Choice of Acquisition Parameters in 2D, 3D Seismic Reflection

Introduction

Seismic reflection surveys, a crucial tool in hydrocarbon exploration and reservoir characterization, utilize seismic waves to image subsurface structures

The choice of acquisition parameters plays a critical role in the success of seismic surveys, influencing data quality, resolution, and cost-effectiveness

This comprehensive 5-day professional training course will equip you with the essential knowledge and skills to effectively select acquisition parameters for 2D and 3D seismic reflection surveys, ensuring optimal data acquisition for the specific exploration objectives

Course Objectives

By the end of this course, you will be able to:

• Understand the fundamental principles of seismic reflection surveys and the impact of acquisition parameters on data quality

• Identify and classify various acquisition parameters for 2D and 3D seismic reflection surveys

• Apply seismic survey design principles to select appropriate acquisition parameters for specific geological settings and exploration objectives

• Evaluate the trade-offs between acquisition parameters, data quality, and cost-effectiveness

• Stay updated on the latest advancements and techniques in seismic acquisition parameter selection

Course Agenda

Day 1: Introduction to Seismic Reflection Surveys and Acquisition Parameters

• Delve into the history, principles, and applications of seismic reflection surveys in hydrocarbon exploration

• Explore the different types of seismic reflection surveys, including 2D, 3D, and 4D surveys

• Understand the concept of seismic waves and their propagation through subsurface layers

• Discuss the impact of acquisition parameters on seismic wave propagation, reflection patterns, and data quality

Day 2: Acquisition Parameters in 2D Seismic Reflection Surveys

• Identify and classify various acquisition parameters for 2D seismic reflection surveys, including source type, source array configuration, receiver spacing, and line spacing

• Analyze the impact of source type on seismic wave characteristics and data quality

• Evaluate the trade-offs between source array configuration, receiver spacing, and data resolution

• Design 2D seismic surveys for specific geological settings and exploration objectives

Day 3: Acquisition Parameters in 3D Seismic Reflection Surveys

• Explore the principles and advantages of 3D seismic reflection surveys over 2D surveys

• Identify and classify various acquisition parameters for 3D seismic reflection surveys, including source grid configuration, receiver line spacing, and shot spacing

• Analyze the impact of source grid configuration on data fold and illumination patterns

• Evaluate the trade-offs between receiver line spacing, shot spacing, and data resolution

• Design 3D seismic surveys for specific geological settings and exploration objectives

Day 4: Practical Considerations and Case Studies

• Discuss practical considerations in selecting acquisition parameters, including cost-effectiveness, environmental constraints, and logistics

• Analyze real-world case studies demonstrating the application of acquisition parameter selection in 2D and 3D seismic surveys

• Evaluate the success of seismic surveys based on data quality, image resolution, and exploration objectives

• Discuss the challenges and opportunities of acquisition parameter selection in various exploration scenarios and geological settings

Day 5: Advanced Acquisition Parameters and Future Trends

• Explore advanced acquisition parameters, such as wide-azimuth seismic surveys and multi-component

seismic surveys
- Discuss the role of seismic survey design software in optimizing acquisition parameters
- Stay updated on the latest advancements and techniques in seismic acquisition parameter selection and survey design
- Prepare for future trends in seismic acquisition technology and its impact on parameter selection

Who Should Attend

This course is designed for:
- Geoscientists and engineers involved in seismic acquisition design and data processing
- Project managers and decision-makers responsible for seismic surveys and data quality
- Seismic contractors seeking to enhance their survey design capabilities and data quality management practices
- Students and professionals interested in pursuing a career in seismic acquisition and survey design

Course Benefits
- Develop a comprehensive understanding of seismic reflection survey principles, acquisition parameters, and their impact on data quality
- Gain hands-on experience in selecting acquisition parameters for 2D and 3D seismic surveys using industry-standard tools
- Enhance your ability to design seismic surveys that meet specific exploration objectives and optimize data quality within budget and schedule constraints
- Stay updated on the latest advancements and techniques in seismic acquisition parameter selection and survey design technologies
- Apply your knowledge to plan and execute seismic surveys that effectively image subsurface structures and identify potential hydrocarbon reservoirs