Petroleum and Natural Gas Regulatory Board

Order pertaining to capacity of Natural Gas East West Pipeline (EWPL) of M/s Reliance Gas Transportation Infrastructure Limited (RGTIL) for the period 1.4.2010 to 31.03.2011 and 1.4.2011 to 31.03.2012

Background

The Petroleum & Natural Gas Regulatory Board in exercising its power as per the proviso 2(d) of the Petroleum and Natural Gas Regulatory Board (Determining Capacity of Petroleum, Petroleum Product and Natural Gas Pipeline) Regulations, 2010, constituted a Pipeline Capacity Assessment Group for determining the capacity of Natural Gas East West Pipeline (EWPL) of M/s Reliance Gas Transportation Infrastructure Limited (RGTIL). The Capacity Assessment Group submitted its report on determination of the capacity of EWPL. Accordingly, the Board vide its order dated 10.07.2014 declared the capacity of this pipeline for the period 1.4.2010 to 31.03.2011 and 1.4.2011 to 31.03.2012 as 85 MMSCMD and 95 MMSCMD respectively.

2. M/s RGTIL has appealed to Hon'ble Appellate Tribunal (APTEL) challenging the aforesaid declaration of capacity of EWPL of M/s RGTIL by the Board vide its Order dated 10.07.2014.

3. Hon'ble APTEL in its judgment dated 08.07.2016 received on 09.08.2016 at PNGRB has passed the following order:

(a) The impugned declaration dated 10/7/2014 issued by the Respondent is set aside only on the ground that there is breach of principles of natural justice.
(b) The matter is remanded to the Respondent
(c) The Respondent is directed to give a personal hearing to the Appellant and pass a reasoned order. The entire exercise should be completed within three months from the date of receipt of this order by the Respondent. Needless to say that the Appellant shall cooperate with the Respondent.

(d) It is made clear that this Tribunal has not expressed any opinion on the merits of the Appellant's case. Nothing said by us in this judgment should be treated as expression of our opinion on the merits of the Appellant's case.

(e) The Respondent shall pass order independently and in accordance with law.

4. Pursuant to the above APTEL Order, a personal hearing was given to M/s RGTIL at PNGRB on 08.08.2016, and the Board vide its Order dated 08.08.2016, directed the following:

i. M/s RGTIL to make written submissions within a week.
ii. M/s RGTIL's submissions along with the Order dated 10.07.2014 of the Board to be webhosted for public consultation.
iii. M/s RGTIL would be given an opportunity to submit their comments on the views received during public consultation.

5. M/s RGTIL made its written submissions on 22.08.2016 after seeking a week's extension for submissions to the Board.

6. On 30.08.2016, a public notice was issued as per the proviso 2(d) of the Petroleum and Natural Gas Regulatory Board (Determining Capacity of Petroleum, Petroleum Product and Natural Gas Pipeline) Regulations, 2010 seeking comments from public, if any, on the declared capacity in Schedule – C, the report of the Capacity Assessment Group and comments received from M/s RGTIL on the same. No comments were received during public consultation.

7. Consequently on 17.10.2016, a personal hearing was given to M/s RGTIL at PNGRB and M/s RGTIL request for a week's time to make summarized written submissions was acceded to. M/s RGTIL made the summerized written submissions on 26.10.2016. A meeting of Capacity Assessment Group was convened at PNGRB on 04.11.2016 to submit its recommendations on the comments / submissions made by M/s RGTIL on the its report on capacity determination of EWPL of RGTIL. The meeting was rescheduled and held on 16.11.2016 at PNGRB. Subsequently, the Capacity Assessment Group submitted its response on the comments / submissions made by M/s RGTIL on the its report on capacity determination of EWPL of RGTIL on 15.12.2016.

8. **M/s RGTIL's submissions**

M/s RGTIL in its submissions has, inter alia, stated as under :

i. On 10.06.2011, there were changes in the operating parameters of the pipeline and the gas supply pressure at entry point at Gadimoga had dropped below 72 barg. In fact, the actual operating pressure had reduced drastically to 45 barg. Accordingly, RGTIL reassessed its capacity in accordance with the Capacity Regulations, at the reduced supply pressure at the entry point, at 60 MMSCMD. In order to combat reduced volume and to sustain EWPL operation, an additional entry point to receive gas from the Shell Hazira Terminal was added. Accordingly, the capacity was revised by RGTIL to 72 MMSCMD (i.e. 60 MMSCMD from the OT + 12 MMSCMD from the Shell Hazira Terminal). This submission was made for capacity determination for the period post financial year 2009-10.

