REPORT

FOR

CAPACITY ASSESSMENT OF HP GAS GRID NATURAL GAS PIPELINE

OF

M/S GSPL LIMITED

[IN LINE WITH PNGRB (DETERMINING CAPACITY OF PETROLEUM, PETROLEUM PRODUCTS AND NATURAL GAS PIPELINE) REGULATIONS,

This Report is prepared for M/s PNGRB and it is for use by M/s PNGRB or their assigned Representatives/ Organisations only. The matter contained in the Report is confidential.

2010]

D	21.03.2024	ISSUED AS FINAL STUDY REPORT	VS /AK	MS	HKP
C	16.02.2024	REVISED & RE-ISSUED AS UPDATED STUDY REPORT	VS /AK	MS	HKP
B	25.01.2024	REVISED & RE-ISSUED AS DRAFT STUDY REPORT	VS /AK	MS	HKP
A	15.11.2023	ISSUED AS PRELIMINARY DRAFT STUDY REPORT	**VS /AK**	**MS**	**HKP**
Rev. No.	**Date**	**Purpose**	**Prepared by**	**Reviewed by**	**Approved by**

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ANNEXURES:

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Abbreviations

PNGRB	:	Petroleum and Natural Gas Regulatory Board
EIL	:	Engineers India Limited
GSPL	:	Gujarat State Petronet Limited
LOA	:	Letter of Award

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1.0 EXECUTIVE SUMMARY

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Petroleum and Natural Gas Regulatory Board (PNGRB) [hereby may also be referred as "Client" for the subject service] was constituted under The Petroleum and Natural Gas Regulatory Board Act, 2006 (NO. 19 OF 2006) notified via Gazette Notification dated 31st March, 2006.

By exercising its power under provision 2 (d) of the said regulation, PNGRB provided LOA PNGRB/Tech/10-CapNGPL/(8)/2015(P-2791) Dated 29.03.2023 (Refer ***ANNEXURE-VIII***) for carrying out the capacity assessment of existing GSPL's HP GAS GRID NATURAL GAS PIPELINE of M/s GSPL Limited [hereinafter referred as an "Entity" also] for the given period of operation i.e. Year 2017-18 to 2023-24.

Role of EIL shall be to review the capacity assessment submitted by the operator & as determined by Entity in line with capacity determination criteria defined in the PNGRB (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010 [hereinafter referred as a "PNGRB Regulation" or "Regulation" also] (Refer ***ANNEXURE-I***) and based on data/ inputs provided by Entity/ PNGRB.

This report presents the observations arrived for the data/ inputs furnished by Entity/ PNGRB w.r.t. provisions of applicable Petroleum and Natural Gas Regulatory Board (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010. Accordingly, following results are summarized based on capacity assessment for each year as carried out by EIL.

PNGRB regulation i.e. Petroleum and Natural Gas Regulatory Board (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010 defines the step wise methodology for the determination of Pipeline capacity. Hence, year wise methodology adopted by Entity has been reviewed by EIL against defined step wise methodology given in the regulation of capacity determination as clause no. 5.(5).

Existing GSPL gas grid source details submitted by entity are as following:

2017-18

	Entry Points
1	RIL Bhadbut New
2	Petronet Supply
3	ONGC Olpad

2018-19

	Entry Points
1	RIL Bhadbut New
2	Petronet Supply
3	ONGC Olpad
4	GIGL Palanpur [GSPL India Gasnet Limited]

2019-20

	Entry Points
1	RIL Bhadbut New
2	Petronet Supply
3	ONGC Olpad
4	GIGL Palanpur [GSPL India Gasnet Limited]

2020-21

	Entry Points
1	RIL Bhadbut New
2	Petronet Supply
3	ONGC Olpad
4	GLL MUNDRA ** [GSPC LNG Limited]
5	GIGL Palanpur [GSPL India Gasnet Limited]

** Commissioning was done on Jan 2020. However, entity considered its impact on capacity in 2020-21

2021-22	Entry Points
1	RIL Bhadbut New
2	Petronet Supply
3	ONGC Olpad
4	GLL MUNDRA [GSPC LNG Limited]
5	GIGL Palanpur [GSPL India Gasnet Limited]

2022-23

	Entry Points
1	RIL Bhadbut New
2	Petronet Supply
3	ONGC Olpad
4	GLL MUNDRA [GSPC LNG Limited]
5	GIGL Palanpur [GSPL India Gasnet Limited]

Input data as received from entity like source list, pipeline details, gas composition etc. has been reviewed by EIL. Data considered for determination/assessment has been attached as **ANNEXURE V.**

Entity data/ inputs has been verified by EIL w.r.t stepwise methodology given in Clause no. 5.(5) of PNGRB capacity assessment regulation and supported data/ inputs submitted by Entity/ PNGRB. Tabulated below are the comparative capacity assessment figures (rounded-off figures) at an interval of one year as carried out by entity & EIL:

Assessment years	Pipeline Capacity as determined by Entity (in MMSCMD)	Pipeline Capacity as assessed by EIL (in MMSCMD)	Remark
	Entity	EIL	
	Software used - Pipeline Studio (TGNET)	Software used - Pipeline Studio (TGNET)	
2017-18	28.29	30.1	
2018-19	29.62	30.2 (Note-2)	
2019-20	32.13	32.2	
2020-21	35.22	36.0 (Note-3)	GLL Mundra source added to the network
2021-22	35.21	36.0	
2022-23	34.17	36.0	
2023-24	34.17	36.0	

Note-1: PIL compressor operative for Years 2017-18, 2018-19 & 2019-20. As per PNGRB capacity regulation, capacity was determined based on MAOP of pipeline in downstream section of compressor. Hence, no impact is envisaged.

Note-2: Capacity without Gana Compressor will be 29.5 MMSCMD during 2018-19 & capacity with Gana compressor is as mentioned in table.

Note -3: Impact of Mundra Tie-in and Anjar Mundra Line has been assessed for 2020-21 [Size 36", Authorized length 50 km & Operating length 67 km (considered in simulation)]. Capacity with connectivity is as mentioned in table & without connectivity will be 33.05 MMSCMD.

Note -4: Impact of Swan Tie-In [Size 30", Authorized Length 3 km], Jamnagar – Dwarka spur line & Chhara Tie-In [Size 36", Authorized Length 85 km] has been assessed for 2023-24. Following cases are studied and capacities are assessed considering their connectivity as under:

- Case 1: Swan Tie-In Connectivity = 36.4 MMSCMD
- Case 2: Chhara Tie-In Connectivity = 36.8 MMSCMD
- Case 3: Both Swan & Chhara Tie-In Connectivity = 37.01 MMSCMD
- Case 4: Jamnagar – Dwarka spur line with Swan & Chhara Tie-In Connectivity = 37.2 MMSCMD
- Case 5: Jamnagar Dwarka spur line with Swan & Chhara Tie-in connectivity & 24" DBPL = 37.3 MMSCMD
- Case 6: Jamnagar Dwarka spur line with Swan & Chhara Tie-in connectivity & 30" DBPL = 37.4 MMSCMD
- Case 7: Jamnagar Dwarka spur line with Swan & Chhara Tie-in connectivity & 24" DBPL & eight proposed spur lines= 37.48 MMSCMD
- Case 8: Jamnagar Dwarka spur line with Swan & Chhara Tie-in connectivity & 30" DBPL [24" DBPL removed] & eight proposed spur lines= 37.49 MMSCMD

Note-5: Delivery point of GSPC LNG Ltd (GLL) Dahej was part of overall network from year 2017-18. Length of spur line is 0.855 km.

