



Hengyi Industries SdnBhd
恒逸实业（文莱）有限公司

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Management System for Instrument & Automation System

仪表及自动化系统管理制度



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1 Purpose

目的

The System is hereby formulated in order to standardize the management of instrument and automatic system, define the management responsibilities of each department and guarantee the safe, stable and long-term operation of instrument and automatic system.

为规范仪表及自动化系统的管理，明确各部门管理职责，确保仪表及自动化系统安全、平稳、长周期运行，特制定本制度。

2 Scope of Application

适用范围

The System is applicable to all departments of the Company.

本制度适用于公司各部门。

3 Terms and Definitions

术语和定义

3.1 Instrumentation: it refers to all kinds of measuring instruments used in production devices, such as conventional instruments for measuring temperature, pressure, flow rate and liquid level, the special instruments for measuring vibration, displacement, rotation speed and current, as well as online analysis instrument and regulating valves. According to the management function, it can be classified into measuring instrument, safety instrument and environmental protection instrument.

仪表设备：是指生产装置所使用的各类检测仪表，如温度、压力、流量、液位等测量的常规仪表，以及振动、位移、转速、电流等测量的特殊仪表和在线分析仪表、调节阀等，按管理功能又分为计量仪表、安全仪表和环保仪表等。

3.2 Automatic system: it refers to the system that realizes automatic control of temperature, pressure, flow rate, material level and other process parameters in the process of production and operation as controlled objects, such as DCS, CCS and PLC.

自动化系统：是指生产运行过程中，对温度、压力、流量、物位等过程参量作为被控对象，实现自动化控制的系统，如 DCS、CCS、PLC 等系统。

3.3 Point inspection of automatic system: it refers to the complete overhaul of the system represented by DCS as per the basic unit of I/O channels (points), including the cleaning,

inspection and testing of each component.

自动化系统点检：是指以 DCS 为代表按 I/O 通道（点数）为基本单位，对系统的全面检修，包括各部件的清扫、检查、测试等。

3.4 Online analysis instruments: it refers to the instruments installed on the devices in the field, which are capable of automatically measuring, analyzing and indicating the components of raw materials, finished products, semi-finished products and intermediate products continuously, including mainly online quality analysis instrument and online environmental analysis instrument, where the latter refers to the online analysis instrument used for monitoring discharged waste water and exhaust gas.

在线分析仪表：是指安装在装置现场能够自动对原料、成品、半成品、中间产品的组份进行连续测量、分析、指示的仪表，主要包括在线质量分析仪表和在线环保分析仪表。其中在线环保分析仪表是指用于外排废水、废气监测的在线分析仪表。

3.5 Safety and environmental instrument: it refers to safety instrument of combustible (toxic) gas detection alarm, radioactive instrument, emergency stop system and fire/gas protection systems (FGS), and environmental instrument of ammonia-nitrogen analyzer, COD and CEMS.

安全环保仪表：是指可燃（有毒）气体检测报警仪、放射性仪表、紧急停车系统、火/气保护系统（FGS）等安全仪表，以及氨氮分析仪、COD、CEMS 等环保监测仪表。

3.6 Instrumentation operation is classified into major instrument operation and general instrument operation. Major instrument operation refers to the operation which may cause the device to shut down or seriously affect the operation of the device, such as the operation of important control loop, important interlock loop, system power supply and control system, the operation when one must wear the gas mask and the operation when the toxic, explosive and flammable medium cannot be isolated. All instrument operations except major instrument operation are general instrument operations.

仪表作业分为重大仪表作业和一般仪表作业两级。重大仪表作业是指在仪表作业时，可能造成装置停工或严重影响装置运行的作业，如重要控制回路、重要联锁回路、系统电源、控制系统等作业，以及必须带防毒面具的作业、无法隔离的有毒、闪爆、易燃介质的作业等。除重大作业以外的均为一般仪表作业。

4 Management Responsibilities

管理职责

4.1 Specified administrative authority

归口管理部门

4.1.1 Equipment Management Dept. is the specified administrative authority for instrument and automatic system, and shall be responsible for preparing (revising) systems related to the instrument and automatic system.

机械动力部是仪表及自动化系统归口管理部门，负责制(修)订仪表及自动化系统管理制度。

4.1.2 Equipment Management Dept. shall be responsible for reviewing the overhaul and updating plans for the instrument and automatic system, organizing the implementation and organizing the quality inspection and completion acceptance of major equipment overhaul and equipment shutdown and maintenance.

负责审核仪表及自动化系统检修、更新计划，并组织实施；组织重要设备大修、装置停工检修的质量检查、竣工验收。

4.1.3 Equipment Management Dept. shall be responsible for reviewing the updating, waste evaluation, overhaul (transformation) plan of important instrument and automatic system, and shall be responsible for the technical exchange of repair, update and technical transformation projects, as well as the signing of technical appendix.

负责重要仪表及自动化系统更新判废鉴定、检修（改造）方案的审核；负责修理、更新和技术改造项目的技术交流，以及技术附件签署。

4.1.4 Equipment Management Dept. shall organize to prepare the spare parts list and reserve quota of instrument and automatic system and be responsible for surveying, replacing and plan approval of spare parts.

