Government of **Western Australia**
Department of **Commerce**
Energy*Safety*

Technical Report

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EnergySafety Technical Comments on the WAGN Proposed Revision to the Access Arrangement 2010-2014 for the ERA

Revision	Description	Date
A	Initial Report	08/06/10
B	Revised from WAGN Response to Draft Decision	07/01/11

CONTENTS PAGE

1 INTRODUCTION

This report includes the technical comments from an Energy*Safety* review of the 'Proposed Revisions to the Access Arrangement for the WA Gas Networks Distribution Systems – Response to Draft Decision' submitted by WA Gas Networks, dated 8 October 2010. The review was conducted on behalf of the Economic Regulation Authority.

In performing the review, Energy*Safety* was asked to only consider the capital expenditure with respect to new capital expenditure criteria set out in National Gas Rules 2009 Rule 79(1)(a), and Rule 79(2)(c). These rules are reproduced below.

79 New capital expenditure criteria

(1) Conforming capital expenditure is capital expenditure that conforms with the following criteria:

(a) the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services;..."

With respect to rule 79(1)(a) Energy*Safety*'*s* conclusion is that overall, the projects detailed meet the criteria for conforming capital expenditure in that the costs associated with the projects appear to be reasonable for a prudent service provider acting efficiently and in accordance with accepted good industry practice.

79 New capital expenditure criteria

(2) Capital expenditure is justifiable if: ...

(c) the capital expenditure is necessary:

i. to maintain and improve the safety of services; or

ii. to maintain the integrity of services; or

iii. to comply with a regulatory obligation or requirement; or

iv. to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); ..."

Energy*Safety*'s assessment of each of the capital expenditure project with respect to rule 79(2)(c) for WAGN's current access arrangement (2005-2009) and forthcoming access arrangement (2010-2014) is set out in the following tables.

2 CAPITAL EXPENDITURE 2005-2009

2.1 Capital expenditure: Projects: 2005 – 2009

Item	Project	WAGN Justification	Frontier Comment	EnergySafety Justification	EnergySafety Comments
1	Upgrade corrosion protection on high pressure pipeline (Pipeline 9)	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
2	Direct current voltage gradient surveys of steel pipelines	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
3	Upgrade corrosion protection system remediation on Pipeline 76	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
4	High pressure gas supply to northern suburbs [redacted]	Rule 79(2)(a), (b), (c)(i)		Rule 79(2)(a), (b)	Not a safety issue, rule (c)(i) not applicable
5	Upgrade corrosion protection: replacement of impressed current transformer units of inadequate capacity	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
6	Transformer/rectifier unit for cathodic protection on steel pipeline (Pipeline 5) East Perth	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
7	Installation of pressure monitoring devices: installation of additional pressure monitoring devices within expanding network to provide the data for system modelling which identifies over-pressure (safety) and under-pressure (capacity maintenance) problems	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(iv)	Required for capacity modelling
8	Improvements in the earthing of steel pipelines, identified in annual corrosion protection system reviews, to reduce induced AC voltages to acceptable levels	Rule 79(2)(c)(ii)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain safety and integrity
9	Modifications to (steel) Pipeline 4, Mounts Bay Road and Kings Park	Rule 79(2)(c)(iv)		Rule 79(2)(c)(iv)	Required for capacity
10	Replacement of corroded high pressure valves 2V9, 12V3, 16V2, 18V1, 18V2, 37V1, 46V1, 52V1 (valves required for emergency isolation of parts of the high pressure system)	Rule 79(2)(c)(i), (ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
11	Corrosion protection: sacrificial anode replacements to maintain the integrity of high pressure steel pipelines	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
12	Corrosion protection upgrade: investigate and mitigate interference issues, and restore corrosion protection system on High Pressure Pipeline 63/64 (O'Connor)	Rule 79(2)(c)(ii)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
13	Modifications to high pressure gas supply [redacted]	Rule 79(2)(c)(i), (ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
14	Condition assessments of high pressure Pipelines 20 and 63	Rule 79(2)(c)(i), (ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity

