CRANE®
NUCLEAR

NEW!

2012 Training Courses

www.cranenuclear.com

Utilities have long recognized the inherent improvements in plant safety, efficiency, and quality that effective training can bring. At CRANE® Nuclear our training courses offer:

1. **Experienced, knowledgeable instructors:** practical information, small class sizes and maximum student/instructor interaction.
2. **Open enrollment training:** empowers you to attend training at CRANE® Nuclear's facility during pre-defined periods that meet your schedule.
3. **Excellent training facilities:** a spacious training room along with representative training equipment.

A diverse curriculum of training courses specifically designed to help nuclear power utilities keep up with the latest technological advancements.

To register for a course, please complete the registration application at:
http://www.cranenuclear.com/admin/uploads/training_registration_application.pdf.

CRANE NUCLEAR

JUNE

Sun	Mon	Tues	Wed	Thur	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

- Comprehensive Control Valve Maintenance
- Limitorque® Act. Technical Maintenance & Repair
- VIPER™ Check Valve Data Acquisition & Basic Analysis
- AOV Actuator/Instrument Maintenance & Repair
- VIPER™ MOV Data Acquisition & Basic Analysis
- VIPER™ Check Valve Adv. Signature Analysis
- VOTES® Infinity AOV Data Acq. & Basic Analysis
- VIPER™ MOV Advanced Signature Analysis
- Valve Maintenance & Repair
- VOTES® Infinity AOV Advanced Signature Analysis
- VIPER MC²™ Data Acquisition & FFT Analysis

JULY

Sun	Mon	Tues	Wed	Thur	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
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29	30	31				

- VOTES® Infinity MOV System Usage
- VOTES® Infinity AOV System Usage
- VOTES® Infinity MOV Data Acquisition & Basic Analysis
- VIPER™ AOV Data Acquisition & Basic Analysis
- VOTES® Infinity MOV Adv. Signature Analysis
- AOV/MOV Technical Seminar

AUGUST

Sun	Mon	Tues	Wed	Thur	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

- AOV/MOV Technical Seminar
- Comprehensive Control Valve Maintenance
- Check Valve Data Acquisition & Basic Analysis
- VIPER™ AOV Advanced Signature Analysis
- Limitorque® Act. Technical Maintenance & Repair
- Check Valve Advanced Signature Analysis

NOVEMBER

Sun	Mon	Tues	Wed	Thur	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

- AOV Actuator/Instrument Maintenance & Repair
- VIPER™ Check Valve Data Acquisition & Basic Analysis

DECEMBER

Sun	Mon	Tues	Wed	Thur	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

- VOTES® Infinity AOV Data Acq. & Basic Analysis
- Limitorque® Act. Technical Maintenance & Repair
- VIPER™ Check Valve Adv. Signature Analysis
- VOTES® Infinity AOV Advanced Signature Analysis
- VOTES® Infinity MOV Data Acquisition & Basic Analysis
- VOTES® Infinity MOV Adv. Signature Analysis

