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STATUTORY INSTRUMENTS

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**1996 No. 439**

**GAS**

**The Gas (Calculation of Thermal Energy) Regulations 1996**

*Made* - - - - 27th February 1996  
*Laid before Parliament* 28th February 1996  
*Coming into force* - - 1st March 1996

The Director General of Gas Supply, with the consent of the Secretary of State, in exercise of the powers conferred on her by sections 12(1) (read with section 48(1)(1)), (3), (4) and (5), 13(2) and (3) and 47 (3)(a), (aa) and (b) and (4) of the Gas Act 1986(2) and of all other enabling powers, hereby makes the following Regulations:

**PART I**

**General**

**Citation and commencement**

1. These Regulations may be cited as the Gas (Calculation of Thermal Energy) Regulations 1996 and shall come into force on 1st March 1996.

**Interpretation and application**

2.—(1) In these Regulations, unless the context otherwise requires—

“the Act” means the Gas Act 1986;

“appropriate standard temperature conversion system” means a system for converting, with such accuracy as is reasonably practicable, any volume of gas into the volume which that volume would have if the gas had been measured at a temperature of 15°C and at the same pressure;

“appropriate standard volume conversion system” means a system for converting, with such accuracy as is reasonably practicable, any volume of gas into the volume which that volume

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(1) See the definition of “prescribed”.

(2) 1986 c. 44; sections 12 and 13 were substituted by paragraphs 6 and 7 respectively of Schedule 3 to the Gas Act 1995 (c. 45); section 47(3)(aa) was inserted by the Competition and Service (Utilities) Act 1992 (c. 43), Schedule 1, paragraph 9(3).

would have if the gas had been measured at a temperature of 15°C and a pressure of 1013.25 millibars;

“charging area” means an area, within an authorised area of a public gas transporter, where the transporter intends to charge for the gas conveyed to any take off point situated in the area on the basis of the same daily calorific value;

“converted volume of gas”, in relation to gas conveyed to any meter for registering the volume of gas conveyed to a take off point during a gas period, means the volume of that gas in cubic metres which—

- (a) in so far as the meter is connected to an appropriate standard volume conversion system and that system is in operation throughout the gas period, is given by the application of the system to the registering of the volume of gas;
- (b) in so far as—
  - (i) the meter is connected to an appropriate standard temperature conversion system and that system is in operation throughout the period; and
  - (ii) gas is conveyed to the meter at a rate which is reasonably expected to exceed 2,500 therms or 73,200 kilowatt hours a year (if the temperature and pressure conversion factor within the meaning of paragraph (b) of the definition of that expression were applied to the volume of gas registered by the meter),

is given by the application of the system to the registering of the volume of gas and by multiplying the result by the number given by the following formula, namely—

$$P \times Z$$

where

P =the pressure conversion factor calculated in accordance with the provisions of Part I of the Schedule to these Regulations;

Z =the compressibility conversion factor calculated in accordance with Part II of that Schedule;

- (c) otherwise, is given by multiplying the temperature and pressure conversion factor by the volume of gas registered by the meter;

“the Director” means the Director General of Gas Supply;

“gas day” means a period of 24 hours beginning at 6am on one day and ending immediately before 6am on the following day;

“gas examiner” means a person appointed under section 13(1) of the Act;

“gas period” means one or more successive gas days;

“relevant licence holder”, in relation to a public gas transporter, means—

- (a) another public gas transporter operating a pipe-line system to which gas is conveyed through pipes by the transporter; or
- (b) a gas shipper who has arranged with the transporter for gas to be introduced into, conveyed by means of or taken out of a pipe-line system operated by the transporter;

“take off point”, in relation to a public gas transporter, means any premises to which gas is conveyed by the transporter or any point at which gas conveyed by the transporter enters any pipe-line system operated by another public gas transporter;

“temperature and pressure conversion factor”, in relation to any meter for registering the volume of gas conveyed to a take off point, means—

- (a) where gas is conveyed to the meter at a rate which is reasonably expected not to exceed 25,000 therms or 732,000 kilowatt hours a year (if the conversion factor within the meaning of paragraph (b) below were applied), 1.02264; or
- (b) where gas is conveyed to the meter at a rate which is reasonably expected to exceed 25,000 therms or 732,000 kilowatt hours a year (if the conversion factor within the meaning of this paragraph were applied) the number given by the following formula, namely—

$$T \times P \times Z$$

where—

T =the standard temperature conversion factor, namely 1.0098;

P =the pressure conversion factor calculated in accordance with the provisions of Part I of the Schedule to these Regulations;

Z =the compressibility conversion factor calculated in accordance with Part II of that Schedule;

(2) Any reference in these Regulations to the volume of gas registered by a meter shall, where the meter registers in cubic feet, be construed as a reference to the volume of gas so registered multiplied by 0.0283.

