PRE COMMISSIONING & COMMISSIONING ASSISTANCE OF GAIL FOCUS ENERGY CROSS COUNTRY PIPELINE PROJECT

By:

Ganta Ravi Kumar

R160208013

M. Tech PLE

College of Engineering

University of Petroleum & Energy Studies

Dehradun

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By

Ganta Ravi Kumar

R160208013

M.Tech PLE

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Under the guidance of

Mr. Antony Thomas

Project Manager

Ace Pipeline Contracts Pvt Ltd

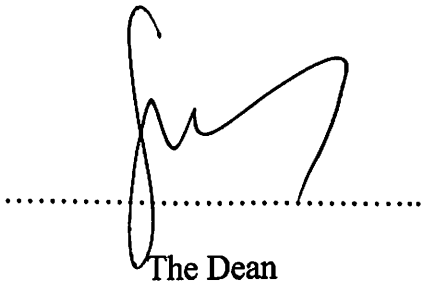
Prof. P. K. Bahl

Professor Emeritus

College of Engineering Studies

UPES, Dehradun

Approved by



The Dean

College of Engineering

University of Petroleum & Energy Studies

Dehradun

May, 2010

CERTIFICATE

This is to certify that the work contained in this thesis titled "PRE COMMISSIONING & COMMISSIONING ASSISTANCE OF GAIL FOCUS ENERGY CROSS COUNTRY PIPELINE PROJECT" has been carried out by GANTA RAVI KUMAR under my supervision and has not been submitted elsewhere for a degree.

Mr. Antony Thomas

Project Manager

Ace Pipeline Contracts Pvt Ltd

Date:

Prof. P. K. Bahl

Professor Emeritus

College of Engineering Studies

University of Petroleum and Energy Studies

Date: 11-5-10

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ABSTRACT

The main objective of this project is to give a brief idea about the minimum technical requirements for testing and commissioning of GAIL Focus Energy Pipeline project including pre-commissioning activities such as pre-commissioning checks, dewatering ,swabbing, flushing/blowing, leak testing etc.

INTRODUCTION

This Pre-commissioning and Commissioning Project is intended to describe the overall scheme of the pre-commissioning tests and commissioning assistance for the Focus Energy Pipeline Project. All activities covered by the constructional phase, which include mechanical completion, are deemed to be completed prior to the commencement of pre-commissioning.

Scope for commissioning assistance include but not limited to, the supply of all materials, consumables and manpower that is required during pre-commissioning and commissioning activities including all co-ordination with and assistance to other agencies / contractors during commissioning operations and all associated work.

FOCUS ENERGY PIPELINE PROJECT (FEPL) :

GAIL(India) Limited is implementing a 88 km long 10" dia pipeline system for transportation of gas from Langtala field of M/s Focus Energy Consortium to the power plant of Rajasthan Rajya Vidyut nigam Limited (RRVUNL) at Ramgarh, Rajasthan. Tractebel Engineering Pvt. Ltd. (TEPL) has been appointed by GAIL as Project Management Consultant (PMC) for this project.

The Focus Energy Pipeline (FEPL) Project scope includes transportation, Laying, Installation, Hook-up, Testing, Pre-Commissioning of Focus Energy Pipeline Project of approximately 88 km long (10" dia) and related facilities.

Brief Description as under

Client : Gas Authorit of India Ltd.(here after consider as GAIL)

PMC : Tractebel Engineering Pvt. Ltd. (here after consider as TEPL)

Contractor: Ace Pipeline Contracts Pvt Ltd. (here after consider as ACE)

REFERENCES:

- API 1104 - Welding of Pipelines and Related Facilities.
- API RP 1110 - Pressure testing of Liquid Petroleum Pipe Line.
- ASME B 31.8 - Gas Transmission and Distribution Piping System.
- TEPL - Project Specification for Pre Commissioning.
- ACE Approved procedure for Testing and Pre Commissioning for FEPL.

CONSTRUCTION OF CROSS COUNTRY PIPELINE

The following are the brief steps involved in construction of cross country pipeline before pre commissioning. Its pre commissioning engineer's responsibility to check whether the pipe line is cleared every step for Pre commissioning and then commissioning.

Sr.No	Description
01	Route Survey
02	Clearing and Grading
03	Trenching
04	Mainline Welding
05	Non Destructive Testing
06	Field Joint Coating
07	Clearance of Part A Pipe Book
08	Lowering
09	Recording of Pipe Top Levels
10	Temporary Cathodic Protection Installation
11	Back Filling
12	Crossings
13	Tie In Welding
14	Lowering & Backfilling of Tie In
15	As Built Elevation
16	Clearance of Part B Pipe Book
17	Hydro Testing
18	Golden Tie In
19	Clearance of Part C Pipe Book
20	Pre Commissioning Checks
21	Commissioning

RESPONSIBILTIES:

- GAIL / TEPL responsible to monitor and inspect the wok execution by ACE during pre commissioning and commissioning.
- ACE shall be responsible for all he pre commissioning and commissioning activities that need to be carried out for the pipe line system as per Agreement / Tender Document.
- The following responsibilities shall apply during execution of the project.

Project Manager:

- Shall report to Project coordinator.
- Shall be responsible for providing resources for the implementation of approved procedure for pre commissioning and commissioning.
- Shall be responsible for control, supervision and direction for implementation and execution of construction plans using calibrated measuring and test equipments.

2.2 Quality Engineer:

- Reports to Project Manager.
- Ensures proper implementation of procedure as per project specification and tender document.
- Checks and verifies all inspection reports are meeting the requirements of project specification.
- Ensures activities are as per Quality Assurance Plan.

