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FOREWORD

HYDROCARBON RESOURCES DEVELOPMENT Co. (P) Ltd., was formed in 1987 by a group of Petroleum Engineers. The objective was to provide indigenous expertise to the Oil, Gas, Chemical and Petrochemical Industries. Over the years HRD has developed many essential products for these industries and rendered related services to these industries in India and abroad.

Today HRD along with its associates can boast of having:

- Sizable team of engineers to handle Projects.***
- Engineers and technicians to handle operations in Petrochemical Plants and Oilfields.***
- A fabrication facility measuring 15000 sq. ft.***
- A precision machining center measuring 2500 sq. ft.***

HRD is also the operator for the Sangapur Oil Field in Mehsana, Gujarat.

HRD IS ACCREDITED AS AN ISO 9001 COMPANY BY THE JAS-ANZ

SERVICES

- GROUP A: OIL/GAS WELL SERVICES**
- GROUP B: PIPELINE SERVICES**
- GROUP C: PROJECT MANAGEMENT & CONSULTATION SERVICES**

GROUP A: OIL/GAS WELL SERVICES

From Oil Well to the Refinery...HRD provides a range of Oil Field services through specially trained Engineers and Operators...

Well Completions

...design and custom built solutions to oil/gas well completions...supervision for installations of well completions...supervision of workovers...

Wireline operations

...from routine operations like setting bottom hole safety valves, to the trickiest of fishing...HRD has the in-house expertise of developing custom-made wireline tools and using them for effective well maintenance...

Production testing

...wells, like people, change every day...and HRD is there to monitor them under controlled conditions and predicting production capabilities by way of providing a complete and accurate history of well and reservoir performance...be it routine test or potential test or productivity test...

Oil & Gas Process Plant Operations

...highly skilled and trained operators are in the business of routine running of oil/gas processing plants under trying conditions...accurate reporting...routine maintenance...building emergency response plans...conformance to all safety and

environmental norms and crack troubleshooting...with HRD your Process Plant is in safe hands....

▪ **Oil/Gas Reservoir Simulation and Prediction of Field Life**

...the Reservoir Engineering division takes up simulation of oil/gas reservoirs using 3-dimensional, 3-phase reservoir simulation software coupled with nodal analysis software to predict optimum production rate from wells and fields and their optimal lives...

GROUP B: PIPELINE SERVICES

We at HRD design, clean, test and commission pipelines – intra-plant as well as trunk-lines...

- **Pipeline pigging**

...a member of Pigging Products and Service Association, HRD is actively involved in the act of scavenging pipelines at various phases of its life...starting from its construction to operation to routine monitoring to decommissioning...HRD boasts of a committed team that has the reputation of completing most of its pigging services ahead of schedule...

- **Pre-commissioning cleanup of plant piping**

...be it pigging or cardboard blasting for product pipelines or hydraulic flushing to meet the cleanliness requirement for control circuits...HRD has the know-how to plan and execute all with consummate ease...

- **Pipeline hydrostatic testing and commissioning.**

...short sections or cross country...HRD has the expertise and equipment to conduct hydrostatic tests with a very high degree of accuracy...

- **Pipeline corrosion control and management.**

...routine corrosion monitoring or an effective corrosion management plan...corrosion inhibition or detecting leaks and physical deformities...HRD does it all to a pipeline to extract its reliability to its limit...

GROUP C: PROJECT MANAGEMENT SERVICES

HRD provides expert Project Management and Engineering Services related to Oil and Gas Fields, Petrochemical Plants and Liquid Storage Terminals....

- **Project/Re-engineering consultants for oil/gas plants offshore/onshore.**

...from conception to the drawing board to the scheduling to its execution...HRD will assure that your project is completed within the projected budget and the set timeframe...

- **Development plan for marginal oil/gas fields.**

...detailing of oil and gas production facilities...topside equipment and subsea technology...development plans Floating Production Systems...HRD provides application of engineering technology to achieve lower capital expenditure and early production from marginal oil/gas fields...

- **Pipeline Engineering Consultants**

...any conceivable problem to a pipeline...be it corrosion or conversion...leak detection or optimization...HRD has an engineering solution for all...

- **Liquid Storage Terminals**

...HRD and its associates can conceptualize, design, fabricate, commission and manage Liquid Storage Terminals storing a range of liquids...from highly inflammable liquid hydrocarbons to liquid molasses...

PRODUCTS

Over the years an expert group of Engineers at HRD has developed a range of high quality products that are extensively used in the Oil/Gas/Petrochemical Industry. Selling under the brand name HYCARE, the principle products are:

- ***Oil & Gas Offshore Burner.***
- ***Completion Equipments.***
- ***High Pressure Needle Valves.***
- ***Various types of pipeline pigs***
- ***Pig Launchers and Receivers up to 36” line size.***
- ***Pig Alert Device.***
- ***Hammer lugged unions.***
- ***Pneumatic control panels for Oil Processing Plants.***
- ***Low pressure diaphragm valves.***
- ***Wire-line tools.***
- ***Flanges and ring gaskets of various sizes and ratings.***
- ***High-pressure pneumatic pumps.***
- ***Hydraulic Flushing Skids.***

- *Teflon coated studs and nuts.*

After Sales & Services

In line with our commitment to ISO 9001, customer service is our highest priority...

All equipment manufactured by HRD undergoes a rigid QA/QC procedure before delivery to a client. Equipment delivered to client is covered under standard warranty offered by HRD.

In the event of supply of special equipment, HRD offers installation services of such equipment at client's site/premises.

HRD at all times maintains a group of trained personnel for carrying out after sales and service at locations where the equipment is installed. These people are specially trained at the factory of HRD during the assembly stage of such equipment.