Note-6: Delivery point of RIL Jamnagar was part of overall network from year 2017-18.

Note-7: Delivery point of Torrent was part of overall network from year 2017-18. Length of line is 6.38 km from ONGC Olpad.

Note-8: As the pipeline capacity was arrived as per PNGRB capacity regulation [based on MAOP considerations], hence variation in determined capacity for various assessment years is due to change in sources and /or deliveries and / or network length and / or network configuration etc.

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2.0 INTRODUCTION

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The Petroleum and Natural Gas Regulatory Board (PNGRB) [hereby may also be referred as Client for the subject service] was constituted under The Petroleum and Natural Gas Regulatory Board Act, 2006 (NO. 19 OF 2006) notified via Gazette Notification dated 31st March, 2006.

The Act provides for the establishment of Petroleum and Natural Gas Regulatory Board to protect the interests of consumers and entities engaged in specified activities relating to petroleum, petroleum products and natural gas and to promote competitive markets and for matters connected therewith or incidental thereto.

In exercise of the powers conferred by section 61 of the Petroleum and Natural Gas Regulatory Act, 2006 (19 of 2006), the Petroleum and Natural Gas Regulatory Board has made the Regulation for determining the capacity of Petroleum, Petroleum products and Natural gas pipeline in year 2010.

PNGRB has entrusted EIL vide Letter of Award (LOA) No.: PNGRB/Tech/10-CapNGPL/(8)/2015(P-2791) Dated 29.03.2023 for carrying out capacity determination which is [hereinafter referred as an “Entity”] for the given period of operation as mentioned above. Scope of work for EIL was to assess the capacity for the given period of operation as mentioned above in line with capacity determination criteria defined in the PNGRB (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010 as per the process given in clause 5.0.

EIL along with PNGRB have interacted with the Entity on the received procedure followed in capacity determination carried out by the Entity.

For capacity assessment purpose, Entity has considered operating conditions. Further, Entity informed that while carrying out capacity determination exercise they have considered Clause no. 5.(5) of PNGRB Capacity Regulations and additional considerations etc. It was requested to entity that capacity determination shall be carried out based on step wise methodology given under Clause no. 5.(5) of PNGRB Capacity Regulations only.

Hence, entities was requested to submit capacity figures & supporting TGNET files based on step wise methodology given under Clause no. 5.(5) of PNGRB Capacity Regulations for assessment purpose.

EIL carried out the assessment of the same based on the procedure detailed in the PNGRB capacity Regulation for determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline, 2010. For capacity assessment purpose, EIL has assumed gas at the entry point is unlimited & the selected software was run till any customer connected to the system reaches limiting condition as defined in capacity regulation. The capacity at this juncture was considered as the maximum system capacity achievable in the pipeline system.

The observations and understanding of applicable Regulation have been presented to PNGRB. PNGRB has reviewed the approach which has been detailed out in following sections of the report.

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3.0 EXISTING PIPELINE NETWORK DESCRIPTION

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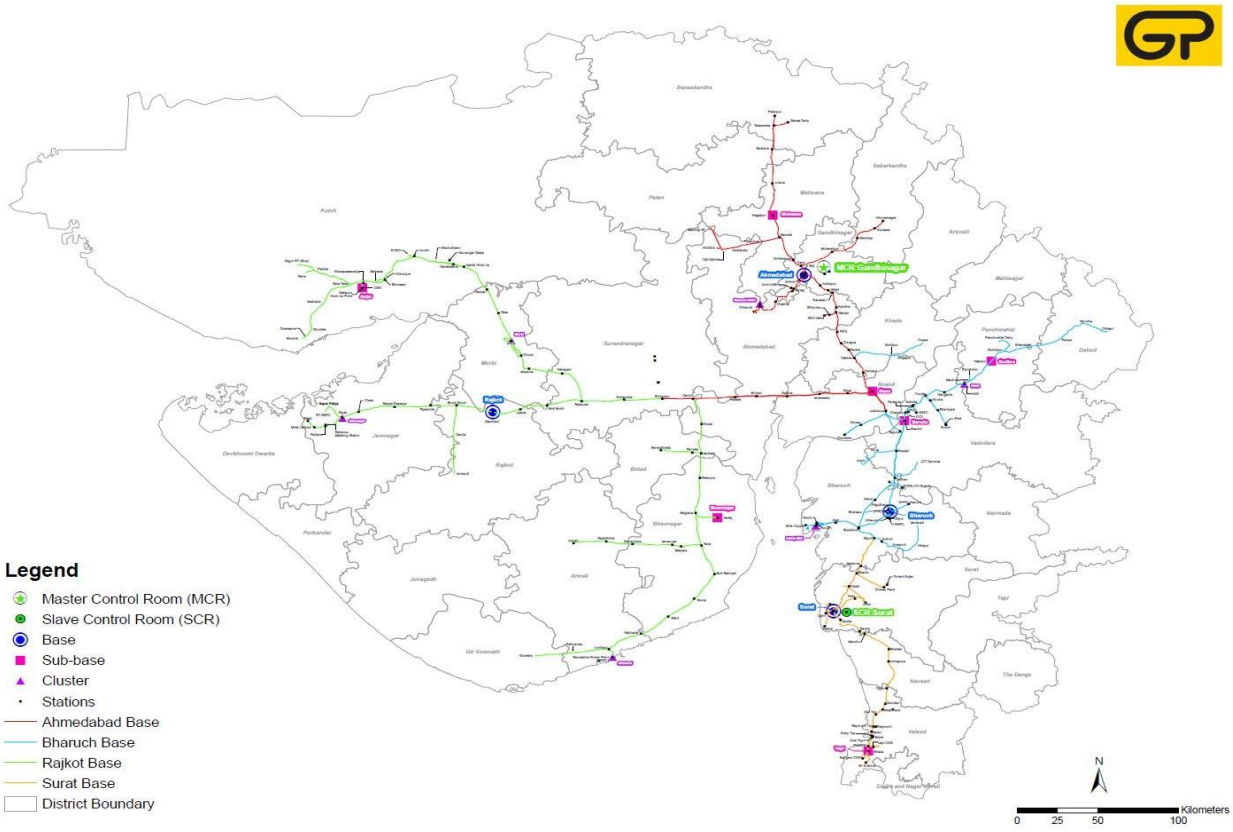

Refer flow diagram given in annexures for pipeline schematic, supply & delivery points flow & process parameters etc. for respective capacity assessment years.