2.3 Planning Engineer:

- Shall be responsible for scheduling activities step by step and intimating appropriate time prior to client and site engineer as well.
- Reports to the Project Manager.
- Setting up, implementing and overseeing the documentation related to pre commissioning and commissioning.
- Ensures that all activities are as per tender / agreement between ACE and GAIL / TEPL.
- Preparing status / Progress reports daily, Weekly and Monthly.

Pre Commissioning Engineer:

- Shall report to Project Manager.
- Preparation of schedule addressing specific issues and characteristics of each spread.
- Monitors, Inspect and record data at every step and he will be responsible for implementing specified procedure and all the standard requirement.
- Site Engineer will be overall responsible for ACE work at the site and will be responsible for the setting up and day to day running of the equipment and personnel.
- The pre commissioning Engineer will also be responsible of implementation of safety procedure regulation.

Safety Engineer:

- Reports to Site Project Manager.
- Manages the implementation of all safety requirements mentioned in the project specified Health, Safety and Environment Plan during operations.
- A safety audit will be carried out by safety engineer during the operation at time intervals specified in HSE Plan, to check if the line of responsibility exists and if any deviations has been made.
- Monitors Personal Protective Equipment to be in place for the manpower engaged in pre commissioning and commissioning activities.
- Conducts tool box meeting at regular intervals to deliver safety instructions for activities which are potentially dangerous.
- Ensures all safety reviews have been conducted at prescribed steps to avoid any mechanical or man power loss and to keep safe work practice at site.
- Responsible for keeping suitable fire extinguishers at electrical boards and at fuel storage place in adequate numbers to avoid fire accidents.

Rigger:

- Will be reporting to the technician, and will be responsible for the set up of the equipment, along with the installation and removal of the temporary facilities.

Technician:

- Will be responsible for setting up and running the equipment and the personal spreads ensuring that all the tasks delegated to him by the engineer are carried out as per the procedure.
- The technician shall be responsible to the project engineer and shall only take instructions from the engineer or in his absence the project manager.

Mechanic:

- Will be responsible for setting up of all the equipment required for successfully completing the pre commissioning and commissioning operations.
- The technician or site engineer shall convey the way in which the equipment is to be setup verbally.

Activities To Be Carried Out By ACE:

- Planning for the pre-commissioning: ACE shall plan in advance in consultation with TEPL/GAIL for pre-commissioning activities and the schedule for the same shall be finalized.

- Supply of operating materials such as tools and devices: ACE shall supply all required tools and tackles for the activity.

- Supply of spare parts during pre-commissioning: ACE shall maintain sufficient stock of spare parts required at work site for the activity.

- Supply of temporary emergency equipment: ACE shall arrange temporary emergency equipment like portable fire fighting equipment, first aid boxes and ambulance.

- Mobilization of the pre-commissioning team including supplier's engineer/supervisor as required: ACE shall identify in advance proper capable personnel for this activity and depute them for the activity.

- Operation of the facilities installed: ACE shall depute proper skilled personnel to operate the facilities provided for the activity.

- Expense for utility consumed/used up to the hand over, such as electricity, telecommunication and fuel for generator: Utility expense shall be borne by ACE.

- Recording the results and reporting on progress of the pre-commissioning: ACE shall depute personnel for recording of parameters and report the progress of the activity from time to time.

- Ensuring safety to personnel, material, equipment and facilities: ACE HSE shall be on the job ensuring safety to the personnel, material, equipment and facilities.

- Ensures that the pre-commissioning team are aware of the operating Parameters, and to take care that operating instructions for the facilities and Equipment are followed and that system design parameters are not exceeded

METHODOLOGY:

Mechanical Completion

Mechanical Completion is the condition that the individual facility, system or equipment has been physically installed in accordance with the drawings, specifications and codes and regulations to the extent to start the pre-commissioning.

Upon mechanical completion of the pipe line system ACE shall submit set of documents to the Spread In –Charge of TEPL/GAIL.

FORMAT-1 : - Intimation regarding system completion

ACE shall prepare and submit Format -1 progressively after completing all activities as per the scope of contract, except the activities, which will not affect the commissioning.

Scope of ACE falls as under mentioned systems to be completed, and each of the systems shall be filled in Format - I separately.

Pipe line system

- Scraper facilities
- Sectionalizing valve (SV) station
- RT – Station. for the complete pipe line system under ACE's scope

Telecom System (OFC laying)

- CP works
- Electrical works. Format
- Instrumentation work.
- General civil, structural & architectural works for SV stations.

Note: For telecom systems FORMAT I need to be filled SV station wise.

List of Documents to be submitted with Format-1:

- Pipe book (Part A, Part B and Part C) duly completed in all respects
- List of Golden Tie-In-joints (Tie-in joints which are not subjected to hydro-testing i.e., for jointing the sections which are already hydro-tested) along with inspection reports for each joint.
- No objection certificates from land owners up on completion of ROU restoration.
- Final clearance certificate from the respective local/government authorities upon satisfactory restoration of ROU crossing of all roads, railway tracks, canals, ponds, rivers, forests etc.
- As-built alignment sheets indicating all the levels, co-ordinates, changes in route of the pipe line actually laid etc.
- All inspection reports pertaining to the pipe line laying, duly documented.
- Hydro testing inspection and clearance report.
- OFC handing over report along with link test report to the telecom vendor and as built alignment sheets for OFC laying.
- Statutory approval for electrical installations along with test reports and as-built drawings.
- Final documents of TCP system.
- Title of land acquired for, PCP anode beds, cable route for laying anode lead cables and anode lead junction boxes.
- Final documents for PCP.
- Instrument installation and calibration reports.
- Instrument loop checking reports.
- As built drawings for SV stations.
- As-built pipeline route map.
- All Inspection reports as per approved procedures.

FORMAT-II:-

Upon verification of the Format-I for each of the above systems, TEPL/GAIL Spread In-Charge will arrange for the issue of "Check list" to ACE in FORMAT-II.

