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**Glossary of terms for thermal
power plants—Gas turbine and
auxiliary equipment**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee, as the result of proposal for revision of Japanese Industrial Standard submitted by Thermal and Nuclear Power Engineering Society (TENPES)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS B 0128 : 1995** is replaced with this Standard.

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Glossary of terms for thermal power plants—Gas turbine and auxiliary equipment

1 Scope This Japanese Industrial Standard specifies the principal terms and their definitions concerning gas turbine and their auxiliary equipment used in thermal power plants.

2 Normative references The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0126 *Glossary of terms for thermal power plants—Boilers and auxiliary equipment*

JIS B 0127 *Glossary of terms for thermal power plant—Steam turbines and auxiliary equipment of thermal and geothermal power plant*

JIS B 8040 *Gas turbines—Vocabulary*

JIS B 8041 *Gas turbines—Acceptance tests*

JIS B 8042-1 *Gas turbines—Procurement—Part 1: General introduction and definitions*

JIS B 8042-2 *Gas turbines—Procurement—Part 2: Standard reference conditions and ratings*

JIS B 8042-4 *Gas turbines—Procurement—Part 4: Fuels and environment*

JIS B 8042-6 *Gas turbines—Procurement—Part 6: Combined cycles*

JIS B 8042-9 *Gas turbines—Procurement—Part 9: Reliability, availability, maintainability and safety*

JIS Z 8106 *International electrotechnical vocabulary Chapter 801: Acoustics and electroacoustics*

3 Classification of terms Classification of terms shall be as follows:

a) **Gas turbine**

- 1) Types and models
- 2) Structure • constitution
- 3) Auxiliary equipment
- 4) Gas turbine in general
- 5) Performance and test

b) **Turbine**

- 1) Types and models
- 2) Structure • constitution

- 3) Auxiliary equipment
- 4) Turbine in general
- 5) Performance and test
- c) **Compressor**
 - 1) Types and models
 - 2) Structure • constitution
 - 3) Auxiliary equipment
 - 4) Compressor in general
 - 5) Performance and test
- d) **Combustor**
 - 1) Types and models
 - 2) Structure • constitution
 - 3) Auxiliary equipment
 - 4) Combustor in general
 - 5) Performance and test
- e) **Control and protection system**
 - 1) Types and models
 - 2) Structure • constitution
 - 3) Auxiliary equipment
 - 4) Control and protection system in general
 - 5) Performance and test
- f) **Fuel system**
 - 1) Types and models
 - 2) Structure • constitution
 - 3) Auxiliary equipment
 - 4) Fuel system in general
- g) **Air intake and exhaust system**
 - 1) Types and models
 - 2) Structure • constitution
 - 3) Auxiliary equipment
 - 4) Air intake and exhaust system in general
 - 5) Performance and test

- h) **NO_x removal equipment**
 - 1) Types and models
 - 2) Structure • constitution
 - 3) Auxiliary equipment
 - 4) NO_x removal in general
 - 5) Performance and test
- i) **Heat recovery steam generator and fully fired steam generator**
 - 1) Types and models
 - 2) Structure • constitution
 - 3) Auxiliary equipment
 - 4) Heat recovery steam generator and fully fired steam generator in general
 - 5) Performance and test
- j) **Gas turbine heat exchanger**
 - 1) Types and models
 - 2) Structure • constitution
 - 3) Heat exchanger in general
 - 4) Performance and test
- k) **Combined cycle**
- l) **Other power generation plants using gas turbine**

4 Terms and definitions Terms and definitions shall be as follows.

Conventional expressions and equivalent English expressions are shown as informative reference.

Remarks : In the Term fields, parenthesised parts of term may be omitted unless it is confusing.

a) Gas turbine

1) Types and models

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1101	ガスタービン	GASU TÂBIN	machine to convert thermal energy of working fluid to mechanical work, i.e. facility consisting of one or more compressors, equipment to heat working fluid, one or more turbines, controlling equipment and heat exchanger and other auxiliary equipment as required Examples of arrangement of constituting elements of gas turbine are shown in attached figures 1 to 6.		gas turbine
1102	ガスタービン発電プラント	GASU TÂBIN HATUDEN PURANTO	power plant including gas turbine and all necessary auxiliary equipment		gas turbine power plant
1103	開放サイクル	KAIHÔ SAIKURU	thermodynamic cycle in which both intake gas and exhaust gas are released to ambience		open cycle
1104	密閉サイクル	MIPPEI SAIKURU	thermodynamic cycle in which the working fluid circulates separated from ambience		closed cycle
1105	内燃ガスタービン	NAINEN GASU TÂBIN	type of gas turbine where fuel is sprayed directly into working fluid and fired to heat the working fluid in combustors		internal combustion gas turbine
1106	外燃ガスタービン	GAINEN GASU TÂBIN	type of gas turbine where fuel is not sprayed directly into working fluid, but the working fluid is heated indirectly by such as heat exchangers		external combustion gas turbine
1107	単純サイクル	TANZYUN SAIKURU	thermodynamic cycle consisting of continuous strokes of only compression, heating and expansion (see JIS B 8042-1)	SINPURU SAIKURU	simple cycle