ii. Subsequently on 14.08.2012, the OT gas pressure had further dropped from the initial level of 72 barg to below 40 barg. Correspondingly, the gas production from the source had also significantly dropped to below 30 MMSCMD. Taking into consideration the aforesaid gas pressure decline and addition of entry point at Hazira, its reassessed capacity for the financial years 2010-11 and 2011-12 on a weighted average annual capacity basis was at 70 MMSCMD for the financial year 2010-11 and 52 MMSCMD for the financial year 2011-12.

iii. The Capacity Regulations defined the capacity of the pipeline in a two-fold manner, namely, the capacity for the pipeline system in regulation 2(k) and also the declared capacity of the pipeline in steady state operating conditions in regulations 2(1). The Board, after having satisfied with the data submitted, can accept, reject or modify and in terms of regulation 6(b) issue the "declared capacity of the pipeline system".

iv. The Regulation 2 (k) of the Capacity Regulations deals with the maximum quantity of natural gas that can be injected into or off-taken from the pipeline system meeting all the technical and operational parameters fixed in a "steady state condition". The determination of this maximum possible

capacity is calculated as per Regulation 5 of the Capacity Regulations according to contractual parameters including the contractually stated pressure. For determining the maximum capacity for the pipeline the maximum allowable operating pressure (MAOP) is taken as a maximum permissible boundary condition i.e. the pressure level which cannot be exceeded at any location along the pipeline during the capacity simulation exercise. Regulation 2 (l) of the Capacity Regulations which deals with "declared capacity of pipeline" concerns itself with the volume of natural gas in MMSCMD which a pipeline is actually capable of transporting under "steady state operating conditions". This is in contrast with Regulation 2 (k) of the Capacity Regulations which defines maximum possible capacity of a pipeline, the declared capacity under Regulation 2 (l) of the Capacity Regulations takes into account the reality of actual operating conditions. The Capacity Regulations stipulate that PNGRB shall determine the declared capacity of the pipeline.

v. The declared capacity has to factor in the ground realities of varying operating parameters since otherwise it would lead to an artificial declaration which would have serious repercussions for both the pipeline's common carrier obligations as well as tariff determination. In keeping with Regulation 2 (l) of Capacity Regulations, Regulation 5 lays down the methodology for determining capacity specifically factors in variable parameters including the inlet pressure, which is also defined as the pressure that is available at entry point.

vi. The capacity determination is not just a one-time exercise and nor is confined only to regulation 5. Regulation 7 and 9 also play an active role in arriving at the declared capacity of the pipeline which the entity is capable of transporting under steady state operating condition. Regulation 7(i) obligates determination on 1st working day of April every year or whenever there stipulated changes arrayed vide sub-clauses (a) to (e) occur. Regulation 7(ii) obligates and permits every entity to submit the details of the so re-determined capacity of the pipeline to the Board in line with the provisions of Capacity Regulations for the purpose of declaration of capacity. Further, Regulation 9(3) allows the Board to validate the computed capacity with actual capacity as per the flow regime of the pipeline with actual flow conditions as and when desired.

vii. A conjoint reading of regulations 5, 7, and 9 lead to an irresistible conclusion that the endeavour of the entity and the approval or validation by the Board either on yearly basis or on account of change in circumstances or as and when desired by the Board as found necessary is to arrive at "declared capacity of the pipeline" in terms of regulation 2(l).

viii. Post the determination of "declared capacity of the pipeline" vide regulation 6(c), every entity shall publish the same in line with the relevant regulation for access code for such pipeline on their website. The expression "publish the same" would reinforce the fact that the webhosting of these information in terms of the access code is to make available the information in the public domain in a transparent manner for the customers to access or avail the declared capacities. The access code has no other independent role or conceivable mechanism for either determination or re-determination of the declared capacity of the pipeline, which exercise is conceived in a wholesome, complete and self-contained manner under the Capacity regulation, 2010. A perusal of the Access Code provisions outlined above specifically provide "inlet pressure at entry point" as one of the technical parameters (as per Schedule I of access code) which is to be webhosted and updated on monthly basis for information to any party desirous of having access to pipeline capacity for transportation.

ix. The determination and declaration of capacity is under the Capacity Regulations and not under the Access Code Regulations. The Access Code Regulations play a limited role in the context of determination and declaration of capacity. Firstly, the publication of the declared capacity is as per the format specified in the Access Code Regulations (Schedule I) so as to enable third parties to know of available capacity which they may wish to utilize as well as technical parameters. Secondly, the mandate on re-determination of capacity when there is a change in operating parameters under Regulation 7 of the Capacity Regulations, is limited to changes in operating parameters falling within the parameters defined under the Access Code Regulations. Thus for the purpose of delineating which parameters can be taken into account for the purpose of re- determination of capacity under the Capacity Regulations, a limited recourse is made to the Access Code Regulations which specify the parameters. Therefore, it is erroneous to ignore the relevant provisions of the Capacity Regulations which provide for the mechanism for determination and declaration of capacity and to rely on the provisions of the Access Code Regulations for the same beyond the limited role as outlined.