FORMAT - II – Check List for System / Sub System.

FORMAT – III :-

ACE shall clear the checklist points for the Systems / Sub Systems as mentioned in the FORMAT-II and submit "Ready for pre-commissioning certificate" which is in the FORMAT –III to TEPL/GAIL spread –in charge.

FORMAT-III:- Ready for Pre Commissioning Certificate.

PHYSICAL COMPLETION:

Physical completion follows the mechanical completion and is when the certificate of physical completion is issued by OWNER. Upon the physical completion, the facilities and pipeline are fully ready for the pre-commissioning and commissioning.

PRE COMMISSIONING:

Pre-commissioning are those activities following the mechanical completion, which include pre-commissioning activities such as pre-commissioning checks, de-watering and swabbing required to be ready for filling of the facilities and pipeline with product

Pre-comissioning activities include but are not limited to non-operating adjustments, energisation of electrical equipment and no load operation tests.

Pre-commissioning will be commenced system by system / equipment by equipment, once the mechanical completion of the same has been completed.

Before attempting any pre-commissioning activities, the individual check lists or procedures prepared for each equipment or system shall be studied along with the relevant supplier's drawings, instructions / manual and shop test reports.

The work to be performed by ACE shall consist of the following activities:

PRE COMMISSIONING CHECKS:

The pre-commissioning checks shall be carried out for the pipeline to ascertain that the pipeline system has been mechanically completed in all respect.
These checks shall cover the main pipeline including pig launchers / receivers, dispatch and receiving terminals and sectionalizing valve stations.
The pre-commissioning activities shall include the following:

a) System Checks

Entire pipeline system shall be checked with respect to latest P&IDs, Engineering and other vendor drawings / Documents and other design specifications. Any short comings observed shall be listed down in the form of punchlists and duly attended.

b) Internal Inspection of Vessels (Scraper traps)

Launchers & receivers shall be cleaned internally and inspected for cleanliness and their internals for proper installation.

c) Operability test of valves

All sectionalizing valves shall be subjected to an operability test to check the performance of the valves.

d) Checking of Field Instruments

All field instruments like transmitters, solenoid valves, shut down switches, alarm etc. shall be checked physically and also for their intended application by simulating the operating condition. It will also for include checking of deferent meters, gauges, action of actuated valves, control valves, shutdown valves etc...

e) Survey of the Pipeline

This shall be performed to confirm that proper fitting / supports, cathodic protection systems, route markers, warning markers, fencing around SV stations etc., have been installed along the pipeline.

f) Checking of Communication System

This is to check that there is proper communication with adequate back up power to ensure uninterrupted communication. Upon completion of the pre-commissioning the pipeline and facilities are considered ready for the commissioning.

g) Checking of Electrical distribution System

This is to ensure safety and also to ensure an uninterrupted power supply during startup and normal pipeline operation.

h) Checking of Instruments, control and inter locks

This is to check that instrument controls and interlocks are functional as per the normal operating condition.

i) Checking of Utilities

This is to check the utilities like power, nitrogen, UPS System, instrument air etc are available prior to start up.

j) Any other checks as may be considered necessary:

Work Instructions

All the activities during the pre-commissioning shall be managed and controlled by the commissioning Engineer.

PRE COMMIOSIONING ACTIVITIES:

Cleaning

Magnetic cleaning pig shall be used for the entire pipeline section and cleaning shall be accepted if less than 3kg / 100km of ferrous material are collected in the last magnetic pig run.

DEWATERING:

General:

A. Dewatering of pipeline section shall be done by ACE subsequent to the hydro-test of the respective pipeline section. During de watering operation, the major quantity of hydro-test water shall be removed from the pipelines and distribution network.

B. It is ACE responsibility to execute the total dewatering process as per GAIL / TEPL approved procedure.

C. ACE shall arrange disposal of water in such a manner that no harm is done to the environment and disposal of water as per approved methodology by GAIL / TEPL.

D. ACE shall neutralize the Hydro test water as per the approved procedure. Necessary arrangements shall be made for safe disposal by making suitable drains.

Operational Requirements:

A. The de-watering operation shall consist of at least two de-watering runs and oil free air used as propellant for pig trains.

B. The minimum speed and back pressure of the pigs shall be maintained in such an order that continuous operation will be performed without the pigs getting stuck by means of throttling the valves at both the ends. However speed of pig shall not exceed apprx. 7-8 KM/hour. Contingency plan in case of pigs gets stuck for implementation shall be prepared.

C. Cup pigs shall be used and will be suitable for traversing the entire length of the pipeline / pipe segments being dewatered. ACE shall ensure that all the pigs are designed to prevent damage to the pipeline's internal coatings.

D. ACE shall provide suitable compressors for oil free air with sufficient capacity and pressure.

E. Upon arrival of the pig at the receiving end, the pigs shall be removed without delay in presence of ACE/TEPL/GAIL.

Contingency Plan

In case the pig gets stuck, a separate pig shall be launched to drive out the stuck up pig. If required a pig locator shall be attached to the pig. Subsequently necessary remedial / corrective action shall be taken.

Flushing of above ground piping:

Flushing of above ground piping at dispatch and receipt stations, SV stations and IP stations shall be done with water to remove debris from within the piping and then with dry air to remove the residual amount of water from the above ground piping.

Acceptance Criteria:

Before proceeding to the swabbing it shall be ensured that bulk of water has been removed from pipeline. ACE shall specify when the dewatering phase and flushing and dry air blowing is finished and shall obtain approval of same from GAIL / TEPL before proceeding to swabbing.

SWABBING:

General:

The swabbing operation, which shall be done subsequent to the dewatering operation, is meant to reduce the remaining water in the pipeline to acceptable condition and to ensure removal of free water left inside the pipeline prior to final drying, Inertisation and commissioning of the pipeline system.

