



## **AFT Impulse Training: Water Hammer and Surge Analysis Techniques**



**AGILE LEADERS**  
Training Center



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### **AFT Impulse Training: Water Hammer and Surge Analysis Techniques Overview:**

AFT Impulse Training: Water Hammer and Surge Analysis Techniques is a comprehensive course designed to empower engineers with the skills needed to master the AFT Impulse software and tackle complex hydraulic transient issues in various piping systems. This course provides an in-depth look at water hammer analysis, surge analysis techniques, and hydraulic transients in piping systems, utilizing real-world scenarios from industrial applications like cooling water systems, fire protection systems, and water supply and distribution networks. Participants will learn about transient analysis and cavitation, piping system design and analysis, and hydraulic modeling and simulation, all tailored to enhance safety, efficiency, and innovation in their engineering projects. By integrating these components, the course not only enhances practical knowledge but also aligns with the latest industry standards and technological advancements.

### **Target Audience:**

- Mechanical Engineers
- Process Engineers
- Design Engineers specializing in hydraulics
- Safety Engineers in industrial settings
- Maintenance and Reliability Engineers

### **Targeted Organizational Departments:**

- Engineering
- Maintenance
- Safety and Compliance
- Research and Development

### **Targeted Industries:**

- Oil and Gas
- Manufacturing
- Utilities
- Chemical Processing
- Governmental Entities

## Course Offerings:

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

- Conduct detailed water hammer and surge analysis using AFT Impulse.
- Design robust piping systems with advanced understanding of hydraulic transients.
- Implement surge mitigation strategies effectively.
- Utilize hydraulic modeling and simulation to predict system behaviors and optimize designs.
- Address transient analysis and cavitation in industrial applications.

## Training Methodology:

This course employs a blend of theoretical instruction and practical application through case studies. Participants will engage in hands-on tasks that mirror real-world challenges, enhancing their problem-solving skills and understanding of complex fluid dynamics. Interactive sessions allow for immediate feedback and iterative learning, ensuring a deep comprehension of surge analysis techniques and their implementation in industrial settings.

## Course Toolbox:

- Course Workbook and Reference Materials
- Hydraulic Transients Analysis Templates
- Surge Analysis and Mitigation Checklists
- Access to Online Resource Portal
- Simulation Exercises and Case Study Materials

## Course Agenda:

### Day 1: Foundations of Hydraulic Transients

- **Topic 1:** Introduction to Water Hammer and Surge Analysis
- **Topic 2:** Basics of AFT Impulse
- **Topic 3:** Hydraulic Transients in Piping Systems - Basics
- **Topic 4:** Design Principles for Piping System Design and Analysis
- **Reflection & Review:** Overview of key concepts and Q&A

### Day 2: Advanced Analysis Techniques

- **Topic 1:** Intermediate Hydraulic Modeling and Simulation
- **Topic 2:** Surge Mitigation Strategies - Basics
- **Topic 3:** Pump Startup and Trip Analysis - Basics
- **Topic 4:** Industrial Applications of Surge Analysis - Cooling Systems
- **Reflection & Review:** Case studies and hands-on practice review



### Day 3: Application and Mitigation

- **Topic 1:** Fire Protection Systems Hydraulic Analysis
- **Topic 2:** Water Supply and Distribution Analysis
- **Topic 3:** Advanced Surge Mitigation Techniques
- **Topic 4:** Transient Analysis and Cavitation - Intermediate
- **Reflection & Review:** Practical applications and mitigation measures

### Day 4: Special Topics in Surge Analysis

- **Topic 1:** Transient Pumps and Check Valves - Advanced Techniques
- **Topic 2:** Pipes and Junction Analysis - Advanced
- **Topic 3:** Impulse Assumptions and Boundary Conditions
- **Topic 4:** Cooling Water Systems Surge Analysis - Advanced
- **Reflection & Review:** Integration of day's learnings with real-world scenarios

### Day 5: Mastery and Troubleshooting

- **Topic 1:** Troubleshooting Impulse Models
- **Topic 2:** Transient Forces - Advanced Applications
- **Topic 3:** Impulse Add on Modules PFA & SSL
- **Topic 4:** Review of Surge Tanks and Gas Accumulators
- **Reflection & Review:** Comprehensive review and feedback session

## How This Course is Different from Other AFT Impulse Training Courses:

AFT Impulse Training: Water Hammer and Surge Analysis Techniques stands out due to its comprehensive coverage of both fundamental and advanced topics tailored to industrial applications. Unlike other courses, it provides extensive hands-on training with simulation tools and real case studies, ensuring that participants not only learn the theory but also apply it practically. The integration of latest software updates and industry-specific scenarios makes this course uniquely beneficial for professionals looking to excel in the field of hydraulic engineering.



## Training Course Categories



**Finance and  
Accounting Training  
Courses**



**Agile PM and Project  
Management Training  
Courses**



**Certified Courses By  
International Bodies**



**Communication and  
Public Relations  
Training Courses**



**Data Analytics Training  
and Data Science  
Courses**



**Environment &  
Sustainability Training  
Courses**



**Governance, Risk and  
Compliance Training  
Courses**



**Human Resources  
Training and  
Development Courses**



**IT Security Training & IT  
Training Courses**



**Leadership and  
Management Training  
Courses**



**Legal Training,  
Procurement and  
Contracting Courses**



**Maintenance Training  
and Engineering  
Training Courses**



# Training Course Categories



**Marketing, Customer Relations, and Sales Courses**



**Occupational Health, Safety and Security Training Courses**



**Oil & Gas Training and Other Technical Courses**



**Personal & Self-Development Training Courses**



**Quality and Operations Management Training Courses**



**Secretarial and Administration Training Courses**



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# WHO WE ARE

Agile Leaders is a renowned training center with a team of experienced experts in vocational training and development. With 20 years of industry experience, we are committed to helping executives and managers replace traditional practices with more effective and agile approaches.

## OUR VISION

We aspire to be the top choice training provider for organizations seeking to embrace agile business practices. As we progress towards our vision, our focus becomes increasingly customer-centric and agile.

## OUR MISSION

We are dedicated to developing value-adding, customer-centric agile training courses that deliver a clear return on investment. Guided by our core agile values, we ensure our training is actionable and impactful.

## WHAT DO WE OFFER

At Agile Leaders, we offer agile, bite-sized training courses that provide a real-life return on investment. Our courses focus on enhancing knowledge, improving skills, and changing attitudes. We achieve this through engaging and interactive training techniques, including Q&As, live discussions, games, and puzzles.



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