COMMISSION OF THE EUROPEAN COMMUNITIES

COM(76) 48 final.

Brussels, 19 February 1976

Proposal for a

COUNCIL RESOLUTION

concerning the determination of criteria for Sulphur Dioxide and Suspended Particulate Matter in urban atmospheres

---

Proposal for a

COUNCIL DIRECTIVE

concerning health protection standards for sulphur dioxide and suspended particulate matter in urban atmospheres

---

(submitted to the Council by the Commission)

Proposal for a Council Resolution concerning the determination of criteria for Sulphur Dioxide and Suspended Particulate Matter in urban atmospheres

EXPLANATORY MEMORANDUM

This proposal for a Resolution determines health criteria (dose-effect relationships) for sulphur dioxide and suspended particulate matter and selects exposure levels on the basis of public health considerations suitable for the preparation of quality objectives and standards in urban environments for these two pollutants.

This proposal is the first step in the measures to be taken to reduce atmospheric pollution by sulphur dioxide and suspended particulate matter pursuant to the Programme of Action of the European Communities on the Environment (Part II, Title I, Chapter 1)*.

The programme requires, in the first instance, that an objective evaluation of the risks to human health and to the environment from each pollutant is carried out so that it is possible, without having resort to arbitrary values, to set limits to the presence of these pollutants in the environment to protect human health and the environment.

* O.J. No. C 112 of 20.12.1973.

In the Environmental Action Programme sulphur dioxide* and suspended particulate matter in the atmosphere are considered as first category pollutants for which priority action is required because of their toxicity, synergistic effects and the current state of knowledge regarding their significance for public health.

These two pollutants are among those substances for which an objective evaluation of the scientific data available could be carried out (a list of most of the documents which have been examined for this evaluation, is annexed to the present explanatory memorandum) with the certainty necessary for the development of criteria from the public health point of view.

The present resolution, in which sulphur dioxide and suspended particulate matter are considered simultaneously, is limited to the urban atmosphere in which most suspended particulates arise from the combustion of fossil fuels. This limitation is due to the fact that in all the scientific studies examined, suspended particulate matter is considered from an overall point of view, without taking the chemical composition into consideration.

* Among the sulphur compounds present in the atmosphere sulphur dioxide is a primary pollutant and forms the preponderant portion. From the health point of view sulphuric acid and sulphates play most probably an important role, but quantitative relationships as to their effects cannot yet be established.

In Annex I to the Proposal for a Resolution are set down the criteria (dose-effect relationships) for which enough scientific data were available to produce numerical values.

In Annex II to the Proposal for a Resolution are set down the exposure levels which have been selected for the preparation of quality objectives and standards. These are based on the criteria laid down in Annex I. The information available on acute effects is such that a range has to be given regarding the short term exposure to sulphur dioxide.

An in depth epidemiological study is currently under way within the framework of the Community's Environmental Research Programme, to gain further insight on the effects of these pollutants on children.

ANNEX

Documents used for the establishment of criteria

I General Documents

1. World Health Organization Air Quality Criteria and Guides for Urban Air Pollutants. Technical Report Series 506, WHO (Geneva) 1972.

2. Advies Inzake Grenswaarden SO_2. 22 Volksgezondheid Verslagen en mededelingen Jaargang 1971.

3. Pollution Atmosphérique. Critères de Qualité de l'Air Rélatifs aux Oxydes de Soufre, No. 7, Comité sur les Défis de la Société Moderne, novembre 1971.

4. Air Pollution. Air Quality Criteria for Particulate Matter, No. 8, Committee on the Challenges of Modern Society, November 1971.

5. Air Quality Criteria and Guides for Sweden in Regard to Sulfur Dixoide and Suspended Particulates. Nordisk Hygienisk Tidskrift Supplementum 5, Stockholm 1973.

