INSTITUTO MEXICANO DEL PETRÓLEO

Talent Development Directorate (TDD)

March 17th, 2017
Objective of the TDD

Recruit, develop, evaluate and generate actions to retain the talent in the Institute.

Design and implement learning solutions to improve staff’s skills and the competitiveness of the Institute.

Provide services in developing and managing talent to PEMEX and the oil industry.

Managing the knowledge in the IMP by protecting its intellectual property, facilitating the information flows and giving access to the internal staff to the state of the art of science and technology.

Carry out the training of highly specialized human resources for the oil and gas industry.

Through
The strategy for talent development of the TDD, focuses on strengthening the training of highly specialized human capital in the hydrocarbon sector, leveraging and aligning the Strategic Training Program on Energy Issues (Programa Estratégico de Formación de Recursos Humanos en Materia Energética, PEFRH).

What we want:

Being the leader in the hydrocarbon sector for the development of technical talent in the industry, for the excellence of our programs and their alignment with the needs of the sector.

To achieve:

The closure of the gaps of technical talent and training specialized human resources in technical disciplines related to the oil industry throughout its value chain, which are strategic for the IMP and the country.
TDD performs the transfer of specialized knowledge through three main areas of expertise:

- **Knowledge management**
  - Design and implement learning solutions that build and improve the skills and knowledge required, increase the potential of staff and develop a culture for the formation and strengthening of their competences.
  - Protecting Intellectual Property. Capitalizing knowledge and transform it into a competitive advantage. Apply it in the processes of the institution.

- **Talent management**
  - Attract, recruit, select, develop, evaluate and retain talent, in order to have the human skills required by the institution to achieve its objectives and goals through the integral development of the staff.

- **Learning and development**
  - Key knowledge transfer to the hydrocarbons sector
  - Generation of solutions for the hydrocarbon sector
Our solutions

**Solutions focused on** giving answer to the talent management, technology and businesses from and to hydrocarbons sector.

Identification of technical and priority needs and challenges

Definition of potential solutions

Agreement of potential solutions

Deployment of solutions (pursuit and control)

Satisfaction of services and later technical assistance

Integration of a multidisciplinary team for the design of the solution

Revision and validation of potential solutions with our clients

Deployment of our talent, infrastructure and equipment for developing and executing the solution

We evaluate our services impact and do long term alliances

**Solutions focused to** developing competencies and technical capacities of the personnel in the hydrocarbons sector.

Identification of customer needs

Identification of key positions

Development of the Competencies Map and Dictionary

Identification of the competencies profile

Desing and development of question banks

Definition of technical and behavioral gaps

Identification and validation of key positions

Identification and definition of competences per speciality

Allocation of each competence to required domain level

Elaboration of technical question banks

Evaluation of skills and attitudes

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Solutions for Talent and Business management

IMP© Map of Specialized Technical Services

Learning and Development | Talent/Businesses Management | Knowledge Management
--- | --- | ---
Integral Program for Formation of New Talents to Mexican Oil Industry | Mentor and Coaching Processes | Studies for identifying Best Practices and Technologies for the Oil Industry
Instructors certification | Integral Study of Technical Talent Capacities in Critical Areas of Hydrocarbon Sector | Technological and talent diagnostics
Experiencial Learning “On site training” | Analysis and Improvement of Businesses Process and Canvas Businesses Model | Technological Route Maps for Hydrocarbon and Energy Sector
Technical competences determinations | Operational Performance Metrics and Root Cause Analysis | Technological Knowledge and Scientific Research Repositories
Competences certification for industrial security and environmental protection audits of hydrocarbon sector | Technical Carreer and Specialization Routes | Design and Development of Expert Networks
 | ISO-9000-14000-18000 Integrated Systems Implementation Workshops | Competitive Intelligence (experts in industry, companies, universities)
 |  | Design and Development of Technological Strategies
Training solutions in the hydrocarbon sector

**IMP training programs**

Learning and development

<table>
<thead>
<tr>
<th>Business lines</th>
<th>Certificate in Reservoir oil Characterization Seismic</th>
<th>Certificate in modeling and characterization of fractured carbonate reservoirs</th>
<th>Certificate of petrophysical formation evaluation</th>
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</thead>
<tbody>
<tr>
<td>Advanced level</td>
<td>Certificate in risk management and pipeline integrity</td>
<td></td>
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<tr>
<td>Medium level</td>
<td>Certificate in management of technology projects</td>
<td>Certificate in Technology Management in the Oil Industry</td>
<td>Training and certification for oil industry consultants</td>
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<td></td>
<td>Certificate in best practices for safe and sustainable operation of the Mexican oil industry</td>
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<tr>
<td>Basic level</td>
<td>Update program for junior engineers geosciences and petroleum engineering</td>
<td>Certificate in management skills for middle managers in the oil industry</td>
<td>Workshop: Business Knowledge of Oil Sector in the National Context</td>
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<td></td>
<td>Induction Program for petroleum engineers and geosciences</td>
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<td>Training program - operational safety inspectors and industrial hydrocarbon sector</td>
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**Learning solutions focused on the oil industry (courses)**