x. The CAG in its report dated 17.04.2014 erred in placing reliance in isolation on regulation 5 of the access code. The CAG interpretation would lead to freezing of the operating parameters at the contractually stipulated parameters. This would render the numerous regulations under the Capacity Regulations which provide for change of capacity linked to change in operating parameters redundant. The CAG while carrying out the capacity assessment for the year 2010-11 and 2011-12, completely ignored ground realities as well as hardware changes carried out and relied on the contractual pressure at entry point agreed between M/s RGTIL and shippers at the time of signing these contracts in 2008-09. The CAG report suffers from two grave lacunas as below:

A. Erroneous interpretation of regulatory provisions
B. Adopting discriminatory approach for assessment of EWPL capacity vis a vis other pipelines of GAIL and GSPL.

A. Erroneous Interpretation of regulatory provisions : According to M/s RGTIL, the following have been mentioned in the CAG Report

i. The capacity assessment group also had a separate sitting on the same day to discuss a possible approach to be followed in this case not explicitly covered in the PNGRB Regulations.

The present PNGRB Capacity Assessment Regulations do not explicitly cover the situation.

Thus, the CAG has erroneously considered that the factum of change in inlet pressure is not a factor which is covered under the PNGRB Regulations ignoring Regulation 7 (i) (c) which explicitly mandates the PNGRB to carry out a reassessment of capacity in the event of change in inlet pressure being one of the operating parameters defined under the Access Code.

ii. The Capacity Assessment Group was prima facie not convinced that drop in OT gas pressure is in itself a reason for reassessment of capacity as per the present PNGRB Regulations. As there is no change in the pipeline hardware and the fact that there is no change in the contracts with shippers, the capacity need not be reassessed.

CAG not only completely ignored regulation 7(i)(c) but also did not take into account changes made at CS#1 by declaring that there is no change in the pipeline hardware.

iii. The CAG has erroneously relied on the proviso under regulation 5 (7) of Access Code which mentions that "the pressure and temperature shall be as per the contract between shipper and the transporter" to ignore the changes in EWPL entry point pressure.

In the Capacity Regulation 7(i)(c), the reference of Access Code is for identifying 'list of parameters' and not 'value of parameters'. The variation in these operating parameters must be considered for reassessment of capacity. There is no controversy that both temperature and pressure which are listed parameters under access code had been duly factored while determining the declared capacity under regulation 7(i)(c) and this has not been disputed by CAG in its report dated 17.04.2014. However, the CAG grossly erred in substituting the "list of parameters" as obligated by the access code to value of parameters and erred in arriving at a conclusion that the contracted pressure would form the basis for determination, overlooking the fact that the contracted pressure as actually performed by the contracting parties has indeed been factored as a part of "list of parameters" in terms of regulation 7(i)(c). The gas at the pressure as furnished by the shipper had been received and transported by RGTIL and correspondingly invoices had been raised for the said supplies and payments duly received. It is a settled legal position that the actual performance of the contract will constitute the basis and would override any variation to the contrary especially when the contracting parties have accepted the performed position and have not raised disputes later.

iv. The reliance on contractual parameters is misplaced since the same is relevant only for the initial capacity declaration. The initial capacity declaration is subject to reassessment whenever there is a change in operating parameters as specified in the capacity regulations. Please see in this regard regulation 7 of the Capacity regulations as mentioned above.

Furthermore, the emphasis placed by the CAG on the lack of express amendment to the gas transportation agreement with the shippers is misplaced. In reality the changes in actual operating parameters which

have necessitated the RGTIL to receive gas at lower pressure and transport the same is being ignored by the CAG. In such a scenario, the mere conduct of the parties shows a tacit understanding between the parties to transport gas at lower pressure and as such the lack of express amendment of the gas transportation agreement is inconsequential. It is to be highlighted that emphasis should be on actual operating parameters, which would determine access to the pipeline by new shippers and not contractual terms which may not have been expressly modified to reflect the underlying reality. The entire objective of the capacity regulations and the access code to provide access to new shippers would be defeated if the ground reality of actual transportation capacity is ignored and out-dated contractual terms are given precedence.

v. Regulation 4 of Access Code Regulations, which deals with declaration of capacity, specifically provide that the transporter shall web-host on a monthly basis the available capacity of the pipeline in the format specified in Schedule I of the said access code regulations. Schedule I which specifies the format for declaring capacity of pipeline. Specifically includes "inlet pressure at entry point" as one of the technical parameters to be specified on a monthly basis. The specified format which provides all the actual information updated on a monthly basis is available to any prospective shipper who wishes to avail transportation services. These actual parameters including entry point pressure, mentioned in the specified format are the very parameters whose change to the extent of +/- 10 % is to be taken into account in re-determination and consequential declaration of capacity is evident from the very definition of "declared capacity of pipeline" which specifies that if it is the volume of natural gas that a pipeline is capable of transporting under steady state operating conditions. Thus, necessarily, any change in operating conditions has to be factored in declaration of capacity. It is a factually indisputable position that in case of EWPL, that entry point pressure has drastically reduced and the same is supported by detailed logs submitted by RGTIL. Ignoring the factual reality of reduced entry point pressure in capacity computation is not in line with the capacity regulation as well as access code regulation as outlined above.

