BHARAT PETROLEUM CORPORATION LIMITED
KOCHI REFINERY
Post bag No.2, Ambalamugal-682 302, Kerala

Expression of Interest (EOI)

Integrity study of BPCL-KR Cross Country Pipelines

J13/11005 06th April 2011

Bharat Petroleum Corporation limited – Kochi Refinery (BPCL-KR), engaged in Petroleum Refining with an installed capacity of 9.5 MMTPA at Ambalamugal, Kochi, invites Expression of Interest (EOI) from competent and experienced contractors for carrying out the direct assessment on pipelines owned by BPCL-KR. The Contractor shall carry out External Corrosion Direct Assessment (ECDA), Stress Corrosion Cracking Direct Assessment (SCCDA) and Internal Corrosion Direct Assessment (LP-ICDA) of BPCL-KR Cross Country Pipelines from Kochi Refinery to Cochin Oil Terminal, Ernakulam, Kerala, India. The last date of submission of the EOI shall be on or before 1400 Hrs on 30.05.2011. Pre-qualification criteria and scope of work have been furnished.

Contact Persons: for commercial clarifications Mohammed Mishal P M, Engineer (P&CS), Tel: 0484-2821629 Fax: 0484-2720803 email-mohammedmishalp@bharatpetroleum.in, for Technical Clarifications Mahesh S, Senior Engineer (Inspection), Tel: 0484-2821343 Fax: 0484-2720735 email-maheshs@bharatpetroleum.in

Interested parties are requested to submit the EOI along with documents substantiating the relevant pre-qualifications and experience specified, in a sealed envelope super scribing “Expression of Interest for Integrity Study of BPCL-KR Cross Country Pipelines, Col No: J13/11005”. The sealed envelope shall be deposited in the tender box kept inside the tender hall at BPCL-KR office at Ambalamugal, or if sent by post / courier, it shall reach the office of the undersigned on or before 14:00 hrs on 30.05.2011. BPCL-KR shall not be responsible for any postal delays.

Deputy General Manager
Procurement & Contract Services
Pre-Qualification Criteria

Integrity study of BPCL-KR Cross Country Pipelines

Bharat Petroleum Corporation limited – Kochi Refinery would like to hire a contractor who is having sufficient experience to conduct direct assessment on the pipelines owned by BPCL-KR.

The Contractor shall carry out External Corrosion Direct Assessment (ECDA), Stress Corrosion Cracking Direct Assessment (SCCDA) and Internal Corrosion Direct Assessment (LP-ICDA) of following pipelines

1. 30 inch Crude line from Kochi Refinery to Jetty
2. 12 inch white oil no:1 from Kochi Refinery to Jetty
3. 12 inch black oil no:1 from Kochi Refinery to Jetty
4. 12 inch black oil no:2 from Kochi Refinery to Jetty
5. 12 inch MS/Naphtha line from Kochi Refinery to Irumpnam
6. 12 inch HSD/SKO line from Kochi Refinery to Irumpnam
7. 24 inch MS/Naphtha line from Irumpnam to Jetty
8. 24 inch HSD/SKO line from Irumpnam to Jetty

Detailed scope of work is attached as a separate document.

Pre-qualification criteria for the job is as mentioned below,

1. The Bidder shall have a minimum five (5) years experience in corrosion management and/or direct assessment of hydrocarbon liquid/gas pipelines. The Bidder shall submit necessary documentary evidence of previous experience, indicating client name with contact details, total number of pipelines, total length of pipelines, service of the pipeline, size of pipelines and the like.
2. The Bidder shall have carried out direct assessment of at least five (5) pipelines of total length 100 km as a minimum (for each pipeline viz ECDA, ICDA, SCCDA) and shall submit the necessary documentary evidence of the same.
3. The Bidder shall submit all technical details of proprietary software, used for ICDA modeling.
4. The Bidder shall submit one copy of the DA Final reports (ECDA/SCCDA/ICDA) of a fictitious pipeline including Pre-Assessment, Indirect Inspection, Direct Examination and Post Assessment report for Company’s review.
5. The Bidder shall submit details of previous experience in manual GPS mapping survey. Bidder shall also submit the details and accuracy specification of GPS mapping equipment.
6. Companies/organization who possess and demonstrate a high degree of technical competence, support and infrastructure, proven previous experience, and are recognized in the field of corrosion management/ Direct Assessment of hydrocarbon liquid pipelines will only be considered for the job.
**SCOPE OF SERVICES**