<table>
<thead>
<tr>
<th>Business Lines</th>
<th>Advanced Level</th>
<th>Medium Level</th>
<th>Basic Level</th>
</tr>
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<tbody>
<tr>
<td><strong>Learning and talent development</strong></td>
<td>Geological modeling of carbonate reservoirs</td>
<td>Petrophysical modeling of carbonate reservoirs</td>
<td>Improved recovery processes in carbonate reservoirs</td>
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<td></td>
<td>Petroleum geology in carbonate reservoirs</td>
<td>Geostatistical modeling of carbonate reservoirs</td>
<td>Flow assurance</td>
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<tr>
<td><strong>Knowledge Management</strong></td>
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<tr>
<td><strong>Management support model SSPA (SSPA mixed and Commissions)</strong></td>
<td>Pipelines methods of inspection and monitoring</td>
<td>Technological innovation and its impact on oil production</td>
<td>Technology scaling and deployment in the oil industry</td>
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<tr>
<td></td>
<td>SSPA induction system - PEMEX and general knowledge of the best 12 international practices (12MPI)</td>
<td>technological challenges in ensuring the integrity of Pipelines</td>
<td>Portfolio management of technology projects to generate value to the oil industry</td>
</tr>
<tr>
<td></td>
<td>Criticality management by processes (security)</td>
<td>OTS based training simulators</td>
<td>Managerial effectiveness for middle management in the oil industry</td>
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<tr>
<td></td>
<td></td>
<td>Learning and development program for plant waste conversion operators</td>
<td>Leadership for middle management in the oil industry</td>
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<td>Effective audits for compliance with the SSPA system</td>
<td>Containment program and operational reinforcement for engineers on duty</td>
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<td>Incident research and analysis</td>
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<td>Workshop: General concepts for enabling technologies.</td>
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**IMP learning solutions**

*not exhaustive*
Specialized solutions

Technology Management in the Petroleum Industry:
Aimed at strengthening the knowledge in innovation, scaling and commercialization of technologies from/to the petroleum industry.

Risk Management and Pipelines Integrity:
Its purpose is to know methods of inspection, monitoring, analysis and evaluation of the mechanical integrity, applying technologies developed by the IMP, as Electromagnetic Technology Pipeline Inspection (TIEMS) and inhibitors, among others.

Petrophysical Formation Evaluation:
It provides concepts and work flows that allows for the petrophysical evaluation of subsurface formations, to build a detailed model of the sites under study.

Modeling and Characterization of Mexican Fractured Carbonate Reservoirs:
Its objective is to identify the characteristics and challenges of fractured carbonate reservoirs, which allow participants to design optimal exploitation scenarios, reserve estimation and optimization of the exploitation of fractured mature fields.

Knowledge Production Processes and Industrial Transformation for the Petroleum Industry:
The program is aimed at executives interested in acquiring knowledge about the value chain of industrial transformation processes and the main higher value products.

Training and Evaluation for Certification of Instructors for the Petroleum Industry:
Aimed at training internal instructors which are able to share their competencies through acquiring knowledge, development of skills and attitudes corresponding to a professional instructor profile in the hydrocarbons sector.

Training and Certification for the Petroleum Industry Consultants:
It aims to equip participants with processes and theoretical and practical tools, to enable them to carry out consulting services to companies, public institutions and service firms by advising managers and executives, contributing to the improvement and taking actions that contribute to systemic and ongoing effectiveness and efficiency of organizations.
Specialized solutions

Curse - Workshop
Business Knowledge of Oil Sector in the National Context©

Objective:
To understand the value chain of the national oil industry, its technological challenges and risks in the current context of the energy reform.

Addressed to:
- Specialists that require a general understanding of the current dynamics of the hydrocarbon sector and its key processes.
- Decision makers in the various disciplines of the oil and gas industry.
- Staff members responsible for the definition of investment projects and strategic planning.
- Specialists willing to understand current oil and gas business schemes.

Develop skills:
After completing the course, participants will be able to understand and analyze the critical processes of the hydrocarbon sector and its technical challenges and risks.

It is comprised of 6 modules.