CLIENTELE

Over the years HRD has developed a Clientele List that includes the best names in Oil Gas and Petrochemical Industry in India, as the following list will endorse:

- ***M/s Adani Port Ltd.***
- ***M/s Ageis Chemicals Ltd.***
- ***M/s Bhaba Atomic Research Centre***
- ***M/s Bharat Shell Ltd.***
- ***M/s Bridge and Roof (India) Co. Ltd.***
- ***M/s Cairn Energy India Pty. Ltd.***
- ***M/s Chennai Petroleum Corporation Ltd.***
- ***M/s Command Petroleum India Pte. Ltd.***
- ***M/s Essar Oil Limited***
- ***M/s Geo-Enpro Petroleum Ltd.***
- ***M/s Gujarat State Fertilizer and Chemicals Ltd.***
- ***M/S Gujarat State Petroleum Corporation Ltd.***
- ***M/s Haldia Petrochemicals Ltd.***
- ***M/s Hardy Exploration and Production India Inc.***
- ***M/s Hindustan Oil Exploration Co. Ltd.***
- ***M/s Hitech Drilling Services India Ltd.***
- ***M/s Hyundai Offshore***
- ***M/s Indian Oil Blending Ltd.***
- ***M/s Indian Molasses Company Ltd.***

- ***M/s Indian Oil Corporation Ltd.***
- ***M/s Indian Petrochemicals Corporation Ltd.***
- ***M/s Indian Rare Earth Ltd.***
- ***M/s John Energy Ltd.***
- ***M/s Larsen and Toubro Ltd.***
- ***M/s Mazgaon Docks Ltd***
- ***M/s Millenium Oil & Gas Company Limited.***
- ***M/s Mitra Offshore***
- ***M/s Oil & Natural Gas Corporation Ltd.***
- ***M/s Oil India Ltd.***
- ***M/s.Prize Petroleum Co. Ltd.***
- ***M/s Punj Lloyd Ltd.***
- ***M/s Reliance Industrial Infrastructure Ltd.***
- ***M/s Reliance Industries Limited***
- ***M/s Reliance Industries Ltd (Oil & Gas Div).***
- ***M/s Reliance Petroleum Ltd.***
- ***M/s Special Oilfield Services, Doha***
- ***M/s. Sterling Global Oil Resources Co. Ltd.***
- ***M/s Tata Industries Limited***
- ***M/s. Trenergy (Malaysia) Bhd***
- ***M/s Tata Petrodyne Ltd.***
- ***M/s Triune Projects***
- ***M/s Viraj Agro Products Pvt. Ltd***

PERSONNEL

Our manpower is our biggest asset...

At HRD, the core management is by persons who grew up in the Oil/Gas sector and who brought with them a wide range of rich experience in almost all aspects of Oil Engineering...

The middle management consists of a group of qualified and handpicked youngsters who are also go-getters...

The workforce consists of about fifty skilled and trained operators in the works and service personnel...

SOFTWARES ACCESSIBLE TO HRD AND ITS ASSOCIATE

The Following is the list of software's accessible to HRD and its associate.

NAME OF THE SOFTWARE	WORK PERFORMED
WEM	THIS SOFTWARE CAN BE USED FOR KNOWING WELL PERFORMANCE, PERFORATING GUN PERFORMANCE, ARTIFICIAL LIFT, SURFACE NETWORK SIMULATION, MATERIAL BALANCE AND DYNAMIC FIELD SIMULATION.
DYNAFILED	COMPOSITE SOFTWARE FOR RESERVOIR SIMULATION, WELL DESIGN TO DESIGNING PROCESS PLANTS AND PIPELINES.
HYSIS	THIS SOFTWARE IS USED FOR PROCESS PLANT DESIGN.
SAPHIR	WELL TEST INTERPRETATION SOFTWARE
TOPAZ	WELL TEST INTERPRETATION SOFTWARE
EMERAUDE	WELL TEST INTERPRETATION SOFTWARE
BOAST 98	RESERVOIR SIMULATION SOFTWARE

ASSOCIATES

Over the years HRD has formally associated itself with the following companies to provide mutual back-ups for the services:

- ***M/s INTEC ENGINEERING ASIA PACIFIC SDN BHD***
- ***M/s SEMMON CONSULTANTS, MUMBAI***
- ***M/s CARLTON INDUSTRIAL ENGINEERS, MUMBAI***
- ***M/S ACE PIPELINE CONTRACTS (P) LTD – MUMBAI***
- ***M/s DARCY RESERVOIR CONSULTANCY SERVICES.***
- ***M/s TORCH INTERNATIONAL***
- ***M/s WELL FLOW PETROLEUM SERVICES***
- ***M/s. TREENERGY (MALAYSIA) BHD.***

HEALTH, SAFETY & ENVIRONMENT

At HRD, we care not only for our customers but also for our people and the environment...

It is our firm belief that no part of the business objectives can be achieved without an effective HSE system...

HRD has developed a full-fledged HSE procedure to comply with:

- *All oil field safe operating practices.*
- *Effective shop floor safety.*
- *Ensure a healthy work environment to protect the health of its people.*
- *Comply with all environmental norms and to prevent pollution in all possible manners.*

OPERATION AND MAINTENANCE OF PROCESS PLANTS (OFFSHORE & ONSHORE)

1. Client : M/s. Command Petroleum India Pty. Ltd. (Presently owned by M/s Cairn Energy India Pty. Ltd.)

- Taking over the offshore platforms, onshore Oil and Natural Gas processing and Oil storage facility.
- Assessing deficits and preparing requisitions for management.
- Operation of existing processing facility involving separation of crude oil & Natural gas.
- Operation of Instrumentation required for process.
- Operation of Electrical substation and accessory units.
- Maintenance of pumps, compressors, fire water system and all auxiliary equipment.
- Consultation for more cost effective operations and maintenance policy.
- Stabilizing system operation, training of client personnel.

2. Client: M/s. Punj Lloyd Limited.

- Commissioning of Dandewala Gas Processing Complex, which is owned by OIL INDIA LIMITED in Western Rajasthan. Job involved bringing gas from the wells, processing the same at

the complex which consisted of separators, dehydrator, and sending the gas through the despatch line.

- Suggesting design changes for trouble free operation of plan and implementing same.
- Commissioning of Tanot Gas Gathering Complex. Collection of gas from Tanot field and sending to the Dandewala Gas Processing Complex.
- Operation and Maintenance of the processing facility over a period of 1-1/2 years with our trained manpower.

