

2D and 3D Seismic Interpretation Training Course

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Overview

2D and 3D Seismic Interpretation Training Course is a one-week intermediate course for geophysicists, exploration geoscientists, development geologists, subsurface teams, and technical reviewers who leave with a 2D/3D Seismic Interpretation and Mapping File. Participants practice 2D and 3D seismic interpretation, seismic horizon and fault interpretation, seismic stratigraphic interpretation, seismic attribute interpretation, and seismic time-depth conversion. The course starts from processed seismic data and keeps geological reasoning, uncertainty, and interpretation quality central. Agile Leaders Training Center presents applied seismic interpretation and mapping.

Who Should Attend

- Functions responsible for interpreting seismic lines, volumes, horizons, and faults
- Exploration teams responsible for structural closures, stratigraphic features, and prospect maps
- Development teams responsible for field-scale structural and depositional frameworks
- Subsurface functions integrating seismic interpretation with wells and geological evidence
- Technical assurance teams responsible for interpretation review, uncertainty, and traceability

The course assumes participants use processed seismic sections and basic reflection terminology, and it leaves out acquisition design, processing parameter selection, production machine-learning development, and reserves certification.

Departments and Industries

The course supports departments and industries that interpret reflection seismic data for subsurface decisions.

- Oil and gas exploration, appraisal, and field development
- Geophysical services and subsurface consulting
- Geothermal, carbon storage, and underground-resource projects
- Exploration geophysics, development geology, and reservoir teams
- Technical assurance, subsurface data, and project evaluation functions

Learning Objectives

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

- Analyze 2D lines and 3D volumes for interpretation readiness
- Build traceable horizon, fault, and well-tie interpretations
- Apply structural and seismic-stratigraphic interpretation methods
- Use attributes and maps to evaluate geological features
- Evaluate time-depth relationships and interpretation uncertainty
- Build an integrated prospect and interpretation review

Course Agenda

Day 1: Establish Interpretation Foundations

- Processed Seismic Data Orientation and Interpretation Readiness Checklist
- Polarity, Phase, Frequency, Resolution, and Display Convention Guide
- Reflection Character, Continuity, Amplitude, and Termination Framework
- Synthetic Seismogram and Seismic-Well Tie Review Sheet
- 2D Line, 3D Inline, Crossline, and Time-Slice Navigation Map

Day 2: Interpret Horizons and Faults

- Seed Selection and Seismic Horizon Picking Method
- Line Intersection, Mistie, and Loop-Closure Quality Check
- Fault Evidence, Throw, Dip, and Termination Interpretation Matrix
- Fault Framework, Correlation, and Fault-Block Construction Workflow
- Horizon-Fault Relationship and Interpretation Confidence Register

Day 3: Analyze Structure and Stratigraphy

- Fold, Fault, Unconformity, and Structural Style Analysis
- Reflection Termination and Seismic Sequence Boundary Method
- Onlap, Downlap, Truncation, and Toplap Interpretation Guide
- Depositional Geometry, Channel, Fan, and Carbonate Feature Map
- Structural and Stratigraphic Alternative Interpretation Board

Day 4: Build Attributes, Maps, and Depth Views

- Amplitude, Coherence, Curvature, and Dip Attribute Selection Matrix
- Time Structure, Isochron, and Attribute Map Construction Workflow
- Contour Quality, Closure, Spill Point, and Area Review Sheet
- Velocity Source and Seismic Time-Depth Conversion Concept Map
- Well Control, Map Integration, and Uncertainty Envelope Register

Day 5: Practice Integrated Seismic Interpretation

- Suggested Exercise: Tie Horizons across a 2D Seismic Grid
- Suggested Exercise: Build a 3D Fault and Horizon Framework
- Suggested Exercise: Interpret Structural and Stratigraphic Features
- Suggested Exercise: Review Attributes, Maps, and Depth Uncertainty
- Capstone Exercise: Complete the 2D/3D Seismic Interpretation and Mapping File

Practical Exercises

The course uses suggested activities to convert seismic evidence into documented geological interpretations.

- Suggested activity: orient processed 2D lines and 3D slices, confirm polarity, and record interpretation readiness.
- Suggested activity: pick horizons and faults, resolve intersection misties, and close interpretation loops.
- Suggested activity: compare structural and stratigraphic alternatives using reflection terminations and attributes.
- Suggested activity: construct time maps, test closures, integrate well control, and record uncertainty ranges.

FAQs

Who suits 2D and 3D seismic interpretation training, and what does it assume?

2D and 3D seismic interpretation training suits geophysicists, geologists, subsurface teams, and technical reviewers. It assumes familiarity with processed seismic sections and basic reflection terminology.

How does 2D and 3D seismic interpretation differ from acquisition and processing training?

2D and 3D seismic interpretation extracts geological meaning from processed lines and volumes. Acquisition and processing training concentrates on survey geometry, field records, signal conditioning, velocity processing, stacking, migration, and image quality.

How are horizons and faults interpreted in seismic data?

Horizons and faults are interpreted by combining reflection continuity, terminations, character, amplitude, intersections, time slices, attributes, well ties, structural relationships, and geological plausibility while recording uncertainty and alternatives.

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Why are line ties and loop closure important in 2D seismic interpretation?

Line ties and loop closure expose horizon or fault misties at intersections and help maintain a consistent three-dimensional geological model from separate two-dimensional seismic images.

How are seismic time maps converted to depth?

Seismic time maps are converted using a suitable velocity model tied to available well and seismic information. The method must state velocity sources, assumptions, calibration, spatial variation, uncertainty, and limits of the resulting depth view.

Conclusion

Participants take back a 2D/3D Seismic Interpretation and Mapping File linking data readiness, well ties, horizons, faults, stratigraphy, attributes, maps, depth concepts, and uncertainty. It changes isolated picks and displays into a traceable geological interpretation. The file supports exploration reviews, field studies, prospect mapping, alternative testing, and technical assurance.

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