组织编制仪表及自动化系统备品配件明细表及年度储备定额；负责备品配件测绘、替代以及计划审定。

4.1.5 The Equipment Management Dept. shall organize to prepare the inspection and approval plans of fixed combustible (toxic) gas detection alarm, heating furnace zirconia and environmental instrument and organize the plan implementation.

组织编制公司固定式可燃（有毒）气体检测报警仪、加热炉氧化锆、环保仪表等检验计划，审定检验方案，并组织实施。

4.1.6 Equipment Management Dept. shall be responsible for the accidents investigation, handling, summary and reporting of instrument and automatic system, and organize the establishment of the instrumentation defect management records and organize the rectification of major equipment defects.

负责仪表及自动化系统的事故调查、处理及统计上报工作；组织建立仪表设备缺陷管理台帐并组织设备重大缺陷整改。

4.1.7 Equipment Management Dept. shall organize the archiving and management of the completion data of the project instrument for equipment shutdown overhaul, annual repair and equipment updating, and organize the establishment of the technical files of the instrumentation.

组织做好装置停工大修和年度修理、设备更新等项目仪表竣工资料的存档管理工作；组织建立仪表设备技术档案。

4.1.8 Equipment Management Dept. shall check and supervise the inspection and maintenance of instrumentation and the work of the outsourced unit according to the contract requirements.

检查、督促仪表设备检维修工作以及外协单位按合同要求应做好的工作。

4.2 Coordinated management departments

协同管理部门

4.2.1 Scheduling & Dispatch Dept. shall be responsible for approving instrument changes (including the software changes of control system) due to production process and technology.

计划调度部负责因生产工艺、技术原因引起的仪表变更（含控制系统软件变更）的审批。

4.2.2 HSE Dept. shall participate in the management of safety and environmental instruments, be responsible for the approval of the changes of combustible (toxic) gas alarm and other safety and environmental instruments, and be responsible for the professional management of radiation protection of radioactive instruments. In addition, HSE Dept. shall organize the transfer, protection, isolation and marking of radioactive sources of instruments, and organize to review the configuration of safety and environmental instrument of production equipment.

HSE 管理部参与装置安全、环保仪表的管理；负责可燃（有毒）气体报警仪等安全环保仪表变更的审批；负责放射性仪表射线防护的专业管理，组织仪表放射源的转移、防护、隔离、标识等工作；组织生产装置安全、环保仪表配置的审查。

4.3 Executive departments

执行部门

4.3.1 Instrument Control Dept. is the executive department for the management of instrument and automatic system.

仪表控制部是仪表及自动化系统管理的执行部门。

4.3.1.1 Instrument Control Dept. shall be responsible for the daily management of operation, maintenance and fault handling of instrument and automatic system; shall be responsible for the establishment of instrument/ equipment records, archives and full instrumentation contracting system.

负责全厂仪表及自动化系统运行维护、保养、故障处理等日常管理工作；负责建立仪表设备台帐、档案以及全员仪表设备承包体系。

4.3.1.2 Instrument Control Dept. shall organize the waste evaluation, updating and type selection of general instrumentation; participate in the waste evaluation of important instrumentation; participate in the design review and equipment type selection of technical transformation project; be responsible for developing emergency plans for instrumentation maintenance, verification procedures and instrument failures.

组织一般仪表设备的判废鉴定和更新选型，参与重要仪表设备的判废工作；参与技术改造项目的设计审查、设备选型；负责制定仪表设备检修、校验规程以及仪表故障的应急预案。

4.3.1.3 Instrument Control Dept. shall be responsible for on-site instrumentation construction

management; be responsible for preparing and reporting the maintenance plan, technical transformation project plan, renovation and transformation plan, annual maintenance plan and the upgrading plans for all kinds of process control computer system and advanced control system.

负责现场仪表施工管理；负责编制、上报各装置仪表的检修计划、技术改造项目计划、更新改造计划、年度修理计划、各类过程控制计算机系统及先进控制系统升级计划。

4.3.1.4 Instrument Control Dept. shall be responsible for the training of instrument technicians and instrument operators, and assist in the instrumentation training of production equipment operators.

负责仪表技术人员和仪表工的培训，协助做好生产装置操作人员的仪表培训工作。

4.3.2 The Electrical Operation Dept. shall be responsible for the upstream power supply management of instrument and automatic system; and be responsible for the management of video monitoring system of the department.

电气运行部负责仪表及自动化系统上游供电管理；负责本部门视频监控系统管理。

4.3.3 Production & Operation Dept. is the user department of instrument and automatic system and shall be responsible for filling the applications for instrument changes (including the software changes of control system) due to production process and technology.

生产运行部是仪表及自动化系统的使用部门，负责提出因生产工艺、技术原因引起的仪表变更（含控制系统软件变更）的申请。

5 Management Content

管理内容

5.1 Management of fundamental data

基础资料管理

5.1.1 Instruments and equipment shall establish and improve basic data such as equipment account, files, design data, specifications, random data, calibration records, inspection and maintenance procedures, etc., and also establish equipment defect account and change records during operation.

