

DIN EN ISO 10437:2005-07 (E)

Petroleum, petrochemical and natural gas industries - Steam turbines - Special-purpose applications (ISO 10437:2003); English version EN ISO 10437:2003

Contents

Page

Foreword	5
Introduction	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	10
4 Dimensions	14
5 Statutory requirements.....	14
6 Basic design	14
6.1 General	14
6.2 Nameplates and rotation arrows	17
7 Casings	18
7.1 Pressure casings	18
7.2 Casing connections	20
7.3 Internal stationary components.....	21
7.4 External forces and moments	21
8 Rotating elements	21
8.1 General	21
8.2 Shafts	22
8.3 Blading	22
8.4 Speed-sensing element	23
9 Rotor dynamics	23
9.1 General	23
9.2 Lateral analysis	24
9.3 Unbalanced rotor response verification test.....	29
9.4 Additional testing	30
9.5 Torsional analysis.....	31
9.6 Vibration and balancing	32
10 Bearings, bearing housings, and seals	33
10.1 Radial bearings	33
10.2 Thrust bearings and collars	34
10.3 Bearing housing	35
10.4 Grounding	35
10.5 Shaft seals	35
11 Materials	36
11.1 General	36
11.2 Castings	37
11.3 Welding	38
12 Controls and instrumentation.....	39
12.1 General	39
12.2 Turbine governing system	39
12.3 Overspeed shutdown system	42
12.3.1 General	42
12.3.2 Electronic overspeed detection system	43
12.3.3 Electro-hydraulic solenoid valves	43
12.3.4 Trip valves/combined trip and throttle valves.....	43
12.4 Other alarms and shutdowns.....	45
12.5 Instrument and control panels.....	46

	Page
12.6	Indicating instrumentation47
12.6.1	Tachometers47
12.6.2	Temperature gauges47
12.6.3	Thermowells.....47
12.6.4	Thermocouples and resistance temperature detectors47
12.6.5	Pressure gauges.....47
13	Electrical systems47
14	Piping and appurtenances.....47
14.1	General47
14.2	Oil piping48
14.3	Instrument piping48
15	Accessories48
15.1	Couplings and guards.....48
15.2	Gear units48
15.3	Mounting plates49
15.3.1	General49
15.3.2	Baseplates.....50
15.3.3	Soleplates and subplates51
15.4	Relief valves.....51
15.5	Lubrication and control-oil system51
15.6	Gland vacuum systems52
15.7	Insulation and jacketing.....52
15.8	Turning gear.....52
15.9	Special tools53
16	Inspection, testing and preparation for shipment53
16.1	General53
16.2	Inspection.....54
16.2.1	General54
16.2.2	Materials inspection54
16.2.3	Mechanical inspection55
16.3	Testing.....55
16.3.1	General55
16.3.2	Casing pressure hydro tests56
16.3.3	Mechanical running test56
16.3.4	Optional tests and inspections58
16.4	Preparation for shipment.....59
17	Vendor's information61
17.1	General61
17.2	Proposals62
17.2.1	General62
17.2.2	Drawings.....62
17.2.3	Technical data.....62
17.2.4	Curves.....63
17.3	Contract data63
17.3.1	General63
17.3.2	Drawings and technical data.....64
17.3.3	Parts lists and recommended spares.....64
17.3.4	Installation, operation, maintenance and technical manuals64
Annex A (informative)	Typical data sheets.....65
Annex B (informative)	Steam turbine nomenclature86
Annex C (normative)	Procedures for determining residual unbalance88
Annex D (informative)	Alarm and shutdown systems.....89
Annex E (normative)	Coupling guards96
Annex F (informative)	Foundation drawings98

Annex G (informative) **Gland sealing and leak-off system**..... **102**
Annex H (informative) **Typical inspection of components**..... **104**
Annex I (informative) **Inspector's checklist** **105**
Annex J (informative) **Vendor drawing and data requirements (VDDR)** **107**
Bibliography **119**