



Hengyi Industries SdnBhd
恒逸实业（文莱）有限公司

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Management System for Interlock Protection

联锁保护系统管理制度

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 HENGYI	Hengyi Industries SdnBhd 恒逸实业（文莱）有限公司			
	Management System for Interlock Protection 联锁保护系统管理制度			
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1 Purpose

目的

The System is hereby formulated to ensure the safe operation of production equipments, and normalize the commissioning, change, removal, maintenance and other work of interlock protection system.

为确保生产装置（或系统）安全运行，规范联锁保护系统的投用、变更、切除以及维护检修等工作，特制定本制度。

2 Scope of Application

适用范围

The System is applicable to the management of interlock protection systems of all production equipments.

本制度适用于各生产装置联锁保护系统管理。

3 Terms and Definitions

术语和定义

3.1 Interlocking protection system: refers to the protection system that automatically converts the production process to a safe state in order to prevent or reduce the occurrence of hazardous events when operating variables exceed the preset limits or when equipment fails.

联锁保护系统：是指在装置生产过程中，当操作变量超过预设定的限值或设备发生突发故障时，为防止或减少危险事件发生，使生产过程自动转移到安全状态的保护系统。

3.2 Interlock change: refers to the change of logic or value of the original interlock protection system due to the change of production or process technology, including changes such as addition, removal, recovery and cancellation of interlock circuits.

联锁变更：是指因生产或工艺技术改变，需要对原联锁保护系统逻辑或数值进行的变更，包括对联锁回路的增加、切除、恢复、取消等变更。

3.3 Interlock is composed of equipment interlock and process interlock. Equipment interlock refers to the interlock protection circuit that protects the safe operation of units, pumps and other equipment and their accessories; process interlock refers to the interlock protection circuits other than the equipment interlock circuit in production equipments.

联锁分为设备联锁和工艺联锁。设备联锁是指保护机组、泵等设备及其附件本体安全运行的联锁

保护回路；工艺联锁指生产装置除设备联锁回路以外的其它联锁保护回路。

3.4 Interlock pre-alarm: refers to the alarm set before the interlock value is reached and the interlock action is made.

联锁预报警：是指联锁值还未到达、联锁动作之前的提前设置的报警。

4 Management Responsibilities

管理职责

4.1 Specified administrative authority

归口管理部门

4.1.1 Equipment Management Department is the centralized management department of interlocking protection system of production equipment, responsible for compiling and revising relevant systems of interlocking protection system and supervising its implementation.

机械动力部是生产装置设备联锁保护系统的归口管理部门，负责编制与修订联锁保护系统相关制度并监督执行。

4.1.2 It is responsible for the technical management of the interlock protection system, technical review of changes, and approval of equipment interlock changes.

负责公司联锁保护系统的技术管理、变更的技术审查、设备联锁变更的审批。

4.1.3 It is responsible for organizing relevant departments such as the production operation department, Instrument Control Dept. and Electrical Operation Dept. to confirm the interlock circuits prior to commissioning.

组织生产运行部、仪表控制部、电气运行部等相关部门对联锁回路进行投用前确认。

4.2 Coordinated management departments

协同管理部门

4.2.1 The schedule and dispatch department is the centralized management department of the process interlock protection system of the production device, and the planning and dispatching department is responsible for organizing relevant departments to confirm the process interlock before putting into use; Be responsible for the examination and approval of interlock changes caused by plant production and process technology; Participate in technical review and countersignature of interlocking protection system.

计划调度部是生产装置工艺联锁保护系统的归口管理部门，计划调度部负责组织相关部门对工艺联锁进行投用前确认；负责因装置生产及工艺技术原因引起的联锁变更的审批；参与对联锁保护系统的技术审查以及会签。

4.2.2 HSE Department participates in technical review and countersignature of interlocking

protection system, or participates in interlocking confirmation before construction.

HSE 管理部参与联锁保护系统的技术审查以及会签，或参与开工前的联锁确认工作。

4.3 Executive departments

执行部门

4.3.1 As the executive department of instrument interlock changes, the Instrument Control Dept. is responsible for the maintenance and comprehensive management of the interlock protection system of instruments; the establishment of the interlock protection system records, files, and the update of interlock logic diagrams; and attending the technical review and confirmation of the interlock protection system.

