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

HYBN-T4-11-0282-2024

On-site Disposal Plan of No.2 Refining Dept.

炼油二部现场处置预案

Issued Date：Sept 2024　　颁布日期：2024 年 9 月

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1 General

总则

1.1 Preparation purpose

编制目的

This Plan is hereby formulated in order to implement the HSE objective of “zero injury, zero pollution and zero accident”, so as to respond to possible major safety accidents of the Unit effectively and timely, protect the safety of staff’s life and business property as far as possible and maintain social stability.

为贯彻落实零伤害、零污染、零事故的公司 HSE 目标，特制订本方案，旨在能高效及时地应对本装置可能发生的重大安全事故，最大限度地保障员工生命和企业财产安全，维护社会稳定。

1.2 Preparation basis

编制依据

1.2.1 *Guidelines for Enterprises to Develop Emergency Response Plan for Workplace Accidents* (GBT29639-2020)

《生产经营单位生产安全事故应急预案编制导则》（GBT29639-2020）

1.2.2 General ERP for Production Safety Accidents (HYBN-T4-08-0002-2024-2)

《生产事故综合应急预案》（HYBN-T4-08-0002-2024-2）

1.3 Scope of application

适用范围

This Plan is applicable to on-site emergency disposal and emergency rescue of unit of the Company.

本预案适用公司装置现场应急处置和应急救援工作。

2 Emergency Organization and Responsibilities

应急组织与职责

2.1 Emergency organization

应急组织机构

Commander-in-chief: operation department leader

总指挥：运行部部长

Members: deputy process department leader, deputy equipment department leader, process engineer, equipment engineer, HSE engineer, team leader, indoor operator and outdoor operator.

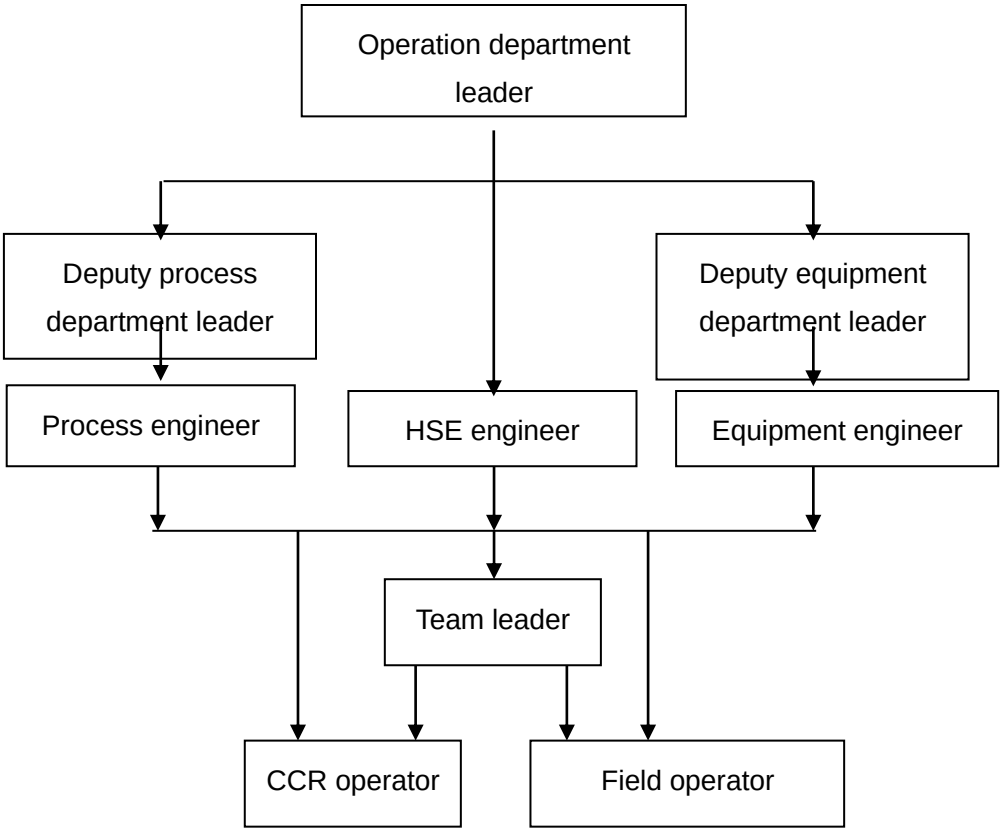
成员：工艺副部长、设备副部长、工艺工程师，设备工程师、HSE工程师、班长、内操、外操

Relationship of organizations of No.2 Refining Dept.

炼油二部组织机构关系

See Fig. 1

见图1


Operation department leader
Deputy process department leader
Deputy equipment department leader
Process engineer
HSE engineer
Equipment engineer
Team leader
CCR operator
Field operator

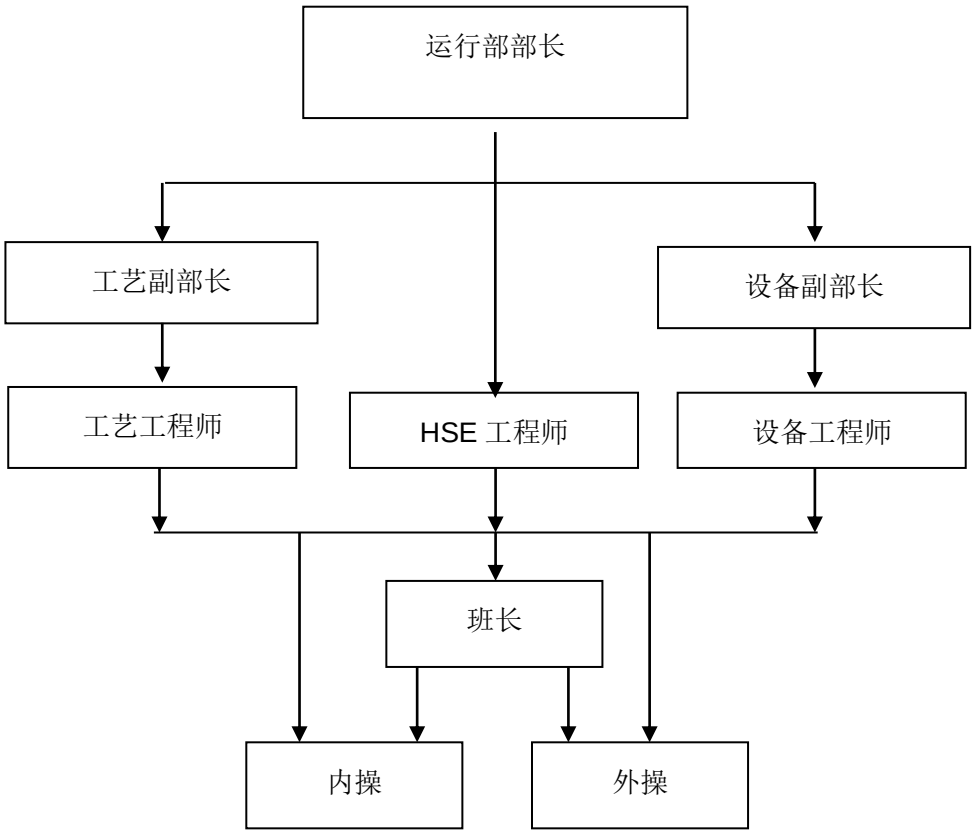


Fig. 1 Relationship of organizations of No.2 Refining Dept.

图 1 炼油二部组织机构关系

2.2 Responsibilities

职责

2.2.1 Responsibilities of the commander-in-chief:

总指挥职责：

Comprehensively command emergency rescue for any emergency; command the process engineer, equipment engineer, safety engineer and post holders to take effective actions quickly as per the accident emergency plan; after accident disposal, command department staff to resume production; cooperate with the fire department, security department and first aid department to dispose the accident and rescue personnel; and report the accident condition to the emergency office and leaders of the Company.

全面指挥突发事件应急救援工作；指挥工艺、设备、安全工程师和岗位人员按照事故应急方案，迅速采取有效行动；事故处理后，指挥部门人员进行恢复生产工作；协同消防、保卫、急救等部门处理事故和人员救护；负责向公司应急办公室和公司领导汇报事故情况。

2.2.2 Responsibilities of the deputy process department leader:

工艺副部长职责：

Assist the commander-in-chief to command field emergency rescue and exercise the power of the commander-in-chief when the commander-in-chief is absent; know the production process condition at the accident state and quickly prepare a process disposal plan and a pollution prevention plan; command the post holder to conduct process disposal and take effective measures to prevent accident expansion; and prepare a process plan of production recovery and organize production recovery.

配合总指挥指挥现场应急救援工作，在总指挥不在时行使总指挥职权；负责了解清楚事故状态时岗位的生产工艺状况，迅速制定工艺处理方案和防污染方案；负责指挥岗位人员进行工艺上的处理，采取有效措施防止事故扩大；负责制定恢复生产的工艺方案并组织恢复生产。

2.2.3 Responsibilities of the deputy equipment department leader:

设备副部长职责：

Assist the commander-in-chief to command field emergency rescue; know the equipment condition at the accident state and report the equipment damage condition in the accident to the commander-in-chief; prepare a repair plan of equipment and facilities; coordinate and provide emergency equipment and supplies; organize repair of equipment and facilities; command the maintenance personnel to process and repair equipment; be responsible for maintenance of equipment and facilities and production recovery after accident disposal; and report to relevant leaders and organize field personnel to conduct disposal in advance.

配合总指挥指挥现场应急救援工作；负责了解清楚事故状态时的设备状况，向总指挥汇报事故中设备损坏情况；负责制定设备、设施抢修方案；负责应急设备、物资的协调、保障工作；负责组织设备、设施的抢修；负责指挥检修人员进行设备处理和抢险；负责事故处理后，设备、设施维修恢复生产的职责；负责汇报有关领导，组织现场人员进行先期处置。

2.2.4 Responsibilities of the process engineer:

工艺工程师职责：

Know the production process condition in case of an accident of the unit under his/her charge and assist the deputy process department leader to prepare a process disposal plan and a pollution prevention plan of the unit under his/her charge; command the post holder to conduct process disposal as per the instruction of the commander-in-chief, and take effective measures to prevent accident expansion; and prepare a process plan of production recovery of the unit under his/her charge and organize production recovery.

负责了解所负责单元事故时岗位的生产工艺状况，配合工艺副部长制定所负责单元的工艺处理方案和防污染方案；负责根据总指挥的安排指挥岗位人员进行工艺上的处理，采取有效措施防止事故扩大；负责制定所负责单元恢复生产的工艺方案并组织恢复生产。

2.2.5 Responsibilities of the equipment engineer:

设备工程师职责：

Know the equipment condition at the accident state of the unit under his/her charge; report the equipment damage condition in the accident of the unit under his/her charge to the deputy equipment department leader and commander-in-chief; prepare a repair plan of equipment and facilities of the unit under his/her charge; assist the deputy equipment department leader to coordinate and provide emergency equipment and supplies; organize repair of damaged equipment and facilities of the unit under his/her charge; and be responsible for maintenance and production recovery of equipment and facilities after accident disposal of the unit under his/her charge.

负责了解所负责单元清楚事故状态时的设备状况；负责向设备副部长及总指挥汇报所负责单元事故中的设备损坏情况；负责制定所负责单元的设备、设施抢修方案；负责配合设备副部长进行应急设备、物资的协调、保障工作；负责组织所管辖单元损坏设备、设施的抢修；负责所管辖单元事故处理后，设备、设施维修恢复生产。

2.2.6 Responsibilities of HSE engineer:

HSE 工程师职责：

Set a warning area and prevent irrelevant personnel and vehicles from entering the accident site; command field fire control and first aid; assist the firefighter to put out a fire and rescue the wounded; provide emergency supplies such as fire-fighting appliances and gas protection equipment; implement pollution prevention measures; and participate in accident survey and

analysis and monitor implementation of preventive measures.

负责设立警戒区，阻止无关人员和车辆进入事故现场；负责指导现场消防和医疗急救工作；负责协助消防人员灭火和抢救伤员；负责保障各种消防、气防设备等应急物资；负责落实防污染措施；负责参与进行事故调查分析，监督防范措施落实情况。

2.2.7 Responsibilities of the team leader:

班长职责：

Know the accident site condition and report to relevant leaders; perform responsibilities of the commander-in-chief on command of field emergency before the commander-in-chief arrives; command team members to conduct preliminary accident disposal as per the emergency plan; organize implementation of process disposal measures and accident control measures; apply to the Company for initiating the emergency plan of higher level as per the field condition; and organize implementation of production recovery measures.

负责了解事故现场状况并汇报有关领导；负责在总指挥到来前行使总指挥职责指挥现场应急；负责指挥班组成员按应急方案进行事故的初期处理；负责组织落实工艺处理措施和事故控制措施；负责根据现场情况向公司申请启动上一级应急方案；负责组织落实恢复生产措施。

2.2.8 Responsibilities of the indoor operator:

内操职责：

Report any abnormity timely; implement the process disposal measures in and after the accident; and command the outdoor operator to adjust the process to prevent accident expansion.

负责发生异常情况时，及时汇报；负责落实事故中和事故后的工艺处理措施；指挥外操做工艺调整，防止事故扩大。

2.2.9 Responsibilities of the outdoor operator:

外操职责：

Report any abnormity; be responsible for field warning and evacuation; guide the fire fighting

truck; implement field process disposal measures in and after the accident; and implement pollution prevention measures at site.

负责对所发生的异常情况进行汇报；负责现场警戒和疏散；负责引领消防车辆；负责落实事故中和事故后现场工艺处理措施；负责落实现场的防污染措施。

3 Accident Risk Analysis

事故风险分析

3.1 Accident types

事故类型

Main accident type in the field emergency disposal of unit of No.2 Refining Dept. includes fire, explosion and poisoning.

炼油二部装置的现场应急处置过程中主要事故类型是火灾、爆炸和中毒事故。

3.2 Name of unit subject to an accident

事故发生的装置名称

No.2 Refining Dept. owns four process units. The substances that may cause fire and explosion in process units include volatile hydrocarbons such as gasoline, LPG and fuel gas, and flammable substances such as hydrogen, hydrogen sulfide and dimethyl disulfide. See Table 1 for fire hazards of production units of the Project.

炼油二部包括四套工艺装置，这些装置可能引起火灾爆炸的物质有汽油、液化气、燃料气等易挥发的烃类物质，氢气、硫化氢、二甲基二硫醚等易燃物质。本项目生产装置的火灾危险性列表见表 1。

Table 1 Category of fire hazards of units

表 1 装置火灾危险性类别

S/N 序号	Description 装置名称	Nominal size (0.1 MMTPA) 公称规模（万吨/年）	Fire hazard classification 火灾危险性分类

1	Kerosene hydrotreating unit (1020) 煤油加氢精制装置（1020）	1.3 MMTPA 130 万吨/年	IA 甲 A
2	Diesel hydrotreating unit (1030) 柴油加氢精制装置（1030）	2.2 MMTPA 220 万吨/年	IA 甲 A
3	Hydrocracking unit (1040) 加氢裂化装置（1040）	2.2 MMTPA 220 万吨/年	IA 甲 A
4	LPG fractionation unit (1041) 气体分馏装置（1041）	0.6 MMTPA 60 万吨/年	I 甲

3.3 Hazard severity and effect range of accident

事故发生的危害严重程度及其影响范围

Through evaluation and analysis, no effects on living of nearby residents will be generated during normal production. In case of leakage or ignition of a small quantity of hazardous materials, the initial fire can be discovered and disposed timely by the flammable and poisonous gas and fire alarm system at site and fixed fire-fighting appliances at site. In case of leakage of a great quantity of substances such as liquid hydrocarbon, hydrogen, hydrogen sulfide and hydrocarbons, if this condition cannot be controlled, fire, explosion and poisoning accidents may occur, affecting surrounding communities. As per QRA analysis and evaluation data, the top risk for Refining Dept. #2 is leakage and explosion accident of hydrogenation reactor, where the death radius is 108m, the serious injury radius is 210m and the minor injury radius is 365m.

经过评估分析，正常生产情况下，不会对周边居民生活产生影响。如果发生危险物料小量泄漏或引燃，通过现场设置的可燃、有毒气体和火灾报警系统以及现场固定消防设施能及时发现并处置初期火灾。只有在液态烃、氢气、硫化氢、烃类等物质大量泄漏时，如不能及时得到有效遏制，会引发火灾、爆炸和中毒事故的发生，可能会导致周边社区受到影响。依据 QRA 分析评估数据分析，炼油二部最大风险是加氢反应器发生泄漏爆炸事故，其死亡半径为 108 米，重伤半径为 210 米，轻伤半径为 365 米。

3.4 Symptoms prior to the accident

事故前可能出现的征兆

Symptoms prior to the accident include alarm of hydrogen sulfide, hydrogen and flammable gas detector on FGS, large-area audible and visual alarm on SIS console, drastic fluctuation of process parameters, interlocking actions, interruption of oil feed and hydrogen feed, light in the operation room and at site being off, drastic fluctuation of furnace box temperature of heating furnace, interruption of backflow of tanks of fractionating tower, failure of product delivery, abnormal flame in the hearth discovered by field routing inspection, and leakage of vessel, equipment and pipeline at site.

事故前可能出现的征兆包括：FGS 上硫化氢、氢气、可燃气检测仪报警；SIS 控制台大面积声光报警；各工艺参数大幅度波动，各类联锁动作；油品进料和氢气进料中断；操作室和现场照明熄灭；加热炉炉膛温度大幅度波动；分馏各塔罐回流中断；产品无法外送；现场巡检可见炉膛火焰异常；现场容器、设备、管线泄漏等等各种异常征兆。

3.5 Possible secondary or derivative accidents

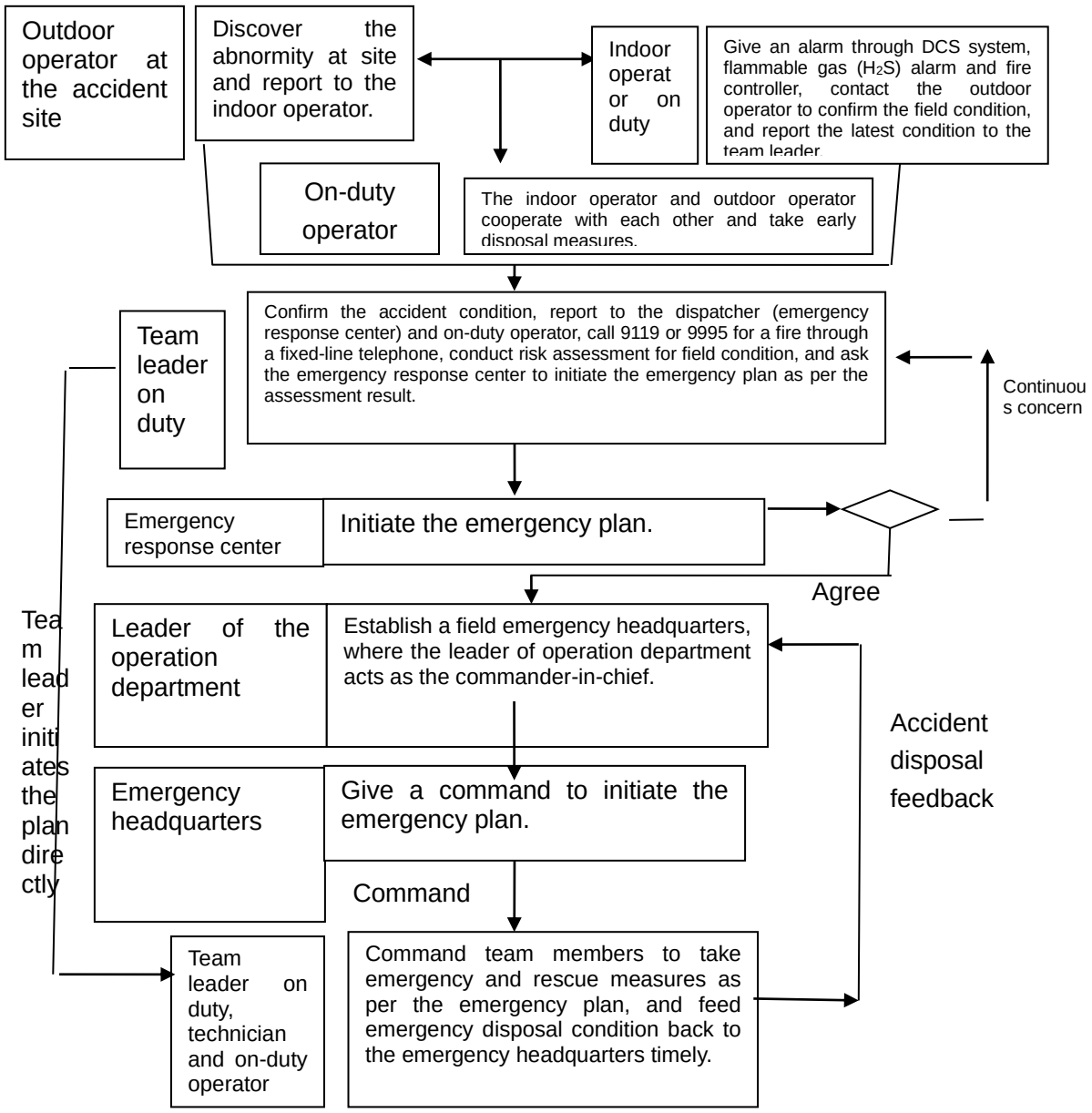
事故可能引发的次生、衍生事故

Possible secondary or derivative accidents include object strike, mechanical injuries, lifting injuries, electric shock, burning, fall injuries, collapse and suffocation.

事故可能引发的次生、衍生事故包括：物体打击、机械伤害、起重伤害、触电、灼烫、高处坠落、坍塌、窒息。

4 Emergency Response Procedures (See Fig. 2)

应急响应程序 见图 2



Note: In case of emergency, the person concerned can report to the dispatcher of the Company directly.