The Contractor shall carry out External Corrosion Direct Assessment (ECDA), Stress Corrosion Cracking Direct Assessment (SCCDA) and Internal Corrosion Direct Assessment (ICDA) of following pipelines

1. 30 inch Crude line from Kochi Refinery to Jetty
2. 12 inch white oil no:1 from Kochi Refinery to Jetty
3. 12 inch black oil no:1 from Kochi Refinery to Jetty
4. 12 inch black oil no:2 from Kochi Refinery to Jetty
5. 12 inch MS/Naphtha line from Kochi Refinery to Irumpanam
6. 12 inch HSD/SKO line from Kochi Refinery to Irumpanam
7. 24 inch MS/Naphtha line from Irumpanam to Jetty
8. 24 inch HSD/SKO line from Irumpanam to Jetty

The Contractor shall carry out External Corrosion Direct Assessment (ECDA), Stress Corrosion Cracking Direct Assessment (SCCDA) and Internal Corrosion Direct Assessment (ICDA) shall be carried out as per NACE International Standard Practice for External Corrosion Direct Assessment (SP-0502-2008), for assessing Stress Corrosion Cracking Direct Assessment via NACE International Standard Practice SP-0204-2008 and Internal Corrosion Direct Assessment (ICDA) using NACE International Standard Practice SP0208-2008.

A broad scope of services is defined as follows, based on NACE SP0208-2008, SP0204-2008, and SP0502-2008.

a) Pre-Assessment (PA)

b) Indirect Inspection (Idi) - Simulate the pipeline with a proven internal corrosion prediction model.

c) Direct Examination (DEx)

d) Post Assessment (PoA)

The Contractor shall carry out pipeline route survey for each pipeline mentioned above utilizing manual GPS mapping technique with system sub-centimeter accuracy. The GPS point readings are to be taken continuously, as a minimum on straight section for every 50 – 100 m, at every bend, manifold, branching, isolation valves, Cathodic protection test posts, bonding stations, road crossings and the like.

Contractor shall prepare pipeline elevation/depth profile for each pipeline for entire length including city limits, including pipeline depth of cover, by using sufficiently accurate and
precision instrument. GIS/GPS system shall be of sub-centimeter accuracy. Approval from the Company shall be obtained prior to use of this kind of instrument. Civil work and the like to prepare elevation profile of each pipeline shall be in Contractor’s scope of work. Documents of pipeline elevation (depth profile shall be submitted to BPCL in hard copy and soft copy.

Contractor shall mobilize suitable qualified and skilled personnel, necessary equipments and instruments to complete the work covered under this Contract.

BPCL GCC (General Conditions of Contract) applicable.

**GENERAL INFORMATION OF PIPELINES:**

The following general information and important features of the pipelines are given for guidance purpose only and shall not be considered as definitive. The Contractor shall verify the details by scrutinizing the records available with the Company and various departments within its organization:

**Construction details:**

<table>
<thead>
<tr>
<th>SL No :</th>
<th>Line Size inch</th>
<th>Product Material Spec</th>
<th>Op. Pr. (psi)</th>
<th>Design Pr. (psi)</th>
<th>Design Temp (°F)</th>
<th>Hydro test Pr (psi)</th>
<th>Nominal thickness (mm)</th>
<th>Commissioning year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>Crude</td>
<td>A155 Gr. C55</td>
<td>115</td>
<td>120</td>
<td>150</td>
<td>150</td>
<td>6.35</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>White oil (MS/LAN)</td>
<td>A53 Gr. A &amp; B</td>
<td>140</td>
<td>168</td>
<td>150</td>
<td>210</td>
<td>6.35</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>Black oil No:1 (Furnace oil)</td>
<td>A53 Gr. A &amp; B</td>
<td>140</td>
<td>168</td>
<td>150</td>
<td>210</td>
<td>6.35</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>Black oil No:2 (Furnace oil)</td>
<td>A53 Gr. A &amp; B</td>
<td>140</td>
<td>168</td>
<td>150</td>
<td>210</td>
<td>6.35</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>MS/LAN</td>
<td>API 5L Gr.A</td>
<td>5 kg/cm²</td>
<td>7 kg/cm²</td>
<td>150</td>
<td>10.5 kg/cm²</td>
<td>9.52</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>HSD/SKO</td>
<td>API 5L Gr.A</td>
<td>5 kg/cm²</td>
<td>7 kg/cm²</td>
<td>150</td>
<td>10.5 kg/cm²</td>
<td>9.52</td>
</tr>
<tr>
<td>7</td>
<td>24</td>
<td>MS/LAN</td>
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<td>150</td>
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<td>9.52</td>
</tr>
<tr>
<td>8</td>
<td>24</td>
<td>HSD/SKO</td>
<td>API 5L Gr.B</td>
<td>5 kg/cm²</td>
<td>7 kg/cm²</td>
<td>150</td>
<td>10.5 kg/cm²</td>
<td>9.52</td>
</tr>
</tbody>
</table>

*MS – Motor Spirit (Petrol), HSD – Diesel, LAN – Naphtha, SKO – Kerosene*
Pipelines (Serial No:1 to 4)

Linear length of each pipeline (serial no: 1 to 4) is approximately 12 KM. Pipe body has been coated with bituminastic enamel coal tar with glass reinforced felt (factory applied) and the weld joints with protecto wrap (field applied). Since the commissioning any of the future repairs have been coated with coal tar coating. The pipes are considered to have a seamless weld. Since commissioning up to 2004 sacrificial anode cathodic protection system was in place, thereafter is has been impressed current cathodic protection system. Depth of cover for all the four pipelines ranges from 0.3 to 2.0 m. Pipeline is starting from Kochi Refinery wagon loading battery limit and is passing through Kochi Refinery Right of Way (ROW)/railway property up to Salim Raja Road. Crossings at all river/canal is above ground. Pipeline is crossing railway track at four locations. Two Railway crossing is below the Major railway track. The other two railway crossings are one at Irumpnam Rail sliding and other at FACT rail sliding. Pipeline is passing through city limits parallel to road (approx. 2.5 KM is under road) up to Jetty . Excavation at city limit is not possible. Contractor has to model the data at city location for all direct DA studies. Work at city limits (indirect inspection) can be carried out only at night hours. Three road crossings are there for the pipeline. If excavation is essentially required at city limits, job has to be carried out after getting approval from civic authorities.

Pipelines (Serial No:5 & 6)

Linear length of each pipeline (serial no: 5 & 6) is approximately 3 KM. Pipe body has been coated with polyethylene. Since the commissioning some of the future repairs have been coated with coal tar coating. The pipes are considered to have a seamless weld. Since commissioning up to 2007 sacrificial anode cathodic protection system was in place, thereafter is has been impressed current cathodic protection system. Depth of cover for all the four pipelines ranges from 0.3 to 2.0 m. Pipeline is starting from Kochi Refinery wagon loading battery limit and is passing through Kochi Refinery Right of Way (ROW)/railway property up to Irumpanam. Crossings at all river/canal are above ground. Pipeline is crossing railway track at FACT rail sliding. Pipeline is underground inside Irumpanam Installation.

Pipelines (Serial No:7 & 8)

Linear length of each pipeline (serial no: 7 & 8) is approximately 9 KM. Pipe body has been coated with polyethylene. Since the commissioning some of the future repairs have been coated with coal tar coating. The pipes are considered to have a seamless weld. Since commissioning up to 2007 sacrificial anode cathodic protection system was in place, thereafter is has been impressed current cathodic protection system. Depth of cover for all the four pipelines ranges from 0.3 to 2.0 m. Pipeline is starting from BPCL Irumpnam installation and is passing through Kochi Refinery Right of Way (ROW)/railway property up to Salim Raja Road. Crossings at all river/canal are above ground. Pipeline is crossing railway track at three locations. Two Railway crossing is below the Major railway track. The other railway crossings is at Irumpanam Rail sliding. Pipeline is passing through city limits parallel to road (approx. 2.5 KM is under road) up to Jetty. Excavation at city limit is not possible. Contractor has to model the data at this location for all direct DA studies. Work at city limits (indirect inspection) can be carried out only at night hours. Three road crossings are there for the pipeline. Pipeline is underground inside Irumpanam Installation.
DIRECT ASSESSMENT (DA) PROGRAM

The Contractor shall carry out all the four steps of the DA program as per NACE International Standards Practice. The following shall be carried out as a minimum.