Item	Project	WAGN Justification	Frontier Comment	EnergySafety Justification	EnergySafety Comments
15	Mandurah lateral: 16.9 km x 200 mm Class 600 HP steel pipeline to reinforce Rockingham-Mandurah subnetwork and allow increase in number of connections	Rule 79(2)(a), (b), (c)(i), c(iv)		Rule 79(2)(a), (b), (c)(iv)	Required for capacity to Mandurah
16	Main relocation: Southern River	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Required to maintain integrity
17	Relocation of 120 mm X 80 mm PVC main to allow work by City of Gosnells	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
18	Main relocation: Foreshore Drive, Geraldton	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
19	Modifications to corrosion protection system, Flynn Drive Neerabup, affected by induced currents from new Western Power lines	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
20	Cast iron pipeline replacement: replacement of cast iron pipelines in the Fremantle area which are being operated at higher than industry standard pressures to maintain capacity, but with increased safety risk because of the age of these pipelines	Rule 79(2)(c)(i), (iv)		Rule 79(2)(c)(ii),(iv)	Necessary to maintain integrity and capacity
21	Condition assessment and repair of steel pipeline, Thomas Street, Nedlands	Rule 79(2)(c)(i), (iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
22	Replacement of pressure monitoring devices and telemetry systems which have reached ends of technical lives	Rule 79(2)(c)(iv)		Rule 79(2)(c)(iv)	Required for capacity modelling
23	Main relocation: St Ives Stage 6	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
24	Condition assessment and repair of steel pipeline, Maylands	Rule 79(2)(c)(i), (iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
25	Cast iron pipeline replacement: replacement of cast iron pipelines currently being operated at higher than industry standard pressures to maintain capacity, but with increased safety risk because of the age of these pipelines	Rule 79(2)(c)(i), (iv)		Rule 79(2)(c)(ii))	Necessary to maintain integrity and supply
26	Replacement of odd-sized unprotected steel pipelines in South Perth: replacement of older coated steel mains the coatings on which have now decayed allowing corrosion of the pipe itself, and replacement of pipes of unusual diameters for which fittings are no longer available, and which cannot now be worked on using standard equipment	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
27	Replacement of 380 mm diameter unprotected and corroded steel pipelines in Victoria Park	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
28	Collie River: replacement Collie River crossing with PE DN160 pipeline	Rule 79(2)(c)(iv)		Rule 79(2)(c)(iv)	Required for capacity
29	Minor mains replacement: Marshall Road	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity

Item	Project	WAGN Justification	Frontier Comment	EnergySafety Justification	EnergySafety Comments
30	Main upgrading: 1350 m x 225 mm PE from Rome Road, Melville, north across Canning Hwy to Attadale and Bicton	Rule 79(2)(c)(iv)		Rule 79(2)(c)(iv)	Necessary to maintain capacity
31	Pipeline markers: marker signs on higher pressure pipelines to comply with changed standard of AS 4645	Rule 79(2)(c)(iii)		Rule 79(2)(c)(iii)	Necessary for regulatory compliance
32	Replacement of obsolete impressed current transformer/rectifier units used for corrosion protection on high pressure steel pipelines	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
33	Condition assessments of steel pipelines	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
34	TDW equipment overhaul: overhaul of special tool used for steel pipeline emergency isolation	Rule 79(2)(c)(ii)		Rule 79(2)(c)(iii)	Necessary for emergency response
35	Corrosion protection upgrade to maintain the integrity of steel pipelines in medium pressure parts of the network	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
36	(Steel) Pipeline 84 condition assessment and upgrading of cathodic protection	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
37	Replacement of ME602 and M6EW meters which have now been, or which will have been at the time of replacement, in service for a period exceeding their regulated service lives	Rule 79(2)(c)(iv)		Rule 79(2)(c)(iii)	Regulatory requirement
38	Upgrade regulator pit OS73	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(ii)	Necessary to maintain integrity
39	Medium pressure regulator set upgrades: upgrading of existing medium pressure regulator sets to accommodate increase in number of connections	Rule 79(2)(c)(iv)	Rule 79(2)(b)	Rule 79(2)(c)(iv)	Necessary to maintain capacity
40	Replacement of regulators as part of replacement of odd-sized unprotected steel pipelines in South Perth	Rule 79(2)(c)(ii), (iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
41	Medium pressure regulator set upgrade: MN189 Bellevue Crescent, Dianella; MS036, Rivervale	Rule 79(2)(c)(ii), (iv)		Rule 79(2)(c)(iv)	Necessary to maintain capacity
42	Replacement of lids on regulator pits: replacement of damaged or corroded pit lids to allow safe access and ensure integrity of equipment	Rule 79(2)(c)(i), (ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
43	Modifications to pressure regulator station PRS003, Geraldton	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
44	End of life replacement of gate station equipment	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
45	Mandurah gate station: gate station on Dampier to Bunbury Natural Gas Pipeline to allow gas delivery into the Mandurah lateral	Rule 79(2)(a), (b), (c)(i), c(iv)		Rule 79(2)(c)(iv)	Necessary to maintain capacity