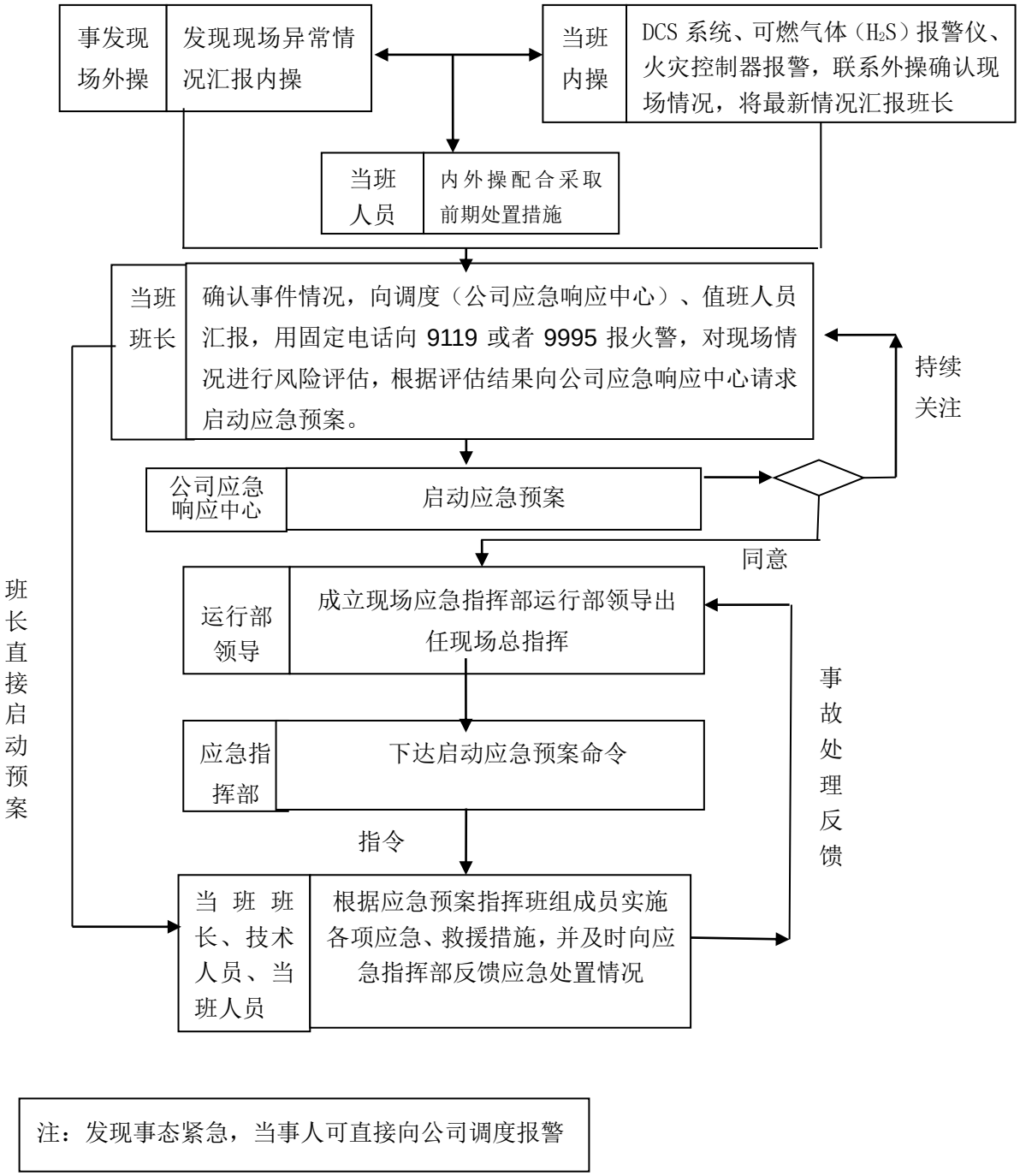


Fig. 2 Emergency response procedures of Refining Dept. #2

图 2 炼油二部应急响应程序

5 Emergency Disposal of Emergencies

突发事件应急处置

5.1 Various accident scenes of 1.3 MMTPA jet fuel hydrotreating unit (1020)

130 万吨/年航煤加氢装置（装置代号 1020）各类事故场景

5.1.1 Emergency disposal of leakage of hydrogen sulfide and personnel poisoning of 1.3 MMTPA jet fuel hydrotreating unit (see Table 2)

130 万吨/年航煤加氢装置硫化氢介质泄漏及人员中毒应急处置见表 2

Table 2 Emergency disposal of leakage of hydrogen sulfide and personnel poisoning

表 2 硫化氢介质泄漏及人员中毒应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	In case of an alarm of hydrogen sulfide detector of FGS system, report to the team leader and ask the post holder to wear the air respirator quickly to confirm it at site. 发现FGS 系统硫化氢气体检测仪报警时：汇报班长，同时要求岗位人员正确、迅速佩戴好空气呼吸器现场确认。	Indoor operator taking the accident disposal post 事故岗位内操
	After discovering the accident through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable hydrogen sulfide detector and go to the site for confirmation; and operators taking other posts shall move to a safe area to observe and report to the main control room at any time. 巡检发现，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式硫化氢气体检测仪前往确认；其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	The first leak finder 发现泄漏第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable hydrogen sulfide detector, go to the site for confirmation, and report to the main control room. 班长或岗位外操佩戴空气呼吸器并携带便携式硫化氢气体检测仪现场确认，向主控室报告。	Team leader, the first leak finder 班长、发现泄漏第一人

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Cut off the leakage source 切断泄漏源	Confirm leakage of hydrogen sulfide at site and shut off automatic control valves in front of and behind the leakage source remotely. 确认现场有硫化氢泄漏，远程切断泄漏源前后的自控阀门。	Indoor operator taking the accident disposal post 事故岗位内操
	Confirm leakage of hydrogen sulfide at site and close manual valves in front of and behind the leakage point (if possible). 确认现场有硫化氢泄漏，切断泄漏点前后的手动阀门（若可能）。	Team leader, outdoor operator taking the accident disposal post 班长，事故岗位外操
Take measures based on actual conditions 视情况采取措施	Stop the operation procedure when possible. Reroute or stop normal production locally. 在可能的情况下关闭作业流程。通过流程改线或局部终止正常生产操作。 In case of no need to stop the operation procedure, reduce the system pressure of leakage part to eliminate leakage. 若不需要关闭作业流程，应采用降低泄漏部分系统压力的方法消除泄漏。 In case of high possibility of serious secondary accident, initiate the emergency shutdown procedure. 若极有可能发生严重恶性次生事故，启动紧急停工程序。	Indoor and outdoor operator taking the accident disposal post 事故岗位内操、事故岗位外操、
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader or indoor operator taking the accident disposal post 班长或事故岗位内操
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	Team leader or indoor operator taking the accident disposal post 班长或事故岗位内操
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance. 通知其他岗位人员配合处理。	Team leader 班长
Personnel rescue 人员抢救	Wear an air respirator to transfer the poisoned personnel to a safe place and carry out first aid (never give up before replacement of the professional). 戴空气呼吸器转移中毒人员至安全地点，并施行急救(专业人员未接替前决不放弃)。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Process disposal 工艺处置	Judge whether to conduct shutdown of unit as per the leakage position. 根据泄漏部位，判断装置是否进行停工处理。	On-duty operator 当班人员
	If the leakage position is at the fractionation system or the leakage rate is low, change the unqualified line, reduce the pressure of unit, and ensure that no leakage stoppage work is conducted at site. 泄漏部位处于分馏系统，或者泄漏量较小的情况下，装置改不合格线后进行降压，确保现场不再泄漏后进行堵漏工作。	
	If the leakage rate is high or the leakage position is at the reaction system, conduct emergency shutdown of unit, extinguish the fire in the heating furnace, cut off the feed, remove oil to the unqualified line, fire vapor covers the leak site，and replace the reaction system with nitrogen. 泄漏量较大,或处于反应系统,则装置紧急停工,熄炉，切断进装置原料，油品走不合格线，消防蒸汽掩护泄漏部位，同时对反应系统使用氮气置换。	
Provide fire-fighting appliances and steam facilities 消防、蒸汽设施保障	Check whether the nearby fire water monitor, fire standpipe and fire hydrant can be used in case of emergency (use only when required, do not use in case of oil leakage and fire due to oil). 检查就近消防水炮、消防竖管、消防栓等设施是否能够紧急投用（只在需要时投用，油品泄漏、火灾禁用）。	On-duty operator 当班人员
	Purge with steam at nearby service point. 就近用服务点蒸汽在四周进行吹扫掩护。	On-duty operator 当班人员
Blocking and recycling of leakage 泄漏物的封堵与回收	Block through reducing or eliminating the pressure. 应采用降低压力、撤压等手段进行封堵。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector and hydrogen sulfide detector, establish a warning range, and arrange an obvious warning area mark. 携可燃气检测仪以及硫化氢气体检测仪进行测试，划定警戒范围，设立明显警戒区域标识。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Stop leakage with pressure 带压堵漏	If the leakage stoppage condition is met, organize personnel to enter the site to stop leakage with pressure. 具备堵漏条件时，组织人员进入现场带压堵漏。	On-duty operator 当班人员
Environmental	Wash the ground and platform of leakage point with water and reduce and absorb hydrogen sulfide. 用水冲洗泄漏点地面、平台、降低和吸收硫化氢。	On-duty operator

Steps 步骤	Disposal 处　　置	Person in charge 负责人
disposal 环境处置	Contact with the HSE department and ask to dispose substances which may pollute the environment. 联系HSE部，请求处理现场可能造成的环保污染的物质。	当班人员
	Collect pollutions in the open trench together with the professional disposal personnel to prevent them flowing into downstream units or the open trench outside the unit. 与专业处置人员一起，将明沟内污染回收起来，严禁流入下游装置或进入装置外的明沟。	
Attention 注　意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 4、 While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。 5、 For rescue at site, do not use the mouth-to-mouth artificial respiration method to prevent secondary poisoning of the rescuer. 现场抢救人员时不能采用口对口人工呼吸，防止抢救人员二次中毒。 6、 Reduce the number of personnel at site as far as possible, wear the air respirator while entering the site, and inform the adjacent unit. 现场尽可能减少人员，进入现场的人员必须佩带呼吸器，通知相邻装置。	

5.1.2 Emergency disposal of leakage and fire of fractionator of 1.3 MMTPA jet fuel hydrotreating unit (see Table 3)

130 万吨/年航煤加氢装置分馏塔泄漏着火应急处理见表 3

Table 3 Emergency disposal of leakage and fire of fractionator

表 3 分馏塔泄漏着火应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Find emergency on the site 现场发现	Discover leakage and fire of fractionator at site through routing inspection. 现场巡检发现分馏塔泄漏着火。	The first fire finder 发现火情第一人

Give an alarm 报警	Report to the central control room that the fractionator is subject to leakage and fire and no one gets hurt at site. 向中控室报告：发现分馏塔泄漏起火燃烧，现场没有人员受伤。	The first fire finder 发现火情第一人
	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader 班长
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance and tell them that the fractionator is subject to leakage and fire and no one gets hurt at site, ask one person of each post to stay behind for normal operation and other personnel to arrive at the site immediately, command emergency rescue by the team leader, and evacuate irrelevant personnel and construction personnel to the emergency assembly point along the upwind immediately (repeat for several times). 通知其他岗位人员增援：发现分馏塔泄漏着火、现场没有人员受伤；请各岗位留守一人维持正常作业，其他人员立即到现场,由班长指挥开展应急抢险，请无关人员及施工人员立即沿上风向、到紧急集合点集中（重复数遍）。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关人员（含施工人员）撤离。	On-duty operator 当班人员
Stop relevant operations 停止相关作业	Slight oil leakage: ask for instructions from superior leaders, shield with steam, cool and reduce the pressure, and stop leakage without the need of shutdown. Reduce the liquid level of fractionator bottom. 轻度漏油：请示上级领导，蒸汽掩护，降温降压不停工堵漏。迅速降低分馏塔塔底液面。	On-duty operator 当班人员
	Serious oil leakage and fire: shield with steam and contact firefighters to extinguish fire. Extinguish the heating furnace. 严重漏油时着火：蒸汽掩护联系消防灭火。加热炉熄火。	On-duty operator 当班人员

	Contact the tank farm to cut off the crude oil feed, reduce oil in the tower as soon as possible, and increase the extraction amount at the tower bottom. 联系罐区切断原油进料，塔内尽快减油，加大塔底抽出量。	On-duty operator 当班人员
	After extracting all oil in the tower, shield with steam, maintain a positive pressure in the tower and purge the tower with steam. 塔内油抽完后，塔内给蒸汽掩护，保持塔内正压，蒸塔。	On-duty operator 当班人员
	Close relevant valves to the tower, close inlet valves of product pump P202 and reboiler pump P203, evacuate the reflux tank D201, and release the pressure. 关闭进塔的有关阀门，关闭产品泵P202、重沸炉泵P203入口阀门，回流罐D201尽量抽空，泄压。	On-duty operator 当班人员
	Normally shut down for other conditions. 其他按正常停工处理	On-duty operator 当班人员
Process disposal 工艺处理	Extinguish the fractionating reboiler and purge the hearth. 灭分馏重沸炉，进行炉膛吹扫。 Cool the reaction system and reduce the feed, change to short circulating of reaction system, and stop material feed. 反应系统降温降量，改反应系统短循环，停原料进料。 Remove oil to the unqualified line. 分馏退油至不合格线。 Release pressure of the fractionation system, purge with nitrogen, and cover and dispose the leakage point. 分馏系统泄压，氮气吹扫，掩护处理漏点。	On-duty operator 当班人员
Fire fighting system assurance 消防系统保障	Monitor the automatic operation condition of fire water system and ensure the pressure of pipe network. 监视消防水系统自动运行情况，保证管网压力。	On-duty operator 当班人员
	Prepare complete fire-fighting appliances in the fire box at site and put the wheeled fire extinguisher at site in place. 现场消防箱内灭火器材准备齐全好用，现场推车式灭火器摆放到位。	On-duty operator 当班人员

Extinguish fire 灭火操作	Cool the ignition source with fire water monitor, cool and isolate adjacent facilities. 开消防水炮对着火源进行冷却，对邻近设施降温隔离。	On-duty operator 当班人员
	In case of small fire, shield with local firefighting steam pipe. 如果火势不大，利用就近的消防蒸汽带掩护。	On-duty operator 当班人员
	Wait for professional firefighters to extinguish fire. 等待消防专业人员的灭火处理。	On-duty operator 当班人员
Blocking and recycling of pollutants 污染物封堵回收	Check and confirm that the rain and sewage drain outlets near the fractionator of unit are blocked. 检查确认装置分馏塔附近的雨排、污排已经封堵。	On-duty operator 当班人员
	When necessary, block the external discharge trench with sand bags. 必要时用沙袋封堵外排沟。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector and establish a warning range. 携可燃气检测仪测试，划定警戒范围。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援。	On-duty operator 当班人员
Environmental disposal 环保处置	Check and confirm that the rain and sewage drain outlets of unit are blocked. Inform the No.1 Refining Department. 检查确认装置的雨排、污排最后一道已经封堵。告知炼油一部。	On-duty operator 当班人员
	(When necessary,) Block the external discharge trench with sand bags. Inform the Public Works Department. （必要时）用沙袋封堵外排沟最远处。告知公用工程部。	
	Contact with the HSE department and ask to dispose substances which may pollute the environment. 与HSE部联系，请求处理现场可能造成环保污染的物质。	
Attention 注意	1、 Wear air respirators in the unit area and possible poisoning area. 装置及可能中毒区域戴空气呼吸器。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 4、 Prevent any flowing-type fire. 防止出现流淌式火灾。	

5.1.3 Disposal of gas leakage of 1.3 MMTPA jet fuel hydrotreating unit (see Table 4)

130 万吨/年航煤加氢装置瓦斯泄漏事故处置见表 4

Table 4 Emergency disposal of gas leakage

表 4 瓦斯泄漏事故应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	Discover an alarm of DCS gas concentration system. 发现DCS 瓦斯浓度系统报警： Report to the team leader and ask the post holder to confirm at site. 汇报班长，同时要求岗位人员现场确认。	Indoor operator and main operator 内主操
	Discover through routing inspection, return immediately and go to the site for confirmation. 巡检发现，立即返回，前往确认。	The first leak finder 发现泄漏第一人
Confirm at site and report 现场确认、报告	Confirm by the team leader or outdoor operator taking the post at site and report to the operation room. 班长或岗位外操现场确认，向操作室报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Close manual valves in front of and behind the leakage point. 切断泄漏点前后的手动阀门。	Team leader, outdoor operator taking the accident disposal post 班长，事故岗位外操
Take measures based on actual conditions 视情况采取措施	Shut down the furnaces F-101 and F-201. 停炉 F-101、F-201。 Do not use general metal wrenches in the leakage area to prevent sparks. 不允许在泄漏区域使用一般金属扳手，避免出现火花。 Make identifications of leakage area and prohibit traffic of all motor vehicles. 做好泄漏区域的标识，禁止一切机动车辆通行。 Do not carry with communication facilities such as mobile phone in the area. 区域作业禁止携带手机等通讯设施。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Process disposal 工艺处理	1、 Transfer the product into unqualified line, reduce the load of heating furnace, reduce the pressure of gas operation system, and dispose the leakage point. 产品改进不合格线，降加热炉降负荷，降低瓦斯运行系统压力，进行漏点处理。 2、 If pressure relief at the leakage point cannot be achieved, stop feeding the unit, remove oil to the unqualified line, extinguish the hearth fire of heating furnace, turn off the pilot burner and cut off main fuel gas metal hose. 若漏点无法实现降压处理，则停装置进料，退油至不合格线，加热炉灭炉，断长明灯和主燃料气金属软管。 3、 Close double valves for controlling gas flow into the unit and replace the gas system with nitrogen in a closed environment. 关闭瓦斯进装置双阀，并通过进装置双阀后氮气对瓦斯系统进行密闭置换。 4、 Replace and purge the gas system with steam. 瓦斯系统蒸汽置换吹扫。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader 班长
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance. 通知其他岗位人员增援。	Team leader 班长
Personnel rescue 人员抢救	Rescue the injured at site preliminarily (if any). 对受伤人员现场初步抢救（若有）	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。	On-duty operator 当班人员
Fire fighting system assurance 消防系统保障	Put out a fire with a foam extinguisher at site. (in case of small fire) 用现场泡沫灭火器灭火。（若着火且火势小）	On-duty operator 当班人员
	Open the bottom valve of fire water monitor at site. Put out a fire with the fire water monitor (when necessary). 打开现场消防炮底阀，保证消防炮好用。用消防水炮灭火 (若有必要)。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector and establish a warning range. 携可燃气检测仪测试，划定警戒范围。	On-duty operator 当班人员
Receive the	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and	On-duty operator

Steps 步骤	Disposal 处　　置	Person in charge 负责人
rescue force 接应救援	external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援力量。	当班人员
Stop leakage with pressure 带压堵漏	If the leakage stoppage condition is met, organize personnel to enter the site to stop leakage with pressure. 具备堵漏条件时，组织人员进入现场带压堵漏。	On-duty operator 当班人员
Environmental disposal 环保处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注意	1、 Wear labor protection appliances while entering the rescue site. Do not wear clothes made of chemical fiber or shoes with nails. 进入抢险现场必须严格穿戴好劳保护品。严禁穿化纤衣物、带钉子鞋进现场。 2、 Handle tools gently. 使用工具时，要轻拿轻放。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 While giving an alarm, tell the leakage location, leakage medium, severity, casualties and fire condition. 报警时，须讲明泄漏地点、泄漏介质、严重程度、人员伤亡情况、有无火情。	

5.1.4 Emergency disposal of flash explosion of F-201 hearth of 1.3 MMTPA jet fuel hydrotreating unit (see Table 5)

130 万吨/年航煤加氢装置 F-201 炉膛闪爆应急处置见表 5

Table 5 Emergency disposal of flash explosion of F-201 hearth

表 5 F-201 炉膛闪爆应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Find emergency on the site 现场发现	The indoor operator finds that the temperature of F-201 hearth and convection chamber rises quickly, there is a positive pressure in the hearth and the smoke temperature rises. The outdoor operator hears the explosive sound from F-201. 内操发现 F-201 炉膛温度、对流室温度突然迅速上升，炉膛呈正压，排烟温度上升；外操现场听到 F-201 传来爆炸声。	Indoor operator, outdoor operator 内、外操人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Give an alarm and report 报警汇报	Report to the central control room that the fire window of F-201 is open and the cover plate of elbow box of convection chamber is blasted away. 向中控室报告：发现 F-201 看火窗全部弹开，对流室弯头箱盖板炸开。	Outdoor operator 外操人员
	Report to the emergency response center of the Company and department leader. There is no flash explosion of F-201 hearth and no one gets hurt. 向公司应急响应中心及部门领导报告。F-201 炉膛闪爆，没有人员受伤的情况。 Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警 9119 或者 9995 报警。急救 9120 报警。	Team leader 班长
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance and tell them that F-201 hearth of hydrotreating unit is subject to flash explosion, ask one person of each post to stay behind for normal operation and other personnel to arrive at door of outdoor operator's room immediately, command emergency rescue by the team leader, and evacuate irrelevant personnel and construction personnel along the upwind immediately (repeat for several times). 通知其他岗位人员增援：加氢装置F-201炉膛闪爆，请各岗位留守一人维持正常作业，其他人员立即到外操室门口区域集合,由班长指挥开展应急抢险，请无关人员及施工人员立即停止作业沿上风向、离开装置现场（重复数遍）。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员（含施工人员）撤离。	On-duty operator 当班人员
Process disposal 工艺处理步骤	Cut off the gas to F-201 main nozzle and pilot burner and open the baffle of flue wide. 紧急切断 F-201 主火嘴、长明灯瓦斯，开大烟道挡板。	On-duty operator 当班人员
	Close the manual gas valve of F-201 main nozzle and pilot burner, inject firefighting steam to the hearth, and stop the fan. 关 F-201 主火嘴、长明灯瓦斯手阀，炉膛内通入灭火蒸汽，停风机。	On-duty operator 当班人员
	Contact the dispatcher and storage and transportation department, cut off the external material, and change the unit to great circle. 联系调度及储运部，切断外来原料，装置改大循环。	On-duty operator 当班人员
	Stabilize the liquid level and pressure of system, and prevent overpressure, vacuum pressure and evacuation. 稳定系统液界面，压力，防止超压，压空，抽空。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector as per the wind direction and establish a warning range. Prohibit operations at site unrelated to emergency disposal and prohibit irrelevant personnel from entering the leakage area. 根据风向和携可燃气检测仪测试数据，划定警戒范围。禁止现场与应急处理无关的一切作业，禁止无关人员进入泄漏区域。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	If the oily sewage flows into the peripheral rain water system, block with sand bags. Deliver the oily sewage to the sewage lifting pond. 若含油污水进入外围雨水系统，则用沙袋进行封堵，将含油污水改进污水提升池。	On-duty operator 当班人员
	Open the fresh water at the service station and make the gasoline on the ground of furnace area flow into the oily sewage system by water. 打开服务站新鲜水，利用水将炉区地面的汽油带入含油污水系统。	On-duty operator 当班人员
Receive the rescue force 接应救援	Keep the fire fighting access smooth and receive the fire fighting truck, environmental monitoring vehicle and external emergency rescue force. 确认消防通道通畅，接应消防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
	Ask the team leader at rest to organize personnel to support follow-up work. 通知休息班组班长组织人员支援后续工作。	On-duty operator 当班人员
Leakage stoppage 堵漏	While F-201 is controlled at site, the hearth temperature is reduced to the room temperature and furnace access condition is met, organize personnel to enter F-201 for check and organize maintenance personnel to check the cover plate of elbow box of convection chamber. 在 F-201 现场得到控制，炉膛温度降至常温，具备进炉条件后，组织人员进入 F-201 进行检查，组织维修人员对对流室弯头箱盖板进行检查处理。	On-duty operator 当班人员
Attention 注　　意	1、 Guiding principles: define works, make preparations, handle the heavy object and then the light object, keep in contact, respond easily, do not rush to recover feed, and ensure stable conditions. 指导性原则：分工明确、跑位准备、先重后轻、独挡一面、保持联系、从容应对，不急于开工恢复进料，先确保安全平稳的将工况稳下来。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 Personnel near the site must turn off the mobile phone timely. 进入现场附近人员务必及时关闭手机。	

5.1.5 Field emergency disposal of leakage and fire of high-pressure position of 1.3 MMTPA kerosene hydrotreating unit (see Table 6)

130 万吨/年煤油加氢装置高压部位泄漏着火现场应急处理见表 6

Table 6 Field emergency disposal of leakage and fire of high-pressure position

表 6 高压部位泄漏着火现场应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	Discover an alarm of flammable gas and hydrogen sulfide alarm system on DCS, report to the team leader and ask the outdoor operator taking the post to wear the air respirator correctly and quickly for confirmation at site. 发现DCS 上可燃气，硫化氢报警系统报警时：汇报班长，同时要求岗位外操正确、迅速佩戴好空气呼吸器现场确认。	Indoor operator taking the accident disposal post 事故岗位内操
	After discovering the accident through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable flammable gas detector and go to the site for confirmation; and operators taking other posts shall move to a safe area to observe and report to the main control room at any time. 巡检发现，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式可燃气体检测仪前往确认；其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	The first leak finder 发现泄漏第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable flammable gas detector, go to the site for confirmation, and report to the main control room. 班长或岗位外操佩戴空气呼吸器并携带便携式可燃气体检测仪现场确认，向主控室报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Close automatic valves in front of and behind the leakage source remotely. 远程切断泄漏源前后的自控阀门。	On-duty operator 当班人员
	Close manual valves in front of and behind the leakage point (in case of leakage of instrument lead and sampler). 切断泄漏点前后的手动阀门（仪表引线，取样器泄漏的情况下）。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Take measures based on actual conditions 视情况采取措施	Stop the operation procedure when possible. Reroute or stop normal production locally. 在可能的情况下关闭作业流程。通过流程改线或局部终止正常生产操作。 In case of no need to stop the operation procedure, reduce the system pressure of leakage part to eliminate leakage. 若不需要关闭作业流程，应采用降低泄漏部分系统压力的方法消除泄漏。 Open the high-temperature flange remotely to inject the firefighting steam, and control the fire behavior at site. 远程打开高温法兰灭火蒸汽，控制现场火势。 In case of high possibility of serious secondary accident, initiate the emergency feed cutting-off and cooling shutdown procedure. 若极有可能发生严重恶性次生事故，启动紧急切断进料，降温停工程序。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader 班长
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance. 通知其他岗位人员配合处理。	Team leader 班长
Process disposal 工艺处理	1、 Conduct emergency hearth fire extinguishing of heating furnace. 加热炉紧急灭炉。 2、 Stop feeding the unit and remove oil to the unqualified line. 停装置进料，装置退油至不合格线。 3、 Stop feeding of fresh hydrogen and remove load of fresh hydrogen compressor. 停新氢进料，新氢机摘负荷。 4、 Relieve pressure of the reaction system, stop the circulator and replace with nitrogen. 反应系统泄压，停循环机，氮气置换。 5、 Extinguish the fractionating and heating furnace of fractionation system, transfer oil of system, and maintain the pressure and liquid level. 分馏系统灭分馏加热炉，系统转油，保压保液面。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Provide fire-fighting appliances and steam facilities 消防、蒸汽设施保障	Check whether the nearby fire water monitor, fire standpipe and fire hydrant can be used in case of emergency (use only when required, do not use in case of oil leakage and fire due to oil). 检查就近消防水炮、消防竖管、消防栓等设施是否能够紧急投用（只在需要时投用，油品泄漏、火灾禁用）。	On-duty operator 当班人员
	Purge with steam at nearby service point. 就近用服务点蒸汽在四周进行吹扫掩护。	On-duty operator 当班人员
Blocking and recycling of leakage 泄漏物的封堵与回收	Block through reducing or eliminating the pressure. 应采用降低压力、撤压等手段进行封堵。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector, establish a warning range, and arrange an obvious warning area mark. 携可燃气检测仪测试，划定警戒范围，设立明显警戒区域标识。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Environmental disposal 环境处理	Purge and shield the leakage position with steam and reduce the concentration of flammable gas in the environment. 用蒸汽吹扫掩护泄漏部位，降低环境中可燃气浓度。	On-duty operator 当班人员
Attention 注意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Carry with special anti-explosion tools to the site for operation. 携带专用防爆工具进入现场作业。 3、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 4、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 5、 While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。 6、 If the leakage position is near the heating furnace, cool and extinguish the hearth fire of heating furnace timely, shield with steam, keep the site wet, and close the road to prevent access of vehicles. 泄漏部位若距离加热炉较近，需及时降温灭加热炉，并用蒸汽掩护，保持现场湿润环境，封路防止车辆经过。	

