



GNI GT17 Submission

**Recommendations on Maintenance
and Asset Replacement**

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(Confidential)

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EXECUTIVE SUMMARY

This note provides Rune Associates' recommendations on GNI's forecast costs for maintenance and asset replacement set out in its Business Plan Reporting Template, with supporting text in its GT17 Asset Replacement and Operating Expenditure submission and further clarified through the Question and Answer process.

Rune Associates has reviewed the GNI maintenance forecast costs for the GT17 period and is of the opinion that, with a limited number of exceptions, the forecasts are reasonable. Rune Associates has provided its recommendations of a reasonable level for the exceptions.

Rune Associates has also reviewed GNI's asset replacement forecast costs for the GT17 period and has provided recommendations on the work proposed and associated costs.

1 CONTEXT

The Utility Regulator (UR) is undertaking the GT17 price control review for the four high pressure gas networks in Northern Ireland, which covers the period from October 2017 to October 2022. The four gas conveyance licence holders subject to this price control are:

- GNI (UK) is a subsidiary of Ervia, a utility infrastructure company owned by the government of the Republic of Ireland.
- Premier Transmission Limited (PTL), Belfast Gas Transmission Limited (BGTL) and West Transmission Limited (WTL)¹ are all part of the Mutual Energy Group (MEL).

GNI submitted business plan documents and data tables setting out their proposals for the GT17 period.

Rune Associates was commissioned by UR to assist with its evaluation of the business plans and advise on the reasonableness of the forecast costs for maintenance and asset replacement. Rune Associates has reviewed the GNI business plan submission, raised clarification queries to which the company has responded through a formal Question and Answer process and taken part in a teleconference and subsequent meeting with GNI.

This report provides Rune Associates' recommendations on GNI's forecast costs for maintenance and asset replacement.

2 MAINTENANCE

2.1 Overview



There is a modest increase to the asset base during the GT17 period, which is associated with the gas to the west developments. AGI maintenance represents the single largest maintenance cost (just over 40% of total maintenance).

2.2 Rune Associates Review

Rune Associates has reviewed GNI's proposals for the costs associated with maintenance, the related explanation in its business plan document and has sought further clarification through the Question and Answer process.

UR asked Rune Associates to consider whether benchmarking of maintenance costs between the companies and with other potential comparators might offer additional insights on which to assess the forecast costs. In Rune Associates' experience benchmarking of gas transmission maintenance which consists of mainly low volume, variable frequency activities on relatively small numbers of assets, makes it difficult to produce productive conclusions. In addition to the difficulty of comparing the different maintenance activities that may be applied to gas transmission assets depending on their configuration, duty, condition and stage in their lifecycle, confirming consistent cost allocation at activity level, particularly in relation to contract and own labour, is a major challenge. Regulators such as Ofgem and CER have, to date, based their assessments of gas transmission maintenance on 'bottom up' analysis rather than benchmarking.

Rune Associates has therefore reviewed the cost trends, in particular between the actual values reported for the 3 historical years and those forecast for the GT17 period and its views on the maintenance submission are as follows:

2.2.1 Asset Management and Compliance

GNI indicates that costs in this area reflect the provision of compliance advice and work management support from its parent company Gas Networks Ireland and that this was not previously allocated, the costs forecast for engineering compliance and asset management are not material whereas those for work planning are.



. As outlined above this approach is being reconsidered. However, in Rune Associates' view it is reasonable to assume that there would be some element of work planning costs associated with GNI actively managing and controlling the work flow, and capturing data on work completion.

2.2.2 Emergency Response

Rune Associates has recommended an allowance of £260k annually.

2.2.3 Pipeline Inspection

The forecast costs for aerial inspection are consistent with historical trends, as is the routine element of on land inspections. There is one on line inspection activity planned for the GT17 period, that of the South North pipeline in 2018/19. The forecast cost for this is £295k, which compares with a forecast of £357k for on line inspection of the North West pipeline and the Kernan Spur carried out in 2015/16 and 2016/17. The length of the South North pipeline is greater than the North West pipeline and the Kernan Spur and in Rune Associates the pipeline inspection cost forecast are reasonable.

