



Hengyi Industries Sdn Bhd
恒逸实业（文莱）有限公司

HYBN-T3-07-0015-2024-2



Management System for Equipment Repair, Update Plan and Cost

设备修理、更新计划和费用使用管理制度



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 HENGYI	Hengyi Industries Sdn Bhd 恒逸实业（文莱）有限公司			
	Management System for Equipment Repair, Update Plan and Cost 设备修理、更新计划和费用使用管理制度			
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1 Purpose

目的

The System is hereby formulated to further strengthen the plan management of equipment repair and item update, regulate the use of repair costs and update funds, improve the planning, rationality, scientific nature and economical efficiency of equipment repair and item update, to effectively control the repair costs and update funds of fixed assets and maximize the service efficiency.

为进一步加强设备修理和更新项目的计划管理，规范修理费、更新资金的使用，提高设备修理、更新项目的计划性、合理性、科学性和经济性，使固定资产修理费和更新资金得到有效控制和使用效率的最大化，特制订本制度。

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

The repair plan can be divided into: annual repair plan and device shutdown maintenance plan.

修理计划可分为：年度修理计划、装置停工检修计划。

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 management department for equipment repair, plan update and repair cost.

机械动力部是设备修理、更新计划和修理费用归口管理部门。

4.1.1.1 It is responsible for reviewing repairs and item updates, organize the preparation,

reporting and release of various repairs and update plans.

负责审核修理、更新项目，组织编制、上报及下达各类修理、更新计划。

4.1.1.2 It is responsible for the management of the Company's repair and update plans and the follow-up, supervision and inspection of plan implementation.

负责公司修理、更新计划的管理和计划实施的跟踪、监督、检查。

4.1.1.3 Organize the technical appraisal of important equipment and the audit of updating equipment selection; Participate in the technical appraisal of general equipment and the examination and approval of updated equipment selection (except for commissioned design projects). ;

组织重要设备判废技术鉴定和更新设备选型的审核；参与一般设备的判废技术鉴定和更新设备选型的审批（委托设计项目除外）。

4.1.1.4 It is responsible for the use management of repair and update expenses; analyzing and releasing the control index of annual repair cost of each department; and checking the use of costs.

负责修理、更新费用的使用管理；分解和下达各部门的年度修理费控制指标，检查费用的使用情况。

4.2 Coordinated management departments

协同管理部门

4.2.1 Finance Dept. is responsible for raising and balancing funds according to the control index of annual repair cost of the Company, providing monthly repair cost entry, and supervising the expense. It is responsible for the accounting and statistics of repair costs and recording expenses in accordance with the audit list of settlement in time; providing the breakdown table of actual payments of repair cost and update expense and analysis of usage.

财务管理部根据公司年度修理费用指标，负责筹措和平衡资金，每月提供修理费入帐情况，监督费用的开支情况。负责修理费的核算和统计，按结算审核单及时入账；提供修理费、更新费的实际支付明细表及使用情况的分析。

4.2.2 Materials Supply dept. is responsible for purchasing and supplying materials needed for repair and update. 物资装备部负责修理、更新所需物资的采购和供应。

4.3 Executive departments

执行部门

4.3.1 Relevant departments and operation departments of the Company are the executive departments.

公司各相关部门和运行部为执行部门。

4.3.1.1 They are responsible for reporting all kinds of repair and update items, implementing and tracking the planned items.

负责上报各类修理、更新项目计划，做好计划项目的实施和跟踪管理工作。

4.3.1.2 Responsible for the use and management of repair fees and renewal fees, and control the use according to the indicators issued by the company.

负责修理费、更新费的使用管理工作，按公司下达的指标控制使用

5 Management Content

管理内容

5.1 Plan management

计划管理

5.1.1 The repair plan is divided into annual repair plan and device shutdown maintenance plan.

修理计划分为年度修理计划、装置停工检修计划。

5.1.1.1 Reporting scope of annual repair plan: see Appendix 1 for details.

年度修理计划申报范围：详见附件 1。

(1) Procedures for declaration, planning and approval of annual repair projects.

年度修理项目的计划申报、计划编制、审批程序。

Each department is responsible for organizing the annual repair project declaration of its own department (within the scope of the company, it shall be declared by the Equipment Management Department), and after being audited by the competent leader, it shall submit an application form for the next year's repair project and expenses to the Equipment Management Department at the beginning of November each year, and each major of the Equipment Management Department shall conduct a preliminary examination on the necessity and accuracy of the declared project and put forward preliminary examination opinions.

各部门负责组织本部门年度修理项目的申报（公司范围内的由机动部申报），经主管领导审核后，在每年 11 月初向机械动力部上报下一年度修理项目及费用申请表，机械动力部各专业对申报项目必要性、费用的准确性进行初审，提出初审意见。

2) The Equipment Management Department will complete the preliminary review of the plan before the end of mid-November, and organize all departments to conduct docking and joint review before the middle and late November. Adjust the plan according to the opinions of the joint review, prepare the annual repair project and cost plan and report it to the department leader for review.