5.1.6 Field emergency disposal of fracture and fire of furnace tube of reaction heating furnace of 1.3 MMTPA kerosene hydrotreating unit (see Table 7)

130 万吨/年煤油加氢装置反应加热炉炉管破裂着火现场应急处理见表 7

Table 7 Field emergency disposal of fracture and fire of furnace tube of reaction heating furnace

表 7 反应加热炉炉管破裂着火现场应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	Discover on DCS that the furnace box temperature rises abnormally, the temperature of some chip thermocouples of furnace tube rises,report to the team leader and ask the outdoor operator taking the post to wear the air respirator correctly and quickly for confirmation at site. 发现DCS 上炉膛温度异常上升，部分炉管贴片热偶温度上升：汇报班长，同时要求岗位外操正确、迅速佩戴好空气呼吸器现场确认。	Indoor operator taking the accident disposal post 事故岗位内操
	After discovering black smoke from the stack of heating furnace through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable flammable gas detector and go to the site for confirmation; and operators taking other posts shall move to a safe area to observe and report to the main control room at any time. 巡检发现加热炉烟囱冒黑烟，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式可燃气体检测仪前往确认；其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	The first leak finder 发现泄漏第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable flammable gas detector, go to the site for confirmation, and report to the main control room. 班长或岗位外操佩戴空气呼吸器并携带便携式可燃气体检测仪现场确认，向主控室报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Put out a fire urgently (extinguish the main nozzle and keep the pilot burner burn) and cut off feed of the unit (raw oil and hydrogen). 紧急灭火（灭主火，保持长明灯燃烧），切断装置进料（原料油及氢气）。	On-duty operator 当班人员
	Conduct emergency pressure release and shutdown of reaction system. 反应系统紧急泄压停工。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	Shut down the fractionation system and remove jet fuel to the unqualified tank. 分馏系统停工，航煤退至不合格罐。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader 班长
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance. 通知其他岗位人员配合处理。	Team leader 班长
Process disposal 工艺处理	1、 Cut off the main fuel gas to heating furnace urgently and ensure that the pilot burner and leakage in the hearth are subject to controlled combustion. 紧急停加热炉主燃料气，保证长明灯及泄漏物质在炉膛内进行控制性燃烧。 2、 Stop the preheating and recycling system. 停预热回收系统。 3、 Stop feeding the unit and remove load of fresh hydrogen compressor. 停装置进料，新氢压缩机摘负荷。 4、Relieve pressure of the reaction system and stop the circulator. 反应系统泄压，停循环机。 5、 Replace the reaction system with nitrogen after passing the compressor and material pump. 反应系统从压缩机及原料泵后使用氮气进行置换 6、 Extinguish the heating furnace of fractionation system and cool. 分馏系统灭加热炉，降温。 7、 Receive the transfer oil of reaction system by the fractionation system and remove oil to the unqualified line. 分馏系统接收反应系统转油，退油至不合格线。 8、Maintain the pressure and liquid level of fractionation system. 分馏系统保压保液面。 9、 After fire extinguishing at the fracture position of furnace tube of heating furnace, extinguish the pilot burner of heating furnace and purge the hearth of heating furnace with firefighting steam. 加热炉炉管破裂部位熄火后，灭加热炉长明灯，使用灭火蒸汽对加热炉炉膛进行吹扫。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Provide fire-fighting appliances and steam facilities 消防、蒸汽设施保障	Check whether the nearby fire water monitor, fire standpipe and fire hydrant can be used in case of emergency (use only when required, do not use in case of oil leakage and fire due to oil). 检查就近消防水炮、消防竖管、消防栓等设施是否能够紧急投用（只在需要时投用，油品泄漏、火灾禁用）。	On-duty operator 当班人员
	Shield with the firefighting steam of hearth (after fire extinguishing of heating furnace and stop of pilot burner). 启动炉膛灭火蒸汽进行掩护（加热炉火焰熄灭，长明灯停运后使用）。	On-duty operator 当班人员
Blocking and recycling of leakage 泄漏物的封堵与回收	Burn the leakage through controlled combustion. 应采用控制燃烧的方式，将泄漏物进行燃烧处理。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector, establish a warning range, and arrange an obvious warning area mark. Appoint a specially-assigned person to watch over the warning area. 携可燃气检测仪测试，划定警戒范围，设立明显警戒区域标识。专人看护警戒区域。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Environmental disposal 环境处理	Purge and shield the leakage position with steam and reduce the concentration of flammable gas in the environment. 用蒸汽吹扫掩护泄漏部位，降低环境中可燃气浓度。	On-duty operator 当班人员
Attention 注意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Carry with special anti-explosion tools to the site for operation. 携带专用防爆工具进入现场作业。 3、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 4、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 5、 While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	6、 If the leakage rate of heating furnace is high and the adjacent fractionating and heating furnace is affected, conduct emergency extinguishing of fractionating and heating furnace, purge and shield with firefighting steam. 若加热炉泄漏量较大，影响邻近分馏加热炉，应同时将分馏加热炉进行紧急灭炉处理，吹扫，并进行消防蒸汽掩护。	

5.1.7 Field emergency disposal of interruption of circulating water of 1.3 MMTPA kerosene hydrotreating unit (see Table 8)

130 万吨/年煤油加氢装置循环水中断现场应急处理见表 8

Table 8 Field emergency disposal of interruption of circulating water

表 8 循环水中断现场应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	Discover on DCS that the flow and pressure of circulating water feed device are reduced and an alarm is given, the outlet temperature of water cooler rises and an alarm is given, and the oil temperature of lubricating oil of pump rises and an alarm is given; report to the team leader and ask the outdoor operator taking the post to check the pressure and temperature of circulating water at site. 发现DCS 上循环水进装置流量和压力不断降低，报警；水冷器出口温度升高，报警；机泵润滑油油温升高，报警：汇报班长，同时要求岗位外操现场检查循环水压力及温度情况。	Indoor operator taking the accident disposal post 事故岗位内操
	Discover through routing inspection that the inlet pressure of circulating water cooler is reduced while the outlet temperature rises, and the oil temperature of lubricating oil of unit rises; report the information to the indoor operator immediately. 巡检发现循环水水冷器入口压力下降，出口温度升高；机组润滑油油温升高，立即将信息汇报至内操。	The first accident finder 发现事故第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall check the pressure of circulating water, open the circulating water valve to check the water flow, check the outlet temperature of water cooler, and report to the main control room. 班长或岗位外操现场检查循环水压力，打开循环水放空检查水流情况，水冷器出口温度情况，向主控室报告。	Team leader, the first accident finder 班长、发现事故第一人

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance and make the unit be subject to emergency shutdown. 通知其他岗位人员配合处理，装置进入应急停工阶段。	Team leader 班长
Personnel evacuation 人员疏散	Evacuate irrelevant personnel at site (including construction personnel). 疏散现场无关人员（含施工人员）。	On-duty operator 当班人员
Process disposal 工艺处理	1、 Cool the reaction system urgently, cut off the feed, shut down, cool by the water cooler of circulator with temporary fresh water, and control the oil temperature at oil station of circulator. 反应系统紧急降温，切断进料，停工；循环机水冷器采用临时新水冷却，确保循环机油站油温得到控制。 2、 Cool the fractionation system, receive the transfer oil of reaction system, and maintain the pressure and liquid level. 分馏系统降温，接收反应系统转油，保压保液面。 3、 When the circulator condition permits, delay the shutdown process as far as possible and operate with circulating hydrogen and oil. 在循环机工况允许的条件下，尽可能延迟停机过程，进行循环氢带油操作。 4、 Stop all operating devices. 各运转设备停运。 5、 Maintain the pressure and liquid level of system. 系统保压，保液面。	On-duty operator 当班人员
Safety protection 安全防护	After emergency extinguishing of hearth fire of heating furnace, disconnect all metal gas hoses. 加热炉紧急灭炉后，要断开各瓦斯金属软管。	On-duty operator 当班人员
	Prevent flange leakage of high-temperature and high-pressure reaction system during shutdown. 防止反应高温高压系统在紧急停工处理过程中，出现法兰泄漏。	
	Ensure firefighting steam and fire-fighting appliances at site are ready. 现场消防蒸汽，灭火蒸汽，灭火器材随时备用。	
Environmental disposal 环境处理	Cool the temporary fresh water and discharge to nearby trench and floor drain. Release system pressure to low-pressure blowdown system. 临时生产水冷却，排放至附近地沟，地漏。系统泄压应密闭泄放至低压放空系统。	On-duty operator 当班人员
Attention 注意	1、 Disconnect the metal hose immediately after extinguishing of heating furnace, prevent leakage, and purge and replace the hearth with steam. 加热炉熄炉后应切断金属软管，防止泄漏，并对炉膛进行蒸汽吹扫置换。 2、 Prevent overheating and journal sticking of pump and monitor operation parameters of pump. 防止机泵过热抱轴，应密切监控机泵运行参数。 3、 Cool temporary fresh water to the oil station and water station of compressor and extend the forced shutdown process of circulator. 对压缩机油站，水站进行接新水临时冷却，延长循环机被迫停机过程。	

Steps 步骤	Disposal 处 置	Person in charge 负责人
	4、 After emergency cooling, pay attention to the high-temperature and high-pressure flange and prevent rapid change to temperature and pressure which may cause flange leakage. 紧急降温后，应时刻注意高温高压法兰，防止温度压力急剧变化，引起法兰泄漏。	

5.1.8 Field emergency disposal of interruption of raw oil of 1.3 MMTPA kerosene hydrotreating unit (see Table 9)

130 万吨/年煤油加氢装置原料油中断现场应急处理见表 9

Table 9 Field emergency disposal of interruption of raw oil

表 9 原料油中断现场应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	Discover on DCS that the temperature, pressure and flow of material feeding device are reduced and an alarm is given. 发现DCS 上原料进装置温度，压力不断下降，流量下降并报警。 The main operator shall report to the team leader immediately and ask the outdoor operator taking the post to check parameters of the material feeding device and conditions of the flowmeter. 主操立即汇报班长，同时要求岗位外操现场检查进装置参数及流量计情况。	Indoor operator taking the accident disposal post 事故岗位内操
	Discover through routing inspection that the temperature and pressure of material feeding device at site are reduced and the number on the flowmeter is reduced, and report the information to the indoor operator immediately. 巡检发现现场原料进装置温度压力下降，流量计显示数字下降，立即将信息汇报至内操。	The first finder at site 现场第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall check all parameters of the material feeding device and the flowmeter and report the check results to the main control room. 班长或岗位外操现场检查原料进装置各个参数，检查进装置流量计，并将检查结果，向主控室报告。	Team leader, the first accident finder 班长、发现事故第一人
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance and make the unit be subject to emergency shutdown. 通知其他岗位人员配合处理，装置进入应急停工阶段。	Team leader 班长

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Personnel evacuation 人员疏散	Evacuate irrelevant personnel at site (including construction personnel). 疏散现场无关人员（含施工人员）。	On-duty operator 当班人员
Process disposal 工艺处理	1、 In case of interruption of material supply of upstream device, change the device to internal great circle and reduce the temperature and quantity. 若是上游装置供料中断，将装置改内部大循环，同时降温降量。 2、 In case of interruption of material supply due to blocked control valve of material feeding device or blocked flowmeter, change to the auxiliary line immediately and recover feeding. 若是进装置控制阀卡，或者流量计卡造成进料中断，则立即改副线，恢复进料。 3、 If the pressure of D-101 or SR-101 is high, causing high feed backpressure and material interruption, reduce the system of rear system immediately. 若是D-101或者SR-101压力较高，造成进料背压高，引起原料中断，则立即降低后路系统压力。 4、 Adjust the liquid level of all vessels of the device and increase the circulation volume timely in case of insufficient liquid level. 调整装置各容器液面，液面不足应及时增大循环量。	On-duty operator 当班人员
Safety protection 安全防护	In case of material interruption, low liquid level of the material tank will cause pump stoppage. 原料中断后，原料罐低液位引起停泵联锁，将导致。	On-duty operator 当班人员
	Prevent flange leakage of high-temperature and high-pressure reaction system during shutdown. 防止反应高温高压系统在紧急停工处理过程中法兰泄漏。	
	Ensure firefighting steam and fire-fighting appliances at site are ready. 现场消防蒸汽，灭火蒸汽，灭火器材随时备用。	
Attention 注意	1、 Disconnect the metal hose immediately after extinguishing of heating furnace, prevent leakage, and purge and replace the hearth with steam. 加热炉熄炉后应切断金属软管，防止泄漏，并对炉膛进行蒸汽吹扫置换。 2、 Prevent overheating and journal sticking of pump and monitor operation parameters of pump. 防止机泵过热抱轴，应密切监控机泵运行参数。 3、 Cool temporary fresh water to the oil station and water station of compressor and extend the forced shutdown process of circulator. 对压缩机油站，水站进行接新水临时冷却，延长循环机被迫停机过程。 4、 After emergency cooling, pay attention to the high-temperature and high-pressure flange and prevent rapid change to temperature and pressure which may cause flange leakage. 紧急降温后，应时刻注意高温高压法兰，防止温度压力急剧变化，引起法兰泄漏。 5、 Control the liquid level of all vessels and prevent evacuation and vacuum pressure. 注意各容器液位的控制，防止抽空，压空。	

5.1.9 Field emergency disposal of interruption of fuel gas of 1.3 MMTPA kerosene hydrotreating unit (see Table 10)

130 万吨/年煤油加氢装置燃料气中断现场应急处理见表 10

Table 10Field emergency disposal of interruption of fuel gas

表 10 燃料气中断现场应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	Discover on DCS that the pressure of fuel gas feeding device and fuel gas tank, the pressure behind the main nozzle and flame arrestor of pilot burner, and flow are reduced and an alarm is given; report to the team leader immediately; and ask the outdoor operator taking the post to check the pressure of fuel gas and operation condition of heating furnace at site. 发现DCS 上燃料气进装置要，燃料气罐压力及主火嘴，长明灯阻火器后压力不断下降，流量下降并报警：主操立即汇报班长，同时要求岗位外操现场检查燃料气压力和加热炉运行情况。	Indoor operator taking the accident disposal post 事故岗位内操
	Discover through routing inspection that the pressure of fuel gas at site is reduced and the nozzle of heating furnace is red, and report the information to the indoor operator immediately. 巡检发现现场燃料气压力下降，加热炉火嘴发红，立即将信息汇报至内操。	The first accident finder 发现事故第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall check all parameters of the fuel gas feeding device and report the check results to the main control room. 班长或岗位外操现场检查燃料气进装置各个参数，并将检查结果，向主控室报告。	Team leader, the first accident finder 班长、发现事故第一人
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance and make the unit be subject to emergency shutdown. 通知其他岗位人员配合处理，装置进入应急停工阶段。	Team leader 班长
Personnel evacuation 人员疏散	Evacuate irrelevant personnel at site (including construction personnel). 疏散现场无关人员（含施工人员）。	On-duty operator 当班人员
Process disposal 工艺处理	In case of interruption of fuel gas of system, cool the unit, change to great circle, shut down, cool the fractionation system, and maintain the pressure. 若是系统燃料气中断，装置降温改大循环停工，分馏系统降温保压。	On-duty operator 当班人员
	In case of interruption of fuel gas due to blocked control valve of feeding device, change to the auxiliary line immediately and recover feeding. 若是进装置控制阀卡，造成燃料气中断，则立即改副线，恢复进料。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	In case of interruption of fuel gas due to high pressure difference caused by blocking of flame arrestor, switch to the standby flame arrestor immediately. 若是阻火器堵塞，造成压差高，引起燃料气中断，则立即切换至备用阻火器进行运行。	
Safety protection 安全防护	After shutdown of heating furnace due to interruption of fuel gas, purge the hearth of heating furnace with steam timely. 燃料气中断后，引起加热炉停炉，因及时对加热炉使用吹扫蒸汽进行炉膛吹扫。	On-duty operator 当班人员
	Prevent flange leakage of high-temperature and high-pressure reaction system during shutdown. 防止反应高温高压系统在紧急停工处理过程中，出现法兰泄漏。	
	During disposal of gas flame arrestor, prevent burns from steam tracing. 瓦斯阻火器在处理过程中，注意防止蒸汽伴热线烫伤。	
Environmental disposal 环境处理	Change the unit to unqualified tank and internal great circle timely to prevent polluting the tank farm. 装置改不合格罐，并及时改装置内部大循环，防止污染罐区。 Switch the fuel gas system to liquid system and discharge condensate to low-pressure blowdown system. 燃料气系统切液，排凝应密闭排放至低压放空系统。	On-duty operator 当班人员
Attention 注意	1、 Disconnect the metal hose immediately after extinguishing of heating furnace, prevent leakage, and purge and replace the hearth with steam. 加热炉熄炉后应切断金属软管，防止泄漏，并对炉膛进行蒸汽吹扫置换。 2、 Cut off liquid of knockout drum of fuel gas at site, discharge in closed environment, and carry with the hydrogen sulfide detector and wear goggles for field check. 燃料气分液罐现场切液，应注意密闭排放，现场检查要配带好硫化氢检测仪及护目镜。 3、In case of high pressure difference of flame arrestor, change the flame arrestor timely, clean and re-install the flame arrestor with pressure difference. 若阻火器压差大，应及时切换阻火器，并对压差的阻火器进行清理，回装。 4、 After emergency cooling, pay attention to the high-temperature and high-pressure flange and prevent rapid change to temperature and pressure which may cause flange leakage. 紧急降温后，应时刻注意高温高压法兰情况，防止温度压力急剧变化，引起法兰泄漏。 5、 After cooling the unit and change the circle, close discharge of waste hydrogen, stop supply of fresh hydrogen, and prevent loss of hydrogen sulfide in the circulating hydrogen. 装置降温改循环后，应及时关闭废氢外排，停止新氢补入，防止循环氢中硫化氢流失。	

5.1.10 Field emergency disposal of unqualified product of 1.3 MMTPA kerosene hydrotreating unit (see Table 11)

130 万吨/年煤油加氢装置产品质量不合格现场应急处理见表 11

Table 11 Field emergency disposal of unqualified product

表 11 产品质量不合格现场应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	Discover that the laboratory claims the laboratory analysis of jet fuel product is not passed. 发现化验室发布产品航煤化验分析不合格	Personnel taking the accident disposal post 事故岗位人员
Confirm at site and report 现场确认、报告	The main operator shall report to the team leader timely that the jet fuel product is unqualified. 主操及时向班长汇报，航煤产品质量不合格。	Team leader, the first accident finder 班长、发现事故第一人
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance and tell that the product quality of unit is unacceptable. 通知其他岗位人员配合处理，装置产品质量不合格。	Team leader 班长
Process disposal 工艺处理	1、 Inform the dispatcher and tank farm and change to deliver the jet fuel to the unqualified tank of tank farm. 通知调度及罐区，改航煤至罐区不合格罐。 2、 Adjust the reaction temperature and reaction pressure of reaction system. 调整反应系统反应温度，反应压力。 3、 Control the temperature and liquid level of reaction system. Adjust operation parameters of fractionator. 控制好反应系统温度，液界面。调整分馏塔操作参数。 4、 Check whether the unqualified product is caused by the fine desulfurizing drum of jet fuel. If the silver strip test of jet fuel is not passed, check and confirm the operation time of fine desulfurizing drum and switch to the standby fine desulfurizing drum timely. In addition, adjust the level of reflux tank at top of fractionator. 检查是否是航煤精脱硫罐引起，若航煤银片不合格，需检查确认精脱硫罐运行时间，及时切换至备用精脱硫罐。同时注意调整分馏塔顶回流罐的界面。 5、 Check whether characters of raw materials of feeding device are changed and inform upstream to stabilize these characters. 检查进装置原料物料性质是否发生变化，通知上游稳定原料进料性质。 6、 Check leakage of pipelines E-205 and E-202. 排查E-205，E-202管束是否泄漏。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Safety protection 安全防护	Change the unit to unqualified line and report the procedure change information. 装置改不合格线，流程变动信息应。	On-duty operator 当班人员
	Prevent flange leakage of high-temperature and high-pressure reaction system during shutdown. 防止反应高温高压系统在紧急停工处理过程中，出现法兰泄漏。	
	During disposal of gas system, prevent burns from steam tracing. 瓦斯系统在处理过程中，注意防止蒸汽伴热线烫伤。	
Environmental disposal 环境处理	Change the product to unqualified tank and internal great circle timely to prevent polluting the tank farm. 产品改去不合格罐，并及时改装置内部大循环，防止污染罐区。 Switch the fuel gas system to liquid system and discharge condensate to low-pressure blowdown system. 燃料气系统切液，排凝应密闭排放至低压放空系统。	On-duty operator 当班人员
Attention 注意	1、 Issue the procedure change information to all operators. 流程变动信息，应立即发布告知所有操作人员。 2、 While sampling and checking leakage of heat exchanger, pay attention to safety protection for sampling personnel and provide at least one guardian. 取样排查换热器是否泄漏时，注意取样人员的安全防护工作，并应该有至少一人监护。 3、 While switching to the fine desulfurizing drum, use the standby drum timely, remove the drum in operation slowly, and prevent pressure accumulation due to unsmooth procedure. 切换精脱硫罐时，应线投用备用罐，再缓慢切除在用罐，防止流程不畅引起憋压。 4、 To change to the unqualified line in the unit, initiate the unqualified line procedure and stop the product delivery procedure slowly. 若需要在装置内部改不合格线，操作时必须线打开不合格线流程，再逐渐关闭产品外送流程。 5、 After adjustment, contact the laboratory to sample and analyze timely and reduce the quantity of unqualified products as far as possible. 调整操作后及时联系化验进行加样分析，尽量减少不合格产品数量。	

5.2 Various accident scenes of 2.2 MMTPA diesel hydrotreating unit (1030)

220 万吨/年柴油加氢装置（装置代号 1030）各类事故场景

5.2.1 Emergency disposal of leakage of hydrogen sulfide of 2.2 MMTPA diesel hydrotreating unit (see Table 12)

220 万吨/年柴油加氢装置硫化氢介质泄漏应急处置见表 12

Table 12Emergency disposal of leakage of hydrogen sulfide

表 12　硫化氢介质泄漏应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	In case of an alarm of hydrogen sulfide detector of DCS system, report to the team leader and ask the post holder to wear the air respirator quickly to confirm it at site. 发现 DCS 系统硫化氢气体检测仪报警时：汇报班长，同时要求岗位人员迅速佩戴好空气呼吸器现场确认。	Indoor operator taking the accident disposal post 事故岗位内操
	After discovering the accident through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable hydrogen sulfide detector and go to the site for confirmation; and operators taking other posts shall move to a safe area to observe and report to the main control room at any time. 巡检发现，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式硫化氢气体检测仪前往确认；其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	The first leak finder 发现泄漏第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable hydrogen sulfide detector, go to the site for confirmation, and report to the main control room. 班长或岗位外操佩戴空气呼吸器并携带便携式硫化氢气体检测仪现场确认，向主控室报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Confirm leakage of hydrogen sulfide at site and shut off automatic control valves in front of and behind the leakage source remotely. 确认现场有硫化氢泄漏，远程切断泄漏源前后的自控阀门。	Indoor operator taking the accident disposal post 事故岗位内操
	Confirm leakage of hydrogen sulfide at site and close manual valves in front of and behind the leakage point. 确认现场有硫化氢泄漏，切断泄漏点前后的手动阀门。	Team leader, outdoor operator taking the accident disposal post 班长，事故岗位外操