2.2.4 Routine Maintenance

Forecast pipeline maintenance costs increase by under 10% compared with historical actual values and at the level shown, appear reasonable.

Forecast costs for AGI maintenance however increase by over 40% compared with historical actuals, as indicated previously.

Rune Associates has considered these elements, together with the associated replacement programme recommendations, in deriving its recommendation.

The only other item under the routine maintenance heading is AGI utility costs, as it appears that electricity supplies to AGIs are now metered and forecasts are based on estimated usage, the cost forecast appear reasonable.

2.2.5 Unplanned Maintenance

Forecast costs for both drainage and fault repairs are consistent with historical actual values. With regard to drainage, the forecast costs appear reasonable but



in the case of fault repairs, with the targeted replacement of assets based on condition and the proposed move to condition based maintenance over time, Rune Associates would expect a reduction in fault repairs and proposes that it is reasonable that the values for the GT17 period are held at the 2016/17 and 2017/18 forecast level of £200k annually.

2.3 Summary

Rune Associates has reviewed GNI's maintenance forecast costs for the GT17 period and is of the opinion that, with the exception of Emergency Response fixed costs, AGI Maintenance and Fault Repairs, the forecasts are reasonable. In the case of the Emergency Response fixed costs, AGI Maintenance and Fault Repairs, Rune Associates has provided its recommendations of a reasonable level.

Tables 1 and 2 below show GNI's proposals and Rune Associates' recommendations respectively.



		GNI Proposals (£m)					
		2017-18	2018-19	2019-20	2020-21	2021-22	Total
A	Asset Management & Compliance						
1	Engineering Compliance	0.006	0.006	0.006	0.006	0.006	0.030
2	Work Planning	0.097	0.097	0.096	0.099	0.099	0.488
3	Asset Management	0.007	0.007	0.007	0.007	0.007	0.034
4	Total	0.109	0.109	0.109	0.112	0.112	0.551
B	Emergency Response						
5	MERC Fixed Costs	0.281	0.281	0.281	0.281	0.281	1.405
6	MERC Variable Costs	0.007	0.007	0.007	0.007	0.007	0.035
7	Emergency Spares	-	-	-	-	-	-
8	Emergency Exercise	-	-	-	-	-	-
9	Total	0.288	0.288	0.288	0.288	0.288	1.440
C	Pipeline Inspection						
10	Sub-Sea Surveys	-	-	-	-	-	-
11	On-Land Inspections	0.024	0.320	0.031	0.031	0.049	0.455
12	Aerial Inspections	0.146	0.146	0.146	0.146	0.146	0.730
13	Total	0.170	0.466	0.177	0.177	0.195	1.185
D	Routine Maintenance						
14	Pipeline Maintenance	0.096	0.081	0.075	0.115	0.096	0.463
15	Sub-Sea Maintenance	-	-	-	-	-	-
16	AGI Maintenance	1.074	1.104	1.094	1.129	1.153	5.554
17	Landowner Liaison	-	-	-	-	-	-
18	Specialist Equipment	-	-	-	-	-	-
19	Non-MERC Contracts	0.147	0.147	0.147	0.147	0.147	0.735
a	<i>Utility Costs at AGIs</i>	0.147	0.147	0.147	0.147	0.147	0.735
20	Total	1.317	1.332	1.316	1.391	1.396	6.752
E	Unplanned Maintenance						
21	Drainage	0.273	0.273	0.273	0.273	0.273	1.365
22	Fault Repairs	0.200	0.230	0.235	0.235	0.240	1.140
23	Other Unplanned Maintenance	0.010	0.025	-	-	-	0.035
F	Cost Totals						
24	Planned Maintenance	1.884	2.195	1.890	1.968	1.991	9.928
25	Unplanned Maintenance	0.483	0.528	0.508	0.508	0.513	2.540

