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Working Party on Gas

Ad Hoc Group of Experts on the
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EXISTING STANDARDS AND REGULATIONS ON PERMISSIBLE CONCENTRATIONS OF HARMFUL COMPONENTS IN GASEOUS FUELS AND GASEOUS FUELS COMBUSTION PRODUCTS

Draft questionnaire prepared by the delegation of Poland */

You are kindly requested to review the questionnaire and send your comments and proposals to the General Rapporteur, Mr. Andrzei Fronski, Deputy Director, Oil and Gas Institute, Ul. Lubicz 25 A, 31-503 Crakow, Poland, Fax: +48 12 653 1665, with a copy to the ECE secretariat by 1 December 1999

*/ In accordance with the decision taken by the first meeting of the Bureau and the General Rapporteurs of the Ad Hoc Group of Experts, held in January 1999 (ENERGY/WP.3/GE.5/1, para 9(c)).

1. The former Meeting of Experts on the Use and Distribution of Gas decided, at its twenty-ninth session in September 1998, to merge the two programme elements “Existing standards on permissible concentrations of noxious components in gas combustion products” (06.3.7.2.1) and “Instruments for continuous measurement of concentrations of noxious components in gas combustion products and in the atmosphere (06.37.2.2) into a new one - “Existing standards and regulations on permissible concentrations of harmful components in gaseous fuels and gaseous fuels combustion products”.

2. The Meeting invited the delegation of Poland to prepare a draft questionnaire on this new topic.

3. Harmful effects on the environment and health related to the use of gaseous fuels are mainly a result of:

- emission to the atmosphere of the pollutants of gaseous fuels and products of pollutants combustion, and

- emission of NO_x and CO formed during the combustion of gaseous fuels.

4. The following pollutants contained in gaseous fuels represent a danger to the environment and to users of fuels: sulphur compounds (mainly H_2S and mercaptans) and, sometimes, mercury content in natural gases (mainly produced from Permian limestone formations). Permissible concentrations of these contaminants in gaseous fuels are given either in legal rules which are obligatory in some countries or in standards or technical codes of practice for gaseous fuels. Existing processes for the cleaning of natural gas and LPG gases can meet all environmental and health requirements. It would be useful to review the maximum permissible pollutant concentrations in gaseous fuels distributed and supplied to final consumers in order to collect information used in possible future harmonization of these requirements. It would also be useful if the questionnaire covered requirements for odorisation (e.g. type of odorant, odorisation level, methods of its control and measurement), which are important from the point of view of safety of environment and users.

5. This project is to some extent a continuation of ISO activities on the preparation of standards: “Natural gas - Quality designation” (ISO 13686) and “Natural gas - Organic sulphur compounds used as odorants - Requirements and test methods” (ISO 13734). These standards describe the parameters which should be taken into account during quality assessment of natural gases, but the permissible or optimum values of these parameters are not specified.

6. During combustion of gaseous fuels the formation of dangerous products takes place (mainly No_x and CO). Concentration and emission levels of these

products to the atmosphere depend on the design of burner, type of combustion process and the value of the λ coefficient. To minimize the emission of all combustion products harmful to the environment and people (NO_x, CO) the manufacturers of gas appliances are doing their best to limit concentrations of CO and NO_x in flue gases because the “environment friendly” gas appliances are winning against competition in the market. On the other hand, for the benefit of environment and society, the governments of many countries implement legislation or standards limiting concentrations of toxic compounds in flue gases. The questionnaire concerning NO_x emissions should also cover CO emissions, because conditions promoting CO formation limit, at the same time, the formation of NO_x and vice versa.

7. The results of this project would allow us to collect and compare legislation and standards existing in various countries concerning emissions of No_x and CO to the atmosphere as well as to use them as a basis for their possible optimization and harmonization.

8. The questionnaire should cover:

- types of obligatory legislation (acts, decrees, standards, technical codes of practice);
- types of appliances under legislation (e.g. their thermal output);
- pollutant emission limits (permissible concentrations in fuel gases, maximum permissible discharge to atmosphere, factors taken into account for limitation of emissions (age of appliances, kind of emitters, location, thermal output, etc.);
- changes in legislation during the last 10 years due to technical progress, growing environmental concerns and trends towards sustainable development;
- requirements concerning measurement of the concentration of harmful components in flue gases (frequency, precision, etc.).

9. There is no need to collect data on the measuring instruments since these vary greatly in performance and precision. Generally they are fast multi-functional analysers frequently modified by producers. The collected information would be fully representative and up to date for only a very short period of time.

