

## *Technical Description*

Crane Nuclear offers to provide the services as described in this Technical Description subject to the pricing, terms and conditions delineated in the Commercial Description.

### **VOTES<sup>®</sup> Infinity Check Valve Data Acquisition and Basic Analysis Training**

<b>Standard Class Size:</b>	6 Students
<b>Course Duration:</b>	5 Days
<b>Prerequisite:</b>	Working knowledge of check valves
<b>Course Location:</b>	Crane Nuclear, Kennesaw, GA.
<b>Supplied Materials:</b>	Training manual for each student
<b>Suggested Training Aides:</b>	VOTES Infinity Check Valve system
<b>Suggested Attendees:</b>	Check valve, instrument & control, and maintenance engineers

#### **Course Description:**

The course will instruct students in the use of acoustics, eddy current and ultrasonic devices used for check valve diagnostics. The student will be shown the proper installation techniques for the diagnostic transducers and operation of the VOTES Infinity Check Valve system. The instructor will demonstrate how to acquire and store the signatures to provide information concerning the operation of check valves. Operational issues covered during the class will include; detecting non-operational check valves, frequency of disk flutter, disk position in flow, and backseat disk tapping. The student will become familiar with the VOTES Infinity Check Valve system software features for evaluation purposes.

#### **Course Terminal Objectives:**

Each student will be required to pass a written exam with a minimum score of 80% in order to successfully complete this course. Upon successful completion of this course, the student will:

- Properly install all of the VOTES Infinity Check Valve Data Acquisition System Components in preparation for data acquisition.
- Acquire, store, and perform basic analysis on a complete set of signatures from each of the function tests; stable flow test, stroke test, and leak test.
- Identify common degradations associated with check valves and derive their possible causes.

**Enabling Objectives:**

After completing this course, the student will:

- Describe the purpose of a check valve and the most common types of check valves tested.
- Explain the general maintenance of check valves.
- Describe the different testing categories implemented regarding check valves.
- Discuss the basic flow path of the check valve data acquisition software.
- Describe the principles of UT, AE, EC testing.
- Perform the proper installation of all applicable equipment.
- Perform the data acquisition and signature analysis routines including, stable flow test, stroke test, manual mode, live display, leak test, baseline, trending and comparison reports and data analysis, and explain the outcomes.

**Course Benefits:**

- Increased knowledge of check valve operation and terminology.
- Increase the plant's self-sufficiency in check valve testing.
- Increase the reliability of the plant's check valves.
- Reduce the plant's cost of check valve diagnostic testing.