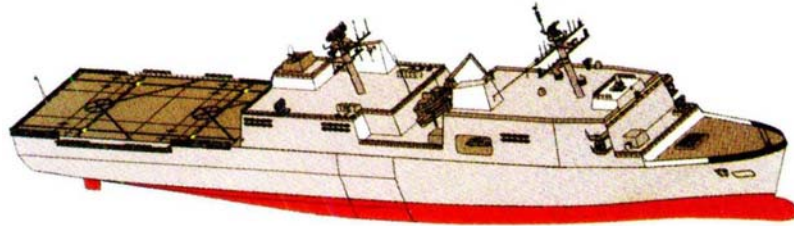
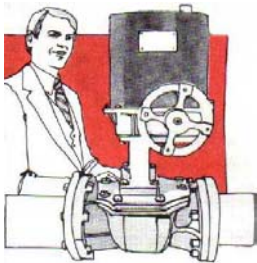


23 – 25 May 2005 - Harrisburg, PA



1. COURSE TITLE

Navy Valves & Actuators - Operation, Design, Application, Maintenance, and Logistics

2. COURSE DESCRIPTION

The Navy is seeking innovative ways to design future ships with significantly reduced crew manning requirements. To meet this goal, the operation of ship machinery would require highly automated, sophisticated and intelligent fluid piping systems. Valves and their Actuators are the lifeblood of fluid systems - they must control flow of water, steam, air, gas, fuel, oil, slurries, wastes, and treatment chemicals very reliably. Furthermore, as the Navy prepares to implement DoD's policy on Acquisition Reform, Milspec valves would be replaced with commercial, off-the shelf valves. Proper specification of valves and actuators requires a thorough understanding of system (s) requirements, modern valve/actuator designs, operation, specifications, automation, testing, maintenance, and logistic issues. This 3-day intensive course, especially prepared for the Navy/DLA/shipyard/contractor personnel provides a balanced blend of these issues.

3. COURSE EMPHASIS AND APPLICATION

IN THIS COURSE YOU WILL LEARN TO

- Select types of on/off and control valves
- Apply elements of valve design. Understand design deficiencies
- Apply applicable industry and military standards
- Select optimum materials of construction
- Specify Pressure-temperature ratings, flow coefficient Cv
- Select types of actuators: electric, pneumatic, hydraulic
- Pick the optimum valve-actuator combination
- Perform flow, system pressure head loss calculations
- Select optimum valve size: effects of pipe fittings & reducers on flow
- Avoid costly valve damage -predict/avoid cavitation, corrosion and erosion
- Avoid incorrect Valve and Actuator installation practices
- Implement DoD's policy on Acquisition reform for valves

- ❑ Understand Performance versus Detail specifications, MILSPECS, MILPRFSPECS, CIDS
- ❑ Substitute Performance specifications for Milspecs – technical & logistic issues
- ❑ Know the types of valves/actuators specified on US Navy and NATO ships
- ❑ Get familiar with the latest cutting edge electric actuators
- ❑ Understand shipboard fluid systems/components: MIL-STD-777 and MIL-STD-438
- ❑ Solve typical fleet problems encountered in valves & actuators
- ❑ Understand shortcomings of current maintenance approach: Preventive maintenance (PMS)
- ❑ Know emerging maintenance technologies - predict impending valve failures (CBM/ICAS)

You will learn to apply these techniques to select the optimum valves and actuators to reduce lifecycle costs and manning requirements. Discussing actual problems from your job experience is encouraged.

4. SPECIAL FEATURES AND BENEFITS

Participants will receive comprehensive notes based on the course presentation.

5. WHO SHOULD ATTEND?

This course was developed for engineers and other individuals involved with the design, specification, use, logistics, and maintenance of valves & actuators with special emphasis on shipboard applications. Valve specialists and those with some valve experience will come away with valuable information from this course. Participants should have some technical background and job related experience. Please bring calculators to the class.

6. COURSE OUTLINE

DAY 1 AM: Module Description

- Types of On-Off and Control Valves: Gate, Globe, Ball, Plug, Butterfly, and Diaphragm valves
- Types of valve Actuators
 - Manual, pneumatic, hydraulic, and electrical operated actuators
- Valve design and selection philosophy
 - Applicable standards, specifications and codes
 - Milspecs and Industry standards
 - End connections, Pressure classes, Pressure-Temperature ratings
 - Valve leak rate classifications

DAY 1 PM: Module Description

- Materials of Construction
 - Body, trim, seat, fasteners, packing, O-rings, gaskets etc.
 - Corrosion, galvanic corrosion, strength, erosion, wear, galling, and fracture considerations
 - Materials for high and low temperature services
 - Coatings, Hard surface, and plating. Materials for special services
 - How to specify valve materials – use of commercial versus military specifications
- Quarter-turn valves: Butterfly, Ball, and Plug valves
 - Valve construction: body, trim, packing, and seat, etc.
 - Operational torque and flow calculations
 - Fire-resistant valves
 - Composite Ball valves
 - Minimum body wall thickness determination
- Rising-stem valves: Globe, Gate, and Diaphragm valves
 - Valve construction: body, trim, packing, and seat, etc.
 - Operational torque and flow calculations
 - Minimum body wall thickness determination