机械动力部在 11 月中旬前完成计划初审，11 月下旬前组织各部门进行对接和会审。根据会审意见调整计划，编制年度修理项目及费用计划报部门领导审核。

3) The annual repair project and cost plan shall be submitted to the company's assistant

general manager and deputy general manager for review and CEO's approval.

年度修理项目及费用计划报公司协管副总师、分管副总经理审核和 CEO 审批。

4) The annual repair project and cost plan approved by the CEO of the company shall be sent to all relevant departments before the end of December and incorporated into the annual repair cost budget.

经公司 CEO 审批后的年度修理项目及费用计划，在 12 月底前发至各有关部门，并编入年度修理费用预算。

(2) Reporting scope and procedure of annual urgent repair items.

年度修理急批项目申报范围和程序。

1) Scope of application: If the equipment is damaged and the cost is high due to sudden production accidents and the project falls within the scope of application in Annex 1, it can be applied for urgent approval of annual repair projects. Urgent approval projects are limited to productive repair projects, but non-productive repair projects that the company decides are really in urgent need of implementation can also be declared.

申报范围：因生产突发性事故，造成的设备损坏、费用较高且属于附件 1 申报范围内的项目，可申报急批年度修理项目。急批项目限于生产性修理项目，但对于公司决定确实急需实施的非生产性修理项目也可申报。

2) The department where the item is located shall be responsible for filling in the annual repair application form for the urgent items, and submit it to the Equipment Management Dept. after being reviewed by the leader. After being examined by the leader of the Equipment Management Dept., it shall be submitted to the Assistant Deputy Chief Engineer, Division Deputy General Manager for review and the CEO for approval.

急批项目由项目所在部门负责填报年度修理申请表，主管领导审核后报机械动力部，经机械动力部领导审核后，报公司协管副总师、分管副总经理审核和 CEO 审批。

5.1.1.2 Equipment shutdown & maintenance plan

装置停工检修计划

(1) The preparation scope of shutdown maintenance plan: any overhaul items that must be implemented during the shutdown maintenance of the device, as well as update projects, maintenance projects and technical transformation projects involving construction and installation shall be included in the equipment shutdown & maintenance plan.

停工检修计划的编制范围：凡必须在装置停工检修期间实施的大修理项目、涉及施工安装的更新项目、维修项目、技术改造项目等应列入装置停工检修计划。

(2) Procedures for declaration and approval of shutdown maintenance project plan.

停工检修项目计划申报、审批程序。

Each operation department is responsible for the preparation of the shutdown and

maintenance plan of the device in its own department. After being audited by the department leader, it shall be reported to the Equipment Management Department 18 months before the shutdown and maintenance of the device.各运行部负责本部门装置的停工检修计划的编制，经部门领导审核后，在装置停工检修前 18 个月上报机械动力部。

(3) The Equipment Management Department organizes the review and balanced adjustment of the project contents, and prepares the final draft of the plant shutdown and maintenance plan. After being reviewed by the leaders of the Equipment Management Department, it is submitted to the company's assistant general manager and deputy general manager for review and CEO approval, and distributed to all relevant departments twelve months before the plant shutdown.机械动力部组织进行审核、平衡调整项目内容，并编制装置停工检修计划最终稿，经机械动力部领导审核后，报公司协管副总师、分管副总经理审核和 CEO 审批，在装置停工前 12 个月分发至各有关部门。

(4) Adjustment and supplement of shutdown maintenance plan should be made one month prior to device shutdown, and a supplementary plan should be prepared; within three days after handing over the maintenance, additional to the shutdown maintenance plan should be made according to device inspection, and an additional plan should be prepared; in addition, it is allowed to modify the maintenance content and add maintenance items in the form of project change or additional application form and engineering contact list. The maintenance materials for adjusted and added items shall be proposed by the department of items and solved jointly with the Materials Supply Dept.; for the additional items with great maintenance difficulty and tight maintenance time, the reporting can only be made after the confirmation by the Equipment Management Dept., operation department and Equipment Maintenance Dept., and the implementation of the required materials and spare parts.

装置停工前三个月应对停工检修计划进行一次调整和补充，编制补充计划；检修交出三天内根据设备打开检查情况，对停工检修计划进行一次追加，并编制追加计划；此外，还允许以项目变更或追加申请表及工程联系单的形式，调整检修内容、追加检修项目。对调整、追加项目的检修用料由项目所在部门提出，会同物资装备部解决；对检修难度大、检修时间紧的追加项目，在机械动力部、运行部、检修部门三方确认，并落实所需材料、备件，方可申报。

(5) Shutdown maintenance plans must be uniformly numbered, and the source of cost should be clearly and respectively filled in as per annual repair item, update item, maintenance item, and technical transformation item.

停工检修计划必须统一编号，费用来源应按年度修理项目、更新项目、维修项目、技术改造项目分别填写清楚。

5.1.2 Update plan

更新计划

5.1.2.1 Reporting scope of update items: equipment that meets one of the following conditions may be reported for update.