6. Schwefeloxide in der Atmosphäre. Luftqualitätskriterien SO_2. Akademie der Wissenschaften Herausgegeben vom Bundesministerium für Gesundheit und Umweltschutz. Wien 1975.

7. Air Quality Criteria for Sulfur Dixoide US-NAPCA No. AP-50 (1969).

8. Air Quality Criteria for Particulate Matter. US-NAPCA No. AP-49 (1969).

II Scientific Literature

1. Animal Inhalation Experiments

a) Amdur, M. 1974 Cummings Memorial Lecture "The Long Road from Donora". Am.Indust.Hyg. Ass.J. 35, 589-597, 1974.

2. Human Inhalation Experiments

2.1 SO_2 effects at concentrations above 1 ppm

a) Lawther, P.J., Macfarlane, A.J., Waller, R.E. and Brooks, A.G.F. Pulmonary function and sulphur dioxide, some preliminary findings. Environ. Res. 10 (in press) Dec. 1975.

b) Andersen, I., Lundqvist, G-R., Jensen, P.L. and Proctor, D.F. Human response to controlled levels of sulphur dioxide. Arch. Environ. Hlth. 28, 31-39, 1974.

2.2 Prepared mixtures

a) Burton, G.G., Corn, M., Gee, J.B.L., Basallo, C. and Thomas, A.P. Response of healthy men to inhaled low concentrations of gas aerosol mixtures. Arch. Environ. Hlth., 18, 681, 1969.

b) Snell, R.E. and Luchsinger, P.C. Effects of sulphur dioxide on expiratory flow rates and total respiratory resistance in normal human subjects. Arch. Environ. Hlth., 18, 693, 1969.

c) Weir, F.W. and Bromberg, P.A. Effects of Sulfur Dixoide on Healthy and Peripheral Airway Impaired Subjects. Proceedings CEC-EPA-WHO International Symposium "Recent Advances in the Assessment of the Health Effects of Environmental Pollution". EUR 5360, Luxembourg 1975, pg. 1989.

d) Bates, D.V. and Hazucha, M. "The Effects of Low Levels of SO_2 and Ozone in the same atmosphere on Human Pulmonary Function". Proceedings CEC-EPA-WHO International Symposium "Recent Advances in the Assessment of the Health Effects of Environmental Pollution". EUR 5360, Luxembourg 1975, pg. 1979.

2.3 Urban Air

a) Kerr, H.D. Diurnal variation of respiratory function independent of air quality. Experience with an environmentally controlled exposure chamber for human subjects. Arch. Environ. Hlth., 26, 144-152, 1973.

3. Epidemiological Studies

3.1 1952 London Fog - 4000 excess deaths

a) Mortality and Morbidity during the London Fog of December 1952. H.M.Stationery Office, London, 1954.

3.2 Daily deaths

a) Lawther, P.J. Compliance with the Clean Air Act, Medical Aspects. J. Inst. Fuel, 36, 341, 1963.

b) Martin, A.E. Mortality and Morbidity Statistics in Air Pollution. Proc. Roy. Soc. Med., 57, 969-975, 1964.

c) Waller, R.E., Lawther, P.J. and Martin, A.E. Clean Air and Health in London. Proc. Clean Air Conf., Eastbourne, 71-79. Nat. Soc. Clean Air, London, 1969.

d) McCarroll, J. and Bradley, W. Excess Mortality as an indicator of Health Effects of Air Pollution. Am. J. Pub. Hlth., 56, 1933-42, 1966.

e) Buechley, R.W., Riggan, W.B., Hasselblad, V. and Van Bruggen, J.B. Arch. Environ. Hlth., 27, 134-137, 1973.

f) Schimmel, H. and Murawski, T.J. The relation of air pollution to mortality, New York City, 1963-72. J. Occup. Med. (in press) 1975.

g) Lebowitz, M.D., Toyama, T. and McCarroll, J. The relationship between air pollution and weather as stimuli and daily mortality as responses in Tokyo, Japan, with comparisons with other cities. Environ. Res. 6, 327-333, 1973.

h) Kandus, J. and Jurica, Z. The influence of SO_2 on the incidence of lower respiratory airways disease. Cited in Air Pollution Abstracts, 16879, February 1972.

i) Maziarka, S. and Moos, E. On the relation between air pollution and morbidity/mortality of the population of Polish towns. Cited in Air Pollution Abstracts, APRIC 29575, August 1971.