vi. Non-consideration of actual parameters for capacity computation will lead to artificial and technically non-existent capacity. As part of common carrier obligation, the transporter is required to webhost the

declared capacity and availability to third parties. Since, in reality RGTIL would never be able to transport gas upto such declared capacity, if requests from third parties were made in this regard, RGTIL will continue to be at risk of violation of its common carrier obligations.

vii. Fixation of an artificial capacity would also result in an arbitrary, illegal and irrational tariff regime, the consequences of which lead to impossibility of carrying on business. Furthermore, if contract values are taken as absolute this may lead to serious repercussions as the parties entering into an agreement can collude and agree upon artificial values in contracts leading to artificial capacity determination.

viii. It also raises question of parity, which is whether CAG would not have been obligated to consider change in ground conditions during capacity reassessment, in case these would have led to increase in capacity. Plain reading of capacity regulations mandate for accounting such changes for reassessment / verification of capacity.

ix. If changes in ground reality are to be considered in case of increase in capacity, the same stand has to be also taken in case of reduction as well. There is already a precedence of the Board approving a declared capacity in terms of regulation 6(b) which is lower than that declared for a previous period in the case of GSPL HP network where the original capacity of 36 mmscmd has been reduced to 31 mmscmd.

x. On 04.09.2012, the constituted members of CAG had laid down various parameters to be considered in the declared capacity determination exercise which include source field depletion, contractual off-take, entry point pressure limitation of source, non-availability of gas at connected source etc. The CAG had found the parameters catalogued vide resolution dated 04.09.12 as critical parameters which need to be factored in arriving at the capacity of the pipeline which in fact had been applied and extended, as applicable, in the case of IOC/GSPL/GAIL networks but failed to be done in case of RGTIL.

xi. The CAG report accepts and admits the position that "the capability of the pipeline to handle physical flow may not be at the same level corresponding to various reduced entry point pressures actually

available at Gadimoga". Thus, having accepted the same the CAG cannot rely on contractual terms to artificially freeze the capacity at higher level or higher than previous level contrary to the PNGRB Regulations.

B. Discriminatory approach for assessment of EWPL capacity vis a vis other pipelines:

i. On 04.09.2012, capacity assessment group consisting of representatives from IIT Bombay, GSPL, GAIL, RGTIL as well as PNGRB, laid down various parameters to be considered for capacity assessment for natural gas pipeline networks. The aforesaid CAG resolution dated 04.09.2012 is quoted herein below:

"During capacity assessment of natural gas pipelines under the provision of regulations the duly constituted committee deliberated on various practical limitations and suggested following parameters to be incorporated in the Report for finalization of capacity of IOCL, GAIL and GSPL. The committee further deliberated that these parameters shall be uniformly applicable in all the future capacity assessment of natural gas pipelines:

1. All deliveries within 50 km of any source shall be limited to contractual flow quantities.
2. Pressure drop across the metering and regulating stations taken as 4 barg or higher on the basis of documentary evidence.
3. Pressure drop across check meter / station will be 2 barg.
4. Following source capacity limitations considered:
   a. Source / Field depletion
   b. LNG terminal capacity
   c. Contractual off take
   d. Entry point pressure limitations of source
   e. Non-availability of gas at connected sources."

ii. While declaring the capacity for other pipelines namely GSPL and GAIL for the financial years 2008 to 2012 the aforesaid parameters, as applicable, have been considered by the CAG in computation of the capacities and such computed capacities were subsequently accepted and declared by the PNGRB. The list of parameters from above resolution duly taken into account and applied for other pipelines are as below:

for GSPL : applied 1,2,3, & relevant sections of 4
for GAIL . : applied 1,2,3, & relevant sections of 4

iii. Parameters as applicable for various pipelines were considered by the CAG in the above cases in arriving at the capacity of the pipeline under steady state operating conditions instead of the maximum capacity of the pipeline. However, in case of EWPL a discriminatory treatment was given wherein entry point pressure, even though part of set of parameters unanimously agreed, was not considered and ignored by CAG and the resultant consequences are drastic and catastrophic.