仪表设备应建立和健全设备台帐、档案、设计资料、说明书、随机资料、校验记录、检维修规程等基础资料，运行过程中还应建立设备缺陷台帐、变更记录等。

5.1.2 Control system files shall be established for automatic systems, such as DCS, SIS, CCS and PLC. The files shall include:

自动化系统如 DCS、SIS、CCS、PLC 等应建立控制系统档案，档案应包括：

5.1.2.1 Configuration data of the system hardware and software, the plans of cabinet and control room, power distribution drawings, system wiring drawings, route diagrams of incoming

and outgoing cables, configuration data and complex circuit configuration description, acceptance data, the original data of hardware and software and maintenance manual.

系统硬件及软件的配置资料、机柜及控制室平面图、供电分配图、系统接线图、进出电缆走向图、组态资料及复杂回路组态说明、验收资料、软硬件原版资料和保养手册等。

5.1.2.2 System grounding resistance test report, fault handling record and its analysis report, change record, etc.

系统接地电阻检测报告、故障处理记录及其分析报告、变更记录等。

5.1.2.3 System spare parts records, and incoming and outgoing spare parts records.

系统备品配件台帐及进、出备品配件记录。

5.2 Prophase management

前期管理

5.2.1 The instrument selection should follow the *Code for the Design of Instrument Selection* (SH3005), and the attention shall be paid to the selection of explosion-proof instruments and the adoption of lightning protection measures.

仪表选型应遵循《石油化工自动化仪表选型设计规范》(SH3005), 应重视防爆型仪表的选型和防雷措施的采取。

5.2.2 The construction of instrumentation must be carried out in accordance with the design requirements and the *Technical Specification for Construction of Instrumentation Engineering in Petrochemical Industry* (SH/T3521). The construction unit of instrumentation must have corresponding construction qualifications and a sound engineering quality assurance system.

仪表设备施工必须按设计要求及《石油化工仪表工程施工技术规程》(SH/T3521) 进行, 仪表设备施工单位必须具有相应的施工资质和健全的工程质量保证体系。

5.2.3 The construction and acceptance of instrumentation must be carried out in accordance with the relevant standards, regulations and requirements in the *Code for Construction and Quality Acceptance of Automation Instrumentation Engineering* (GB50093) and the completion data shall be complete.

仪表设备施工验收要按《自动化仪表工程施工及质量验收规范》(GB50093) 中的相关标准、规定、要求执行, 做到竣工资料齐全。

5.2.4 Before the instrumentation is put into operation, the Instrument Control Dept. shall draw up the relevant regulations according to the characteristics of the equipment, carry out technical training and exercise the accident plan.

仪表设备投用前, 仪表控制部应根据设备的特点编制相关规程, 开展技术培训、事故预案演练等工作。

5.3 Use, maintenance and services

使用及维护保养

5.3.1 Instruments and equipment should be calibrated, checked and compared according to the procedures of instrument calibration, check and comparison, and the corresponding check list or check and confirmation list and comparison record should be filled in, and they can be used only after they are qualified. Interlocking instruments and control instruments should be calibrated at least once every production cycle.

仪表设备应按仪表校验、检查确认、比对等规程进行相应的校验、检查确认和比对，并填写相应校验单或检查确认单及比对记录，合格后方可使用，联锁仪表、控制仪表每生产周期至少进行一次校验。

5.3.2 Before the instrumentation is put into operation, the instrument maintenance personnel must implement a comprehensive inspection of each instrument and confirm the zero position and measurement range. The circuit must pass the joint calibration before putting into operation and the instrumentation must be calibrated after failure repair.

仪表设备投运前，仪表维护人员必须对每台仪表进行全面检查，并对零位、量程等进行确认，回路投用前必须经过联校，仪表设备故障修复后必须进行校准。

5.3.3 The commissioning of instruments shall be put forward by the operation department to the instrument control department in advance, which shall be responsible for the implementation and cooperate with the operation department. The commissioning of the instrument shall include power supply, gas supply, opening of primary and secondary valves, etc., until the instrument is in good operation and then handed over to the operation department for use.

仪表的投运应由运行部提前向仪控部提出，仪控部负责实施，运行部配合。仪表投运应包括给仪表供电、供气、一二次阀开启等，直至仪表运行良好后交运行部使用。

5.3.4 For the mechanical parameters such as the vibration and displacement of the unit, it is necessary to conduct the probe characteristic test and the loop joint calibration test. The circuit test for the rotation speed probe of the unit shall be implemented with rotation speed table, and the displacer and pressure switch shall be inspected with medium or actual signal.

对于机组振动、位移等机械量参数，需要做探头特性试验及回路联校试验，机组转速探头需要用实际转速台做回路试验，沉筒、压力开关要用介质或实际信号进行校验。

5.3.5 For the important instruments and equipment listed in the company, such as DCS, SIS, CCS and other control systems, inspection, cleaning, testing and problem maintenance must be carried out during the shutdown and maintenance of the devices. For the fault treatment of important equipment, a treatment plan must be prepared in advance.