3.3 Morbidity Studies

3.3.1 Bronchitis

a) Lawther, P.C., Waller, R.E. and Henderson, M. Air Pollution and Exacerbations of Bronchitis. Thorax, 25, 172-177, 1970.

b) Clifton, M., Kerridge, D., Pemberton, J., Moulds, W. and Donaghue, J.K. Morbidity and mortality from bronchitis in Sheffield in four periods of severe air pollution. Proc. Int'l. Clean Air Conf. 188-192, Nat. Soc. Clean Air, London, 1959.

c) Royal College of Physicians. Air Pollution and Health, Pitman, London, 1970.

d) Gardner, M.J., Crawford, M.D. and Morris, J.N. Patterns of mortality in middle and early old age in the County Boroughs of England and Wales. Brit. J. Prev. Soc. Med., 23, 133, 1969.

e) Wenkelstein, W. The relationship of air pollution and economic status to total mortality and selected respiratory system mortality in man. Arch. Environ. Hlth., 16, 401-405, 1968.

f) Fairbairn, A.S. and Reid, D.D. Air pollution and other local factors in respiratory disease. Brit. J. Prev. Soc. Med., 12, 94-103, 1958.

g) Holland, W.W. and Reed, D.D. The urban factor in chronic bronchitis. Lancet, 1, 445-448, 1965.

h) Freour, P. and Coudray, P. Incidence of chronic bronchitis and of respiratory insufficiencies in an industrial rural population. Bulletin, INSERM, 25, 165, 1970.

i) Colley, J.R.T. and Reid, D.D. Urban and social origins of childhood bronchitis in England and Wales. Brit. Med. J., 2, 213-217, 1970.

j) Isunetoshi, Y. et al. Epidemiological study of chronic bronchitis with special reference to effect of air pollution. J. Int. Arch. Arbmed., 29, 1-27, 1971.

3.3.2 Ventilatory functions

a) Lawther, P.J., Lord, P.W., Brooks, A.G.F. and Waller, R.E. Air pollution and pulmonary airways resistance - a pilot study. Environ. Hlth., 6, 424-435, 1973.

b) Shy, C.M. et al. Air pollution effects on ventilatory function of U.S. schoolchildren. Arch. Environ. Hlth., 27, 125-128, September 1973.

c) Van der Lende, R. et al. A temporary decrease in the ventilatory function of an urban population during an acute increase in air pollution. Bull. Physic. Path. Resp. (Nancy), 11, 31-43, 1975.

d) Lawther, P.J., Brooks, A.G.F., Lord, P.W. and Waller, R.E. Day-to-day changes in ventilatory function in relation to the environment. Parts I, II and III. Environ. Res. 7, 27-40 and 41-53, 8, 119-130. 1974.

3.3.3 Respiratory Illnesses

a) Holland, W.W., Halil, T., Bennett, A.E. and Elliott, A. Factors influencing the onset of chronic respiratory disease. Brit. Med. J., 2, 205, 1969.

b) Holland, W.W., Reid, D.D., Seltser, R. and Stone, R.W. Respriatory disease in England and the United States. Arch. Environ. Hlth., 10, 338-345, 1965.

c) Douglas, J.W.B. and Waller, R.E. Air pollution and respiratory infection in children. Brit. J. Prev. Soc. Med., 20, 1, 1966.

d) Colley, J.R.T., Douglas, J.W.B. and Reid, D.D. Respiratory disease in young adults: influence of early childhood lower respiratory tract illness, social class, air pollution and smoking. Brit. Med. J., 3, 195-198, 1973.