Table 1

		Rune Associate Recommendations (£m)					
		2017-18	2018-19	2019-20	2020-21	2021-22	Total
A	Asset Management & Compliance						
1	Engineering Compliance	0.006	0.006	0.006	0.006	0.006	0.030
2	Work Planning	0.097	0.097	0.096	0.099	0.099	0.488
3	Asset Management	0.007	0.007	0.007	0.007	0.007	0.034
4	Total	0.109	0.109	0.109	0.112	0.112	0.551
B	Emergency Response						
5	MERC Fixed Costs	0.260	0.260	0.260	0.260	0.260	1.300
6	MERC Variable Costs	0.007	0.007	0.007	0.007	0.007	0.035
7	Emergency Spares	-	-	-	-	-	-
8	Emergency Exercise	-	-	-	-	-	-
9	Total	0.267	0.267	0.267	0.267	0.267	1.335
C	Pipeline Inspection						
10	Sub-Sea Surveys	-	-	-	-	-	-
11	On-Land Inspections	0.024	0.320	0.031	0.031	0.049	0.455
12	Aerial Inspections	0.146	0.146	0.146	0.146	0.146	0.730
13	Total	0.170	0.466	0.177	0.177	0.195	1.185
D	Routine Maintenance						
14	Pipeline Maintenance	0.096	0.081	0.075	0.115	0.096	0.463
15	Sub-Sea Maintenance	-	-	-	-	-	-
16	AGI Maintenance	0.884	0.930	0.931	0.950	0.981	4.676
17	Landowner Liaison	-	-	-	-	-	-
18	Specialist Equipment	-	-	-	-	-	-
19	Non-MERC Contracts	0.147	0.147	0.147	0.147	0.147	0.735
a	<i>Utility Costs at AGIs</i>	0.147	0.147	0.147	0.147	0.147	0.735
20	Total	1.127	1.158	1.153	1.212	1.224	5.874
E	Unplanned Maintenance						
21	Drainage	0.273	0.273	0.273	0.273	0.273	1.365
22	Fault Repairs	0.200	0.200	0.200	0.200	0.200	1.000
23	Other Unplanned Maintenance	0.010	0.025	-	-	-	0.035
F	Cost Totals						
24	Planned Maintenance	1.673	2.000	1.707	1.768	1.797	8.945
25	Unplanned Maintenance	0.483	0.498	0.473	0.473	0.473	2.400

Table 2



3 ASSET REPLACEMENT

3.1 Overview

GNI has an ambition to progressively move to a position where their asset maintenance strategies and replacement activities are more deeply informed by asset health and failure data. They claimed that the proposed new contract strategy, which was to adopt an 'activity based' approach, would enable this and so lead to future benefits. As outlined above GNI have indicated that they are now reviewing the proposed changes to the MERC commercial strategy.

It is apparent from a review of their submission, together with the responses to queries raised, that there is limited evidence in some cases to support specific proposals. GNI provided extracts from the relevant Functional Specifications and Requirements (FSRs) to support their repex proposals. The FSR extracts provided indicate the 'average life expectancies' for the assets and/or sub components, and it is these values that GNI are using to prompt proposals in many cases. These 'average life values' are typically based on a design life, sourced from a code or manufacturer, with limited asset health and fault data used to inform actual asset performance.

GNI has indicated that the costings for the proposed replacement activities are in many cases initial budget estimates, with an expected accuracy tolerance of c +/- 15%. They would expect the costings, and the specific location of requirements in some cases, to be firmed up following further design work.

3.2 Rune Associates Review

Rune Associates has reviewed the proposals and its conclusions are set out below. The references quoted against each item below are the relevant clauses from the document 'GT17: Asset Replacement Expenditure' dated 7 September 2016, and Table 7 of GNI's submission.

Cathodic Protection refurbishment (section 3.2.2, table 7 A1f)

The need for some refurbishment of these assets is accepted. The evidence that the timing is appropriate is limited and the GNI proposed replacement is not site specific.