Table 12 (continued)

表 12 （续）

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Take measures based on actual conditions 视情况采取措施	Stop the operation procedure when possible. Reroute or stop normal production locally. 在可能的情况下关闭作业流程。通过流程改线或局部终止正常生产操作。 In case of no need to stop the operation procedure, reduce the system pressure of leakage part to eliminate leakage. 若不需要关闭作业流程，应采用降低泄漏部分系统压力的方法消除泄漏。 In case of high possibility of serious secondary accident, initiate the emergency shutdown procedure. 若极有可能发生严重恶性次生事故，启动紧急停工程序。	Indoor and outdoor operator taking the accident disposal post 事故岗位内操、事故岗位外操
Give an alarm 报警	Call 9119 or 9995. Report to the emergency response center of the Company and department leader. 报警 9119 或者 9995。向公司应急响应中心及部门领导报告。	Team leader 班长
Ask to initiate the emergency procedure 请求启动应急程序	The team leader commands emergency rescue and asks irrelevant personnel and construction personnel to stop operation immediately and leave the site along the upwind direction. 由班长指挥开展应急抢险，请无关人员及施工人员立即停止作业沿上风向、离开装置现场。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。	On-duty operator 当班人员
Provide fire-fighting appliances and steam facilities 消防、蒸汽设施保障	Check whether the nearby fire water monitor, fire standpipe and fire hydrant can be used in case of emergency (use only when required, do not use in case of oil leakage and fire due to oil). 检查就近消防水炮、消防竖管、消防栓等设施是否能够紧急投用（只在需要时投用，油品泄漏、火灾禁用）。	On-duty operator 当班人员
	Purge with steam at nearby service point. 就近用服务点蒸汽在四周进行吹扫掩护。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector and hydrogen sulfide detector, establish a warning range, and arrange an obvious warning area mark. 携可燃气检测仪以及硫化氢气体检测仪进行测试，划定警戒范围，设立明显警戒区域标识。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Stop leakage with pressure 带压堵漏	If the leakage stoppage condition is met, organize personnel to enter the site to stop leakage with pressure. 具备堵漏条件时，组织人员进入现场带压堵漏。	MC personnel MC 人员
Environmental disposal 环境处置	Wash the ground and platform of leakage point with water and reduce and absorb hydrogen sulfide. 用水冲洗泄漏点地面、平台、降低和吸收硫化氢。	HSE engineer HSE 工程师
	Contact with the HSE department and ask to dispose substances which may pollute the environment. 联系 HSE 部，请求处理现场可能造成的环保污染的物质。	
	Collect pollutions in the open trench together with the professional disposal personnel to prevent them flowing into downstream units or the open trench outside the unit. 与专业处置人员一起，将明沟内污染回收起来，严禁流入下游装置或进入装置外的明沟。	
Attention 注　意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 4、 While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。 5、 For rescue at site, do not use the mouth-to-mouth artificial respiration method to prevent secondary poisoning of the rescuer. 现场抢救人员时不能采用口对口人工呼吸，防止抢救人员二次中毒。 6、 Reduce the number of personnel at site as far as possible, wear the air respirator while entering the site, and inform the adjacent unit. 现场尽可能减少人员，进入现场的人员必须佩带呼吸器，通知相邻装置。	

5.2.2 Emergency disposal of leakage of much hydrogen of 2.2 MMTPA diesel hydrotreating unit (see Table 13)

220 万吨/年柴油加氢装置大量泄漏氢气应急处置见表 13

Table 13Emergency disposal of leakage of much hydrogen

表 13 大量泄漏氢气应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	An alarm of hydrogen detector in the press area displays on DCS. The amount of hydrogen make-up or fresh hydrogen for the unit is extremely low. DCS 上显示压机区氢气检测仪报警；装置补充氢或新氢量异常降低。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	The post holder shall carry with the hydrogen alarm to the site. The crater or flange of hydrogen pipeline are open, much hydrogen leaks, but no fire occurs. Report to the indoor main operator and team leader immediately. 岗位人员携带氢气报警仪到现场查找。现场发现氢气管线焊口或法兰呲开，大量氢气泄漏，但未着火。立即报告室内主操和班长。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Contact the dispatcher of the Company and upstream unit to stop feeding hydrogen or raw materials. 联系公司调度及上游单位停送氢气或原料。	Main operator taking the post 岗位主操联系
	Stop the procedure at the leakage part and close the manual valve at the leakage part. 切除泄漏部位流程，关闭泄漏部位手阀。	Team leader, outdoor operator taking the post 班长、岗位外操
Give an alarm 报警	Give a fire alarm (9119 or 9995), report to the emergency response center of the Company and department leader. 火警（9119 或者 9995）向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Issue action commands to all team/group members and rush to the accident site for rescue coordination. 向班组各成员下达行动指令，迅速赶赴事故现场进行抢险协调。	Team leader 班长
Alert 警戒	Test at site with the hydrogen alarm and establish a warning range. Prevent access of irrelevant personnel. 携氢气报警仪现场测试，划定警戒范围。防止人员无关人员进入。	On-duty operator 当班人员
Adjust the procedure 流程调整	Conduct emergency shutdown of the unit as per “emergency shutdown” accident plan. 装置按“紧急停工”事故预案进行紧急停工处理。	On-duty operator taking the post 当班岗位人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and shield with steam. 在泄漏点用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Attention	1、 While entering the dangerous area of hydrogen leakage, turn off the phone	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
注　　意	and wear anti-static overalls. 进入氢气泄漏危险区人员关闭手机，必须穿防静电工装。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 While giving an alarm, tell the leakage location, leakage medium, severity, casualties and fire condition. 报警时，须讲明泄漏地点、泄漏介质、严重程度、人员伤亡情况、有无火情。 5、 Use anti-explosion tools at site, prevent all factors causing electric spark, put out the fire in the heating furnace if the wind is towards the heating furnace, relieve pressure to reduce leakage, shield the leakage point with steam, and prevent high-speed leakage from generating static electricity which may cause flash explosion. 现场使用防爆工具，防止引起电火花的一切因素，若风向朝向加热炉，加热炉全部熄火，泄压减少泄漏量，并用蒸汽掩护泄漏点，防止高速泄漏产生静电引发闪爆。	

5.2.3 Emergency disposal of leakage and fire of high-pressure reaction system of 2.2 MMTPA diesel hydrotreating unit (see Table 14)

220 万吨/年柴油加氢装置高压反应系统泄漏着火应急处理见表 14

Table 14Emergency disposal of leakage and fire of high-pressure reaction system

表 14　高压反应系统泄漏着火应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	Discover leakage and fire of high-pressure reaction system through routing inspection. 巡检发现高压反应系统泄漏着火。 Display an alarm of detector of reactor area on DCS of indoor operator. 内操 DCS 上显示反应区检测仪报警。	The first fire finder 发现火情第一人
Confirm and report 确认报告	Report to the on-duty team leader that the high-pressure reaction system is subject to leakage and fire, the fire is big, but no one gets hurt. 报告当班班长高压反应系统泄漏着火、火势较大但没有人员受伤。	The first fire finder 发现火情第一人
Give an alarm 报警	Give a fire alarm (9119 or 9995). 火警（9119 或者 9995）。	The first fire finder 发现火情第

		一人
	Report to the emergency response center of the Company and on-duty operator of department. 向公司应急响应中心及部门值班人员报告。	Team leader 班长
Initiate the emergency procedure 应急程序启动	After receiving the alarm, the emergency rescue command personnel of department shall report to the emergency rescue commander-in-chief of the Company, issue action commands to professional action groups, rush to the accident site for rescue coordination. 部门抢险应急指挥人员接到报警后，在向公司部抢险救灾总指挥报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关人员（含施工人员）撤离。	Outdoor operator taking the post 岗位外操
Shut off the ignition medium 切断着火介质	Conduct emergency disposal on production as per the process accident plan: close the upstream and downstream isolating valves of leakage medium immediately (when possible), reduce pressure of the reaction system, and conduct emergency shutdown of the unit. 根据工艺事故预案，生产上做紧急处理：立即关闭泄漏介质上下游隔断阀（若可能）；反应系统卸压，装置作紧急停工处理。	Team leader, operator taking the post 班长、岗位操作员
Provide fire-fighting appliances 消防设施保障	Know the operation condition of fire water system timely and ensure the pressure of pipe network. 及时联系消防水系统运行情况，保证管网压力。	On-duty operator 当班人员
	Collect fire extinguishers, fire hoses and steam pipes in the unit area and use fire water monitors. 集中装置区域内灭火器、消防水带、蒸汽带，投用消防水炮。	
	In case of insufficient fire-fighting appliances in the unit area, borrow from adjacent unit. 如装置区域内消防器材不足，可到相临装置借用。	
Extinguish fire 灭火操作	Cool the equipment on fire with fire water monitor, cool and isolate adjacent equipment and facilities. 开消防水炮对着火设备进行冷却，对邻近设备、设施降温隔离。	On-duty operator 当班人员
	Extinguish fire with the fire extinguisher, fire-fighting steam and field fire-fighting water. 用灭火器、消防蒸汽、现场消防水等进行灭火。	
Alert 警戒	Establish a warning range as per the fire condition. If the fire is big and cannot be extinguished, evacuate rescuers and wait for professional firefighters. 根据火势情况划定警戒范围，若火势较大，无法扑救，则撤出救灾人员，等待专业消防人员。	On-duty operator 当班人员
Receive the rescue force 接应救援	Receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force at the intersection. 在装置路口接应消防、气防、环境监测等车辆及外部应急增援。	On-duty operator 当班人员

Environmental disposal 环境处置	Check and confirm that the rainwater outlet of open trench is blocked and the flow from the open trench to well is smooth. 检查确认装置明沟的雨排口已经封堵、明沟去地井畅通。 Block the trench at the unit outlet with sandbags. 装置出口明沟用沙袋封堵。	On-duty operator 当班人员
Attention 注意	1、 In case of poisonous mediums due to combustion, the personnel entering the area must wear air respirators while personnel in other nearby areas shall wear filtered gas masks. Personnel for valve closing, recovery and leakage stoppage who contact with poisonous medium must wear protective clothes. 如燃烧产生有毒介质，进入区域内人员须佩戴空气呼吸器，其它附近区域佩戴过滤式防毒面具。接触有毒介质的关阀人员、回收人员和堵漏人员须穿防护服。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 4、 While giving an alarm, tell the ignition location, ignition medium, fire condition and casualties. 报警时，须讲明着火地点、着火介质、火势、人员伤亡情况。 5、Do not extinguish fire directly during system pressure relief, because this will cause hydrogen sulfide poisoning and flash explosion due to hydrogen gathering. Relieve the pressure and extinguish fire automatically, shield surrounding equipment or adjacent flange with steam, and prevent burning the equipment. 系统泄压，不能直接灭火，直接灭火后易造成硫化氢中毒和氢气聚集闪爆，应泄压使其自动灭火，用蒸汽掩护周围设备或相邻法兰，防止烧坏设备。 6、 Isolate anti-explosion tools used to reduce the possibility of generation of electric spark. 隔离所使用防爆工具，减少现场一切产生电火花的可能。	

5.2.4 Emergency disposal of power failure of 2.2 MMTPA diesel hydrotreating unit (see Table 15)

220 万吨/年柴油加氢装置停电事故应急处理见表 15

Table 15Emergency disposal of power failure of unit

表 15 装置停电事故应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	1、 Large-area audible and visual alarm on SIS console; SIS 控制台大面积声光报警； 2、 Interruption of reaction feed, fresh hydrogen and water; 反应进料中断、新氢中断、注水中断。 3、 Interlocking and hearth fire extinguishing of heating furnace, interruption of backflow of tanks of fractionator,	Main operator taking the post 岗位主操

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	failure of product delivery; 加热炉联锁灭炉、分馏各塔罐回流中断、产品无法外送； 4、 Light in the operation room and at site being off; 操作室和现场照明熄灭； 5、 DCS instrument and SIS system supplied with power through UPS. DCS 仪表和 SIS 系统转由 UPS 供电。	
Confirm at site and report 现场确认、报告	Contact the dispatcher, find the reason of power failure, and initiate the emergency plan if power supply cannot be restored in a short time. 联系调度，查明停电原因，若短时间无法恢复电源供应，则启动应急方案。 Report to the indoor main operator and team leader immediately. 立即报告室内主操和班长	Team leader, the first leak finder 班长、发现泄漏第一人
Give an alarm 报警	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。	On-duty operator 当班人员
Alert 警戒	Test at site with the hydrogen alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携氢气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Adjust the procedure 流程调整	Conduct emergency shutdown of the unit as per “emergency shutdown” accident plan. 装置按“紧急停工”事故预案进行紧急停工处理。	On-duty operator 当班人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and shield with steam. 在泄漏点用蒸汽吹扫、掩护。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　意	1、 During emergency shutdown of the unit, shut down safely within half an hour and prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，必须在半小时以内时装置安全停下来，同时严防高压串低压事故发生。 2、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 3、 In case of heavy oil smell, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在油气味较重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、 During emergency shutdown of the unit and operation of sump oil removal system, contact the dispatcher and storage and transportation department. 装置紧急停工，外甩污油系统时，要联系好调度和储运部。 6、 The fire disposal method of fractionation system is different from that of reaction system. Extinguish the fire of fractionation system as soon as possible and extinguish the fire of reaction system by reducing the pressure. 分馏系统着火和反应系统着火处理方法不一样，分馏系统着火尽快灭火，反应系统着火靠降压熄火。	

5.2.5 Emergency disposal of leakage and fire of furnace tube of fractionating furnace of 2.2 MMTPA diesel hydrotreating unit (see Table 16)

220 万吨/年柴油加氢处理装置分馏炉炉管泄漏着火应急处理见表 16

Table 16Emergency disposal of leakage and fire of furnace tube of fractionating furnace

表 16　分馏炉炉管泄漏着火应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人

Find emergency on the site 现场发现	Find that black smoke rises from the heating furnace and the furnace tube of heating furnace is subject to leakage and fire. 发现加热炉冒黑烟，炉膛内加热炉炉管泄漏着火	The first fire finder 发现火情第一人
Give an alarm 报警	Report to the central control room that the furnace tube of heating furnace is subject to leakage and fire and no one gets hurt at site. 向中控室报告：发现加热炉炉管泄漏起火燃烧，现场没有人员受伤。	The first fire finder 发现火情第一人
	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警 9119 或者 9995 报警。急救 9120 报警。	Team leader 班长
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	Deputy team leader 副班长
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance and tell them that the furnace tube of heating furnace is subject to leakage and fire and no one gets hurt at site, ask one person of each post to stay behind for normal operation and other personnel to arrive at the site immediately, command emergency rescue by the team leader, and evacuate irrelevant personnel and construction personnel to the emergency assembly point along the upwind immediately. 通知其他岗位人员增援：发现加热炉炉管泄漏着火、现场没有人员受伤；请各岗位留守一人维持正常作业，其他人员立即到现场，由班长指挥开展应急抢险，请无关人员及施工人员立即沿上风向、到紧急集合点集中。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关人员（含施工人员）撤离。	On-duty operator 当班人员
Stop relevant operations 停止相关作业	For slight oil leakage and small fire of furnace tube, reduce the feed rate as per the shutdown plan, cool and stop the heating furnace. 炉管轻度漏油着小火苗，按停工方案降进料量，加热炉降温停炉处理。	On-duty operator 当班人员
	For serious oil leakage and fire of furnace tube, close the gas pressure control valve, fuel pressure control valve and backflow control valve, cut off fuel feed and stop the heating furnace. 炉管严重漏油着火，关闭瓦斯压控阀、燃料油压控阀及回流控制阀，切断燃料，加热炉熄火。	On-duty operator 当班人员
	Close the gas pressure control valve, extinguish fire at nozzles and close two manual valves of each nozzle. 关闭瓦斯压控手阀，火嘴全部熄灭，各火嘴两道手阀全部关闭。	On-duty operator 当班人员
	Contact the dispatcher to cut off raw material feed. The post holder stops the reboiling pump P203 at the bottom of fractionator and close the inlet valve and outlet valve. Close the valve of controlling flow from E202 to fractionator. Close the shutoff valve XMV21201 at tower bottom. 联系调度切断原料进料。岗位人员把分馏塔底重沸泵 P203 停运，出入口阀关闭。E202 进分馏塔的阀门关闭。塔底切断阀 XMV21201 切断。	On-duty operator 当班人员

	Deliver steam into the hearth, open the flue damper wide and close the ventilation door. 炉膛通入蒸汽，开大烟道挡板，关闭通风门。	On-duty operator 当班人员
	Provide steam behind the shutoff valve at the bottom of fractionator and feed control valve, make the procedure smooth and purge the furnace tube top with oil. 分馏塔底切断阀后、进料控制阀后给蒸汽，打通流程向炉管顶油吹扫。	On-duty operator 当班人员
	Change the reaction part to reaction cycle, return the bottom oil of fractionator to the unacceptable line, and put a little of bottom oil to the underground slop tank after cooling. Discharge oil in the reflux tank D202 of fractionator. Conduct nitrogen displacement. 反应部分改反应循环，分馏塔塔底油直接退不合格线，少量底油待温度降低后进入地下污油罐。分馏塔回流罐 D202 退油放空。氮气置换。	On-duty operator 当班人员
Fire fighting system assurance 消防 系统保障	Know the operation condition of fire water system and ensure the pressure of pipe network. 联系消防水系统运行情况，保证管网压力。	On-duty operator 当班人员
	Prepare complete fire-fighting appliances in the fire box at site and put the wheeled fire extinguisher at site in place. 现场消防箱内灭火器材准备齐全好用，现场推车式灭火器摆放到位。	On-duty operator 当班人员
Extinguish fire 灭火操作	Cool the ignition source with fire water monitor, cool and isolate adjacent facilities. 开消防水炮对着火源进行冷却，对邻近设施降温隔离。	On-duty operator 当班人员
	Wait for professional firefighters to extinguish fire. 等待消防专业人员的灭火处理。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector and establish a warning range. 携可燃气检测仪测试，划定警戒范围。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援。	On-duty operator 当班人员
Environmental disposal 环保处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员

Attention 注意	1、 Wear air respirators in the unit area and possible poisoning area. 装置及可能中毒区域戴空气呼吸器。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。

Table 16 (continued)

表 16 （续）

Attention 注意	4、 For leakage and fire of furnace tube, isolate all gas (the same for the adjacent furnace), cut off the medium to the heating furnace, purge extinguishing steam to the hearth, and prevent flash explosion of hearth. Open the ventilation door only after cooling the hearth. 炉管泄漏着火，将瓦斯气全部隔离，相邻炉子同样，切断进加热炉介质，炉膛吹入灭火蒸汽，同时注意防止炉膛闪爆。不要紧急开风门，炉膛温度降下来后再开。

5.2.6 Emergency disposal of leakage of much hydrogen sulfide and personnel poisoning of desulfurization area of 2.2 MMTPA diesel hydrotreating unit (see Table 17)

220 万吨/年柴油加氢处理装置脱硫区域大量硫化氢泄漏、人员中毒应急处理见表 17

Table 17Emergency disposal of leakage of much hydrogen sulfide and personnel poisoning of desulfurization area

表 17 脱硫区域大量硫化氢泄漏、人员中毒应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	An alarm of hydrogen sulfide alarm of desulfurization area displays on DCS screen. The main operator taking the post judges leakage of hydrogen sulfide of desulfurization area. Report to the team leader and ask the post holder to confirm at site. DCS 画面显示脱硫区硫化氢报警仪报警；岗位主操判断脱硫区硫化氢泄漏；汇报班长；同时要求岗位人员现场确认；	Main operator taking the post 岗位主操

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Confirm at site and report 现场确认、报告	The team leader and outdoor operator taking the post wear the air respirator and confirm at site. 班长、岗位外操佩戴空气呼吸器现场确认。 Report to the main control room that there is leakage of hydrogen sulfide, much hydrogen sulfide exists in the environment, and one person falls on the ground due to poisoning. 向主控室报告：发现硫化氢泄漏，周围环境中有大量硫化氢，一人中毒倒地。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Implement the procedure of cutting off the leakage point. 关断泄漏点流程。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警（9119 或者 9995）报警。急救（9120）报警。	On-duty operator 当班人员
	Report to the emergency response center and department leader that there is leakage of hydrogen sulfide and one person falls on the ground. 向公司应急响应中心及部门领导报告硫化氢泄漏，一人中毒倒地。	On-duty operator 当班人员
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel rescue 人员抢救	Wear the air respirator, move the poisoned person to a safe and open area, and give first aid. 戴空气呼吸器将中毒人员转移至安全空旷地带，并施行急救。	On-duty operator 当班人员
	Give first aid continuously (never give up) until professionals arrive. 持续进行急救(决不放弃)，直到专业人员到达。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel) to the safe isolation area along the upwind. 组织现场与抢险无关的人员(含施工人员)沿上风口向安全隔离区疏散。	On-duty operator 当班人员
Alert 警戒	Test with the hydrogen sulfide detector and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携硫化氢检测仪测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Adjust the procedure 流程调整	Adjust the procedure and maintain normal production as far as possible. 调整流程，尽量维持正常生产。	On-duty operator 当班人员
Field safety protection 现场安全防护	Make the fire fighting access and gas protection road smooth to ensure smooth traffic of rescue vehicles. 疏通消防、气防道路，保证救护车辆通行无阻。	On-duty operator 当班人员
	Block other roads within the impact area and inform irrelevant vehicles to change their routes. 封闭影响范围内的其他道路，通知无关车辆改道行驶。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Environmental disposal 环保处置	Block the floor drain for discharging oily sewage in the desulfurization area as well as the outlet of surrounding open trench. 将脱硫区去含油污水的地漏封堵起来，周围明沟出口封堵起来。	On-duty operator 当班人员
	Wash the ground and platform of leakage point with water and reduce and absorb hydrogen sulfide. 用水冲洗泄漏点地面、平台，降低和吸收硫化氢。	
	Purge the hydrogen sulfide poisonous area with steam and reduce the concentration of hydrogen sulfide in the environment. 用蒸汽吹扫硫化氢毒区，降低环境中硫化氢浓度。	
	Contact with the HSE department and ask to dispose substances which may pollute the environment. 与 HSE 部联系，请求处理现场可能造成环保污染的物质。	
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive personnel from the gas protection and hospital. 在装置道路入口安排接应人员，迎接气防和医院人员。	On-duty operator 当班人员
Recycling of leakage 泄漏物的回收	Collect pollutions in the open trench together with the professional disposal personnel to prevent them flowing into downstream units or the open trench outside the unit. 与专业处理人员一起，将明沟内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注意	1、 Wear air respirators in the possible poisoning area. Personnel for valve closing, recovery and leakage stoppage who contact with poisonous medium must wear protective clothes. 进入可能中毒区域戴空气呼吸器。接触有毒介质的关阀人员、回收人员和堵漏人员须穿防护服。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 While giving an alarm, tell the leakage location, leakage medium, severity, casualties and fire condition. 报警时，须讲明泄漏地点、泄漏介质、严重程度、人员伤亡情况、有无火情。	

5.2.7 Emergency disposal of leakage of LPG and field personnel poisoning of 2.2 MMTPA diesel hydrotreating unit (see Table 18)