对列入公司重要仪表设备，如 DCS、SIS、CCS 等控制系统，装置停工检修期间必须进行检查、清扫、测试及问题检修。重要设备的故障处理，必须事先编写处理方案。

5.3.6 The maintenance of important instrumentation shall be carried out by special personnel,

and the maintenance of general instrumentation shall be subject to specific area of responsibility. In the event of failure of important instrument or key equipment, it shall be reported and dealt with step by step in time.

重要仪表设备的维护实行专人负责，一般仪表设备的维护实行专区分片负责；重要仪表或关键设备发生故障时，应及时逐级报告和处理。

5.3.7 Identify the name of the instrument loop and the power switch, so that the identification is clear and tidy. According to the operation status of each instrument, make a regular maintenance plan and organize its implementation.

对仪表回路的名称及电源开关进行标识，做到标识清晰、整齐。根据每台仪表运行状况，编制定期保养计划并组织实施。

5.3.8 The grounding resistance of the control system (such as DCS, SIS and PLC) and the instrument cable bridge shall be tested comprehensively every year and the test records shall be maintained.

每年应对 DCS、SIS、PLC 等控制系统及仪表电缆桥架的接地电阻，进行一次全面测试，并保存测试记录。

5.3.9 The common defect records and major defect records of instrumentation shall be established in accordance with the requirements of *Management System of Equipment Defect and Fault* of the company.

按公司《设备缺陷及故障管理制度》要求，建立仪表设备一般缺陷台帐和重大缺陷台帐。

5.3.10 The *Instrument Change Order* shall be filled in if there is modification or displacement of instrument or change of control plan. The Instrument Control Dept. shall be responsible for the concrete implementation after the approval of specified administrative authority.

发生仪表修改、移位、控制方案改变等，需填写《仪表变更单》，归口管理部门批准后，由仪表控制部负责具体实施。

5.4 Grading management of operation

作业的分级管理

5.4.1 Major instrumentation operation must have two or more personnel, one of who must be the chief repairman and above of instrument, and when necessary, maintenance engineer and safety officer shall confirm on site.

重大仪表作业必须有两人及以上人员作业，其中一名必须为仪表主修及以上人员，必要时维护工程师、安全员等到现场确认。

5.4.2 For major instrument operations, an implementation plan for major instrument operations needs to be prepared; for operations with high risk level, the operation plan needs to be countersigned by the Operation Department, audited by the competent department and approved by the leaders of the competent department of the company; For relatively low-risk operations, the operation plan needs to be countersigned by the production operation

department and approved by the leaders of the instrument control department.

重大仪表作业需编写仪表重大作业实施方案，风险等级高的作业，作业方案需经运行部会签、主管部门审核、公司主管领导批准；风险相对较低的作业，作业方案需经生产运行部会签，仪表控制部领导批准。

5.4.3 For general instrument operations, all instrument operations require two or more operators except those which have no direct impact on production or personal safety.

一般仪表作业，除对生产无直接影响或人身安全无影响的仪表作业可一人作业外，其他仪表作业均需要两人及以上作业。

5.4.4 The instrument inspection and maintenance shall be subject to the operation permit system, and shall be carried out in accordance with the management regulations on maintenance construction safety permit of the Company in the Management System of Equipment Maintenance.

仪表检维修实行作业票许可制度，按照公司《设备检修管理制度》中检修施工安全许可票管理规定执行。

5.5 Power supply and air sources management

电源及气源管理

5.5.1 Instrument Control Dept. shall periodically perform patrol inspection on the parts of the instrument power supply system, check the operation of power box, power distributor, switch and fuse and solve the problem found in time. When satisfying the hardware conditions, the power fault alarm function should be set.

仪表控制部应定期对仪表供电系统的各部位进行巡回检查，检查电源箱、电源分配器、开关、熔断器等部件运行情况，发现问题及时处理。在硬件条件具备时，应设置电源故障报警功能。

5.5.2 The marking of switch, power distributor and terminal strip in the power supply system must be accurate and clear, and the drawing data of power supply system shall be complete.

供电系统中的开关、电源分配器、供电端子排的标识必须准确清晰，供电系统图纸资料要齐全。

5.5.3 The instrument power switch of the instrument panel (cabinet) shall keep at least 10% backup circuit. It is strictly prohibited to supply power to non-instrument load from instrument power supply and to overlap temporary load from instrument power supply.

仪表盘（柜）的仪表供电开关宜留有至少 10% 备用回路。严禁从仪表电源上向非仪表负载供电，严禁从仪表电源上搭接临时负载。

5.5.4 The power supply of DCS, SIS and CCS systems and the 24VDC power supply system of the important equipment shall be provided by independent dual-circuit power supply, where UPS power supply shall be adopted in at least one circuit.

DCS、SIS、CCS 系统及重要装置的 24VDC 供电系统的供电应采用双路独立供电方式，其中至少一路采用 UPS 电源。

5.5.5 The power of the instrument interlocking system shall be supplied separately from that

of other instruments.

仪表联锁系统电源应采用与其他仪表的电源分开供电。

5.5.6 The fuse shall be replaced in strict accordance with the capacity of the original fuse, and the capacity of the fuse shall not be changed without authorization.