e) Lunn, J.E., Knowelden, J. and Roe, J.W. Patterns of respiratory illness in Sheffield junior schoolchildren. A follow-up study. Brit. J. Prev. Soc. Med., 24, 223-228. 1970.

f) Comstock, G.W., Stone, R.W., Sakai, Y., Matsuya, T. and Tonascia, J.A. Respiratory findings and urban living. Arch. Environ. Hlth., 27, 143-150, 1973.

g) Ferris, B.G. Jr., Higgins, I.T.T., Higgins, M.W., Peters, J.M., Van Ganse, W.F. and Goldman, M.D. Chronic nonspecific respiratory disease, Berlin, New Hampshire, 1961-67. A cross-sectional study. Amer. Rev. Resp. Dis., 104, 232, 1971.

h) Carne, S. Air pollution study. Proc. Roy. Soc. Med., 57, 620-624, 1964.

i) Environmental Protection Agency. Health consequences of sulfur oxides: a report from CHESS, 1970-71. EPA 650/1-74-004. Government Printing Office, Washington D.C.

Proposal for a Council Resolution concerning the determination of criteria for Sulphur Dioxide and Suspended Particulate Matter in urban atmospheres

The Council of the European Communities

Having regard to the proposal of the Commission;

Whereas specific measures to protect man and his environment against the pollution and nuisances which assail him, should be supported by an objective analysis of the facts and the results of studies,

Whereas the definition of criteria establishing the relationship between a given exposure and an observable effect on human health is an important element in the objective evaluation of the undesirable effects or dangers inherent in any given pollution, and that these criteria should consist of the relationship between the exposure of a target to pollution or nuisance, and the risk and/or the magnitude of the adverse or undesirable effects resulting from the exposure in given circumstances,

Whereas analysis of criteria permits in particular the identification of the levels of pollution which have certain undesirable or harmful effects on man and to select "exposure levels" for the preparation of quality objectives and standards.

Whereas the Environmental Action Programme of the European Communities* states that criteria should be established as quickly as possible and that sulphur dioxide and suspended particulate matter should receive priority investigation, and have been chosen on the grounds of their toxicity and of the current state of knowledge of their significance in the health field,

* O.J. No. C112 of 20.12.1973.

Whereas sulphur dioxide is the most abundant sulphur compound present in urban atmospheres and the one for which adequate scientific information exists regarding the effects on health,

Whereas the most adequate scientific information which exists on the effects of suspended particulates refers to the suspended particulates in urban atmospheres arising from the combustion of fossil fuels,

Whereas sulphur dioxide and suspended particulate matter may act synergistically to produce significant effects on health,

Approves the criteria, establishing the relationships between given exposures and observable effects on man, set out in Annex I of this resolution,

Agrees to choose, for the purpose of preparing the basis for the establishment of quality objectives and standards to be included in measures to be adopted for the protection of human health against pollution by sulphur dioxide and suspended particulate matter, on the basis of these criteria, the "exposure levels" set out in Annex II of the present resolution.

Notes that the Commission will shortly present appropriate proposals based on the above points.

Annex I

Criteria establishing the relationships between given exposures and observable effects on man for sulphur dioxide and suspended particulate matter

1. When sulphur dioxide and suspended particulate matter (determined as "black smoke"*) exceed simultaneously a mean value of 500 $\mu g/m^3$ for several days, excess mortality and increase in the number of hospitalizations are observed among aged persons, having in particular severe cardiovascular and respiratory symptoms.

2. When sulphur dioxide and suspended particulate matter exceed simultaneously concentrations of 250 $\mu g/m^3$ for several days a subjective exacerbation of symptoms is observed in patients having chronic bronchitis. This exacerbation is much less pronounced when only sulphur dioxide exceeds these levels.