9. Observations of Capacity Assessment Group on M/s RGTIL's submissions

The capacity Assessment Group of PNGRB has inter alia submitted its response on the submissions of M/s RGTIL as under :

i. The regulation has been followed strictly and in entirety and the same has been elaborated in the CAG report. The capacity assessment exercise goes by the contractual obligation of the shipper as regards to supply gas pressure to the transporter. Maintaining contractual pressure at inlet is shipper's obligation. It is the shipper's responsibility to ship at the contractual conditions or pay for the default. Such a 'ship or pay' clause is an important part of the contract between the transporter and the shipper. Any drop in this pressure is extraneous to the capacity assessment procedure unless it is reflected in the contract. Unless the purported drop in gas pressure from KG-D-6 is reflected in a revised contract between the shipper and the transporter, it is of little relevance for the capacity assessment exercise. CAG verified that the claimed change in inlet pressure at OT has not been reflected in the contract between the transporter and the shipper in the case of EWPL. PNGRB procedure is bound only by contractual obligations. Even though it has already been explained in detail in the CAG report dated 17.04.2014 for RGTIL, it is once again reiterated that the Capacity Regulations 7(i)(c) is cross-referred to relevant Access Code Regulations wherein under Regulations 5(6) and 5(7), it has been clearly specified that *the entry point*

pressure and temperature shall be as per the contract between shipper and the transporter. In this regard, Capacity Regulation 5(a)(i) is also quoted, *"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."* Further, the assertion of RGTIL in its submission, "in the Capacity Regulation 7(i)(c), the reference of Access Code is for identifying 'list of parameters' and not for 'value of parameters'" is erroneous and misconceived as the parameters relevant for capacity assessment have already been listed under PNGRB Capacity Assessment Regulations. Further, when Access Code Regulations specifies *"the pressure and temperature shall be as per the contract between shipper and the transporter"*, it refers to *"values of pressure and temperature" only and nothing else, certainly not "list of parameters" again!*

ii. The letter as mentioned in para 10 above was not by any CAG constituted for any entity but by a group of members involved in respective CAGs constituted for GAIL, GSPL, RGTIL pipelines. All the members were available during one of the meetings held at IIT Bombay and the opportunity was used to arrive at some guidelines to handle certain practical constraints in future capacity assessment exercises. These constraints became apparent during the first capacity assessment exercises for all these entities and the letter only documents guidelines which could be used in future for all pipeline operators.

Regarding LP network of GSPL, some of the gas sources for this network were decades old gas wells. The pipeline network itself is about 17 years old and some sections of it even de-rated. It was in this context that it was felt that a more practical upper limit could be placed on the gas availability at source for such cases. It was thought that this practical upper limit on gas availability could be based on the figures pertaining to previous few years. In spite of this, CAG had estimated the capacity by maximising the flow from Essar source till the gas velocity limit was met. At the capacity recommended by CAG in its report, gas velocity reached 19.91 m/s.

Effectively, no concession was granted to GSPL on source depletion, although it was considered justified in view of the age of the wells concerned. The consideration is not applicable even remotely to the EWPL case where the pipeline and the gas source are both very recent. RGTIL itself had claimed, as well as achieved, EWPL capacity of 80 MMSCMD for 2009-10.

iii. As per the process defined in the regulation to determine capacity of the entity, contractual parameters are sacrosanct and the same were obtained from all the entities in all the capacity assessment exercises in line with sub-clause 5(a)(i) of Capacity Regulations. Any default by the shipper and the hardware modification carried out by the transporter to cover the default by the shipper is not in the purview of CAG. No contract between shipper and transporter was provided to CAG showing any change in inlet parameters to support the claimed actual conditions at inlet.

CAG would like to highlight the fallacy in RGTIL's argument. Supposing that the shipper was able to provide natural gas at entry point at the contractual pressure of 80-98 bar g and RGTIL still decided to swap the CS-1 and CS-9 bundles, would the EWPL capacity reduce as per the PNGRB procedure because of this hardware change? If the answer is 'yes', any entity would be free to lower the capacity of its network by several means. One of these could be to simply reduce the pipe diameter over some small stretch of the pipeline which does not affect the business, but ensures that the velocity limitation criterion in the PNGRB Capacity Regulations suitably brings down the pipeline capacity.

CAG would like to reiterate that its capacity assessment exercise is model-based and bound by relevant PNGRB Regulations and the estimated capacity is simply not the actualised capacity of the network? If that is so, the entire capacity assessment exercise will be meaningless and unnecessary.

iv. LNG terminal (HLPL) capacity for GSPL network was considered as a practical limitation. It was based on the design capacity of the terminal itself. This benefit was given to RGTIL also despite their own submission of 12 MMSCMD capacity of the terminal. The CAG for EWPL considered it at 10 MMSCMD only as was done in the case of GSPL.