(3) Except in the cases prescribed by paragraph (4) below, the number of therms or kilowatt hours conveyed by a public gas transporter to a take off point shall be calculated in accordance with Part II of these Regulations, or, where a public gas transporter makes or adopts a declaration of calorific value in accordance with regulation 8(1) below, Part III of these Regulations.

(4) The cases prescribed by this paragraph are the following cases, namely—

(a) where—

(i) gas continues to be conveyed through a pipe to particular premises; and

(ii) the number of therms or kilowatt hours conveyed through that pipe to those premises was, immediately before the commencement of these Regulations, calculated on the basis of calorific values determined by means of apparatus provided and maintained only for purposes connected with the conveyance of gas through that pipe to those premises;

(b) where an agreement between a public gas transporter and a relevant licence holder or the owner or occupier of particular premises provides for the number of therms or kilowatt hours conveyed through a pipe to those premises to be calculated on the basis of calorific values determined by means of apparatus provided and maintained only for purposes connected with the conveyance of gas through that pipe to those premises.

(5) Any reference in these Regulations to therms shall cease to have effect on 1st January 2000.

## PART II

### Calculation of Thermal Energy on Basis of Determined Calorific Values

#### Calculation of thermal energy

3.—(1) The number of therms or kilowatt hours conveyed by a public gas transporter to any take off point during any gas period shall be calculated in accordance with the following formulae—

$$\begin{array}{l} \text{number of therms so conveyed} \\ \text{number of kilowatt hours so conveyed} \end{array} = \frac{A \times B}{105.5} = \frac{A \times B}{3.6}$$

where

A is the number of cubic metres in the converted volume of gas conveyed to the take off point during the gas period and B is the average calorific value of gas calculated in accordance with paragraph (2) below.

(2) The average calorific value of gas so conveyed during any such gas period shall be calculated by adding the daily calorific values calculated in accordance with regulation 4 below for each gas day in that gas period and dividing the sum by the number of those gas days but so that any amount of less than 0.1 megajoules per cubic metre shall be ignored.

#### Calculation of daily calorific values

4.—(1) Subject to paragraphs (2) and (3) below, the daily calorific value of gas conveyed to any take off point in respect of any gas day shall be the lowest of—

- (a) any of the average calorific values determined on that gas day by the public gas transporter pursuant to directions given by the Director under regulation 6(a) and (b) below for the purpose of making determinations of calorific values of gas conveyed to that take off point or, where the take off point is situated in a charging area, to the take off points situated in that charging area; and
- (b) any daily calorific value for that gas day adopted by the transporter in accordance with paragraph (5) below which is calculated in respect of a point at which gas conveyed to the take off point or, where the take off point is situated in a charging area, to the take off points in that charging area, enters the pipe-line system operated by the transporter.

(2) Where such directions as are referred to in paragraph (1)(a) above require determinations to be made on the basis of samples of gas taken at different places or premises in respect of the take off points in a charging area and the flow of the gas to be sampled at any, but not all, of those places or premises is interrupted on any gas day for a period exceeding 12 hours in that gas day, any determination of calorific value on the basis of the samples taken at that place or those premises shall be ignored in calculating the daily calorific value for that gas day in respect of those take off points.

