As a part of detection and repair, leakages must be defined in the context of volume of water being wasted through them. There are two empirical and one mathematical methods for determining the value of the defect (leakage) <h3 style="margin: 12pt 0cm 0.0001pt 36pt; text-align: justify; text-indent: -36pt; line-height: normal;"> Determining the Value of the Defect by Using a Container of Known Volume and a Stopwatch</h3> <h3 style="margin: 12pt 0cm 0.0001pt 36pt; text-align: justify; text-indent: -36pt; line-height: normal;"> </h3> This is the simplest method for determining the value of the leakage. The container of known volume is being filled with water during a certain period of time based on which the water flow through the leak is calculated. If the leakage is smaller, the container is used for one minute and the figure obtained is expressed in l/min. If the container is to be used for a shorter period of time, then the calculations are performed in accordance with the following table: <table style="border-collapse: collapse; border: none;" border="1" cellspacing="0" cellpadding="0"> <tr> <td style="width: 8cm; border: 1pt solid windowtext; padding: 0cm 5.4pt;" valign="top" width="302"> Time in seconds </td> <td style="width: 2cm; border-style: solid solid solid none; border-top-color: windowtext; border-right-color: windowtext; border-bottom-color: windowtext; border-top-width: 1pt; border-right-width: 1pt; border-bottom-width: 1pt; padding: 0cm 5.4pt;" width="76"> 6 </td> <td style="width: 2cm; border-style: solid solid solid none; border-top-color: windowtext; border-right-color: windowtext; border-bottom-color: windowtext; border-top-width: 1pt; border-right-width: 1pt; border-bottom-width: 1pt; padding: 0cm 5.4pt;" width="76"> 10 </td> <td style="width: 2cm; border-style: solid solid solid none; border-top-color: windowtext; border-right-color: windowtext; border-bottom-color: windowtext; border-top-width: 1pt; border-right-width: 1pt; border-bottom-width: 1pt; padding: 0cm 5.4pt;" width="76"> 15 </td> <td style="width: 2cm; border-style: solid solid solid none; border-top-color: windowtext; border-right-color: windowtext; border-bottom-color: windowtext; border-top-width: 1pt; border-right-width: 1pt; border-bottom-width: 1pt; padding: 0cm 5.4pt;" width="76"> 30 </td> </tr> <tr> <td style="width: 8cm; border-style: none solid solid; border-right-color: windowtext; border-bottom-color: windowtext; border-left-color: windowtext; border-right-width: 1pt; border-bottom-width: 1pt; border-left-width: 1pt; padding: 0cm 5.4pt;" valign="top" width="302"> Multiply the volume of the container in liters with </td> <td style="width: 2cm; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width:

1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt;" width="76"> 10 </td> <td style="width: 2cm; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt;" width="76"> 6 </td> <td style="width: 2cm; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt;" width="76"> 4 </td> <td style="width: 2cm; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt;" width="76"> 2 </td> </tr> </table> Table - Multiplication coefficient for the container of known volume for the purpose of determining the leakage value Obtained value represents the value of the leakage expressed in l/min. <h3 style="margin: 12pt 0cm 0.0001pt 36pt; text-align: justify; text-indent: -36pt;"> Determining the Value of the Defect by Using a Hose and a Water Meter</h3> This method requires certain intervention on the pipeline. Handy tools are being made in the ViK&#65533;s workshop comprising of a saddle to which the hose and the water meter are connected. Leakage value is simply read on the water meter. This is the most precise way to determine the value of the leakage and it is especially convenient for ViK having frequent leakages on the same type of pipeline. Determining the Value of the Defect by the Application of Greeley&#65533;s Formula For this type of calculation with the application of this formula, it is required to know data on pressure in the system, as well as the cross-sectional area and the shape of the opening through which the water is leaking. Most often, it is not possible to precisely measure the cross-section and therefore it has to be estimated. According toGreeley, water outflow is calculated with the following formula: Q_h= 67,947 x A x P^{1/2} <span style="font-family: arial, helvetica, sans-serif; font-size:

12pt;">Where: Q_{kv}- Outflow through the opening expressed in l/min, A &#65533; outflow opening cross-section area expressed in cm², P &#65533; Pressure in the network at outflow location expressed in bars In the event of leakages appearing on the fittings, valve gaskets and taps, the above formula is being multiplied by the coefficient 0,8. The following two tables show leakage values through different cross-sections depending on the pressure and values of defects through which the water is flowing drop by drop.   Table - Water volume flowing from the openings / crack at different pressure values   <table style="width: 316px; margin-left: 4.65pt; border-collapse: collapse;" border="0" cellspacing="0" cellpadding="0">   <tr style="height: 30pt;"> <td style="width: 70pt; border: 1pt solid windowtext; padding: 0cm 5.4pt; height: 30pt;" width="93"> No. of drops per second </td> <td style="width: 59pt; border-style: solid solid solid none; border-top-color: windowtext; border-right-color: windowtext; border-bottom-color: windowtext; border-top-width: 1pt; border-right-width: 1pt; border-bottom-width: 1pt; padding: 0cm 5.4pt; height: 30pt;" width="79"> l/min </td> <td style="width: 50pt; border-style: solid solid solid none; border-top-color: windowtext; border-right-color: windowtext; border-bottom-color: windowtext; border-top-width: 1pt; border-right-width: 1pt; border-bottom-width: 1pt; padding: 0cm 5.4pt; height: 30pt;" width="67"> l/day </td> <td style="width: 58pt; border-style: solid solid solid none; border-top-color: windowtext; border-right-color: windowtext; border-bottom-color: windowtext; border-top-width: 1pt; border-right-width: 1pt; border-bottom-width: 1pt; padding: 0cm 5.4pt; height: 30pt;" width="77"> m³/year </td> </tr> <tr style="height: 15pt;"> <td style="width: 70pt; border-style: none solid solid; border-right-color: windowtext; border-bottom-color: windowtext; border-left-color: windowtext; border-right-width: 1pt; border-bottom-width: 1pt; border-left-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="93"> <p style="text-align: center;"

align="center">1 </td> <td style="width: 59pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="79"> 0,023 </td> <td style="width: 50pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="67"> 32,71 </td> <td style="width: 58pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="77"> 11,94 </td> </tr> <tr style="height: 15pt;"> <td style="width: 70pt; border-style: none solid solid; border-right-color: windowtext; border-bottom-color: windowtext; border-left-color: windowtext; border-right-width: 1pt; border-bottom-width: 1pt; border-left-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="93"> 2 </td> <td style="width: 59pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="79"> 0,045 </td> <td style="width: 50pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="67"> 65,42 </td> <td style="width: 58pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="77"> 23,88 </td> </tr> <tr style="height: 15pt;"> <td style="width: 70pt; border-style: none solid solid; border-right-color: windowtext; border-bottom-color: windowtext; border-left-color: windowtext; border-right-width: 1pt; border-bottom-width: 1pt; border-left-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="93"> 3 </td> <td style="width: 59pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="79"> 0,068 </td> <td style="width: 50pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="67"> <span

style="font-family: arial, helvetica, sans-serif; font-size: 12pt;">98,13 </td> <td style="width: 58pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="77"> 35,82 </td> </tr> <tr style="height: 15pt;"> <td style="width: 70pt; border-style: none solid solid; border-right-color: windowtext; border-bottom-color: windowtext; border-left-color: windowtext; border-right-width: 1pt; border-bottom-width: 1pt; border-left-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="93"> 4 </td> <td style="width: 59pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="79"> 0,091 </td> <td style="width: 50pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="67"> 130,84 </td> <td style="width: 58pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="77"> 47,76 </td> </tr> <tr style="height: 15pt;"> <td style="width: 70pt; border-style: none solid solid; border-right-color: windowtext; border-bottom-color: windowtext; border-left-color: windowtext; border-right-width: 1pt; border-bottom-width: 1pt; border-left-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="93"> 5 </td> <td style="width: 59pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="79"> 0,114 </td> <td style="width: 50pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="67"> 163,56 </td> <td style="width: 58pt; border-style: none solid solid none; border-bottom-color: windowtext; border-bottom-width: 1pt; border-right-color: windowtext; border-right-width: 1pt; padding: 0cm 5.4pt; height: 15pt;" valign="bottom" nowrap="nowrap" width="77"> 59,70 </td> </tr> </table>   Table - No. of drops and leakage value ratio