3. For levels slightly lower than 250 $\mu g/m^3$ (daily concentrations) for sulphur dioxide and suspended particulate matter there are indications that sensitive persons exhibit temporary changes in their pulmonary respiratory functions.

4. When sulphur dioxide and suspended particulate matter exceed simultaneously 100 $\mu g/m^3$ as long term averages respiratory symptoms in the form of increased infection of the lower respiratory tract and decrease in the maximum expiratory flow rates are observed in children.

* Based on the standardized method put forward by the OECD Working Group on methods for the measurement of air pollution, 1964.

Annex II

Exposure Levels Selected for the Preparation of Quality Objectives and Standards

1. Short term exposure of 250 to 500 $\mu g/m^3$ of sulphur dioxide accompanied by 250 $\mu g/m^3$ of suspended particulate matter.

Note: Short term exposure is defined as 24 hour concentrations not to exceed a few days and occurring quite infrequently in the course of a year.

2. Long term exposure of 100 $\mu g/m^3$ of sulphur dioxide and suspended particulate matter.

Note: Long term exposure is defined as an exposure to mean concentrations over periods exceeding one year.

Proposal for a Council Directive concerning health protection standards for sulphur dioxide and suspended particulate matter in urban atmospheres

EXPLANATORY MEMORANDUM

This proposal for a directive makes provision for the establishment of health protection standards prescribing levels of sulphur dioxide and suspended particulates which must not be exceeded in urban atmospheres in the interests of public health.

I Observations on the proposal for a directive

This proposal for a directive is one of the measures to reduce reduce pollution and nuisances pursuant to the Action Programme of the European Communities on the Environment (Part II, Title I, Chapter 1)*.

The programme requires that an objective evaluation of the risks to human health and to the environment from pollution be carried out, so that it is possible, without having resort to arbitrary values, to set limits to the presence of pollutants in the environment to protect human health and the environment.

In order to set these limits, a critical and objective analysis has been made of the adverse and undesirable effects of the exposure of a target (man) to sulphur dioxide and suspended particulate matter, and a proposal for a resolution determining criteria has been submitted to the Council of Ministers.

* OJ No. C 112 of 20 December 1973.

In this Environmental Action Programme of the European Communities sulphur dioxide* and suspended particulate matter in the atmosphere are considered as first-category pollutants, for which priority action is required because of their toxicity, synergic effects and the current state of knowledge of their significance for public health.

Sulphur dioxide and suspended particulate matter are among those substances for which an objective evaluation of the effects may be carried out with the certainty necessary for the adoption of appropriate regulations.

In drawing up its proposal for a directive, the Commission has been guided by the principles defined in the Community's "Action Programme on the Environment" (Part II, Title I, Chapters 1 and 2).

In order to assess objectively the risks represented by these pollutants, the Commission has undertaken the following tasks:

- compilation of as complete a bibliography as possible on the effects of the pollutants under consideration and a critical analysis of this information;

* Of all the sulphur compounds present in the atmosphere, sulphur dioxide is a primary pollutant and forms the preponderant portion.

- determination of criteria for the pollutants under consideration;

- harmonization of the measuring methods and instruments, so as to render the results of pollution measurements in the Community comparable.

The Commission has also taken into account the work carried out at national and international level. In particular the Commission has examined the report by the WHO Committee of Experts (1972) on sulphur dioxide and suspended particulate matter, (No. 506 of the Technical Report Series), as well as a number of national scientific reports.

In the Commission's view there is sufficient knowledge of the effects on health of exposure to sulphur dioxide and suspended particulate matter to allow appropriate health protection standards to be set for urban atmospheres. The Commission therefore proposes the adoption of the directive concerning these standards.

Health protection is the main consideration underlying the formulation of this proposal for a directive, but account is also taken of the economic and technical aspects.

With regard to the reduction of atmospheric pollution by sulphur dioxide from individual heating installations and from diesel-driven vehicles, the Commission forwarded to the Council on 13 February 1974 a proposal for a directive on the sulphur content of certain combustible liquids (COM/74/158 final).