Entity informed following w.r.t Year-wise Pipeline network of HP grid:

Financial Year	Length considered in Simulation (km) for capacity determination
2017-18	2351.00
2018-19	2455.66
2019-20	2500.93

2020-21	2500.93
2021-22	2500.93
2022-23	2500.93
2023-24	2500.93

Delivery details:

2017-18

Cust 1	sarigam GIDC
Cust 2	GGCL_Node
Cust 3	GNFC_Node
Cust 4	NTPCJanore_Node
Cust 5	GPEC node
Cust 6	GSFC+Adani
Cust 7	Node2153
Cust 8	BAKPL-Gandhinagar
Cust 9	IFFCO node
Cust 10	santej node
Cust 11	Himmatnagar_Node
Cust 12	Mehsana_Node
Cust 13	GPPC-Pipavav_Node
Cust 14	Rajkot-Gauridad-RJPL
Cust 15	Thangadh-SV1-Morbi spur
Cust 16	SV-2+TOP2+Hirapar+MMPL
Cust 17	Halol_Node
Cust 18	Essar-N1-2
Cust 19	Sidhpur node
Cust 20	CH35.66
Cust 21	Node1269
Cust 22	CH60.815
Cust 23	CH40.074
Cust 24	CH30.023
Cust 25	Raymond node

2018-19

Cust 1	sarigam GIDC
Cust 2	GGCL_Node
Cust 3	GNFC_Node
Cust 4	NTPCJanore_Node
Cust 5	GPEC node
Cust 6	GSFC+Adani
Cust 7	Node2153
Cust 8	BAKPL-Gandhinagar
Cust 9	IFFCO node
Cust 10	santej node
Cust 11	Himmatnagar_Node
Cust 12	Mehsana_Node
Cust 13	GPPC-Pipavav_Node
Cust 14	Rajkot-Gauridad-RJPL
Cust 15	Thangadh-SV1-Morbi spur
Cust 16	SV-2+TOP2+Hirapar+MMPL
Cust 17	Halol_Node
Cust 18	Essar-N1-2
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Cust 25	Raymond node

Cust 26	Welspun
Cust 27	Dabhan
Cust 28	Chappara
Cust 29	Node1377-2
Cust 30	BAKPL-VALAD
Cust 31	kalol_Node
Cust 32	KHPL-Node-1
Cust 33	KMPL- Kadi
Cust 34	KMPL-Mandli
Cust 35	vilayat-Jubilant-Node
Cust 36	Kelod
Cust 38	Vartej1
Cust 39	Silvai
Cust 40	bhrugupur
Cust 41	Nava-Kataria-SV3-MMPL
Cust 42	Sumangal-N1
Cust 43	Euro-node
Cust 44	metrade-Node
Cust 45	ratnamani-node
Cust 46	Anjar-Node
Cust 47	Motimaladi
Cust 48	Sajod_Node
Cust 49	GGL Palej Node
Cust 50	Steelco node
Cust 51	GSFC-cst-node
Cust 53	AEC node
Cust 54	Nirma node
Cust 55	Suzlon-N
Cust 56	Nano node
Cust 57	chimique cst node
Cust 58	Piramal node
Cust 59	Banas node
Cust 60	SV4-chella-RJPL
Cust 62	Maruti CST node
Cust 63	Amreli1
Cust 66	Thasara node

Cust 26	Welspun
Cust 27	Dabhan
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Cust 29	Node1377-2
Cust 30	BAKPL-VALAD
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Cust 36	Kelod
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Cust 44	metrade-Node
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Cust 47	Motimaladi
Cust 48	Sajod_Node
Cust 49	GGL Palej Node
Cust 50	Steelco node
Cust 51	GSFC-cst-node
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Cust 62	Maruti CST node
Cust 63	Amreli1
Cust 65	Dahod node

Cust 67	Ambardi
Cust 70	Bhuj
Cust 71	Parle node
Cust 72	Ineos CST node
Cust 73	Panchmahal Cst Node
Cust 74	Rochling Cst node
Cust 76	Iffco- node
Cust 77	Dhuvaran_Node-2
Cust 78	JCT-node
Cust 79	GGL vapi node
Cust 80	Halol_Node
Cust 81	Dhanora Terminal
Cust 82	Nano CNG node
Cust 84	Node1512-2
Cust 85	BASF node
Cust 86	styrolution node
Cust 87	GACL_Node
Cust 88	Roxul-node
Cust 89	Sarju node
Cust 91	Dic - node
Cust 92	Torrent DGEN node
Cust 93	OPAL CST node
Cust 94	Node1410
Cust 95	GGL Dahej-node
Cust 96	GNFC CST node
Cust 97	china steel cst node
Cust 98	cosmo node
Cust 99	vilayat-Jubilant-Node
Cust 100	Piramal node
Cust 101	Takarwada Node
Cust 103	GGL Vadhela Node
Cust 104	Paguthan-GNFC
Cust 105	cosmo node
Cust 106	IRM cst node
Cust 107	Takarwada Node
Cust 108	GGLpalitana1

Cust 66	Thasara node
Cust 67	Ambardi
Cust 68	Node1397-2
Cust 70	Bhuj
Cust 71	Parle node
Cust 72	Ineos CST node
Cust 73	Panchmahal Cst Node
Cust 74	Rochling Cst node
Cust 76	Iffco- node
Cust 77	Dhuvaran_Node-2
Cust 78	JCT-node
Cust 79	GGL vapi node
Cust 80	Halol_Node
Cust 81	Dhanora Terminal
Cust 82	Nano CNG node
Cust 84	Node1512-2
Cust 85	BASF node
Cust 86	styrolution node
Cust 87	GACL_Node
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Cust 100	Piramal node
Cust 101	Takarwada Node
Cust 103	GGL Vadhela Node
Cust 104	Paguthan-GNFC
Cust 105	cosmo node
Cust 106	IRM cst node

Cust 109	Ramacylinder
Cust 111	SV-1+Gala+MMPL
Cust 112	Bhodigodi
Cust 113	GGLsaparpatia
Cust 114	Lonthpur
Cust 116	RIL-Jamnagar
Cust 117	GNFC Hot tap - node
Cust 118	Uttran node
Cust 121	Eklere shrikrishna
Cust 122	Mora_Node
Cust 123	Node1479
Cust 124	Node1520
Cust 125	Torrent_Node

Cust 107	Takarwada Node
Cust 108	GGLpalitana1
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Cust 66	Ambardi
Cust 67	Node1397-2
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Cust 70	Parle node
Cust 71	Ineos CST node
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Cust 87	Sarju node
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Cust 90	Torrent DGEN node
Cust 91	OPAL CST node
Cust 92	Node1410