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1108	再生サイクル	SAISEI SAIKURU	thermodynamic cycle consisting of continuous strokes of compression, regenerative heating, heating, expansion and regenerative cooling (heat transfer from exhaust gas to compressor outlet fluid) of working fluid with exhaust heat recovery		regenerative cycle
1109	中間冷却サイクル	TYŪKAN REIKYAKU SAIKURU	thermodynamic cycle in which working fluid is cooled between successive stages of compression strokes		intercooled cycle
1110	再熱サイクル	SAINETU SAIKURU	thermodynamic cycle in which working fluid is heated between successive stages of expansion strokes In case reheating is made by combustion, this is called "re-combustion" cycle.		reheat cycle
1111	複合サイクル, コンバインドサイ クル	HUKUGŌ SAIKURU, KONBAINDO SAIKURU	thermodynamic cycle combining multiple heat cycles to improve heat efficiency Generally, this designates the thermodynamic cycle combining gas turbine cycle and steam turbine cycle. Remarks: Generally, this word applies to the case where high temperature system and low temperature system are both for power generation. But it may also apply to the case in a broad sense where the low temperature system is only for heat supply (see JIS B 8042-6).	GASU TĀBIN- ZYŌKI TĀBIN HUKUGŌ SAIKURU	combined cycle, combined gas and steam turbine cycle
1112	一軸形ガスタービ ン	ITZIKUGATA GASU TĀBIN	gas turbine in which rotation shafts of compressor and turbine are connected mechanically and the output is taken out directly or via transmission (see attached figures 1 and 2)		single-shaft gas turbine

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1113	多軸形ガスタービン	TAZIKUGATA GASU TÂBIN	gas turbine with at least two turbines operating with independent rotating shafts This includes free turbine type (where load output shaft is not connected mechanically to gas generating machine shaft) and compound type (where parallel compressor/turbine shafts are provided for high and low pressure, respectively) (see attached figures 3 and 4). Remarks: For example, those with two shafts are called two-axis gas turbine. Especially the type where high pressure compressor/turbine and low pressure compressor/turbine have a common axis is called twin spool type.		multi-shaft gas turbine
1114	定置(式)ガスタービン	TEITI (SIKI) GASU TÂBIN	gas turbine facility operated at a fixed location and which cannot easily be moved		stationary gas turbine
1115	移動(式)ガスタービン	IDÔ (SIKI) GASU TÂBIN	gas turbine facility operated at a fixed location but which can easily be moved to another place and operated		mobile gas turbine
1116	抽気ガスタービン	TYŪKI GASU TÂBIN	gas turbine where compressed air is extracted from between the stages or from the outlet of compressors, or where hot gas is extracted from the inlet or between stages of the turbine, for usage outside (see attached figure 5)		bleed gas turbine, extraction gas turbine
1117	ヘビーデューティガスタービン	HEBĪ ZYŪTI GASU TÂBIN	gas turbine originally designed for land or ship use assuming long term continuous operation		heavy duty gas turbine
1118	航空転用(形)ガスタービン	KÔKÛTENYÔ (GATA) GASU TÂBIN	gas turbine converted for power generation by design change of aircraft engines or by combining gas generator as the main unit and output turbine	KÔKÛKI TENYÔ (GATA) GASU TÂBIN	aero-derivative gas turbine

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1119	パッケージ形ガスタービン	PAKKÊZIGATA GASU TÂBIN	gas turbine shipped in a unit (package) into which gas turbine and main auxiliary equipment have been assembled in the factory Particularly, gas turbine of several hundreds kilo watts or less is sometimes called "micro gas turbine", because of its characteristics such as structure and serviceability.		package type gas turbine

Remarks: Example of compound expression: Open regenerative reheat cycle two axis type gas turbine

2) Structure · constitution

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1201	タービン	TÂBIN	component of gas turbine, i.e. rotating machine to generate power by expansion of working fluid		turbine
1202	圧縮機	ASSYUKUKI	component of gas turbine, i.e. rotating machine to boost pressure of working fluid	KÛKI ASSYUKUKI	compressor
1203	燃焼器	NENSYÔKI	equipment which heats working fluid directly by firing fuel to the specified turbine inlet temperature Remarks: This includes those for reheating.	NENSYÔSITU	combustion chamber, combustor
1204	ガス発生機	GASU HASSEIKI	facility assembled from gas turbine components to generate hot compressed gas supplied to the process or output turbine This facility consists of one or more compressors, heating equipment of working fluid, one or more compressor-driven turbines, controller and necessary auxiliary equipment. Remarks: This includes those for aero-derivative gas turbine.		gas generator