仪表控制部负责仪表联锁保护系统的维护维修和综合管理，是仪表联锁变更的执行部门；负责建立联锁保护系统台账、档案，以及联锁逻辑图的更新；参加联锁保护系统的技术审查与确认

4.3.2 Each production and operation department is the executive department of the interlocking protection system, responsible for the use and management of the interlocking protection system; Participate in technical review and countersignature of interlocking protection system; Be responsible for applying for changes of interlocking protection system (including putting into use, modification, addition, removal, cancellation, etc.).

各生产运行部是联锁保护系统的执行部门，负责联锁保护系统的使用管理；参加联锁保护系统的技术审查以及会签；负责提出联锁保护系统变更（包括投用、修改、增加、切除、取消等）的申请。

4.3.3 The Electrical Operation Department is responsible for the maintenance of the electrical circuit of the interlock protection system, the executive department of the electrical interlock change, the data archiving of the electrical circuit of the interlock protection system, and the technical review and confirmation of the interlock protection system.

电气运行部负责联锁保护系统电气回路的维护维修，是电气联锁变更的执行部门，负责联锁保护系统电气回路的资料归档，参加联锁保护系统的技术审查与确认。

5 Management Content

管理内容

5.1 Management of interlock values, interlock pre-alarm values and interlock logic diagrams
联锁值、联锁预报警值及联锁逻辑图的管理

5.1.1 The interlock value, interlock pre-alarm value and interlock logic diagram of the new device shall be subject to the design data. After the start of the plant, the interlock value and interlock pre-alarm value shall be compiled into a book by the process and equipment

technicians of the production and operation department according to the technical regulations and design data of the plant, and shall be submitted to the planning and dispatching department and the mechanical power department for approval within one month after the start of normal operation. Interlocking logic diagram shall be arranged and archived by technicians of instrument control department and electrical operation department according to design data and software configuration data.

新装置的联锁值、联锁预报警值及联锁逻辑图以设计资料为准。装置开工后，联锁值、联锁预报警值由生产运行部工艺、设备技术人员根据技术规程、装置设计资料等负责整理成册，在开工正常 1 个月内报计划调度部、机械动力部核准后执行；联锁逻辑图由仪表控制部、电气运行部技术人员根据设计资料、软件组态资料负责整理、存档。

5.1.2 The interlock values and interlock pre-alarm values are reviewed once per production cycle. Within one month before each shutdown & maintenance, the production operation department will fill in and submit the "List of Interlock Values and Interlock Pre-Alarm Values" of the unit's next production cycle; the list for process interlock will be submitted to the Scheduling & Dispatch Dept. for approval; the list for equipment interlock will be submitted to the Equipment Management Dept. for approval (when there is any change in the interlock values, interlock change procedures must be handled); the approved "List of Interlock Values and Interlock Pre-Alarm Values" will be distributed respectively by the Scheduling & Dispatch Dept. to the production operation department, Instrument Control Dept. and Electrical Operation Dept.

联锁值及联锁预报警值每一个生产周期审核一次。在每次停工检修前一个月内，由生产运行部按照实际使用的联锁值及联锁预报警值，填报装置下一生产周期的《联锁值及联锁预报警值清单》，工艺联锁报计划调度部审核，设备联锁报机械动力部审核（如联锁值发生变更，必须办理联锁变更手续），审核确认后的《联锁值及联锁预报警值清单》分别由计划调度部和机械动力部下发给生产运行部、仪表控制部、电气运行部。

5.2 Use management of interlock protection system

联锁保护系统的使用管理

5.2.1 Interlock equipment of production equipments must be kept in good condition, and all interlock protection circuits must be put into use except for the removal approved according to the procedure. Spare interlock units and equipment must be in the same good condition as the in-service interlock equipment of the operation units.