3. Client: M/s. Hitech Drilling Services India Limited (A TATA Company)

Engineering and Execution of Repair / Upgradation of 'TAHARA' a Floating Production Facility for processing crude oil & natural gas, at Jurong Shipyard, Singapore, and subsequently assisting client in installing the system and flow of first oil at the PY3 field in the South Eastern Coast of India.

- Assessment of the overall system.
- Preparation of detailed design change requirement for operation at PY-3 location..
- Preparing BOM for upgradation of the system.
- Preparing new set of drawings and documentation of the system.
- Preparing towing plan for unit to be towed to Singapore.
- Assist the client in procurement of the material.
- Supervise construction jobs at Jurong Shipyard in Singapore.

- Commission the unit in the Pondecherry field at offshore Chennai and stabilizing the operation.

4. Development of SANGANPUR Oil & Gas Field.

HRD has been awarded the SANGANPUR oilfield by GOVERNMENT OF INDIA. The field was awarded for development and production. Job involves

- Development of the oil field to optimize production of crude oil & natural gas.
- Design and Fabrication of the process plant involving Separators, Storage facility, and flow-lines.
- Design of control philosophy for smooth, safe and efficient operation of the process.
- Operation and Maintenance of the processing facility.

5. Client: M/s. Heramec Limited.

M/s. Heramec Limited has awarded HRD for Start up and Operation Management of Dholasan and Alora oilfield. The field was awarded for development and production. Job involves

- Development of the oil field to optimize production of crude oil & natural gas.
- Operation and Maintenance of the processing facility.

6. Client: M/s. Millenium Oil & Gas

M/s. Millenium Oil & Gas attached with M/s. Hardy oil Nigeria Limited has awarded HRD for Operation management in their OZA field in Nigeria. Job involves:

- Oil field Engineering Consultancy.
- Operation and maintenance of oilfield Process Plant.
- Project management and operating services.
- Drilling, Well testing and well completion services.
- Pipeline Pigging Services.

7. Development of BANTUMILLI Oil & Gas Field.

HRD has been awarded a marginal field named “BANTUMILLI” by OIL AND NATURAL GAS CORPORATION. The field is awarded for field development, production and operation.

Job involves

- Development of the oil field to optimize production of crude oil & natural gas.
- Plan for new wells to be drilled in the field.
- Design and Fabrication of the process plant involving Separators, Storage facility, and flow-lines.
- Design of control philosophy for smooth, safe and efficient operation of the process.
- Operation and Maintenance of the processing facility.

PIGGING, HYDROTESTING AND OTHER PIPELINE SERVICES

1. CLIENT: M/s. Essar Gujarat Limited (Year 1987)

- Project consisted of Hydrostatic testing of 11 offshore platform pipelines of ONGC, BRBC's WIPPM i.e. Water Injection Process Platforms at Mumbai Offshore.

2. CLIENT: M/s. Chembur Patalganga Pipeline Ltd. (CPPL) (Year 1991-92)

- Project consisted of Hydrostatic testing of 8" Product Pipeline from Chembur to Patalganga. Commissioning of the same was also carried out by HRD.

3. CLIENT: M/s. Reliance Petroleum Limited, Jamnagar (Year 1998-1998)

- **HRD** was awarded a pipeline pigging operation job as Pre-commissioning activity in their Refinery complex, which is the largest grass-root level refinery in the world. Job involved
 - Preparation of detailed Engineering report suggesting Procedures, Pigs, and optimization of equipment.
 - Execution of pigging operation as per prepared procedures. Completed 2750-Km run of pigging operation in pipelines ranging from 3" to 42". Used Polyurethane foam pigs effectively to clear the construction debris in the pipeline.

**4. CLIENT: M/s. Haldia Petrochemicals Limited,
Haldia
(Year 1999)**

- HRD was awarded a pipeline pigging operation job as Pre-commissioning activity in their Petrochemical complex, which is the one of largest in the India. Job involved
- Preparation of detailed Engineering report suggesting Procedures, Pigs, and optimization of equipment.
- Execution of pigging operation as per prepared procedures. Completed 300-Km run of pigging operation in pipelines ranging from 4" to 30". Used Polyurethane foam pigs effectively to clear the construction debris in the pipeline.

**5. CLIENT: M/s. Indian Oil Corporation Ltd., Sewree,
Mumbai.(Year 2000)**

- Conversion of 14"/12" pipeline between Hay Bunder to IOC Terminal at Sewree from stagnant Black Oil to White Oil Product. This too was a very challenging assignment particularly because the line was 20 years old, and remained unused for a long time with stagnant black oil inside.

**6. CLIENT: M/s. Gujarat Chemical Port Terminal Co.
Ltd. (GCPTCL)**

- Engineering and modification of all the jetty to plant pipelines to make them piggable for taking multi-products and following it with pigging prior to their commissioning. This job was also completed within a very tight schedule so as to minimize Tanker Waiting time.

7. CLIENT: M/s. Hindusthan Storage & Distribution Co. Ltd. Kolkatta. (Year 2000)

- Modification of 10” Existing line to pigable line from jetty to Terminal

8. CLIENT: M/s. Hikel Chemical Industries Ltd Mumbai. (Year 2000)

- Pigging of Brine supply and return header using poly pigs. Pipeline sizes 3” NB to 10” NB

9. CLIENT: M/s. Consolidated Engineer Const. Co. Cochin (Year 2000)

- Hydrotesting and Pigging of 14” NB Bitumen line of M/s. IOC from Terminal to Jetty at Cochin Port.

10. CLIENT: M/s. Arun fabricator. Manglore (Year 2000)

- Hydrotesting and Pigging of 14” NB Bitumen line of M/s. IOC from Terminal to Jetty at Manglore Port.

11. CLIENT: M/s. TDW India Ltd (Year 2000)

- Calliper survey & pigging of M/s. Gail’s pipeline from Jamnagar to Loni (UP)

12. CLIENT: M/s. Indian Petrochemicals Limited. (IPCL), Nagothane. (Year 2001)

- Continuous corrosion monitoring of Wastewater disposal line of 22” size.
- Design and Fabrication of Corrosion Monitoring System.