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1205	制御—保安装置	SEIGYO-HOAN SÔTI	system consisting of control system required for normal start, stable operation and normal stop (e.g. start control system, governor and fuel control system), protection system for alarm or stop in emergencies (e.g. overspeed control device, fuel shut-off system), monitoring system and instruments for operation monitoring (e.g. rotation speed indicator and gas thermometer) and power system required by the system, including all equipment for control, protection and monitoring required for operation	KONTORÔRU SISUTEMU	control and protection system
1206	燃料装置	NENRYÔ SÔTI	equipment to supply, treat and control fuel to be suitable for gas turbine		fuel system
1207	吸排気装置	KYÛHAIKI SÔTI	generic term for equipment which leads air from outside to the compressor and discharges combustion gas to the outside		air intake and exhaust system
1208	脱硝装置	DASSYÔ SÔTI	equipment which removes nitrogen oxide (NO _x) contained in exhaust gas of gas turbine	DE-NOKKUSU	NO _x removal equipment
1209	排熱回収ボイラ	HAINETUKAISYÛ BOIRA	boiler which recovers the heat of exhaust gas of gas turbine and generates steam	EITIÂRUESUZÎ, EITIÂRUBÎ	heat recovery steam generator
1210	排気再燃ボイラ	HAIKI SAINEN BOIRA	boiler which utilizes exhaust gas of gas turbine as combustion air		fully fired steam generator
1211	排気助燃ボイラ	HAIKI ZYONEN BOIRA	boiler which leads exhaust gas of gas turbine for supplementary firing and generates steam by the recovered heat		supplementary fired steam generator
1212	ガスタービン用附属熱交換器	GASU TÂBINYÔ HUZOKU NETUKÔKANKI	equipment which heats or cools working fluid, lubricating oil, cooling air and cooling water of gas turbine This also includes the feed water heater by exhaust gas of gas turbine.		gas turbine heat exchanger

3) Auxiliary equipment

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1301	減速装置	GENSOKU SÔTI	gearing to reduce the rotation speed of turbine output axis and to transfer the turbine output to the driven machine	GENSOKU HAGURUMA	reduction gear
1302	ターニング装置	TÂNINGU SÔTI	equipment to rotate turbine rotor in low speed		turning gear, turning device, barring gear
1303	起動装置	KIDÔ SÔTI	equipment to start gas turbine Remarks: This equipment uses such as electric motor, diesel engine, compressed air, steam and thyrister.	SIDÔ SÔTI	starting equipment, starter
1304	潤滑油装置	ZYUNKATUYU SÔTI	equipment to supply lubricating oil This includes oil tank, oil pump, emergency oil pump, oil filter, oil cooler, piping and instruments.		lubricating system
1305	エンクロージャ	ENKURÔZYA	removable outer casing to protect main parts of gas turbine plant from weather and to reduce noise		enclosure
1306	換気装置	KANKI SÔTI	equipment consisting of ventilating fan, duct and damper to prevent high temperature within enclosure		ventilation equipment
1307	純水装置	ZYUNSUI SÔTI	equipment to remove impurities in the water to make pure water		water purification system, demineralizer
1308	冷却水装置	REIKYAKUSUI SÔTI	equipment to supply cooling water to cool working fluid, lubricating oil, cooling air and equipment used in gas turbine		cooling water system
1309	制御油装置	SEIGYOYU SÔTI	equipment to supply hydraulic fluid for electric governor This consists of oil tank, hydraulic fluid cooler and hydraulic fluid pump.		hydraulic power unit, control oil supply unit

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1310	制御油冷却器	SEIGYOYU REIKYAKUKI	equipment to cool hydraulic fluid for electric governor		hydraulic fluid cooler
1311	主制御油ポンプ	SYU SEIGYOYU PONPU	pump to supply hydraulic fluid for electric governor		(main) control oil pump
1312	補助制御油ポンプ	HOZO SEIGYOYU PONPU	pump which starts automatically in the emergencies of main control oil pump to supply hydraulic fluid Remarks 1 In case main control oil pump is driven by main shaft, this pump works also at the start and stop of turbine. 2 In case lubricating oil and main control oil are in common use, auxiliary oil pump is used in common.		auxiliary control oil pump

4) Gas turbine in general

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1401	起動, 始動	KIDÔ, SIDÔ	transition of gas turbine from stationary or turning state to operation “Stop” signifies transition from operation to stationary or turning state.		start
1402	自力起動	ZIRIKI KIDÔ	start performed without supplied power from outside of the plant		black start

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1403	回転方向	KAITEN HÔKÔ	direction of rotation of gas turbine rotor defined in reference to the flowing direction of working fluid Remarks: Attention is required since the same direction of rotation can be contrary depending on the direction of view, e.g. from intake side to exhaust side, or from exhaust side to intake side. The viewing direction shall be determined beforehand.		direction of rotation
1404	自立運転	ZIRITU UNTEN	state where rotation speed can be kept or accelerated as required without aid of torque from starting equipment		self sustaining
1405	無負荷定格速度運転	MUHUKA TEIKAKU-SOKUDO UNTEN	no load operation at the rated rotation speed	EHUESUENUERU	full speed no load operation
1406	定格負荷定格速度運転	TEIKAKUHUHUKA TEIKAKU-SOKUDO UNTEN	rated load operation at the rated rotation speed	EHUESUEHUERU	full speed full load operation
1407	タービン入口温度一定運転	TÂBIN IRIGUTIONDO ITTEI UNTEN	operation in which turbine inlet temperature is kept at the constant value independent of ambient condition		inlet temperature-constant operation
1408	出力一定運転	SYUTURYOKU ITTEI UNTEN	operation in which output is kept at the constant value independent of ambient condition		output-constant operation
1409	冷却運転	REIKYAKU UNTEN	operation continued at low or no load in order to avoid sudden temperature change of various sections when gas turbine is stopped		cooling down