QUESTIONNAIRE

A. Environmental aspects of the use of gaseous fuels
Permissible content of pollutants in gaseous fuels

COUNTRY:		
1. Are there any regulations regarding the quality of gaseous fuels (legal acts, standards, codes of practice)? *Answer "yes" or "no". If "yes", please give detailed information in the "Specification" column on the act or standard (title in original language and in English, number of standard, date of publication)*		
	Yes or No	Specification
Natural gas		
LPG		

2. Which pollutants are subject to limitation? *Please give detailed information in the "Specification" column on the permissible concentration*			
		Yes or No	Specification
Natural gas	H_2S		
	S_{H2S}		
	R-SH		
	S_{R-SH}		
	S_t		
	Hg		
	Others		
LPG	H_2S		
	S_{H2s}		
	R-SH		
	S_{R-SH}		
	S_t		
	Hg		
	Others		

H_2S - hydrogen sulphide R-SH - mercaptans S_t - total sulphur
S_{H2s} - hydrogen sulphide sulphur S_{R-SH} - mercaptan sulphur Hg - mercury

B. Environmental aspects of the use of gaseous fuels
Requirements on odorization

COUNTRY:	

1. Are there any regulations regarding the odorization of gaseous fuels (legal acts, standards, codes of practice)?

Answer "yes" or "no". If "yes", please give detailed information in the "Specification" column on the act or standard (title in original language and in English, number of standard, date of publication).

	Yes or No	Specification
Natural gas		
LPG		

2. Are there any regulations regarding odorisation levels?

Answer "yes" or "no". If "yes", please give detailed information in the "Specification" column on the required level of odorisation.

	Yes or No	Specification
Natural gas		
LPG		

3. Are there any regulations regarding odorisation level control?

Answer "yes" or "no". If "yes", please give detailed information in the "Specification" column on the standards or method of control procedure

	Yes or No	*Specification*
Natural gas		
LPG		

C. Environmental aspects of the use of gaseous fuels: Permissible emissions of No_x and CO from natural gas and LPG combustion

COUNTRY:			
1. GOVERNMENT LEGAL REGULATIONS			
1.1 Are there any GOVERNMENT regulations on permissible NOx and CO emission levels for power production equipment using gaseous fuels (natural gas, LPG)? *Answer "yes" or "no". If "yes", please indicate in the "Specification" column the kind of regulation (act, decree) and give detailed information (title in original language and in English, date of publication, duration of validity)*			
		Yes or No	Specification
Gas turbines	NO_x		
	CO		
Gas engines	NO_x		
	CO		
Industry energy boilers	NO_x		
	CO		
Industrial burners	NO_x		
	CO		
1.2 What criteria are used in determining the emission limits? *Please indicate in the "Specification" column the limit values and conditions under which they are valid i.e. thermal output of the power production equipment, year of power production equipment construction, etc.*			
(a) Permissible emission of NO_x and CO per unit of produced energy			
		Yes or No	Specification
Gas turbines	NO_x		
	CO		
Gas engines	NO_x		
	CO		
Industry energy boilers	NO_x		
	CO		

Industrial burners	NO_x		
	CO		
(b) Permissible concentration in flue gases			
		Yes or No	Specification
Gas turbines	NO_x		
	CO		
Gas engines	NO_x		
	CO		
Industry energy boilers	NO_x		
	CO		
Industry energy boilers	NO_x		
	CO		
(c) Possibility of use of power producing equipment depending on the level of permissible concentrations of pollutants in the air in a given area			
		Yes or No	Specification
Gas turbines	NO_x		
	CO		
Gas engines	NO_x		
	CO		
Industry energy boilers	NO_x		
	CO		
Industry energy boilers	NO_x		
	CO		
1.3 Are there any requirements for monitoring the NO_x and CO emissions from power production equipment? *Answer "yes" or "no". If "yes", please indicate in the "Specification" column the obligatory measurements, precision and frequency, and the measurement method (if applicable)*			
		Yes or No	Specification
Gas turbines	NO_x		
	CO		

Gas engines	NO_x		
	CO		
Industry energy boilers	NO_x		
	CO		
Industrial burners	NO_x		
	CO		

2. STANDARDS

2.1 Do standards dealing with requirements and test methods for gas appliances include limitations on the NOx and CO concentrations in flue gases?

Answer "yes" or "no". If "yes", please indicate in the "Specification" column the number of the standard, its title in original language and in English.

		Yes or No	Specification
Central heating boilers	NO_x		
	CO		
Catering equipment	NO_x		
	CO		
Air heaters (space heaters)	NO_x		
	CO		
Gas cookers	NO_x		
	CO		
Instantaneous water heaters	NO_x		
	CO		
Storage water heaters	NO_x		
	CO		

2.2 What are the permissible values of NOx and CO concentrations in flue gases from gas appliances?

If applicable give in the "Specification" column the limit values with an explanation of the conditions under which they are valid i.e. oxygen concentration in flue gases or 8 value

		Specification
Central heating boilers	NO_x	
	CO	
Catering equipment	NO_x	
	CO	
Air heaters (space heaters)	NO_x	
	CO	
Gas cookers	NO_x	
	CO	
Instantaneous water heaters	NO_x	
	CO	
Storage water heaters	NO_x	
	CO	

3. COMMENTS

3.1 What were the main changes in legal rules and standards concerning NO_x and CO emissions from gaseous fuels combustion in the last decade?

3.2 Are any substantial changes intended in the near future in the legal rules and standards concerning NO_x and CO emissions?

3.3 Any other comments (e.g. on the strictness of legal rules and standards, on the need for amendments to legal rules and standards, etc.