- Installation of online corrosion coupon in pipeline.
- Routine retrieval of the coupon for collection of sample.
- Preparation of detailed test report and suggestion of remedial measures.

13. CLIENT: M/s. Reliance Petroleum Limited, Jamnagar. (Year 2001)

- Flushing and Commissioning of Hydraulic Control System consisting of tubings of various sizes. HCS is one of the parts of Coker plant in the refinery, job involved
- Detailed Engineering study of the system as well as plan to carry out the job.
- Design and fabrication of flushing module & test skid.
- Execution of job as per the engineering report.

14. CLIENT: M/s. Reliance Petroleum Limited, Jamnagar. (Year 2001)

- Hydrostatic Testing for 48" dia, 39.7 km long Crude Oil Pipeline at the Marine Tank Firm area. This is the main line through which the entire refinery gets its raw material (crude) for production. The hydrostatic test was done after the refinery was under production for more than a year. The entire job had to be completed within 72 hours, which was the total time available between berthing of two oil tankers. This makes the job unique and particularly challenging, because any delay would have meant huge loss for the refinery.

15. CLIENT: M/s. Tubestar Ltd. (Year 2001)

- Pigging of Offshore pipelines of various size at Bombay high Mumbai offshore ONGC

16. CLIENT: M/s. Haldia Petrochemicals Limited, Haldia (Year 2001)

- Conversion of 8", 6.25 km long line from Benzene to Hexane. This job was one of the first of its kind where an existing Benzene line was cleaned to meet the stringent specifications so as to be suitable for taking Hexane. The line had to be completely devoid of any free water and other impurities.

17. CLIENT: M/s. State Trading Corporation, Mumbai. (Year 2002)

- Engineering and modification of 12"NB twin pipelines from jetty to terminal to make them piggable for taking multi-products and following it with pigging prior to their commissioning. This job was also completed within a very tight schedule.
- Under annual Contract with STC for unloading cargo through their pipelines after every shipment.

18. CLIENT: M/s. British Gas Exploration and Production (Year 2001 - Onwards)

- Under annual contract for pigging Offshore Hydrocarbon Lines as a part of BG's pipeline maintenance programme.

19. CLIENT: M/s. Cairn Energy India Pty Ltd.(Year 2003)

- Carry out pigging of 24” gas line – 35 km long from Offshore to Hazira Terminal on a regular basis.

20. CLIENT M/s. Haldia Petrochemicals Limited (Year 2003)

- Carry out pigging of 8” Butadiene Line – 10 km long from HPL Terminal to HOJ Jetty at Haldia.

21. CLIENT M/s. Reliance Industries Limited. (Year 2003)

- Carry out pigging of 16” Coker-plant – 1-km long line Inside Reliance Terminal at Jamnagar.

22. CLIENT M/s. Indian Oil Corporation Limited. (Year 2004)

- Carrying hydrotesting of Oil Supply Line 4.4 Kms long and identification of leakage subsequently getting it repaired finally hydrotesting at 10 kg/cm³.

23. CLIENT M/s. Reliance Industries Limited

- Carrying Pigging operation of Oil Supply Line totaling to nearly 1500 Kms length, the pre engineering for the pigging operation is in progress.

**24. CLIENT: M/s. Haldia Petrochemicals Limited,
Haldia (Year 2007)**

- HRD has been appointed as Consultant for the piggability of the MS and PYGAS line in their Petrochemical complex connecting to the two jetties with a single pipeline.

Job involved

- Detailed Engineering report for the piggability of the line which includes specification of equipments Pig Traps, Y Connection, Pigs, etc.
- Preparation of the pigging procedure for the line with the minimum use of inert gas.

25. CLIENT M/s. Reliance Industries Limited (Year 2007)

- HRD has been awarded pre commissioning of Pipeline for JREP (Jamnagar Refinery Export Project) admeasuring 1200 kms in length of various sizes. (In progress)

Drilling, Well Completion, Workover and Well testing Operation

1. CLIENT: QGPC, Doha, Qatar (Development of North Gas Field, offshore) - 1989 to 1999

- Between 1989 to 1999, carried out Well Completions and Workover operations, supervised Wireline and Production Testing operations in the following offshore fields of QGPC (now QPC), Doha, Qatar:
- North Dome Gas Field, offshore Qatar, Phase-I (consisting of 16 wells). Well conditions: H₂S – 1.5%, CO₂ – 7.9% and FTHP – 4400 psi. Gas Flow Rate: about 1 million M³/day.
- Bul Hanine Field, offshore Qatar: Well conditions: H₂S –9.0%, CO₂ – 6.0%
- Maydam Mazham Field, offshore Qatar: Well conditions: H₂S – 2.0%, CO₂ – 5.0%
- Idd-el-Shargi Field, offshore Qatar: Well conditions: H₂S – 1.5%, CO₂ – 6.0%

2. CLIENT: M/s CDC, Doha, Qatar - 1991 to 1992.

Carried out Well Testing Operations in QGPC's offshore areas of Idd-el-Shargih, Maydam Mazham and Bul Hanine. The testing operations were carried out by HRD personnel on behalf of M/s. CDC and jointly with M/s.Expro of UK.

3. CLIENT: M/s Specialized Oil Services, Doha, Qatar - 1993-1994

Carried out Well Testing Operations in QGPC's offshore areas of Idd el-Shargih, Maydam Mazham and Bul Hanine for a period of 1 year. The testing operations were carried out by HRD personnel on behalf of M/s. Specialized Oil Services, Doha and jointly with M/s. Production Testers International.

4. Client: M/s Hindustan Oil Exploration Company Ltd.

HRD conducted Well Testing Operation on Palej-4 for HOEC. The job consisted of:

- Preparation of Procedures for Reservoir Studies and Well Test Operations.
- Providing all Well Test Equipment (Surface Facilities).
- Conducting Well Test Operations at location.
- Interpretation of Well Test Data.

5. Client: M/s Hindustan Oil Exploration Company Ltd.

HRD has conducted Well Completion Operation on Pramoda-1 for HOEC. The job consisted of:

- Completion of the well and wireline job related to completion.