220 万吨/年柴油加氢处理装置液化气泄漏人员现场中毒应急处理见表 18

Table 18Emergency disposal of leakage of LPG and field personnel poisoning

表 18　液化气泄漏人员现场中毒应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	Discover an alarm of DCS system, report to the team leader and ask the outdoor operator taking the post to wear the air respirator correctly and quickly for confirmation at site. 发现 DCS 系统报警时：汇报班长，同时要求岗位外操正确、迅速佩戴好空气呼吸器现场确认。	Indoor operator taking the accident disposal post 事故岗位内操
	After discovering the accident through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable flammable gas detector and go to the site for confirmation; and operators taking other posts shall move to a safe area to observe and report to the main control room at any time.	On-duty operator
	巡检发现，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式可燃气体检测仪前往确认；其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	当班人员
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable flammable gas detector, go to the site for confirmation, and report to the main control room. 班长或岗位外操佩戴空气呼吸器并携带便携式可燃气体检测仪现场确认，向主控室报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Close automatic valves in front of and behind the leakage source remotely. 远程切断泄漏源前后的自控阀门。	On-duty operator 当班人员
	Close manual valves in front of and behind the leakage point (if possible). 切断泄漏点前后的手动阀门（若可能）。	On-duty operator 当班人员
Take measures based on actual conditions 视情况采取措施	Stop the operation procedure when possible. Reroute or stop normal production locally. 在可能的情况下关闭作业流程。通过流程改线或局部终止正常生产操作。 In case of no need to stop the operation procedure, reduce the system pressure of leakage part to eliminate leakage. 若不需要关闭作业流程，应采用降低泄漏部分系统压力的方法消除泄漏。 In case of high possibility of serious secondary accident, initiate the emergency feed cutting-off and shutdown procedure. 若极有可能发生严重恶性次生事故，启动紧急切进料停工程序。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警（9119 或者 9995）报警。急救（9120）报警。	Team leader 班长
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance. 通知其他岗位人员配合处理。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。	On-duty operator 当班人员
Provide fire-fighting appliances and steam facilities 消防、蒸汽设施保障	Check whether the nearby fire water monitor, fire standpipe and fire hydrant can be used in case of emergency (use only when required, do not use in case of oil leakage and fire due to oil). 检查就近消防水炮、消防竖管、消防栓等设施是否能够紧急投用（只在需要时投用，油品泄漏、火灾禁用）。	On-duty operator 当班人员
	Purge with steam at nearby service point for shielding. 就近用服务点蒸汽在四周进行吹扫掩护	On-duty operator 当班人员
Blocking and recycling of leakage 泄漏物封堵与回收	Block through reducing or eliminating the pressure. 应采用降低压力、撤压等手段进行封堵。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector, establish a warning range, and arrange an obvious warning area mark. 携可燃气检测仪测试，划定警戒范围，设立明显警戒区域标识。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Environmental disposal 环境处理	Block the floor drain of LPG in the leakage area as well as the outlet of surrounding open trench. 将泄漏区液化气地漏封堵起来，周围明沟出口封堵起来。 Purge the leakage area of LPG with steam and reduce the concentration of LPG in the environment. 用蒸汽吹扫液化气泄漏区域，降低环境中液化气浓度。 Contact with the HSE department and ask to dispose substances which may pollute the environment. 与 HSE 部联系，请求处理现场可能造成环保污染的物质。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Attention 注意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Carry with special anti-explosion tools to the site for operation. 携带专用防爆工具进入现场作业。 3、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 4、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 5、 While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。 6、 In case of leakage of LPG, isolate it to prevent poisoning of hydrogen sulfide and open fire at site, extinguish the hearth fire, dilute with steam, keep the site wet, and close the road to prevent access of vehicles. 液化气泄漏要隔离，防止硫化氢中毒和现场出现明火，量大时灭炉，用蒸汽稀释，保持现场湿润环境，封路防止车辆经过。	

5.2.8 Emergency disposal of leakage of rich solvent of C-301 hydraulic control flange of LP separated gas desulphurizing tower of 2.2 MMTPA diesel hydrotreating unit (see Table 19)

220 万吨/年柴油加氢处理装置低分气脱硫塔 C-301 液控法兰泄漏富溶剂应急处理见表 19

Table 19Emergency disposal of leakage of rich solvent of C-301 hydraulic control flange of LP separated gas desulphurizing tower

表 19　低分气脱硫塔 C-301 液控法兰泄漏富溶剂应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	On DCS screen, the red lamp of flammable gas explosimeter at C-301 blinks and a sound alarm is given. Judge that there may be leakage in the desulphurizing area. Report to the team leader and ask the post holder to confirm at site. DCS 画面突然显示：C-301 处可燃气测爆仪红灯闪烁，并伴声音报警。判断：脱硫区域可能有泄漏。汇报班长；同时要求岗位人员现场确认。	Main operator taking the post 岗位主操

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Confirm at site and report 现场确认、报告	The team leader and outdoor operator taking the post wear the air respirator and confirm at site. 班长、岗位外操佩戴空气呼吸器现场确认。 Report to the central control room that the gasket of C-301 hydraulic control flange is open and leakage occurs, much amine-rich liquid is accumulated on the ground, and one person falls on the ground due to poisoning. 向中控室报告：发现 C-301 液控阀法兰垫片呲开正在泄漏、周围地面已积聚大量富胺液，发现一人中毒倒地。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Contact the indoor operator and outdoor operator, change C-301 hydraulic control valve to the auxiliary line, and cut off the leakage source. 内外操联系，立即将 C-301 液控改副线，切断泄漏源。	Team leader 班长
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警（9119 或者 9995）报警。急救（9120）报警。	Team leader 班长
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance and tell them that the gasket of C-301 hydraulic control flange is open and leakage occurs, much amine-rich liquid is accumulated on the ground, and one person falls on the ground due to poisoning, ask one person of each post to stay behind for normal operation and other personnel with air respirator to arrive at the site immediately, command emergency rescue by the team leader, and evacuate irrelevant personnel and construction personnel to the emergency assembly point along the upwind immediately (repeat for several times). 通知其他岗位人员增援：C-301 液控阀法兰垫片呲开正在泄漏、周围地面已积聚大量富胺液，现场有一人中毒倒地；请各岗位留守一人维持正常作业，其他人员立佩戴空气呼吸器到现场集合,由班长指挥开展应急抢险，请无关人员及施工人员立即沿上风向、到紧急集合点集中（重复数遍）。	Team leader 班长
Personnel rescue 人员抢救	The person at site for confirmation transfers the poisoned personnel to the safe area and asks the emergency rescuer for first aid. 现场确认人员首先将中毒人员转移至安全区域，交与应急救援人员进行急救。	Team leader, the first leak finder 班长、发现泄漏第一人
	Give first aid continuously (never give up) by the emergency rescuer until professionals arrive. 应急救援人员持续进行急救(决不放弃)，直到专业人员到达。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员（含施工人员）撤离。	On-duty operator 当班人员
Adjust the procedure 流程、操作调整	Adjust the auxiliary line timely and stabilize the liquid level of C-301. 及时调整副线，平稳 C-301 液面。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Fire fighting system assurance 消防系统保障	Contact the dispatcher of the Company to coordinate sufficient fire fighting water and ensure the pressure of pipe network for fire extinguishing. 联系公司调度协调消防水充足，保证管网压力，以备扑救之用。	On-duty operator 当班人员
Blocking and recycling of leakage 泄漏物的封堵与回收	Check and confirm that the funnel for rain and sewage discharge around the hydraulic control valve at site is blocked. 检查确认现场液控阀附近去雨排及污排的漏斗已经堵上。	On-duty operator 当班人员
	(When necessary,) Block the external discharge trench with sand bags. （必要时）沙袋封堵外排沟。	On-duty operator 当班人员
	Dilute amine-rich liquid containing hydrogen sulfide with much clean water or bury with sand. 用大量清水对富含硫化氢的富胺液进行稀释或用沙土进行填埋。	On-duty operator 当班人员
Alert 警戒	Test with the hydrogen sulfide detector and establish a warning range. 携硫化氢检测仪测试，划定警戒范围。	On-duty operator 当班人员
Receive the rescue force 接应救援	Receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 接应消、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Stop leakage with pressure and dispose at site 带压堵漏及现场缺陷处理	With the disposal conditions, organize maintenance personnel to enter the site for replacing the gasket. 具备处理条件后，组织维修人员进入现场换垫处理。	On-duty operator 当班人员
Environmental disposal 环保处置	Check and confirm that the funnel for rain and sewage discharge around the hydraulic control valve at site is blocked. 检查确认现场液控阀附近去雨排及污排的漏斗已经堵上。	On-duty operator 当班人员
	(When necessary,) Block the external discharge trench with sand bags. （必要时）用沙袋封堵外排沟。	
Attention 注意	1、 The personnel entering the possible poisoning area must wear air respirators while personnel in other nearby areas shall wear filtered gas masks. Personnel for valve closing, recovery and leakage stoppage who contact with amine-rich liquid must wear protective clothes. 进入可能中毒区域戴空气呼吸器，其它附近区域戴过滤式防毒面具。接触富胺液的关阀人员、回收人员和堵漏人员须穿防护服。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Attention 注意	2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 Leaked rich solvent shall not enter the sewage disposal system and high COD will cause impacting of sewage disposal plant. Cut off, collect and prevent poisoning of hydrogen sulfide. 富溶剂泄漏注意不要进入污水处理系统，COD 太高，易造成污水处理装置冲击，切断，收集，防止硫化氢中毒即可。	

5.2.9 Emergency plan of fracture of F101 furnace tube of heating furnace of 2.2 MMTPA diesel hydrotreating unit (see Table 20)

220 万吨/年柴油加氢处理装置加热炉 F101 炉管破裂事故应急预案见表 20

Table 20Emergency disposal of fracture of F101 furnace tube of heating furnace

表 20 加热炉 F101 炉管破裂事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	The DCS screen displays suddenly that the temperature of outlet header of F101 (TI11301, 11303), the furnace box temperature of F101 and the surface temperature of furnace tube rise, the negative pressure of hearth decreases quickly, the oxygen content in smoke of F101 is reduced or back to zero, the red lamp of flammable gas explosimeter at F101 blinks and a sound alarm is given. Judge that the combustion of heating furnace is abnormal and furnace area is subject to abnormity alarm. Report to the team leader and ask the post holder to confirm at site. DCS 画面突然显示：F101 出口总管温度 TI11301,11303 升高，F101 炉膛温度升高，炉管表面温度升高，炉膛负压迅速减少，F101 烟气氧含量降低或回零，F-101 处可燃气测爆仪红灯闪烁，并伴随声音报警。判断：加热炉燃烧异常，炉区异常报警。汇报班长；同时要求岗位人员现场确认。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Check and confirm that oil burns at the bottom in F101 hearth, the hearth is dark, the flame is red, oil flows out of the bottom of F101 and burns, and black smoke rises from the stack of heating furnace at site. 现场检查确认 F101 炉膛内底部有油燃烧，炉膛发暗，火焰发红，现场 F101 底地面有油流出着火燃烧，现场加热炉烟囱冒黑烟	Team leader, the first leak finder 班长、发现泄漏第一人

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Information exchange 信息沟通	Report to the leader in charge immediately and Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 立即汇报主管领导并报火警（9119 或者 9995）报警。急救 9120 报警。	Team leader 班长
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	
Process disposal 工艺处置	1、 Conduct emergency shutdown of unit, interlock and cut off feed of unit, and stop the furnace of F101. 装置按紧急停工处理，装置进料联锁切断，F101 联锁停炉 2、 Conduct emergency pressure release of reaction system. 反应系统紧急泄压 3、 Control the liquid level of reaction and separation vessels. 控制好反应分离各容器液面 4、 Stop the water injection pump. 注水泵停运 5、 Stop the material feeding pump and close the shutoff valve at the outlet of feeding pump. 停原料进料泵并且关闭进料泵出口切断阀 6、 Stop the make-up hydrogen compressor. 停新氢压缩机 7、 Stop the reaction circulating pump. 停反应循环泵 8、 Extinguish fire of fractionating furnace. 分馏炉熄火 9、 Cool the fractionation system and reduce the quantity in it. 分馏系统降温降量 10、 Maintain the pressure and liquid level of fractionation system. 分馏系统保压保液面	Team leader, on-duty operator 班长、当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员（含施工人员）撤离。	On-duty operator 当班人员
Fire fighting system assurance 消防系统保障	Contact the dispatcher of the Company to coordinate sufficient fire fighting water and ensure the pressure of pipe network for fire extinguishing. 联系公司调度协调消防水充足，保证管网压力，以备扑救之用。	On-duty operator 当班人员
Alert 警戒	Test with the hydrogen sulfide detector and flammable gas alarm and establish a warning range. 携硫化氢检测仪、可燃气报警仪测试，划定警戒范围。	On-duty operator 当班人员
Receive the rescue force 接应救援	Receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 接应消、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Attention 注意	Stop the furnace of F101, extinguish the fire in heating furnace, stop the reaction feed pump, conduct emergency pressure release of reaction system, supplement accident nitrogen, control the temperature of reactor, stop the circulating oil pump, control the liquid level of knockout drum at top of up-flow reactor, or discharge all oil in the reactor based on actual conditions, stop injecting deoxygenated water, cool the fractionation system and conduct short circulation, stop the reboiler furnace, shut off blowing steam, and empty the steam generator. F101 联锁停炉，加热炉熄火；停运反应进料泵；反应系统紧急泄压，补入事故氮，反应器温度受到控制，循环油泵停运行；上流式反应器顶部分离罐液位已受到控制；或视情况排尽反应器内油；停止注入除氧水；分馏系统降温短循环；或视情况停再沸炉；塔吹汽停；蒸汽发生器改放空。	
Attention 注意	2、 The short circulation of fractionation system is normal. Be ready to receive the feed and maintain the system pressure. 分馏短循环正常，等待接受进料，系统保压。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。	

5.2.10 Emergency plan of interruption of reaction feed of 2.2 MMTPA diesel hydrotreating unit (see Table 21)

220 万吨/年柴油加氢装置反应进料中断事故应急预案见表 21

Table 21Emergency disposal of interruption of reaction feed

表 21 反应进料中断事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	The reaction feed flow is reduced; UV11101 and FV11101 are closed; the outlet temperature of heating furnace increases; and a low low flow alarm of reaction feed is given. 反应进料下降，UV11101 关闭，FV11101 关闭，加热炉出口温度上升，反应进料低低流量报警。	Main operator taking the post 岗位主操
	The liquid level of material buffer tanks D-101 and D-102 increases quickly. 原料缓冲罐 D-101，D-102 液面快速上升。	
	US11401 is triggered; the main nozzle of F101 is extinguished; and UV11401 is closed. US11401 触发，F101 主火嘴全部联锁熄灭，UV11401 联锁关闭。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	Shutdown alarm of P102 occurs on DCS SIS; the inlet temperature of R101 decreases; and the liquid level of knockout drum at top of R-101 decreases. DCS SIS 出现停 P102 的停车报警 R101 入口温度下降，R-101 顶部分液罐液面下降 。	
Confirm at site and report 现场确认、报告	Check and confirm that the reaction material pump P102 is stopped at site. 现场检查确认，反应原料泵 P102 现场停运	Team leader 班长
Information exchange 信息沟通	Report to the leader in charge immediately. Report to the dispatching center of the Company. 立即汇报主管领导。立即汇报公司调度中心。	Team leader 班长
Process disposal 工艺处置	1、 Confirm that the reaction feed is interrupted, F-101 main nozzle is extinguished, and the pilot burner burns normally. 确认反应进料中断，F-101 主火嘴熄灭，长明灯燃烧正常。 2、 Control the liquid level of reaction and separation vessels and monitor whether the pressure of reaction system is normal. 控制好反应分离各容器液面，监控反应系统压力正常。	Team leader, main operator taking the post
Process disposal 工艺处置	3、 Organize team/group members to ignite the heating furnace F101 and initiate P102 standby pump. 组织班组人员，准备点加热炉 F101，启动 P102 备用泵。 4、 Keep normal operation of the make-up hydrogen compressor and control the bed temperature. 保持新氢压缩机正常运行，控制床层温度。 5、 Adjust the fractionation system properly and maintain stable operation. 分馏系统适当调整，维持稳定运行。 6、 Stop product delivery and change operation of fractionation system to circulating. 停产品外送，分馏系统改循环操作。	班长、岗位主操
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员（含施工人员）撤离。	On-duty operator 当班人员
Fire fighting system assurance 消防系统保障	Contact the dispatching center to arrange a fire fighting truck at site. 联系调度中心，安排消防车来现场值班。	On-duty operator 当班人员
Receive the rescue force 接应救援	Receive the fire fighting truck and external emergency rescue force. 接应消防车辆及外部应急增援力量。	On-duty operator 当班人员

Steps 步骤	Disposal 处 置	Person in charge 负责人
Attention 注意	In case of abnormal interruption of reaction feed, confirm the state of feed solenoid valves UV11101 and FV11101 at site. 反应进料异常中断时，对进料电磁阀 UV11101 和 FV11101 状态进行现场确认。 In case of F101 extinguishing due to US11401, arrange team/group members to confirm at site and reset UV11401 at site after confirming no risk. US11401 造成 F101 联锁熄灭时，必须安排班组人员到现场进行检查确认，确认无风险后对 UV11401 进行现场复位。 For feed interruption by various causes, pay attention to risk control of change from high pressure to low pressure during disposal. 各种原因造成的进料中断，在组织处置时应重点做好高压窜低压的风险控制。	

5.3 Various accident scenes of 2.2 MMTPA hydrocracking unit (1040)

220 万吨/年加氢裂化装置（装置代号 1040）各类事故场景

5.3.1 Emergency disposal of leakage of hydrogen sulfide of 2.2 MMTPA hydrocracking unit (see Table 22)

220 万吨/年加氢裂化装置硫化氢介质泄漏应急处置见表 22

Table 22 Emergency disposal of leakage of hydrogen sulfide

表 22 硫化氢介质泄漏应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	In case of an alarm of hydrogen sulfide detector of DCS system, report to the team leader and ask the post holder to wear the air respirator quickly to confirm it at site. 发现DCS 系统硫化氢气体检测仪报警时：汇报班长，同时要求岗位人员迅速佩戴好空气呼吸器现场确认。	Indoor operator taking the accident disposal post 事故岗位内操
	After discovering the accident through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable hydrogen sulfide detector and go to the site for confirmation; and operators taking other posts shall move to a safe area to observe and report to the main control room at any time. 巡检发现，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式硫化氢气体检测仪前往确认；其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	The first leak finder 发现泄漏第一人

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable hydrogen sulfide detector, go to the site for confirmation, and report to the main control room. 班长或岗位外操佩戴空气呼吸器并携带便携式硫化氢气体检测仪现场确认，向主控室报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Confirm leakage of hydrogen sulfide at site and shut off automatic control valves in front of and behind the leakage source remotely. 确认现场有硫化氢泄漏，远程切断泄漏源前后的自控阀门。	Indoor operator taking the accident disposal post 事故岗位内操
	Confirm leakage of hydrogen sulfide at site and close manual valves in front of and behind the leakage point (if possible). 确认现场有硫化氢泄漏，切断泄漏点前后的手动阀门（若可能）。	Team leader, outdoor operator taking the accident disposal post 班长，事故岗位外操
Take measures based on actual conditions 视情况采取措施	Stop the operation procedure when possible. Reroute or stop normal production locally. 在可能的情况下关闭作业流程。通过流程改线或局部终止正常生产操作。 In case of no need to stop the operation procedure, reduce the system pressure of leakage part to eliminate leakage. 若不需要关闭作业流程，应采用降低泄漏部分系统压力的方法消除泄漏。 In case of high possibility of serious secondary accident, initiate the emergency shutdown procedure. 若极有可能发生严重恶性次生事故，启动紧急停工程序。	Indoor and outdoor operator taking the accident disposal post 事故岗位内操、事故岗位外操
Give an alarm 报警	Give a fire alarm (9119 or 9995) and call 9120 for first aid. 火警（9119或者9995）急救 9120	Team leader 班长
	Report to the emergency response center of the Company and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长
Ask to initiate the emergency procedure 请求启动应急程序	The team leader commands emergency rescue and asks irrelevant personnel and construction personnel to stop operation immediately and leave the site along the upwind direction. 由班长指挥开展应急抢险，请无关人员及施工人员立即停止作业沿上风向、离开装置现场。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	
Provide fire-fighting appliances and steam facilities 消防、蒸汽设施保障	Check whether the nearby fire water monitor, fire standpipe and fire hydrant can be used in case of emergency (use only when required). 检查就近消防水炮、消防竖管、消防栓等设施是否能够紧急投用（只在需要时投用）。	On-duty operator 当班人员
	Purge with steam at nearby service point for shielding. 就近用服务点蒸汽在四周进行吹扫掩护	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector and hydrogen sulfide detector, establish a warning range, and arrange an obvious warning area mark. 携可燃气检测仪以及硫化氢气体检测仪进行测试，划定警戒范围，设立明显警戒区域标识。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Stop leakage with pressure 带压堵漏	If the leakage stoppage condition is met, organize personnel to enter the site to stop leakage with pressure. 具备堵漏条件时，组织人员进入现场带压堵漏。	On-duty operator 当班人员
Environmental disposal 环境处置	Contact with the HSE department and ask to dispose substances which may pollute the environment. 联系 HSE 部，请求处理现场可能造成的环保污染的物质。	On-duty outdoor operator 当班外操
	Collect pollutions in the open trench together with the professional disposal personnel to prevent them flowing into downstream units or the open trench outside the unit. 与专业处置人员一起，将明沟内污染回收起来，严禁流入下游装置或进入装置外的明沟。	
Attention 注　意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 4、 While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。 5、 For rescue at site, do not use the mouth-to-mouth artificial	

Steps 步骤	Disposal 处 置	Person in charge 负责人
	respiration method to prevent secondary poisoning of the rescuer. 现场抢救人员时不能采用口对口人工呼吸，防止抢救人员二次中毒。 6、 Reduce the number of personnel at site as far as possible, wear the air respirator while entering the site, and inform the adjacent unit. 现场尽可能减少人员，进入现场的人员必须佩带呼吸器，通知相邻装置。	

5.3.2 Emergency disposal of leakage of much hydrogen of 2.2 MMTPA hydrocracking unit (see Table 23)

220 万吨/年加氢裂化装置大量泄漏氢气应急处置见表 23

Table 23Emergency disposal of leakage of much hydrogen

表 23 大量泄漏氢气应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	An alarm of hydrogen detector in the compressor area is displayed on DCS. The amount of hydrogen make-up or fresh hydrogen for the unit is extremely low. DCS上显示压缩机区氢气检测仪报警;装置补充氢或新氢量异常降低。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	The post holder shall carry with the hydrogen alarm to the site. 岗位人员携带氢气报警仪到现场查找。	Team leader, the first leak finder 班长、发现泄漏第一人
	The crater or flange of hydrogen pipeline are open, much hydrogen leaks, but no fire occurs. 现场发现氢气管线焊口或法兰吡开，大量氢气泄漏，但未着火。	
	Report to the indoor main operator and team leader immediately. 立即报告室内主操和班长。	
Cut off the leakage source 切断泄漏源	Contact the dispatcher of the plant and upstream unit to stop feeding hydrogen or raw materials. 联系厂调度及上游单位停送氢气或原料。	Main operator taking the post 岗位主操联系
	Stop the procedure at the leakage part and close the manual valve at the leakage part. 切除泄漏部位流程，关闭泄漏部位手阀。	Team leader, outdoor operator taking the post 班长、岗位外操
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader or main operator 班长或主操
	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the	While reporting to the emergency response center, issue	Team leader

Steps 步骤	Disposal 处　　置	Person in charge 负责人
emergency procedure 启动应急程序	action commands to all team/group members, and rush to the accident site for emergency treatment. 在向应急中心报告的同时，向班组各成员下达行动指令，迅速赶赴事故现场进行应急处理。 Perform emergency shutdown of furnace F101 and all heating furnace are shut down. 紧急停炉F101，加热炉全部熄火。	班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	Deputy team leader or post holder 副班长或岗位人员
Alert 警戒	Test at site with the hydrogen alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携氢气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止无关人员进入。	On-duty operator 当班人员
Adjust the procedure 流程调整	Perform emergency shutdown on the unit. 装置按紧急停工处理。	On-duty operator taking the post 当班岗位人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and shield with steam. 在泄漏点用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Attention 注　　意	1、 While entering the dangerous area of hydrogen leakage, turn off the phone and wear anti-static overalls. 进入氢气泄漏危险区人员关闭手机，必须穿防静电工装。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 While giving an alarm, tell the leakage location, leakage medium, severity,	

Steps 步骤	Disposal 处 置	Person in charge 负责人
	casualties and fire condition. 报警时，须讲明泄漏地点、泄漏介质、严重程度、人员伤亡情况、有无火情。 5、 Use anti-explosion tools at site, prevent all factors causing electric spark, put out the fire in the heating furnace if the wind is towards the heating furnace, relieve pressure to reduce leakage, shield the leakage point with steam, and prevent high-speed leakage from generating static electricity which may cause flash explosion. 现场使用防爆工具，防止引起电火花的一切因素，若风向朝向加热炉，加热炉全部熄火，泄压减少泄漏量，并用蒸汽掩护泄漏点，防止高速泄漏产生静电引发闪爆。	

5.3.3 Emergency disposal of leakage and fire of high-pressure reaction system of 2.2 MMTPA hydrocracking unit (see Table 24)

220 万吨/年加氢裂化装置反应高压系统泄漏着火应急处理见表 24

Table 24Emergency disposal of leakage of high-pressure reaction system

表 24 反应高压系统泄漏应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	Discover leakage and fire of high-pressure reaction system through routing inspection. 巡检发现高压反应系统泄漏着火。 Display an alarm of detector of reactor area on DCS of indoor operator. 内操DCS上显示反应区检测仪报警。	The first fire finder, indoor operator 发现火情第一人、内操
Confirm and report 确认报告	Report to the on-duty team leader that the high-pressure reaction system is subject to leakage and fire, the fire is big, but no one gets hurt. 报告当班班长高压反应系统泄漏着火、火势较大但没有人员受伤。	The first fire finder 发现火情第一人
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader or main operator 班长或主操
	Report to the emergency response center of the plant and on-duty operator of department. 向公司应急响应中心及部门值班人员报告。	Team leader 班长
Initiate the emergency procedure 应急程序启动	After receiving the alarm, the emergency rescue command personnel of department shall report to the emergency rescue commander-in-chief of the plant department, issue action commands to professional action groups, rush to the accident site for rescue coordination. 部门抢险应急指挥人员接到报警后，在向厂部抢险救灾总指挥报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢	Team leader 班长