A detailed study of the laws, regulations and administrative provisions in force in the Member States has shown that no air quality standards, as envisaged in this directive, exist for the two pollutants in question in any Member State.

II Observations on certain basic aspects of the proposal for a directive

Article 1 defines the meaning of air quality standards for sulphur dioxide and suspended particulates and prescribes the levels which must not be exceeded. These concentrations are based on the proposal for a Council resolution concerning the determination of criteria for sulphur dioxide and suspended particulates in urban atmospheres, previously submitted to the Council.

Article 2 requires the Member States to take the necessary measures to ensure compliance with the air quality standards. Paragraph 2 of this Article provides for exceptions, which are clearly defined in Annex 2, to the implementation of this directive during a transition period ending in 1987 in order to allow the Member States time to take all the measures required.

The Member States may always impose more severe air quality stnadards and anticipate the deadlines laid down in Article 2, provided that these standards are not an obstacle to the proper functioning of the Common Market.

Article 3 lays down the procedure by which the Member States are to inform the Commission of existing pollution levels and also of proposed measures to reduce these levels.

This procedure is largely based on the Council Decision of 24 June 1975 establishing a common procedure for the exchange of information between the surveillance and monitoring networks based on data relating to atmospheric pollution caused by certain sulphur compounds and suspended particulates.

In the case of regions not covered by the above common procedure for the exchange of information, the Commission is to be informed only of levels exceeding the standards.

Article 4 emphasises that the implementation of this Directive must not lead to a deterioration of air quality in the "clean" regions; as far as possible, compliance with the standards must be achieved by reducing emissions and not by wider dispersal of pollutants in the environment.

Articles 5 and 6 and Annex 3 lay down reference methods for analysis of the pollutants with which this Directive is concerned, but at the same time allow the Member States the option of using equivalent methods and require the Commission to help Member States to demonstrate that such methods are equivalent.

Articles 7, 8 and 9 lay down a procedure for modification of standards and methods of measurement to take account of scientific and technical progress.

The following proposal for a directive is based on Article 235 of the Treaty establishing the European Economic Community.

III Consultation of the European Parliament and the Economic and Social Committee

Under the terms of Article 235 of the Treaty establishing the European Economic Community, the opinion of these two institutions must be sought.

Proposal for a

COUNCIL DIRECTIVE

on health protection standards for sulphur dioxide and suspended particulate matter in urban atmospheres

THE COUNCIL OF THE EUROPEAN COMMUNITIES -

Having regard to the Treaty establishing the European Economic Community, and in particular Article 235,

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 one of the essential tasks of the European Economic Community is to promote the harmonious development of economic activities and a continuous and balanced expansion throughout the Community; whereas these aims must involve the control of pollution and nuisance and the improvement of the quality of life and of environmental protection;

Whereas the Action Programme of the European Communities on the Environment provides for priority action in the cases of sulphur compounds and suspended particulates because of their harmful effects and the current state of knowledge of their significance with regard to public health;

Whereas health protection standards must be established based on the degree of harmfulness of the above pollutants in order to safeguard the population;

Whereas the health protection standards for these two pollutants consist of concentrations, observed over specified periods of time, below which there is no unacceptable hazard to health;

Whereas during a first phase exceptional concentrations could be tolerated;

Whereas the adoption of health protection standards is necessary to create a harmonized Community policy designed to reduce emissions of these pollutants; whereas since the Treaty does not provide the necessary powers for such action, Article 235 of the Treaty must be relied on;

Whereas fresh scientific knowledge may subsequently render it necessary to revise the health protection standards specified in Annex I, the exceptional concentrations specified in Annex II and the methods specified in Annex III in respect of the two pollutants covered by this Directive;

Whereas, to make in easier to adopt the necessary measures, there should be a procedure to ensure close cooperation between the Member States and the Commission within a Committee to amend this Directive in the light of technical progress,

HAS ADOPTED THIS DIRECTIVE:

Article 1

(1) This Directive is intended to establish health protection standards for sulphur dioxide and suspended particulates in the atmosphere in order to safeguard public health against contamination of urban atmospheres.