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Cust 91	OPAL CST node

Cust 93	GGL Dahej-node
Cust 94	GNFC CST node
Cust 95	china steel cst node
Cust 96	vilayat-Jubilant-Node
Cust 97	Piramal node
Cust 98	Takarwada Node
Cust 100	GGL Vadhela Node
Cust 101	Paguthan-GNFC
Cust 102	IRM cst node
Cust 103	GGLpalitana1
Cust 104	Ramacylinder
Cust 105	toyo-navin-convergence node
Cust 106	SV-1+Gala+MMPL
Cust 107	Bhodigodi
Cust 108	GGLsaparpatia
Cust 109	Lonthpur
Cust 110	DJPL-Meglana
Cust 111	RIL-Jamnagar
Cust 112	GNFC Hot tap - node
Cust 113	Uttran node
Cust 114	Node2115
Cust 115	Eklere shrikrishna
Cust 116	Mora_Node
Cust 117	Node1479
Cust 118	Node2166
Cust 119	Torrent_Node
Cust 121	Node2161
Cust 122	hadala
Cust 123	Node2186

Cust 92	Node1410
Cust 93	GGL Dahej-node
Cust 94	GNFC CST node
Cust 95	china steel cst node
Cust 96	vilayat-Jubilant-Node
Cust 97	Piramal node
Cust 98	Takarwada Node
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Cust 116	Mora_Node
Cust 117	Node1479
Cust 118	Node2166
Cust 119	Torrent_Node
Cust 121	Node2161
Cust 122	hadala
Cust 123	Node2186

2021-22

Cust 1	sarigam GIDC
Cust 2	GGCL_Node
Cust 3	GNFC_Node
Cust 4	NTPCJanore_Node
Cust 5	GPEC node
Cust 6	GSFC+Adani
Cust 7	Node2153
Cust 8	BAKPL-Gandhinagar
Cust 9	IFFCO node
Cust 10	santej node
Cust 11	Himmatnagar_Node
Cust 12	Mehsana_Node
Cust 13	GPPC-Pipavav_Node
Cust 14	Rajkot-Gauridad-RJPL
Cust 15	Thangadh-SV1-Morbi spur
Cust 16	SV-2+TOP2+Hirapar+MMPL
Cust 17	Halol_Node
Cust 18	Essar-N1-2
Cust 19	Sidhpur node
Cust 20	CH35.66
Cust 21	Node1269
Cust 22	CH60.815
Cust 23	CH40.074
Cust 24	CH30.023
Cust 25	Raymond node
Cust 26	Welspun
Cust 27	Dabhan
Cust 28	Chappara
Cust 29	Node1377-2
Cust 30	BAKPL-VALAD
Cust 31	kalol_Node
Cust 32	KHPL-Node-1
Cust 33	KMPL- Kadi
Cust 34	KMPL-Mandli
Cust 35	vilayat-Jubilant-Node

2022-23

Cust 1	sarigam GIDC
Cust 2	GGCL_Node
Cust 3	GNFC_Node
Cust 4	NTPCJanore_Node
Cust 5	GPEC node
Cust 6	GSFC+Adani
Cust 7	Node2153
Cust 8	BAKPL-Gandhinagar
Cust 9	IFFCO node
Cust 10	santej node
Cust 11	Himmatnagar_Node
Cust 12	Mehsana_Node
Cust 13	GPPC-Pipavav_Node
Cust 14	Rajkot-Gauridad-RJPL
Cust 15	Thangadh-SV1-Morbi spur
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Cust 17	Halol_Node
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Cust 19	Sidhpur node
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Cust 28	Chappara
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Cust 30	BAKPL-VALAD
Cust 31	kalol_Node
Cust 32	KHPL-Node-1
Cust 33	KMPL- Kadi
Cust 34	KMPL-Mandli
Cust 35	vilayat-Jubilant-Node

Cust 36	Kelod
Cust 38	Vartej1
Cust 39	Silvai
Cust 40	bhrugupur
Cust 41	Nava-Kataria-SV3-MMPL
Cust 42	Sumangal-N1
Cust 43	Euro-node
Cust 44	metrade-Node
Cust 45	ratnamani-node
Cust 46	Anjar-Node
Cust 47	Motimaladi
Cust 48	Sajod_Node
Cust 49	Steelco node
Cust 50	GSFC-cst-node
Cust 52	AEC node
Cust 53	Nirma node
Cust 54	Suzlon-N
Cust 55	Nano node
Cust 56	chimique cst node
Cust 57	Piramal node
Cust 58	Banas node
Cust 59	SV4-chella-RJPL
Cust 60	Becharaji Node
Cust 61	Maruti CST node
Cust 62	Amreli1
Cust 63	Gundala1
Cust 64	Dahod node
Cust 65	Thasara node
Cust 66	Ambardi
Cust 67	Node1397-2
Cust 69	Bhuj
Cust 70	Parle node
Cust 71	Ineos CST node
Cust 72	Panchmahal Cst Node
Cust 73	Rochling Cst node
Cust 75	Iffco- node

Cust 36	Kelod
Cust 38	Vartej1
Cust 39	Silvai
Cust 40	bhrugupur
Cust 41	Nava-Kataria-SV3-MMPL
Cust 42	Sumangal-N1
Cust 43	Euro-node
Cust 44	metrade-Node
Cust 45	ratnamani-node
Cust 46	Anjar-Node
Cust 47	Motimaladi
Cust 48	Sajod_Node
Cust 49	Steelco node
Cust 50	GSFC-cst-node
Cust 52	AEC node
Cust 53	Nirma node
Cust 54	Suzlon-N
Cust 55	Nano node
Cust 56	chimique cst node
Cust 57	Piramal node
Cust 58	Banas node
Cust 59	SV4-chella-RJPL
Cust 60	Becharaji Node
Cust 61	Maruti CST node
Cust 62	Amreli1
Cust 63	Gundala1
Cust 64	Dahod node
Cust 65	Thasara node
Cust 66	Ambardi
Cust 67	Node1397-2
Cust 69	Bhuj
Cust 70	Parle node
Cust 71	Ineos CST node
Cust 72	Panchmahal Cst Node
Cust 73	Rochling Cst node
Cust 75	Iffco- node

