ENBRIDGE GAS DISTRIBUTION INC. RESPONSE TO
BOMA INTERROGATORY #32

INTERROGATORY

Issue: A.1

Page 3, Paragraph 4

Please explain, in more detail than you have in paragraph 4, why "Station B" "often" experiences the lowest pressure in the XHP network. Include in the explanation:

(a)   Why Station B does not always experience the lowest system pressure, and provide the percentage of time and the actual days in the year for the last ten years (in order to illustrate the situation before and after entry into service of the Portlands energy plant) during which Station B experienced the lowest system pressure?

(b)   What other points on the system (stations or otherwise) experience the lowest system pressures, when Station B does not?

(c)   When was the HP line running east and north from Station B constructed? What is its capacity, pressure, what parts of the city does it supply?

(d)   Please explain carefully the relationship between pipeline length, flow or throughput, diameter, wall thickness, and maximum operating pressure, and actual operating pressure. Please provide relevant equations and examples to illustrate the relationship.

(e)   Why were the recent amendments to this made? The ones effective November 2012 to March 2013, at which the pipeline is operating, and distance. Please use examples and calculations where appropriate.

(f)   Please explain the difference in materials, and wall thickness, for each category of main pressures shown at Footnote 4 on Schedule 3 (A.3.3).

(g)   Page 3 – Please provide the system forecast model, with sufficient necessary commentary to make it intelligible to an informed layperson, which demonstrate the system operation at various volumes and pressures, and allows Enbridge to manage its system.

(h)   Please provide the TJ/day of gas consumed by Portlands at Enbridge system peak day, Portlands's peak day, average winter day, average summer season

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day, for 2013 to date, and then 2008 to 2012. Also forecast amounts for 2013 (total), 2014, 2015, 2016 through 2025.

RESPONSE

a)   EGD would like to note that the word "often" is misleading. Station B is always the lowest point on the XHP grid, in the GTA influence area, except when there are non-normal operating conditions, such as when in line inspections or maintenance activities are underway.

b)   See answer to a.

c)   The NPS 20 HP line running west of Station B was constructed in 1954 as described in Exhibit A, Tab 3, Schedule 2 paragraph 6. This pipeline currently has a maximum operation pressure of 1210 kPa (175 psi). This line is now fully integrated into the HP grid that supplies Toronto and therefore, it is not possible to stipulate a specific capacity of this pipeline.

d)   The design calculation for steel pipe as specified in Section 4.3.5.1 of CSA Z662-11 is as shown below. The Maximum Operating Pressure is the maximum pressure at which the pipe is qualified to operate, and is a function of the design pressure, pressure testing, and pipe condition. The flow rates are related to pipe size, wall thickness, pressure, and temperature. As referenced;

4.3.5 Pressure design for steel pipe — General 4.3.5.1
For straight pipe, the design pressure for a given design wall thickness or the design wall thickness for a given design pressure shall be determined by the following design formula:

$$P = 2St/D \times F \times L \times J \times T$$

where
P = design pressure, MPa
S = specified minimum yield strength, as specified in the applicable pipe standard or specification, MPa. For pipe of unknown origin, see Clause 5.6.4
t = design wall thickness, mm
D = outside diameter of pipe, mm
F = design factor (see Clause 4.3.6)
L = location factor (see Clause 4.3.7)
J = joint factor (see Clause 4.3.8). For pipe of unknown origin, see Clause 5.6.4
T = temperature factor (see Clause 4.3.9)

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Note: *Calculated design pressures should be rounded to the nearest* 10 kPa *and calculated design wall thicknesses should be rounded to the nearest* 0.1 mm*.*

e) We are unable to understand the question or find the reference and cannot answer it as written. If the question can be clarified with references to the evidence we would be pleased to answer it.

f) The following Table below shows the material and wall thickness information for the pipelines listed in Footnote 4 of Schedule 3.A.3.3.

Pipeline	Grade (MPa)	Wall Thickness (mm)
NPS 20 (HP)	290	7.9
NPS 24 (XHP)	359 & 414	9.5 & 12.7
NPS 30 (XHP)	359	9.5
NPS 36 (XHP)	448	9.2

g) Please refer to the response to BOMA Interrogatory # 25 found at Exhibit I.A1.EGD.BOMA.25 (sub question (d) part (ii)) for current operating system description.

h) As described in EB-2006-0305, Portlands Energy Centre has a daily contact demand of 104 TJ/day. Enbridge does not supply actual consumption of its customers and designs its system to accommodate all firm contracts at design day conditions.

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