INTRODUCTION

The Federation of Rental-housing Providers of Ontario (FRPO) appreciates the opportunity to assist the Board in its consideration of facilities projects which ultimately could impact the rates of its members and in support of the Board's mandate of serving the public interest.

FRPO has been very concerned with the impacts of the Community Expansion Projects and the risk of costs been transferred to ratepayers at the end of the Rate Stabilization Period ("RSP"). Evidence in the EGI Rebasing proceeding depicts many projects with substantial cost overruns and economic shortfalls that create ratepayer risk.[1] Moreover, we are concerned with the lack of evidence provided by EGI to even justify the project in the Leave-to-Construct ("LTC") applications.[2] This lack of information requires precision in interrogatories to just establish a clear understanding of the facilities being proposed and resourcefulness to evaluate the proposal. Unfortunately, our request for a technical conference[3] was denied.[4]

Having strived to leverage the responses in interrogatories and information in the application, we were able to put the pieces of the puzzle together to form, what we understand to be, the proposed Supply and Reinforcement piping. Absent additional information that we would have sought in the technical conference, we researched pipeline equations and models to test the adequacy of the proposed pipe sizing. In our respectful submission, EGI has not justified its proposed Reinforcement pipeline as necessary at the outset of the project. In fact, in our assessment, the Reinforcement pipeline may not ever be needed. We urge the Board not to approve the LTC for the NPS 8 Reinforcement pipeline.

EVIDENCE IN SUPPORT OF PROPOSED DESIGN IS LACKING

We understand and respect that these projects were applied for and accepted as part of the Ontario Government's Phase 2 NGEP as specified in the Expansion of Natural Gas Distribution System Regulation.[5] As such, in spite of what we believed would be poor economics given the costs and the number of customers, we were resigned to the fact that the projects would proceed with incremental costs borne by the community, the customers served, Ontario taxpayers and potentially natural gas ratepayers in 10 years.

[1] EB-2022-0200 Exhibit JT3.16
[2] FRPO_REQ EGI COMPLETE EVID_KAWARTHA_20230703
[3] FRPO_EGI LTC KAWARTHA_FRPO REQ TECH CONF_20230923
[4] Decision_Procedural Order 2_EGI Bobcaygeon NGEP_LTC appn_20240220
[5] Ontario Regulation 24/19 Expansion of Natural Gas Distribution Systems, Schedule 2

However, the one area where we believed we could assist the Board was with the facility sizing.

Before providing more detailed comments on the respective projects, FRPO would like to highlight our concerns that these and other facilities projects have been submitted to the Board with very little information on the proposed layout of the piping network to serve the communities including pressure and flow and other critical information required to assess the "right-sizing" of the project to the demands identified. In our view, the facilities information provided in the pre-filed evidence on these projects falls far short of that prescribed in the Natural Gas Facilities Handbook.[6]

As such, even though our initial inquiry yielded some enhanced understanding of the operating pressures and flows of the proposed network[7], our ability to assist the Board was limited by not having the sizing, pressure and layout of these networks in the pre-filed evidence to inform more precise questions. These gaps in evidence prompted our request for a Technical Conference. Without the benefit of a technical conference, we needed to invest more time to locate a reliable tool from the public realm to confirm our belief that the proposed piping is over-designed.

THE PROPOSED REINFORCEMENT PIPELINE IS NOT JUSTIFIED

The application proposes to extend an NPS 6 near Cowan's Bay for approximately 25 km to Bobcaygeon. The design also proposes to loop the existing pipeline from its source point near Stewart Line with NPS 8 for 8 km. In our respectful submission, there is no evidence to justify this Reinforcement.