Methodology:

A. This is done by driving number of foam pigs propelled by oil free compressed dry sir, which can pick up free water in the pipeline.

B. Prior to Launching, ACE shall weigh the Pigs. On arrival of the pig at the receiving end they shall be weighed again and finally checked for touch dry.

C. ACE shall ensure that swabbing operation is considered to be completed when the last pig received is found to be touch dry.

D. Air pigging headers shall be used for launching the foam pigs while the receiving header shall be of similar type with extra length to accommodate three pigs. Pigs shall be received in the receiving header having sufficient length to accommodate three pigs at a time.

E. Foam pigs of high, medium and low density shall be used according to the requirements arising at site.

F. Compressors to be used are of 300, 350, 600 and 800 CFM capacity.

G. Weighing arrangements shall be available at stores / launching end and receiving end.

Acceptance Criteria:

Ace shall ensure that swabbing operation is considered to be completed when it is considered that there is no free water left in the pipe line. This can be decide by the dryness of the last pig.

This shall also be subjected to Company Approval.

DRYING

- The pipeline system including underground pipeline and the above ground piping at launching, SV Stations and receiving stations prior to charging of natural gas or Nitrogen gas purging.
- Drying is required to prevent internal corrosion of the pipeline & to meet the supply specification and also means of preservation of the pipeline sections subsequent to the pre commissioning activities.
- The pipeline shall be dried by vacuum drying method.

Vacuum Drying

- For Vacuum drying initially pull vacuum from one end of the pipeline up to 40-50 mm Torr.
- Introduce dry air from one end of the pipeline to maintain desired vacuum level.
- Vacuum is stabilized and desired drying level is achieved.

Acceptance Criteria:

- ACE shall ensure that drying operation is complete before proceeding to the next step of initiation.
- The drying of pipeline system shall be considered to be achieved on attaining a water dew point of -8°C at atmospheric pressure and this water dew point in pipeline shall be continuously maintained till initiation.

Safety Review Prior To Start of Commissioning Activities:

- A pre-startup safety review of the pipeline system including the underground pipeline and the above ground at launching and receiving stations, SV stations shall be carried out by ACE before permitting entry of natural gas into the new pipeline facility.
- GAIL / TEPL representative shall also participate in the pre-start up safety review.

FORMAT-IV:

ACE shall submit "Ready for commissioning certificate" which is in the form of FORMAT-IV to TEPL / GAIL site in-charge after completion of all pre commissioning activities as directed by GAIL / TEPL or as per agreement / Tender Document and approved project procedure.

FORMAT-IV:- Ready for Commissioning Certificate.

ACE shall provide the commissioning assistance as directed by TEPL/GAIL.Commissioning Assistance and Commissioning:

ACE shall provide the following commissioning assistance and commissioning.

PIPELINE CHARACTERISTICS

AA	LENGTH OF PIPE	88 Kms (Langtala to Ramgarh)
BB	MATERIAL AND GRADE	API-5L Gr x42-CS
CC	DIAMETER:	10 INCH
CC	THICKNESS:	a) 6.4 mm for Class-1
		b) 7.1mm for Class-2&3
		c) 7.8mm for Class-4
		d) 12.7 mm For receiving and despatch stations
DD	COATING	*Internal*: Epoxy coating
		External : 3 PE Layers
		Welded Joint : Heat shrinkable sleeves
EE	DESIGN PRESSURE	70 KG/CM2
FF	DESIGN TEMPERATURE	65 DEG C for above ground section
		45 DEG C for underground section

Pipe Line Total Volume including all Stations: 4514.12 M^3

PRE GAS-IN STAGE

PRE GAS-IN STAGE DESPATCH STATION –LANGATALA (KM 0.00)

The following valves shall be operated by M/S GAIL/ TEPL Rep (O&M Group only)

S.NO	VALVE No.	TYPE OF VALVE	LOCATION	PURPOSE	REMARKS
1	GV-0214	4" Globe Valve	Pig Launcher	Gas kicker line(Throttle)	Green / Red (Open / Close)
2	XV-0208	10" Integrated Double Blocked Bleed Actuated Valve	Pig Launcher	Pig Launcher	Green / Red (Open / Close)
3	GV-0223	2" Globe Valve	Blow Downline	Venting (Throttile)	Green / Red (Open / Close)
4	XV-0221	10" IDB Actuated Valve	Gas In	Gas In	Green / Red (Open / Close)
5	GV-0204	4" Globe Valve	By Pass	Balancing	Green / Red (Open / Close)
6	GV-0209	4" Globe Valve	Blow Down	Venting	Green / Red (Open / Close)

Pig Launching & Gas in Procedure

A. The 10" Dia Gas line laid from LANGTALA, DESPATCH STATION having pig launcher Y-0201 passing through SV_1 (32km), SV_2 (57km) & SV_3 (80 km) to receipt station (88 km) at Ramgarh with pig receiver Y-0601.

B. This gas after running through filter skid, meter skid, let down skid flow Control Valve goes to M/s RRVUNL.

C. ACE shall Review and check the valves operating status as per attached list marked up on P & ID referred there in.

D. The whole line having positive pressure of 2 to 3kg/cm2 of hot dry air cut by closing valve XU 0208, BV – 0222, BV-0221, BV,224, BV 0228 GV-0214, GV 0215 (these valve numbers as per P & ID of launching station at Langtala) and spading at battery limit of gas supply refer latest revision of P & ID to load the 4 cup polyurethane conical pig into pig launcher Y-0201.Open the Quick open coupler mounted on the head of launcher Y-0201 and load the 4 cup conical polyurethane -1 pig.