As regards considering or not considering this LNG terminal on High Pressure network of GSPL, the CAG has the following clarification. The LNG Terminal is close to the nearby gas sources, namely, RIL Atakpardi, RIL Bhadbhut and Petronet Dahej. The LNG terminal (HLPL) can provide gas at a much lower pressure than the contractual pressure at the other sources. To maximise the capacity of GSPL network, CAG has taken higher pressure Atakpardi source of 93 bar g instead of 85 bar g HLPL pressure. By running the simulation with other nearby sources at higher pressure, simulated Node pressure at HLPL comes out to be approx. 86 bar g. This was higher as against the maximum contractual available pressure at HLPL, which was 85 bar g. Therefore, the flow from HLPL terminal is automatically forced to zero by the simulation itself. In other words, HLPL source will not contribute in maximising capacity through simulation exercise, whether it is considered or not.

v. Discriminatory approach for assessment of EWPL capacity.

a. The CAG for capacity estimation of various networks comprises of members from GAIL, GSPL, RGTIL and PNGRB. Therefore, the concerns of all entities get taken into account. As all the members from the three entities were present together in the meeting at IIT Bombay, the rare opportunity was used to arrive at some guidelines to take care of certain practical constraints in future capacity assessment exercises. These constraints and the need to incorporate them in the capacity estimation became apparent during the first capacity assessment exercises for all these entities.

Therefore the parameters: 1, 2, 3 and relevant part of 4 were also considered in case of EWPL/RGTIL.

b. As per the first step in capacity assessment exercise, the entity is required to submit to Board requisite details/ parameters along with its simulations for the capacity of its pipeline. For the Capacity Assessment of EWPL pipeline, RGTIL made submission to the Board that entry point pressure at Onshore Terminal (OT) is 72 bar g, which actually corresponds to the minimum suction pressure of the first compressor CS-1 on the pipeline at Gadimoga. Considering RGTIL's submissions to Board, the capacity

assessment exercise was carried out by the EWPL capacity assessment group and accordingly recommendations pertaining to EWPL capacity were submitted to the Board. While carrying out simulation run with 72 barg as entry point pressure at Gadimoga, i.e. suction pressure to CS-01, the capacity of the pipeline got limited owing to reaching the rated capacity of the first compressor i.e. CS-01. After perusing subsequent submissions by RGTIL pertaining to details of agreement with Shippers, it has been found out that as per these contracts, the Shipper's obligation regarding entry point pressure at Gadimoga is much higher and is in the range of 80 to 98 barg. It may be noted that 72 bar g was the minimum suction pressure requirement of CS-1. The shipper was obliged to provide the gas at even higher pressure as per the contractual obligation. If that pressure was taken as suction pressure at CS-1 as mandated by the PNGRB regulation, the capacity of EWPL would have come out to be higher due to reduction in the required compression ratio to get compressor discharge pressure of 98 bar g. This use of 72 bar g as gas pressure available at Gadimoga instead of aforementioned contractual entry point pressure at Gadimoga resulted in significant reduction in the recommended capacity of EWPL even for 2009-10.

c. Capacity assessment simulations of other pipelines have been done taking into consideration contractual entry point pressures. Similarly, if capacity assessment simulation of EWPL is carried out considering contractual pressure, the estimated capacity of EWPL will be at a much higher level. Thus, this in itself in a way became a favourable consideration only to RGTIL in capacity estimation (albeit owing to RGTIL's submission of entry point pressure as 72 barg to Board instead of contractual entry point pressure of 80-98 barg), and subsequent recommendations of the capacity of EWPL.This concession continued even for subsequent capacity estimations of EWPL. The other entities did not get an equivalent concession in capacity estimation.

10. In the light of the submissions of M/s RGTIL and response of CAG as outlined above, it has been noted that the main contention of M/s RGTIL is on the interpretation of regulatory provisions for determining the capacity of the natural gas pipelines. The related provisions of various PNGRB Regulations in respect of are as under :

a. The PNGRB (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010.

i. *Regulation 2 : Definitions*

"capacity for the pipeline system" *means the maximum quantity of petroleum, petroleum products or natural gas that can be injected into the system or off taken from the system at specific points, meeting all the technical and operational parameters fixed in each pipeline section in a steady state conditions , that is, all parameters like flow, pressure, temperature are in harmony and vary only along the length of pipeline but not with time;*

"declared capacity of pipeline" *means the volume of natural gas in MMSCMD (million standard cubic meters per day) that a pipeline is capable of transporting under the steady state operating conditions. For liquid pipeline the declared capacity of pipeline shall be the quantity of petroleum, petroleum products in MMTPA (million tones per annum), the pipeline is capable of transporting under the operating steady state conditions. Provided that the capacity has been determined based on the approved flow equation and the selected software package;*

The regulations in terms of the capacity of the pipeline system and declared capacity of the pipeline is differentiating only under steady state and steady state operating conditions. The steady state condition has been defined further in the regulations as under :

"steady state condition" *means calculation carried out based on time-invariant pressure, temperature and flow profiles throughout a pipeline using specified boundary conditions. In other words, the steady-state run calculates the hydraulic state of a pipeline system operating at equilibrium with input and output balance*;

The steady state operating conditions is used to measure the efficiency factor of the pipeline in normal condition. This efficiency factor is used in the approved flow equation for determining the capacity in the software as mentioned in the Capacity Regulations. In case, interpretation of M/s RGTIL about actual operating conditions being taken for declaring the capacity than the actual volume transported would be inferred as capacity of pipeline thereby making the all other parameters as mentioned in Capacity Regulations in fructuous.