6. Client: M/s Great Eastern Energy Corporation Ltd.

GEECL is involved in exploiting coal bed methane in Ranigunj belt of West Bengal.

- HRD is executing the well testing operation. It involves flow of fluid through separator and separation of water and gas.

7. Client: M/s Reliance Industries Ltd (Oil & Gas)

Reliance Industries Limited has asked to carry out complete consultancy work for their offshore well testing and completion operations. The operation included the following.

1. Preparing the “Composite Well Test Document for both open hole DST and Cased hole DST.
2. Suggesting the sand control measures for the gas wells.
3. Carrying out complete well testing operations on site.

8. Client: M/s Gujarat State Petroleum Company

GSPC has asked to carry out complete consultancy work for their offshore well testing and completion operations. The operation included the following.

1. Preparing the “Composite Well Test Document for both open hole DST and Cased hole DST.
2. Suggesting the sand control measures for the gas wells.
3. Carrying out complete well testing operations on site.

9. Client: M/s Essar Oil Limited (in progress)

EOL has asked to carry out complete well testing operations at Bokarwada & Kanama ESU oil fields. The operation includes the following in progress.

1. Injection fall test
2. Reservoir Limit test.
3. Pressure Gradient Survey, Temperature Gradient Survey, Pressure Buildup studies & Down Hole Sample collection.
4. Provision of Separator & personnel for the well testing operation.

10. Client: M/s Prize Petroleum Corporation

PPCL has asked to carry out complete well testing operations at the Hirapur, Khambel & W. Becharji Oil fields. The operation included the following.

1. Provision of Separator & personnel for the well testing operation.
2. Pressure Gradient Survey, Temperature Gradient Survey, Pressure Buildup studies & Down Hole Sample collection.

Engineering project management and consultation services

1. CLIENT: M/s. Hardy Exploration and Production India Inc.

Consultation and Engineering for PY-3 Offshore Oil Field:

- Review of existing well performance (PY3-2, PY3-3, PD3 and PD4) and suggestions for immediate improvement in wells productivity.
- Preparation of Basic Workover and Well Stimulation Plan, and Cost Estimate for the four flowing wells.
- Estimation and planning for re-entry, completion and hook-up of the new well PY3-4.
- Preliminary Engineering for having a Sea-water Injection System for the field for pressure maintenance purpose, consisting of:
 - An injection well.
 - Flow-line, riser, umbilical and control for hook-up of the well to the existing Floating Production Unit.
 - Top side facility for treatment and injection of seawater into the reservoir.
- Possibilities and plans for converting a producer into an injector.

2. CLIENT: Oil & Natural Gas Corporation Ltd. (Personnel Experience)

Carried out sub-sea drilling and well completions for the following wells

- 4 wells in SC location of Bombay High.
- 4 wells in D-18 location of Bombay High.

3. CLIENT: Hardy Exploration and Production India Inc. (Personnel Experience)

Carried out sub-sea drilling and well completions for the following wells

- 4 wells in PY3 location in Eastern Coast.

4. CLIENT: M/s Niko Resources Limited

- Adequacy Check for the Gas Gathering Station at their Land Based Drilling Platform (LBDP), Hazira. Job involved re-engineering of all the major components prior to the plants Certification and start up.

5. CLIENT: Hardy Exploration and Production India Inc.

Front End Engineering for Development Plan of TR-A Offshore Oil Field. This included:

- System Identification – i.e. identifying the best options for drilling (Jack/up vs Semi), completion (sub-sea vs surface), Processing Facility (EPS vs Permanent System) and all other macro components (like the umbilicals, flowlines, jackets, metering system etc.
- Relevant Engineering Calculations
- Project Cost Estimation.

6. CLIENT: Reliance Industries Ltd. (Oil & Gas)

Preparation of Technical Part of the Tender Document for testing sixteen exploratory wells off East and West Coast of India.

The document involved detailed information on the following:

- Description and brief analyses of the Blocks.
- Detailing Scope of Work for Bidder.

- Instruction to Bidder for Filling and submission of bid.
- Detailed Equipment Specifications
- Personnel Requirement.
- QA requirements.
- HSE Requirements.
- Price Format.

7. CLIENT: Chennai Petroleum Corporation Ltd. (CPCL)

Basic Engineering for 48” Crude Oil line from SPM to Landfall Point involving the following major components:

- Route Selection after analyzing environmental and seabed criteria.
- Hydraulic Study and Pipeline Optimization Criteria.
- Design and configuration of PipeLine End Manifold (PLEM).
- Pig Launcher and Receiver Stations.
- Cathodic Protection System.

- Chemical Injection Systems.
- Sampling System.
- Instrumentation System.
- Communication System between Tanker Spm and Crude Oil Terminal (COT)
- Electrical Power Distribution System
- Estimation of total CAPEX.

8. CLIENT: TATA Petrodyne Ltd.

Study on assessing market potential for natural gas along Surat-Mumbai National Highway route and in Trombay area in Maharashtra for the CB-OS-2 gas.

- Identification of potential gas utilization points along the route based on demands.
- Based on above identifying the best alternative of sizing the pipeline and compressor stations etc.
- Basic preliminary engineering for the pipeline and compressor stations.

- Analyzing the Cost Factors.
- Calculation of Project Costing on various alternatives.
- Deriving optimum selling price of gas to Industrial as well as Domestic and Commercial Consumers.

9. CLIENT: Reliance Industries Ltd. (Oil & Gas)

A techno-economic study on development of Well No. A1 in D-6 field (#D6-A1) by reentry. This consisted of:

- Determining completion philosophy and equipment.
- Procedure for completion.
- System Specifications – including the subsurface completion equipment.
- Cost analysis.

10. CLIENT: M/s Gujarat State Petroleum Corporation Ltd.

A techno-economic study on developing Kanwara field in Gujarat, using the existing resources to the maximum extent, identifying need of drilling additional wells for maximum recovery and also identifying

potential for expansion of field to area outside the contract area. The study involved:

- Revalidation of Seismic Interpretation
- Log Analysis
- Mapping and Reserve Estimation
- Reservoir Performance Prediction and Development Variants
- Workover of existing wells.
- Drilling and Stimulation of new wells.
- Well Completion Philosophy and Mud Policy
- Artificial Lift
- Flow Assurance
- Process Plant Requirements
- Analyses of current production.