	险协调。	
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关人员（含施工人员）撤离。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	Outdoor operator taking the post 岗位外操
Emergency treatment steps 应急处理步骤	1、Manually open the pressure relief valve to relieve the pressure at the rate of 0.7MPa /min and confirm all interlocking actions. Pay close attention to the temperature changes of the reactor bed. If the temperature of any point of the reactor bed exceeds the normal temperature 28℃ or 454℃, or any point of the reactor wall exceeds 449℃, or the fire is out of control and the situation is urgent, immediately relieve the pressure at the rate of 2.1MPa/min. 手动打开0.7MPa /min泄压，确认各联锁动作情况。要密切注意反应器床层温度的变化，若反应器床层任一点温度超过正常值28℃或454℃，或者反应器器壁温度任一点超过449℃，或者现场火势失控、 情况紧急，则立即启用2.1MPa/min泄压。 Confirm the interlocking actions related to emergency pressure relief. 确认紧急泄压相关联锁动作情况。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	2、 Immediately give a fire alarm and notify the dispatcher and the department. Arrange personnel to confirm the leaking part and fire intensity and control the initial fire by fire-fighting facilities. 立即报火警，通知调度和部门。安排现场确认泄漏部位及着火程度，现场通过消防设施控制初期火灾。 3、 Activate the emergency shutdown button of furnace F101 to stop all material supplies to the heating furnace. Confirm that the gas valve UV14801 and UV14802 of the main nozzle of the heating furnace are closed and close the FV14801 and PCV14801; confirm that the gas-stop valve UV14803 and UV14804 of the pilot burner of reaction furnace are closed. 3、启动F101紧急停炉按钮，关闭所有通向加热炉的燃料供给。确认反应加热炉主火嘴瓦斯切断阀UV14801及UV14802关闭，关闭FV14801，关闭PCV14801；确认反应加热炉长明灯瓦斯切断阀UV14803及UV14804关闭。 4、 Confirm that the interlocking UC15101 action of the heating furnace, and the induced draft fans and air blowers are shut down, the quick-opening damper is open and the PV15106 baffle of the F101 flue is wide open. 确认加热炉联锁UC15101动作，引风机、鼓风机均停机，加热炉快开风门打开，全开F101烟道挡板PV15106。 5、 Confirm that the P102 pump is stopped and the outlet shutoff	On-duty operator 当班人员

	valve is off. Close the outlet control valve. Shut down ST101 and confirm that the LV12105A is closed. 确认P102停泵，出口切断阀关闭，关闭出口控制阀。停运ST101，确认LV12105A关闭。 6、 Shut down K102 and close the outlet valve of K102 and the inlet valve for fresh hydrogen. 确认K102停机，关闭K102出口阀，新氢入口阀。 7、 Confirm that the high-pressure water injection pump P103 and the high-pressure pump P104 of lean amine liquid are stopped. Close the shutoff valves of each outlet and close the outlet control valve. 确认高压注水泵P103停泵及高压贫胺液泵P104停泵，关闭各出口切断阀，关闭出口控制阀。 8、 Control the liquid level and interface level of the hot and cold HP separators, the inlet knockout drum of hydrogen-circulating desulfurizer and the hydrogen-circulating desulfurizer to prevent the accident of high/low pressure cascade. 控制好热、冷高分、循环氢脱硫塔入口分液罐、循环氢脱硫塔液位、界位，严防高压串低压事故发生。 9、 Try to maintain the operation of K101. In case of the shutdown of K101, close the electric valve at both the inlet and outlet of the unit. 尽量维持K101运转，若K101停机，关闭机组进出口电动阀。 10、 Shut down P101 and close the material-feeding valve within the battery limit. Close the valve of fuel gas and fresh hydrogen pipeline within the battery limit. 停P101，关闭界区原料进装置阀。关闭界区燃料气和新氢管线阀门。 11、 Perform emergency shutdown on others. 其余按紧急停工处理。	

Shut off the ignition medium 切断着火介质	Conduct emergency disposal on production as per the process accident plan: close the upstream and downstream isolating valves of leakage medium immediately (when possible), reduce pressure of the reaction system, and conduct emergency shutdown of the unit. 根据工艺事故预案，生产上做紧急处理：立即关闭泄漏介质上下游隔断阀（若可能）；反应系统泄压，装置作紧急停工处理。	Team leader, operator taking the post 班长、岗位操作员
Provide fire-fighting appliances 消防设施保障	Know the operation condition of fire water system timely and ensure the pressure of pipe network. 及时联系消防水系统运行情况，保证管网压力。	On-duty operator 当班人员
	Collect fire extinguishers, fire hoses and steam pipes in the unit area and use fire water monitors. 集中装置区域内灭火器、消防水带、蒸汽带，投用消防水炮。	
	In case of insufficient fire-fighting appliances in the unit area, borrow from adjacent unit. 如装置区域内消防器材不足，可到相临装置借用。	

Extinguish fire 灭火操作	Cool the equipment on fire with fire water monitor, cool and isolate adjacent equipment and facilities. 开消防水炮对着火设备进行冷却，对邻近设备、设施降温隔离。	On-duty operator 当班人员
	Extinguish fire with the fire extinguisher, fire-fighting steam and field fire-fighting water. 用灭火器、消防蒸汽、现场消防水等进行灭火。	
Alert 警戒	Establish a warning range as per the fire condition. If the fire is big and cannot be extinguished, evacuate rescuers and wait for professional firefighters. 根据火势情况划定警戒范围，若火势较大，无法扑救，则撤出救灾人员，等待专业消防人员。	On-duty operator 当班人员
Receive the rescue force 接应救援	Receive the fire fighting truck and environmental monitoring vehicle and external emergency rescue force at the intersection. 在装置路口接应消防、环境监测等车辆及外部应急增援。	On-duty operator 当班人员
Environmental disposal 环境处置	Check and confirm the flow from the open trench to well is smooth. Block the trench at the unit outlet with sandbags. 检查确认装置明沟去地井畅通。装置出口明沟用沙袋封堵。	On-duty operator 当班人员
Attention 注意	1、 In case of poisonous mediums due to combustion, the personnel entering the area must wear air respirators while personnel in other nearby areas shall wear filtered gas masks. Personnel for valve closing, recovery and leakage stoppage who contact with poisonous medium must wear protective clothes. 如燃烧产生有毒介质，进入区域内人员须佩戴空气呼吸器，其它附近区域佩戴过滤式防毒面具。接触有毒介质的关阀人员、回收人员和堵漏人员须穿防护服。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。	
Attention 注意	4、 While giving an alarm, tell the ignition location, ignition medium, fire condition and casualties. 报警时，须讲明着火地点、着火介质、火势、人员伤亡情况。 5、 Do not extinguish fire directly during system pressure relief, because this will cause hydrogen sulfide poisoning and flash explosion due to hydrogen gathering. Relieve the pressure and extinguish fire automatically, shield surrounding equipment or adjacent flange with steam, and prevent burning the equipment. 系统泄压，不能直接灭火，直接灭火后易造成硫化氢中毒和氢气聚集闪爆，应泄压使其自动灭火，用蒸汽掩护周围设备或相邻法兰，防止烧坏设备。 6、 Isolate anti-explosion tools used to reduce the possibility of generation of electric spark. 隔离所使用防爆工具，减少现场一切产生电火花的可能。	

5.3.4 Emergency disposal of leakage of hydrogen sulfide and personnel poisoning of 2.2 MMTPA hydrocracking unit (see Table 25)

220 万吨/年加氢裂化装置硫化氢泄漏、人员中毒应急处理见表 25

Table 25Emergency disposal of leakage of hydrogen sulfide and personnel poisoning

表 25　硫化氢泄漏、人员中毒应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	An alarm of H_2S alarm of the area containing sulfur is displayed on DCS. DCS画面显示含硫区H_2S报警仪报警； The main operator taking the post shall make judgment on H_2S leakage of the area containing sulfur. 岗位主操判断含硫区H_2S泄漏； Report to the team leader and ask the post holder to confirm at site; 汇报班长；同时要求岗位人员现场确认；	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	The team leader and outdoor operator taking the post wear the air respirator and confirm at site. 班长、岗位外操佩戴空气呼吸器现场确认。 Report to the main control room that there is H_2S leakage, a large amount of H_2S exists in the environment, and one person falls on the ground due to poisoning. 向主控室报告：发现H_2S泄漏，周围环境中有大量H_2S，一人中毒倒地。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Cut off the leakage source 关断泄漏源。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警（9119或者9995）报警。急救 9120 报警。	Team leader or main operator 班长或主操
	Report to the emergency response center of the plant and department leader that there is H_2S leakage and one person falls on the ground. 向公司应急响应中心及部门领导报告H_2S泄漏，一人中毒倒地。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	Team leader 班长
Personnel rescue 人员抢救	Wear the air respirator, move the poisoned person to a safe and open area, and give first aid. 佩戴空气呼吸器将中毒人员转移至安全空旷地带，并施行急救。	On-duty operator 当班人员
	Give first aid continuously (never give up) until professionals arrive. 持续进行急救(决不放弃)，直到专业人员到达。	On-duty operator 当班人员
Personnel evacuati	Organize evacuation of personnel unrelated to rescue at site (including construction personnel) to the safe isolation area along the upwind.	On-duty operator 当班人员

Steps 步骤	Disposal 处 置	Person in charge 负责人
on 人员疏散	组织现场与抢险无关的人员(含施工人员)沿上风口向安全隔离区疏散。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	
Alert 警戒	Test with a H_2S detector and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携H_2S检测仪测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Adjust the procedure 流程调整	Adjust the procedure and maintain normal production as far as possible. 调整流程，尽量维持正常生产。	Main operator taking the post 岗位主操
Field safety protection 现场安全防护	Make the fire fighting access smooth to ensure smooth traffic of rescue vehicles. 疏通消防道路，保证救护车辆通行无阻。	On-duty operator 当班人员
	Block other roads within the impact area and inform irrelevant vehicles to change their routes. 封闭影响范围内的其他道路，通知无关车辆改道行驶。	On-duty operator 当班人员
Environmental disposal 环保处置	Block the floor drain for discharging oily sewage in the desulfurization area as well as the outlet of surrounding open trench with sand bags. 将脱硫区去含油污水的地漏封堵起来，周围明沟出口用沙袋封堵起来。	On-duty operator 当班人员
	Wash the ground and platform of leakage point with water and reduce and absorb H_2S. 用水冲洗泄漏点地面、平台，降低和吸收H_2S。	
	Purge poisonous area of H_2S with steam and reduce the concentration of H_2S in the environment. 用蒸汽吹扫H_2S毒区，降低环境中H_2S浓度。	
	Contact with the HSE department and ask for disposing substances which may pollute the environment. 与HSE部门联系，请求处理现场可能造成环保污染的物质。	
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive rescue personnel. 在装置入口安排接应人员，迎接救援人员。	On-duty operator 当班人员
Recycling of leakage 泄漏物的回收	Collect pollutions in the open trench together with the professional disposal personnel to prevent them flowing into downstream units or the open trench outside the unit. 与专业处理人员一起，将明沟内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Attention 注意	1、 Wear air respirators in the possible poisoning area. Personnel for valve closing, recovery and leakage stoppage who contact with poisonous medium must wear protective clothes. 进入可能中毒区域佩戴空气呼吸器。接触有毒介质的关阀人员、回收人员和堵漏人员须穿防护服。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 While giving an alarm, tell the leakage location, leakage medium, severity, casualties and fire condition. 报警时，须讲明泄漏地点、泄漏介质、严重程度、人员伤亡情况、有无火情。	

5.3.5 Disposal plan of leakage of LPG pump P212 of 2.2 MMTPA hydrocracking unit (see Table 26)

220 万吨/年加氢裂化装置液化气泵 P212 泄漏处理预案处理见表 26

Table 26Emergency disposal of leakage of LPG pump

表 26　液化气泵泄漏应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	When the flow indicator FIQ22106 of LPG sent to the gas fractionator is fluctuating (or even returning to zero), the DCS in the main control room is alarmed. DCS 液化气去气分流量 FIQ22106 波动，甚至回零、报警。	Indoor operator taking the accident disposal post 事故岗位内操
	The overhead pressure of C-206 on the DCS of the main control room drops. 主控室 DCS 上 C-206 顶压力下降。	
	The fixed combustible gas alarm and H_2S alarm on site give alarms. 现场固定式可燃气体报警仪和 H_2S 报警仪报警。	
	Frost is forming on the end face of P212 on site. 现场 P212 端面结霜。	
	White mist is coming out of the P212 end face and a layer of white mist is floating near the ground and the low-lying places. 现场 P212 端面冒白雾，地面附近及低洼处有一层白雾漂浮。	
	The smell of H_2S is strong on site. 现场有浓烈的 H_2S 气味。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	After discovering the accident through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable flammable gas detector and go to the site for confirmation; and operators taking other posts shall move to a safe area to observe and report to the main control room at any time. 巡检发现，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式可燃气体检测仪前往确认；其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	The first leak finder 发现泄漏第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable flammable gas detector, go to the site for confirmation, and report to the main control room. 班长或岗位外操佩戴空气呼吸器并携带便携式可燃气体检测仪现场确认，向主控室报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Close automatic valves in front of and behind the leakage source remotely. 远程切断泄漏源前后的自控阀门。	Indoor operator 内操
	Close manual valves in front of and behind the leakage point (if possible). 切断泄漏点前后的手动阀门（若可能）。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995). 火警（9119或者9995）报警。	Team leader or indoor operator 班长或内操
	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance. 通知其他岗位人员配合处理。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	1、 Start the emergency treatment procedure of unit upon the discovery of leakage. Arrange personnel wearing positive pressure type respirator to confirm the leakage on the site through DCS and cameras and inform department leaders at all levels and the dispatching department. 发现泄漏后，立即启用装置应急处理程序，安排人员通过 DCS、摄像头、佩戴正压式呼吸器现场确认，并通知部门各级领导及调度部门。 2、 Upon the discovery of leakages, count the number of team/group members and reasonably assign personnel and divide work. Two or three indoor operators stay on their work and the others cooperate in the process treatment and rescue work as rescuers. 发现泄漏后，清点班组人员，合理分配与分工，内操留守两至三人，其余人员作为抢险人员配合工艺处置及救援工作。 3、 Organize personnel to enter the site for rescuing with positive pressure type air respirators, confirm the leaking conditions and leaking parts and urge to cut off the media leakage. 组织人员佩戴正压式空气呼吸器，佩戴防冻手套进入现场进行抢险，确认泄漏情况及泄漏部位，督促切断泄漏介质。 4、 The dangerous area is delimited with the leaking point as the center. Arrange the evacuation of personnel from the dangerous area and isolate the dangerous area. The radius of isolated area for a small leakage is 150m and the radius of isolated area for a big leakage is 300m. 根据检测数据划定泄漏点为中心的危险区域，安排疏散危险区域内人员，并做好隔离工作，小泄漏隔离 150 米，大泄漏隔离 300 米。 5、 Quickly evacuate the personnel from the dangerous area to a place of uptake. Forbid irrelevant personnel from entering the dangerous area and isolate this area until the gas dissipates. Cut off the source of ignition and set up warning line around the unit. 迅速撤离危险区人员至上风处，禁止无关人员进入危险区，并隔离直至气体散尽，切断火源，装置四周拉警戒绳。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	

Steps 步骤	Disposal 处　　置	
Attention 注意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Carry with special anti-explosion tools to the site for operation. 携带专用防爆工具进入现场作业。 3、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 4、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 5、 While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。 6、 In case of leakage of LPG, isolate it to prevent poisoning of hydrogen sulfide and open fire at site, extinguish the hearth fire, dilute with steam, keep the site wet, and close the road to prevent access of vehicles. 液化气泄漏要隔离，防止硫化氢中毒和现场出现明火，量大时灭炉，用蒸汽稀释，保持现场湿润环境，封路防止车辆经过。	

5.3.6 Emergency disposal of P211 leakage and fire of 2.2 MMTPA hydrocracking unit (see Table 27)

220 万吨/年加氢裂化装置 P211 泄漏着火事故处理见表 27

Table 27 Emergency disposal of big leakage and fire of P211

表 27 P211 大漏着火事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	The end seal of P211 suffers from a big leakage of hot oil and this leakage is on fire. P211 端封泄漏，热油漏出着火。	The first leak finder 发现泄漏第一人
	After discovering the accident through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable flammable gas detector and go to the site for confirmation; 巡检发现，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式可燃气体检测仪前往确认。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	Operators taking other posts shall move to a safe area to observe and report to the main control room at any time. 其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable flammable gas detector, go to the site for confirmation, and report to the main control room. 班长或岗位外操佩戴空气呼吸器并携带便携式可燃气体检测仪现场确认，向主控室报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Close automatic valves in front of and behind the leakage source remotely. 远程切断泄漏源前后的自控阀门。	Indoor operator 内操
	Close manual valves in front of and behind the leakage point (if possible). 切断泄漏点前后的手动阀门（若可能）。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader or indoor operator 班长或内操
	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长
Initiate the emergency procedure 应急程序启动	Inform personnel of other posts to provide assistance. 通知其他岗位人员配合处理。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	1、 Extinguish the fire by properly using fire-fighting appliances and inform the dispatcher and the on-duty operator of the operation department. Inform the unit director and associated personnel. 正确使用消防器材进行灭火，通知调度及运行部值班。通知装置主管及相关人员。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	2、 Immediately press the stop button of P211 to stop the pump when it is accessible, and if it's not accessible because the fire is intense, inform the electric maintenance staff to power off it. 在人可靠近的情况下应立即按下 P211 停电按钮，停泵，若由于火势较大而不能按泵停电按钮，则通知电修，将 P211 停电。	
Emergency treatment steps 应急处理步骤	3、 The main control room closes C204 bottom draw-off valve (UV21201) and unconverted oil regulating valve (FV21303). 主控室关 C204 底抽出阀 UV21201 和未转化油调节阀 FV21303 调节阀。 4、 Stop the stripping steam of fractionator C204 and the electric heater EH201. 停分馏 C204 汽提蒸汽和电加热器 EH201。 5、 Increase the discharge amount of tail oil cooled by air cooler A203 and discharge it into the tank farm. 增大自空冷 A203 冷却后外甩尾油至罐区。切断塔进料阀 FV 6、 Extinguish the fire on the burning part and remove the leaking machine and pump. Use the spare pump and resume the operation gradually. 扑灭着火部位，切除泄漏机泵。启用备用泵，逐渐恢复操作。 7、If the fire is large, cut off the fractionated feed 如果火势较大，则切断分馏进料	On-duty operator 当班人员
Provide fire-fighting appliances and steam facilities 消防、蒸汽设施保障	Check whether the nearby fire water monitor, fire standpipe and fire hydrant can be used in case of emergency (use only when required). 检查就近消防水炮、消防竖管、消防栓等设施是否能够紧急投用（只在需要时投用）。	On-duty operator 当班人员
	Purge with steam at nearby service point. 就近用服务点蒸汽在四周进行吹扫掩护。	On-duty operator 当班人员
Blocking and recycling of leakage 泄漏物的封堵与回收	Block through reducing or eliminating the pressure. 应采用降低压力、撤压等手段进行封堵。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector, establish a warning range, and arrange an obvious warning area mark. 携可燃气检测仪测试，划定警戒范围，设立明显警戒区域标识。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Environmental disposal	Block the floor drain in the leakage area as well as the outlet of surrounding open trench. 将泄漏区地漏封堵起来，周围明沟出口封堵起来。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
环境处理	Block the external discharge trench with sand bags. 沙袋封堵外排沟。	
	Contact with the HSE department and ask to dispose substances which may pollute the environment. 与HSE部联系，请求处理现场可能造成环保污染的物质。	
Attention 注意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Carry with special anti-explosion tools to the site for operation. 携带专用防爆工具进入现场作业。 3、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 4、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 5、While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。	

5.3.7 Emergency disposal of fracture and fire of furnace tube of heating furnace of 2.2 MMTPA hydrocracking unit (see Table 28)

220 万吨/年加氢裂化装置加热炉炉管破裂着火应急处理见表 28

Table 28Emergency disposal of furnace tube fracture and fire of heating furnace

表 28　加热炉炉管破裂着火应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Find emergency on the site 现场发现	Black smoke rises from the heating furnace on site and the furnace tube in the heating furnace is subject to leakage and fire. 现场加热炉冒黑烟，炉膛内加热炉炉管泄漏着火 There is some oil burning at the inside bottom of the F101 hearth on site. The hearth is dark and the flame is red. 现场F101炉膛内底部有油燃烧，炉膛发暗，火焰发红 Oil flows out of the bottom of F101 to the ground and burns. 现场F101底地面有油流出着火燃烧	The first fire finder 发现火情第一人
Give an alarm 报警	Report to the central control room that the furnace tube of heating furnace is subject to leakage and fire and no one gets hurt at site. 向中控室报告：发现加热炉炉管泄漏起火燃烧，现场没有人员受伤。	The first fire finder 发现火情第一人
Steps	Disposal	Person

步骤	处　　置	in charge 负责人
Give an alarm 报警	Give a fire alarm (9119 or 9995). 火警（9119或者9995）报警。	Team leader or indoor operator 班长或内操
	Report to the emergency response center and department leader. 向应急响应中心及部门领导报告。	Deputy team leader 副班长
Initiate the emergency procedure 启动应急程序	Inform personnel of other posts to provide assistance and tell them that the furnace tube of heating furnace is subject to leakage and fire and no one gets hurt at site. 通知其他岗位人员增援：发现加热炉炉管泄漏着火、现场没有人员受伤。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关人员（含施工人员）撤离。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
	1、 For slight oil leakage and small fire of furnace tube, stop the feed as per the shutdown plan, cool and stop the heating furnace. 炉管轻度漏油着小火苗，按停工方案停进料，加热炉降温停炉处理。 2、Start the pressure relief system to relieve the pressure at the rate of 2.1MPa/min in case the furnace tube is leaking seriously and is on fire. 炉管严重泄漏着火，启动2.1MPa/min泄压系统 。 3、 Start the interlock for stopping furnace F101, confirm that the gas-stop valve UV14201 and UV14202 of the main nozzle of the reaction heating furnace are closed and close FV14801 and FV14801; confirm that the gas-stop valve UV14803 and UV14804 of the pilot burner are closed, and close PCV14802 and the fuel gas main pipe and all nozzles and hand valves. The HV15101 and HV15102 baffle of the F101 flue is wide open. 启动F101停炉联锁，确认反应加热炉主火嘴瓦斯切断阀UV14201及UV14202关闭，关闭FV14801，关闭PCV14801；F101长明灯切断阀UV14803、UV14804关，关闭PCV14802、关闭燃料气总管及各火嘴手阀。全开F101烟道挡板HV15101、HV15102。 4、 Confirm that the interlocking UC15101 action of the heating furnace, and the induced draft fans and air blowers are shut down, the quick-opening damper is open and the PV15106 baffle of the F101 flue is wide open. Open the hearth of heating furnace and turn on the firefighting steam of convection section.	