更新项目的申报范围：满足下列条件之一的设备，可申请更新。

(1) The item has reached the service life, has lost the effectiveness and has no repair value.
使用年限已满，丧失使用效能，无修复价值的。

(2) The item has lost its original use value due to the change of production conditions.
因生产条件改变，已丧失原有使用价值的。

(3) The item hasn't reached the service life but lack of accessories and cannot be repaired.
使用年限未满，但缺乏配件无法修复使用的。

(4) The fixed assets are damaged and have no use value after repair.
固定资产毁损，无修复使用价值的。

(5) After verification, the technical performance still cannot meet the production requirements after overhaul.
经论证，大修理后技术性能仍不能满足生产要求的。

(6) The accuracy and technical performance can be restored after overhaul, but update is a more economic and reasonable choice.
大修理后，虽能恢复精度和技术性能，但更新更为经济合理的。

(7) Items that are eliminated due to outdated technology.
因技术落后淘汰的。

(8) Items fail to meet the requirements of safety and environmental protection and fail to meet the requirements after repair.
不符合安全环保要求且修复后也无法达到使用要求的。

(9) Other items that meet the update requirements.
其它符合更新要求的。

5.1.2.2 Waste evaluation of equipment should be implemented as per the *Fixed Assets Management System*.
设备判废鉴定，按照《固定资产实物管理制度》执行。

5.1.2.3 Procedures for declaration and approval of equipment renewal project plan.
设备更新项目计划申报、审批程序。

(1) Each department shall, according to the equipment status, propose its own item update plan, and report the equipment item update application form, summary form and equipment waste evaluation form of the next year to the Equipment Management Dept. before the end of November every year. For update of important equipment, the technical and economic verification report, risk evaluation form and update plan must be attached; and the technical evaluation of the attached shall be organized by the Equipment Management Dept.
各部门根据设备状况，提出本部门更新项目计划，经主管领导审核后，在每年 11 月初向机械动力部上报下一年度的设备更新项目申请表、汇总表及设备判废鉴定表。对重要设备的更新，还必须附上技术经济论证报告、风险评估表、更新方案，由机械动力部组织进行技术鉴定。

(2) The Equipment Mangement Department shall organize a preliminary examination on the necessity and feasibility of upgrading the rejected equipment, and put forward preliminary examination opinions on the project establishment and the selection of new equipment;

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(2) The Equipment Mangement Department shall organize a preliminary examination on the necessity and feasibility of upgrading the rejected equipment, and put forward preliminary examination opinions on the project establishment and the selection of new equipment;

Equipment Management Department shall complete the initial review of the update plan before the end of mid-November, organize all project departments to conduct docking and joint review before the middle and late November, adjust the update plan according to the joint review opinions, summarize and prepare the company's annual update plan, and report it to the department leaders for review.机械动力部组织对判废设备更新的必要性、可行性进行初审，并对立项和新设备选型审查，提出初审意见；机械动力部在 11 月中旬前编制完成更新计划初审稿，11 月下旬前组织各项目部门进行对接和会审，根据会审意见调整更新计划，汇总、编制公司年度更新计划，报部门领导审核。

(3) The company's annual update plan shall be submitted to the company's assistant general manager and deputy general manager for review and CEO's approval, and then it shall be numbered uniformly by the Equipment Management Department and sent to all relevant departments before the end of December.

公司年度更新计划报公司协管副总师、分管副总经理审核和 CEO 审批后由机械动力部统一编号，在 12 月底前发至各有关部门。

5.2 Plan implementation management

计划实施管理

5.2.1 Construction management division:

施工管理分工:

The principle of annual repair project and equipment renewal project shall be implemented by the company's own maintenance unit, and the project unit shall apply for outsourcing if necessary.

年度修理项目和设备更新项目原则由公司自有的维保单位负责实施，如需要外委由项目所在单位提出申请。

5.2.1.1 The Equipment Management department is responsible for the construction management of annual repair projects and equipment renewal projects within the company. Coordination of construction projects to be outsourced.

机械动力部负责公司范围内的年度修理项目和设备更新项目的施工管理以及需外委施工项目的协调工作。

5.2.1.2 The Operation Department is responsible for the annual repair project, equipment renewal project and construction management of this department.

运行部负责本部门年度修理项目和设备更新项目、施工管理。

5.2.2 Progress control and assessment of plan implementation

计划实施的进度控制和考核

5.2.2.1 The repair and update items shall be managed by the project leader, who should track and manage the whole process from the organization of project implementation, equipment selection and technical negotiation, contract execution, project progress, quality, cost control, project settlement expediting, project quantity review, etc. and has the right to conduct

assessment on responsible persons or departments.

修理、更新项目实行项目负责人管理制，从项目实施的组织、设备选型和技术谈判、合同签订、项目的进度、质量、费用控制、工程结算书催交、工程量复核等进行全过程跟踪管理，有权对责任人或责任部门进行考核。

5.2.2.2 For items with delayed schedule, the project leader shall explain the reasons and put forward assessment opinions on relevant responsible departments or persons, and submit them to the Equipment Management Dept.

对进度延期的项目，由项目负责人说明原因，并对有关责任部门或责任人提出考核意见，提交机械动力部。

5.2.2.3 Each project department will report the completion of the project to the Equipment Management Department in time, explain the reasons for the unfinished projects, and the Equipment Management Department will put forward the assessment opinions for the relevant responsible departments or responsible persons.