(2) For the purposes of this Directive, health protection standards means the maximum concentrations of sulphur dioxide and suspended particulates which must not be exceeded during a specified period of time.

Article 2

(1) Member States shall take the measures necessary to ensure compliance by 1982 with the health protection standards for sulphur dioxide and suspended particulates in urban atmospheres listed in Annex I, without prejudice to other Community provisions in this field.

(2) Between 1982 and 1987, in the event of particularly unfavourable meteorological conditions (such as persistent temperature inversions), concentrations exceeding the standards for daily levels listed in Annex I may be tolerated by way of exception before measures are taken to reduce emissions, provided that such excess concentrations do not occur for longer than three consecutive days and that daily levels do not exceed the concentrations laid down in Annex II.

Article 3

(1) Member States shall, where necessary, establish a measurement network for these pollutants in all urban areas where the concentrations may approach or exceed the air quality standards listed in Annex I.

(2) Pursuant to the Council Decision of 24 June 1975 establishing a common procedure for the exchange of information between the surveillance and monitoring networks based on data relating to atmospheric pollution caused by certain sulphur compounds and suspended particulates, Member States shall inform the Commission of the pollution levels measured in Member States for the two pollutants covered by this Directive.

(3) Until 1982 Member States shall additionally make annual returns of all information relating to the zones in which the standards listed in Annex I of this Directive are exceeded.

(4) Between 1 January 1982 and 31 December 1986 Member States shall, in addition to the information required under Article 3 (2), make half-yearly returns of all information relating to the zones in which the standards listed in Annex I of this Directive are exceeded. They shall also inform the Commission of the measures taken if the exceptional levels listed in Annex II are exceeded and shall indicate the meteorological conditions which caused the levels to be exceeded. The Commission shall, within three months, deliver an opinion on the measures taken.

(5) From 1 January 1987 Member States shall, in addition to the information required under Article 3 (2), make quarterly returns to the Commission of all information relating to the zones in which the standards listed in Annex I of this Directive are exceeded, of the circumstances causing the standards to be exceeded and the remedial measures taken. The Commission shall, within three months, deliver an opinion on the measures taken.

Article 4

The measures taken by Member States to ensure compliance with the health protection standards in urban atmospheres shall not lead to a deterioration in the quality of the atmosphere in regions where air pollution is slight.

Article 5

Analysis of the concentrations of the pollutants covered by this Directive shall be carried out in accordance with the methods set out in Annex III.

Article 6

The Commission shall assist the implementation and operation of this Directive by harmonizing the measurement methods provided for under Article 5 and by facilitating the exchange of information on measures taken to improve the situation in zones in which pollution levels exceeding the air quality stnadards have been recorded.

Article 7

Any amendments necessary to adapt Annexes I to III of this Directive to the latest developments in science and technology, as regards the numerical values set by the health protection standards and the methods of analysis, shall be made in accordance with the procedure set out in Article 9.

Article 8

(1) A Committee (hereinafter referred to as "the Committee") shall be established, consisting of representatives of Member States and presided over a representative of the Commission, to ensure that the Directive on the health protection standards for sulphur dioxide and suspended particulates in urban atmospheres is amended in the light of scientific and technical progress.

(2) The Committee shall draw up its own Rules of Procedure.

Article 9

(1) Where the procedure laid down in the preceding Article is to be followed, the Chairman shall refer the matter to the Committee, either on his own initiative or at the request of a representative of a Member State.

(2) The representative of the Commission shall submit to the Committee a draft of the measures to be adopted. The Committee shall deliver its Opinion on such measures within a time limit set by the Chairman according to the urgency of the matter. 41 votes shall be required to constitute a majority, the votes of the Member States being weighted in accordance with Article 148(2) of the Treaty. The Chairman shall not vote.

