

Contents

	Page
Foreword	v
9.6.4 Rotodynamic pumps for vibration measurements and allowable values	1
9.6.4.1 Introduction and scope	1
9.6.4.1.1 Introduction	1
9.6.4.1.2 Scope	1
9.6.4.2 Bearing housing vibration measurement	2
9.6.4.2.1 Measurement procedure and units	2
9.6.4.2.2 Vibration measurement instrumentation and transducers	3
9.6.4.2.3 Measurement locations and directions	4
9.6.4.2.4 Vibration acceptance tests	4
9.6.4.2.5 Allowable pump bearing housing vibration	7
Appendix A Test report (informative)	11
Appendix B Factors affecting vibration (informative)	13
B.1 Residual mechanical unbalance of rotating parts	13
B.2 Residual mechanical unbalance of rotating parts - abrasive fluids	17
B.3 Pump and driver natural frequency and resonance	17
B.4 Miscellaneous mechanical problems	17
B.5 Hydraulic disturbances	18
B.6 Hydraulic resonance in piping	18
B.7 Managing vibration of vertical structures	19
Appendix C Guideline for motor vibration for vertical pumps (informative)	20
C.1 Introduction and recommendation	20
C.2 Background	21
Appendix D Vibration source identification chart (informative)	22
Appendix E Vibration transducer mounting and sensitivity (informative)	23
Appendix F Vibration transducer types (informative)	25
Appendix G Index	27
 Figures	
9.6.4.2.2.2 — Mounting methods for vibration transducers	4
9.6.4.2.3.1 — Measurement locations and directions	5
9.6.4.2.5.1a — Allowable pump vibration, pump types BB and OH	8
9.6.4.2.5.1b — Allowable pump vibration, pump types VS1, VS2, VS3, VS4, VS5, VS6, VS7, and VS8	8
9.6.4.2.5.1c — Allowable pump vibration, solids-handling pump types	9
9.6.4.2.5.1d — Allowable pump vibration, horizontal and vertical slurry pump types (excluding wet pit cantilever belt-driven pumps with overhung motors)	9
B.1 — Center of gravity displacement or acceptable residual unbalance (balance grade G6.3) – metric units	14
B.2 — Center of gravity displacement or acceptable residual unbalance (balance grade G6.3) – US customary units	15

B.3 — Single suction impeller	16
B.4 — Double suction impeller.....	16
C.1 — Guidelines for acceptable vibration levels at the top of the motor	20
E.1 — Typical response of three mounting types	23

Tables

9.6.4.2.5.2a — Additional acceptance criteria for pumps operating at 600 rpm and below.....	10
9.6.4.2.5.2b — Additive values to Table 9.6.4.2.5.2a	10