各项目部门将项目完成情况及时上报机械动力部，对未完工项目要说明原因，由机械动力部提出对有关责任部门或责任人考核意见。

5.2.3 The Materials Supply Dept. shall place orders according to the planned equipment, materials and spare parts listed in the repair and update items and their drawings, organize the supply of goods, deliver materials timely, and provide the order/arrival information of equipment and important materials to the project department and the Equipment Management Dept. on a monthly basis.

物资装备部要根据修理、更新项目及其图纸所列设备、材料、备品配件计划进行订货，组织货源，及时发料，并按月向项目部门和机械动力部提供设备、重要材料订货/到货信息。

5.2.4 For the repair and renewal projects that need to be outsourced, refer to the relevant provisions of the Equipment Maintenance Management System.

对于需要外委施工的修理、更新项目，参照《设备检修管理制度》相关条款执行。

5.3 Use management of repair cost

修理费用使用管理

5.3.1 The repair cost shall be used based on the principle of "repair must be made when it's a necessity; items must be repaired when required; items must be used sparingly", and the review and approval procedures shall be strictly followed.

修理费用使用本着“应修必修、修必修好、节约使用”的原则，严格履行审批程序。

5.3.2 The Equipment Management Dept. shall strengthen the review of repair plans and the budget control of repair costs.

机械动力部应当加强修理计划的审核和修理费用的预算控制。

5.3.4 The repair cost shall, in principle, be used for the maintenance and repair of in-use equipment (including ancillary facilities) incorporated in fixed assets management.

修理费原则上使用于纳入固定资产管理的在用设备（含附属设施）维护和修理。

5.3.5 Device (equipment) maintenance, equipment pickling, alkaline cleaning, high pressure water cleaning and other project costs can be paid by the repair cost.

装置（设备）检修，对设备进行酸洗、碱洗、高压水清洗等工程项目费用可由修理费列支。

5.3.6 Catalyst regeneration, reagent change, standard gas for analysis and calibration, and tank cleaning expenses are not included in the repair cost.

催化剂再生、换剂、分析标定用的标准气等以及油罐清罐费用，不在修理费中列支。

5.3.7 Project that is not of repair property, such as costs resulted from afforestation, environmental sanitation and advertisement are not included in the repair cost.

非修理性质的项目，如：绿化、环境卫生、宣传广告等所发生的费用不在修理费中列支。

6 Inspection and Supervision

检查与监督

The Equipment Management Dept. shall be responsible for the supervision, inspection and assessment on the implementation of equipment repair, update plan and the management system of cost use.

机械动力部负责对设备修理、更新计划和费用使用管理制度的执行情况进行监督检查并考核

7 Associated Procedures and Records

关联程序和记录

7.1 Associated procedures

关联程序

7.1.1 Annual Cost Approval Procedures(HYBN-T2-07-0049-2024-2)

年度费用审批程序 HYBN-T2-07-0049-2024-2

7.1.2 Approval and Management Procedures of Maintenance and Repair Items

HYBN-T2-07-0050-2024-2

检维修项目审批管理程序 HYBN-T2-07-0050-2024-2

7.1.3 Approval Procedures of Equipment Update Plan(HYBN-T2-07-0051-2024-2)

设备更新计划审批程序 HYBN-T2-07-0051-2024-2

7.1.4 Confirmation Procedures of Repair Cost and Project Quantity (HYBN-T2-07-0052-2024-2)

修理费工程量确认程序 HYBN-T2-07-0052-2024-2

7.2 Associated records

关联记录

- 7.2.1 Application Form of Equipment Update Items(HYBN-T6-07-0113-001-2018)
设备更新项目申请表 HYBN-T6-07-0113-001-2018
- 7.2.2 Summery Table of Annual Equipment Update Items(HYBN-T6-07-0114-001-2018)
年设备更新项目汇总表 HYBN-T6-07-0114-001-2018
- 7.2.3 Application Form of Annual Repair Items(HYBN-T6-07-0115-001-2018)
年度修理项目申请表 HYBN-T6-07-0115-001-2018
- 7.2.4 Summery Table of Annual Repair Items(HYBN-T6-07-0116-001-2018)
年度修理项目汇总表 HYBN-T6-07-0116-001-2018
- 7.2.5 Shutdown Maintenance Plan(HYBN-T6-07-0117-001-2018)
停工（月度）检修计划 HYBN-T6-07-0117-001-2018
- 7.2.6 Application Form for Change of Equipment Repair and Update Item
(HYBN-T6-07-0119-001-2018)
设备修理、更新项目变更申请表 HYBN-T6-07-0119-001-2018
- 7.2.7 Application Form for Change or Addition of Items in the Maintenance Plan
(HYBN-T6-07-0120-001-2018)
检修计划项目变更或追加申请表 HYBN-T6-07-0120-001-2018

8 Supplementary Rules

附则

- 8.1 The System is under the specific management of the 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

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Appendix 1

附件 1

Reporting Scope of Annual Repair Items 年度修理项目申报范围

Any item meeting the following conditions can be listed as the annual repair item:

具备下列条件者，均可列为年度修理项目：

1 Columns

塔类

When the diameter is less than DN1000mm, half of the column trays or more should be replaced.