GNI has not had to undertake this activity to date with some initial work planned in 2016/17. Rune Associates has current knowledge of typical costs of CP related work carried out in small batches in GB. Based on this understanding (e.g. T/R replacement at c £12k/unit, ground bed at c £6k/unit) it is proposed that funding of £0.20m be allowed for the period to enable these systems to be refurbished as appropriate.

This approach will allow GNI to manage the system population, through targeted replacement, and to gather data to inform subsequent condition based replacement proposals.

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.079	0.042	0.042	0.042	0.042
Rune Recommendation	0.060	0.030	0.030	0.040	0.040

Table 3

Boiler refurbishment programme (section 3.2.1, table 7 A1g)

The need for effective pre-heating is accepted. The evidence base for the quoted 50% failure rate of units past their design life is limited. The rationale for replacing 27 units and in particular the demonstration that this is the optimal proposal, is unsubstantiated.

It is proposed that funding be allowed to replace 10 boilers by the end of the period, rather than the 27 suggested by GNI over the first 3 years of the period. This approach will allow GNI to manage the asset population, through targeted replacement and the harvesting of spares, and to assimilate data to inform subsequent condition based replacement proposals.

Additionally, it is proposed that the GNI requested unit cost is reduced by 5% to reflect the procurement scale benefit opportunity that such a programme offers.

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.277	0.852	0.852	-	-
Rune Recommendation	-	-	0.200	0.250	0.250

Table 4

Control System Upgrades (section 3.2.3, table 7 A1h)

The proposed work to replace the obsolescent distributed control system equipment at Gormanston Phase 11 AGI is considered broadly reasonable in terms of both need and forecast cost.

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.029	0.085	0.000	0.000	0.000
Rune Recommendation	0.029	0.085	0.000	0.000	0.000

Table 5

Instrumentation Refurbishment (section 3.2.4, table 7 A1i)

The proposed work to replace remote terminal units, uninterrupted power supply equipment and battery chargers on the basis of age and obsolescence, is considered broadly reasonable in terms of both need and forecast cost.

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.102	0.050	0.050	0.050	0.050
Rune Recommendation	0.102	0.050	0.050	0.050	0.050

Table 6

AGI metering recalibration (section 3.2.5, table 7 A1j)

The need for the work is accepted. GNI has confirmed that work is required at 10 sites and that (since the metering assets were commissioned over ten years ago), none of the metering systems in the scope of this initiative have been calibrated.



GNI is proposing to undertake this work at a broadly even rate through the period. This would not appear to provide an optimised position given the current 'non-compliance with respect to relevant codes' that GNI highlights. It is acknowledged that logistical and resource factors may be a limitation, however it is considered that the proposed activity should be accelerated if practicable.

The proposed costs are considered broadly reasonable. However, it is considered that it would be appropriate to reduce the GNI requested unit cost by 5% to reflect both the scale benefit and also the opportunity the range of service providers available may provide should the company be able to adopt a flexible procurement proposal.

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.092	0.107	0.107	0.107	0.107
Rune Recommendation	0.088	0.101	0.101	0.101	0.101

Table 7

Gormanston Phase II metering (section 3.3.1, table 7 A1k)

It is acknowledged that there are a range of activities required to ensure that the metering conforms to the accuracy standard required by the Transportation Network Code. However, given that it appears gas is not expected to flow through the AGI in other than emergency situations where metering accuracy is unlikely to be the main consideration, Rune Associates does not currently consider that the benefit cases for either the enhanced upgrade proposal or the more limited calibration work option have been made.