1. **Pre-Assessment (PrA)**

   The contractor shall carry out the Pre-Assessment step (PrA) on a per pipeline basis for the three combined direct assessment (ECDA, SCCDA and ICDA). Following the completion of the PrA, an interim report is to be developed and submitted to BPCL which summarizes and presents the initial collection and analysis of available operation, historical and other relevant data focusing on the external corrosion, internal corrosion and SCC susceptible pipelines within the system. The pre-assessment report should determine the feasibility of the process, define preliminary DA regions within a pipeline and select indirect inspection tools to be used in the implementation of the second step of DA (i.e. indirect surveys - IDi).

   Contractor shall obtain as a minimum data as per relevant NACE standards, from respective Operations Team within the organization of the Company.

2. **Indirect Inspection (IDI)**

   Indirect inspection (IDI) techniques will be determined based on the pre assessment report. The selection of IDI techniques (for example, Close Interval on/off, DCVG, PCM, Soil/Terrain survey, Soil Resistivity survey etc) for the corresponding DA regions from the pre-assessment report shall be submitted to BPCL for approval. For ECDA/SCCDA three techniques shall be utilized as a minimum. Contractor shall select the technique based on pre-assessment and the probability of detection (POD) of the technique to find defects.

   In the case of ICDA, the indirect inspection step consists of multiphase flow modelling identifying those factors which influence internal corrosion such as non-steady flow temperature gradients or even historical pigging operations, which influence solids deposition, liquid hold-up and other related parameters. The corrosion, solids and/or liquid hold-up prediction models which may be used are restricted to only those cited in the non-mandatory Appendices A, C and D and for the specific variable under investigation. Pipeline sub-region corrosion rate calculations shall be conducted at a maximum interval length of 50 m.

   In the case of SCCDA, the indirect step may consist of the SCC predictive models as cited in the non-mandatory Appendix A of the NACE International Standard. Through these predictive models a correlation can be made with soil/terrain conditions and the coating type.

   Before commencement of the Indirect Survey/Inspection on the selected Pipeline, the Contractor shall carry out pre survey to ensure that there is minimum CP current afforded to the Pipeline under Survey which shall be reported to the company prior to carrying out any Indirect Survey/Inspection thru a pre survey report ;in case if it is found the voltage swing is insufficient to carry out the DCVG survey, the Contractor shall be responsible to provide temporary CP System consisting of Shallow Groundbed and portable power source.
A pipeline locator shall be used to locate the exact Pipeline route which shall be marked with temporary markers at every one hundred meter (100 m) intervals; less where there are Pipeline bends and/or in congested areas.

The pipeline locator shall be used to measure the exact depth of the pipeline at every 100 m intervals and near every pipeline markers, test post, defect locations, road crossings etc which shall be plotted in graph form in the report as depth chart and tabulated form in the survey finding table.

Pipeline elevation profile shall be incorporated in the Idi report.

The Contractor shall use GIS/GPS co-ordinates to identify all ‘DE Locations’.

The Contractor shall provide GPS Co-ordinates for all survey findings, pipeline crossings, road crossings etc. along the pipeline ROW.

The contractor shall use sufficient numbers of GPS Synchronized interrupters with Switching Cycle Period (ON/OFF)’ which shall be agreed between the Company and the Contractor.

In case the IDi instrument does not consist of inbuilt GPS system the contractor shall provide a separate GPS system which shall have an Accuracy of 1 meter or better.

The Contractor shall use GIS/GPS co-ordinates to identify all ‘Defects’ Locations’ which shall have an accuracy of 1 meter or better. The Contractor shall also provide ground pegs at every defect locations.