直径 DN1000mm 以下，塔盘更换在一半及以上。

Replacement of column trays when the diameter is DN1000~DN2000mm: for carbon steel, 10 layers or more; stainless steel, 5 layers or more.

直径 DN1000~DN2000mm 塔盘更换：碳钢的 10 层及以上、不锈钢的 5 层及以上。

Replacement of column trays when the diameter is DN2000~DN3000mm: for carbon steel, 5 layers or more; stainless steel, 2 layers or more.

直径 DN2000~DN3000mm 塔盘更换：碳钢的 5 层及以上、不锈钢的 2 层及以上。

Replacement of column trays when the diameter over DN3000mm: for carbon steel, 3 layers or more; stainless steel, 1 layer or more.

直径 DN3000mm 以上塔盘更换：碳钢的 3 层及以上、不锈钢的 1 层及以上。

Demisters or packing should be completely replaced, using the column maintenance cost.

破沫网或填料全部更换；塔体检修费用。

2 Vaporizer, Heater

汽化器、加热器

Maintenance of individual items such as shell, cyclone separator, dipleg, distribution tube and slide valve.

壳体、旋风分离器、料腿、分布管、滑阀等单项检修。

3 Reactor

反应器

Maintenance of individual items such as scaling basket, grating and distribution plate.

结垢篮、格栅网、分配盘等单项检修。

4 Boiler, Fuel Furnace, Heating Furnace

锅炉、燃料炉、加热炉

Maintenance of furnace tube, air preheater, economizer, superheater, refractory bricks, alloy hanger, oil bend, burner and pattern plate.

炉管、空气预热器、省煤器、过热器、耐火砖、合金吊挂、油弯头、燃烧器、花板等检修

5 Heat Exchanger, Cooler, Reboiler

换热器、冷却器、重沸器

Replacement of core, header; replacement of individual high-pressure alloy steel bolt.

更换芯子、管箱；单台高压合金钢螺栓更换。

6 Equipment lining

设备衬里

Maintenance of thermal insulation lining and stainless steel lining.

隔热衬里、不锈钢衬里的检修。

7 Oil Tank, Storage Tank

油罐、贮罐

Tank bottom and tank top should be replaced completely; coiled tube and central drain pipe of Heater should be replaced completely; the entire sealing tape should be replaced; partial tank wall and bottom should be replaced.

罐底、罐顶全部更换；加热器盘管、中央排水管全部更换；密封胶带整条更换；更换部分罐壁和罐底。

8 Pressure vessel and Pressure pipe inspection

压力容器、压力管道检测

Overall inspection of Boiler, pressure vessels and pressure pipeline.

锅炉、压力容器、压力管道全面检验。

9 Individual pipeline

单项管线

Replacement of pipeline of DN 250, 100m or more.

DN 250、100m 及以上管道更换。

10 Replacement and Maintenance of Valves

阀门更换和检修

PN≥1MPa DN≥400mm

PN≥1.6Mpa DN≥200mm

PN≥2.5Mpa DN≥150mm

PN≥4Mpa DN≥100mm

Replacement and maintenance of individual valves.

以及单台阀门更换、检修。

11 Instrument

仪表

Individual replacement of production instruments and their accessory equipment.

生产用仪表及其附属设备单台更换。

12 Cables and electrical equipment

电缆、电器设备

Individual power, control cables should be all replaces.

电力、控制电缆单根一次更换。

Motor with 75 kW or above, power transformer with rewound coils, and 200 kW motor or above for overhaul.

75 千瓦及以上电机，动力变压器线圈重绕者，及 200 千瓦及以上电机大修者。

Overhaul of important electrical equipment.

重要类电气设备的大修。

13 Rotating equipment

转动设备

Overhaul of important rotary equipment and rotating equipment with the prime mover power greater than or equal to 500KW.

重要动设备以及原动机功率大于等于 500KW 转动设备的大修。

14 Water Cooling Tower

凉水塔

More than half of the water collector, packing layer, nozzle to be replaced.

更换收水器、填料层、喷头在二分之一以上。

Replacement of blower reducer.

更换风机减速箱。

15 Plants, rooms and structures

厂房、房屋和构筑物

Overall renovation of waterproof layer of the roof.

屋顶防水层全部翻修。

The interior wall, exterior wall and floor of houses and structures should be completely renovated (excluding coating), reinforced, surface finished (excluding separate whitewashing) and all doors and windows should be replaced; public roads, floors, walls, slopes and other fixed assets should be renovated; protective strings for berths should be completely replaced.

房屋、构筑物内壁、外壁、地坪全部翻修（不包括涂料）、加固、粉面（不包括单独刷白）、门窗全部更换者；属固定资产的公用道路、地坪、围墙、护坡等翻修；泊位护弦全部更换。

16 Anti-corrosion and thermal insulation

防腐、保温

Anti-corrosion, painting and thermal insulation of the whole equipment, pipelines and components of the device or system; anti-corrosion, painting and thermal insulation of tanks.