更换熔断器时，要严格按照原熔断器的容量更换，不得擅自变更熔断器的容量。

5.5.7 The third circuit power supply for the inspection and maintenance of instrumentation shall be set up in the cabinets of the instrument control system for lighting the cabinets and other auxiliary power supply.

仪表控制系统机柜间应设立仪表设备检维修用的第三路电源，用于机柜的照明及其它辅助用电。

5.5.8 The instrument air source shall be dedicated and the purified air shall not contain flammable, explosive, toxic, harmful and corrosive gases (or steam). The dew point of the air source under normal operating pressure shall be -20°C .

仪表气源应专线专用，净化后的气体中不应含有易燃、易爆、有毒、有害及腐蚀性气体（或蒸汽），在正常操作压力下的气源露点为 -20°C 。

5.5.9 The instrument gas supply system (air tank, valve, pipeline, degreaser, filter, pressure reducing valve, pressure gauge, etc.) shall be inspected regularly, and the instrument equipment of the system shall be ensured to be in good condition.

应定期对仪表供气系统（风罐、阀门、管线、除油器、过滤器、减压阀、压力表等）进行检查，并确保系统仪表设备完好。

5.6 Management of online analysis instrument

在线分析仪表管理

5.6.1 The reliability, maintainability, applicability and economy shall be considered in the design and type selection of online analysis instruments. Priority should be given to products produced by ISO 9001 system certified enterprises or products conforming to international standards.

在线分析仪表设计选型应考虑可靠性、维修性、适用性、经济性等特点，优先选用 ISO 9001 体系认证企业生产的产品或符合国际标准的产品。

5.6.2 For the type of online analysis instruments, try to select the instrument adopting the same or similar principles of laboratory testing instruments of the Company.

在线分析仪表选型尽量选择与公司实验室检测仪器原理相同或相近仪表。

5.6.3 For online analysis instruments that are no longer required due to changes in the process flow or monitoring requirements of the plant, Production & Operation Dept. shall be responsible for the application of changes, Equipment Management Dept. shall be responsible for the approval and Instrument Control Dept. shall be responsible for the implementation.

因装置工艺流程发生变化或监控要求发生变化而不再需要使用的在线分析仪表，生产运行部提出变更申请，机械动力部审批，仪表控制部负责实施。

5.6.4 Instrument Control Dept. shall, according to the characteristics and operating environment of all kinds of online analysis instruments, formulate the detailed rules on regular maintenance of all kinds of instruments and stipulate the maintenance cycle, operation method and precaution.

仪表控制部应根据各类在线分析仪表特点及使用环境，制订各类仪表定期保养细则，规定保养周期、操作方法、注意事项。

5.6.5 Online analysis instruments shall be verified at least once per production cycle and the verification records shall be filled out in time. New instruments or instruments after fault repair shall be verified (or compared) and qualified before putting into operation.

在线分析仪表至少每个生产周期校验一次，并及时填写校验记录。对于新投用的或故障修复后的仪表，在投用前必须校验（或比对）合格方可投用。

5.6.6 For online analysis instruments that are not qualified or cannot be verified, the instrument inspection or confirmation method may be adopted and the corresponding records shall be filled in to ensure the normal operation of the instrument.

对于不具备条件或无法校验的在线分析仪表，可采用仪表检查或确认的方法进行，并填写相应记录，确保仪表正常运行。

5.6.7 The verification of online analysis instruments must be carried out with qualified and valid standard instrument or standard sample (air). The newly purchased standard sample (air) shall be verified and qualified before adoption. In the verification, the standard sample (air) can be used as sample and the corresponding instrument parameters can be adopted for analysis and verification.

在线分析仪表校验必须使用合格、有效的标准仪器或标样（气）校验。新采购的标样（气）需进行验证合格后才能使用，验证方法可把标样（气）当作样品，采用对应仪表的参数进行分析验证。

5.7 Management of Safety and Environmental Instrument

安全及环保仪表的管理

5.7.1 The radioactive instrument shall be approved by the HSE Dept. of the Company before use. Warning signs shall be set up on the spot, and the protective screen shall meet the field radiation protection requirements.

放射仪表使用前必须经公司 HSE 管理部批准。放射仪表现场需设置警示标记，防护屏设置必须达到现场射线的防护要求。

5.7.2 The installation, dismantling and debugging of instrument radioactive sources shall be entrusted to a unit with radioactive source maintenance qualification, and the instrument control department shall cooperate accordingly. It is forbidden to install or dismantle the instrument radioactive sources without permission, and a corresponding ledger shall be established for each dismantling and installation.

仪表放射源的安装、拆除和调试，应委托具有放射源检修资质的单位负责，仪表控制部做好相应

配合工作，严禁私自进行安装、拆除，每次拆除、安装均要建立相应台账。

5.7.3 The maintenance personnel of radioactive instruments shall receive special training and obtain the training certificate before performing the maintenance, overhaul and calibration of radioactive instruments. Protective equipment and monitoring instruments shall be equipped during the operation.