11. CLIENT: M/s Hindustan Oil Exploration Company Ltd.

Engineering and Project Management for Drilling and Development of CB-ON-7 Block. Job included:

- Preparation of GTO for drilling of Exploratory Well.
- Preparation of Drilling, Completion and Testing Plan
- Identification and Finalization of Technical Specifications and Tender Documents for all Services – i.e. Land Rig, Logging, Mud Services, Mud Logging, Waste Disposal, Civil Jobs, Cementation, Well Completion.
- Evaluation of all bids and assisting HOEC in finalizing Contractors.
- Preparation of Contract Documents
- Inventory Management System for the drilling job.
- Obtaining statutory permits from DGMS and GPCB.
- Preparation of HSE and Emergency Response Procedures.
- Providing technical assistance while drilling is in progress.

12. CLIENT: M/s Hydrocarbon Resources Development Company Pvt. Ltd.

Engineering and Project Management for Work-over of wells in Sangapur Block. Job included:

- Preparation of detailed workover plans for Sangapur 1 and 2 wells.
- Identification and Finalization of Technical Specifications and Tender Documents for all Services – i.e. Land Rig, Logging, Mud Services, Mud Logging, Waste Disposal, Civil Jobs, Cementation, Well Completion.
- Evaluation of all bids and finalizing Contractors.
- Preparation of Contract Documents
- Supervision of Workover activities at site.

13. CLIENT: M/s Hydrocarbon Resources Development Company Pvt. Ltd.

Engineering, Project Management, Construction, Installation and Commissioning of Group Gathering Station and Tank Farm at Sangapur 1 site for processing Sangapur Crude oil and gas. Job included:

- Basic and Detailed Engineering for all vessels and equipments required for the set-up. This included the Separator, Storage Tanks, KO vessel, Gas Scrubber, Water Treatment System and all civil and structural requirements.
- On-site construction of two 45 m³ and one 70 m³ storage tanks and crude offloading system.
- Installation, hook-up and commissioning of the above system. The plant is presently under operation at Sangapur, Mehsana.

14. CLIENT: M/s Hindustan Oil Exploration Company Ltd.

Front End Engineering Design (FEED) for development of Palej-4 Early Production System

- Basic Engineering for all vessels and equipments required for the set-up. This included the Separator, Storage Tanks, KO vessel, Gas Scrubber, Water Treatment System and all civil and structural requirements.
- Estimation of CAPEX and OPEX and establishing Cash Flow Calculations under different scenarios.
- Suggesting the best option after carrying out NPV and IRR under different options.

15. CLIENT: M/s Hindustan Oil Exploration Company Ltd.

Engineering and Project Management for Drilling and Development of Palej EPS. Job includes:

- Preparation of GTO for drilling of 2 development wells.
- Preparation of Drilling, Completion and Testing Plan
- Identification and Finalization of Technical Specifications and Tender Documents for all Services – i.e. Land Rig, Logging, Mud Services, Mud Logging, Waste Disposal, Civil Jobs, Cementation, Well Completion.
- Evaluation of all bids and assisting HOEC in finalizing Contractors.
- Preparation of Contract Documents
- Inventory Management System for the drilling job.
- Obtaining statutory permits from DGMS and GPCB.
- Preparation of HSE and Emergency Response Procedures.
- Providing technical assistance while drilling is in progress.

16. CLIENT M/s. Semmon Consultant (Year 2003)

1. Preparation of scope of work and tender documents for LSTK contract.
2. Recommended vendor list
3. Preparation qualification criteria for selection of LSTK Contractor.

17. CLIENT: M/s Oil & Natural Gas Corporation Ltd (Subcontracted by INTEC Malaysia).

Basic Engineering for Drilling and Completion for G-1 & GS-15 Fields
(4 development wells, 2 Re-entry Wells) in KG Offshore of
Rajahmundry Asset :

- Preparation of GTO for drilling of 4 development wells.
- Preparation of Drilling, Completion and Testing Plan
- Identification and Finalization of Technical Specifications and Tender Documents for all Services – i.e. Offshore Rigs (Floaters and Jack-up) , Logging, Mud Services, Mud Logging, Waste Disposal, Cementation, Well Completion.
- Evaluation of all bids and assisting ONGC in finalizing Contractors.

18. CLIENT: M/s Selan Technologies Ltd.

Engineering Services on Revival of Bakrol Oil Field

- Analyses of Basic Data of the Wells.
- Analyses of Past Jobs and Data

- Proposed Remedial Work to be taken up.
- Cost estimate.
- Recommendations.

19. CLIENT: M/s Hindustan Oil Exploration Company Ltd.

Project Management and Consultation Services on development of PY-1 Field (Ongoing). Assisting client to develop documents and scope of work for carrying out the Conceptual Engineering Study to identify the best option for development.

20. CLIENT: M/s Great Eastern Shipping Company Ltd.

Consultancy services for viewing the data of Marginal Blocks of ONGC and preparation of detailed report of all the 19 Marginal Blocks under offer by ONGC. It included the details of “Production Profile” for each of the blocks.

21. CLIENT: M/s Larsen & Toubro Ltd.

Consultancy services for data viewing of the offshore marginal fields of ONGC and generation of reports based on data collected and recommendations on the fields.

22. CLIENT: M/s Hindustan Oil Exploration Company Ltd.

HOEC has asked HRD to carry out the following job for their North BALOL Block.

1. Augmentation of onshore facilities, instrumentation and metering system.
2. Drilling a new well. The job included complete design of GTO, preparation of tenders and onsite supervision of the drilling job by our experienced Engineers.

23. CLIENT: M/s Great Eastern Energy Corporation Ltd.

Consultancy for detailed engineering report on CBM gas exploration & development work. Scope of work:

- Process design engineering for gas gathering station consisting mainly of: a) dehydration unit, b) gas compression unit, c) water

- disposal unit, d) gas flaring unit along with any other auxiliary facilities.
- Engineering design aspects and design guidelines for mechanical, civil, structural, instrumentation, fire fighting system engineering, water cooling system, gas transportation pipe line system.
 - Front end engineering package.
 - Piping and instrumentation engineering.
 - Administrative and instrument building.
 - Tender specification and bid evaluation
 - Designer's supervision.