The Contractor shall provide GPS Co-ordinates for all survey findings, pipeline crossings, road crossings etc. along the pipeline ROW.

All tools/equipment/instrument used to carry out the Services shall be calibrated. A ‘Calibration Certificate’ shall be submitted for each tool/equipment/instrument prior to carrying out the Services. All electronic measurement instrumentation shall have formal ‘Laboratory/Test House Calibration Certificates’, traceable to International/National (India) Standards, and shall be valid for a three (3) month minimum period or for the anticipated period of the Survey, whichever is longer. The Calibration Certificates, with period indicated, shall be attached to the Certificate of Compliance.

Contractor shall water the soil for better contact between soil and the tip of the reference electrodes prior any CIPS & DCVG survey measurements.

Contractor shall be responsible for removing the contaminated soil over the pipeline ROW prior to any measurements; the removal of such contaminated soil shall be limited to 1 foot every 1 meter.

IDi inspection tools for road crossing and inside city limits to be selected based on POD of defects under the bitumen flooring.

The IDi results shall also be provided in an electronic format for each of the techniques that can easily be loaded to the any computer. Software for seeing the document shall be provided by contractor.
A severity criteria shall be developed based on the additional data collected from the IDi surveys for each of the given threats that is external corrosion, internal corrosion and stress corrosion cracking. These severity criteria will be used to select and prioritize the sites for Direct Examination excavations.

A “Direct Examination” (DEx) plan shall be generated for each pipeline which is to include the susceptible dig locations with sub-meter GPS coordinates.

3. Direct Examination (DEx)

DEx shall be performed as per NACE guidelines

DEx shall be performed at each selected site for at least a pipe joint length (about 15 meter). DEx for a complete pipe joint length should allow for girth weld as well as pipe body examination for External Corrosion and/or Stress Corrosion Cracking and Liquid Petroleum Pipelines Internal Corrosion.

The various DA, DEx examinations shall contain, as a minimum, the following activities:

- Prioritization of indications found during the previous ECDA, SCCDA and ICDA steps
- Excavations are at least a joint length, located and exposed where the threat is more likely to occur
- ICDA site selection shall be in accordance with Section 4.7 of the ICDA, SP0208-2008 Standard Practice.
- Sub meter GPS correlation of the IDi indications to the coating faults
- Measurements are made and documented in a consistent manner regarding the relationship of the anomaly to other pipe and environmental characteristics
- Description and documentation of Terrain conditions
- Pipe to Soil measurements, Soil Resistivity readings along with pH and Redox.
- Quantitative description and documentation of Coating condition including determination of adhesion, location and size of disbondment and the external coating holidays.
- Sampling, recording and identification of pipeline corrosion deposits and electrolyte found under the external coating or as predicted in ICDA.
- External and internal corrosion mapping and measurements.
- NDE for Stress Corrosion Cracking at all disbonded coating areas, girth weld and long seam locations. If SCC detected, then sizing and measurements of colonies.
- Determine, measure and document all external Pipe Body Damage found during the examination of the pipe
- Identify and measure MIC, if any.
- Photographs (digital format) for all of the above.
- Field evaluations are completed regarding remaining strength as per ASME B31G, Modified B31G and/or Effective Area Method
- Root cause analysis is completed.
- A comprehensive evaluation of the DEx process is completed
On a per DEx site basis, an engineering schematic shall be generated displaying correlation of IDi indications, disbonded coating areas, location of anomalies along with applicable pass/fail criteria based on pressure burst calculations as per ASME B31G etc. Each of the anomalies that have failed the pressure burst calculations shall also be represented in a graphical format. Defect locations of each pipeline shall be mentioned in the drawing.

Contractor shall carry out minimum 30 direct examinations sites for EC and SCC investigation and shall carry out minimum 18 direct examination sites for IC investigation. Location overlap is allowed up to 15 locations. Locations mentioned is for all the 8 pipelines.

All the excavation, backfilling and recoating in the DEx program will be carried out by BPCL. Location shall be identified by the contractor to BPCL officials and excavation contractor at site and in the drawing.

