

TRAINING TITLE

SEISMIC ACQUISITION PROJECT MANAGEMENT

Training Duration

5 days

Training Venue and Dates

Ref. No. PMI091	SEISMIC ACQUISITION PROJECT MANAGEMENT	5	03-07 Feb. 2025	\$5,500	Abu Dhabi, UAE
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In any of the 4 or 5-star hotels. The exact venue will be informed later.

Training Fees

- \$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch

Training Certificate

Define Management Consultants Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

This training program is designed to provide participants with the essential skills and knowledge needed to manage seismic acquisition projects effectively. Seismic acquisition is a critical process in various industries, especially in oil, gas, mining, and environmental surveying. The program focuses on the core aspects of managing seismic data collection, from planning to execution and analysis.

TRAINING OBJECTIVES

By end of course participants will be able to understand

- Understand seismic fundamentals as they affect the interpretation of seismic data
- Understand the concepts involved in imaging geologic structures and properties with seismic data
- Comprehend the parameters that can seriously affect seismic data quality, costs and interpretation accuracy
- Determine if seismic data has been recorded and processed in a technically correct manner for subsurface objectives
- Apply quality assurance steps in acquisition and processing

WHO SHOULD ATTEND?

- **Project Managers:** Individuals responsible for overseeing seismic projects from initiation to completion.
- **Field Supervisors:** Those directly managing field crews and operations during seismic acquisition activities.
- **Geophysicists and Geologists:** Professionals involved in interpreting seismic data and ensuring that acquisition processes meet scientific requirements.
- **Operations and Logistics Managers:** Those in charge of managing the operational and logistical aspects of seismic fieldwork.
- **Safety Officers:** Professionals focusing on health, safety, and environmental protection during seismic surveys.
- **Engineers (Mechanical, Electrical, and Civil):** Engineers responsible for the technical aspects of seismic equipment and operations.
- **Consultants and Contractors:** External experts or service providers working on seismic acquisition projects.

TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

COURSE PROGRAM

1: Introduction to Seismic Acquisition and Processing

- Understand seismic fundamentals as they affect the interpretation of seismic data
- Understand the concepts involved in imaging geologic structures and properties with seismic data
- Comprehend the parameters that can seriously affect seismic data quality, costs and interpretation accuracy

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- Determine if seismic data has been recorded and processed in a technically correct manner for subsurface objectives
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2: Seismic Wave Propagation

- Understand the fundamentals of wave propagation to better appreciate the nature of seismic signals and noise
- Develop the concept of seismic velocity and why it controls arrival times and event patterns recorded at the surface
- Define stress, strain and the elastic parameters of rock and their relationship to seismic velocity, ray bending and diffraction

3: Seismic Reflection Principles

- Understand the process of seismic reflection
- Develop the concepts of seismic wavelength and how it affects vertical and lateral resolution
- Define the seismic wavelet, earth reflectivity and the convolutional model
- Learn how spherical divergence, absorption and scattering affect seismic reflection amplitude and resolution

4: Signal Analysis

- Develop a working knowledge of temporal sampling, spatial sampling and aliasing which are critical for seismic acquisition design and processing
- Identify aliased signals in data and learn the steps to avoid acquisition and processing problems
- Understand the relationship between wavelet phase and the fidelity of seismic data

5: Seismic Acquisition Principles

- Understand the effects of seismic acquisition on seismic processing and interpretation
- Understand basic field techniques and parameters
- Know how to identify various types of noise on field recordings
- Learn the steps of the seismic acquisition business process

6: Survey Design

- Learn how to set the goals for seismic acquisition based on the requirements of subsurface objectives
- Calculate parameters that match survey requirements
- Learn how to avoid costly mistakes when specifying seismic acquisition

7: Acquisition Implementation

- Learn of the choices between seismic sources and their wavelet characteristics
- Understand the importance of accurate source/receiver positioning
- Develop an understanding of quality control and testing procedures and how they are used to ensure survey success

8: Data Processing Factors

- Seismic reflections distort true geologic structure and require careful conversion from time to depth to depth to avoid errors
- Data processing is a powerful tool that can enhance data quality or, if misused, can destroy its fidelity and value
- Data processing can be stretched beyond theoretical and practical limits

Module 9: Prestack Analysis and Signal Corrections

- Final results from processing depend on choices made in this early stage of processing
- Suppressing noise and multiple interference affect image quality
- Wavelet shape and stability affect signal fidelity and interpretability of seismic data
- Skill and knowledge of seismic interpreters can improve the over-all results of data processing
- Proper static corrections improve reflection quality and are required for accurate structural interpretation
- Near-surface statics can produce sub-surface effects that can be mistaken for true structure
- Static correction and velocity analysis are linked and must be determined in a recursive fashion

10: Velocity and Velocity Analysis

- Velocity is the most important factor in determining image quality
- Velocity has different definitions depending on how it is measured and how it is used
- Seismically derived velocities are highly dependent on methods and assumptions
- Learn how velocity analysis is accomplished

11: Seismic Migration / Processing

- Learn the purpose and principles of seismic migration and the critical role it plays in both acquisition design and processing
- Understand geometric rules for seismic migration
- Understand the migration process that drives accurate imaging of subsurface objectives

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- Imaging controls final accuracy of structure maps
- Cost/quality trade-offs can approach those of seismic acquisition
- Modern 3D imaging is fundamentally an interpretive process
Imaging drives quantitative extraction of subsurface properties

12: 3D Imaging

- Understand the difference between 3D migration techniques and where each should be used appropriately
- Choice of imaging technique can have significant impact on cost, timing and quality of a 3D seismic project

13: Processing Strategies & Pitfalls

- Mistakes cost time and money
- Processing pitfalls lower data quality and introduce artifacts that limit seismic interpretation and reduce exploration success

14: Specialized Technologies: AVO / Attributes / Inversion / Multi-component: Acquisition/Processing Issues

- These techniques can provide information that reduces drilling risk
- Special acquisition and processing procedures are required to optimize the results from these techniques

NOTE:

Pre-& Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.

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