Duration: 40 contact hours (5 days), 8 Daily hours – total immersion.

Price per person: 15,000.00 Mexican pesos (discount for groups)

Taught by industry experts. Include visits to labs.
TDD has the infrastructure to carry out technology intelligence activities.
Technology intelligence

Technology roadmaps can cover:
• Key technologies
• Technology developers
• Technical and R&D centers
• Researchers
• Case studies and best practices
• Pros and cons
• Technology maturity and competitive position

Roadmaps address specific purposes so that they are designed to meet the specific customer needs.

Technology evaluation and selection

Technologies are evaluated and selected on the basis of specific needs.

• Technical specifications (Impact – deployment feasibility – value)
• Recommended actions (adapt, test, acquire, discard)

• Recommendations are based on experts' criteria, and information provided by suppliers.
One of the key branches is postgraduate studies, whose programs are aligned with the main specialties required by the hydrocarbon industry and focused on developing technical talent with the skills that the industry needs.

**Qualification levels**
- 1 Certificate
- 2 Advanced diploma
- 3 Master
- 4 Doctorate

**Methodology**
- Carry out applied research to develop technologies and products to the hydrocarbon industry.
- On site practices and access to IMP’s specialized labs to perform research and tests.
- Flexible academic program with the possibility of carry out research and academic visits in national and international institutions.
To develop their learning and development programs, TDD has 21 training centers at different locations nationwide and one strategic analysis laboratory in the headquarters.

**Central Region**
- 4 Center entities:
  - Distrito Federal
  - Guanajuato
  - Hidalgo
  - Puebla

**South Region**
- 9 Center entities:
  - Tabasco
  - Veracruz
  - Chiapas
  - Oaxaca

**North Region**
- 7 Center entities:
  - Tamaulipas
  - Nuevo León
  - Veracruz

**Marina Region**
- 1 Center
  - Campeche

**MARINA REGION**
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**MARINA REGION**
1 Center
- Campeche
Information reservoir

Covers a broad range of scientific, technological and business information in the oil industry, the unique in Mexico.

- 53,199 volumes
- 22 Information banks
- 1,533 periodicals titles (print and online; excluding effect)
- 5,481 domestic and foreign theses
Current challenges in learning and development

We are currently developing capabilities for accelerated training and certification of skills in the hydrocarbon sector through simulators and blended learning.

Technological teaching resources:

- 3D animations - Videos
- Training Simulators (OTS)
- Prototypes plant and equipment (physical models)
- E-books
- E-learning
- Case studies

Special facilities for the use of simulators learning environments (alarms, equipment, plants, etc.)

Real scale plants, equipment and facilities (Wells, pilot plants, emergency response centers)

Accelerated Learning Laboratory (Training centers)

Comprehensive systems management information technical talent (LMS – LMC)
Challenge - Certification of technical skills in the hydrocarbon sector

- To develop competency standards for critical skills and occupations in the oil sector at both technical and operational level.
- To develop high-level programs to close technical gaps.
- To design an accreditation and certification program for instructors.
- To develop critical competencies in the hydrocarbon sector.
The Center of Excellence for the Certification and Evaluation of Competencies of the Mexican Petroleum Institute will be an entity accredited by CONOCER to train, evaluate and certify the labor competencies of the people.
The IMP will support and promote the competitiveness and educational development of our country, based on the strengthening of people’s competencies.

The Competence Standards describe, in terms of results, the set of knowledge, skills, skills and attitudes that you require to perform an activity in the labor, social, government or educational field and is the benchmark that allows you to evaluate your competencies and in your case, Get a certificate to back it up.
Likewise, there will be an increase in the certifications required by the Energy Sector, according to the specific needs derived from the energy reform and the regulatory provisions of Pemex and regulatory bodies such as: CNH, ASEA, CRE, CENAGAS.

Initial Development Potential

Initially, the Entity has the potential to support approximately 20 projects in the delivery of competency-based learning and development programs, with the aim of certifying Sector staff.

Entities such as: PEMEX, SAT, CRE, COMCESA, ASEA, GOVERNMENT OF THE STATE OF TABASCO, CENAGAS, SEMARNAT, will benefit
In order to develop its work, the Entity will be based on competition standards endorsed by CONOCER itself, mainly in the Energy Sector specialties, in the Hydrocarbons Subsector covering the value chain that includes: Upstream, Midstream and Downstream.

The IMP will develop standards of competencies denominated of company, with the purpose of maintaining the intellectual property of the same ones.

Arquitectura de la Cadena de Valor de Hidrocarburos en México
Fuente: Prospectiva de Talento del Sector Energía: Volumen 1