Cust 76	Dhuvaran_Node-2
Cust 77	GGL vapi node
Cust 78	Halol_Node
Cust 79	Dhanora Terminal
Cust 80	Nano CNG node
Cust 82	Node1512-2
Cust 83	BASF node
Cust 84	styrolution node
Cust 85	GACL_Node
Cust 86	Roxul-node
Cust 87	Sarju node
Cust 89	Dic - node
Cust 90	Torrent DGEN node
Cust 91	OPAL CST node
Cust 92	Node1410
Cust 93	GGL Dahej-node
Cust 94	GNFC CST node
Cust 95	china steel cst node
Cust 96	vilayat-Jubilant-Node
Cust 97	Piramal node
Cust 98	Takarwada Node
Cust 100	GGL Vadhela Node
Cust 101	Paguthan-GNFC
Cust 102	IRM cst node
Cust 103	GGLpalitana1
Cust 104	Ramacylinder
Cust 105	toyo-navin-convergence node
Cust 106	SV-1+Gala+MMPL
Cust 107	Bhodigodi
Cust 108	GGLsaparpatia
Cust 109	Lonthpur
Cust 110	DJPL-Meglana
Cust 111	RIL-Jamnagar
Cust 112	GNFC Hot tap - node
Cust 113	Uttran node
Cust 114	Node2115

Cust 76	Dhuvaran_Node-2
Cust 77	GGL vapi node
Cust 78	Halol_Node
Cust 79	Dhanora Terminal
Cust 80	Nano CNG node
Cust 82	Node1512-2
Cust 83	BASF node
Cust 84	styrolution node
Cust 85	GACL_Node
Cust 86	Roxul-node
Cust 87	Sarju node
Cust 89	Dic - node
Cust 90	Torrent DGEN node
Cust 91	OPAL CST node
Cust 92	Node1410
Cust 93	GGL Dahej-node
Cust 94	GNFC CST node
Cust 95	china steel cst node
Cust 96	vilayat-Jubilant-Node
Cust 97	Piramal node
Cust 98	Takarwada Node
Cust 100	GGL Vadhela Node
Cust 101	Paguthan-GNFC
Cust 102	IRM cst node
Cust 103	GGLpalitana1
Cust 104	Ramacylinder
Cust 105	toyo-navin-convergence node
Cust 106	SV-1+Gala+MMPL
Cust 107	Bhodigodi
Cust 108	GGLsaparpatia
Cust 109	Lonthpur
Cust 110	DJPL-Meglana
Cust 111	RIL-Jamnagar
Cust 112	GNFC Hot tap - node
Cust 113	Uttran node
Cust 114	Node2115

Cust 115	Eklere shrikrishna
Cust 116	Mora_Node
Cust 117	Node1479
Cust 118	Node2166
Cust 119	Torrent_Node
Cust 121	Node2161
Cust 122	hadala
Cust 123	Node2186

Cust 115	Eklere shrikrishna
Cust 116	Mora_Node
Cust 117	Node1479
Cust 118	Node2166
Cust 119	Torrent_Node
Cust 121	Node2161
Cust 122	hadala
Cust 123	Node2186

2023-24

Cust 1	sarigam GIDC
Cust 2	GGCL_Node
Cust 3	GNFC_Node
Cust 4	NTPCJanore_Node
Cust 5	GPEC node
Cust 6	GSFC+Adani
Cust 7	Node2153
Cust 8	BAKPL-Gandhinagar
Cust 9	IFFCO node
Cust 10	santej node
Cust 11	Himmatnagar_Node
Cust 12	Mehsana_Node
Cust 13	GPPC-Pipavav_Node
Cust 14	Rajkot-Gauridad-RJPL
Cust 15	Thangadh-SV1-Morbi s
Cust 16	SV-2+TOP2+Hirapar+MMP
Cust 17	Halol_Node
Cust 18	Essar-N1-2
Cust 19	Sidhpur node
Cust 20	CH35.66
Cust 21	Node1269
Cust 22	CH60.815
Cust 23	CH40.074

Cust 24	CH30.023
Cust 25	Raymond node
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Cust 27	Dabhan
Cust 28	Chappara
Cust 29	Node1377-2
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Cust 35	vilayat-Jubilant-Node
Cust 36	Kelod
Cust 38	Vartej1
Cust 39	Silvai
Cust 40	bhrugupur
Cust 41	Nava-Kataria-SV3-MMF
Cust 42	Sumangal-N1
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Cust 44	metrade-Node
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Cust 56	chimique cst node
Cust 57	Piramal node
Cust 58	Banas node
Cust 59	SV4-chella-RJPL
Cust 60	Becharaji Node
Cust 61	Maruti CST node

Cust 62	Amreli1
Cust 63	Gundala1
Cust 64	Dahod node
Cust 65	Thasara node
Cust 66	Ambardi
Cust 67	Node1397-2
Cust 69	Bhuj
Cust 70	Parle node
Cust 71	Ineos CST node
Cust 72	Panchmahal Cst Node
Cust 73	Rochling Cst node
Cust 75	Iffco- node
Cust 76	Dhuvaran_Node-2
Cust 77	GGL vapi node
Cust 78	Halol_Node
Cust 79	Dhanora Terminal
Cust 80	Nano CNG node
Cust 82	Node1512-2
Cust 83	BASF node
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Cust 85	GACL_Node
Cust 86	Roxul-node
Cust 87	Sarju node
Cust 89	Dic - node
Cust 90	Torrent DGEN node
Cust 91	OPAL CST node
Cust 92	Node1410
Cust 93	GGL Dahej-node
Cust 94	GNFC CST node
Cust 95	china steel cst node
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Cust 97	Piramal node
Cust 98	Takarwada Node
Cust 100	GGL Vadhela Node
Cust 101	Paguthan-GNFC
Cust 102	IRM cst node
Cust 103	GGLpalitana1
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Cust 105	toyo-navin-convergence n
Cust 106	SV-1+Gala+MMPL
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Cust 109	Lonthpur
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Cust 112	GNFC Hot tap - node
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Cust 116	Mora_Node
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Cust 118	Node2166
Cust 119	Torrent_Node
Cust 121	Node2161
Cust 122	hadala
Cust 123	Node2186

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4.0 DATA/ INPUTS SUBMITTED BY ENTITY

4.0 DATA/ INPUTS SUBMITTED BY ENTITY

Entity has submitted requisite data along with the capacity to PNGRB in line with the assessment Regulations, as applicable:

a. Pipeline Network simulation snapshot indicating pipeline sections, entry and exits points, compressor station etc.
b. Simulation Input data for each pipe section such as length (km), inside diameter (mm), wall thickness (mm), pipe wall roughness (micron), ground elevation profile, subsoil temperature, pipeline efficiency etc.
c. Simulation Input data including all gas sources, gas entry temperature & pressure, quality & composition of natural gas, minimum and maximum gas flow etc.
d. Equipment data.
e. Consumer and supply contracts with contractual pressure, flow, temperature, gas quality etc. at source and delivery nodes.
f. Latest model files for simulation as created & used by entity i.e. Input & output files of simulations/ calculations of pipeline facilities.
g. Design/ operational inputs/ information/ data which entity considered to be applicable for carrying out the capacity assessment of pipeline facilities.
h. During meeting, Entity has submitted the following inputs to PNGRB as per regulation for capacity assessment of the pipeline:

- Presentation by Entity During meeting (Refer ***ANNEXURE-VII***)
- Capacity Assessment Applications
- As-Built Data
- Input/ Output Data considered for Simulation
- Gas Contracts Extract
- Simulation Models
- Entry/ Exit Point Pressure

Further, In line with Sr. No. 12 & 13 of Schedule-A of PNGRB capacity regulation, EIL requested Entity to submit "Maximum achievable capacity of the pipeline under steady state condition as determined under section 5 of these regulations" and “Section wise maximum achievable capacity of the pipeline as determined under section 5 of these regulations" respectively.

