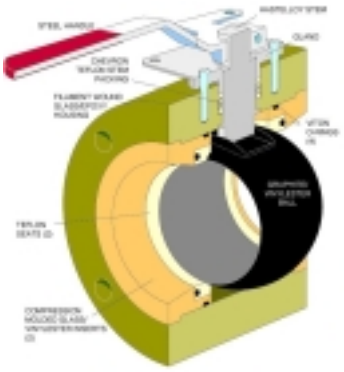
SigmaTech

Valve and Actuator Engineering

SigmaTech is a unique consulting company specializing in solving difficult valve and actuator problems.

We understand valves. We understand applications. We will save you time, money, and hassles. Call us to evaluate your existing system or to design your new one.



Custom Solutions

- Valve and actuator design
- Procurement specifications
- Prototype manufacture
- Qualification testing
- Refurbishing and repair
- Troubleshooting
- Technical documentation
- Training
- Supplier network

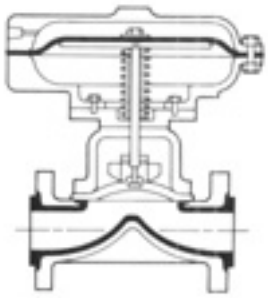
Solving difficult valve and actuator problems

Valve and Actuator Engineering Services

SigmaTech offers a complete line of services for your valve and actuator needs -- from a highly qualified and readily available staff. Our engineers represent a wide range of technical disciplines and capabilities including valve design, testing, applications, and troubleshooting.

Engineering and design

Brainstorming and conceptual design



Layout and detail drawings

Design for manufacture

Reverse Engineering

FEA stress analysis

Flow calculations, simulation

Qualification testing

Hydrostatic, leakage, flow, operational

Valve actuation

Fire testing

Shock & vibration, noise

Pipe flexure

Safety relief

NDE (nondestructive evaluation)

Applications

Selection of valves and applications

Compliance with piping codes and standards

Material analysis & selection; corrosion control

Automation, actuation, instrumentation, and controls

Refurbishing, repair, and maintenance

Any type, material, or make of valve

Custom repair, your plant or our shop

Test with steam, air/gas, or liquid

Compliance testing

Our repair facilities are certified and hold the VR stamp of approval from The National Board of Boiler & Pressure Vessel Inspectors.

Long-term maintenance partnerships available.

Third party design review

Unbiased design review

Independent test certification

Procurement specifications

Develop commercial standards for your unique needs

Represent your company on premier technical committees

Develop military standards and specifications

Troubleshooting

Problem valve/actuator analysis and recommendations

Failure analysis

Technical documentation

Technical manuals

Maintenance of customer drawings

Catalog development

Maintenance procedures

Reports

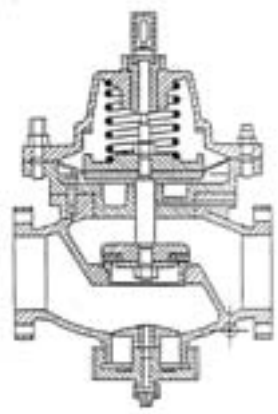
Expert witness engineering services

Product failure analysis

Material testing resources

Prototype manufacture

Rapid prototyping – speeds your time to market



Small production runs

Product samples required for R&D

Cost reduction

Valve substitution using alternate off-the-shelf designs

Material substitution, processing

Design modification

Value engineering

Supplier network

Extensive network of proven suppliers and manufacturers

Recommend the right suppliers for your needs saving you time and money

Our markets

Refining
Chemicals
Pulp and Paper
Power Generation
Mining
Food and Beverages
Water and Waste Treatment
Pharmaceuticals
Heating and Air Conditioning
Oil and Natural Gas Distribution
Navy
Commercial Ships
Coast Guard
Nuclear Waste Disposal
Aerospace