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1410	シンクロアイドル運転	SINKURO AIDORU UNTEN	operating state in multi-shaft gas turbine, where the output axis driving power generator is rotating at the synchronous speed with the system frequency (or, in case reduction gear is used, at the velocity in accordance with the reduction ratio) with no load		synchronous idle operation
1411	コアアイドル運転	KOA AIDORU UNTEN	operating state in multi-shaft gas turbine, where the rotating shaft of gas generator is rotating slowly but not slower than at the self sustaining speed with no load		core idle operation
1412	スピン運転, クラッキング運転	SUPIN UNTEN, KURANKINGU UNTEN	operation driven only by starting equipment with no fuel fed	MÔTARINGU	spin operation, cranking operation
1413	強制冷却運転	KYÔSEI REIKYAKU UNTEN	spin operation in order to cool hot zones of gas turbine		forced cooling operation
1414	バージ運転	PÂZI UNTEN	spin operation for removing unburned fuel in combustor or duct prior to ignition when starting		purging operation
1415	起動曲線	KIDÔ KYOKUSEN	curve which shows the change of rotating speed, pressure, temperature and load during processes of start, speed up, parallel start and load increase along the time elapse		starting characteristics diagram
1416	ターニング	TÂNINGU	operation to rotate turbine at low speed by turning gear before starting or after stopping the turbine to avoid occurrence of strain in turbine rotors		turning
1417	遠隔操作	ENKAKU SÔSA	method to start, operate and stop gas turbine facility from remote location (generally, out of premises) by wire communication, radio communication, ultra high frequency communication or carrier transmission		remote operation
1418	点火	TENKA	operation to activate the ignition equipment in order to start fuel combustion		ignition

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1419	着火	TYAKKA	state where fuel has started combustion by ignition operation		light off
1420	起動時間	KIDÔ ZIKAN	duration for gas turbine to reach the rated rotation speed under rated load or no load condition from the stationary or turning state		starting-time
1421	起動回数	KIDÔ KAISŪ	total number of starts during a certain period		number of starts
1422	等価寿命時間	TÔKA ZYUMYÔ ZIKAN	usable time of hot parts considering the operating condition of the equipment (start/stop, load change, trips and fuel types)		equivalent life time
1423	等価運転時間	TÔKA UNTEN ZIKAN	operating time considering the operating condition of the equipment (start/stop, load change and trips) Coefficient for converting to this equivalent operating time is called "equivalent operating factor".		equivalent operating hour, equivalent operating time
1424	着火運転時間	TYAKKA UNTEN ZIKAN	accumulated operation time from ignition to extinction (see JIS B 8042-9)		fired operating hour
1425	高温部	KÔONBU	part where hot combustion gas passes through including combustor, turbine blade and vane		hot section, hot gas-path
1426	高温部品	KÔON BUHIN	part located in hot gas pass Generally, equipment life is managed by operating hour.		hot parts
1427	開放点検	KAIHÔ TENKEN	operation where the casing of turbine is removed and the main components are inspected on site or at the repair factory and defective parts are repaired or replaced Inspection may be performed for total system (major inspection, overhaul) or limited to hot sections (hot section inspection).	BUNKAI TENKEN, ÔBAHÔRU	major inspection, overhaul

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1428	高温部点検	KÔONBU TENKEN	operation of, with a part of the casing of turbine removed, inspecting components subjected to combustion gas such as combustor and turbine on site or at the repair factory and repairing or replacing defective parts (see JIS B 8042-9)		hot section inspection, hot gas path inspection
1429	燃焼器点検	NENSYÔKI TENKEN	operation of, with the combustor removed, inspecting the main components on site or at the repair factory and repairing or replacing defective parts		combustor inspection
1430	内視鏡点検	NAISIKYÔ TENKEN	inspecting operation to check rotating and stationary sections visually using endoscope without opening the casing	BOA SUKÔPU TENKEN	bore scope inspection
1431	遮熱コーティング	SYANETU KÔTINGU	ceramic coating applied to surfaces of hot parts to protect them from high temperature of combustion gas by preventing temperature rise of metal by its thermal resistance Remarks: Ceramic coating is a type of treatment to melt and spray alumina, zirconia, zircon or chromia to form ceramic inorganic coating on metal surfaces.	TÊBÎSÎ, SYANETU HIHUKU	thermal barrier coating
1432	耐高温腐食コーティング	TAI KÔON HUSYOKU KÔTINGU	coating to prevent corrosion of gas turbine parts caused by corroding components in hot working fluid		hot corrosion resistant coating
1433	耐酸化コーティング	TAI SANKA KÔTINGU	coating to prevent high temperature oxidation of gas turbine parts		oxidation resistant coating
1434	耐食コーティング	TAISYOKU KÔTINGU	coating to prevent corrosion of blades and vanes caused by corroding components in hot working fluid		corrosion protection coating
1435	耐磨耗コーティング	TAI MAMÔ KÔTINGU	coating applied to prevent abrasion by mutual friction in sections where contact and sliding occur between parts in combustor or rotors		wear resistant coating, abrasion resistant coating