Item	Project	WAGN Justification	Frontier Comment	EnergySafety Justification	EnergySafety Comments
46	Modifications to pressure regulator station PRS003, Geraldton	Rule 79(2)(c)(ii)			No cost associated with project
47	Replacement of obsolete wet cells in earthing systems of high pressure steel pipelines: replacement cells use less hazardous materials	Rule 79(2)(c)(i), (ii)		Rule 79(2)(c)(i), (ii)	Necessary to maintain safety and integrity
48	Replacement of transformer/rectifier unit for cathodic protection on steel pipeline (Fremantle)	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity

2.2 Capital expenditure: Information technology: 2005 – 2009

Item	Information technology	WAGN Justification	Frontier Comment	EnergySafety Justification	EnergySafety Comments
49	GNIS upgrade: major upgrade of Gas Network Information System, the geographic information system providing locational data on all network assets	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
50	"Dial before you dig": system to provide advice to builders, homeowners and others digging in the vicinity of gas mains	Rule 79(2)(c)(i)		Rule 79(2)(c)(i), (iii)	Necessary for public safety
51	Project Neon: migration of telemetry sites to Neon remote terminal technology to reduce time taken to download and process daily interval meter data for improved operational control, increased productivity and better leak detection	Rule 79(2)(c)(ii)		Rule 79(2)(c)(iv)	Necessary for capacity management

3 CAPITAL EXPENDITURE 2010-2013/2014

3.1 Capital expenditure: Projects: 2010(1) – 2013/2014

Item	Project	WAGN Justification	Frontier Comment	EnergySafety Justification	EnergySafety Comments
52	High pressure valve replacements: valves 2V9, 12V3, 16V2, 18V1, 18V2, 37V1, 46V1 and 52V1, which are required for isolation of parts of the high pressure system, are corroded and require replacement	Rule 79(2)(c)(i), (ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
53	Corrosion protection: sacrificial anode replacements to maintain the integrity of high pressure steel pipelines	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
54	Remediation of high pressure isolation valves: remediation of older high pressure isolation valves which have become difficult to operate because of corrosion but which do not yet require replacement.	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
55	Replacement of impressed current transformer/rectifier units used for corrosion protection on high pressure steel pipelines	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
56	Slabbing to meet requirements of AS 2885: concrete covering of HP pipelines in residential and other areas as a safety measure	Rule 79(2)(c)(i), (iii)		Rule 79(2)(c)(iii)	Necessary to comply with regulatory obligations Energy*Safety* agrees that slabbing is not the only option and orifice plates may provide a safer alternative.
57	Mandurah lateral: 16.9 km x 200 mm Class 600 HP steel pipeline to reinforce Rockingham-Mandurah subnetwork and allow increase in number of connections	Rule 79(2)(a), (b), (c)(i), c(iv)		Rule 79(2)(c)(iv)	Necessary for capacity
58	Corrosion protection: upgrading of test points to maintain the integrity of high pressure steel pipelines	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
59	Installation of surge protectors: installation of surge protectors at insulation joints to protect personnel from electric currents induced in steel pipelines as a result of proximity to high voltage power lines	Rule 79(2)(c)(i)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
60	Corrosion protection upgrading: replacement of impressed current transformer units of inadequate capacity or at ends of lives, and enclosure of test points to prevent vandalism, to maintain the integrity of high pressure steel pipelines	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
61	Pinjarra extension: extend 7.2 km x 150 mm Class150 pipeline from Pinjarra Gate Station to regulator set HS017 to allow operating pressure to be increased from 600 kPa to 900 kPa, ensuring continuity of supply during winter conditions	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(iv)	Necessary for capacity
62	Canningvale main extension: extension of 135 m x 110PE along Amherst Road across Warton Road to Holmes Street: short main extension required to compensate for pressure drop identified in system modelling studies	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(iv)	Necessary for capacity