In our first interrogatory, we asked EGI to file its network analysis that determined the proposed pipe sizes. Consistent with recent discovery, EGI did not provide the requested network analysis.[8] However, we also asked EGI to provide pressures at the start of Reinforcement pipeline near Stewart Line (Point A), at the connection of the Supply line to the existing pipeline near Cowan's Bay (Point B) and at the end of the proposed HP pipeline near Bobcaygeon (Point C) and the flow through each segment of pipe.[9]

From our experience, we understand that pressure drop can be calculated by different formulae given certain conditions of fluid flow. Weymouth, Panhandle A and

[6] EB-2022-0081 Natural Gas Facilities Handbook, issued March 31, 2022
[7] Exhibit I.FRPO.1
[8] Ibid.
[9] FRPO_IR_EGI_BOBC LTC_20230906, Attachment 1

Panhandle B equations have been used by utilities to estimate the amount of flow available from a selected pipe size given pressure available.[10] Which equation is better depends upon a number of parameters including flow, pressure and other conditions.

To test the need for reinforcement, we analyzed the pressure drops in the pipeline segments between the specific points (A, B and C) using only an NPS 6 HP pipeline. We started with the Year 10 Amended Proposal pressure of 2,260 kPa[11] at the source near Stewart Line and calculated the pressure drop in the segments separately as there are two distinct peak flow conditions in each segment (8,030 m^3/hr for A-B and 6,625 m^3/hr for B-C).[12] Using the most conservative of the pipeline flow equations (Weymouth), we calculated the pressure drop in each segment.

	(kPa)	(psig)*	(m^3/hr)	(scfh)*
Point A Pressure	2,260	328		
Flow between A-B			8,030	285,000
Point B Pressure (Weymouth calculated)	1,831	265.5		
Flow between B-C			6,625	235,000
Point C Pressure (Weymouth calculated)	1,100	159.5		

* many pressure drop equations and programs are developed using Imperial Units with standard cubic feet per hour or scfh as the units of flow and psig as the units of pressure. We have included the results of the pressure drop estimations in Attachment 1 (Points A-B) and Attachment 2 (Points B-C) with the results highlighted.

Given the design minimum of 885 kPa at Point C,[13] these results indicate that the proposed NPS 6 Supply pipeline can supply the demands forecasted for the first 10 years of the project. We understand that EGI's pressure results provided in the interrogatory response are lower for the forecasted demand and we believe they included the Reinforcement pipeline (it is not clear from their responses). EGI may have some

[10] Estimating Pressure Drop in Natural Gas Pipeline, Boms Allen Aka, Nmegbu Godwin Chukwuma Jacob and Ehirim Emmanuel O., International Journal of Scientific & Engineering Research, Volume 8, Issue 1, January-2017 ISSN 2229-5518
https://www.researchgate.net/publication/339401535_Estimating_Pressure_Drop_in_Natural_Gas_Pipeline_A_Case_Study_of_Rumuji_-_Bonny_NLNG_Pipeline

[11] Exhibit I.FRPO.1
[12] Ibid.
[13] Ibid.

asserted explanation for these substantial differences but since the requests for a Technical Conference were not approved, parties will have no way to test this additional information.

What is absolutely clear is no party including the Board nor staff can be assured that the Reinforcement pipeline will in fact be needed to meet future demands that are uncertain. It is clear even from EGI's evidence that the Reinforcement pipeline will not be needed in the first year and, in our view, for many years after. Even if EGI has assertions which reinforce its claim to need the Reinforcement pipeline by the end of the ten year forecast horizon, we would urge the Board to approve the Supply pipeline LTC and provide additional procedural steps to test the need and timing of the Reinforcement pipeline. If the Reinforcement pipeline were deferred several years, shortened or potentially eliminated, the contributions from customers and governments could be reduced while potentially decreasing the amount of asset cost that may be eventually be stranded for this long life asset.

COSTS

In these proceedings, FRPO strived to assist the Board with a view to facilities matters of the expansion projects. We trust that our submissions are helpful. We respectfully request the award of 100% of our reasonably incurred costs at such time as the Board calls for those costs.