24. CLIENT: M/s Prize Petroleum Company Ltd.

Consultancy for detailed engineering for execution of EPF and CTF at Hirapur & Khambel oil field.

Scope of work:

- Process design, Procurement, Construction, Installation and Project Management for Early Production Facility & Custody Transfer Facility.

- Engineering and Detailing for mechanical, civil, structural, instrumentation, fire fighting system.
- Design and Fabrication of process Piping.
- Hydro testing and Commissioning of Process facility.

25. CLIENT: M/s Essar Oil Ltd.

Consultancy for detailed engineering for execution of EPF and CTF at Bokarwada Mehsana field.

Scope of work:

- Process design, Procurement, Construction, Installation and Project Management for Early Production Facility & Custody Transfer Facility.
- Engineering and Detailing for mechanical, civil, structural, instrumentation, fire fighting system.
- Design and Fabrication of process Piping.
- Hydro testing and Commissioning of Process facility.

PETROLEUM PRODUCTION & RESERVOIR ENGINEERING

HRD has carried out Reservoir and Production Engg Studies for companies like M/s. Tata Industries Ltd, Triune Projects, Hyundai, Reliance Industries Ltd., Essar Oil Ltd for their bids for various Blocks.

1. Client: M/s. Tata Industries Ltd

- Produced sharply focussed management style geological/geophysical engineering review of each important single block or tranche of blocks in October 1991.

2. Client: M/s. Hyundai

- Carried out studies for the Tapti, Panna and Mukta fields in July 1993. The study consisted of a dual completion Gravel Pack design for the Tapti field, Horizontal well completion design and a dual completion design for the Panna and Mukta fields.

3. Client: M/s. Reliance India Ltd.

- Designed a Conceptual Development Scheme for D-1 for Reliance India Ltd.

4. Client: M/s. Essar Oil Ltd

- Carried out a number of Reservoir Engineering studies including simulation in respect of Wasna, R-Series (R-7, R-9, R-13), Ratna and South Kadi for M/s. Essar Oil Ltd for their bids for the above fields. Also made studies on the feasibility of drilling horizontal wells in Wasna, R-13 and optimizing the production from the wells of Ratna and South Kadi.

5. Client: M/s. Hindustan Oil Exploration Company

- Interpretation of Reservoir & Production study data of Palej-4

In Association with M/s.Semmon Consultants

1. Storage Terminals & Related Projects

Client	⇒ G.R.Engineering Mumbai
Project	Ammonia Storage & Handling, NFL Panipat
Scope of work	Detailed Engineering comprising of process, piping, electrical, instrumentation engineering for Ammonia Storage Facilities (spheres)
Client	⇒ Jawaharlal Nehru Port Trust, Navi Mumbai
Project	Liquid Cargo Handling-Pipeline Corridor,JNPT.
Scope of work	Consultancy Services consisting of development of additional liquid corridor & philosophy for handling of various liquids with Pipeline Configuration
Client	⇒ IMC Ltd
Project	Tank Terminal Facilities for Petroleum Liquids,JNPT
Scope of work	Project Management Consultancy Services comprising of overseeing project engineering and construction.
Client	⇒ IMC Ltd.
Project	Pipeline from Jetty to Terminal at JNPT (3 lines)
Scope of work	Detailed Engineering comprising of pipeline design and layout, specifications for pigging system for 16", 12"& 8" Docklines, pipe support Civil / Structural Engineering and Project Management

Client ⇒ **Bharat Shell Ltd**

Project Tanker Discharge Line, JNPT

Scope of work Detailed Engineering for 12" Pipeline comprising of pipeline design & layout, providing specifications for pigging equipment for batching and civil/structural design for supports.

Client ⇒ **United Storage & Tank Terminals Ltd**

Project Butadiene Storage facilities, Kandla (Spheres) –Expansion

Project cost Rs.50 million

Scope of work Project Engineering and Management Consultants comprising of overseeing of engineering work of turnkey contractor

Client ⇒ **Adani Port Ltd**

Project Chemical Storage Terminal & Jetty Pipeline at Mundra, Gujarat

Scope of work Detailed Engineering comprising of process, mechanical, piping, electrical, instrumentation and civil design for the storage terminal with 45 nos. Cone Roof Tanks & piggable pipeline engineering for 2 nos. 12" & 1 no. 8" SS pipelines

Client ⇒ **Viraj Agro Products Pvt.Ltd.**

Project Chemical Terminal at JNPT

Scope of work Detailed Engineering comprising of conceptual design, process, mechanical, piping, electrical, instrumentation, civil engineering for the storage terminal with 12 nos. MS Cone Roof Tanks & 1 no. SS Cone Roof Tank & pipeline engineering, project management for 8" SS Dockline

Client	⇒ Sealord Containers Ltd
Project	Chemical Terminal at Mahul
Scope of work	Detailed Engineering comprising of process, piping , electrical, instrumentation & civil engineering for storage terminal with 13 nos. of MS Cone Roof Tanks & pipeline engineering for 2 nos. 12” CS Docklines
Client	⇒ G.R.Engg Works Ltd.
Project	Mounded LPG Storage at Usar
Scope of work	Piping, Electrical & Instrument Engineering for 3 nos. Mounded LPG Bullets
Client	⇒ Cummins India Ltd.
Project	Quantum Test Cell Facility at Pune
Scope of work	Process & Piping Engineering
Client	⇒ United Storage & Tank Terminals Ltd.
Project	Chemical Terminal at Kandla
Scope of work	Process, Piping & Instrument Engineering of Terminal comprising of 13 nos. MS Cone Roof Tanks
Client	⇒ Indian Oiltanking Ltd.
Project	POL Pipeline at JNPT
Scope of work	Technical Consultancy Services comprising of pipeline route survey, pipeline layout for 2 nos. 24” Docklines for white and black oils.

