

AVEVA PI System for Oil & Gas

COURSE CONTENT

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About Multisoft

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About Course

AVEVA PI System for Oil & Gas Training provides industry-oriented knowledge of managing and utilizing real-time operational data across oil & gas facilities. The program combines PI Data Archive, Asset Framework, PI Vision, DataLink, analytics, Event Frames, and administration concepts with practical applications involving wells, rotating equipment, pipelines, storage systems, and processing assets. Participants gain experience in transforming raw process information into contextualized dashboards, operational KPIs, equipment insights, and event-based information that can support production, operations, maintenance, and reliability activities.

Module 1: Introduction to AVEVA PI System and Oil & Gas Data

- ✓ Introduction to operational data infrastructure
- ✓ Role of real-time data in oil & gas operations
- ✓ Overview of AVEVA PI System
- ✓ PI System capabilities and terminology
- ✓ Operational Technology (OT) data fundamentals
- ✓ Time-series data concepts
- ✓ Sources of oil & gas operational data
- ✓ From field measurements to operational intelligence
- ✓ Typical PI System use cases across upstream, midstream, and downstream operations

Module 2: AVEVA PI System Architecture

- ✓ Understanding PI System architecture
- ✓ Major PI System components
- ✓ PI Data Archive
- ✓ PI Asset Framework
- ✓ PI Vision
- ✓ Data acquisition layer
- ✓ Interfaces and connectors
- ✓ PI Buffer Subsystem
- ✓ PI System Management Tools
- ✓ Data flow through the PI infrastructure
- ✓ Distributed PI System considerations

- ✓ Understanding client-server communication

Module 3: PI Data Archive Fundamentals

- ✓ Purpose of PI Data Archive
- ✓ Understanding time-series storage
- ✓ PI Points and point attributes
- ✓ Point types
- ✓ Tag naming conventions
- ✓ Engineering units
- ✓ Point source concepts
- ✓ Instrument tags
- ✓ Scan classes
- ✓ Exception reporting
- ✓ Compression concepts
- ✓ Snapshot and archived values
- ✓ Working with historical data
- ✓ Data retrieval concepts

Module 4: PI Points and Tag Configuration

- ✓ Creating and configuring PI Points
- ✓ Understanding essential point attributes
- ✓ Point source configuration
- ✓ Location attributes
- ✓ InstrumentTag configuration
- ✓ Scan configuration

- ✓ Exception deviation
- ✓ Compression deviation
- ✓ Compression minimum and maximum settings
- ✓ Digital states
- ✓ Timestamp handling
- ✓ Tag configuration practices for industrial environments
- ✓ Oil & gas tag organization considerations

Module 5: Data Acquisition, Interfaces, and Connectors

- ✓ Understanding industrial data acquisition
- ✓ PI Interfaces overview
- ✓ PI Connectors overview
- ✓ Connecting operational data sources
- ✓ Data acquisition from control and monitoring systems
- ✓ OPC-based data acquisition concepts
- ✓ Interface node architecture
- ✓ Scan-based versus event-based collection
- ✓ Data timestamps and synchronization
- ✓ Handling communication interruptions
- ✓ Interface status monitoring
- ✓ Data acquisition troubleshooting
- ✓ Considerations for remote oilfield and pipeline assets

Module 6: PI Buffering and Data Reliability

- ✓ Purpose of PI Buffer Subsystem

- ✓ Buffering architecture
- ✓ Data buffering during communication failures
- ✓ Store-and-forward concepts
- ✓ Maintaining data continuity
- ✓ Buffer queue concepts
- ✓ Monitoring buffering health
- ✓ Recovering data after connectivity interruptions
- ✓ Data reliability considerations for remote facilities

Module 7: PI Asset Framework (AF) Fundamentals

- ✓ Introduction to Asset Framework
- ✓ Asset-centric data organization
- ✓ AF databases
- ✓ Elements and attributes
- ✓ Element hierarchies
- ✓ Attribute configuration
- ✓ Data references
- ✓ Linking PI Points with AF attributes
- ✓ Categories
- ✓ Units of measure
- ✓ Enumerations
- ✓ Organizing operational assets
- ✓ Building meaningful asset structures

Module 8: Asset Modeling for Oil & Gas Operations

- ✓ Designing oil & gas asset hierarchies
- ✓ Enterprise, field, facility, and equipment structures
- ✓ Modeling wells and well groups
- ✓ Production facility modeling
- ✓ Separator representation
- ✓ Pump and compressor modeling
- ✓ Tank asset structures
- ✓ Pipeline and station structures
- ✓ Processing unit representation
- ✓ Equipment attributes and operating parameters
- ✓ Standardizing asset information
- ✓ Connecting asset attributes with operational tags