E. Push the first pig up to mouth of pipeline and insert 2nd – 4 cup conical pig in the barrel also and close the door of pig barrel.

F. Equalize the dry air pressure on the both side of pig by crack opening of 4" GV – 0214 and 10" x V 208 valves.

G. Connect the Inert gas bank to the wet gas filtration skid for pushing the pig put in Y-201 and sufficient inert gas column to cross the 10 x 10 barred tee.

H. Now crack open value 4" GV 0214, GV-0204, 10" x V 221 gradually for inert gas in to displace dry air in line.

I. The opening of 4" dia GV – 0214 shall be such that the pressure in the barrel rises slowly to achieve the traveling speed of the conical pig is not to exceed 2 M/ sec.

J. The pig will now get launched, observe the pig signallers XI-0210 and XI-0214 for the movement of 1st pig.

K. Launch the 2nd pig having 500 meter inert gas column a head of 2nd pig i.e. between 1st pig and 2 pig. Shut off the 10" XV 0208 and pig launcher barrel vent value 2" BV 0228, 0224, BV, 0225 & G" BV – 0210 & 0211.

L. Now natural gas shall be put in with pipeline pressure in the range 2kg/cm2, to 3 kg/cm2.Note down the reading of gas flow and pressure at metering skid as well as PT 0206 and control room display.

M. Leak test to be carried out at 5kg/cm2, 10kg/cm2 up to operating pressure by using Soap Solution. Hang up the sign on the valves as follows in English on one side local language on other side of the tag.

PRE GAS-IN STAGE SECTION VALE-SV-1 (L)- 32KM

The following valves shall be operated by M/S GAIL/ TEPL Rep (O&M Group only)

S.No	Valve No	Type of Valve	Location	Purpose	Remarks
1	XV-0301	10" Actuated Valve	Mainline	Flow Through SV1	Green + Red (Open/Close)
2	BV-0301	2" Ball Valve	Gas Tap Off	Pressure Check PI 0301	Green + Red (Open/Close)
3	BV-0304	2"Ball Valve	Gas Tap Off	Pressure Chck PI 0304	Green + Red (Open/Close)
4	GV-0304	4" Globe Valve	By Pass	Venting (Throttile)	Green + Red (Open/Close)
5	GV-0307	4" Globe Valve	Vent Line	Venting (Throttile)	Green + Red (Open/Close)

SECTION VALVE – SV 1 (L) STATION AT 32 KM

A. On receipt of communication of putting inert Gas in (N2), check % of Nitrogen / Gas mixture at station. Note the changes from Nitrogen to Gas as N2 Column passes through station.

B. Upon purging of all piping at this station as per P & I D, shut off all the vent line valves i.e. GV -0304 & 4" GV 0307.

C. Ensure all tool & tackles as per list are at place.

D. Check Leak test by soap solution for any leak, if any observed attend the same.

E. Check & confirm the pre gas in valve position as per list and P &I D. The 10"-XV 0301 – IDB valve shall be kept open.

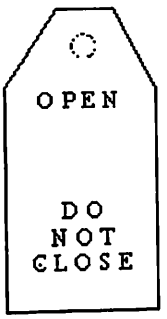
F. Note down the pressure reading at every 30 minutes from PI 0301 & PI 0302.

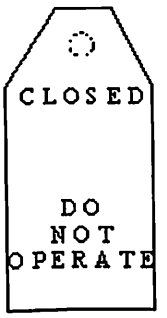
G. Confirm passing 1st Pig by monitoring the pressure difference in upstream and downstream of valve.

H. Upon confirmation of aforesaid, crack open 4" GV 0304 & 307 and BV 0306 for 2-3 minutes to vent out N2 Column in the loop of station and allow natural gas to fill the entire loop.

I. Monitor level of Gas from Vent from time to time by Gas Monitor. Once the line is filled in shut off the 4" BV 0306 & GV 0307.

J. Leak test to be carried out at different pressure i.e. 5 Kg/Cm2 up to operating pressure or maximum pressure available at that time. Hang up the sign on the valve as follows: in English on one side & local language on other side of the tag.





PRE GAS-IN STAGE SECTION VALVE-SV-2 (R)- 57 KM

The following valves shall be operated by M/S GAIL/ TEPL Rep (O&M Group only)

S.NO	Valve No.	Type Of Valve	Location	Purpose	Remarks
1	**XV-0401**	10" Actuated Valve	Main Line	Flow Through SV1	Green / Red (Open/Close)
2	**GV-0404**	4"Ball Valve	By Pass	Venting	Green / Red (Open/Close)
3	**GV-0404**	4"Ball Valve	Vent Line	Venting	Green / Red (Open/Close)
4	**BV-0401**	2" Ball Valve	Gas Tap Off	To Read DPSH 0401	Green / Red (Open/Close)
5	**BV-0406**	2" Ball Valve	Gas Tap Off	To Read DPSH 0401	Green / Red (Open/Close)

SECTION VALVE – SV 2 (R) STATION AT 57 KM.

a. On receipt of communication of putting inert Gas in (N2), check % of Nitrogen / Gas mixture at station.

b. Note the changes from Nitrogen to Gas as N2 Column passes through station.

c. Upon purging of all piping at this station as per P & I D, shut off all the vent line valves i.e. GV -0404 & 4" GV 0409.

d. Ensure all tool & tackles as per list are at place. Check Leak test by soap solution for any leak, if any observed attend the same.

e. Check & confirm the pre gas in value position as per list and P &I D. The 10"-XV 0401 – IDB valve shall be kept open.

f. Note down the pressure reading at every 30 minutes from PI 0402 & PI 0407.Confirm passing 1st Pig by monitoring the pressure difference in upstream and downstream of valve.

g. Upon confirmation of aforesaid, crack open 4" GV 0404 & 409 and BV 0408 for 2-3 minutes to vent out N2 Column in the loop of station and allow natural gas to fill the entire loop. Monitor level of Gas from Vent from time to time by Gas Monitor.

h. Once the line is filled in shut off the 4" BV 0404 & GV 0409.Leak test to be carried out at different pressure i.e. 5 Kg Cm2 up to operating pressure or maximum pressure available at that time.

i. Hang up the sign on the valve as follows: in English on one side & local language on other side of the tag.