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1436	アブレダブル・コ ーティング	ABUREDABURU KÔTINGU	coating applied intentionally to be easily abraded when con- tacted with opposed rotating blade edges in order to realize low leakage seal		abradable coating
1437	リコーティング	RIKÔTINGU	repairing method to remove degraded coating layer and ap- ply new coating, when oxidation resistant, corrosion resis- tant or heat resistant coating applied on gas turbine has degraded by long-term use		recoating
1438	大気プラズマ溶射	TAIKI PURAZUMA YÔSYA	spraying method for hot parts where coating material is sprayed in molten state to base material by using plasma in atmosphere to obtain coated layer	ÊPÎESU	atmospheric plasma spraying
1439	減圧プラズマ溶射	GEN'ATU PURAZUMA YÔSYA	spraying method for hot parts where coating material is sprayed in molten state to base material by using plasma generated in inert gas depressurised to atmospheric pressure or lower to make pure and dense coating	ERUPÎPÎESU	low pressure plasma spraying
1440	高速フレーム溶射	KÔSOKU HURÊMU YÔSYA	spraying method for hot parts where powdered material is melted in high velocity combustion gas and its particles are sprayed to base material in high velocity to make coating	ETIBUIÔEHU	high velocity oxygen spraying, high velocity oxygen-fuel spraying
1441	電子ビーム物理蒸 着	DENSI BÎMU BUTURI ZYÔTYAKU	coating method to irradiate electron beam to evaporation material and melt and evaporate it to be coated on the sur- face of base material	ÎBÎ-PÎBUIDÊ	electron-beam physical vapor deposition
1442	拡散浸透処理	KAKUSAN SINTÔ SYORI	reforming of metal surface by making elements penetrate from metal surface into the inside by diffusion phenomenon Various processes are available, among which diffusion coating of Al or Cr is widely applied to hot parts of gas tur- bine.		diffusion coating

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1443	HIP 処理	EITTAIPĪ SYORI	method of recovering strength of degraded metal materials such as blade of gas turbine, by eliminating creep void by applying both high temperature and high pressure in inert gas and then by making regenerative treatment Also called "hot isostatic pressing".		hot isostatic pressurizing, hot isostatic pressing
1444	拡散ロウ付処理	KAKUSAN RÔTUKESYORI	type of diffusion bonding used for manufacturing and repairing of gas turbine parts, i.e. method to melt and liquefy insert metal between bonding surfaces temporarily and then to bond them by isothermal solidification using diffusion Also called "liquid phase diffusion bonding".		liquid phase diffusion bonding
1445	空気冷却	KŪKI REIKYAKU	cooling method to use air as cooling medium		air cooling
1446	蒸気冷却	ZYÔKI REIKYAKU	cooling method to use steam as cooling medium of hot parts In combined cycle, this is combined with steam system to realize high temperature and high efficiency.		steam cooling
1447	クロージド冷却	KURÔZUDO REIKYAKU	cooling method to recover cooling medium of hot parts without discharging it to main stream Also called recovery type cooling.		closed loop cooling
1448	オーブン冷却	ÔPUN REIKYAKU	cooling method to discharge cooling medium to main stream without recovering it		open loop cooling
1449	対流冷却	TAIRYŪ REIKYAKU	cooling method by convection heat transfer where cooling medium is passed through the flow path in the inner surfaces of hot parts or sleeves	KONBEKUSYON KŪRINGU	convection cooling
1450	膜冷却	MAKU REIKYAKU	cooling method to spray cooling medium onto surface of hot parts to form film-like cooling medium layers and to shut off heat onto hot members of the surface and to cool them When used intensely for front edges of turbine blades, this may be called "shower head cooling". Further, "shaped film cooling hole" may be used which has higher cooling efficiency with the fan-shaped nozzle instead of simple circular-shaped one.	HIRUMU REIKYAKU, HIRUMU KŪRINGU	film cooling