Further, as per Clause No. 5.(2), Entity was requested to submit the detailed calculations of the capacity. Accordingly, it was desired that Entity will submit the year wise & step wise calculations and results based on 10 steps methodology followed by them as given under Clause no. 5.(5)of PNGRB capacity regulation. Moreover, wherever any particular option/ scenario/ parameter has been selected & considered by Entity for capacity determination purpose, the reason for the selection may also be provided for assessment purpose.

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5.0 METHODOLOGY

5.0 METHODOLOGY

PNGRB Act provide for the establishment of Petroleum and Natural Gas Regulatory Board to protect the interests of consumers and entities engaged in specified activities relating to petroleum, petroleum products and natural gas and to promote competitive markets and for matters connected therewith or incidental thereto.

By exercising its power under provision 2 (d) of the said regulation, PNGRB has planned to carry out the capacity determination for the given period of operation.

For the above purpose, PNGRB appointed EIL to carry out the capacity assessment in line with PNGRB (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010.

The following methodology was adopted for meeting the above objective:

a. Kick off meeting of the job was conducted at PNGRB office
b. Required data/ inputs of existing pipeline network were obtained through Kick-off meeting, site visits, e-mails, telephonic discussions with PNGRB etc.
c. Entity was requested to submit the requisite data along with the capacity to PNGRB in line with the Regulations. PNGRB was requested to provide the same to EIL. The submissions inter alia include the following as a minimum:
    - Schematic diagram of the Pipeline Network indicating pipeline sections, entry and exits points, check valve etc. Consumer and supply contracts (for each requested period for assessment)
    - Simulations in terms of pressure, flow, temperature at all source and delivery nodes using Panhandle flow equation.
    - Input data for each pipe section data such as length (km), inside diameter (mm), wall thickness (mm), pipe wall roughness (micron), knot spacing, gas equation used, ground elevation profile, temperature, pipeline efficiency, drag factor etc.
    - Input data including gas sources, gas entry temperature, quality & composition of gas, minimum & maximum gas pressure, minimum and maximum gas flow etc.
    - Performance data, Datasheets, P&IDs etc.
    - Designed & Current operational data.
    - Description of current Pipeline operation w.r.t. designed pipeline facilities.

- Model files for pipeline simulation as created & used by entity i.e. Input & output files of simulations/ calculations of pipeline facilities in line with applicable PNGRB regulation.
- Any other inputs/ information/ data, as applicable, for carrying out the capacity assessment of pipeline faculties.

d. The data received from Entity was reviewed by EIL to check its completeness for capacity assessment purpose. Shortfall in the submission/ clarifications was estimated & informed to Entity/ PNGRB.

e. Entity sent presentation to EIL & PNGRB on overview of pipeline facilities, capacity assessment applications on the capacity determination& limiting condition for capacity determination

f. Model files for pipeline simulation created & used by entity for capacity determination of subject assessment years were reviewed in detail by EIL along with verification of relevant input / output parameters and considered flow equations.

g. EIL reviewed the native files w.r.t the approach considered by entity for capacity assessment purpose

h. During the meeting, EIL provided comprehensive list of additional data / clarifications required from Entity.

i. Entity provided following response w.r.t step wise compliance based on 10 steps methodology followed as given under Clause no. 5.(5) of PNGRB Capacity Regulations. Entity replies as follow-

Sr. no.	PNGRB regulation for capacity determination section 5.a	Entity replies
1	The entire pipeline system shall be configured in the selected software package operating offline. The steady state condition of the pipeline hydraulics with contractual flow parameters (pressure, temperature and flow) at entry and exit points shall be simulated in the selected software package.	Complied
2	At the originating point and at intermediate points in the direction of flow, set the pressure as a fixed parameter corresponding to the maximum allowable operating	Complied: PIL has been taken as the first source.

	pressure (MAOP) or available compression facilities and compute the maximum pressure at all exit points with contractual flow.	
3	Thereafter, assuming gas at the entry point (single source of gas) is unlimited, the selected software will be run till any customer connected to the system reaches limiting condition of pressure required at the respective exit point or maximum flow capacity is reached at entry or intermediate compressor stations (if installed in the system) or the velocity of natural gas reaches limiting value as defined in these regulations. The capacity at this juncture would be the maximum system capacity achievable in the pipeline system and the customer at the exit point where pressure becomes limiting shall be the critical customer.	Complied
4	Now simulate the flow from any other source considering the entry should take place at the pressure marginally higher than the available at that section. The exercise carried above shall be repeated to get threshold pressure limit at any location to calculate the flow exiting from each point in the entire pipeline system and the sum total of these flows shall be the pipeline capacity as determine by the approved flow equation and selected software. This would be the system capacity for multi-source pipeline system.	Not Complied: Justification: If the pressure at different sources are kept marginally higher as given in PNGRB regulation the overall capacity of GSPL HP grid will come out to be lesser than the actual. Therefore, flow from other entry points instead of taking marginally higher pressure; contractual pressure that is the maximum pressure which can

		be provided by supplier has been considered as a reasonable endeavor keeping the goal of the exercise in mind.
5	The section wise capacity of the pipeline system shall be computed between an entry point and exit points. In case of multi entry, the section wise capacity may also be determined taking into account flow from each of the input points. Thus the first section is from first entry point to first exit point and second section shall be from first entry point to second exit point and another section and so on. This exercise shall be repeated for each of the entry point. However, in a real time working, the effect of each source will have to be workout on the pipeline capacity and the flow parameters at intermediate points shall not be allowed to reduce the system or section capacity. The procedure mentioned above shall be applicable for determining the capacity of specific section of the pipeline.	Not Complied: Justification: The complexity in GSPL networks makes it implausible for the estimation of sectional capacities as per PNGRB definition. With many sources and many users, the number of sections in the sense of PNGRB document is very large and the list will depend upon which source is designated as first and in what order the other sources are brought into consideration while defining successive sections for simulation and capacity determination. However, GSPL will

		provide the section wise flow rate in the same simulation scenario of overall capacity that has been submitted.
6	In a real time model of pipeline system, the flow at specific entry point shall be the actual available flow from that source. The gas supply from various sources at entry points and delivery at exit points shall be scheduled to optimize the pipeline system capacity.	This is not a capacity determination exercise.
7	The obligatory or contractual requirement of pressure at any exit point shall determine the possible capacity within a particular section serving that exit points. Provided further that maintainability of a particular steady state hydraulics condition at any exit point shall be mutually determined between capacity determining authority and the transporter within the flexibility available in the system. The section wise capacity thus calculated with single or multiple entry and exit points shall be run with the approved flow equation and selected software package offline in the steady state operation of the system to arrive at capacities of various sections.	Not complied: Justification given against point number 5.
8	This exercise shall be continued for computing section wise capacity of the pipeline system including the spur lines. In case of spur lines the tap off point shall be designated as the source point or entry point for spur line and computable (to be fed to the flow computing formula) or contractual hydraulics shall be allowable pressure at that point after accounting for the pressure drop from the tap off point to the consumer point of the spur line or branch line.	Not complied: Justification given against point number 5.