PRE GAS-IN STAGE SECTION VALVE-SV-3 (L)- 80KM

S.NO	VALVE No.	TYPE OF VALVE	LOCATION	PURPOSE	REMARKS
1	XV-0501	10" Actuated Valve	Main Line	Flow Through SV3	Green / Red (Open/Close)
2	BV-0501	2" Ball Valve	Gas Tap Off	Pressure Check(PI 0501)	Green / Red (Open/Close)
3	GV-0504	4" Globe Valve	By Pass Vent	Venting	Green / Red (Open/Close)
4	BV-0508	2" Ball Valve	Gas Tap Off	Pressure Check(PI 0504)	Green / Red (Open/Close)
5	BV-0506	2" Ball Valve	Vent Line	Venting (Throttle)	Green / Red (Open/Close)
6	GV-0507	2" Globe Valve	Vent Line	Venting (Throttle)	Green / Red (Open/Close)

The following valves shall be operated by M/S GAIL/ TEPL Rep (O&M Group only)

SECTION VALVE – SV 3 (L) STATION AT 80 KM.

a. On receipt of communication of putting inert Gas in (N2), check % of Nitrogen / Gas mixture at station.

b. Note the changes from Nitrogen to Gas as N2 Column passes through station. Upon purging of all piping at this station as per P & I D, shut off all the vent line valves i.e. GV -0504 & 4" GV 0507.

c. Ensure all tool & tackles as per list are at place.

d. Check Leak test by soap solution for any leak, if any observed attend the same. Check & confirm the pre gas in value position as per list and P &I D.

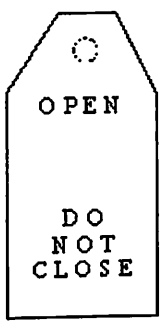
e.. The 10"- XV 0501 – IDB valve shall be kept open. Note down the pressure reading at every 30 minutes from PI 0501 & PI 0504.

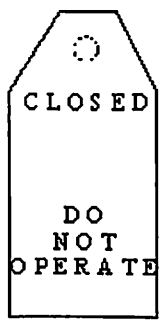
f. Confirm passing 1st Pig by monitoring the pressure difference in upstream and downstream of valve.

g. Upon confirmation of aforesaid, crack open 4" GV 0504 & 507 and BV 0506 for 2-3 minutes to vent out N2 Column in the loop of station and allow natural gas to fill the entire loop. Monitor level of Gas from Vent from time to time by Gas Monitor

h. Once the line is filled in shut off the 4" BV 0504 & GV 0507.Leak test to be carried out at different pressure i.e. 5 Kg Cm2 up to operating pressure or maximum pressure available at that time.

i. Hang up the sign on the valve as follows: in English on one side & local language on other side of the tag.





PRE GAS-IN STAGE RECEVING STATION (RAMGARH) - 88 KM

The following valves shall be operated by M/S GAIL/ TEPL Rep (O&M Group only)

S.NO	VALVE No.	TYPE OF VALVE	LOCATION	PURPOSE	REMARKS
1	**XV-0609**	10" Integrated Double Block & Bleed Actuated Valve	Mainline	Pig Receiving	Green / Red (Open/Close)
2	**GV-0629**	2" Globe Valve	Line Vent	Venting	Green / Red (Open/Close)
3	**BV-0636**	2" Globe Valve	Barrel Vent	Venting	Green / Red (Open/Close)
4	**XV-0601**	10" Integrated Double Block & Bleed Actuated Valve	Mainline	Supply Gas To RRVUNL	Green / Red (Open/Close)
5	**GV-0610**	4" Globe Vale	By Pass	Venting	Green / Red (Open/Close)
6	**GV-0615**	4" Globe Vale	Vent Line	Venting	Green / Red (Open/Close)
7	**BV-0607**	2" Ball Valve	Gas Tap Off	For Actuated DDPSH-0601	Green / Red (Open/Close)
8	**BV-0612**	2" Ball Valve	Gas Tap Off	For Actuated DDPSH-0601	Green / Red (Open/Close)

Pig Receipt at Ramgarh Receiving Station – 88 Km

a. On receipt of communication of passing Pig no. 1 as well as column of Inert gas (N2) from SV3 Station, check % of gas mixture.

b. Ensure tool & tackles are in place. Review and check the valves operating status as per attached list marked up on P & ID referred there in.

c. Have leak test on the valve. Start venting of gas through GV 0636 vent depending upon control require maintaining the back pressure and holding for arrival of 1st Pig through pig indicator X1-0608.

d. Open valve 10" XV 0609 IDB and wait for pig no. 1 passing through pig indicator X1-0611 and arrived in Pig receiver Y-0601.

e. On receipt of Pig at Pig receiver Y – 0601, close the 10"XV 0609 IDB, 2"GB – 0636 and 0629.

f. Reset the pig indicator XI 0608 & 0611 to original position. Start venting of inert gas 4" GV 0610 & 0615 from the line & skids connected to supply the gas to RRVUNL.

g. On receipt of 2 nd Pig in Pig Receiver Y 0601, close 10" XV 0609 IDB and inform Dispatch Station at Langtala to stop Gas in Operation.

h. The Pig Barrel Y – 0601 shall de pressurized by releasing the inert gas and gas mixture to ATMOSPHERE through vent line valve 2" GV 0636,& BV 0634 keeping a check on PI 0612 & 0613.

i. Ensure the big barrel is without any pressure. Open the quick open coupler of Pig barrel and receive pig one by one on Pig trolley.

j. Close the Quick open coupler of Pig barrel. Finally have a check on Metering connected to RRVUNL for flow & pressure Data.

k. Hang up the sign on the valves as follows in English on one side & local Language on other side.