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Part Numbers	Courses	2012 Date(s)	Prerequisite	Days	Tuition (per student)
TR-9-70200-HA	**Valve Maintenance & Repair**	**Jan 9, June 25**	**None**	**5 Days**	**$2,960**
This course provides instruction on how to maintain gate, globe, and check valves to optimum working condition. Included are discussions on motor-operators, air-operators, hydraulic-operators, and manual-operators. The classroom discussion and hands-on laboratory experience covers the principals of operation, disassembly, inspection, adjustment, and reassembly of gate, globe and check valves. An overview is presented on the techniques of packing removal and installation, lapping of valve seats and wedges to facilitate fit up, blue check, and in-line machining of valve components including the use of specialty tools.					
TR-9-90540-HA	**Comprehensive Control Valve Maintenance**	**June 4, Aug 6**	**None**	**5 Days**	**$2,960**
This course introduces control valves and the performance of proper maintenance and repair for Linear and Rotary style valves. Students learn about various control valve characteristics and configurations. Instruction includes performing proper Stack Height measurements, Packing configuration, and Packing Consolidation/ Torquing techniques. Students will learn how to properly evaluate control valve parts.					
TR-9-90530-HA	**AOV Actuator/Instrument Maintenance & Repair**	**Jan 23, June 11, Nov 26**	**None**	**5 Days**	**$2,960**
This course provides instruction on the proper installation, operation, and maintenance of Air-Operated-Valve (AOV) Instruments and Actuators through hands-on laboratory training and class room instruction including OE discussion. Upon successful completion, the student shall be able to correctly perform maintenance on AOV actuators and instruments commonly utilized in the Nuclear Power Industry.					
TR-9-90510-HA	**VIPER™ AOV Data Acquisition & Basic Analysis**	**Jan 30, July 23**	**TR-9-90530**	**5 Days**	**$2,960**
TR-9-91510-HA	**VOTES® Infinity AOV Data Acquisition & Basic Analysis**	**June 18, Dec 3**	**TR-9-90530**	**4 Days**	**$2,370**
These courses provide instruction on the proper installation and operation of the CRANE® Nuclear VIPER 20™ or VOTES® Infinity Air-Operated-Valve (AOV) Diagnostic Systems through classroom instruction, hands-on laboratory training, and OE discussions. Upon successful completion, the student shall be able to correctly set-up and operate the respective CRANE® Nuclear diagnostic system to acquire test data and evaluate typical AOV performance parameters and common actuator/valve degradations.					
TR-9-91550-HA	**VOTES® Infinity AOV System Usage**	**July 16**	**TR-9-90510**	**3 Days**	**$1,780**
This hands-on course is designed for the experienced user of the CRANE® Nuclear VIPER™ 20 now using the VOTES® Infinity for AOV diagnostic testing. Learn to collect and analyze data using the VOTES® Infinity valve diagnostic system. Classroom time will focus on system features and the VOTES® Infinity software. Students will receive advanced training covering: system setup, acquisition, analysis, and advanced software features.					
TR-9-90520-HA	**VIPER™ AOV Advanced Signature Analysis**	**Feb 6, Aug 13**	**TR-9-90510**	**5 Days**	**$2,960**
TR-9-91520-HA	**VOTES® Infinity AOV Advanced Signature Analysis**	**June 25, Dec 10**	**TR-9-90510 or TR-9-91550**	**5 Days**	**$2,960**
These courses provide instruction on the analysis of acquired Air-Operated-Valve (AOV) test data utilizing the respective CRANE® Nuclear Diagnostic Software. Students analyze countless numbers of real traces acquired with CRANE® Nuclear diagnostic equipment and learn to recognize healthy traces and those with anomalies such as: stem wear, packing stiction, improper alignment, component air leaks, component wear, and seat damage/wear.					
****2012 AOV/MOV Techncial Seminar****		**July 31 through Aug 2**	**None**	**3 Days**	**Free with active PSA**
This is a continuing training opportunity for VOTES® Infinity and VIPER™ users to keep updated with the latest software and hardware improvements. Time is allocated for plenty of hands-on training geared toward VOTES® Infinity & VIPER™ Engineering and Maintenance testing personnel.					
TR-9-70110-HA	**Limitorque® Act. Technical Maintenance & Repair**	**Jan 23, June 4, Aug 13, Dec 3**	**None**	**5 Days**	**$2,960**
This course provides instruction on mechanical and electrical operation of Limitorque® SMB, SB, SBD, and HBC actuators and shall provide the student with practical knowledge on the operation, refurbishment, trouble-shooting, and preventative maintenance of Limitorque® actuators. Instruction covers theories of operation of SMB-000 through SMB-4 and HOBC through H3BC actuators, and provides hands-on disassembly/reassembly of various SMB and HBC actuators. This course may be restructured to emphasize SM or SMA operators as requested.					

More course descriptions on the next page.
To register for a course, please complete the registration application at:
http://www.cranenuclear.com/admin/uploads/training_registration_application.pdf.

