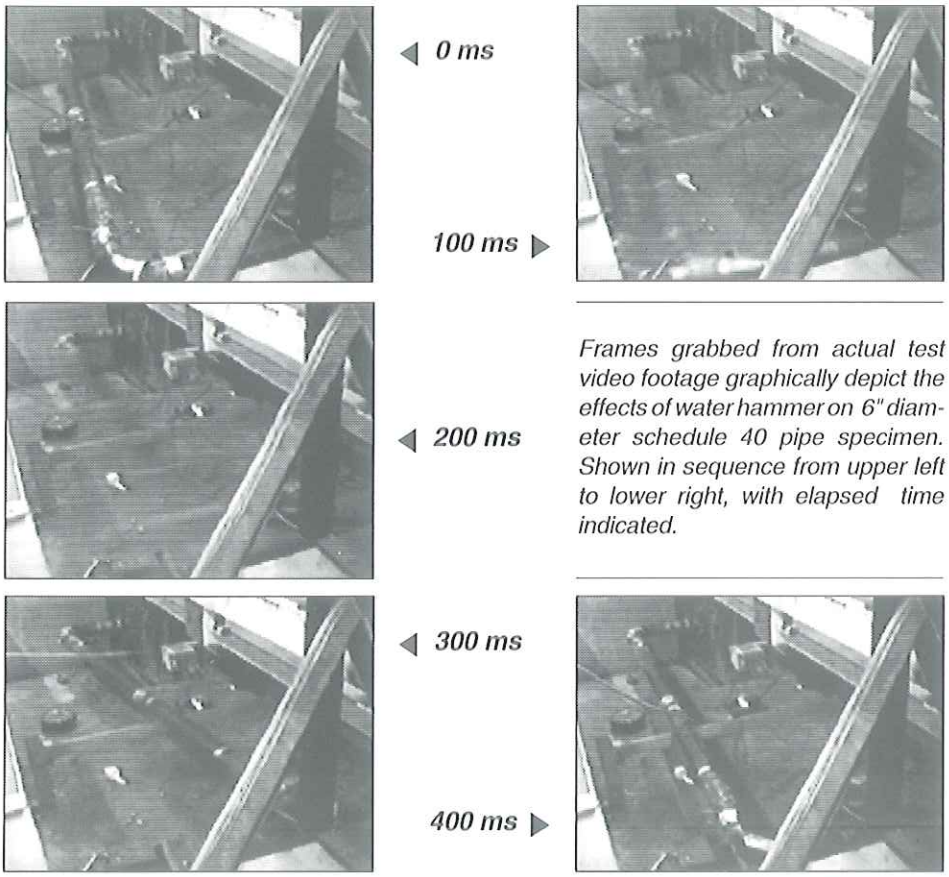
ANCONEWS

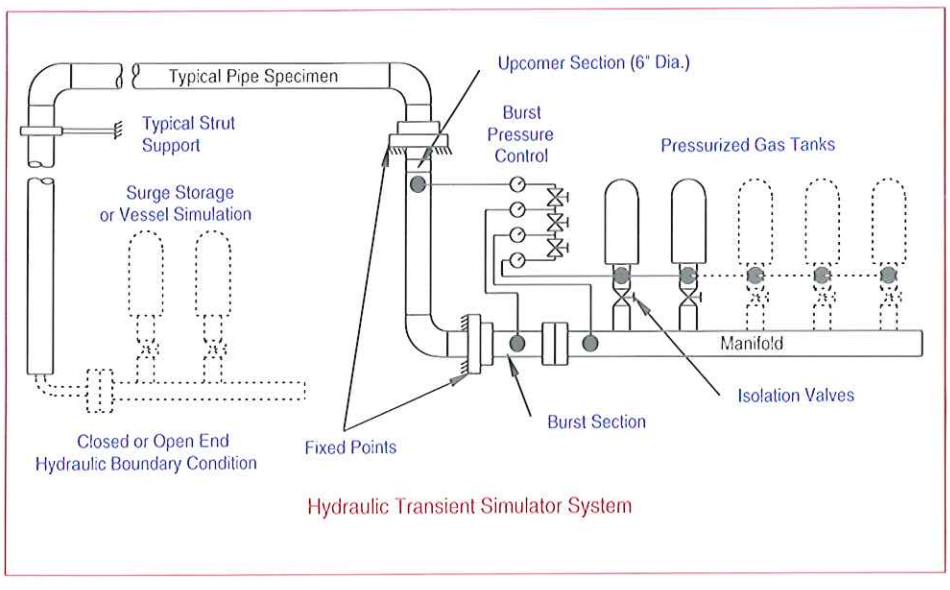
ENERGY, SYSTEMS, & STRUCTURES

Volume 3, No. 2, April 1993

Severe Hydraulic Transients Captured on Video



Frames grabbed from actual test video footage graphically depict the effects of water hammer on 6" diameter schedule 40 pipe specimen. Shown in sequence from upper left to lower right, with elapsed time indicated.



Hydraulic Transient Simulator System

WATER HAMMER SIMULATION

Under the sponsorship of the Electric Power Research Institute (EPRI), ANCO performed pressure wave and water hammer simulations on 2" and 6" diameter pipes and pipe restraints.

Strut support failures, extreme elbow deformation, and failure of eroded/corroded pipe were produced in the course of testing. Response data were recorded using multichannel instrumentation and documented on video tape.

EPRI has used this data in its piping and fitting dynamic reliability program, as support for new ASME code cases, and to produce a training video on water hammers to assist plant operating personnel to locate and understand water hammer damage.