WORK FORCE AT VARIOUS STATIONS by ACE.

Sr. No	Discipline	Despatch Station	SV 1	SV2	SV3	Receiving Station
1	**Supervisor**	**1**	**1**	**1**	**1**	**1**
2	**Foreman**	**1**	**1**	**1**	**1**	**1**
3	**Fitter / Gas cutter**	**1**	**1**	**1**	**1**	**1**
4	**Safety Engineer**	**1**	**1**	**1**	**1**	**1**
5	**Riggers**	**10**	**6**	**6**	**6**	**10**

EQUIPMENT, TOOL & TACKLE AND MACHINERY LIST

Sr.No	Description					
		Langtala	SV1	SV2	SV3	Ramgarh
P&M PROVISION						
1	Diesel Generator Set	1	-	-		1
2	Welding Machine with cable	1	-	-	-	1
3	Vehicle	1	1	1	1	1
4	Diesel (Liters)	200	100	100	100	200
TOOLS & TACKLES						
5	Screw drivers	1 Set	1 Set	1 Set	1 Set	1 Set
6	Cutting Pliers	1	1	1	1	1
8	Ring spanner Set(No12-No40)	2	1	1	1	2
9	D/Open-Spanner (No12-No 40)	2	1	1	1	2
10	Brass hammer (2 lb & 10 lb)each	1+1	1+1	1+1	1+1	1+1
11	Gas cutting Set	1	-	-	-	-
12	M Seal	2	2	2	2	2
13	Grease(1Kg)	1	1	1	1	1
14	Cotton waste(2 kg)	1	1	1	1	1
15	Powder, Soap solution with atomizer	2	2	2	2	2
16	Buckets for making soap solution	2	2	2	2	2
INSTRUMENT						
17	Pressure Gauge (0-6Bar)	1	-	-	-	1
18	Pressure Gauge- Digital(0-100bar)	1	-	-	-	1

PRELIMINARY LIST OF REQUIRED SPARE PARTS

SL. NO.	ITEM DESCRIPTION	SIZE	STATION				
			Langtala	SV1	SV2	SV3	Ramgarh
1	Gasket	2" # 600	10	4	4	4	10
		4" #600	10	4	4	4	10
		10" # 600	4	2	2	2	4
2	Studs & Bolts						
	11/4"X9.5"	10"	10	-	-	-	10
	11/4"X10.75"	10"W SPB	10	-	-	-	10
	7/8"X6.5"	4"	10	-	-	-	10
	5/8"X4.75"	2"	8	4	4	4	8
	5/8"x5"	2"W SPB	8	-	-	-	8

COMMISSIONING WORK- SAFETY ITEMS

SL.NO	ITEM DESCRIPTION	STATION				
		Langtala	SV1	SV2	SV3	Ramgarh
1	Nose Mask	10	10	10	10	10
2	Eye Goggles	10	10	10	10	10
3	Safety Helmets	10	10	10	10	10
4	Cotton Hand Gloves (Set)	10	10	10	10	10
5	Asbestos Hand Gloves	10	10	10	10	10
6	Ear Plug (Set)	10	10	10	10	10
7	Torch Flame Proof (No)	2	2	2	2	2
8	Fire Extinguishers (CO2)	2	2	2	2	2
9	Fire Extinguishers (CO2)	2	2	2	2	2

DOCUMENTATION:

- ACE shall responsible for recording data at every step covering all aspects of HSE, Quality Assurance and Quality Control Plans.
- All necessary recorded data needs to be filled in approved format.ACE shall ensure that these reports are related to as built condition of the pipeline.
- All filled inspection reports shall be duly signed by commissioning engineers of ACE and GAIL / TECPL.

HEALTH, SAFETY & ENVIRONMENT

- HSE Plan shall be applied to all activities during pre-commissioning. Every effort shall be made to identify and assess health, safety and environment hazards and to reduce the risks as low as it is reasonably practical.
- In this respect a system of hazard management controls will be implemented during the commissioning phase.
- The possible hazards that may occur and the effects arising from the above activity are identified.
- Should circumstances, conditions or situations arise during pre-commissioning which are not specifically covered in this plan or other procedures, it is up to the commissioning team to resolve them on location with its expertise and experience and with due regard to the safety of personnel and equipment.
- Hazard management means any activities to reduce the risks, considering identified hazards in each category of activities.

ACE PIPELINE

INSPECTION TEST PLAN		Job Id:	A09-0020-GAIL FOCUS
PRE-COMMISSIONING & COMMISSIONING			
Project : Focus Energy Pipeline Project		Doc Id:	A09-0020-91206-PLN -20/ ITP-01

Sr. No	Activity Description	Controlling Specification	Acceptance Criteria	Verifying Document	Frequency of Inspection /Testing	Inspection category	
						ACE	TEPL/ GAIL
1	Submission and Approval Procedure	Tech Spec 70000/740/GTS/504	Tech Spec 70000/740/GTS/504	Procedure A09-0020-91206-PLN – WI-20	At the Beginning	P	AP
2	P&ID Check / system check	Drawings	Drawings	A09-0020-91206-PLN -20/F-01	100%	P	W
3	Tightness of Piping	Procedure A09-0020-91206-PLN –WI-20	Procedure A09-0020-91206-PLN – WI-20	A09-0020-91206-PLN -20/F-01	100%	P	W
4	Operability test of equipment	Procedure A09-0020-91206-PLN –WI-20	Procedure A09-0020-91206-PLN – WI-20	A09-0020-91206-PLN -20/F-01	100%	P	W
5	Checking of field instruments	Procedure A09-0020-91206-PLN –WI-20	Procedure A09-0020-91206-PLN – WI-20	A09-0020-91206-PLN -20/F-01	100%	P	W