装置或系统整体设备、管线、构件的防腐、油漆、保温；油罐的防腐、保温。

17 Conveying equipment, driving and crushing equipment

输送设备、行车、破碎设备

Replacing belts of conveying equipment, driving and crushing equipment.

更换皮带输送设备、行车、破碎设备。

Application Scope of Repair Cost 修理费使用范围

Table 2 Application Scope of Repair Cost

表 2 修理费使用范围

Equipment classification 设备类别	Contents included in repair cost 修理费用列支内容	Contents not included in repair cost 不属修理费用列支内容
1 Industrial Furnace 工业炉	<p>Partial replacement of furnace tubes; repair, replacement and furnace efficiency test of components such as furnace lining, economizer, burner, soot blower, flue and furnace wall. 炉管局部更换、炉衬、省煤器、燃烧器、吹灰器、烟道、炉壁板等部件修理、更换及炉效测试。</p>	<p>Material upgrade required by the process; replacement of all furnace tubes; replacement of complete set of steam drum, preheater, induced draft fan and blower or replacement of parts required by technical transformation. 因工艺需要进行的材质升级及全部炉管更换、汽包、预热器、引风机、鼓风机整台更换或因技术改造需要对零部件更换。</p>
2 Columns 塔类	<p>Repair and replacement of column internals, accessories, partial column body. 塔内件、塔附件、局部塔体修补更换等。</p>	<p>Replacement of all column internals and modification of internals (including packing); internals and accessories to be technical transformed due to process requirements. 全部塔内件更换及塔内部件（含填料）改型，因工艺需要进行技术改造更换的内件、附件。</p>
3 Storage Tank 储罐	<p>Partial replacement and repair of tank top plate, base plate and wall; replacement and repair of internals and accessories. 罐顶板、底板、壁板局部更换、修复，内构件及附件更换修复等。</p>	<p>Addition of new components such as secondary seal, floating plate, dehydration device, heater composing of individual equipment, and tank cleaning fee. 增加二次密封、新增浮盘等新部件以及脱水装置、构成单台设备的加热器、清罐费等。</p>
4 Reactor 反应器	<p>Replacement and repair of partial internals and safety accessories; repair of reactor wall; replacement of lining. 部分内构件和安全附件更换修理、器壁修补、衬里更换等。</p>	<p>Replacement of complete set of individual equipment constituting fixed assets. 构成固定资产的单台设备整台更换。</p>
5 Cool-heat-exchangers 冷热交换器类		

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<p>5.1 Heat Exchanger 热交换器</p>	<p>Repair and replacement of tube bundle, tube header and floating head; repair and cleaning of partial drum. 管束、管箱、浮头修复更换，局部筒体修补及清理等。</p>	<p>Replacement of shell; upgrade of materials and modification of tube bundle due to process technology requirements. 壳体更换及因工艺技术要求材质升级、管束改型等。</p>
<p>5.2 Air Cooler 空冷器</p>	<p>Repair and replacement of air cooler tube bundle, blower. 空冷器管束、风机修理更换。</p>	<p>Replacement of plate and membrane-type air cooler. 板式及膜式空冷更换。</p>
<p>6 Vessels 容器</p>	<p>Replacement and repair of partial internals and safety accessories; repair of reactor wall; replacement of lining. 部分内构件和安全附件更换修理、器壁修补、衬里更换等。</p>	<p>Replacement of complete set or upgrade of materials due to process requirements. 整台更换或因工艺要求的材质升级。</p>
<p>7 Separating, drying and mixing equipment 分离、干燥及搅拌设备</p>	<p>Equipment maintenance; replacement and repair of parts and components. 设备检修及零部件更换、修理等。</p>	<p>Replacement and modification of internals and auxiliary equipment that alone constitute the fixed assets. 单独构成固定资产的内构件及附属设备更换、改造。</p>
<p>8 Rotating equipment (including compressor, blower, refrigerator, pump, steam turbine, etc.) 转动设备（包括压缩机、风机、冷冻机、泵、汽轮机）</p>	<p>Overhauls, medium repairs and minor repairs as well as parts replacement as per relevant technical specification. 按有关技术规程进行的大、中、小修及零部件更换等。</p>	<p>1 Replacement of single pieces (set) such as rotor, partition and shell with a value of more than USD 400,000; technical transformation required by the process. 单件（套）价值超过 40 万美元以上的转子、隔板、壳体等更换、因工艺需要进行技术改造。 2 Replacement of complete set of large units (pumps), if the attached system has a piece of equipment with an independent role, such as rotating equipment, vessels, cooler (with diameter of 500 mm or more) and other single equipment in the lubricating oil system, sealing oil system and cooling system. 成套的大型机组（泵），若其附属系统中具有独立作用的设备，如润滑油系统、密封油系统和冷却系统中的转动设备、容器及直径 500 毫米及以上冷却器等单台设备的整台更换。</p>
<p>9 Vacuum production and application equipment 真空获得及应用设备</p>	<p>Overhauls, medium repairs and minor repairs as well as parts replacement as per relevant technical specification. 按有关技术规程进行的大、中、小修及零部件更换等。</p>	<p>Replacement of complete sets. 整台更换。</p>