放射仪表的维护人员需经专门培训，并取得培训合格证书后，方能进行放射仪表的维护、检修和校准工作，作业期间需配备防护用品和监测仪器。

5.7.4 When shutdown is required due to the failure of the safety and environmental instrument for more than 48 hours, the Approval Form for the Suspension (Use) of Safety and Environmental Instrument shall be filled in, countersigned by the Production & Operation Dept. and submitted to the HSE Dept. for approval. In case of weekends and holidays, the approval procedures should be handled within two working days.

安全环保仪表故障超过 48 小时需停用时，必须办理《安全环保仪表停用（启用）审批单》，经所在生产运行部会签，报 HSE 管理部审批，遇双休日、节假日可在上班后两天内补办审批手续。

5.7.5 Combustible (toxic) gas alarm instrument shall be calibrated once every six months, and detection instruments such as ammonia nitrogen analyzer, chemical oxygen (COD) analyzer and chimney CEMS shall be calibrated once a year. After calibration, corresponding instrument calibration sheets shall be filled in.

可燃（有毒）气体报警仪每半年校验一次，氨氮分析仪、化学氧量（COD）分析仪、烟囱 CEMS 等检测仪表应每年校验一次，校验后应填写相应的仪表校验单。

5.8 Management of automatic system and system cabinet

自动化系统及系统机柜间管理

5.8.1 The routine management of automatic system mainly includes the routine maintenance and inspection of the operating state of the system power supply and hardware devices such as host and controller, the intact condition of the peripheral equipment such as fans in each cabinet, and the temperature, humidity, sound and light alarm of the machine room.

自动化系统日常管理主要包括对系统供电、主机/控制器等硬件设备的运行状态、各机柜的风扇等外围设备的完好状况、机房的温度、湿度、声光报警等进行日常检查和维护。

5.8.2 If any hardware anomaly or fault is found in the control system, the maintenance personnel shall deal with it in time and record the fault phenomena, causes, handling methods and results. According to the actual operating of the equipment, the maintenance personnel shall develop the fault emergency plan for each control system.

发现控制系统的硬件异常或故障，维护人员应及时进行处理，对故障现象、原因、处理方法及结果做好登记。根据装置实际运行情况，制定每套控制系统的故障应急预案。

5.8.3 The software of control system includes system software and application software, which shall be properly saved in remote dual backup manner, and the backup media shall be

indicated with software description, backup data and backup person. After modification, the software shall be backed up in time.

控制系统的软件包括系统软件和应用软件要妥善保存，做到双备份且异地保存，备份介质要注明软件名称、备份日期、备份人等，软件修改后，应及时备份。

5.8.4 To prevent virus infection, the use of unrelated software on the control system shall be strictly prohibited, and operations unrelated to the maintenance of the control system shall also be prohibited. The password or the key of keylock switch of control system shall be kept by designated person. The isolation measures shall be taken between control system and information management system with firewall added.

为防止病毒感染，严禁在控制系统上使用无关的软件，也不得进行与控制系统维护无关的操作。控制系统的密码或键锁开关的钥匙要由专人保管，控制系统与信息管理系统间必须采取隔离措施，增设防火墙。

5.8.5 In principle, the maintenance of the control system shall be carried out simultaneously with the shutdown and maintenance of the device. According to the current situation and specific conditions of the system, the system shall be inspected or cleaned and inspected. Overhaul should be carried out according to the requirements of Maintenance and Overhaul Regulations for Petrochemical Equipment (SHS07001~07009), and the preparation before overhaul, process quality control, overhaul acceptance and overhaul record filing should be done well.

控制系统的检修原则上随装置停工检修同步进行，根据系统运行现状和具体情况，进行系统点检或清灰、检查；检修应按《石油化工设备维护检修规程》（SHS07001~07009）要求进行，做好检修前的准备、过程质量控制、检修验收及检修记录归档等工作。

5.8.6 The inspection shall include system grounding and cable connection inspection, insulation inspection between different grounding electrodes, and resistance value inspection of grounding resistance (connection resistance); and include cleaning dust inside the equipment and on the plug board, power supply system inspection and confirmation (including various power supply voltage tests), redundant system switching test, I/O card spot check test, system diagnostic test, network check and test.

检修内容应包括系统接地及电缆连接检查，不同接地极之间的绝缘检查，接地电阻（连接电阻）阻值检查；清扫设备内部及插板上的灰尘、供电系统检查确认（包括各种电源电压测试）、冗余系统切换试验、I/O卡抽检测试、系统诊断测试、网络检查及测试等。

5.8.7 The hardware technical performance of the control system after overhaul shall meet the factory technical standards. The system software and application software shall run normally and meet the design performance, and the man-machine interface shall work normally.

控制系统检修后的硬件技术性能应达到出厂时技术标准，系统软件、应用软件运行正常并达到设计指标，人机界面工作正常。

5.8.8 Facilities against small animals shall be provided between the inlet of cabinet and the cable channel, the fire-fighting facilities in the cabinet shall be fully equipped and the

corresponding equipment shall not be used for other purposes.

机柜间入口及电缆通道要有防小动物设施，机柜间内消防设施要配备齐全，相应设备不得挪为他用。

5.8.9 The electrostatic discharge device or electrostatic discharge bracelet shall be provided between the cabinets, and the body static electricity shall be released before operation; during operation of the device, the use of mobile communication tools shall be restricted or controlled within the cabinet.