Therefore, the steady state operating condition only reflects the state in which all parameters like flow, pressure, temperature are in harmony and vary only along the length of pipeline but not with time when the capacity is determined based on the approved flow equation and the selected software package.

ii. The PNGRB (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010 further stipulates the various variable parameters as input to the approved flow equation for determining capacity in the software package. The inlet pressure as specified in these regulations is *"the maximum pressure that is available at the entry point to the pipeline system"*.

The sub-regulation 5 (a) (i) and (ii) of these Regulations specify as under :

"a. Natural Gas Pipelines:

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.

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. "

The sub-regulation 7 (i) (c) of these Regulations specify as under :

"7. Periodicity for determining capacity of a Petroleum, Petroleum Products and Natural Gas pipeline.

1. The capacity of a pipeline shall be determined on first working day of April every year or whenever-

a. there is a major change in the injected quantity or off taken quantity of petroleum, petroleum products and natural gas;

b. contract carrier quantity period expires;

c. there is a change of plus or minus ten percent in gas composition or product quality or in other operating parameters from the operating

conditions of the pipeline system within the parameters defined under the relevant regulations on the access code as and when notified;

d. *there is addition or deletion of entry or exit point; or*

e. *there is addition or deletion of facilities, for example, compressor or pumping station, loop lines or any other facility;"*

iii. It has been noted that the Capacity Regulations provide for the setting of the pressure as a fixed parameter corresponding to the maximum allowable operating pressure (MAOP) or available compression facilities at the originating point and at intermediate points in the direction of flow in determining the capacity of the pipeline. Further, the inherent capacity of the pipeline inter alia depends upon the maximum allowable operating pressure. Any pressure less than MAOP on account of the selection of compressor etc. would result in lower capacity of the pipeline. Further, in case any other pressure than MAOP or the contracted pressure is considered than it would provide room for manipulation as any entity can select a compressor with lower outlet pressure to circumvent the intent of the Regulations to declare lower than inherent capacity of the pipeline. Further, any modification in the pipeline system i.e. change of compressor, reduction in diameter of pipeline to reduce the capacity of the pipeline defeats the purpose of this regulation for efficient and optimal use of capital.

iv. Further, these clauses make a definitive reference to the Petroleum and Natural Gas Regulatory Board (Access Code for Common Carrier or Contract Carrier Natural Gas Pipelines) Regulations, 2008 which inter alia as per sub -Regulation specifies as under :

"5. Gas Parameters

(6) The transporter shall define the gas parameters at entry points in terms of gas hydraulics specifying the acceptable range of pressure and temperature and the same shall be hosted on the website of the transporter.

(7) Shipper shall supply gas conforming to all parameters specified in sub-regulations (1), (4) to (6) and the transporter shall deliver gas at exit point conforming to parameters of gas as specified in sub-regulations (1),(4) and (5):

Provided that the pressure and temperature shall be as per the contract between shipper and the transporter."

The sub-regulations 5 (c) and (d) of the PNGRB (Determining capacity of Petroleum, Petroleum products and Natural Gas Pipeline) Regulations, 2010 specify that :-

"(c). In case the contractual pressure at any entry and exit point is within a and, the arithmetic mean rounded upto first decimal point shall be considered.

(d). The annual capacity of pipeline system and sections shall be as per the operation days specified in the Access Code for respective system."

v. These Regulations when read in conjunction imply that the inlet pressure shall be taken as the contract pressure between shipper and the transporter to determine the capacity of the pipeline. This is also substantiated by the sub-regulation 7 (1) (b) and (c) which reflects the change in capacity to be notified in case of change in contract.

vi. It has also been noted that only contracted pressure is considered in the flow equation at the exit points as given in the sub-regulation 5 (a) (vi) of these Regulations.