Emergency treatment procedure 应急处理程序	确认加热炉联锁 UC15101 动作，引风机、鼓风机均停机，加热炉快开风门打开，全开 F101 烟道挡板 PV15106。打开加热炉炉膛、对流段消防蒸汽。 5、 Perform interlocking shutdown on the fresh hydrogen compressor K102, circulating hydrogen compressor K101, reaction feeding pumpP102, water injection pump P103 and high-pressure pump for lean amine liquid P104. Confirm that the outlet shutoff valve and the electrically-operated fire valve are closed. 联锁停新氢机K102和循环氢压缩机K101、反应进料泵P102、反应注水泵P103、高压贫胺液泵P104。确认出口切断阀及火灾电动阀关闭。 6、 Contact the dispatcher to cut off the feed of raw material and prepare nitrogen; if the unit pressure to be relieved is lower than 0.7MPa, nitrogen of 2.5MPa shall be introduced through the outlet of K101 as replacement to cool down the reaction system. The positive pressure of nitrogen of the reaction system shall always be maintained at more than 0.2MPa. 联系调度切断原料进料和准备氮气； 当装置的压力泄压低于0.7MPa时，在K101出口引入2.5MPa氮气，对反应系统进行置换降温。始终保持反应系统氮气正压大于0.2MPa。 7、 keep adequate steam available for purging the hearth of F101 after the fire is out. Purge the steam to the tube burst to prevent air from coming in through the burst and generating explosive mixture of hydrocarbon. 熄火后，保持足量F101炉膛吹扫蒸汽，吹扫至爆管处以避免空气从爆管处反窜在系统内形成烃类的爆炸性混合物。 8、Perform emergency shutdown on others. During the on-site disposal process, you need to pay attention to personal protection, maintain on-site alert, and cooperate with firefighters to carry out fire extinguishing and technical disposal. 其余系统按照紧急停工处理。现场处置过程，需要注意个人防护，做好现场警戒，配合消防人员开展灭火及工艺处置。	On-duty operator 当班人员
Fire fighting system assurance 消防系统保障	Know the operation condition of fire water system and ensure the pressure of pipe network. 联系消防水系统自动运行情况，保证管网压力。	On-duty operator 当班人员
	Prepare complete fire-fighting appliances in the fire box at site and put the wheeled fire extinguisher at site in place. 现场消防箱内灭火器材准备齐全好用，现场推车式灭火器摆放到位。	On-duty operator 当班人员
Extinguish fire 灭火操作	Cool the ignition source with fire water monitor, cool and isolate adjacent facilities. 开消防水炮对着火源进行冷却，对邻近设施降温隔离。	On-duty operator 当班人员
	Wait for professional firefighters to extinguish fire. 等待消防专业人员的灭火处理。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector and establish a warning range. 携可燃气检测仪测试，划定警戒范围。	On-duty operator 当班人员

Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援。	On-duty operator 当班人员
Environmental disposal 环保处置	Check and confirm that the rainwater discharge trench and sewage discharge trench are blocked and block the external discharge trench with sand bags. 检查确认装置的雨排、污排已经被封堵，用沙袋封堵外排沟。	On-duty operator 当班人员
Attention 注意	1、Wear air respirators in the unit area and possible poisoning area. 装置及可能中毒区域戴空气呼吸器。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、During evacuation of construction personnel, check and shut off the fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 4、For leakage and fire of furnace tube, isolate all gas, cut off the medium to the heating furnace, purge extinguishing steam to the hearth, and prevent flash explosion of hearth. Open the ventilation door only after cooling the hearth. 炉管泄漏着火，将瓦斯气全部隔离，切断进加热炉介质，炉膛吹入灭火蒸汽，同时注意防止炉膛闪爆。不要紧急开风门，炉膛温度降下来后再开。	

5.3.8 Emergency disposal of power failure of 2.2 MMTPA hydrocracking unit (see Table 29)

220 万吨/年加氢裂化装置停电事故应急处理见表 29

Table 29Emergency disposal of power failure

表 29 停电事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	1、When the illuminating lamp is out, the DCS instrument and SIS system are powered by the UPS and large areas of SIS console give audible and visual alarm. 照明灯熄灭，DCS 仪表和 SIS 系统转由 UPS 供电，SIS 控制台大面积声光报警。 2、The indicator lamp is on when the accident alarm is sounded. All parameters on the DCS give audible and visual alarm and the pumps are stopped and discolored, etc. 事故报警响，指示灯亮。DCS 上各类参数声光报警，机泵停泵色变等。 3、The interlocking shutdown of circulating compressor K-101 is due to the shutdown of lubricating oil pump and the interlock is shut down due to low oil pressure. The circulating hydrogen is stopped and the interlock of low-speed pressure relief valve UV-12203 is open. 循环氢压缩机 K-101 因润滑油泵停运，油压不足联锁停运，循环氢停，低速泄压阀 UV-12203 联锁打开。	Main operator taking the post 岗位主操

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	4、The fresh hydrogen compressor, the blower and other motor-driven equipment are shut down and the pressure and flow of each pump outlet and compressor outlet indicate zero. 新氢机、鼓风机及各电机带动的设备停运，各泵出口和压缩机出口压力、流量指示回零。 5、The pressure of reaction system has dropped. 反应系统压力下降。 6、Liquid levels of all vessels and towers are fluctuating. 各容器、塔液面波动。 7、Temperatures of all overheads and air cooler outlets have risen. 各塔顶、各空冷器出口温度升高。	
Confirm at site and report 现场确认、报告	Contact the dispatcher, find the reason of power failure, and initiate the emergency plan if power supply cannot be restored in a short time. Report to the indoor main operator and team leader immediately. 联系调度，查明停电原因，若短时间无法恢复电源供应，则启动应急方案。立即报告室内主操和班长。	Team leader, the first leak finder 班长、发现泄漏第一人
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test at site with the hydrogen alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携氢气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	1、 In case of power failure of the whole unit, shut down electricity-consuming equipment except the equipment connected to the emergency power generator (if any). The DCS still works because the DCS and SIS are connected with UPS power supply. The unit is in the safest state by handling according to the emergency shutdown procedure.	On-duty operator 当班人员

Emergency treatment steps 应急处理步骤	出现整个装置电力故障，除与紧急发电机相连的设备（如果有）其他用电设备将全部停止。DCS和SIS与UPS电源相连，DCS能继续工作。装置按紧急停车处理到最安全的状态。 2、 Maintain the operation of circulating hydrogen compressor as far as possible. If the reaction flow can not be fully cooled, the lubricating oil pump ceases to pump and the compressor is shut down interlockingly as well. After the shutdown of K101, confirm that the low-speed pressure relief valve is open and perform emergency pressure relief on the unit. Closely monitor the temperature of the reactor. If the temperature rises rapidly, start the high-speed pressure relief to speed up pressure relief. The pressure drop of each bed shall not exceed the specified limit during the pressure relief process. Reduce the pressure of system to 0.7MPa and increase the pressure to 1.0MPa by adding 2.5MPa nitrogen via the outlet of circulating hydrogen compressor. Then, discharge the hydrogen and replace it with nitrogen for several times. 循环氢压缩机应尽可能维持运行。如果反应流出物不能充分冷却、润滑油泵停，压缩机也联锁停车。K101停运后，确认低速泄压打开，装置紧急泄压处理。密切监视反应器温度，若温度上升较快，可手动开高速泄压，加快泄压速度。泄压时，必须保证各床层压降不超标，把系统的压力降至0.7MPa，从循环机出口补入2.5MPa氮气至1.0MPa，再排放，多次置换。 3、Interlockingly close the main fuel gas nozzle of F101, maintain a few pilot burners and reduce the temperatures of beds of all reactors as far as possible. 联锁关闭F101主燃料气火嘴，留有少量长明灯，尽量降低各反应器床层温度。 4、 The following equipment will be affected immediately: all electric pumps, fresh hydrogen compressors and air cooler for reaction flow. The air cooler A101 is equipped with fan cover, which can provide 50% of the normal cooling load when the air blower is shut down. 下述设备立刻会受到影响：所有电动泵；新氢压缩机；反应流出物空冷风机停。空冷A101设有风罩，它在风机停运时能提供50%的正常冷却负荷。 5、Close the outlet valve of all pumps and press the stop button to confirm the action. 关闭各机泵出口阀，现场按停泵按钮进行确认。 6、 Pay attention to monitoring the liquid and interface levels of the cold and hot HP separators (D103 and D106). Maintain their normal liquid levels and monitor the pressure to avoid overpressure. 注意监视冷热高分D103、D106液、界面，维持正常液面，注意监视压力，严防超压。 7、 The pressure of each tower vessel shall be released to the flare when it is over-pressurized. 各塔容器超压时必须放压至火炬。 8、 Maintain the liquid level of each vessel with its respective liquid-control valve and open the bypass valve to maintain a stable liquid level. 用各容器液控阀维持各自液面，打开旁路阀，保证液面稳定。	On-duty operator 当班人员

	9、 A 2.1 MPa/min pressure relief system will be started if the temperature of any point of the reactor exceeds its normal value 28℃ or its design temperature. 反应器任何一点温度超过正常值28℃或超过反应器设计温度，将启用2.1 MPa/min泄压系统。 10、 Cool the reactor to 150°C and maintain this temperature until the unit is returned to operation if the raw materials are processed for less than 10 days with catalyst or the shutdown period is too long. 如果催化剂加工原料少于10天，或如果停车时间较长，将反应器冷却至150℃并维持直到装置准备开工。 11、 Fractionation is subject to emergency shutdown. Control the pressure, liquid level of each fractionator, as well as the liquid and interface level of each reflux tank. Close the control valve PV20703 which discharges dry gas from the unit and maintain the pressure of C201, C202 and C203. Close the pressure–control valve PV21803 of the reflux tank of C205 tower overhead and control valve PV22106 which discharges the liquid hydrogen from the unit. Close the light/heavy naphtha delivery control valve FV22703 and LV22306. 分馏按紧急停工处理。控制好各分馏塔压力、各塔液面、各回流罐液界面。关闭干气出装置控制阀PV20703，C201、C202和C203保压；关闭C205塔顶回流罐压控阀PV21803，关闭液态烃出装置控制阀PV22106。关闭轻、重石脑油外送控制阀FV22703、LV22306。 12、 Close the inlet valve for stripping steam to enter into the tower from the bottom of C201 and C204. Shut down electric heater EH201. Close the steam-stop valves of bottom reboilers of C205 and C207. 关闭C201、C204底汽提蒸汽进塔阀门，关闭电加热器EH201。关闭C205、C207塔底重沸器蒸汽切断阀。	
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and shield with steam. 在泄漏点用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员

Table 29 (continued) 表 29 （续）

Steps 步骤	Disposal 处 置
Attention 注 意	1、 During emergency shutdown of the unit, shut down safely within half an hour and prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，必须在半小时以内时装置安全停下来，同时严防高压串低压事故发生。 2、 In case of power failure of air separation/compression device and circulating water yard, dispose together with the hydrotreating unit and start the liquid nitrogen vaporizer especially. 空分空压和循环水场停电后，应和加氢装置同步安全处理，特别启动液氮汽化器。 3、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of heavy oil smell, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在油气味较重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 During emergency shutdown of the unit and operation of heavy sump oil removal system, contact the dispatcher and storage and transportation department, use deodorization facilities timely and eliminate odor in the unit area. 装置紧急停工，外甩重污油系统时，要联系好调度和储运部，及时投用除臭设施，避免厂区产生恶臭。 6、 The fire disposal method of fractionation system is different from that of reaction system. Extinguish the fire of fractionation system as soon as possible and extinguish the fire of reaction system by reducing the pressure. 分馏系统着火和反应系统着火处理方法不一样，分馏系统着火尽快灭火，反应系统着火靠降压熄火。

5.3.9 Emergency disposal of instrument air supply failure of 2.2 MMTPA hydrocracking unit (see Table 30)

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Table 30Emergency disposal of instrument air supply failure

表 30 停仪表风事故应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	The FIQ30401 flow indication of instrument air gradually decreases to zero. The PI30401 pressure indication of instrument air gradually decreases to zero. Start the pressure relief system to relieve the pressure at the rate of 0.7MPa/min.	Main operator taking the post 岗位主操

Steps 步骤	Disposal 处 置	Person in charge 负责人
	仪表风流量指示 FIQ30401 指示逐渐减小，直至为零；仪表风压力指示 PI30401 指示逐渐减小，直至为零；0.7MPa/min 泄压打开。	
Confirm at site and report 现场确认、报告	Contact the production dispatcher, find out the reason of instrument air supply failure, and initiate the emergency plan if the instrument air supply cannot be restored in a short time. Report to the indoor main operator and team leader immediately. 联系生产调度，查明停风原因，若短时间无法恢复供风，则启动应急方案。立即报告室内主操和班长。	Main operator, on-duty operator 主操、当班人员
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional departments, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业部门下达行动指令，迅速赶赴事故现场进行抢险协调。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test at site with the combustible gas alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	1、 The FC valve shall be fully closed and the FO valve shall be fully opened. Because of the interruption of instrument air, the control valve for 0.7MPa/min pressure relief is automatically in fail-open position. The control valve for 2.1MPa/min pressure relief is in fault-close position. FC阀全关，FO阀全开。因为系统仪表风中断，0.7MPa/min泄压控制阀将自动处于故障开的位置。2.1MPa/min泄压控制阀将处于故障关的位置。 2、 Close the emergency stop valve and the pressure-control valve of the main fuel gas nozzles of the heating furnace and the pilot burner. Shut down the furnace, confirm the valve actions on site, manually close the fuel gas hand valve and replace the hearth by opening up the flue baffle. Ensure that the heating furnace is shut down and maintain the largest circulation of circulating hydrogen to quickly cool the catalyst down. If the interruption of the instrument air affects the utility system of the refinery, the steam will be reduced and the circulating hydrogen compressor driven by steam turbine can not guarantee the supply of circulating hydrogen to the reaction part.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	加热炉燃料气主火嘴及长明灯紧急切断阀及压控阀均关闭，炉子熄火，现场确认阀门动作情况，手动关闭燃料气手阀，开大烟道挡板置换炉膛，确保加热炉熄火并保持最大的循环氢循环快速冷却催化剂。如果仪表风中断影响到炼厂的公用系统，蒸汽将会在很短的时间内减小,蒸汽透平驱动的循环氢压缩机不能保证供给反应部分的气体循环量。 3、 The liquid control valves of the HP and LP separators are closed and their corresponding liquid levels are out of control. Manually handle the liquid control valves of the cold and hot HP separators to control their liquid levels instead to avoid the tank is too full or the liquid flows from a high-level separator to a low-level separator resulting from excessively high or low liquid levels. Control the liquid levels of the cold and hot LP separators by a timely adjustment of the bypass of the liquid-level control valve. 高、低压分离器液控阀关闭，相关液位失控。冷热高分液控阀及时改手动控制液位，避免过高或过低，造成满罐或高窜低的事故。冷热低分液面控制及时调节液位控制阀旁路。 4、 Open the bypass of the heat exchanger of raw material/reactor effluent as appropriate to prevent the raw material from absorbing heat from the reactor effluent. Avoid overtemperature of the air cooler A101 of the HP reactor as far as possible and adjust the fan to get a maximum cooling effect. 视情况打开原料/反应流出物换热器旁路避免原料从反应流出物取热，尽量维持反应高压空冷A101温度不超高，将风扇调节至最大冷却效果。 5、 Because of the interruption of the instrument air, the feed control valve will be in fail-closed position, which results in the shutdown of the reaction feed pump and the interlocking shutdown of the feed pump. Close the outlet shutoff valve. Pay attention to the stop valve of the outlet of water and lean amine liquid in case that the water injection pump and lean amine liquid pump are interlocking shut down. 仪表风中断，进料控制阀将处于故障关的位置，导致反应进料泵因低流量停车，联锁停反应进料泵，关出口切断阀。联锁反应注水泵、贫胺液泵停，关注水和贫胺液出口切断阀。 6、 Under the condition of instrument air failure, return-line control valve of the fresh hydrogen compressor will be open in case of failure. Close the outlet shutoff valve in case of the interlocking shutdown of the fresh hydrogen compressor. 在仪表风故障的紧急情况下，新氢压缩机返回线控制阀将处于故障开的位置。新氢压缩机联锁停车，关闭出口切断阀。 7、 Actions of each control valve: 各控制阀动作： 7.1 All pressure-filled valves and drain valves of feed buffer tanks (D-101, D-102, D-105 and D-108) are closed. 各种进料缓冲罐（D-101、D-102、D-105、D-108）充压阀及排放阀关闭。 7.2 The reaction feed rate control valve and the reaction feed emergency stop valve (UV11012) are closed and the control valve of minimum rate of the reaction feed pump are open. The control valve of minimum rate of water injection pump is open and the	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	emergency stop valve of water injection pump is closed. 反应进料流量控制阀、反应进料紧急切断阀（UV11012）关闭，反应进料泵最小流量控制阀打开。注水泵最小流量控制阀打开，注水紧急切断阀关闭。 7.3 The emergency gas stop valve of the reactor is closed. 反应炉瓦斯紧急隔断阀关闭。 7.4 The fresh hydrogen compressor automatically removes the load and the control valve for passing back the load step by step is open. 新氢机自动卸荷，逐级递返控制阀打开。 7.5 The anti-surge valve (FO) of circulator is open. 循环机防喘振阀（FO）打开。 7.6 Close the subline temperature control valves (TV11601 and TV11603) of the reaction product HP heat exchanger and the subline temperature control valves (TV11801, TV11803, HV11902 and HV11905) of the HP heat exchanger for hot HP separated gas. 反应产物高压换热器副线温控阀 TV11601，TV11603，热高分气高压换热器副线温控阀 TV11801，TV11803 和 HV11902 和 HV11905 关闭。 7.7 All control valves controlling the liquid and interface levels of separators shall be closed. 所有分离器液位、界位控制阀关闭。 7.8 Close the outlet pressure control valve of dry gas knockout drum. Close the inlet of the pressure control valve of the fractionator's (C204) reflux tank and open its outlet. Close the inlet and outlet of the pressure control valve of the naphtha fractionator's (C207) reflux tank. 干气分液罐出口压控阀关闭，分馏塔 C204 回流罐压控阀入口关闭，出口阀打开，轻重石脑油分馏塔 C207 回流罐压控阀入口及出口阀关闭。 7.9 Open all overhead backflow control valves. 所有塔顶回流控制阀打开。 7.10 Close all product flow control valves. 所有产品流量控制阀关闭。 7.11 Open minimum flow control valves of all pumps. 所有泵最小流量控制阀打开。 8、 Subsequent operations: 后续操作 If the circulator is shut down during an accident, the unit is subject to the disposal of circulator failure. 如果循环机在事故期间停运，装置按循环机故障停车处理。 9、 If the instrument air can not be restored, Perform emergency shutdown on the unit. 如果仪表风不能恢复：装置按紧急停工处理。 10、 If the instrument air is restored, the indoor and outdoor operators shall establish contacts for putting the control valves into use (adjust operations according to the need). The 0.7MPa/Min emergency pressure relief valve can be closed until the reactor bed temperature is below its normal temperature by 28°C after the normal operation of the circulator. 如果仪表风恢复：内、外操联络投用各控制阀（根据需要调整操作）。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	循环机运行正常后，反应器床层温度低于正常 28℃，才能关 0.7MPa/Min 紧急泄压阀。 The temperature and pressure of the reaction system is rising again to restore to a prior- accident state. 反应系统重新升温升压，装置恢复至事故前状态。	
Emergency treatment steps 应急处理步骤	Fractionation system: 分馏系统： 1、 Shut down the heat source of reboilers, the stripping steam of towers and all heaters. 停各重沸器热源，停各塔汽提蒸汽及加热器。 2、 Maintain the backflow of each towers as far as possible and control the flow through subline when necessary. Increase the backflow properly to lower the overhead temperature and stop the reflux pump when the reflux tank is evacuated. 尽可能维持各塔回流必要时流量改用付线控制，可适当加大回流量以降低塔顶温度，当回流罐抽空时可停回流泵。 3、 Maintain the liquid level and pressure of all towers and vessels. The liquid level shall not reach the top and decrease to the bottom. 维持各塔、容器的液位、压力，液位不满不空。	On-duty operator 当班人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 During emergency shutdown of the unit, strictly prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，严防高压窜低压事故发生。 2、 Perform emergency shutdown on the air separation unit in case any problem occurs to it. 若因空分装置出现问题，则按紧急停工处理。 3、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site.	

Steps 步骤	Disposal 处 置	Person in charge 负责人
	在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.3.10 Emergency disposal of circulating water supply failure of 2.2 MMTPA hydrocracking unit (see Table 31)

220 万吨/年加氢裂化装置停循环水事故应急处理见表 31

Table 31Emergency disposal of circulating water supply failure

表 31 停循环水事故应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	The flow and pressure of circulating water is dropping, and the temperature of all compressors, pump bearings and bushes are rising and the pressure and temperature of all overheads are rising. 循环水流量及压力下降；各压缩机、泵轴承、轴瓦温度升高；各塔顶压力、温度升高。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the dispatcher, find out the reason of circulating water supply failure, and initiate the emergency plan if the supply of circulating water cannot be restored in a short time. 联系调度，查明停循环水原因，若短时间无法恢复循环水供应，则启动应急方案。 The outdoor operator confirms the pressure of circulating water on site and reports it to the indoor main operator and the team leader immediately. 外操现场确认各冷却器循环水压力，立即报告室内主操和班长。	On-duty operator 当班人员
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	
Alert 警戒	Test with the flammable gas alarm at site, establish a warning range based on the condition, arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，根据情况划定警戒范围并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	Cool it if the pressure of circulating water is dropping and the circulating hydrogen compressor K101 still keeps operating. Stop K102/P102/P103/P104 and other pumps if the temperature of lubricating oil is rising rapidly. If the circulating hydrogen compressor ceases operating, implement the shutdown steps of it. 循环水压力下降，循环氢压缩机K101还能维持运转，则立即降温，润滑油温度上升较快，停K102/P102/P103/P104及其他油泵。如循环氢压缩机不能维持运转，按循环氢压缩机停机步骤处理。 Reaction system: 反应系统： 1、 Confirm that the circulating hydrogen compressor K101 is shut down and that the 0.7MPa/min pressure relief valve is open. If the valve is not open, then manually open it. 确认循环氢压缩机K101停机，确认0.7MPa/min紧急泄压阀打开，若未启动，手动启动。 2、 Confirm that the fresh hydrogen compressor K102 is shut down and the stop valve is closed. 确认新氢压缩机K102停机，切断阀关闭。 3、 Manually open the emergency pressure relief valve to relieve the pressure at the rate of 2.1MPa/min and check the leakage of high-pressure flange if the bed temperature rise exceeds the normal temperature by 28°C or the temperature exceeds 454°C. 若任一床层温升超过正常值28℃或温度超过454℃，手动启动2.1MPa/min紧急泄压阀，并检查高压法兰有无泄漏。 4、 Make sure that the pressure drop of reactor bed does not exceed the specified limit during the pressure relief process (the overall pressure drop ≯0.6MPa, the pressure drop of any bed ≯0.3MPa). 泄压时注意反应器床层压降不超标（任一反应器总压降≯0.6MPa，任一床层≯0.3MPa）。 5、 The emergency relief valve shall be closed interlockingly and stops pressure relief after the pressure of reaction system has dropped below 0.07MPa. Keep the outlet of the circulating hydrogen compressor unimpeded for the nitrogen flow to replace the gas in the system. 反应系统压力降至0.07MPa以下后，紧急泄压阀应联锁关闭，停止泄压，导通循环氢压缩机出口氮气，置换系统。 6、 Confirm that the interlocks of F101 and the stop valves (UV14801 and UV14802) of the main nozzle are closed. Manually close the F101 gas flow control valve (FV14801) and close the rear hand valve on site. Switch off some pilot burners as appropriate.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	确认F101联锁，主火嘴切断阀UV14801、UV14802联锁关闭，手动关F101瓦斯流控阀FV14801，现场关后手阀。视情况关闭部分长明灯。 7、 Open the sublines (TV11601, TV11603 and TV11801) of temperature control valves as appropriate, lower the temperature of furnace inlet and pay close attention to the temperature changes of reactor beds. 根据情况开温控副线TV11601，TV11603，TV11801，降低炉入口温度，密切注意反应器各床层温度变化情况。 8、 Control the operation of reaction separation system. The accidents of high pressure channeling low pressure, full and empty liquid are strictly prohibited. Pay attention to the amount of C102 LP separated gas and the post-cooling temperature of A101 shall be kept at ≯60°C. 控制好反应分离系统操作，严禁高压窜低压及满、空液面发生，注意C102低分气量，控制A101冷后温度≯60℃。 9、 Confirm the interlocking shutdown of the reaction feed pump (P102) and the hydraulic turbine (ST101). Confirm that the outlet shutoff valve (UV11012) of P102 is closed and close the outlet control valve. Stop P101 and close the feed control valve of the tank farm and inform the tank farm to stop the raw material pump. Control D101 and D102 to make sure that the liquid levels of them don't reach the top or decrease to bottom. 确认反应进料泵P102及液力透平ST101联锁停机，确认P102出口切断阀UV11012关闭，关闭出口控制阀；停P101，关闭罐区来料控制阀,通知罐区停原料泵,控制好D101、D102液面不满、不空。 10、 Confirm that the water injection pump P103 is stopped, close the outlet shutoff valve of water injection pump and close the outlet control valve. 确认注水泵P103停泵，关注水泵出口切断阀，关闭出口控制阀。 11、 Confirm that the lean amine liquid pump P104 is stopped and its outlet shutoff valve is closed, and close its outlet control valve. Manually stop P105 and close its outlet control valve. 确认停贫胺液泵P104停泵出口切断阀关闭，关闭机泵出口控制阀；手动停止P105，关闭出口控制阀。	
Emergency treatment steps 应急处理步骤	Fractionation system: 分馏系统： 1、 Keep a stable liquid level and pressure of towers and vessels based on the oil return situations. 根据反应退油情况，控制各塔、容器液位、压力平稳。 2、 Stop product deliver. Stop the stripping steam of the stripper C201 and the bottom steam of the fractionator C204. 产品停止外送，停汽提塔 C201 汽提蒸汽及分馏塔 C204 底蒸汽。 3、 Keep the liquid level and pressure of C201 and C204 stable, redirect the circulating oil from D101 to C201 in due time and redirect it in a short fractionation circulation: C201→C204→C201. Keep the temperature of surplus tail oil under 80°C and discharge it out of the unit through the pipeline of heavy sump oil. 维持 C201、C204 液位、压力稳定，适时把循环油由 D101 改进 C201，改通分馏短循环： C201→C204→C201，多余尾油控制温度小于80℃，走不合格重污油线送出装置。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	4、 Try to ensure the backflow of each tower and control the overhead temperature. When the normal liquid level (around 50%) of each reflux tank can no be maintained, stop delivery first and stop the reflux pump until the overhead temperature dose not rise to ensure the liquid level of each reflux tank. Stop the overhead reflux pump (P-202) and delivery pump (P201) of the stripper and keep the liquid level of the reflux tank around 50%, according to the liquid level of the reflux tank (D201) of the stripper. 尽量保证各塔回流，控制好顶温，当各回流罐无法保证正常液面时（50%左右），先停止外送，塔顶温度不在升高，停回流泵，保证各回流罐的液位。根据汽提塔顶回流罐 D201 液位情况，停运汽提塔顶回流泵 P-202 及外送泵 P201，保持回流罐液位在 50%左右。 5、 The bottom liquid level of the absorber (C-202) shall be kept at 50%. Stop lean oil pump (P-204) as appropriate and close the control valve (FV-20801) by which the lean oil can flow into the absorber. 控制吸收塔 C-202 底液位 50%，视情况停贫油泵 P-204，关闭贫油进吸收塔控制阀 FV-20801。 6、Stop the operation of overhead reflux pump (P-208) and the oily water pump (P-209) according to the liquid and interface levels of the overhead reflux tank (D203) of the fractionator C204. 根据分馏塔 C204 顶回流罐 D203 液位及界位，停运分馏塔顶回流泵 P-208、含油水泵 P-209。 7、 Maintain the pressure of C201, C202 and C203. Close the pressure control valve PV20703 by which the dry gas can be discharged out of the unit. If the pressure of C-201 can not be guaranteed, supplement the pressure with nitrogen. C201、C202、C203 保压。关闭干气出装置压控阀 PV20703，如果 C-201 压力无法保证，氮气补压。 8、 Maintain the pressure of C205. Close the overhead pressure control valve PV21803 of the reflux tank D204 of the debutanizer. C205 保压。关闭脱丁烷塔回流罐 D204 顶部压控阀 PV21803。 9、 Keep the liquid level of the debutanizer C-205 stable. Close FV-21610 when the liquid level of the debutanizer C-205 is around 50%. Keep the liquid and interface levels of the reflux tank D204 around 50%. Stop the overhead pump P-212 of the debutanizer when the liquid level can not be maintained. 保持脱丁烷塔 C-205 液位稳定。当脱丁烷塔 C-205 液位在 50%左右，关闭 FV-21610。控制回流罐 D204 液位和界位 50%左右，当液位无法保持时，停脱丁烷塔顶泵 P-212。 10、 Maintain the pressure of C206. Close the pressure control valve PV22106 by which LPG is discharged out of the unit. C206 保压。关闭液化气出装置压控阀 PV22106。 11、 Stop feeding C203 and C206. Maintain the MDEA circulation for the desulfurizer and keep its liquid level stable. C203 和 C206 的进料切断，脱硫塔继续维持 MDEA 循环，控制平稳脱硫塔液位。 12、 Contact the dispatcher to redirect the naphtha product to the light sump oil pipeline through which it will be discharged out of the unit. Close the valves by which the acceptable products will flow out of the unit to the tank farm. Close the reforming battery limit	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	valves for direct supply. Control the bottom liquid level of light/heavy naphtha separator C-207. Stop the pump P-217 and close LV22306 when its liquid level can not be maintained. Stop the pump P-215 and close battery limit valve FV22703 by which the naphtha is discharged out of the unit when the liquid level of the reflux tank D-208 of C-207 can not be maintained. 联系调度将重石脑油产品改走轻污油线退出装置，关合格产品出装置去罐区阀和直供重整界区阀。控制轻重石脑油分离塔 C-207 底液位，无法保持液位时，停泵 P-217，关闭 LV22306；当 C-207 回流罐 D-208 液位无法保持时，停泵 P-215，关闭轻石脑油出装置界区阀 FV22703。	
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 During emergency shutdown of the unit, strictly prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，严防高压窜低压事故发生。 2、 In case that any problem occurs or the air separation or any big leakage occur to the circulating water pipeline of the system, implement emergency shutdown. 若因为空分装置出现问题或者系统循环水管线有大的泄漏，则按紧急停工处理。 3、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.3.11 Emergency disposal of 3.5MPa steam supply failure of 2.2 MMTPA hydrocracking unit (see Table 32)