(3) In any case where, other than by reason of the interruption of the flow of gas to be sampled, apparatus provided by the public gas transporter pursuant to directions under regulation 6(b) below fails to determine accurately, or at all, calorific values for a continuous period exceeding eight hours in any gas day or gas days, an average calorific value shall be deemed to have been determined on any such day or days by means of that apparatus equivalent to—

- (a) where, for the purposes of these Regulations or of the Gas (Alternative Method of Charge) Regulations 1990(3), the apparatus had been provided for determining calorific values in respect of the same place or premises throughout the period of 12 months immediately preceding such failure, the lowest of—
  - (i) the average calorific values determined by that apparatus for each gas day on which paragraph (2) above and this paragraph did not apply in respect of the apparatus in any part of the period after the commencement of these Regulations and for the first two gas days in which the apparatus does not fail to determine calorific values accurately following the failure; and

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(3) S. 1 1990/1634; those Regulations lapsed immediately before the commencement of these Regulations.

- (ii) the actual calorific values determined by that apparatus for any day on which regulation 6 or 7 of the said Regulations of 1990 did not apply in respect of the apparatus in any part of the period before such commencement for the purposes of those Regulations;
- (b) where sub-paragraph (a) does not apply, the lower of—
  - (i) the lowest of the average calorific values or actual calorific values so determined for the purposes referred to in that sub-paragraph before the failure and for the first two gas days in which the apparatus determines calorific values accurately following the failure; and
  - (ii) 37 megajoules per cubic metre.
- (4) In calculating any daily calorific value—
  - (a) any amount of less than 0.05 megajoules per cubic metre shall be ignored; and
  - (b) any amount of less than 0.1 but not less than 0.05 megajoules per cubic metre shall be treated as it were 0.1 megajoules per cubic metre.
- (5) Where—
  - (a) gas has been conveyed to the pipe-line system operated by a public gas transporter (“the first transporter”) by another public gas transporter (“the second transporter”); and
  - (b) the first transporter has notified the Director of his intention to do so,

the first transporter may for the purpose of paragraph (1) above adopt the daily calorific values calculated by the second transporter in respect of any take off point which is a point at which gas conveyed by the second transporter enters the pipe-line system operated by the first transporter.

#### **Availability of calculations of daily calorific values**

- 5. A public gas transporter shall—
  - (a) make available for inspection free of charge during normal office hours by any person the daily calorific values calculated by him during the preceding six years at an office reasonably accessible to the public;
  - (b) immediately notify each relevant licence holder of the calculations of daily calorific values for each gas day; and
  - (c) send free of charge to the owner or occupier of any premises to which he conveys gas who asks for the calculations of daily calorific values of that gas in respect of specific days, those calculations.

#### **Determinations of calorific values**

- 6. A public gas transporter shall—
  - (a) make determinations of calorific values of the gas conveyed by him to premises, or to pipe-line systems operated by other public gas transporters, on the basis of samples of gas taken at such places or premises, at such times and in such manner as the Director may direct;
  - (b) make such determinations at such places or premises, at such times and in such manner as the Director may direct;
  - (c) provide and maintain such premises, apparatus and equipment for the purpose of making such determinations as the Director may direct;
  - (d) make available for inspection free of charge during normal office hours by any person the results of such determinations made by the transporter during the preceding twelve months at—

- (i) an office reasonably accessible to the public; and
  - (ii) the place or premises at which any such determinations were made;
- (e) carry out tests of apparatus and equipment provided and maintained by virtue of paragraph (c) above for conformity with the requirements of directions given under that paragraph at intervals not exceeding 35 days;
- (f) notify the results of such tests to the Director within seven days of the end of the calendar month in which the tests were completed; and
- (g) make available for inspection free of charge during normal office hours by any person the results of such tests carried out within the preceding 12 months at—
- (i) an office reasonably accessible to the public; and
  - (ii) the place or premises at which any such tests were carried out.

### PART III

#### Calculation of Thermal Energy on Basis of Declared Calorific Values

##### Calculation of thermal energy

7.—(1) Where a public gas transporter makes a declaration of calorific value or adopts a declaration of calorific value made by another public gas transporter in accordance with regulation 8(1) below in respect of any area within an authorised area of the transporter, the number of therms or kilowatt hours conveyed by the transporter to any take off point situated in the area to which the declaration relates during the relevant period shall be calculated in accordance with the following formulae—

$$\begin{aligned} \text{number of therms so conveyed} &= \frac{A \times B}{105.5} \\ \text{number of kilowatt hours so conveyed} &= \frac{A \times B}{3.6} \end{aligned}$$

where

A is the number of cubic metres in the converted volume of gas conveyed to the take off point during the period and B is the declared calorific value of the gas.