Some of our clients

Navy-NAVSEA
NAVY- NSWC
Department of Energy
Defense Logistics Agency
Westinghouse
Siemens
Bechtel
MR&S
Vector Research
Ship Yards

Specialties

Fire-safe valves
High-temperature valves
Cryogenic valves
Composite (non-metallic) valves
Chlorine service valves
Oxygen service valves
Vacuum service valves
Corrosive-erosive service valves
Power plant valves
Relief valves
Marine service valves
Actuators: electric, pneumatic, hydraulic
MOV & AOV monitoring & diagnostics
Valve automation & controls
Piping flanges, fittings, gaskets
Pipeline strainers
Welding and producibility

Test facilities

SigmaTech can offer you several test facilities depending upon your requirements. We can perform hydrostatic, flow leakage, torque, operational, shock, vibration, endurance, and fire testing of valves and actuators at our liaison test facilities, or your own test facilities.

Every application is unique

Why work in a crowd when you can get valves, actuators, instrumentation, and automated control packages from a single source?

We recognize that every application is unique. We are fully qualified to evaluate your flow control requirements and recommend control packages that meet your particular requirements.

We can be your single source for prompt and capable assistance when you need it.

We solve tough problems

Often our customers call us for help when nothing else works. We have solved many tough problems... From high pressure to vacuum, from cryogenic to very high temperatures, from simple open-close to automation packages. Including highly corrosive and erosive, clean or dirty, hazardous service, fire resistant valves, zero emission valves, nuclear applications.

We have solved many tough problems. Our people are ready to work for you!

Courses and Training

We offer a variety of courses in valve and actuator design and applications. We can also train your staff for valve actuator maintenance and valve applications.

To stay thoroughly up to date on new innovations, we regularly participate in premier valve technical societies and committees. In fact, we chair many of these technical committees.

Courses and training are offered throughout the United States. We can custom design the courses to suit your special needs and offer them at your site.

Course titles

Please visit our web site to download complete course descriptions.

Valves and Actuators – Design Principles and Applications for Navy Fluid Systems

Valve Design Principles and Procedures

Valve Electric Actuators – Design Principles & Applications

Nondestructive Evaluation (NDE)

Special NDE applications

NDE procedure development

Expertise in Navy, Aerospace, ASME pressure vessel

NDE Training

NDE personnel / certification

NDE Vendor surveillance

Vendor survey / audit

Third party inspection

NDE Services

Visual inspection (VT)

Radiography (RT)

Magnetic particle (MT)

Liquid penetrant (LP)

Ultrasonic testing (UT)

Eddy current testing (ET)

Level III Services

SNT-TC-1A Program Development

NDE Document review

QA Program / Data Packages / Procedures

Fast response

We are a small, dynamic, focused group of specialists and are poised to respond quickly – as fast as within 24 hours of receiving your call. Often our customers call us for help when nothing else works.

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SigmaTech

Valve and Actuator Engineering

Experienced – Innovators - Accommodators

We are a small, dynamic, focused group of specialists and are poised to respond quickly – as fast as within 24 hours of receiving your call.

Vinod Bhasin, Consulting Engineer

Mr. Bhasin, founder and Principal of SigmaTech, has over 30 years of professional experience in engineering consulting and manufacturing programs for 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), CPI 100, and the Journal of Naval Engineering related to piping, valves, and actuators.

Mr. Bhasin has taught valve and actuator design & application courses for the Instrumentation Society of America (ISA), the Navy; and undergraduate courses in Mechanics, and Machine Design at IIT.

Mr. Bhasin is member of ASME and ASTM and is chairing several technical committees under ASTM F25 committee.

Charles Kohlert, Consulting Engineer

Mr. Kohlert brings over 30 years of professional experience in the design, applications, and testing of industrial valves and actuators. His experience includes the development and production start-up of electric and pneumatic actuators, and electronic controls product lines. Additional responsibilities included sales support, field service, production liaison, Underwriters Laboratories and Canadian Standards approvals, and actuators standards committees. His specialties include electromechanical products, motors, gear trains, pneumatics, low-pressure hydraulics, and electronic and pneumatic control components.