"vi. 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."

vii. It has been seen that exit pressure of a pipeline network at times becomes inlet pressure of another pipeline network. As the contractual exit pressure is considered in the flow equation for determining the capacity of pipeline. In case, it is an inlet pressure to another pipeline than only contractual pressure can be taken as inlet pressure which implies contract pressure to be taken as inlet pressure. In case actual inlet pressure is

taken to compute the capacity of pipeline than considering the various methods available to control the same, the capacity determination would be reduced to an exercise to reflect the actual volume transported and not the capacity of the pipeline at the contracted pressure etc.

viii. Therefore, CAG has considered contracted pressure in all exercises on the capacity assessment determination to maintain uniformity, transparency, impartiality etc. and to minimize discretion / manipulations. Hence, the contention of M/s RGTIL on the inlet pressure being the actual pressure and not the contracted pressure is not maintainable.

11. It has been seen that CAG comprises members from various entities in conformity with the Capacity Assessment Regulations. Accordingly, the entities like GAIL, GSPL, RGTIL, PNGRB are represented on various CAGs. Further, an experts from IIT Bombay has been also been included in the CAG to bring in external technical expertise on the matter. These groups arrived at uniform guidelines to maintain uniformity, independence, transparency and impartiality in determining the capacity in an unbiased manner.

12. It has been noted from CAG's submissions that Low Pressure network of GSPL was receiving gas from some of the decades old gas wells. The pipeline network itself is about 17 years old and some sections of it even de-rated. Accordingly, CAG placed an upper limit on the gas availability at source. However, CAG had estimated the capacity by maximising the flow from Essar source till the gas velocity limit was met. At the capacity recommended by CAG in its report, gas velocity reached 19.91 m/s. Therefore, no concession was granted to GSPL on source depletion, although it was considered justified in view of the age of the wells concerned. Such consideration was not applicable even remotely to the EWPL case where the pipeline and the gas source are both very recent. Further, M/s RGTIL itself had claimed, as well as achieved, EWPL capacity of 80 MMSCMD for 2009-10.

13. It has been noted from CAG's submissions that M/s RGTIL's submitted entry pressure at Onshore Terminal (OT) as 72 bar g, which actually corresponds to the minimum suction pressure of the first compressor CS-1 on the pipeline at Gadimoga. According, while carrying out simulation run with 72 barg as entry point pressure at Gadimoga, i.e. suction pressure to CS-01, the capacity of the

pipeline got limited owing to reaching the rated capacity of the first compressor i.e. CS-01. It has been noted that as per the agreement with Shippers, the Shipper's obligation regarding entry point pressure at Gadimoga was in the range of 80 to 98 barg. If that pressure was taken as suction pressure at CS-1 as mandated by the PNGRB regulation, the capacity of EWPL would have come out to be higher due to reduction in the required compression ratio to get compressor discharge pressure of 98 bar g. This use of 72 bar g as gas pressure available at Gadimoga instead of aforementioned contractual entry point pressure at Gadimoga resulted in significant reduction in the recommended capacity of EWPL even for 2009-10. The changes in contractual pressure as evident from the agreement between the shipper and M/s RGTIL, if any in the following years may be considered for capacity determination as applicable in line with the PNGRB ((Determining Capacity of Petroleum, Petroleum Product and Natural Gas Pipeline) Regulations, 2010.

14. From the submission of CAG, it has been noted that in the instant case of EWPL and other cases of GSPL and GAIL also, CAG has considered the parameters as mentioned in para 8 (x) (B) (i) (1), (2), (3) and relevant part of 4 .

15. It has been noted that the new source of supply from Hazira LNG Terminal, Hazira has been added in EWPL in April 2011. Accordingly, CAG has added 10 MMSCMD in the capacity of EWPL in 2011-12 which was similar to as done in the case of GSPL. Furrher, it has been noted that as per sub-regulation 2 (a) (d) of the PNGRB (Determination of Natural Gas Pipeline Tariff) Amendment Regulations, 2016 :-

"(d) In case of addition of any new source to a natural gas pipeline that comes during 01.04.2015 to 31.03.2020, any increase in the design capacity of the pipeline because of this new source shall not be considered in the tariff determination for a period from 01.04.2015 to 31.03.2020".

Therefore, the retrospective application of this amendment may be looked into by the Board separately.

16. The investment in a pipeline project is determined by the entity based on the design capacity of the pipeline which in-turn is based on the entity's own assessment of cost and market conditions. Reduction in capacity utilisation of a

pipeline on account of failure of the Shipper to meet its obligations should not be considered as reduction in pipeline capacity as it would lead to increase in the transportation tariff for the consumer.

On consideration of all the facts, as mentions here-in above, we issue the following order --

Order

Capacity of Natural Gas East West Pipeline (EWPL) of M/s Reliance Gas Transportation Infrastructure Limited (RGTIL) for the period 1.4.2010 to 31.03.2011 and 1.4.2011 to 31.03.2012 shall be 85 MMSCMD and 95 MMSCMD respectively as declared by Board vide its order dated 10.07.2014.

(K. K. Jha)	(Subhash Chandra)	(B. Mohanty) 29/12/2016
Member (KKJ)	Member (L)	Member (BM)