机柜间应设置静电释放装置或放置静电释放手环，作业前需释放身体静电；在装置运行期间，机柜间内应限制或控制使用移动通讯工具。

5.8.10 The environment of the cabinet shall meet and comply with the design requirements of control system. The temperature shall be controlled between 10°C ~ 30°C, the humidity shall be controlled at 20% ~ 80% relative humidity and the cabinet shall be clean and free of dust.

机柜间环境必须符合和满足控制系统设计规定的要求，温度控制在 10°C~30°C，湿度控制在 20%~80%相对湿度，机柜间清洁无尘。

5.8.11 The load of data path and various calculation parts (such as controller, operation station and engineer workstation) during normal operation of the system shall not exceed 70% of the available resources (such as memory and data transfer rate).

系统正常运行期间，数据通路和各个计算部分（如控制器、操作站、工程师工作站等）的负载不能超过可用资源（如存贮器、数据传送速度等）的 70%。

5.9 Management of video monitoring system for production equipment

生产装置视频监控系统管理

5.9.1 Allocation principle of video monitoring system

视频监控系统的设置原则

5.9.1.1 In principle, the distribution of video monitoring camera shall be put forward by the User Dept., and Equipment Management Dept. shall make review comments of the distribution demand. The video equipment shall adopt HD digital system with pan-tilt (ball machine with rotation function) which shall be based on 360° rotation full monitoring. According to the principle of full monitoring and distribution, device area shall be preferably 50×50m matrix in plane. The maximum distance of the device area other than the panoramic video facility shall be recommended to no more than 150m.

视频监控的摄像头布点原则上由使用部门提出，机械动力部对布点需求提出审核意见。视频设备应采用高清数字式系统，宜带云台（球机需带旋转功能），云台以 360° 旋转全监控为基准。按全监控布点原则，装置区以平面 50×50m 矩阵为宜，除全景视频设施外装置区最远距离建议不大于 150m。

5.9.1.2 The production equipment shall be set up according to furnace area, pump area, heat

exchange area, tank farm and large unit area. In principle, the overlapping area shall not be repeatedly set, and for large unit area, focus on monitoring the key compressor area which affects the normal operation of the equipment.

生产装置应按炉区、泵区、换热区、罐区、大机组区等设置，原则上交叉重叠区域不重复设置，大机组区应对影响装置正常运行的关键压缩机组区域进行重点监控。

5.9.1.3 Panoramic monitoring of the device can be a single device or multiple devices. The principle is to see the whole picture of the device and reduce repeated arrangement. The high-altitude inspection site and regional monitoring point shall be considered as a whole.

装置全景监控可以是单个装置，也可以是多个装置，以看清装置全貌、减少重复布置为原则，高空巡检部位与区域监控点应统筹考虑。

5.9.1.4 Video monitoring points should be set up in the equipment cabinet room and important equipment area.

装置仪表机柜间和重要设备区域应设置视频监控点。

5.9.1.5 For the points that are inconvenient for the inspection of inter-plant pipelines, the principle of laying along the line should be adopted, and the laying along the line can be more than 150 meters. Truck scales and track scales used for ex-factory measurement should be equipped with high-definition cameras and supporting video acquisition systems to monitor the weighing process in real time.

厂际管道人员巡检不便到达的点位，采取重点加沿线布设原则，沿线布设可大于 150 米。用于进出厂计量的汽车衡和轨道衡，应设置高清晰摄像头及配套视频采集系统，实时监控称量过程。

5.9.1.6 Video monitoring system shall be set up in hazards areas, such as chemicals storage sites, centralized storage sites for radioactive sources, temporary or permanent solid waste stacking sites.

对危险源区域应设置视频监控系统，如储存化学品场所、放射源集中放置点以及临时或永久性固废堆场等。

5.9.2 Maintenance of video monitoring system

视频监控系统的维护保养

5.9.2.1 The site camera shall be firmly installed, the wiring shall be standardized and tidy and the surface body shall be clean. The front glass of the camera shall be clean and free from dirt, the pan-tilt shall rotate flexibly and the junction box and threading groove shall be sealed well, as well as the screws shall not be corroded or loosened.

现场摄像头安装牢固，接线规范、整齐，表体清洁，摄像头前端玻璃清洁无污，云台转动灵活，接线盒及穿线槽密封良好，螺丝不锈蚀、松动。

5.9.2.2 The monitor shall display normally in the operating room, the image shall be clear without disturbance, and the screen shall be clean without damage. The buttons shall be flexible and the data in the display shall be correct. The power switch and wiring inside the operation panel shall be orderly and firmly installed, and the internal fan shall rotate normally.

操作室内监视器显示正常，图像清晰无干扰，屏幕清洁无破损，各按键动作灵活，显示屏各数据

指示正确。操作台内部电源开关和布线有序、安装牢固，内部风扇转动正常。

5.9.2.3 The system equipment identification shall be clear, the indicator lamp of each equipment shall be normal and the recording equipment shall operate normally. The recorded image content shall be clear and complete.