He has taught engineering design courses at the University of Illinois, Champaign/Urbana, Illinois. A registered PE, Mr. Kohlert holds a BSME degree from Illinois Institute of Technology (IIT), Chicago, Illinois. He is a senior member of Instrumentation Society of America (ISA).

Jack Wild, Consulting Engineer

Mr. Wild has over 30 years of professional experience in product development, prototype manufacture, testing, and servicing of industrial valves. His extensive experience includes Nuclear valves documentation, field service, refurbishing, and troubleshooting of valves, actuators, and centrifugal and metering pumps.

Mr. Wild, a registered PE, has conducted many challenging engineering design investigations. He specializes in Field servicing of all Flow Control products and systems, performing tests on Wear, Hydrostatic, Pneumatic, Fire, Cryogenic, Flow, Deformation, Tensile, Elongation.

Vernon Robbins, Consulting Engineer

Mr. Robbins has worked in the valve industry for over 40 years. His experience spans numerous projects involving conceptual design, development, testing, manufacturing, and applications of metering pumps, ball, butterfly, and diaphragm valves for power, chemical, petro-chemical, pulp and paper, petroleum, and food industries.

Mr. Robbins specializes in industrial valves for severe service applications, which include high pressure and high temperature steam, chlorine, highly corrosive and erosive service, and nuclear applications. He has represented valve-manufacturing companies in numerous professional societies such as ANSI, ASME, MSS, and API. His intimate knowledge of the valve industry, and a knack for troubleshooting has solved many tough valve application problems.

Mr. Robbins holds a BSME from the Illinois Institute of Chicago (IIT), Chicago, Illinois.

James Whitmore, Consulting Engineer

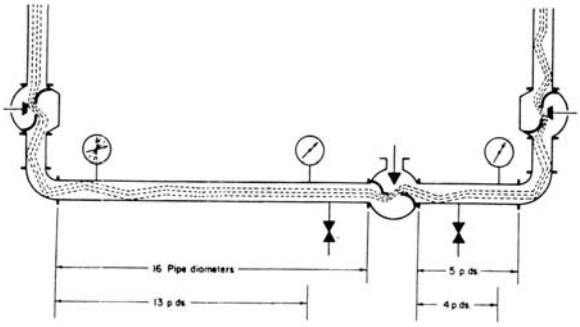
Mr. Whitmore has over 20 years of professional experience in the design, application, and manufacturing of valves and actuators for several companies including EIM Controls, RuLynn, Keystone Controls and Biffi, Inc.. He has a B.S. degree in Maritime Engineering from Texas A&M University. Mr. Whitmore's 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.

Mark Leptinsky, Consulting Engineer

A BSEE graduate from the University of Pittsburgh, Mr. Leptinsky has over 13 years of experience in industrial controls, automation (including PLC, DCS), and drives. He has been responsible for applications, proposals, pricing, design, installation, startup, and maintenance of electrical industrial automation equipment. Mr. Liptinsky is a licensed professional Engineer in the state of Pennsylvania and is member of AISE, Tau Beta Pi, and Eta Kappa Nu.

Test facilities

SigmaTech can offer you several test facilities depending upon your requirements. We can perform hydrostatic, flow leakage, torque, operational, shock, vibration, endurance, and fire testing of valves and actuators at our liaison test facilities, or your own test facilities



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SigmaTech

Valve and Actuator Engineering

Reconditioning, Repair, and Maintenance

Reconditioning and repair

We provide reconditioning, repair, modifications and actuation services on any type, material, and make of valves. We do custom repair of valves – your plant or our shop - under stringent quality control. We can test any valve with steam, air/gas, or liquid in compliance with industry standards such as ASME, API, MSS, FCI, and Pressure Vessel Boiler Codes.