4. Post Assessment (PoA)

The Post-Assessment shall assemble, normalize, integrate and analyze all the data collected from the previous three steps to assess the effectiveness of the DA process.

The post assessment report for each pipeline shall include, as a minimum, the following activities:

- Remaining life calculations
- Definition of reassessment intervals
- Root cause analysis
- Recommendation and mitigation
- Analysis and evaluation of pipeline MAOP
- Assessment of DA effectiveness and possible finalization of DA regions
- Review and adjustment of the Post Assessment process, and
- Compilation of all DA records on a per pipeline basis

REPORT

The Contractor shall provide the following reports (soft & hard copy):

Weekly report:

The Contractor shall submit weekly report to the Company on each Wednesday of the week, describing its daily activities during the week and the plan for the forthcoming week.

Pre assessment Report (ECDA, SCCDA, ICDA)

Pre-assessment report shall be on a per pipeline basis for the three combined direct assessments (ECDA, SCCDA & ICDA).

IDi Report

IDi report shall be on a per pipeline basis

Direct Examination Report (DEx) for each excavation or assessment location.
DEx reports comprise of

- per dig detailed reports
- per exposed pipeline report summarizing and discussing the actual findings of all the excavations for that pipeline

**Post Assessment Report (PoA)**

Post assessment report shall be on a per pipeline basis for ECDA and SCCDA combined or ICDA separately.

**Final Report**

Contractor shall submit (2) copies of final report (soft & hard copy), within forty five (45) working days of completion of all four steps of DA as per NACE standards, for each pipeline. Final report shall be compiled with approved preliminary reports in appropriate format and formatted covers and labels.

The final report shall comprise minimum but not limited to the following,

- The survey results and data collected in tabulated / presentable form separately for each field, each technique for each pipeline. (Compilation of all DA records on per pipeline basis)
- The survey result data interpretation and basis of it.
- Findings / locations of coating faults / damages both qualitatively and quantitatively.
- Recommendations for coating fault / damage
- Over-all CP system’s performance, efficiency / deficiency,
- Full drawing including elevation profile, pipeline route, location sketch
- Recommendations for CP system’s efficiency improvement, rehabilitation, upgradation etc
- Recommendations for pipeline segment change where repair / rectification is not possible with basis of calculation for remaining life.
- Remaining life calculations
- Safest MAOP
- Root cause analysis

**Report Presentation**

On completion of job and submission of the final reports, the Contractor shall make presentation to the Company at Company’s offices in India. The presentation shall take place at a minimum of twenty five (30) days after the receipt of the final reports, at a mutually agreeable date by both parties. The presentation shall also include the development of ICDA model and final reports for each DA. The Contractor shall make all necessary changes, amendments or rework to any sections of the report requested by the Engineer-in-charge.

**CONTRACTOR’S DELIVERABLES**

Contractor’s deliverables shall include the following as per contract specification:
a) Weekly reports  
b) Pre assessment reports  
c) IDi Report  
d) Direct examination report  
e) Post assessment report  
f) Final report  
g) Report presentation

**CONTRACT PERIOD AND WORKING HOURS**

The Contract Period shall be two hundred and forty days (240) days from the Date for Commencement of the work.

Working hours: 08:30 to 17:00 (IST), Monday to Friday excluding BPCL-KR holidays. Any work at inside city limits/road crossing has to be carried out at Night hours and Sundays/Holidays (Day hours).

**SUPERVISION AND MANPOWER**

Upon receipt of purchase order by the contractor, the Contractor shall:

a) Submit details of the personnel it proposes to deploy upon the Services, as described in Contract Specification, for Company’s review and approval. The Company has the right to trade test any of the Contractor’s personnel prior to their deployment on the Services, or at any time thereafter during the Contract Period. Upon approval by the Company, such personnel shall not be removed from the Services without the prior written approval of the Engineer in charge.

b) Nominate a person, for Company’s approval, as the Contractor’s Representative (Site manager) with full responsibility and authorization to act on behalf of the Contractor concerning all matters arising out of or in connection with this Contract. All employees of the Contractor shall be under the direct sponsorship of the Contractor/local agent/subcontractors.

