

Properties at risk of receiving low pressure

This measure is the same as the former [DG2 serviceability indicator](#). Any reference to DG2 in this definition is to aid familiarity and to reinforce that the indicator has not changed from that used in the former June Returns for DG2.

The aim of this indicator is to identify the number of properties that have received, and are likely to continue to receive, pressure below the reference level when demand is not abnormal.

The total number of properties in the undertaker's area of water supply which, at the end of the year, have received, and are likely to continue to receive, a pressure or flow below the reference level.

To ensure consistency of information reported by companies the following regularly used terms are defined below:

Reference level: The reference level of service is a flow of 9l/min at a pressure of 10m head on the customer's side of the main stop tap (mst). The reference level applies to a single property.

The reference level of service must be applied on the customer's side of a meter or any other company fittings that are on the customer's side of the main stop tap.

Where a common service pipe serves more than one property, the flow assumed in the reference level must be appropriately increased to take account of the total number of properties served.

For two properties, a flow of 18l/min at a pressure of 10m head on the customers' side of the mst is appropriate. For three or more properties the appropriate flow should be calculated from the standard loadings provided in BS6700 or Institute of Plumbing handbook. See below for a tabulation of minimum mains pressures for the reporting of low pressures on common services.

Surrogate for the reference level: Because of the difficulty in measuring pressure and flow at the mst, companies may measure against a surrogate reference level. Companies should use a surrogate of 15m head in the adjacent distribution main unless a different level can be shown to be suitable. In some circumstances companies may need to use a surrogate pressure greater than 15m to ensure that the reference level is supplied at the customer's side of the mst (for example in areas with small diameter or shared communication pipes).

Common supplies: Common supplies are where a communication pipe supplies more than one property. The required pressure in the adjacent water main used to estimate properties affected should exceed those given in the table in the guidance section. This table is intended to be a guide to the absolute minimum service acceptable over an hour (i.e. it is not based on an instantaneous peak flow). The calculations assume delivery of 9 l/minute upstairs to a combination tank (not in the loft) in the end property on a common service of half-inch bore. The calculations use the BS 6700 loading units (LU) basis, but at 3 LUs per property (9 l/minute). The LU calculations on larger groups of properties (i.e. more than 100) give instantaneous flows of between 4 and 8 times the peak hour flow rates actually observed on local distribution systems, subject to leakage and hose pipe assumptions. Accordingly, the use of 3 LUs per property is taken as an acceptable minimum.

Allowable exclusions: There are a number of circumstances under which properties identified as receiving low pressure should be excluded from the reported figure. The aim of these exclusions is to exclude properties which receive a low pressure as a result of a one-off event and which, under normal circumstances (including normal peaks in demand), will not receive pressure or flow below the reference level. For exclusions see the guidance section.

Guidance

Surrogate for the reference level: Where companies choose to report against a surrogate pressure of less than 15m, evidence must be provided that this is sufficient to provide the reference level of service for all properties taking into account the length and condition of communication pipes and head loss through any meters or other company fittings. We expect all assumptions to be in the methodology. A surrogate pressure which will only provide the reference level for average properties (i.e. for average length communication pipes in good condition with no meter fitted) is not appropriate because some properties will have communication pipes longer than average; others will be in a poor condition or have meters fitted. Allowance must be made in such instances.

If a higher surrogate is used, the assumptions should be clearly stated in the methodology.

Headline figure: This is an estimate of the total number of properties in the company's area that are below the reference level. Therefore, if the reported figure is likely to represent an underestimate (or overestimate), this must be reflected in the assessment of the reliability and accuracy of the reported information.

In practice, companies will report the number of properties served by a main in which the measured pressure falls below the surrogate for the reference level (usually 15m head in the adjacent distribution main) subject to the allowable exclusions.

Estimated figures: Companies may include in their reported figures estimates for the number of properties which are below the reference level but which have not yet been specifically identified. The basis for the estimate must be explained in the methodology.

Allowable exclusions: Companies must maintain verifiable, auditable records of all the exclusions that they apply in order to confirm the accuracy and validity of their information.

All properties identified as having received pressure or flow below the reference level must be reported, unless it can be confirmed that they are covered by one of the following exclusions.

Abnormal demand

This exclusion is intended to cover abnormal peaks in demand and not the daily, weekly or monthly peaks in demand which are normally expected.

Some companies are more affected by low pressures caused by occasional prolonged peaks in demand than by a few abnormal peak days each year. In such cases, instead of excluding up to five days each year, companies may choose to apply the abnormal demand exclusion over a five-year period. This will allow companies to exclude from their figures properties affected by low pressures that occur on any 25 days in a rolling five-year period.

The 'excluded day' may be applied to the company as a whole or at the level of individual zones. However, in either case, once a property has suffered low pressures on either more than five days in one year or 25 days in five years, it must be added to the reported figures.

Option 1 - During the report year, companies may exclude for each property a maximum of 25 days of low pressure caused by abnormal demand in a rolling five-year period. Companies should exclude from the reported figures properties that are affected by low pressure only on the days identified as "high demand" in the report year. In years where demand is normal (i.e. the exclusion is not being used), properties affected by relevant low pressure incidents should be reported as receiving low pressure (unless covered by one of the other exclusions).