Relief & Safety relief valves – valves of all sizes and manufacturers

Gate, Globe & Check valves – 1" through 48" steel, iron, and steel. Class 125 through 4500

Tilting Disc Check valves – 2" through 36" steel or iron. Class 125 through 2500

Butterfly valves- 6" through 100" resilient seat or metal to metal seats

Control/Pressure regulating valves – 1/2" through 24". All Class 2500

Plug valves – 1" through 24". Class 25 through 2500

Ball valves – 2" through 48". Class 125 through 2500

Strainer valves – 4" through 36". Single, Self-cleaning, or Duplex

Specialty valves – Cryogenic, High-temperature, Oxygen, Chlorine, NACE

Valve actuator and control system packages – fully engineered, mounted, tested, and installed.

Certification

Our repair facilities are certified and hold the VR stamp of approval from The National Board of Boiler & Pressure Vessel Inspectors.

Maintenance

SigmaTech is ready to partner with you to provide a comprehensive valve maintenance service on a long-term basis.

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Valve and Actuator Engineering

Quality Audit & Maintenance Program

Valves have been called the "work horses" or "muscles" of any automatic control system because an unexpected failure of a *critical* valve can shut down an entire plant resulting in huge losses, or in some cases, loss of life. And, with the rapid changes occurring in the process industries, there is a constant need for understanding of the design, testing, and maintenance of older and newer valves.

As with other piping components, the health of valves and actuators deteriorate with time. Since these are essentially opaque equipment, a simple periodic visual examination would not provide definitive clues to determine their internal condition. It has been every plant manager's dream to find out well ahead of time, when a particular critical valve might fail and need maintenance? Not only would this knowledge prevent unexpected costly plant shutdowns, it would make preventive repairs much easier. Well, help is on the way.

First, selecting the "right" valves, and then by installing a comprehensive maintenance program that can detect problems well ahead of time can minimize problems with valves. At SigmaTech, you will meet experienced engineers and technicians who have helped companies solve their valve problems and reduce the costs associated with leaky, jammed, or unsafe valves. We do it economically because valves are our only business. Our work is unbiased because we do not owe allegiance to any valve manufacturer. For a small investment, we can install a comprehensive Quality Audit & Maintenance Program for *critical* valves in your plant that will mitigate your headaches. We will:

- Compile a comprehensive database of critical valves and spare parts. It will include valve cataloging, tagging, compiling failure history, parts list, etc. The database may be sorted by vendor part #, vendor information, application, failure history, etc.
- Review existing valves to ensure if these are the "appropriate" valves for your applications.
- Ensure that the valves are properly installed and maintained.
- Conduct periodic leak detection (manual, ultrasonic, etc.) on valves and pipe joints.
- Periodic check of control air/hydraulic fluid pressure, filter conditions, etc.
- Troubleshoot problem valves. Repair or replace problem valves.
- Custom design, modify an existing design, or suggest a new valve to suit your needs.
- Minimize stocking of repair parts by identifying and eliminating duplication of parts.
- Train your plant personnel with routine maintenance procedures.
- Prepare/Compile Technical and Installation Manuals for valves.

SigmaTech

Valve and Actuator Engineering

Nondestructive Evaluation (NDE/NDT)
of valves, pressure vessels & piping components

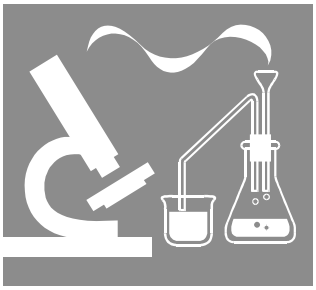
NDE Engineering

Special NDE applications

NDE procedure development

Expertise in Navy, Aerospace and

ASME pressure vessel components



NDE Services

Visual inspection (VT)

Radiography (RT)

Magnetic particle (MT)

Liquid penetrant (LP)

Ultrasonic testing (UT)

Eddy current testing (ET)

Level III Services

SNT-TC-1A Program Development

Training

NDE personnel/certification

Vendor surveillance

Vendor survey/audit

Third party inspection

Document review

QA Program/Data Packages/Procedures

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Valve and Actuator Engineering

Courses and Training

We participate in premier valve technical societies and committees to stay thoroughly up to date on new innovations. In fact, we chair many of these technical committees.