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1451	インピンジメント冷却	INPINZIMENTO REIKYAKU	cooling method to spray and clash cooling medium onto the inner surface of hot parts and to utilize high heat transfer rate obtained at the time	SYÔTOTU REIKYAKU, INPINZIMENTO KÛRINGU	impingement cooling
1452	しみ出し冷却	SIMIDASI REIKYAKU	cooling method to transpire cooling medium from inside of hot parts through small holes and to shut off heat onto hot members by the combination of convection cooling effect and film cooling effect and to cool them	TORANSUPIRÊ-SYON KÛRINGU	transpiration cooling
1453	ピンフィン冷却	PINFIN REIKYAKU	cooling method to provide pin-shaped fins in the cooling path to improve cooling efficiency by the improvement of convection heat transfer rate and by the increase of heated surface area	PINFIN KÛRINGU	pin-type fin cooling
1454	積層冷却	SEKISÔ REIKYAKU	cooling method where inner cylindrical wall of combustor is made in multi-layer structure within which cooling air is passed		multi-wall construction cooling
1455	逆流膜冷却	GYAKURYÛ MAKU REIKYAKU	cooling method similar to film cooling, to feed cooling air from downstream side and by reversing the flow, to form film-like cooling medium layers		reverse flow film cooling
1456	(アクティブ) クリアランスコントロール (Active Clearance Control)	(AKUTIBU) KURIARANSU KONTORÔRU	method of maintaining the clearance between rotor and stator by heating or cooling rotor or stator and controlling the clearance by the difference of thermal expansion coefficient, in order to keep clearance at optimal value during steady and transient operation It is applied to the compressor side as well as to the turbine side.		(active) clearance control
1457	ホットエンドドライブ	HOTTO ENDO DORAIBU	arrangement of gas turbine where generator is connected to the exhaust side of turbine		hot end drive
1458	コールドエンドドライブ	KÔRUDO ENDO DORAIBU	arrangement of gas turbine where generator is connected to the intake side of compressor		cold end drive

5) Performance and test

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1501	定格出力	TEIKAKU SYUTURYOKU	generic term for designed or assured output at the generator terminal when gas turbine is operated under the specified condition		rated output, rating
1502	標準定格出力	HYÔZYUN TEIKAKU SYUTURYOKU	rated output at the standard reference conditions		standard rated output, standard rating
1503	実機標準定格出力	ZIKKI HYÔZYUN TEIKAKU SYUTURYOKU	output given when intake and exhaust pressure loss in most typical usage of the gas turbine is applied under the standard reference conditions		standard rated output in actual use
1504	現地定格出力	GENTI TEIKAKU SYUTURYOKU	rated output under the condition of the site where the gas turbine plant is installed (such as atmospheric pressure, atmospheric temperature and intake and exhaust pressure loss)		site rated output, site rating
1505	届出力	TODOKED SYUTURYOKU	rated output permitted at the specified atmospheric temperature at the installation site of the gas turbine Remarks 1 Output value, whose “approval” has been applied for before June 2000 and the granted, is called “approved output”. 2 In case of single-shaft combined cycle, this signifies the total rated output of gas turbine and steam turbine permitted at the specified atmospheric temperature at the installation site.		permitted output
1506	ベースモード	BÊSU MÔDO	operation mode with the turbine inlet gas temperature equal to that when standard rated output is determined		base operation mode

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1507	ピークモード	PĪKU MÔDO	operation mode where output is increased by raising the turbine inlet temperature higher than that for standard rated output Remarks: Surface temperature of hot parts rises higher, and life becomes shorter, than in the base mode operation.		peak operation mode
1508	ピーク定格出力	PĪKU TEIKAKU SYUTURYOKU	rated output corresponding to the operation mode where annual operation time is over 500 h but not more than 2 000 h and annual mean number of starts is 100 or more and below 500 (see JIS B 8042-2)		peak load rated output, peak load rating
1509	ベース定格出力	BÊSU TEIKAKU SYUTURYOKU	rated output corresponding to the operation mode where annual operation time is over 6 000 h but not more than 8 760 h (see JIS B 8042-2)		base load rated output, base load rating
1510	短時間定格出力	TANZIKAN TEIKAKU SYUTURYOKU	rated output which can be generated continuously for the duration specified beforehand		short time rated output, short time rating
1511	制限出力	SEIGEN SYUTURYOKU	maximum output at the generator terminal determined by conditions other than combustion gas temperature (e.g. shaft strength and capacity of driven machine)		limit output
1512	出力曲線	SYUTURYOKU KYOKUSEN	curve indicating the output variation depending on the atmospheric temperature (see attached figure 7)	SYUTURYOKU SEINÔ KYOKUSEN	output capability diagram, output performance diagram
1513	修正出力	SYÛSEI SYUTURYOKU	output at the generator terminal determined by correcting the output measured at arbitrary atmospheric conditions to the value at the standard reference conditions or the specified conditions		corrected output

