipment.

TITLE VI

Article 12

1. Each Member State shall ensure that individual limits of exposure are kept below the values laid down in Article 3.
2. Each Member State shall ensure that an appropriate monitoring service is available, to the extent necessary, to undertakings manufacturing, importing, distributing or using microwave appliances.
3. Without prejudice to subsequent Community provisions, Member States shall lay down the emission standards provided for in Article 10.

Article 13

4. Member States shall take the measures necessary to comply with this Directive within one year of its notification.
5. Member States shall communicate to the Commission the provisions of national law which they adopt in the field governed by this Directive.

Article 14

This Directive is addressed to the Member States.

Done at Brussels, 19 June 1980

ANNEX- Limits of exposure for individuals

- a) For any period longer than 0.1 h, maximum energy fluence rates shall be lower than  $100 \text{ Wm}^{-2}$  ( $10 \text{ mW.cm}^{-2}$ ).
- b) For any period shorter than 0.1 h, energy fluences shall be lower than  $3.6 \cdot 10^4 \text{ Jm}^{-2}$  ( $1 \text{ mWh.cm}^{-2}$ ) with a maximum energy fluence rate not exceeding  $1000 \text{ Wm}^{-2}$  ( $100 \text{ mW.cm}^{-2}$ ).