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.238	0.307	0.307	-	-
Rune Recommendation	-	-	-	-	-

Table 8

AGI Security Upgrade (section 3.3.2, table 7 A1l)



UR has indicated its intention to treat this project as a 'relevant item' i.e. make no allowance at this stage but accept a submission on this for money in the GT17 period when there is clarity on the proposed work and costs. Rune Associates acknowledges this as a prudent course and in its recommendation has not included an allowance at this stage

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.137	0.230	0.230	0.230	0.230
Rune Recommendation	0.000	0.000	0.000	0.000	0.000

Table 9

Cyber Security Upgrades (section 3.3.3, table 7 A1m)

broadly reasonable in terms of both need and forecast cost is considered

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.015	0.139	0.000	0.000	0.000
Rune Recommendation	0.015	0.139	0.000	0.000	0.000

Table 10

Emergency Escapes (section 3.3.4, table 7 A1n)

Rune Associates considers that this work is required and that there may be scale related cost benefits

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.083	0.139	0.139	0.139	0.139
Rune Recommendation	0.050	0.110	0.110	0.110	-

Table 11

Remote Line Valve actuation analysis (section 3.3.5, table 7 A1o)

This is a proposed feasibility study, and would be considered as opex. In Rune Associates' opinion the number of valves that it may be appropriate to consider for remote actuation will be determined by a range of network specific, geographic, and customer related factors, not by reference to a comparison of levels of 'remote actuation' capability in other networks.

The proposed amount of £27k is considered high for the analysis involved. It is suggested that this analysis is something that GNI should carry out as part of their (opex funded) periodic emergency planning considerations to see if there are benefits that can be confirmed, and associated activities that they would wish



to progress. It is considered that any proposals in due course would be a capital item.

Costs (£m)	2017-18	2018-19	2019-20	2020-21	2021-22
GNI Proposal	0.027	-	-	-	-
Rune Recommendation	-	-	-	-	-

Table 12

3.3 Summary

Rune Associates has reviewed GNI's asset replacement forecast costs for the GT17 period and has provided recommendations of the reasonableness of the work proposed and associated costs.

Tables 13 and 14 below show GNI's proposals and Rune Associates' recommendations respectively.

Asset Replacement	GNI Proposals (£m)					Total
	2017-18	2018-19	2019-20	2020-21	2021-22	
Cathodic Protection	0.079	0.042	0.042	0.042	0.042	0.247
Boiler Refurbishment	0.277	0.852	0.852	0.000	0.000	1.982
Control System Upgrades	0.029	0.085	0.000	0.000	0.000	0.114
Instrumentation Refurbishment	0.102	0.050	0.050	0.050	0.050	0.303
Metering Recalibration	0.092	0.107	0.107	0.107	0.107	0.518
Gormanstown P2 Metering	0.238	0.307	0.307	0.000	0.000	0.852
AGI security	0.137	0.230	0.230	0.230	0.230	1.056
Cyber Security Upgrades	0.015	0.139	0.000	0.000	0.000	0.155
Emergency Escapes	0.083	0.139	0.139	0.139	0.139	0.641
Remote Line Valve Actuation	0.027	0.000	0.000	0.000	0.000	0.027
Total	1.081	1.952	1.727	0.568	0.568	5.896

Table 13



Asset Replacement	Rune Associates Recommendations (£m)					
	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Cathodic Protection	0.060	0.030	0.030	0.040	0.040	0.200
Boiler Refurbishment	0.000	0.000	0.200	0.250	0.250	0.700
Control System Upgrades	0.029	0.085	0.000	0.000	0.000	0.114
Instrumentation Refurbishment	0.102	0.050	0.050	0.050	0.050	0.303
Metering Recalibration	0.088	0.101	0.101	0.101	0.101	0.492
Gormanstown P2 Metering	0.000	0.000	0.000	0.000	0.000	0.000
AGI security ¹	0.000	0.000	0.000	0.000	0.000	0.000
Cyber Security Upgrades	0.015	0.139	0.000	0.000	0.000	0.155
Emergency Escapes	0.050	0.110	0.110	0.110	0.000	0.380
Remote Line Valve Actuation	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.344	0.516	0.492	0.552	0.442	2.345

Table 14

¹ Treated as a 'relevant item', allowance to be established during GT17 when there is clarity on the proposed work and costs