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1514	軸端出力	ZIKUTAN SYUTURYOKU	output of gas turbine at the end of output shaft		shaft-end output
1515	減速機端出力	GENSOKUKI TAN- SYUTURYOKU	output at the end of output shaft of the reduction gear, when installed		shaft output of gearbox
1516	定格回転速度	TEIKAKU KAITEN SOKUDO	rotation speed of gas turbine output shaft at the rated output	TEIKAKU KAITENSŪ, TEIKAKU SOKUDO	rated speed
1517	修正回転速度	SYŪSEI KAITEN SOKUDO	rotation speed determined by correcting the rotation speed measured at arbitrary atmospheric conditions to the values at the standard reference conditions or the specified conditions (min ⁻¹) This is used for the parameter of performance characteristic diagram of compressor. $N_{\text{corr}} = N \sqrt{\frac{T_0}{T}}$ where, N_{corr} : corrected speed (min ⁻¹) N : rotation speed (min ⁻¹) T : suction temperature (K) Suffix 0 signifies the value at the specified condition.	SYŪSEI KAITENSŪ	corrected speed
1518	自立速度	ZIRITU SOKUDO	minimum rotation speed where gas turbine can be accelerated without using the power of the starting equipment under the most unfavourable atmospheric conditions in actual operation (min ⁻¹)		self-sustaining speed
1519	点火速度	TENKA SOKUDO	rotation speed where ignition can be started (min ⁻¹)		ignition speed
1520	タービントリップ速度	TÂBIN TORIPPU SOKUDO	rotation speed where independent overspeed control device actuates to shut off fuel to gas turbine (min ⁻¹)		turbine trip speed

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1521	アイドリング速度	AIDORINGU SOKUDO	rotation speed specified by the manufacturer where gas turbine can be operated stably and where load can be increased, decreased or shut off from this stable state (min ⁻¹)		idling speed
1522	危険速度	KIKEN SOKUDO	rotation speed which coincides with the character frequency of shaft for bending (min ⁻¹) This is called primary critical speed, secondary critical speed, etc. from the smaller value first.		critical speed
1523	熱効率	NETU KÔRITU	ratio of generated effective work to supplied amount of heat Remarks: Which of the fuel heating values, high or low, has been used for calculation shall be clarified. In case of gas turbine, low heating value is generally used.		thermal efficiency
1524	修正熱効率	SYÛSEI NETUKÔRITU	thermal efficiency determined by correcting the actually measured thermal efficiency at arbitrary atmospheric conditions to the value at the standard reference conditions or the specified conditions		corrected thermal efficiency
1525	修正流量	SYÛSEI RYÛRYÔ	flow determined by correcting the flow defined at arbitrary conditions (pressure and temperature) to the value at the standard reference conditions or the specified conditions (kg/s)		corrected flow
1526	燃料消費量	NENRYÔ SYÔHIRYÔ	amount of fuel consumption per unit hour		fuel consumption
1527	燃料消費率	NENRYÔ SYÔHIRITU	amount of fuel consumption per unit hour per output		specific fuel consumption
1528	熱消費量	NETU SYÔHIRYÔ	amount of heat supplied per unit hour Remarks: Which of the fuel heating value, high or low, has been used for calculation shall be clarified.		heat consumption

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1529	熱消費率	NETU SYÔHIRITU	amount of heat consumption per unit hour per output Remarks: Which of the fuel heating value, high or low, has been used for calculation shall be clarified.		heat rate
1530	熱収支	NETU SYÛSI	calculating operation of energy balance by analyzing the processes of heat generation, absorption and loss	NETU KANZYÔ, NETU SEISAN, NETU HEIKÔ SENZU	heat balance
1531	熱利用率	NETU RIYÔRITU	ratio of sum of generated effective work and recovered amount of heat to supplied amount of heat Remarks: Which of the fuel heating value, high or low, has been used for calculation shall be clarified.		fuel heat utilization
1532	低発熱量	TEI HATUNETURYÔ	method to indicate amount of generated heat of fuel, i.e. high heating value minus latent heat of steam	ERUEITIBUL, TEI HATUNETURYÔ	low heating value, lower heating value
1533	高発熱量	KÔ HATUNETURYÔ	method to indicate amount of generated heat of fuel, i.e. amount of generated heat measured by calorimeter, which includes latent heat of steam	EITIEITIBUI, KÔ HATUNETURYÔ	high heating value, higher heating value
1534	比出力	HISYUTURYOKU	gas turbine output per unit flow of working fluid		specific power
1535	機械損失	KIKAI SONSITU	work which cannot be taken out effectively as shaft-end output such as friction generated in bearings and gears or power to drive directly connected auxiliary equipment		mechanical loss
1536	熱損失	NETU SONSITU	thermal energy loss to outside caused by heat transfer from casing, of which value is required for the calculation of heat balance in design		heat loss
1537	現地条件	GENTI ZYÔKEN	condition of the site to install gas turbine (such as atmospheric pressure, atmospheric temperature, humidity and intake and exhaust pressure loss)		site conditions

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1538	比較基準条件	HIKAKU KIZYUN ZYÔKEN	operating condition of gas turbine in the standard environment (see JIS B 8042-2) Remarks 1 Standard environment signifies atmospheric temperature of 15 °C, atmospheric pressure of 1 013 hPa and relative humidity of 60 %. 2 See JIS B 8040 .	AIESUÔ ZYÔKEN	standard reference conditions
1539	修正曲線	SYÛSEI KYOKUSEN	curve indicating output variation according to atmospheric conditions (temperature, pressure and humidity) and parameters of targeted equipment (such as generator power factor and exhaust gas pressure loss) Especially, the curve indicating output variation according to atmospheric temperature is called "output capability diagram". Remarks: In combined cycle power generating plants, parameter such as degree of vacuum of condensed water of steam turbine is also used.		correction curve
1540	暗騒音	ANSÔON	environmental sound condition at the location when the targeted sound does not exist (see JIS Z 8106)		ground noise, back ground noise
1541	音響パワーレベル	ONKYÔ PAWÂ REBERU	logarithm of ratio of a sound power to the reference sound power By taking logarithm of the ratio by radix ten (common logarithm) and multiplying by ten, sound power level in decibels is obtained. Unit sign is dB.		sound power level in decibels
1542	音圧レベル	ON'ATU REBERU	logarithm of ratio of a sound pressure to the reference sound pressure By taking logarithm of the ratio by radix ten (common logarithm) and multiplying by 20, sound pressure level in decibels is obtained. Unit sign is dB.		sound pressure level