生产装置的联锁设备必须保持完好，联锁保护回路除按程序批准切除外，必须全部投用。联锁备用单元和设备必须与运行装置投用联锁一样处于完好状态。

5.2.2 After maintenance, the interlock protection system of production equipments, new units and newly added circuits must be confirmed by field tests prior to commencement or

commissioning, to confirm the accuracy of interlock values, and the correctness and reliability of interlock actions. For temporary device maintenance involving change of interlock circuits, the field test must be carried out as well prior to the operation of the said interlock circuits. Field tests are also required before the interlock protection system, which has been removed for a long time, can be put back into operation.

检修后的生产装置、新装置、新增回路的联锁保护系统，必须在开工前或投运前进行现场试验确认，确认联锁值的准确性、联锁动作的正确性、可靠性。对临时安排检修装置，涉及联锁回路动改的，在该联锁回路投运前也须进行现场试验确认。长期切除的联锁保护系统恢复投用之前，也须进行现场试验确认。

5.2.3 Test and confirmation of process interlock will be organized by the Scheduling & Dispatch Dept.; and test and confirmation of equipment interlock will be organized by the Equipment Management Dept. For interlock confirmation, the production operation department will operate the test, and the Instrument Control Dept. and Electrical Operation Dept. will assign technicians to attend the test. Once the interlock is confirmed, all departments attended the test will sign the "Interlock Confirmation Sheet". The signed "Interlock Confirmation Sheet" will be uniformly distributed by the Scheduling & Dispatch Dept. or Equipment Management Dept. to the attending departments such as the production operation department, Instrument Control Dept. and Electrical Operation Dept., and properly kept by all departments.

工艺联锁的试验确认由计划调度部组织，设备联锁的试验确认由机械动力部组织。联锁确认时由生产运行部操作试验，仪表控制部、电气运行部派技术人员参加，联锁确认后参加部门在《联锁确认单》上签字，签字后的《联锁确认单》由计划调度部或机械动力部统一下发给生产运行部、仪表控制部、电气运行部等参加部门，各部门应保存至少一个生产周期。

5.2.4 The Scheduling & Dispatch Dept. and Equipment Management Dept. are responsible for coordinating and solving issues occurred during interlock confirmation.

计划调度部、机械动力部负责协调解决联锁确认过程中遇到的问题。

5.2.5 The front switches (including soft switches in DCS operation station) and buttons of the interlock protection system of the production device are operated by the operators of the operation department; The operation department issues operation tickets for switches and buttons behind the desk or in the cabinet, and the instrument or electrical professionals perform the operations.

生产装置联锁保护系统的盘前开关(包括 DCS 操作站内软开关)、按钮由运行部操作人员操作；盘后或机柜内开关、按钮均由运行部开出作业票，仪表或电气专业人员执行操作。

5.3 Change management of interlock protection system

联锁保护系统的使用管理

5.3.1 When any change needs to be made with interlock value, interlock pre-alarm value, interlock condition, interlock method and interlock logic, interlock change procedures must be

taken care of, and corresponding prevention methods should be made for when removing interlock protection system.

联锁值、联锁预报警值、联锁条件、联锁方式及联锁逻辑等需要变更时，必须办理联锁变更手续，切除联锁保护系统时应制订相应的防范措施。

5.3.2 Interlock change should be applied by the production operation department. When any change is required due to instrument or electrical reasons, the Instrument Control Dept. and Electrical Operation Dept. should respectively contract the production operation department, and the production operation department will fill in and submit the "Interlock Change Order" in accordance with the information passed.

联锁变更由生产运行部负责提出申请。因仪表、电气等原因需变更时，分别由仪表控制部、电气运行部负责联系生产运行部，由生产运行部根据信息传递内容填报《联锁变更单》。

5.3.3 Approval procedure of interlock change: the production operation department will fill in and submit the "Interlock Change Order", along with the before and after logic diagrams of the interlock to be changed (except removal, recovery), and evaluate the risk of change content; the order will be countersigned by the Instrument Control Dept. or Electrical Operation Dept. and sent to the leader of the Company for approval after being verified by discipline competent departments in charge (according to the process or equipment interlock).