Option 2 - Where extensive pressure logging covering the majority of properties in the supply area is used, the company may exclude properties where logger records verify that up to five incidents of low pressure lasting more than one hour have occurred. Under this option, it is not necessary to match the low pressure incidents with high demands. Companies that choose this method must include the number of properties that suffer more than five incidents of low pressure lasting more than one hour in the reported figure without necessarily identifying the specific occasions and reasons for abnormal demand. If this method is used, no other allowance may be made for abnormal demand but the other exclusions still apply.

Companies must clearly state in their methodologies which approach they have adopted in applying this exclusion, list the distribution or supply zones they have chosen and the number of days excluded. If the exclusion is applied at the level of individual zones, rather than to the company as a whole, the company must maintain verifiable records which list the number of 'excluded days' used for each distribution zone each year.

Planned maintenance

Companies should not report low pressures caused by planned maintenance. It is not intended that companies identify the number of properties affected in each instance. However, companies must maintain sufficiently accurate records to verify that low pressure incidents that are excluded because of planned maintenance are actually caused by maintenance.

One-off incidents

This exclusion covers a number of causes of low pressure:

- mains bursts;
- failures of company equipment (such as Pressure Reducing Valves or booster pumps);
- firefighting; and
- action by a third party.

If problems of this type affect a property frequently, they cannot be classed as one-off events and further investigation will be required before they can be excluded.

Low pressure incidents of short duration

Properties affected by low pressures which only occur for a short period, and for which there is evidence that incidents of a longer duration would not occur during the course of the year, may be excluded from the reported figures.

- In locations where companies carry out continuous pressure logging year round, low pressure incidents of less than one hour may be excluded.
- Where short term or intermittent logging is used, if all low pressure incidents lasting less than one hour are excluded then there is a danger that properties which are actually below the reference level will be missed from the figures. In this case a suitable minimum duration depends on the exact methodology used but may be 30 or even 15 minutes. If logging is carried out at times when low pressures are unlikely to be detected because demand is low, the results cannot be used to confirm zero returns.

Common services

Companies should establish the numbers of properties supplied via common services from sample investigation of the distribution system. Many instances of low pressure in these situations are presently unreported. Not all of these properties have either loft tank storage or any water supply upstairs.

Companies are required to record the numbers of properties on common services that have received and continue to receive pressures below the reference level, and include these in the reported numbers.

Companies may use their own calculations, but the required pressure in the adjacent water main used to estimate properties affected should exceed those given in the table below. This table is intended to be a guide to the absolute minimum service acceptable over an hour (i.e. it is not based on an instantaneous peak flow). The calculations assume delivery of 9 l/minute upstairs to a combination tank (not in the loft) in the end property on a common service of half-inch bore. The calculations use the BS 6700 loading units (LU) basis, but at 3LUs per property (9 l/minute). The LU calculations on larger groups of properties (i.e. more than 100) give instantaneous flows of between 4 and 8 times the peak hour flow rates actually observed on local distribution systems, subject to leakage and hose pipe assumptions. Accordingly, the use of 3LUs per property is taken as an acceptable minimum.

Number of properties fed from one direction on common service	Pressure (in head) required in adjacent main			
	Half-inch communication pipe		Three quarter-inch communication pipe	
	Short side ¹	Long side	Short side	Long side
2*	10	11	10	11
3	12	14	11	13
4	15	18	13	16
5	19	23	16	20
6	25	29	21	24
7	30	35	25	28
8	37	42	31	33
9	45	51	38	40
10	54	61	46	48

Note: if delivery to a loft tank is taken to be the minimum acceptable service, not less than 3 m pressure should be added to the above tabulated values.

The values calculated for two properties are theoretical: for delivery to a loft, the usual surrogate of 15 m head to a single property should be taken as a minimum reference level.

The section on the reference level refers to the need for companies to use a higher flow rate in the reference level for common services and sets out the criteria for determining appropriate flows in these circumstances.

These criteria are not intended to extend the company's responsibility to solving problems caused by deficiencies in customers' pipes. Its aim is to ensure that there is a proper recognition of pressure and flow problems which affect properties sharing common services, where there is a deficiency in the part of the apparatus which is the company's responsibility (e.g. an undersized communication pipe which is unable to provide sufficient flow).

Properties with the common service pipes can be split into four categories:

- company's and customer's apparatus are adequate:
 - no problems with pressure or flow, nothing to report;
- company's apparatus adequate, but customer's pipework is deficient:
 - pressure and/or flow problems are not reportable because company pipes are able to provide sufficient pressure and flow to the limit of company responsibility;
- company's apparatus is inadequate but customer's pipework is adequate:

¹ Short side and long side refer to the length of supply pipes from properties to water mains which are usually not laid down the middle of a road.

- pressure and/or flow problems which are reportable because there is a deficiency in the company's apparatus;
- both the company's and the customer's apparatus are inadequate:
 - pressure and/or flow problems are reportable.

Of these four categories, only the last two fall within the definition of properties at risk of receiving low pressure.

Ofwat recognises that in cases covered by the final category it may not always be sensible for the company to take unilateral action to solve the problem unless the customer takes some action to improve their own pipework. Nevertheless, these problems must be included in the reported figure. If significant, companies should note the number of properties which are below the reference level but the company cannot solve because there are also defects in the customer's part of the system.

Company methodologies should discuss how common service problems are identified and assessed and include reference to standard loadings.