CRANE® Nuclear 2012 - Training Course Schedule

Part Numbers	Courses	2012 Date(s)	Prerequisite	Days	Tuition (per student)
TR-9-90400-HA	**VIPER™ MOV Data Acquisition & Basic Analysis**	**Jan 30, June 11**	**TR-9-70110**	**5 Days**	**$2,960**
TR-9-91400-HA	**VOTES® Infinity MOV Data Acquisition & Basic Analysis**	**July 16, Dec 10**	**TR-9-70110**	**5 Days**	**$2,960**
These courses provide instruction on the proper installation and operation of the CRANE® Nuclear VIPER 20™ or VOTES® Infinity Motor-Operated-Valve (MOV) Diagnostic Systems through classroom instruction, hands-on laboratory training, and OE discussions. Upon successful course completion, the student shall be able to correctly set-up and operate the respective CRANE® Nuclear diagnostic system, adjust actuator limit and torque switches to specified criteria, and identify critical MOV parameters and common actuator/valve degradations through basic signature analysis techniques.					
TR-9-91420-HA	**VOTES® Infinity MOV System Usage**	**July 10**	**TR-9-90400**	**3 Days**	**$1,780**
This hands-on course is designed for the experienced user of the CRANE® Nuclear VIPER™ 20 who is now using the VOTES® Infinity for MOV diagnostic testing. The student will collect data using the VOTES® Infinity valve diagnostic system. Classroom time will focus on system features and the VOTES® Infinity software. Students will be guided through three days of advanced training covering: system setup, acquisition, analysis, and advanced software features.					
TR-9-90410-HA	**VIPER™ MOV Advanced Signature Analysis**	**Feb 6, June 18**	**TR-9-90400**	**4 Days**	**$2,370**
TR-9-91410-HA	**VOTES® Infinity MOV Advanced Signature Analysis**	**July 23, Dec 17**	**TR-9-91400 or TR-9-91420**	**4 Days**	**$2,370**
These courses provide instruction on the analysis of acquired Motor-Operated-Valve (MOV) test data utilizing the respective CRANE® Nuclear diagnostic system. The signature analysis techniques covered in this course will include: critical MOV parameters, actuator/valve degradations, and the components of differential pressure traces. An overview is presented on generic acceptance criteria for MOVs and industry-standard pressure equations.					
TR-9-90340-HA	**VIPER MC²™ Data Acquisition & FFT Analysis**	**June 25**	**TR-9-70110**	**4 Days**	**$2,370**
This course provides instruction on the utilization of the CRANE® Nuclear MC2™ data acquisition system through classroom instruction, hands-on laboratory training, and accounts of testing experience. Upon successful course completion, the student shall be able to correctly set-up and operate this equipment to perform basic data acquisition and signature analysis. Instruction will include the following topics: software, proper installation, operation, and maintenance. This course provides instruction on Motor-Operated-Valve (MOV) Actuator Frequency Identification, Frequency Domain Characteristics, FFT Tracking and Trending, and Repeatability of Acquisition/Analysis Techniques.					
TR-9-90600-HA	**VIPER™ Check Valve Data Acquisition & Basic Analysis**	**June 4, Nov 26**	**None**	**5 Days**	**$2,960**
TR-9-91600-HA	**Check Valve Data Acquisition & Basic Analysis (Platform TBD)**	**Aug 6**	**None**	**5 Days**	**$2,960**
These courses instruct students in the use of acoustics, eddy current, and ultrasonic devices used for check valve diagnostics and illustrates the proper installation techniques for the diagnostic transducers and operation of the VIPER™ 20 or VOTES® Infinity Check Valve System. The instructor will demonstrate how to acquire/analyze the signatures to provide information on the operation of check valves. Operational issues covered during the class will include: frequency of disk flutter, disk position in flow, and backseat disk tapping.					
TR-9-90610-HA	**VIPER™ Check Valve Advanced Signature Analysis**	**June 11, Dec 3**	**TR-9-90600**	**4 Days**	**$2,370**
TR-9-91610-HA	**Check Valve Advanced Signature Analysis (Platform TBD)**	**Aug 13**	**TR-9-90600**	**4 Days**	**$2,370**
These courses instruct students in the advanced techniques for acoustic emission (AE), eddy current (EC) and ultrasonic (UT) theory and application for check valve diagnosis. The course will review advanced acquisition techniques and advanced signature analysis. The instructor will lecture on advanced techniques as result of operational experience and practical application for acoustic, eddy current, and ultrasonic technologies. Operational issues covered during the class include: advanced UT theory and application, AE advanced theory and application, and EC advanced theory and application. The student will leave class familiar with advanced signature analysis of Check valve diagnostic traces.					

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Terms and Conditions

- CRANE reserves the right to limit class sizes.
- Attendees are strongly encouraged to register greater than 30 days prior to class start as CRANE® reserves the right to cancel classes when necessary. Every effort will be made to cancel classes 30 days or greater before class date.
- Pricing does not include food, lodging or transportation.
- All courses are offered at CRANE® Nuclear Kennesaw, GA Training Center.
- Pricing is per US Domestic student, per course, and includes all classroom materials.
- Class registrations are not confirmed by CRANE without a P.O. or registration committing payment (P.O. or Credit Card).
- Course attendee substitutions are acceptable any time prior to the course start date, but CRANE must be notified in writing (e-mail is acceptable) prior to the class start date.
- CRANE reserves the right to cancel any class. If a class is cancelled, students will be notified via telephone and e-mail. Every effort will be made to reschedule a cancelled class or transfer enrollments to a later date.
- If notification is received at least two weeks prior to the start of the course, credit may be granted to a later seminar date. No refunds are available for cancellations made less than 30 days prior to the start of the scheduled course.

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