(2) In paragraph (1) above “a relevant period” means any gas period during which a declared calorific value has effect.

##### Declarations of calorific value

8.—(1) A public gas transporter shall not make or adopt any declaration of calorific value in respect of an area within an authorised area of the transporter in respect of which he has made or adopted no previous declaration unless he has given to the Director and to each relevant licence holder who is a gas shipper two months' notice of his intention to do so and the notice is accompanied by a map (drawn to an appropriate scale) delineating the area to which the notice relates.

(2) Where a public gas transporter makes or adopts a declaration of calorific value in respect of the area delineated in a notice given under paragraph (1) above, he shall do so at such times and in such manner as the Director may direct.

(3) A public gas transporter shall publish as soon as practicable any declaration of calorific value made or adopted by him, or any revocation of such a declaration, in such newspapers as are

calculated to ensure that the declaration or revocation is circulated throughout the area to which the declaration relates.

(4) No declaration shall take effect until the declaration has been published in accordance with paragraph (3) above.

#### **Uniformity of calorific value**

**9.**—(1) Where a public gas transporter has made or adopted a declaration of calorific value under regulation 8(1) above, he shall secure that any average calorific value of the gas conveyed to any take off point situated in the area in respect of which the declaration is made or adopted and while it has effect during any gas period of three months commencing on 1st January, 1st April, 1st July or 1st October in any year is not less than that declared calorific value.

(2) For the purpose of paragraph (1) above, an average calorific value of such gas means the value given by adding the average of the calorific values of the gas on each of not less than any six different gas days in any such gas period and dividing the sum by the number of those gas days, but so that any amount of less than 0.1 megajoules in any average shall be ignored.

#### **Tests of calorific value by public gas transporters**

**10.**—(1) Where a public gas transporter has made or adopted a declaration of calorific value under regulation 8(1) above, he shall carry out tests of the calorific value of the gas being conveyed to any take off point situated in the area in respect of which the declaration is made or adopted at such places or premises, at such times and in such manner as the Director may direct.

(2) A public gas transporter shall—

- (a) notify the results of any tests carried out under paragraph (1) above to the Director or a gas examiner appointed under section 13(1) of the Act for the purposes of paragraph (c) of that subsection of the Act within 7 days of the end of the calendar month in which the tests were completed; and
- (b) make available for inspection free of charge during normal office hours by any person the results of such tests carried out within the preceding 12 months at—
  - (i) an office reasonably accessible to the public; and
  - (ii) the place or premises at which any such tests were carried out.

## **PART IV**

### **Gas Examiners**

#### **Places etc. for tests of gas by gas examiners**

**11.**—(1) Tests of gas by gas examiners for the purpose of ascertaining whether a public gas transporter is complying with regulation 9(1) above shall be carried out at such places or premises as the Director may direct.

(2) A public gas transporter shall provide and maintain such premises, apparatus and equipment for the purpose of carrying out those tests as the Director may direct.

(3) A public gas transporter shall take samples of gas at such places or premises, at such times and in such manner as the Director may direct and provide those samples to a gas examiner appointed under section 13(1) of the Act, at such places or premises, at such times and in such manner as the Director may direct.

### **Presence of public gas transporter's representative at tests by gas examiners**

12.—(1) On any occasion that a gas examiner carries out a test of—

- (a) apparatus and equipment provided and maintained by a public gas transporter under regulation 6(c) above; or
- (b) gas conveyed by a public gas transporter for the purpose of ascertaining whether the transporter is complying with regulation 9(1) above,

a person representing the transporter may be present so long as he does not interfere with the test.

### **Publication of results of tests by gas examiners**

13. Where the Director has notified a public gas transporter of the results of tests carried out by a gas examiner of apparatus and equipment provided by the transporter or of gas conveyed by the transporter, the transporter shall make the results available for inspection free of charge during normal office hours by any person at—

- (i) an office reasonably accessible to the public; and
- (ii) the place or premises at which any such tests were carried out.

### **Powers of entry by gas examiners**

14. Any gas examiner who is a member of the Director's staff may enter any premises owned or occupied by a public gas transporter for the purpose of carrying out such tests as are mentioned in section 13(1) of the Act or of assisting the Director in exercising her functions under sections 12 or 13 of the Act or these Regulations.