系统设备标识清楚，各设备指示灯指示正常，录像设备运行正常，录制的图像内容清晰、完整。

5.9.3 Use of video monitoring image information

视频监控图像信息的使用

5.9.3.1 Production & Operation Dept. shall be responsible for the use and management of the industrial TV monitoring system, conduct the operation training of the video monitoring system and formulate the relevant operation regulations of the video monitoring system.

生产运行部负责工业电视监控系统的使用管理，做好视频监控系统的操作培训，制定视频监控系统有关操作规程。

5.9.3.2 The authority of video monitoring system can be divided into two categories according to the calling mode: accessing and operating. Only the real-time and historical video images can be accessed in accessing while controls such as focusing and rotating field camera equipment are allowed in operating.

视频监控系统权限按调用方式分调阅和操作两类，调阅只能查看实时和历史视频图像，操作允许对现场摄像设备进行调焦、转动等控制。

5.9.3.3 If the video monitoring image information is required by any department or individual of the Company for business, the *Application Form for Use the Video Monitoring Image Information* shall be filled in and approved by the competent department. After that, the information shall be operated and provided by the relevant professional and technical personnel.

公司部门及个人因业务需要视频监控图像信息的，需填写《视频监控图像信息使用申请表》，经主管部门审核后，由相关专业技术人员操作、提供。

5.9.3.4 As required by accident investigation, the investigation team shall send the information to the competent department of video monitoring in the form of meeting instructions and emails. After approved by the competent department, the professional technical personnel shall be notified to operate and provide the information.

因事故调查需要，调查小组以会议指令、邮件等形式下达给视频监控主管部门，经主管部门审核后，通知专业技术人员操作、提供。

6 Inspection and Supervision 监督检查

Equipment Management Dept. shall be responsible for supervising the whole process management of the company's instrument and automatic system and incorporating the same into performance management for which regular inspection and assessment shall be carried

out.

机械动力部负责对公司仪表及自动化系统全过程管理情况进行监督，并纳入公司绩效管理，定期进行检查和考核。

7 Associated Procedures and Records

关联程序和记录

7.1 Associated procedures

关联程序

7.1.1 Instrument Change Management Procedures(HYBN-T2-07-0057-2024-2)

仪表变更管理程序 HYBN-T2-07-0057-2024-2

7.1.2 Suspension (Use) Procedure for Safety and Environmental Instrument (HYBN-T2-07-0058-2024-2)

安全环保仪表停（启）用程序 HYBN-T2-07-0058-2024-2

7.1.3 Instrument Inspection and Verification Procedures (HYBN-T2-07-0059-2024-2)

仪表检查校验程序 HYBN-T2-07-0059-2024-2

7.1.4 Approval Procedure of Use the Video Monitoring Image Information (HYBN-T2-07-0060-2024-2)

视频监控图像信息使用审批程序 HYBN-T2-07-0060-2024-2

7.2 Associated records

关联记录

7.2.1 Instrument Change Order(HYBN-T6-07-0122-001-2018)

仪表变更单 HYBN-T6-07-0122-001-2018

7.2.2 Operational Status Form of Instrument and Automatic System (HYBN-T6-07-0123-001-2018)

仪表及自动化系统运行状况表 HYBN-T6-07-0123-001-2018

7.2.3 Approval Form of Suspension (Use) for Safety and Environmental Instrument (HYBN-T6-07-0124-001-2018)

安全环保仪表停（启）用审批单 HYBN-T6-07-0124-001-2018

7.2.4 Instrument Verification Form (HYBN-T6-07-0125-001-2018)

仪表校验单 HYBN-T6-07-0125-001-2018

7.2.5 Instrument Inspection and Confirmation Form (HYBN-T6-07-0126-001-2018)

仪表检查确认单 HYBN-T6-07-0126-001-2018

7.2.6 Instrument Comparison and Confirmation Form(HYBN-T6-07-0127-001-2018)

仪表比对确认单 HYBN-T6-07-0127-001-2018

7.2.7 Application Form of Video Monitoring Image Information (HYBN-T6-07-0128-001-2018)

视频监控图像信息使用申请表 HYBN-T6-07-0128-001-2018

7.2.8 Test Records of Instrument Grounding Resistance(HYBN-T6-07-0129-001-2018)

仪表接地电阻测试记录 HYBN-T6-07-0129-001-2018

8 Supplementary Rules

附则

8.1 The System is under the jurisdiction of Equipment Management Dept.

本制度由机械动力部归口管理。

8.2 The System is drafted by Equipment Management Dept.

本制度起草部门：机械动力部。

8.3 Equipment Management Dept. is responsible for the interpretation of the System.

本制度解释权归机械动力部拥有。

8.4 Revision, preparation and approval of the System are shown in Table 1:

本制度版本编制和审批情况见表 1:

Table 1 Revision, preparation and approval of document

表 1 文件版本编制和审批情况

2	2024-04-01	Lian Yongqing 练永青	Zhao Tingyun 赵挺云	Xu Ye 徐野	Chen Liancai 陈连财
Revision 版本	Issued date 颁布日期	Prepared by 编制人	Reviewed by 审核人	Authorized by 审定	Reviewed by 审核人