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<p>10 Process pipeline, long distance pipeline 工艺管线、长输管线</p>	<p>Repair or partial replacement of pipeline, flange, bend and valves as per the original specification. 按原规格修复或局部更换管线、法兰、弯头、阀门等。</p>	<p>Replacement of valves constituting the fixed assets; material upgrade, diameter expansion and addition of pipeline due to process requirements. 构成固定资产的阀门更换、因工艺要求管线材质升级、扩径、新增等。</p>
<p>11 Conveying, packaging equipment 输送、包装设备</p>	<p>Overhauls, medium repairs and minor repairs as well as parts replacement as per relevant technical specification. 按有关技术规程进行的大、中、小修及零部件更换等。</p>	<p>Replacement of complete sets and equipment that constitutes a single unit (set) of fixed assets. 整台更换及构成单台（套）固定资产的设备更换。</p>
<p>12 Hoisting equipment 起重设备</p>	<p>Overhauls, medium repairs and minor repairs, parts replacement as well as equipment detection and evidence collection as per relevant technical specification. 按有关技术规程进行的大、中、小修，零部件更换及设备的检测、取证等。</p>	<p>Replacement of complete set of traveling bridge and equipment that constitutes a single unit (set) of fixed assets. 整台更换行车桥架及构成单台（套）固定资产的设备更换。</p>
<p>13 Boiler 锅炉</p>	<p>Maintenance as per relevant technical specification; repair and replacement of economizer, preheater, water cooler wall tube, flue, burner, furnace lining, electrode field, soot blower and other accessories. 按有关技术规程进行的检修，省煤器、预热器、水冷器壁管、烟道、燃烧器、炉衬、电极场、吹灰器及其他附件的修理及更换。</p>	<p>Complete set replacement of equipment constituting the fixed assets and has an independent role in the boiler auxiliary system, such as steam drum, deaerator, fan, pump, and heater. 锅炉附属系统中具有独立作用、可构成固定资产的设备，如汽包、除氧器、风机、机泵、加热器等整台更换。</p>
<p>14 Electrical equipment 电气设备</p>		
<p>14.1 Generator 发电机</p>	<p>Overhauls, medium repairs and minor repairs as well as replacement of components such as stators, rotors and exciter windings as per relevant technical specification. 按有关技术规程进行的大、中、小修及定子、转子及励磁机绕组等部件修复。</p>	<p>Replacement of stators and rotors. 定子、转子更换。</p>
<p>14.2 Motor 电动机</p>	<p>Overhauls, medium repairs and minor repairs as per relevant technical specification; complete set replacement of motors with 100KW power or less; repair, replacement or other maintenance of components such as stators, rotors, exciter windings and end covers. 按有关技术规程进行的大、中、</p>	<p>Replacement of motors with power more than 100KW. 功率大于 100KW 的电机更换。</p>

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	小修, 功率在 100KW 及以下电机的整体更换, 定子、转子及励磁机绕组、端盖等部件修复、更换及其他修理等。	
14.3 Power transformation and distribution equipment 变配电设备		
14.3.1 Transformer, arc suppression coil 变压器、消弧线圈	Repair, replacement and maintenance and test of windings and iron cores. 绕组、铁芯修复、更换及按有关规程进行的检修、试验等。	Replacement of transformers with the input voltage no less than 6KV; capacity increase of various types of transformers. 输入电压 6KV 及以上的变压器更换及各类变压器增容。
14.3.2 Distribution cabinet (high-voltage switch cabinet, low-voltage switch cabinet, load switch, protection screen, compensating cabinet, control cabinet and other transformation and distribution equipment) 配电柜 (高压开关柜、低压开关柜、负荷开关、保护屏、补偿柜、控制柜及其他变配电设备)	设备内部元器件更换、按有关规程进行的检修、试验等。 Replacement of equipment internal components and parts; maintenance and tests as per relevant procedures.	整台更换。 Replacement of complete sets.
14.3.3 Electric and electronic equipment (rectifier, frequency converter, UPS, excitation cabinet or excitation device, voltage regulator or voltage stabilizer, charger or fast charger) 电力电子设备 (整流器、变频调速器、不间断电源、励磁柜或励磁装置、调压器或稳压器、充电器或充电机)	Replacement of equipment internal components and parts; replacement, inspection and test of various boards; complete set replacement of variable-frequency governor with the power less than 100KW. 设备内部元器件更换, 各种板卡更换, 检查、试验及小于 100KW 的变频调速器整台更换等。	Replacement of complete sets (including variable-frequency governors with the power more than 100KW). 整台更换 (包括大于 100KW 的变频调速器)。
14.3.4 Electric reactor and non - cabinet capacitor and transformer with voltage of 35KV or above 电抗器及电压在 35KV 及以上的非柜装式电容器、互感器	Replacement or repair of parts and components. 元器件更换或修理。	Replacement of complete sets. 整台更换。
14.4 Power transmission line, distribution line,	Inspection, repair or partial replacement of ancillary facilities.	Replacement of entire line. 整条线路更换。