The Contractor shall provide all of its personnel employed on the Services with identification badges. All Contractor’s personnel engaged on the Services shall at all times be properly attired in clean and tidy apparel and shall wear safety boots and safety helmets when required.

The Contractor shall be responsible at all times for the transportation of its personnel.

The Contractor shall employ sufficient number of personnel with the required qualification/experience to perform the Services in a safe and responsible manner. The Company may request the Contractor to employ more personnel and/or with better qualification/experience to carry out the Services successfully based on the evaluation of the performance.
The Services require technically qualified and experienced personnel in the field of Pipeline Inspection, External and Internal Corrosion Control and Pipeline Corrosion Integrity Management (PCIM). Prior to performing the Services, the Contractor shall submit the qualification and experience details of the personnel to be employed in the provision of Services (either at site or off-site), detailing the role and responsibilities of each, for Company approval.

For all contract personnel’s who are foreign nationals, BPCL has to get prior permission from Government of India (GOI) before allowing them inside Refinery. Hence contractor shall submit the bio data, passport and visa details of all foreign nationals to BPCL and mobilisation of the personnel’s are subject to approval from GOI. Approval will take around 2 months.

**DA Engineer**

The Contractor shall appoint fulltime Direct Assessment (DA) Engineer. The Engineer shall be fully qualified academically and, by previous experience, be able to execute, all the Contractor’s services related to DA survey as defined in this Contract, and to liaise fully with the Engineer in charge.

DA Engineers shall be able to plan and direct the entire Contractor’s Service related to the DA survey activities and to liaise fully with the Engineer in charge.

DA Engineers shall be responsible for maintaining satisfactory survey levels of Company pipelines throughout the ROW and to ensure its subordinates compliance with Company HSE requirements.

DA Engineers shall directly report to the Site Manager. The Contractor's Personnel in this position shall be fluent in both spoken and written English.

Minimum qualification requirements for this position are given below.

- **DA Engineer** shall possess a Bachelor’s Degree in any Engineering discipline with accreditation. A minimum of eight (8) years relevant experience in all segments of Pipeline Integrity Management. Must have specific experience in External Corrosion Direct Assessment (ECDA), Stress Corrosion Cracking Direct Assessment (SCCDA), Internal Corrosion and Direct Assessment (ICDA), pipeline inspection and assessment techniques.

- He shall be either a Professional Member of the Institute of Corrosion (UK) or a NACE International (USA) Certificated Corrosion specialist.

- Must have participated in assessment of at least 20 pipelines totalling pipeline lengths of at least 200 kms for the ECDA,ICDA & SCCDA program.

- Must have inspected at least 100 Direct Examination sites (each site to be at least a joint length) which should account for at least 20 different pipelines and the total pipeline length to be at least 200 kms.
- He must be able to supervise and be responsible for all site operations during all stages of ICDA along with quality control and management as per NACE SP0208-2008 standards.

- Must be able to supervise and be responsible for all site operations during the 4 stages of ECDA, ICDA and SCCDA along with quality control and management as per NACE SP0502-2008 & SP0204-2008 standards.

- Must be able to identify and quantify the surrounding soils conditions and environment

- Must be able to perform engineering assessment calculations and be responsible for ensuring accuracy of the final inspection engineering reports and interpretive content.

- He shall be at Site at all the time when DA work is in progress and to liaise fully with the Engineer in charge.

If one DA engineer does not have all the experience mentioned above on all technique, contractor may deploy additional engineers for each technique who are sufficiently qualified in that particular technique.

**DA- Site Manager:-**

Followings are minimum qualification, experience and job descriptions of ICDA- Survey Manager-

- He shall be engineering graduate in mechanical/electrical/chemical/metallurgical or other relevant discipline).

- He shall be either a Professional Member or Fellow of the institute of Corrosion (UK) or a NACE International (USA) certificated Senior Corrosion Technologist, or Corrosion specialist.

- He shall have a minimum of 10 years experience in Pipeline Integrity Management in oil and gas industry, out of which minimum 5 years as senior, responsible in corrosion management and/or DA methodology applied to Gas/Liquid Petroleum Pipelines.