联锁的变更审批程序：生产运行部填报《联锁变更单》，并附上所变更联锁（切除、恢复除外）变更前后的逻辑图，及对所变更内容的风险进行评价，经仪表控制部或电气运行部会签，（按工艺或设备联锁分）交专业主管部门审核后，报公司主管领导批准。

5.3.4 The Instrument Control Dept., Electrical Operation Dept. and production operation department will implement interlock change as per the approval opinion of interlock change.

When change implementation is completed, the Instrument Control Dept. and Electrical Operation Dept. will revise relevant diagram pages in the interlock logic diagram volume.

仪表控制部、电气运行部、生产运行部根据联锁变更的审批意见，实施联锁变更。变更实施完成后，仪表控制部、电气运行部应对联锁逻辑图集中相关图页进行修订。

5.3.5 Removal and operation recovery of interlock under special circumstances

特殊情况下联锁的切除、恢复投运。

5.3.5.1 For interlocked needs to be temporarily removed at startup and shutdown, the removal should be directly carried out by the production team leader on duty, with the cooperation from instrument and electrical personnel, and the records must be properly kept.

When commissioning conditions are established, the production team leader should propose or restore the operation.

在开、停工时需要临时切除的联锁，由当班生产班长直接执行，需要时由仪表、电气人员配合实施，并作好记录。投运条件具备后，由生产班长负责提出或恢复投运。

5.3.5.2 When interlock removal is temporarily required due to abnormality of production equipments or in case of emergency (such as instrument malfunction), relevant prevention measures should be proposed by the team leader on duty and agreed by unit technicians and

leader of the production operation department; the team leader on duty (or personnel of instrument or electrical disciplines notified) should remove the interlock directly after the prevention measures as taken. When the unit is restored to normal, the team leader on duty should propose and timely implement interlock restoration after being agreed by the unit technicians and leader of the production operation department.

在生产装置发生异常或在紧急情况下（如仪表失灵等）需暂时切除联锁时，由当班班长提出，经装置技术人员、生产运行部主管领导同意，提出相应的防范措施并得到落实后，由当班操作班长直接执行（或通知仪表、电气专业人员执行）。装置恢复正常后，由当班班长请示装置技术人员、生产运行部主管领导同意后，及时恢复联锁。

5.3.5.3 When the instrument and electrical equipment maintenance personnel need to temporarily remove the interlock when performing regular maintenance, troubleshooting and other operations related to the interlock circuit, the instrument and electrical equipment maintenance personnel shall apply to the on-duty operation team, and the interlock can be removed only after the approval is completed and preventive measures are implemented. During operation, the system of instrument interlocking operation ticket and electrical operation ticket must be strictly implemented. Before resuming putting-in-service proactively, it must be confirmed by the instrument and electrical equipment maintenance personnel and the operation monitor on duty, and then resume putting-in-service proactively.

仪表、电气设备维护人员在定期进行保养、故障处理等与联锁回路有关的作业需临时切除联锁时，由仪表、电气设备维护人员向当班操作班组提出申请，审批完成并落实防范措施后方可切除联锁。作业时必须严格执行仪表联锁作业票、电气作业票制度。恢复投用前必须经仪表、电气设备维护人员及当班操作班长共同确认，完成后恢复投用。

5.3.6 During the production period, no matter what the reason is, if the interlock removal time exceeds 48 hours, the approval procedures for interlock change must be completed in time; if it's during weekends and holidays, then the approval procedures should be handled on the first working day after the change.

生产期间不论何种原因，联锁切除时间超过 48 小时的，必须及时办理联锁变更审批手续，双休日、节假日在变更后首个工作日补办审批手续。

5.3.7 In the first quarter of each year, the Scheduling & Dispatch Dept., together with the Equipment Management Dept., should organize all production operation departments, Instrument Control Dept., Electrical Operation Dept. and other relevant departments to review interlock circuit removed for a long time and "Interlock Change Order"s unable to be implemented due to lack of conditions, and put forward safety measures and review opinions.

计划调度部联合机械动力部在每年第一季度组织各生产运行部、仪表控制部、电气运行部等相关部門，对长期切除的联锁回路以及暂时无条件实施的《联锁变更单》组织进行评审，提出安全措施和评审意见。

5.4 Maintenance and repair management of interlock protection system

联锁保护系统的维护、检修管理

5.4.1 Instrument and equipment used in the interlock protection system shall be repaired, calibrated and rated along with equipment shutdown and maintenance. When repairing the interlock protection system, new components, instruments and equipment for replacement must be used after strict inspections and tests.