We offer a variety of courses in valves and actuators design and applications. Courses and training are offered throughout the United States. We can custom design the courses to suit your special needs and offer them at your site. If you would like to register for a particular course or need additional information, please let us know. You may also download course details from our web site.

We can also train your staff for valve/actuator maintenance and valve applications.

Valves and Actuators –
Design Principles and Applications for Navy Fluid Systems

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 requires highly automated, sophisticated, and intelligent fluid piping systems. Valves and their actuators are the lifeblood of fluid systems. They must reliably control flow of water, steam, air, gas, fuel, oil, slurries, wastes, and treatment chemicals. Furthermore, as the Navy gets ready to implement DoD's policy on Acquisition Reform, Milspec valves will be replaced with commercial, off-the-shelf valves. Proper specification of valves requires a thorough understanding of system requirements, modern valve/actuator logistic, design specifications, automation, testing, and maintenance issues.

This three-day intensive course, especially prepared for the Navy/DLA/shipyard/contractor personnel, provides a balanced blend of these issues.

Valve Design Principles and Procedures

The control valve has been called the "work horse" or "muscle" of any automatic control system. And, with the rapid changes occurring in the process industries, there is a constant need for the design, development, and testing of new and better valves. Defining a need, identifying a new application, designing new valves, improving valve design, replacing old designs, and offering less expensive options are all part of the valve designer's environment.

A methodology of valve design is presented with an in-depth look at the design of various valve components, actuator selection and its valve interface, materials of construction, as well as latest machining practices and manufacturing processes. A close look at prototyping, industry standards, and testing requirements is also included. In this three-day course, the instructor uses multiple examples of various valve types to present a systematic design methodology, which the valve designer will find very useful for designing any type of valve.

Valve Electric Actuators –
Design Principles & Applications

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. Proper specification of valves and actuators requires a thorough understanding of system (s) requirements, design, specification, automation, testing, maintenance, and logistic issues. This one-day intensive course focused on electric actuators, and especially prepared for the valve/actuator engineers, provides a balanced blend of these issues.

Valve and Actuator Engineering

Articles and Technical Papers

Our staff has written many articles and technical papers about valves and actuators. This lists some of them. *You may download these papers from our web site.*

Why a Butterfly?, Vinod Bhasin, *CPI 100,* (March 1984).

How Safe Are Fire-Safe Valves?, Vinod Bhasin, *Chemical Processing* (February 1990)

Actuator Selection: There Are at Least a Dozen Points to Consider, Vinod Bhasin, *Chemical Engineering* (November 1990)

Sixteen Considerations for Valve Selection You Can't Afford to Ignore, Vinod Bhasin, *Chemical Processing* (December 1990)

New Developments in Butterfly Valves, Vinod Bhasin and Lloyd Nilsen/Navsea, *Naval Engineers Journal* (January 1991)

Valves and the Viable Alternatives to Asbestos, Vinod Bhasin, *Chemical Processing Technology International* (Annual Edition 1992)

Making Piping Systems Fire-Safe - Simple Solutions to Preventing a Disaster, Vinod Bhasin, Lloyd Nilsen/NAVSEA & Dennis Conroy/NSWC, and K. Gupta, *Naval Engineers Journal* (May 1994)

Development of a Family of Commercial Marine Composite Ball Valves, Vinod Bhasin, Dennis Conroy/NSWC, & Jim Reid/NAVSEA, *Naval Engineers Journal* (October 1998)

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