- Valves for specialty applications
 - High-temperature, cryogenic, and fire-safe applications

DAY 2 AM: Module Description

- Introduction to Electric Actuators
 - Forces required by valve
 - Valve Design – its impact on actuator selection
 - Valve to Actuator Stem Connections
 - Actuator Gear Design
 - Quarter-Turn Electric Actuators

DAY 2 PM: Module Description

- Electric Actuators - Continued
 - Multi-Turn Electric Actuators
 - Actuator Motor Design
 - Controls Options (Open/Close)
 - Controls Options (Modulating)
 - Smart Actuators
 - Fire Safety Issues

DAY 3 AM: Module Description

- Hydraulic Theory
 - Flow of fluids through pipes; liquids, steam and gases
 - Definition of Cv flow coefficient
- Criteria for Valve selection
 - Cavitation, Flashing, and Choked flow
 - Effect of pipe reducers and expanders on flow
 - Valve Flow characteristics
 - Sizing valves for optimum performance

DAY 3 PM: Module Description

- Typical Valve and Actuator Problems
 - US Navy Valves: Discussion on MIL-STD-777 & MIL-STD-438
 - Survey of US Navy valve and actuator problems
 - Survey of Navies of UK, Netherlands, and Canada. Survey of cargo ships
 - Comparison of electric, pneumatic, hydraulic automation
 - Survey of Navies of US, UK, Netherlands, and commercial industry
- DoD's Policy on Acquisition Reform: Milspecs, CIDs, and Standards
 - Use of Commercial specifications in lieu of Milspecs
 - ASTM, ASME, MSS, API, UL specifications
 - Replacing Milspecs with commercial specs: Logistics problems

7. COURSE INSTRUCTORS

Mr. Vinod Bhasin, President of SigmaTech, a consulting engineering company, has over 27 years of professional experience in the design, application, and manufacturing of piping, valves, and actuators for several companies including Hills McCanna Company, Rockwell International, and Westinghouse Electric Corporation. He served as Chief Engineer at Hills McCanna Company and Rockwell International. He is an alumnus of Illinois Institute of Technology (IIT), Chicago, Illinois. A registered PE, he holds BSME, MSME, and MSIE degrees. He has published numerous papers in Chemical Engineering, Chemical Processing, Chemical Processing International (UK), and the Journal of Naval Engineering related to piping, valves, and actuators. Mr. Bhasin has taught professional development courses on valves and actuators for the Instrument Society of America (ISA), and Navy's Life Cycle managers. He has also taught undergraduate courses in Solid Mechanics, and Machine Design at IIT. Mr. Bhasin is a member of ASME B16 committee and has chaired several valve and actuator technical committees on ships and marine technology under ASTM F25.

Mr. James 'Ron' Whitmore, has over 22 years of professional experience in the design, application, and manufacturing of valves and actuators for several companies including EIM Controls, RuLynn, Keystone Controls and Biffi, Inc. He has a B.S. Degree in Maritime Engineering from Texas A&M University. Mr. Whitmore's expertise is in the field of electric actuators. He has taught valve and actuator classes worldwide from basic applications for Valve distributors to advanced courses for Valve and Engineering Companies and Navy shipyard personnel.



Registration Form: Valves & Actuators – Operation, Design, Application, Maintenance, and Logistics

REGISTRATION AND FEES

Course fee is \$1200 per person, payable in advance. Class size will be limited to ensure optimum interaction among participants. SigmaTech reserves the right to cancel the course if the minimum enrollment has not reached. We may slightly modify the course content or substitute instructors due to unforeseen circumstances.

The course fee is payable in advance and includes the cost of classroom materials. The fee does not include expenses for hotel accommodations. Please make check payable to SigmaTech. The course program is all day sessions from 8:30 am to 4.30 pm. There will be a one-hour lunch, and two morning & evening 15-minute coffee breaks.

Cancellation Policy: All cancellations must be in writing, postmarked 14 days prior to the course date to receive a full refund. Those postmarked less than 14 days prior to the class will be subject to a service charge of \$250. After the 14 days cancellation period, no refund is given. You may send a substitute.

Course Dates: 23, 24, and 25 May 2005. (8.30 am to 4.30 pm)

Course Location: Harrisburg, PA (exact course location address will be sent at a later date)

Hotel Accommodations: You may reserve your hotel accommodation at the nearby hotel, Holiday Inn - Harrisburg West, Phone: 717-697-0321 (800-772-7829).

Name _____ Organization _____

Title _____ Code _____

Phone (____) _____ Fax (____) _____ Email _____

Address _____

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Method of payment: Circle one

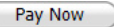
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**Make check or purchase order payable to "SigmaTech" and mail with registration form to:
SigmaTech, 601 Wyndham Crossings Circle, St. Louis, MO 63131.
Phone: (636) 346-7594 Fax: (314) 821-3386 E-mail: info@sigmatechconsulting.com**

If paying by a credit card, please mail/fax the registration form to the above address and click the online button located next to the course description on:
<http://www.sigmatechconsulting.com/coursetraining/coursetraining.htm>



Please visit the following WEB site for downloading the course content and any course changes: <http://www.sigmatechconsulting.com> Click on the LHS menu under "Courses and Training".