## **PART V**

### **Miscellaneous**

#### **Penalties**

15. Any public gas transporter contravening any provision of these Regulations shall be guilty of an offence and liable on summary conviction to a fine not exceeding level 5 on the standard scale.

#### **Public gas transporters' offices**

16. Any question as to whether any office of a public gas transporter is reasonably accessible to the public shall be determined by the Director.

#### **Transitional provision**

17. Any declaration of calorific value made by a public gas supplier in accordance with regulations under section 12(3) of the Act which—

- (a) is in force immediately before the commencement of these Regulations; and
- (b) relates to an area in respect of which the supplier was not then a relevant supplier for the purposes of section 13 of the Act in relation to any therms or kilowatt hours supplied by him in that area,

shall have effect on and after that day as if it had been made by the supplier's transport successor (within the meaning of Part II of Schedule 5 to the Gas Act 1995<sup>(4)</sup>) in accordance with these Regulations.

26th February 1996.

*Clare Spottiswoode,*  
Director General of Gas Supply.

I consent to the making of these Regulations.

27th February 1996.

*Tim Eggar,*  
Minister for Industry and Energy,  
Department of Trade and Industry

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(4) See paragraph 18(2) of that Schedule.

## SCHEDULE

Regulation 2(1)

## Calculations of Pressure Conversion and Compressibility Conversion Factors

## PART I

## Calculation of Pressure Conversion Factor

The pressure conversion factor is the number given by the following formula, namely—

$$\frac{1013.25 + (M - A)}{1013.25}$$

where—

M = the number of millibars in the pressure of the gas at the meter;

A = the number of millibars of pressure to be deducted from M on account of the height of the meter above mean sea level measured at Ordnance Survey datum given by the table below.

TABLE

Height above sea level in metres	Pressure in millibars to be deducted	Height above sea level in metres	Pressure in millibars to be deducted	Height above sea level in metres	Pressure in millibars to be deducted
≤0.0	0.00	>97.5≤100.0	12.021	>197.5≤200.0	24.041
>0.0≤2.5	0.301	>100.0≤102.5	12.321	>200.0≤202.5	24.342
>2.5≤5.0	0.601	>102.5≤105.0	12.622	>202.5≤205.0	24.643
>5.0≤7.5	0.902	>105.0≤107.5	12.922	>205.0≤207.5	24.943
>7.5≤10.0	1.202	>107.5≤110.0	13.223	>207.5≤210.0	25.244
>10.0≤12.5	1.503	>110.0≤112.5	13.523	>210.0≤212.5	25.544
>12.5≤15.0	1.803	>112.5≤115.0	13.824	>212.5≤215.0	25.845
>15.0≤17.5	2.104	>115.0≤117.5	14.124	>215.0≤217.5	26.145
>17.5≤20.0	2.404	>117.5≤120.0	14.425	>217.5≤220.0	26.446
>20.0≤22.5	2.705	>120.0≤122.5	14.725	>220.0≤222.5	26.746
>22.5≤25.0	3.005	>122.5≤125.0	15.026	>222.5≤225.0	27.047
>25.0≤27.5	3.306	>125.0≤127.5	15.326	>225.0≤227.5	27.347
>27.5≤30.0	3.606	>127.5≤130.0	15.627	>227.5≤230.0	27.648
>30.0≤32.5	3.907	>130.0≤132.5	15.927	>230.0≤232.5	27.948
>32.5≤35.0	4.207	>132.5≤135.0	16.228	>232.5≤235.0	28.249
>35.0≤37.5	4.508	>135.0≤137.5	16.529	>235.0≤237.5	28.549
>37.5≤40.0	4.808	>137.5≤140.0	16.829	>237.5≤240.0	28.850
>40.0≤42.5	5.109	>140.0≤142.5	17.130	>240.0≤242.5	29.150
>42.5≤45.0	5.409	>142.5≤145.0	17.430	>242.5≤245.0	29.451