联锁保护系统所用仪表设备应随装置停工检修进行检修、校准、标定。在联锁保护系统检修时，新更换的部件、仪表、设备必须经过严格检验、试验之后方可使用。

5.4.2 During equipment shutdown and maintenance, all terminals in the interlock circuits must be inspected, tightened and confirmed, and the interlocking instruments should be single and joint calibrated.

装置停工期间必须对联锁回路中的所有接线端子进行检查紧固确认，并对联锁仪表进行单校、联校。

5.4.3 Fault handling and maintenance work of interlock protection system must be supervised by special personnel. Maintenance personnel must check the operation status of the interlock protection system every day and properly keep the written record. If any problem is found, it shall be dealt with timely and defect record should be properly made.

联锁保护系统故障处理、维护作业，必须专人监护。维护人员必须每天检查联锁保护系统运行状态，并做好书面记录，发现问题应及时处理，做好缺陷登记。

5.4.4 For the interlock fault treatment of important equipment, a treatment plan must be prepared in advance, which is prepared by the instrument control department or the electrical operation department, countersigned by the production operation department, reviewed by the professional competent department, and approved by the company leaders.

重要设备的联锁故障处理，事先必须编写处理方案，方案由仪表控制部或电气运行部编写，生产运行部会签，专业主管部门审核，公司领导审批。

5.4.5 Equipment of interlock protection system should be provided with clear warning signs. Emergency stop button should be equipped with a protective cover.

联锁保护系统的设备要设立明显的警示标识。紧急停车按钮，应设有按钮防护罩。

5.4.6 System software and application software of interlock protection system should be provided with two backups properly kept in different locations. Software backup should indicate the software name, revision, modification date and modified by whom, and relevant modification and design data should be archived.

联锁保护系统的系统软件和应用软件至少有两套备份，并异地妥善保管。软件备份要注明软件名称、版本、修改日期、修改人，并将有关修改设计资料存档。

5.4.7 Data such as equipment records, interlock schematic diagrams / logic diagrams, wiring diagrams, change orders, confirmation sheets, list of interlock values and interlock pre-alarm values should be timely collected and archived and kept for at least two production cycles,

among which the interlock change orders should be kept for a longer period of time.

联锁保护系统的设备台帐、联锁原理图/逻辑图、接线图、变更单、确认单、联锁值及联锁预报警值清单等资料要及时整理归档，并至少保存二个生产周期，其中联锁变更单需长期保存。

5.4.8 Continuous measuring instruments should be used instead of switching instruments in interlock protection system.

联锁保护系统宜采用连续测量仪表代替开关类仪表。

6 Inspection and Supervision

监督检查

The Equipment Management Dept. is responsible for supervising the management of the Company's interlock protection system and incorporating the same into performance management for regular inspection and examination.

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 Interlock Change Management Procedures (HYBN-T2-07-0062-2024-2)

联锁变更管理程序 HYBN-T2-07-0062-2024-2

7.1.2 Management Procedures for Interlock Pre-Alarm Values and Interlock Values (HYBN-T2-07-0063-2024-2)

联锁预报警值及联锁值管理程序 HYBN-T2-07-0063-2024-2

7.1.3 Interlock Confirmation Management Procedures (HYBN-T2-07-0064-2024-2)

联锁确认管理程序 HYBN-T2-07-0064-2024-2

7.2 Associated records

关联记录

7.2.1 Interlock Change Order (HYBN-T6-07-0130-001-2018)

联锁变更单 HYBN-T6-07-0130-001-2021

7.2.2 List of Interlock Pre-Alarm Values and Interlock Values (HYBN-T6-07-0131-001-2018)

联锁预报警值及联锁值清单 HYBN-T6-07-0131-001-2018

7.2.3 Interlock Confirmation Sheet (HYBN-T6-07-0132-001-2018)

联锁确认表 HYBN-T6-07-0132-001-2018

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 Ting yun 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

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