(3) The Commission shall adopt the measures where they are in accordance with the Opinion of the Committee.

Where they are not in accordance with the Opinion of the Committee, or if no Opinion is delivered, the Commission shall forthwith propose to the Council the measures to be adopted. The Council shall act by a qualified majority.

If the Council has not acted within three months of the date of the submission of the proposal, the Commission shall adopt the proposed measures.

Article 10

Annexes I, II and III to this Directive are an integral part of this Directive.

Article 11

(1) Member States shall bring into force the laws, regulations and administrative provisions needed in order to comply with this Directive within 18 months of its notification and shall forthwith inform the Commission thereof.

(2) Member States shall communicate to the Commission the texts of the main provisions of national law which they adopt in the field covered by this Directive.

Article 12

This Directive is addressed to the Member States.

ANNEX I

HEALTH PROTECTION STANDARDS FOR SULPHUR DIOXIDE AND SUSPENDED PARTICULATES IN URBAN ATMOSPHERES

SULPHUR DIOXIDE

Reference Period	Maximum Concentrations	Associated concentrations of suspended particulates
Year	Median of daily means 80 $\mu g/m^3$	Annual medial of daily means > 40 $\mu g/m^3$
Year	Median of daily means 120 $\mu g/m^3$	Annual median of daily means < 40 $\mu g/m^3$
Winter (October-March)	Median of daily means 130 $\mu g/m^3$	Winter median of daily means > 60 $\mu g/m^3$
Winter (October-March)	Median of daily means 180 $\mu g/m^3$	Winter median of daily means < 60 $\mu g/m^3$
24 hours	Arithmetic mean 250 $\mu g/m^3$	Arithmetic mean of concentration over 24 hours > 100 $\mu g/m^3$
24 hours	Arithmetic mean 350 $\mu g/m^3$	Arithmetic mean of concentration over 24 hours < 100 $\mu g/m^3$

SUSPENDED PARTICULATES

Reference Period	Maximum Concentrations
Year	Median of daily means 80 $\mu g/m^3$
Winter (October-March)	Median of daily means 130 $\mu g/m^3$
24 hours	Arithmetic mean 250 $\mu g/m^3$

ANNEX II

EXCEPTIONAL CONCENTRATIONS
FOR SULPHUR DIOXIDE AND SUSPENDED PARTICULATES
IN URBAN ATMOSPHERES

SULPHUR DIOXIDE

Reference Period	Maximum Concentrations	Associated concentrations of suspended particulates
24 hours	Arithmetic mean 350 μ g/m^3	Arithmetic mean of concentration for 24 hours > 100 μ g/m^3
24 hours	Arithmetic mean 500 μ g/m^3	Arithmetic mean of concentration for 24 hours < 100 μ g/m^3

SUSPENDED PARTICULATES

Reference Period	Maximum Concentrations
24 hours	Arithmetic mean 300 μ g/m^3

ANNEX III

METHODS OF ANALYSIS TO BE EMPLOYED
FOR THE PURPOSES OF THIS DIRECTIVE

Sulphur Dioxide

The reference method of analysis for the measurement of sulphur dioxide is that proposed in the draft ISO standard DP 4219. This method is based on the principle of colorimetric reaction with pararosaniline.

Any other method shown by the Member States to be equivalent may be used. To this end, periodic intercomparison programmes will be organized by the Commission.

Suspended Particulates

For measurement of particulate matter suspended in the atmosphere, the method used for black smoke, as standardized by the Working Party on methods of measuring air pollution and survey techniques of the OECD (1964), is taken as the comparison method.

Note: This method is still adequate for this purpose, though there is a need for more refined methods to determine physical and chemical composition of particles due to the changing pattern of fuel usage in the Community.

The development of an adequate comparison method based on gravimetric and particle size determinations will be promoted by the Commission.