ALL OF WHICH IS RESPECTFULLY SUBMITTED ON BEHALF OF FRPO,

Digitally signed by R. Dwayne Quinn
DN: cn=R. Dwayne Quinn, o=DR QUINN & ASSOCIATES LTD., ou=PRINCIPAL, email=drquinn@rogers.com, c=CA
Date: 2024.03.25 20:44:09 -04'00'

Dwayne R. Quinn
Principal
DR QUINN & ASSOCIATES LTD.

Imperial units

Data input			
Gas conveyed		Natural Gas	
Molecular weight of the gas		17.4	g/mol
Spefici gravity of gas vs air		0.60	
Gas viscosity		0.011	
Inlet temperature	T1	40	F
		499.67	R
Outlet temperature	T2	40	F
		499.67	R
Inlet pressure	P1'	328	Psi abs
Outlet pressure	P2	265.5	Psi abs
Total pipe length	Lm	8.75	miles
Pipe internal diameter	d	6.065	in
Pipe roughness	epsilon	0.015	mm
Pipe elevation	DZ	0	ft
Friction factor (Darcy)	f	0.0128	
Efficiency factor	E	0.95	

Average temperature	Tavg	40	F
		499.67	R
Average pressure	Pavg	297.8469531	Psi abs
Compressibility factor	Zf,avg	0.96	
Potential energy term	phi	0	
Absolute temperature at standard conditions	Tb	520	R
Absolute pressure at standard conditions	Pb'	14.7	Psi abs
	Tb/P'b	35.37414966	
(P1')2-(P2')2 – phi		37093.75	
f.Lm.Tavg.Zfavg.Sg		32.23471104	
Lm.Tavg.Zfavg.Sg		2518.3368	
Lm.Tavg.Zfavg.Sg^0.8539		2713.475559	
Lm.Tavg.Zfavg.Sg^0.931		2608.683405	

Calculation flow of compressible fluid in the pipeline			
Isothermal equation	q'h iso	333645	scfh
Weymouth equation	q'h wey	285153	scfh
Panhandle A equation	q'h pan A	371390	scfh
Panhandle B equation	q'h pan B	410360	scfh

BOBCAYGEON - PRESSURE DROP AT FLOW BETWEEN POINTS B and C

A ac n

Imperial units

Data input			
Gas conveyed		Natural Gas	
Molecular weight of the gas		17.4	g/mol
Spefici gravity of gas vs air		0.60	
Gas viscosity		0.011	
Inlet temperature	T1	40	F
		499.67	R
Outlet temperature	T2	40	F
		499.67	R
Inlet pressure	P1’	265.5	Psi abs
Outlet pressure	P2	159.5	Psi abs
Total pipe length	Lm	15.625	miles
Pipe internal diameter	d	6.065	in
Pipe roughness	epsilon	0.015	mm
Pipe elevation	DZ	0	ft
Friction factor (Darcy)	f	0.0128	
Efficiency factor	E	0.95	

Average temperature	Tavg	40	F
		499.67	R
Average pressure	Pavg	216.9062745	Psi abs
Compressibility factor	Zf,avg	0.96	
Potential energy term	phi	0	
Absolute temperature at standard conditions	Tb	520	R
Absolute pressure at standard conditions	Pb’	14.7	Psi abs
	Tb/P’b	35.37414966	
(P1’)2-(P2’)2 – phi		45050	
f.Lm.Tavg.Zfavg.Sg		57.561984	
Lm.Tavg.Zfavg.Sg		4497.03	
Lm.Tavg.Zfavg.Sg^0.8539		4845.492069	
Lm.Tavg.Zfavg.Sg^0.931		4658.363224	

Calculation flow of compressible fluid in the pipeline			
Isothermal equation	q’h iso	275154	scfh
Weymouth equation	q’h wey	235163	scfh
Panhandle A equation	q’h pan A	301665	scfh
Panhandle B equation	q’h pan B	337118	scfh