9	For determining, de-rated MAOP of an existing pipeline, results based on the Instrumented pig survey shall be considered to calculate de-rating factor. In absence of results of the intelligent pig survey (IPS) in any pipeline, hydro testing shall be carried out to establish MAOP of that pipeline as per provisions in the relevant regulations on Technical Standard and Specifications including Safety Standards. Provided that in absence of hydro testing the entity may put up proposal for de-rating based on random thickness survey of the pipeline. Board reserves the right to check such survey data.	Complied
10	The entity shall submit the details of maximum achievable system capacity and section wise capacity of the natural gas pipeline so determined, under the steady state simulation with the details of variable 13[and] constant parameters, to the Board in the specified format at Schedule A along with the hydraulic gradient and system flow diagram for the pipeline system including compressor stations, metering and regulating stations as applicable.	Complied

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6.0 RESULTS & ANALYSIS

6.0 RESULTS & ANALYSIS

6.1 Constant Parameters used under Steady State conditions for Determining Capacity of Pipeline are as below:

1. Pipeline Outside diameter: As per data submitted by entity in capacity applications
2. Weighted average wall thickness: As per data submitted by entity in capacity applications
3. Length of the pipeline: As per data submitted by entity in capacity applications
4. Roughness for trunk line: As per data submitted by entity in capacity applications
5. Friction factor equation: Panhandle – A Modified for < 24”, Panhandle – B Modified for
> 24”
6. Standard Temperature & Pressure: 1.01325 Barg & 15 Deg C
7. Allowable Max velocity in the pipeline: 20 m/s
8. Average Sub- Soil temperature: 25 - 30 Deg C
9. In case of contractual pressure at any entry & exit point is within a band, the arithmetic mean rounded up to first decimal has been considered.
10. MAOP- 98 barg [As per input by Entity]

6.2 Step wise methodology given for Capacity determination in Clause No. 5.(5) of PNGRB regulation

Capacity determination shall be carried out by Entity w.r.t. step wise methodology given for Capacity determination in Clause No. 5.(5) of PNGRB capacity regulation.

Subsequently, all data/inputs & capacity determination carried out by Entity have been reviewed by EIL w.r.t. step wise methodology given for Capacity determination in Clause No. 5.(5) of PNGRB capacity regulation.

In view of the same, EIL observations as below may be referred against year wise action taken by Entity for each step of methodology for capacity determination of Natural Gas Pipeline:

(i) The entire pipeline system shall be configured in the selected software package operating offline. The steady state condition of the pipeline hydraulics with contractual flow parameters (pressure, temperature and flow) at entry and exit points shall be simulated in the selected software package.

Entity Action:
Entity has configured the entire pipeline system operating offline on year wise basis in the selected software package.

EIL observation:
EIL during meeting observed that Entity has configured the entire pipeline system operating offline on year wise basis in the selected software package i.e. TGNET

(ii) At the originating point and at intermediate points in the direction of flow, set the pressure as a fixed parameter corresponding to the maximum allowable operating pressure (MAOP) or available compression facilities and compute the maximum pressure at all exit points with contractual flow.

Entity Action:
At the originating point, pressure was set in terms of operating conditions.

EIL observation:
As per capacity regulation, at the originating point and at intermediate points in the direction of flow, the pressure should be set as a fixed parameter corresponding to the MAOP in one case and corresponding to the available compression facilities in another case.

(iii) Thereafter, assuming gas at the entry point (single source of gas) is unlimited, the selected software will be run till any customer connected to the system reaches limiting condition of pressure required at the respective exit point or maximum flow capacity is reached at entry or intermediate compressor stations (if installed in the system) or the velocity of natural gas reaches limiting value as defined in these regulations. The capacity at this juncture would be the maximum system capacity achievable in the pipeline system and the customer at the exit point where pressure becomes limiting shall be the critical customer.

Entity Action:

Entity has run the selected software with limiting operating conditions. The capacity at this juncture has been defined as maximum system capacity achievable in the pipeline system.

EIL observation:

As per capacity regulation, for capacity assessment purpose, gas at the entry point has been assumed as unlimited with MAOP conditions & then the selected software was run till any customer connected to the system reaches limiting condition as defined in capacity regulation.

(iv) Now simulate the flow from any other source considering the entry should take place at the pressure marginally higher than the available at that section. The exercise carried above shall be repeated to get threshold pressure limit at any location to calculate the flow exiting from each point in the entire pipeline system and the sum total of these flows shall be the pipeline capacity as determine by the approved flow equation and selected software. This would be the system capacity for multi-source pipeline system.

Entity Action:

Entity has run the selected software till the limiting operating conditions.

EIL observation:

Considering unlimited gas availability from entry points at MAOP, flow at exit points was increased until limiting conditions are achieved as defined in capacity regulation.

(v) The section wise capacity of the pipeline system shall be computed between an entry point and exit points. In case of multi entry, the section wise capacity may also be determined taking into account flow from each of the input points. Thus the first section is from first entry point to first exit point and second section shall be from first entry point to second exit point and another section and so on. This exercise shall be repeated for each of the entry point. However, in a real time working, the effect of each source will have to be workout on the pipeline capacity and the flow parameters at intermediate points shall not be allowed to reduce the system or section capacity. The procedure mentioned above shall be applicable for determining the capacity of specific section of the pipeline.

Entity Action:

Section wise maximum achievable capacity of the pipeline as determined under limiting operating conditions has been submitted.

EIL observation:

Section wise capacity has been simulated as per methodology described under sub clause 5.(5).a (v) of capacity regulation.

(vi) In a real time model of pipeline system, the flow at specific entry point shall be the actual available flow from that source. The gas supply from various sources at entry points and delivery at exit points shall be scheduled to optimize the pipeline system capacity.

Entity Action :

Scheduling of sources at entry points and delivery at exit points with operating conditions is being done to optimize the pipeline system capacity as described under 5.(5).a(vi) of capacity regulations.

EIL observation:

Scheduling of sources at entry points and delivery at exit points has been done to optimize the pipeline system capacity as described under 5.(5).a(vi) of capacity regulations.