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
1543	透過損失	TÔKA SONSITU	value expressed in dB of the decrease of transmitted sound pressure level compared to the incoming sound pressure level		sound transmission loss
1544	起動試験	KIDÔ SIKEN	test to confirm various characteristics concerning the start of gas turbine plant		starting characteristics test
1545	負荷遮断試験	HUKA SYADAN SIKEN	test of gas turbine while operating at the rated speed and with a certain load to confirm the response when the load is shut off		load dump test, load rejection test

b) **Turbine**

1) **Types and models**

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
2101	軸流タービン	ZIKURYÛ TÂBIN	turbine where the gas flow direction in expansion stroke coincides with the direction of the rotating axis of machine as a whole		axial flow turbine
2102	半径流タービン	HANKEIRYÛ TÂBIN	turbine where the gas at the inlet of turbine wheel flows inward in the radius direction in the plane perpendicular to the axis	HUKURYÛ TÂBIN, RAZIARU TÂBIN	radial inflow turbine
2103	出力タービン	SYUTURYOKU TÂBIN	turbine in multi-shaft gas turbine which has an independent rotating shaft to drive the load (see attached figure 3)		free power turbine, power turbine
2104	圧縮機タービン	ASSYUKUKI TÂBIN	turbine in multi-shaft gas turbine used for driving compressor		compressor turbine

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
2105	ガスエキスパンダ	GASU EKISUPANDA	turbine inserted in the use process of gas for particular application to convert a part of its thermal energy to mechanical work In case using steam as the thermal energy, this is called “steam expander”.		gas expander

2) Structure · constitution

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
2201	高圧タービン	KÔATU TÂBIN	in case multiple turbines share an expansion stroke divided in time sequence, they are called respectively high pressure-, intermediate pressure- and low pressure turbine, in the order of their working pressures from high to low		high pressure turbine
2202	中圧タービン	TYÛATU TÂBIN			intermediate pressure turbine, medium pressure turbine
2203	低圧タービン	TEIATU TÂBIN			low pressure turbine
2204	(タービン)ケーシング	(TÂBIN) KÊSINGU	cover surrounding the turbine rotor which has functions to lead combustion gas flow, to maintain pressure, and generally to retain structures such as stator in itself	SYASITU	casing
2205	(タービン)外部ケーシング	(TÂBIN) GAIBU KÊSINGU	outer casing in double structured casing which constitutes outer shell of turbine and does not come in direct contact with gas	GAIBU SYASITU	outer casing
2206	(タービン)内部ケーシング	(TÂBIN) NAIBU KÊSINGU	inner casing in double structured casing which comes in direct contact with gas	NAIBU SYASITU	inner casing

No.	Term (Japanese character)	Reading	Definition	Informative	
				Conventional expression	English equivalent
2207	(タービン)ディフューザ	(TÂBIN) DEHYŪZA	outlet part of turbine to reduce the absolute speed of combustion gas and convert a part of its kinetic energy into static pressure It has the cross section of duct widening toward the end.		diffuser
2208	タービンロータ	TÂBIN RÔTA	generic term for the rotating section of turbine This section has function to extract work obtained by spraying high speed stream of combustion gas to blades. Remarks: Those without implanted blades may be called turbine rotor.	RÔTA, SYAZIKU	turbine rotor
2209	タービンディスク	TÂBIN DESUKU	disk fixed to a part of turbine rotor or to the shaft, i.e. structure to implant blades around it	DESKU, ENBAN	turbine disk
2210	ディスク締付ボルト	DESKU SINETUKE BORUTO	tightening bolt to connect disks of various stages of turbine in modular-type turbine rotor		stacking bolt
2211	カービックカップリング	KÂBIKKU KAPPURINGU	shape for gear engagement provided on the coupling surfaces between disks in order to improve torque transmission of rotor “Hirth coupling” is used for the same meaning.		curvic coupling, hirth coupling
2212	タービン翼車	TÂBIN YOKUSYA	turbine disk implanted with blades Remarks: In case of radial inflow turbine, this term designates disc-shaped rotating body with blades.	YOKUSYA	turbine wheel
2213	(タービン)翼	(TÂBIN) YOKU	component which generates impact or reaction by combustion gas and applies torque to turbine rotor Remarks: This includes vanes fixed to the casing side and blades implanted to the turbine disk.	HANE, BURÊDO	blade