Client	⇒ G.R. Engineering Works Ltd.
Project	LPG Storage Facility – MRPL2
Scope of work	Civil, Piping, Electrical & Instrumentation Engineering for 1 no. LPG Sphere
Client	⇒ Bharat Petroleum Corporation Ltd.
Project	POL Bunkering Pipeline at JNPT
Scope of work	Consultancy Services comprising of pipeline layout and civil / structural design for pipe supports.
Client	⇒ Adani Port Ltd.
Project	Chemical Storage Terminal & Jetty Pipeline at Mundra, Gujarat
Scope of work	Commissioning Assistance comprising of precommissioning and commissioning activities for storage terminal and pipelines.
Client	⇒ Adani Port Ltd
Project	POL Terminal Ph-II at Mundra, Gujarat
Project cost	Rs.300 million
Scope of work	Detailed Engineering of process, mechanical, piping electrical, instrumentation for storage Terminal having 6 nos. MS Cone Roof Tanks & 2 nos. MS Floating Roof Tanks & pipeline engineering for 2 nos. 24"Ø / 1 no. 16" Ø Docklines

Client	⇒ Adani Port Ltd
Project	Edible Oil Terminal at Mundra, Gujarat
Scope of work	Detailed Engineering comprising of process, mechanical, piping, electrical, instrumentation, civil engineering for storage terminal with 9 nos. MS Cone Roof Tanks with 3 nos. having heating arrangement
Client	⇒ Sharp Tanks & Structural (P) Ltd
Project	LPG Bottling Plant at Wai, Maharashtra
Scope of work	Preparation of P&I, Piping layout
Client	⇒ Viraj Agro Products (P) Ltd
Project	12" CS Pipeline from Jetty to Terminal at JNPT
Scope of work	Detailed Engineering comprising of route study, pipeline design and layout for 12" Pipeline and specifications for pigging system
Client	⇒ G.R. Engineering Works Ltd
Project	LPG Propylene Horton Spheres – IOCL Mathura
Scope of work	Detailed Engineering comprising of Piping, Electrical, Instrumentation & General Civil Works for the 3 nos. Horton Spheres
Client	⇒ G.R. Engineering Works Ltd
Project	LPG Mounded Storage Vessels – GPC, Gandhar
Scope of work	Detailed Engineering comprising of Piping, Electrical, Instrumentation & General Civil Works for the 3 nos. LPG Mounded Bullets

2. Process Plants

Client	⇒ Vinati Organics Ltd.
Project	Detailed Engineering comprising of process, mechanical, piping and instrumentation for Debottlenecking of Distillation Section
Plant	Isobutyl Benzene Plant, Mahad, Maharashtra
Client	⇒ Apar Ltd.
Project	Detailed Engineering comprising of process, mechanical, electrical, instrumentation and civil engineering for expansion of reactor, drier sections and utilities.
Plant	HSR Plant, Mahul, Mumbai
Client	⇒ VVF Ltd.
Project	Detailed Engineering comprising of piping layout for Distillation Section
Plant	Fatty Acid Plant , Sion

3. Pre Project Consultancy

Client	⇒ ATV Projects Ltd.
Project	Cost Estimate for Naphtha Storage
Client	⇒ ATV Projects Ltd.
Project	Cost Estimate for LPG Storage & Bottling Facilities
Client	⇒ Bharat Petroleum Corporation Ltd.
Project	Route Study for 2 nos. 24"Ø Pipeline from Proposed New Jetty ~ Terminal @ JNPT
Client	⇒ JNPT Liquid Chemical Berth User's Association
Project	Report for Additional Pipelines Laying @ JNPT

In Association with M/s. Well flow International

- HRD in association with M/s. Well flow international has promoted the USRD (Ultra Short Radius Drilling) programme in India. The ONGC project for Assam & Mehsana is in progress and HRD gives the complete well testing, drilling services and personnel for the USRD.

In Association with M/s. Geodynamics

- HRD in association with M/s. Geodynamics has promoted the Geodynamics, Infrasonic Passive Differential Spectroscopy programm in India. We are also involved in the promotion of IPDS in Libya & African countries.

In Association with M/s. Trenergy & M/s. Prize Petroleum

- HRD in association with M/s. Trenergy & M/s. Prize Petroleum has successfully helped with the Tendering & data calculations so as to enable M/s. Trenergy & M/s. Prize awarded the OMF (Offshore Marginal Field) from ONGC. HRD is presently working with M/s. Trenergy to develop 3 marginal fields located in Western offshore, India.

In Association with M/s. Tierra Alta Artificial System

Tierra Alta is a rapidly expanding distributor of Artificial Lift Solutions to the global oil & gas community. We have various strategically located sales, distribution and service centers in the global marketplace. Whether you are looking for a single downhole pump replacement, an entire pumping system or a comprehensive artificial lift solution, Tierra Alta's experienced, knowledgeable staff is ready to assist you in achieving your goals.

- ***Progressing Cavity Pumps (PCP)*** Tierra Alta is the only PC Pump manufacturing company with complete control over the entire manufacturing process, including stator injection, rotor peeling and chroming, drivehead manufacturing and everything in between. The manufacturing equipment is one of a kind, while the entire design and manufacturing process is controlled by a rigorous standard of quality.
- ***Electric Submersible Pumps (ESP)*** Through 2007, Tierra Alta will introduce full scale ESP manufacturing capabilities to the rapidly expanding global marketplace. These capabilities will include full manufacturing of all related components including impellers, diffusers, bearing and seal assemblies, as well as the entire suite of electrical components from the electric motor, cable and accessories to variable frequency drives (VFD) on surface.

- **Reciprocating Rod Lift** Tierra Alta is a supplier of equipment for Reciprocating Rod Lift applications. With many different options for surface and downhole equipment, we can help you properly design a system from a detailed product offering to ensure maximum success and efficiency.
- **Accessories** Tierra Alta is proud to be associated with some of the most well respected companies in the global oilfield supply business. From coiled rod to pipe valves and fittings, Tierra Alta is ready to work with you to ensure project success in all corners of the globe. We understand the importance of being properly prepared especially in remote areas of the world, where organization saves money.