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<p>communication line 输电线路、配电线路、通讯线路</p>	<p>附属设施的检查、修理或局部更换。</p>	
<p>15 Control system 控制系统</p>		
<p>15.1 Complete set dedicated control system of DCS, ESD, PLC and other units DCS、ESD、PLC、及其他机组成套专用控制系统</p>	<p>Cleaning, inspection, repair, spot check and performance test of the entire system as per relevant procedures; repair or replacement of cards and terminals. 按有关规程对整套系统进行清洗、检查、修理、点检、性能测试; 卡件、终端修理或更换等。</p>	<p>Replacement of entire system, software upgrade and additions of new hardware equipment. 系统整体更换、软件升级和新增硬件设备等。</p>
<p>15.2 Status monitoring system of unit, speed control system of steam turbine, gas alarm system, on-line analysis instrument system 机组状态监测系统、汽轮机调速控制系统、气体报警系统、在线分析仪表系统</p>	<p>Cleaning, inspection, repair and spot check as per relevant procedures; replacement of partial components. 按有关规程进行清洗、检查、修理、点检、及对局部部件更换。</p>	<p>Replacement or upgrade of entire system; replacing mechanical governor with electronic governor. 系统整体更换或升级; 机械式调速器更换为电子调速器。</p>
<p>15.3 Industrial television monitoring system, fire alarm system, patrol inspection management system 工业电视监控系统、火灾消防报警系统、巡检管理系统</p>	<p>Cleaning, inspection, repair and spot check as per relevant procedures; replacement of partial components. 按有关规程进行清洗、检查、修理、点检、及对局部部件更换。</p>	<p>Replacement or upgrade of entire system. 系统整体更换或升级。</p>
<p>16 Instruments and meters 仪器、仪表</p>		
<p>16.1 Temperature measurement components such as temperature transmitter, thermocouple and resistance thermometer of primary measuring components; pressure transmitter, differential pressure transmitter, liquid level transmitter, flow transmitter; various throttle, pressure tapping units, zirconia analyzer 一次检测部件中的温度变送器、热电偶、热电阻温度计等各种测温元件; 压力变送器、差压变送器、液位变送器、流量变送器; 各种节流、取压单元、氧</p>	<p>Replacement and repair of single set. 单台更换、修理。</p>	<p>Replacement, modification and upgrade of entire set of instrument within the device. 装置内整套仪表更换、改型升级。</p>

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化锆分析仪等		
16.2 Regulator, display instrument, recorder, alarm, safety barrier, power supply, converter and all kinds of auxiliary instruments of the secondary instrument 二次仪表中的调节器、显示仪、记录仪、报警器、安全栅、电源、转换器及各类辅助仪表	Replacement and repair of single set. 单台更换、修理。	Replacement, modification and upgrade of entire set of instrument within the device. 装置内整套仪表更换、改型升级。
16.3 Measuring instrument 计量仪表	Calibration, inspection; replacement and repair of components. 标定、检查及部件更换、修理。	Replacement of measuring instruments with accuracy of 0.2 or above or with special calibration requirements. 实际使用精度要求在 0.2 级及其以上,或需特殊检定要求的计量仪表更换。
16.4 Regulating valve, locator, solenoid valve and other accessories 调节阀、定位器、电磁阀及其他附件	Replacement and repair of single piece. 单件更换、修理等。	Replacement of complete sets with individual fixed asset No. 有单独固定资产号的整套更换。
16.5 Slide valve, plug valve for catalytic cracking; high temperature butterfly valve at flue gas turbine inlet; high pressure interlock valve for hydrocracking; and other high-temperature high-pressure special control valves 催化裂化用滑阀、塞阀、烟机入口高温蝶阀、加氢裂化高压联锁阀及其他高温高压特殊控制阀	Partial replacement and repair. 局部更换、修理。	Replacement of complete sets. 整套更换。
16.6 Other instruments (chemical examination instruments, medical instruments, environmental monitoring instruments, experimental instruments, measuring instruments, online analyzer, etc.)	Replacement and repair of parts and components. 零部件更换、修理。	Complete set replacement of instruments with the unit price over USD 4,000. 单价超过4000美元的仪器整套更换。

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<p>其他各类仪器（化验仪器、医疗仪器、环境监测仪器、实验仪器、测量仪器、在线分析仪等）</p>		
<p>17 Buildings, structures, roads 建筑物、构筑物、道路</p>	<p>Repair or renovation on the original base of buildings, structures (including stack, flare, pipe rack, retaining wall, slope and wall, fire bank), roads. 建筑物、构筑物（包括烟囱、火炬、管廊、挡土墙、护坡及围墙、防火堤等）、道路在原有基础上进行修理或修缮。</p>	<p>Demolition and rebuild of, and storey increase, floor area expansion, decoration, indoor system (such as air conditioning system network system) addition in buildings; road widening, upgrade and addition. 建筑物推倒重建、增加层数、扩大建筑面积、装饰装潢、新增室内系统如空调系统、网络系统；道路拓宽、提高等级、新增等。</p>

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