- He shall have leadership and administrative skills to supervise and co-ordinate all the activities related to this Contract and having communication skills to report to the Engineer in charge.

- He shall be responsible for all the work covered under this contract.

- He shall carry out technical review of all the data collected, along with all the quality management and calibration records. Also, responsible for ensuring the accuracy of
the Report and for any interpretative content, conclusions and recommendations for any future additional investigation work, survey work or remedial work.

- The Site Manager may be based in the Contractor’s offices; however he shall visit India frequently during DA work as required by BPCL.

GIS/GPS In charge:

- He shall have adequate qualification in the relevant discipline and shall have at least 2 years of experience in the field of GIS/GPS application and collecting GPS coordinates.

- He shall have thorough knowledge of various aspects of GIS/GPS system, tools and equipments.

- He shall be in charge of manual GPS mapping and supervise all activities related to it.

- He shall be employed full time at Site during manual GPS mapping activities.

CP Engineer:-

NACE qualified CP engineer with sufficient experience to be deployed, if required.

Site Supervisor:-

- He shall be an engineering diploma holder in mechanical/electrical/metallurgical or other relevant discipline with minimum 5 years field experience in pipeline inspection, data collection/integration, NDT methods, Indirect Assessment methods, out of which 2 years as a supervisor in the field.

- He shall be employed full time at Site during all stages of DA requiring field work. He shall be in charge of all activities at field level.

- He must be able to perform Direct Examination, collect data as per NACE guidelines and assess any other threat present in each of the Direct Examination site.

- Must be able to supervise all logistic operations involved in Direct Examination inspection, i.e. proper excavation of site, coating removal, pipe surface preparation, recoating and backfilling.

REVIEW AND APPROVALS OF TECHNICAL DOCUMENTS

The Contractor shall submit the following documents, for prior Company’s review and approval immediately after Date for Commencement:

- Detailed plan including all activities to complete the DA successfully
Procedure for all stages of ECDA/SCCDA/ ICDA methodology. Procedure shall comply with all relevant clauses of NACE standards.

Proposal for data integration in the software supplied

Details, including calibration certificates, of equipments and tools to be used. All data loggers, DVMs, oscilloscopes and any other electronic measurement instrumentation shall have formal laboratory/ test house calibration certificates, traceable to International Standards, which shall be valid for a minimum period of 3 months or the anticipated period of the survey, whichever is longer.

Appointment of Key Personnel

The Contractor shall provide Curriculum Vitae’s (CV’s) or Resumes for its Managerial, Engineering and Supervisory Personnel including their Leave Relief Personnel or replacements for Engineer in charge’s approval prior to the engagement. The Company shall have the right to reject any proposed Personnel. In case of rejection the Contractor shall immediately submit details of alternative candidates for Company’s consideration.

The Contractor shall notify the Engineer in charge in writing prior to the removal of any managerial or supervisory Personnel together with detailed notification of the proposed replacement. No such removal or replacement shall be made without the written approval of the Engineer in charge. The Company shall have the right to interview and reject, without giving any reason for, any of the above Category if it sees it necessary for the purpose of ensuring they are appropriate for the proposed position.

Appointment of Other Personnel

The Contractor shall ensure that all other Personnel, are fully experienced and competent to carry out their duties. The Company may call for CV’s/Resumes of any such Personnel either before or after engagement and if not satisfied the Contractor shall replace such Personnel at no cost to the Company.

TRANSPORT

The Contractor shall provide exclusive Vehicles for Key Personnel and for various monitoring and inspection crews besides arranging transportation for supporting Personnel.

The Contractor shall ensure provision of adequate number of vehicles for satisfactory execution of the Services.

The Company has the right to instruct the Contractor to increase the number of Vehicles/Equipment if Services demand so without assigning reasons and at no additional cost to the Company.

The Contractor shall ensure that the Vehicles supplied are maintained in a safe and roadworthy condition.

The Contractor shall ensure the supply of fuel and lubricants for all vehicles supplied.
The Vehicles/Equipment mentioned herein are the minimum required to be made available by the Contractor to carry out the Services and the Contractor shall provide immediate replacement Vehicles in case of breakdown and/or total loss, or servicing and maintenance.