Item	Project	WAGN Justification	Frontier Comment	EnergySafety Justification	EnergySafety Comments
63	Beresford Main Extension: extend 300m x 110PE along Chapman Rd and 1660m x 160PE SDR17.6 PE80B along North West Coastal Hwy to connect to 160PE on Flores Rd short main extension required to compensate for pressure drop identified in system modelling studies	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(iv)	Necessary for capacity
64	Cast iron pipeline replacement: replacement of cast iron pipelines currently being operated at higher than industry standard pressures to maintain capacity, but with increased safety risk because of the age of these pipelines	Rule 79(2)(c)(i), (iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
65	Replacement of unprotected and odd–sized steel pipelines: systematic replacement of coated steel mains installed 30 to 40 years ago, the coatings on which have now decayed allowing corrosion of the pipe itself, and replacement those pipelines (now) of unusual diameters and for which fittings are no longer available, and which cannot be worked on using standard equipment	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
66	Floreat: replacement of older pipelines and remediation work	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
67	Wembley: condition assessment of older mains in the Wembley area and expected replacement and remediation work	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
68	Osborne Park: condition assessment of older mains in the Osborne Park area and expected replacement and remediation work	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
69	Preston River: replacement of corroded steel pipeline on Preston River bridge near Bunbury	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
70	Shenton Park condition assessment of older pipelines and remediation work	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
71	High pressure regulator set capacity upgrades: upgrading of high pressure regulator sets at network locations at which system modelling has identified a significant pressure reduction and a requirement for additional capacity	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(iv)	Necessary for capacity
72	Medium pressure regulator set capacity upgrades: upgrading of high pressure regulator sets at network locations at which system modelling has identified a significant pressure reduction and a requirement for additional capacity	Rule 79(2)(a), (b)	Rule 79(2)(c)	Rule 79(2)(c)(iv)	Necessary for capacity
73	Medium pressure regulator pit replacements	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
74	Medium pressure regulator pit remediation: remediation work to prevent further water ingress into medium pressure regulator pits and corrosion of equipment	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
75	High pressure regulator pit remediation: remediation work to prevent further water ingress into high pressure regulator pits and corrosion of equipment	Rule 79(2)(c)(iv)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
76	Mandurah gate station: gate station on Dampier to Bunbury Natural Gas Pipeline to allow gas delivery into the Mandurah lateral	Rule 79(2)(a), (b), (c)(i), c(iv)		Rule 79(2)(c)(iv)	Necessary for capacity

Item	Project	WAGN Justification	Frontier Comment	EnergySafety Justification	EnergySafety Comments
77	Replacement of ME602 and M6EW meters which have now been, or which will have been at the time of replacement, in service for a period exceeding their regulated service lives	Rule 79(2)(c)(iv)		Rule 79(2)(c)(iii)	Necessary for regulatory compliance
78	Telemetry replacement: replacement of flow computers, transducers, data loggers and communications equipment which have reached the ends of their technical lives	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
79	Pressure monitoring data visualisation: project to facilitate dynamic monitoring of pressure across the network for strategic asset management	Rule 79(2)(c)(ii)		Rule 79(2)(c)(iv)	Necessary for capacity management
80	Corrosion protection upgrading: replacement of impressed current transformer units of inadequate capacity or at ends of lives, and enclosure of test points to prevent vandalism, to maintain the integrity of high pressure steel pipelines	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii)	Necessary to maintain integrity
81	Installation of pressure monitoring devices: installation of additional pressure monitoring devices within expanding network to provide the data for system modelling which identifies over-pressure (safety) and under-pressure (capacity maintenance) problems	Rule 79(2)(c)(ii)		Rule 79(2)(c)(iv)	Necessary for capacity management

3.2 Capital expenditure: Information technology: 2010(1)–2013/2014

Item	Information technology	WAGN Justification	Frontier Comment	EnergySafety Justification	EnergySafety Comments
82	Modifications to Gas Network Information System (GNIS) to capture network pressures and other data from live system monitoring	Rule 79(2)(c)(ii)		Rule 79(2)(c)(ii), (iv)	Necessary to maintain integrity and capacity