(vii) The obligatory or contractual requirement of pressure at any exit point shall determine the possible capacity within a particular section serving that exit points. Provided further that maintainability of a particular steady state hydraulics condition at any exit point shall be mutually determined between capacity determining authority and the transporter within the flexibility available in the system. The section wise capacity thus calculated with single or multiple entry and exit points shall be run with the approved flow equation and selected software package offline in the steady state operation of the system to arrive at capacities of various sections.

Entity Action:

With operating conditions, Entity has simulated all Exit points for meeting contractual minimum pressure requirements.

EIL observation:

Considering unlimited gas availability from entry point at the prevailing MAOP conditions, flow at exit points is increased until limiting conditions are achieved as defined in capacity regulation.

(viii) This exercise shall be continued for computing section wise capacity of the pipeline system including the spur lines. In case of spur lines the tap off point shall be designated as the source point or entry point for spur line and computable (to be fed to the flow computing formula) or contractual hydraulics shall be allowable pressure at that point after accounting for the pressure drop from the tap off point to the consumer point of the spur line or branch line.

Entity Action :

While doing section wise capacity determination, Entity has estimated the same from simulation model of entire network with operating conditions.

EIL observation:

Section wise capacity was estimated from the simulation model of P/L network with MAOP conditions.

(ix) For determining, de-rated MAOP of an existing pipeline, results based on the Instrumented pig survey shall be considered to calculate de-rating factor. In absence of results of the intelligent pig survey (IPS) in any pipeline, hydro testing shall be carried out to establish MAOP of that pipeline as per provisions in the relevant regulations on Technical Standard and Specifications including Safety Standards. Provided that in absence of hydro testing the entity may put up proposal for de-rating based on random thickness survey of the pipeline. Board reserves the right to check such survey data.

Entity Action:

Entity had informed that there is no derating of the Pipeline system. Hence, no section is considered with de-rated MAOP for capacity determination.

EIL observation:

Noted and found ok.

(x) The entity shall submit the details of maximum achievable system capacity and section wise capacity of the natural gas pipeline so determined, under the steady state simulation with the details of variable or constant parameters, to the Board in the specified format at Schedule A along with the hydraulic gradient and system flow diagram for the pipeline system including compressor stations, metering and regulating stations as applicable.

Entity Action:

The entity has submitted capacity so determined, in the specified format at Schedule A.

EIL observation:

Noted.

6.3 Results

Entity data / inputs has been verified by EIL w.r.t stepwise methodology given in Clause no. 5.(5) and supported data / inputs submitted by Entity/PNGRB. Tabulated below are the comparative capacity assessment figures (rounded-off figures) of pipeline (at an interval of one year) carried out by entity & EIL:

Assessment years	Pipeline Capacity as determined by Entity (in MMSCMD)	Pipeline Capacity as assessed by EIL (in MMSCMD)	Remark
	Entity	EIL	
	Software used - Pipeline Studio (TGNET)	Software used - Pipeline Studio (TGNET)	
2017-18	28.29	30.1	
2018-19	29.62	30.2 (Note-2)	
2019-20	32.13	32.2	
2020-21	35.22	36.0 (Note-3)	GLL Mundra source added to the network
2021-22	35.21	36.0	
2022-23	34.17	36.0	
2023-24	34.17	36.0	

Note-1: PIL compressor operative for Years 2017-18, 2018-19 & 2019-20. As per PNGRB capacity regulation, capacity was determined based on MAOP of pipeline in downstream section of compressor. Hence, no impact is envisaged.

Note-2: Capacity without Gana Compressor will be 29.5 MMSCMD during 2018-19 & capacity with Gana compressor is as mentioned in table.

Note -3: Impact of Mundra Tie-in and Anjar Mundra Line has been assessed for 2020-21 [Size 36", Authorized length 50 km & Operating length 67 km (considered in simulation)]. Capacity with connectivity is as mentioned in table & without connectivity will be 33.05 MMSCMD.

Note -4: Impact of Swan Tie-In [Size 30", Authorized Length 3 km], Jamnagar – Dwarka spur line & Chhara Tie-In [Size 36", Authorized Length 85 km] has been assessed for 2023-24. Following cases are studied and capacities are assessed considering their connectivity as under:

- Case 1: Swan Tie-In Connectivity = 36.4 MMSCMD
- Case 2: Chhara Tie-In Connectivity = 36.8 MMSCMD
- Case 3: Both Swan & Chhara Tie-In Connectivity = 37.01 MMSCMD
- Case 4: Jamnagar – Dwarka spur line with Swan & Chhara Tie-In Connectivity = 37.2 MMSCMD
- Case 5: Jamnagar Dwarka spur line with Swan & Chhara Tie-in connectivity & 24" DBPL = 37.3 MMSCMD
- Case 6: Jamnagar Dwarka spur line with Swan & Chhara Tie-in connectivity & 30" DBPL = 37.4 MMSCMD
- Case 7: Jamnagar Dwarka spur line with Swan & Chhara Tie-in connectivity & 24" DBPL & eight proposed spur lines= 37.48 MMSCMD
- Case 8: Jamnagar Dwarka spur line with Swan & Chhara Tie-in connectivity & 30" DBPL [24" DBPL removed] & eight proposed spur lines= 37.49 MMSCMD

Note-5: Delivery point of GSPC LNG Ltd (GLL) Dahej was part of overall network from year 2017-18. Length of spur line is 0.855 km.

Note-6: Delivery point of RIL Jamnagar was part of overall network from year 2017-18.

Note-7: Delivery point of Torrent was part of overall network from year 2017-18. Length of line is 6.38 km from ONGC Olpad.

Note-8 : As the pipeline capacity was arrived as per PNGRB capacity regulation [based on MAOP considerations], hence variation in determined capacity for various assessment years is due to change in sources and /or deliveries and / or network length and / or network configuration etc.

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7.0 SUMMARY

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This report presents the observations arrived for the data/inputs furnished by Entity/PNGRB w.r.t. provisions of applicable Petroleum and Natural Gas Regulatory Board (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010. Accordingly, following results are summarized based on capacity assessment carried out by EIL :

PNGRB regulation i.e. Petroleum and Natural Gas Regulatory Board (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010 defines the step wise methodology for the determination of Pipeline capacity.

Hence, year wise methodology adopted by Entity has been reviewed by EIL against defined step wise methodology given in the regulation of capacity determination as clause no. 5.(5).

Entity was requested to determine the capacity following the stepwise methodology given in Clause no. 5.(5) (methodology for calculation of pipeline capacity). Entity data / inputs has been verified by EIL w.r.t stepwise methodology given in Clause no. 5.(5) and supported data / inputs submitted by Entity/PNGRB.

Tabulated below are the comparative capacity assessment figures (rounded-off figures) of pipeline (at an interval of one year) carried out by entity & EIL:

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Note-5: Delivery point of GSPC LNG Ltd (GLL) Dahej was part of overall network from year 2017-18. Length of spur line is 0.855 km.

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