Height above sea level in metres	Pressure in millibars to be deducted	Height above sea level in metres	Pressure in millibars to be deducted	Height above sea level in metres	Pressure in millibars to be deducted
>45.0≤47.5	5.710	>145.0≤147.5	17.731	>245.0≤247.5	29.751
>47.5≤50.0	6.010	>147.5≤150.0	18.031	>247.5≤250.0	30.052
>50.0≤52.5	6.311	>150.0≤152.5	18.332	>250.0≤252.5	30.352
>52.5≤55.0	6.611	>152.5≤155.0	18.632	>252.5≤255.0	30.653
>55.0≤57.5	6.912	>155.0≤157.5	18.933	>255.0≤257.5	30.953
>57.5≤60.0	7.212	>157.5≤160.0	19.233	>257.5≤260.0	31.254
>60.0≤62.5	7.513	>160.0≤162.5	19.534	>260.0≤262.5	31.554
>62.5≤65.0	7.813	>162.5≤165.0	19.834	>262.5≤265.0	31.855
>65.0≤67.5	8.114	>165.0≤167.5	20.135	>265.0≤267.5	32.155
>67.5≤70.0	8.415	>167.5≤170.0	20.435	>267.5≤270.0	32.456
>70.0≤72.5	8.715	>170.0≤172.5	20.736	>270.0≤272.5	32.757
>72.5≤75.0	9.016	>172.5≤175.0	21.036	>272.5≤275.0	33.057
>75.0≤77.5	9.316	>175.0≤177.5	21.337	>275.0≤277.5	33.358
>77.5≤80.0	9.617	>177.5≤180.0	21.637	>277.5≤280.0	33.658
>80.0≤82.5	9.917	>180.0≤182.5	21.938	>280.0≤282.5	33.959
>82.5≤85.0	10.218	>182.5≤185.0	22.238	>282.5≤285.0	34.259
>85.0≤87.5	10.518	>185.0≤187.5	22.539	>285.0≤287.5	34.560
>87.5≤90.0	10.819	>187.5≤190.0	22.839	>287.5≤290.0	34.860
>90.0≤92.5	11.119	>190.0≤192.5	23.140	>290.0≤292.5	35.161
>92.5≤95.0	11.420	>192.5≤195.0	23.440	>292.5≤295.0	35.461
>95.0≤97.5	11.720	>195.0≤197.5	23.741	>295.0	35.762

## PART II

### Calculation of Compressibility Conversion Factor

The compressibility factor is:

- (a) where the pressure of the gas at the meter does not exceed 2 bar, the number one; and
- (b) where that pressure exceeds 2 bar, the number given by the following formula, namely:

$$\frac{0.9978}{1-0.00000226M}$$

where

M=the number of millibars of that pressure.

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## EXPLANATORY NOTE

*(This note is not part of the Regulations.)*

The Regulations provide for the number of therms (until 1st January 2000) or kilowatt hours, conveyed by public gas transporters to premises, or to pipe-line systems operated by other public gas transporters, to be calculated on the basis of calorific values of the gas (with adjustments of volumes for temperature and pressure) either determined by, or declared by, the transporter in accordance with the Regulations, except in the cases prescribed by regulation 2(3) (regulations 3, 4 and 7). They provide for the places or premises and the times at which and the manner in which determinations of calorific values are to be made to be such as the Director General of Gas Supply (“the Director”) may direct (regulation 6). Provision is made for making available the results of determinations (regulation 5). They also provide for declarations of calorific values to be made at such times and in such manner as the Director may direct, for securing uniformity of calorific value and for the carrying out of tests of gas by public gas transporters (regulations 8 to 10), and also by persons (“gas examiners”) appointed by the Director under section 13 of the Gas Act 1986 at such places or premises as the Director may direct and for such premises, apparatus and equipment to be provided and maintained for carrying out those tests as the Director may direct (regulation 11).

Provision is made for persons representing public gas transporters to be present at the carrying out of tests of apparatus and equipment or of gas by gas examiners (regulation 12), for the publication of their results (regulation 13) and for entry by gas examiners on premises owned or occupied by public gas transporters (regulation 14). Any contravention of the regulations is made an offence punishable on summary conviction by a fine not exceeding level 5 on the standard scale (now £5,000) (regulation 15). There are provisions in respect of public gas transporters' offices and for saving declarations of calorific value made before the commencement of the Regulations (regulations 16 and 17).