Module 9: AF Templates and Scalable Asset Configuration

- ✓ Introduction to AF templates
- ✓ Element templates
- ✓ Attribute templates
- ✓ Creating reusable equipment models
- ✓ Template inheritance concepts
- ✓ Standardizing similar assets
- ✓ Creating multiple assets from templates
- ✓ Updating template-based assets
- ✓ Naming patterns
- ✓ Consistent KPI definitions

- ✓ Template strategies for wells, pumps, compressors, tanks, and other repeating equipment

Module 10: PI Analysis and Operational Calculations

- ✓ Introduction to Asset Analytics
- ✓ Creating analyses
- ✓ Expression-based calculations
- ✓ Calculation scheduling
- ✓ Input and output attributes
- ✓ Derived operational parameters
- ✓ Conditional calculations
- ✓ Rolling calculations and aggregations
- ✓ Performance indicator calculations
- ✓ Operating limit evaluation
- ✓ Equipment efficiency calculations
- ✓ Production-related calculations
- ✓ Analysis status and troubleshooting
- ✓ Managing calculations across template-based assets

Module 11: Event Frames and Operational Event Monitoring

- ✓ Introduction to Event Frames
- ✓ Event-based versus continuous data analysis
- ✓ Event Frame templates
- ✓ Defining event start and end conditions
- ✓ Capturing contextual event information

- ✓ Event attributes
- ✓ Event severity and categorization
- ✓ Equipment shutdown events
- ✓ Process excursion events
- ✓ Compressor or pump trip scenarios
- ✓ Production interruption tracking
- ✓ Pipeline operating events
- ✓ Event duration analysis
- ✓ Comparing recurring operational events

Module 12: PI Vision and Operational Visualization

- ✓ Introduction to PI Vision
- ✓ Navigating the PI Vision environment
- ✓ Creating operational displays
- ✓ Searching PI Points and AF assets
- ✓ Adding real-time values
- ✓ Trends and historical visualization
- ✓ Gauges and indicators
- ✓ Tables and graphical symbols
- ✓ Multi-state visualization
- ✓ Asset-based displays
- ✓ Using collections
- ✓ Display navigation
- ✓ Monitoring equipment operating conditions
- ✓ Creating oil & gas operational dashboards
- ✓ Production monitoring displays

- ✓ Equipment performance visualization
- ✓ Event visualization

Module 13: Data Quality, Security, and PI System Administration

- ✓ Understanding PI System data quality
- ✓ Identifying missing and questionable data
- ✓ Bad-value handling concepts
- ✓ Timestamp issues
- ✓ Data gaps and communication failures
- ✓ Checking point status
- ✓ Basic PI System administration concepts
- ✓ PI identities and mappings
- ✓ Authentication concepts
- ✓ Access permissions
- ✓ Data Archive security
- ✓ AF security considerations
- ✓ Managing access according to operational roles
- ✓ System health monitoring
- ✓ Backup and recovery concepts
- ✓ Common PI System troubleshooting approaches

Module 14: AVEVA PI System Applications in Oil & Gas

Upstream Operations

- ✓ Well production monitoring
- ✓ Wellhead parameter visualization
- ✓ Production rate tracking
- ✓ Pressure and temperature monitoring
- ✓ Production surveillance
- ✓ Artificial lift equipment monitoring

Midstream Operations

- ✓ Pipeline operational monitoring
- ✓ Pump and compressor station monitoring
- ✓ Flow and pressure trend analysis
- ✓ Tank and terminal data visualization
- ✓ Operational event tracking

Downstream Operations

- ✓ Process unit monitoring
- ✓ Equipment condition visualization
- ✓ Operating parameter tracking
- ✓ Utility performance monitoring
- ✓ Process KPI dashboards
- ✓ Shutdown and excursion analysis

Operational Performance

- ✓ Production KPI monitoring

- ✓ Equipment availability tracking
- ✓ Downtime analysis
- ✓ Asset performance comparison
- ✓ Historical operating trend analysis
- ✓ Shift and operational reporting concepts

Module 15: Integrated Oil & Gas PI System Practical Project

- ✓ Defining an oil & gas operational scenario
- ✓ Identifying data sources and operational tags
- ✓ Planning PI Point structures
- ✓ Creating representative PI Points
- ✓ Designing the AF hierarchy
- ✓ Modeling facilities and equipment
- ✓ Creating reusable AF templates
- ✓ Mapping operational data to assets
- ✓ Configuring calculated attributes
- ✓ Building Asset Analytics
- ✓ Configuring operational Event Frames
- ✓ Creating PI Vision dashboards
- ✓ Visualizing production and equipment KPIs
- ✓ Reviewing abnormal operational events
- ✓ Validating data quality
- ✓ Applying basic access considerations
- ✓ Troubleshooting the configured solution
- ✓ End-to-end review from data acquisition to operational visualization