ACE PIPELINE	INSPECTION TEST PLAN		Job Id:	A09-0020-GAIL FOCUS
	PRE-COMMISSIONING & COMMISSIONING			
	Project : Focus Energy Pipeline Project		Doc Id:	A09-0020-91206-PLN -20/ ITP-01

Sr. No	Activity Description	Controlling Specification	Acceptance Criteria	Verifying Document	Frequency of Inspection /Testing	Inspection category	
						ACE	TEPL/ GAIL
6	Testing of safety valve	Procedure A09-0020-91206-PLN –WI-20	Procedure A09-0020-91206-PLN –WI-20	A09-0020-91206-PLN - 19/F-01	100%	P	W
7	Checking of instruments,control & interlocks	Procedure A09-0020-91206-PLN –WI-20	Procedure A09-0020-91206-PLN – WI-20	A09-0020-91206-PLN - 19/F-01	100%	P	W
8	Checking of utilities	Procedure A09-0020-91206-PLN –WI-20	Procedure A09-0020-91206-PLN –WI-20	A09-0020-91206-PLN - 19/F-01	100%	P	W
9	Dewatering	Procedure A09-0020-91206-PLN –WI-20	Procedure A09-0020-91206-PLN –WI-20	A09-0020-91206-PLN - 19/F-01	100%	P	W
10	Swabbing Acceptance	Procedure A09-0020-91206-PLN –WI-20	ProcedureA09-0020-91206-PLN – WI-20	A09-0020-91206-PLN - 19/F-01	100%	P	W

ACE PIPELINE	INSPECTION TEST PLAN		Job Id:	A09-0020-GAIL FOCUS
	PRE-COMMISSIONING & COMMISSIONING			
	Project : Focus Energy Pipeline Project		Doc Id:	A09-0020-91206-PLN -20/ ITP-01

Sr. No	Activity Description	Controlling Specification	Acceptance Criteria	Verifying Document	Frequency of Inspection /Testing	Inspection category	
						ACE	TEPL/ GAIL
11	Drying	Procedure A09-0020-91206-PLN –WI-20	Procedure A09-0020-91206-PLN – WI-20	Procedure A09-0020-91206-PLN –WI-20	100%	P	W
12	Nitrogen filling	Procedure A09-0020-91206-PLN –WI-20	Procedure A09-0020-91206-PLN – WI-20	Procedure A09-0020-91206-PLN – WI-20	100%	P	W

Legend: P: Perform, H: HOLD Point, W: Witness S: Surveillance, R: Review of Reports, AP : Approval, RM : Random

For ACE	For TECPL	For GAIL
Name:	Name:	Name:
Sign:	Sign:	Sign:
Date:	Date:	Date:

	INTIMATION REGARDING SYSTEM COMPLETION	Job Id:	A09-0020-GAIL FOCUS
	Project : Focus Energy Pipeline Project	Doc Id:	FORMAT –I

FORMAT – I

Following system /sub-system has been mechanically completed in all respects with exceptions noted below. The system /sub-system can be taken up for checking and preparation of checklist.

SYSTEM DESCRIPTION:

EXCEPTIONS:

SIGNATURE

DATE

EXECUTING AGENCY (ACE) :

The system is ready / not ready for check listing :

SIGNATURE

DATE

TECPL SPREAD/STATION-IN-CHARGE :

Distribution :

1. GAIL
2. TEPL

ACE PIPELINE	CHECK LIST	Job Id:	A09-0020-GAIL FOCUS
	Project : Focus Energy Pipeline Project	Doc Id:	FORMAT –II

FORMAT – II

SYSTEM/SUB-SYSTEM

CHECKLIST TYPE		**PRELIMINARY/FINAL**

SL.NO.			**REMARKS**

ACE to attend above points and raise format-III

SIGNATURE

DATE

TEPL :

ACE PIPELINE	READY FOR PRECOMMISSIONING CERTIFICATE	Job Id:	A09-0020-GAIL FOCUS
	Project : Focus Energy Pipeline Project	Doc Id:	FORMAT –III

FORMAT – III

SYSTEM/SUB-SYSTEM_____

This is to certify that the following plant/system/sub-system as detailed below is completely installed and all the checklist points are carried out except for minor details as given below. These points can be attended during pre-commissioning stage.

SIGNATURE

DATE

EXECUTING AGENCY (ACE) :

The system is ready/not ready for Pre-commissioning with/without above check list.

SIGNATURE

DATE

TEPL SPREAD / STATION-IN-CHARGE :

The system is taken for Pre-commissioning with/without check list :

SIGNATURE

DATE

GAIL'S COMMISSIONING CO-ORDINATOR :

ACE PIPELINE	READY FOR COMMISSIONING CERTIFICATE	Job Id:	A09-0020-GAIL FOCUS
	Project : Focus Energy Pipeline Project	Doc Id:	FORMAT –IV

FORMAT – IV

SYSTEM/SUB-SYSTEM_____

This is to certify that all the necessary pre-commissioning activities for the system /sub -system as detailed below have been completed and the system /sub-system is ready for commissioning except for the minor details as given below which will not effect the commissioning trial runs.

DESCRIPTION OF SYSTEM /SUB - SYSTEM_____

SIGNATURE

DATE

TEPL SPREAD/STATION-IN-CHARGE :

EXCUTING AGENCY (GAIL Commissioning) :

GAIL'S COMMISSIONING CO-ORDINATOR :