

ISO 10437:2003-07 (E)

Petroleum, petrochemical and natural gas industries - Steam turbines - Special-purpose applications

Contents		Page
Foreword		vi
Introduction		vii
1	Scope	1
2	Normative references	1
3	Terms and definitions	4
4	Dimensions	8
5	Statutory requirements	8
6	Basic design	8
6.1	General	8
6.2	Nameplates and rotation arrows	11
7	Casings	12
7.1	Pressure casings	12
7.2	Casing connections	14
7.3	Internal stationary components	15
7.4	External forces and moments	15
8	Rotating elements	15
8.1	General	15
8.2	Shafts	16
8.3	Blading	16
8.4	Speed-sensing element	17
9	Rotor dynamics	17
9.1	General	17
9.2	Lateral analysis	18
9.3	Unbalanced rotor response verification test	23
9.4	Additional testing	24
9.5	Torsional analysis	25
9.6	Vibration and balancing	26
10	Bearings, bearing housings, and seals	27
10.1	Radial bearings	27
10.2	Thrust bearings and collars	28
10.3	Bearing housing	29
10.4	Grounding	29
10.5	Shaft seals	29
11	Materials	30
11.1	General	30
11.2	Castings	31
11.3	Welding	32
12	Controls and instrumentation	33

12.1	General	33
12.2	Turbine governing system	33
12.3	Overspeed shutdown system	36
12.3.1	General	36
12.3.2	Electronic overspeed detection system	37
12.3.3	Electro-hydraulic solenoid valves	37
12.3.4	Trip valves/combined trip and throttle valves	37
12.4	Other alarms and shutdowns	39
12.5	Instrument and control panels	40
12.6	Indicating instrumentation	41
12.6.1	Tachometers	41
12.6.2	Temperature gauges	41
12.6.3	Thermowells	41
12.6.4	Thermocouples and resistance temperature detectors	41
12.6.5	Pressure gauges	41
13	Electrical systems	41
14	Piping and appurtenances	41
14.1	General	41
14.2	Oil piping	42
14.3	Instrument piping	42
15	Accessories	42
15.1	Couplings and guards	42
15.2	Gear units	42
15.3	Mounting plates	43
15.3.1	General	43
15.3.2	Baseplates	44
15.3.3	Soleplates and subplates	45
15.4	Relief valves	45
15.5	Lubrication and control-oil system	45
15.6	Gland vacuum systems	46
15.7	Insulation and jacketing	46
15.8	Turning gear	47
15.9	Special tools	47
16	Inspection, testing and preparation for shipment	47
16.1	General	47
16.2	Inspection	48
16.2.1	General	48
16.2.2	Materials inspection	48
16.2.3	Mechanical inspection	49
16.3	Testing	49
16.3.1	General	49
16.3.2	Casing pressure hydro tests	50
16.3.3	Mechanical running test	51
16.3.4	Optional tests and inspections	52
16.4	Preparation for shipment	54
17	Vendor's information	55
17.1	General	55
17.2	Proposals	56
17.2.1	General	56
17.2.2	Drawings	56
17.2.3	Technical data	56
17.2.4	Curves	57
17.3	Contract data	57
17.3.1	General	57
17.3.2	Drawings and technical data	58
17.3.3	Parts lists and recommended spares	58
17.3.4	Installation, operation, maintenance and technical manuals	58

Annex A (informative) Typical data sheets	59
Annex B (informative) Steam turbine nomenclature	80
Annex C (normative) Procedures for determining residual unbalance	82
Annex D (informative) Alarm and shutdown systems	88
Annex E (normative) Coupling guards	90
Annex F (informative) Foundation drawings	92
Annex G (informative) Gland sealing and leak-off system	96
Annex H (informative) Typical inspection of components	98
Annex I (informative) Inspector's checklist	99
Annex J (informative) Vendor drawing and data requirements (VDDR)	101
Bibliography	113