

# Table of Contents

## LECTURES

MECHANICAL SEAL RELIABILITY IMPROVED WITH API PIPING PLAN 23 .....	1
<i>V. Ray Dodd, Thomas E. Hinkel</i>	
PRESSURE RATINGS OF MECHANICAL SEALS .....	7
<i>Gordon S. Buck</i>	
REPLACEMENT OF THE BOILER FEEDPUMPS DURING THE RETROFIT OF THE 500 MW UNITS AT A GERMAN POWER STATION .....	15
<i>Cord H. Laux, Uwe Burchhardt, and Uwe Kirstein</i>	
REBUILDING PROCESS PUMPS TO COMPLY WITH FUGITIVE EMISSIONS STANDARDS .....	25
<i>Stephen C. Rossi and John B. Cary</i>	
DEVELOPMENT AND FIELD TEST RESULTS OF HIGH PERFORMANCE SEALS FOR AN NGL INJECTION PUMP .....	35
<i>Thomas D. Maceyka, Peter Kay, and David R. Leet</i>	
DESIGN AND APPLICATION OF DUAL GAS SEALS FOR SMALL BORE SEAL CHAMBERS .....	43
<i>Alan O'Brien and James R. Wasser</i>	
CONTROL VALVE INDUCED PIPELINE VIBRATIONS IN A PAPER PULP PUMPING SYSTEM .....	49
<i>Andrew L. Lewis, Fred R. Szenasi, and Daniel R. Roll</i>	
THE APPLICATION OF COMPUTER SIMULATION AND REAL-TIME MONITORING TO MINIMIZE THE PRESSURE PULSATIONS IN COMPLEX PUMPING SYSTEMS .....	61
<i>Edward Graf and John F. Marchi, Jr.</i>	
TWO-PHASE FLOW PERFORMANCE OF A HEAT TRANSPORT PUMP .....	69
<i>H. Samarasekera</i>	
TWENTY-THREE YEARS OPERATING EXPERIENCE WITH THE WORLD'S LARGEST BOILER FEEDWATER PUMP .....	75
<i>Frank L. Michell, Daniel H. Drew, Timothy L. Wotring, and Richard P. Koch</i>	
BONE-DRY RUNNING TESTS UTILIZING DIAMOND LIKE CARBON COATED SILICON CARBIDE BEARINGS AND POLYMER LUBRICATING STRIPS IN AN ANSI MAGNETIC DRIVE PUMP .....	85
<i>Anthony E. Stavale</i>	
DIAMOND LIKE CARBON COATINGS-TRIBOLOGICAL POSSIBILITIES AND LIMITATIONS IN APPLICATIONS ON SINTERED SILICON CARBIDE BEARING AND SEAL FACES .....	93
<i>Michael Fundus and Heinrich Knoch</i>	

## TUTORIALS

A COMPARISON OF POSITIVE DISPLACEMENT AND CENTRIFUGAL PUMP APPLICATIONS .....	99
<i>John E. Purcell and Joseph A. Silvaggio, Jr.</i>	
PUMP LIFE-CYCLES AND THE INTERNET- UTILIZING TECHNOLOGY TO IMPROVE PUMP RELIABILITY .....	105
<i>Paul Shank</i>	
PRESENT LIMITS OF OPERATION OF PRODUCT LUBRICATED AND MAGNETIC BEARINGS IN PUMPS .....	113
<i>Michael K. Swann, Jonathan Watkins, and Kevin R. Bornstein</i>	
OIL LUBRICATION SYSTEMS FOR PROCESS PUMPS AND RELATED EQUIPMENT .....	129
<i>Vinod P. Patel and Donald G. Coppins</i>	
TUTORIAL ON SPECIAL PURPOSE PUMPS-PITOT; PROGRESSING CAVITY; AIR OPERATED DIAPHRAGM; AND HYDRAULICALLY ACTUATED DIAPHRAGM .....	141
<i>Bruno Schiavello, Thomas L. Angle, Aleksander S. Roudnev, James G. Shaw, Kent Whitmire, Charles W. Taylor, William F. Versaw, and Daniel W. Chacchia</i>	
TROUBLESHOOTING TACTICS TO IMPROVE PUMP MEAN TIME BETWEEN REPAIRS .....	171
<i>John P. Joseph II and Perry C. Monroe</i>	
DISCUSSION GROUPS AND LEADERS .....	177
SHORT COURSES .....	197
ADVISORY COMMITTEE .....	209
PROFESSIONAL STAFF .....	215
TURBOMACHINERY LABORATORY .....	219