TRANSIENT SIMULATOR SYSTEM

The ANCO hydraulic transient simulator is represented in the drawing at left. Energy to produce a pressure wave or moving water slug comes from pressurized nitrogen tanks acting through a rupture diaphragm. The surge can be vented to atmosphere, stopped at a dead end, or sent into a surge tank at pressure. The system can operate from 600 to 3,000 psi and has a drive gas volume of 10 cubic feet. Slug velocities up to 400 fps and peak pressures up to 8,000 psi have been achieved. Equipment such as valves can be placed in line to demonstrate design adequacy under hydrodynamic flow and shock forces.

CODES VALIDATED

ANCO has also performed laboratory simulation of BWR torus blowdown, and field measurements of actual water hammer events to validate computer codes (such as RELAP).

For more information, contact Paul Ibanez, Los Angeles

ANCO Engineers, Inc.
Culver City, CA
(800) 932-5515

Optical Scanning Improves Lighting Retrofit Productivity

INCREASED DEMAND

When Consolidated Edison (ConEd) of New York's "ENLIGHTENED ENERGY" program increased the rebate level for lighting fixture replacements from $300/kW to $1000/kW, customer response was overwhelming. In the Westchester Operating Area alone, the application rate increased from a monthly average of 11 in 1990 to 254 in 1991.

ANCO personnel, who implement the ConEd program, recognized that in order to maintain a reasonable turnaround time in managing and processing applications, a new, more automated approach would be needed to accommodate the increased work load. Working with ConEd, they focused on developing a computerized report generating system.

ANCO and ConEd personnel evaluated many potential automation solutions. Specially programmed field laptop and pen computers had problems with breakage, theft, battery life, and temperature tolerance. They were quickly rejected. Other methods were rejected on the basis of cost, learning curve time, and unproven technology.

OPTICAL SCANNING

Surprisingly, a method relatively low on the technology scale was selected: optical scanning. The optical scanner, which reads pencil marks on specially designed forms, was chosen for the following reasons:

1) Proven technology: The optical scanner has been utilized for decades by a wide variety of industries.
2) Low initial cost: The scanner cost approximately $10,000 (including software).
3) Ease of use: There is no lengthy training required for personnel to learn new technologies.

The data is extracted from the completed scan sheets using ***Clipper***. After editing, information is merged with customer information located in a database in the central computer system, which in turn is sent to the final report document (which is composed in ***WordPerfect***) to create a professional looking report that is sent to customers.

RESULTS

1) Greater Productivity: Report generation time has decreased by 20% to 50%, for approximately half of all applications.
2) Lower Error Rates: Descriptions and notes are standardized and automated, decreasing checking and training time of new personnel. All fixture information, wattages and fixture price caps are now controlled centrally, further reducing potential errors.
3) Complete Flexibility: Operators are able to edit their work at any stage in the process.

THE FUTURE

Little remains to fully integrate this program with the new database being developed at ConEd. Ultimately, there is the potential of linking the optical scanner program directly to the customer master database and E-mailing the reports through the approvals process to reduce the paper paths created by the present system.

This process is also suited for a stand-alone rebate reporting program and can be developed into a full tracking program. Compatibility with popular word processing and spreadsheet programs is one more reason that this program is successful and would be a practical solution for most rebate programs today.

For more information contact
George Marriott, New York

NASA Evaluates Computerized Torque Wrench

INCREASED PERFORMANCE

INTOWS, the **IN**strumented **TO**rque **W**rench **S**ystem, is currently being evaluated by both NASA and Lockheed. Developed for the NASA-Kennedy Space Center's *Space Shuttle Payload Division* by ANCO Engineers, INTOWS is a quality assurance tool, which ensures that all bolt torquing operations are performed according to specified procedures and provides a documented history of those operations. INTOWS is now entering its final phase of evaluation.

DECREASED COSTS

INTOWS will reduce costs during the torquing of the several thousand bolts in a typical payload by reducing the number of test personnel needed by at least one-third, while providing greater QA control and performance.

COMPLETE SYSTEM

The system consists of a desktop computer equipped with a barcode label printer, an instrumented torque wrench, and a handheld microcomputer equipped with a barcode wand.

The handheld microcomputer is equipped with an integral keyboard, a backlit display, internal rechargeable NiCad battery pack (cappable of providing over 8 hours of operation between recharges), over 1 mbyte of memory, an RS-232 serial communications port, a printer port, and an ANCO-designed single-channel signal conditioner and digital data acquisition board. The handheld unit's applied torque data is uploaded to the desktop computer when desired so that the data acquired during the performance of the procedures can be recorded and archived for QA purposes.

The torque wrench is instrumented with a strain gage array to transduce the applied torque. An approved torque procedure is identified with a barcode label describing the number of bolts, type of torque operation, torque tolerances, and proper torque range. The procedure barcode label is scanned by the wand attached to the handheld unit, this informs the program of the proper parameters. The handheld unit monitors and records the torque applied by the wrench to the fasteners. Audible and visual annunciations are provided to the operator throughout the torque procedure. Over and undertorque conditions cause audible and/or visual alarms and cause the unit to lockout until cleared by approved personnel for further use.

For more information contact
Tom Solimeo, Los Angeles

ANCO Engineers, Inc., (800) 932-5515

Los Angeles:
9937 Jefferson Blvd., Suite 200
Culver City, CA 90232-3591
Tel: (310) 204-5050,
(800) 932-5515
Fax: (310) 202-6085

Grand Rapids:
2660 Horizon Dr., S.E., Suite D-1
Grand Rapids, MI 49546
Tel: (616) 957-1588
Fax: (616) 957-2510

East Lansing:
2105 University Park Dr., Suite A
Okemos, MI 48864
Tel: (517) 349-8223
Fax: (517) 349-8253

New York:
222 W. 14th St., Suite 2A
New York, NY 10011
Tel: (212) 627-1940,
(800) 966-8451
Fax: (212) 627-1439