220 万吨/年加氢裂化装置停 3.5MPa 蒸汽事故应急处理见表 32

Table 32Emergency disposal of 3.5MPa steam supply failure

表 32　停 3.5MPa 蒸汽事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	1、 The alarm for steam system accident is sounded and the DCS gives an alarm. 蒸汽系统事故警报响，DCS 报警。 2、 The rotating speed of K101 drops sharply until it stops rotating and the flow of circulating hydrogen drops sharply too. K101 转速骤降直至停运，循环氢流量骤降。 3、 Because of the interlocking actions of F101, the heating furnace is shut down. F101 联锁动作，加热炉熄火。 4、 The amount of cold hydrogen is reduced and the temperature of reactor bed is rising. 冷氢量减少，反应器床层温度上升。 5、 The 0.7MPa/min emergency pressure relief system starts automatically. 0.7MPa/min 紧急泄压系统自启动。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the production dispatcher, find out the reason of 3.5MPa steam supply failure, and initiate the emergency plan if the 3.5MPa steam supply cannot be restored in a short time. 联系调度，查明停 3.5MPa 蒸汽原因，若短时间无法恢复 3.5MPa 蒸汽，循环机停机应急预案处理。	On-duty operator 当班人员
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader and outdoor operator 班长、主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the emergency rescue to the safe isolation area or central control room. 组织现场与应急无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Alert 警戒	Test with the flammable gas alarm at site, establish a warning range based on the condition, arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，根据情况划定警戒范围并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	Reaction system: 反应系统： 1、 Stop the operation of K101, the 0.7MPa /min emergency pressure relief systems is automatically started, and confirm that the 0.7MPa /min emergency pressure relief valve is opened. Pay close attention to the temperature changes of the reactor bed. If the temperature of any point of the reactor bed exceeds the normal temperature 28°C or 454°C, or any point of the reactor wall exceeds 449°C, immediately relieve the pressure at the rate of 2.1MPa/min. K101 停运 0.7MPa /min 自启动，确认 0.7MPa /min 紧急泄压阀打开。要密切注意反应器床层温度的变化，若反应器床层任一点温度超过正常值 28℃或 454℃，或者反应器器壁温度任一点超过 449℃，2.1MPa/min 紧急泄压启动。 2、 The liquid levels of cold/hot HP separators can be manually controlled instead. Arrange specially-assigned personnel to lower the oil by transferring it to a LP separator to keep the liquid level of the HP separator normal. Meanwhile, pay attention to the pressure of the LP separator and strictly prevent high pressure channeling low pressure. Control the liquid levels of HP and LP separators to prevent full tanks and pressure cascade. In order to prevent the liquid level of HP separator from being excessively high during pressure relief process, open the liquid control valves in parallel of the HP separator to speed up oil discharge. 冷、热高分液面必要时可改手动控制，由专人负责缓慢向低分减油，保持高分正常液面，同时要注意低分的压力，严防串压。控制好高低分液位，防止满罐或串压。为了防止在泄压的过程中高分液位超高，打开高分的并联液控阀，加快排油速度。 3、 Close hand valve of each nozzle of F101, and close some pilot burners as appropriate. When the main nozzle of F-101 flames out, immediately close the main fuel gas regulating valve FV14801 and its subline valve, the front shutoff valve, all hand valves of the main nozzles in front of furnace, as well as the hand valves in front and behind PCV14801. F101 关各火嘴手阀，视情况关闭部分长明灯。F-101 主火嘴熄火，立即关闭主燃料气调节阀 FV14801 及副线阀和前截止阀并关闭全部炉前主火嘴手阀，关闭 PCV14801 前后手阀。 4、 Close inlet and outlet electric valves of K101 as appropriate. 视情况关 K101 进出口电动阀。 5、 Perform emergency shutdown on K102 and close its inlet and outlet electric valves. Maintain positive pressure within it for the commencement of work. K102 作紧急停机处理，关进出口阀。机体维持正压，等待开工。 6、 Manually close the temperature control valves (TV11336, TV114185, TV114183, TV114182, TV11503 and TV11504) of quenching hydrogen pumps (R101 and R102) instead.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	R101、R102 急冷氢温控阀 TV11336、TV114185、TV114183、TV114182、TV11503、TV11504 改手动关闭。 7、 Confirm the interlocking shutdown of P102 and ST101 and close LV-12105A. Close the outlet UV11012 of P102, the small flow rate control valve FV11015 and the feed regulating valve FV11803. Shut down P101 and close the material-feeding valve within the battery limit. 确认联锁停 P102、ST101，关 LV-12105A。P102 出口 UV11012 关，小流量控制阀 FV11015 和进料调节阀 FV11803 关。停 P101，关闭界区原料进装置阀。 8、 Interlockingly shut down water injection of P103 and close the outlet shutoff valve UV14505. Interlockingly shut down lean amine liquid of P104 and close the outlet shutoff valve UV12510. 联锁停注水 P103 及关出口切断阀 UV14505。联锁停贫胺液 P104，出口切断阀 UV12510 关。 9、 Know the time for restoring MP steam from the dispatcher. If it will take a long time, periodically open the low point for condensate discharge to avoid liquid in the main pipe. 向调度了解恢复中压蒸汽时间，如时间较长，定期打开低点排凝，避免总管中带液。	
Emergency treatment steps 应急处理步骤	Fractionation system: 分馏系统： 1、 Keep a stable liquid level and pressure of towers and vessels based on the oil return situations. 根据反应退油情况，控制各塔、容器液位、压力平稳。 2、 Stop product deliver. Stop the stripping steam of the stripper C201 and the bottom steam of the fractionator C204. and shut down electric heaters. 产品停止外送，停汽提塔 C201 汽提蒸汽及分馏塔 C204 底蒸汽及电加热器。 3、 Keep the liquid level and pressure of C-201 and C-204 stable, redirect the circulating oil from D101 to C201 in due time and redirect it in a short fractionation circulation: C201→C204→C201. Keep the temperature of surplus tail oil under 80°C and discharge it out of the unit through the pipeline of heavy sump oil. 维持 C-201、C-204 液位、压力稳定，适时把循环油由 D101 改进 C201，改通分馏短循环： C201→C204→C201，多余尾油控制温度小于 80℃，走不合格重污油线送出装置。 4、 Try to ensure the backflow of each tower and control the overhead temperature. When the normal liquid level of each reflux tank can not be maintained, stop the reflux pump to ensure the liquid level of each reflux tank. Stop the overhead reflux pump (P-202) and delivery pump (P201) of the stripper and keep the liquid level of the reflux tank around 50%, according to the liquid level of the reflux tank (D201) of the stripper. The bottom liquid level of the absorber (C-202) shall be kept at 50%. Stop lean oil pump (P-204) as appropriate and close the control valve (FV-20801) by which the lean oil can flow into the absorber. 尽量保证各塔回流，控制好顶温，当各回流罐无法保证正常液面时，停回流泵，保证各回流罐的液位。根据汽提塔顶回流罐 D201 液位情况，停运汽提塔顶回流泵 P-202 及外送泵 P201，保持回流罐液位在	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	50%左右。控制吸收塔 C-202 底液位 50%，视情况停贫油泵 P-204，关闭贫油进吸收塔控制阀 FV-20801。 5、Stop the operation of overhead reflux pump (P-208) and the oily water pump (P-209) according to the liquid level of the overhead reflux tank (D203) of the fractionator C204. 根据分馏塔 C204 顶回流罐 D203 液位，停运分馏塔顶回流泵 P-208、含油水泵 P-209。 6、 Maintain the pressure of C201, C202 and C203. Close the pressure control valve PV20703 by which the dry gas can be discharged out of the unit. If the pressure of C-201 can not be guaranteed, supplement the pressure with nitrogen. C201、C202、C203 保压。关闭干气出装置压控阀 PV20703，如果 C-201 压力无法保证，氮气补压。 7、 Maintain the pressure of C205. Close the overhead pressure control valve PV21803 of the reflux tank D204 of the debutanizer. C205 保压。关闭脱丁烷塔回流罐 D204 顶部压控阀 PV21803。 8、 Keep the liquid level of the debutanizer C-205 stable. Close FV-21610 when the liquid level of the debutanizer C-205 is around 50%. Keep the liquid and interface levels of the reflux tank D204 around 50%. Stop the overhead pump P-212 of the debutanizer when the liquid level can not be maintained. 保持脱丁烷塔 C-205 液位稳定。当脱丁烷塔 C-205 液位在 50%左右，关闭 FV-21610。控制回流罐 D204 液位和界位 50%左右，当液位无法保持时，停脱丁烷塔顶泵 P-212。 9、Maintain the pressure of C206. Close the pressure control valve PV22106 by which LPG is discharged out of the unit. C206 保压。关闭液化气出装置压控阀 PV22106。 10、 Stop feeding C203 and C206. Maintain the MDEA circulation for the desulfurizer and keep its liquid level stable. C203 和 C206 的进料切断，脱硫塔继续维持 MDEA 循环，控制平稳脱硫塔液位。 11、 Contact the dispatcher to redirect the naphtha product to the light sump oil pipeline through which it will be discharged out of the unit. Close the valves by which the acceptable products will flow out of the unit to the tank farm. Close the reforming battery limit valves for direct supply. Control the bottom liquid level of light/heavy naphtha separator C-207. Stop the pump P-217 and close LV22306 when its liquid level can not be maintained. Stop the pump P-215 and close battery limit valve FV22703 by which the naphtha is discharged out of the unit when the liquid level of the reflux tank D-208 of C-207 can not be maintained. 联系调度将重石脑油产品改走轻污油线退出装置，关合格产品出装置去罐区阀和直供重整界区阀。控制轻重石脑油分离塔 C-207 底液位，无法保持液位时，停泵 P-217，关闭 LV22306；当 C-207 回流罐 D-208 液位无法保持时，停泵 P-215，关闭轻石脑油出装置界区阀 FV22703。	
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Steps 步骤	Disposal 处　　置	
Attention 注　　意	1、 During emergency shutdown of the unit, strictly prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，严防高压窜低压事故发生。 2、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 3、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.3.12 Emergency disposal of leakage of sulfur-containing sewage of 2.2 MMTPA hydrocracking unit (see Table 33)

220 万吨/年加氢裂化装置含硫污水泄漏事故应急处理见表 33

Table 33Emergency disposal of leakage of sulfur-containing sewage

表 33　含硫污水泄漏应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	An alarm of H_2S alarm of the area containing sulfur is displayed on DCS. DCS画面显示含硫区H_2S报警仪报警； The main operator taking the post shall make judgment on H_2S leakage of the area containing sulfur. 岗位主操判断含硫区H_2S泄漏； Report to the team leader and ask the post holder to confirm it at site. There might be someone falling on the ground because of poisoning. 汇报班长；同时要求岗位人员现场确认；现场可能出现人员中毒昏	Main operator taking the post 岗位主操

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	倒。	
Confirm at site and report 现场确认、报告	The team leader and outdoor operator taking the post wear the air respirator and confirm at site. 班长、岗位外操佩戴空气呼吸器现场确认。 Report to the main control room that there is H_2S leakage, a large amount of H_2S exists in the environment, and someone falls on the ground due to poisoning. 向主控室报告：发现H_2S泄漏，周围环境中有大量H_2S，有人中毒倒地。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Take effective protective measures and cut off leakage sources. 作好防护措施，关断泄漏源。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995) and call 9120 for first aid. 火警（9119或者9995）报警，急救 9120 报警。	Team leader or main operator 班长或者主操
	Report to the emergency response center of the plant and department leader that there is H_2S leakage and someone falls on the ground. 向公司应急响应中心及部门领导报告H_2S泄漏，有人中毒倒地。	On-duty operator 当班人员
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel rescue 人员抢救	Wear the air respirator, move the poisoned person to a safe and open area, and give first aid. 戴空气呼吸器将中毒人员转移至安全空旷地带，并施行急救。	On-duty operator 当班人员
	Give first aid continuously (never give up) until professionals arrive. 持续进行急救(决不放弃)，直到专业人员到达。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel) to the safe isolation area along the upwind. 组织现场与抢险无关的人员(含施工人员)沿上风口向安全隔离区疏散。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	须撤离。	
Alert 警戒	Test with a H_2S detector and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携H_2S检测仪测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment procedure 应急处理程序	The emergency personnel at the site shall wear protective clothing, positive pressure type air respirators and other protective equipment. Spray water and steam towards leakage point by using water sources and steam near the leakage point to dilute and disperse the sulfur-containing sewage so as to avoid hydrogen sulfide poisoning. Cut off leakage point and reduce leakage. If the leakage can not be controlled still, perform emergency shutdown on the unit. 现场处理和抢险急救的人员佩戴防护服、正压式空气呼吸器等防护用品，利用泄漏点附近的水源、蒸汽对准泄漏点喷水和蒸汽，进行稀释和驱散，防止人员硫化氢中毒。切断泄漏点，减少泄漏量。仍无法控制泄漏，装置按紧急停工处理。 1、 Arrange the outdoor operator to confirm the leakage situation at site under the condition of self-protection according to the situation of alarm point displayed on DCS screen. 根据DCS上画面报警点情况，安排外操在做好自身防护前提下，去现场确认泄漏情况。 2、 A dangerous area (leakage and diffusion area)and a initial dangerous area shall be delimited according to the test report of hydrogen sulfide gas done by the outdoor operator. 根据外操对硫化氢气体的检测报告，划定危险区域（泄漏扩散区域）和初始危险区域。 3、Take self-protection measures and carry portable hydrogen sulfide detector to search for leakage points on site. 做好自身防护，带上便携式硫化氢检测仪寻找现场泄漏点。 4、 Contact with the team leader and report to him about the location of tested area and the concentration of this poisonous gas and wind directions. 与班长联系，报告检测区域位置和有毒气体浓度及风向。 5、 The team leader shall call the fire brigade (9119 or 9995) and dial the number of first aid (9120) to report about the specific leakage point, leakage medium and the amount of leakage, etc., and send someone to receive them at the intersection. 主操给消防队打电话（9119或者9995）急救电话（9120）汇报装置具体泄漏点，泄漏介质，泄漏量大小等，并派人到路口迎接。 6、 Manually adjust the opening of regulating valve in front and behind the leakage point and reduce the media flow towards the leakage point. 手动调整泄漏点前后调节阀开度，减少流向泄漏点的介质流量。 7、 Immediately cut off the pipeline through which the media flowing towards the leakage point or remove the control valve and	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	the level gage of the leakage point. 立即切断介质到泄漏点的管线，或切除泄漏的控制阀、液面计。 8、 If the leakage can not be controlled still, perform emergency shutdown on the unit as per the instruction from leaders. 如仍无法控制泄漏，听从领导指令，装置按紧急停工处理。	
Emergency treatment procedure 应急处理程序	Immediately perform rescue in case of poisoning. 如现场有人员中毒，立即进行抢救： 1、 Call the fire brigade (9119 or 9995) and dial the number of first aid (9120) to report hydrogen sulfide poisoning of our unit and send someone to receive them at the intersection. 2、 Arrange two people wearing positive pressure type air respirators and general protective clothing to arrive at site to rescue the poisoned. 给消防队打电话（9119或者9995）急救电话（9120），汇报我装置有人员硫化氢中毒，派人到路口迎接。2、两人戴好正压式空气呼吸器，穿一般防护服到现场抢救中毒人员。 2、 Take the poisoned person out of the contaminated area to where there is fresh air. Unbuckle the clothing and remove foreign matters in his/her oral cavity to keep breathing smooth. Prior to the arrival of medical workers, patients with mild symptoms should rest on their back to prevent toxic pulmonary edema induced by excessive movements. 将患者迅速脱离污染区，移至空气新鲜处，解开衣扣，清除口腔异物，保持呼吸通畅。急救医护人员到达前，症状较轻者平卧休息，以防活动太多诱发中毒性肺水肿。 3、 Determination of cardiac arrest: the cardiac arrest can be confirmed if the beating of carotid arteries or femoral arteries can not be felt in case of a sudden coma or seizure due to acute poisoning. In addition, mydriasis, respiratory arrest, no heart sounds from the precordium and deadly-pale face, all are typical features of cardiac arrest. 心脏跳停的确定：凡是急性中毒引起突然昏迷或惊厥，颈动脉或股动脉都摸不到搏动，心脏跳停即可确定。而瞳孔放大，呼吸停止，心前区又听不到心音及面色死灰更是典型的特征。 4、 In order to relieve respiration disorders, open his/her oral cavity to remove substances which will block his/her breathing, such as dirty things and false tooth. Press the part where the middle section of sternum is and the two-fingers away from the upper position of xiphoid with the lower part of your palm, and the other hand place on its hand back. Stretch your elbow joints and press the lower section of sternum forcibly for 3-5cm deepdown towards the spine with proper force resulting from your weight and the strength of back muscles. Loose the press after each press to restore the sternum to its original place and the heart to dilatation state. The time for pressing and relaxing shall be basically equal. The pressing rate of heart shall be 60 times/min and the rate of artificial respiration shall be 14-16 times/min with the each tidal volume of 800-1200ml. Consecutively blow air for four times for the first artificial respiration. The proportion of pressing and artificial respiration shall be 30:2 and the conduct them alternatively until the poisoned person is transferred to the hospital. 解除呼吸障碍，打开口腔，清理污物及假牙等阻碍呼吸的东西，以	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	一手掌根部按住病员胸骨中段，剑突上二指心脏位置处，另一手压在该手的手背上，肘关节伸直，依体重和背肌肉的力量，适度用力，有节奏地带有冲击性向脊柱方向压迫胸骨下段，下压3～5厘米，每次按压后随即放松，使胸骨复位，心脏舒张，按压与放松时间大致相等，心脏按压频率是60次/分，人工呼吸频率应为14～16次/分钟，每口吹气量应为800～1200毫升，第一次吹气时应连续吹四口气，按压与人工呼吸的比例是30:2按压与吹气交替进行，一直坚持送到医院为止。 5、 Assist the medical staff on site to quickly classify these patients according to their states and mark them to ensure the severely poisoned people can get treatment from medical staff. 协助到现场的医务人员对患者病情迅速将病员进行分类，作出相应的标志，以保证医护人员对危重伤员的救治。 6、Delimit a dangerous area and evacuate irrelevant personnel to a safe place. Inform the personnel from the dangerous area to quickly evacuate to a place of uptake. Forbid irrelevant personnel from entering the dangerous area and isolate this area until the gas dissipates. 划定危险区域，疏散无关人员到安全处。通知危险区域人员进行疏散并迅速撤离至上风处，禁止无关人员进入危险区，并隔离直至气体散尽。	
Emergency treatment procedure 应急处理程序	7、 The state of moving back to standby needs to meet three conditions: the leakage source is under complete control and stops leaking; the concentration of toxic gas is no longer harmful to personnel as indicated by the environment detection; personnel on site is transferred to a safe zone or to the hospital. 退守状态需要符合三个条件：泄漏源完全控制住，泄漏点停止泄漏；环境检测显示有毒气体浓度不再对人员构成伤害；现场伤员及时转移至安全地带或送往医院。	On-duty operator 当班人员
Field safety protection 现场安全防护	Make the fire fighting access and gas protection road smooth to ensure smooth traffic of rescue vehicles. 疏通消防、气防道路，保证救护车辆通行无阻。	On-duty operator 当班人员
	Block other roads within the impact area and inform irrelevant vehicles to change their routes. 封闭影响范围内的其他道路，通知无关车辆改道行驶。	On-duty operator 当班人员
Environmental disposal 环保处置	Block the floor drain for discharging oily sewage in the desulfurization area as well as the outlet of surrounding open trench. 将脱硫区去含油污水的地漏封堵起来，周围明沟出口封堵起来。	On-duty operator 当班人员
	Wash the ground and platform of leakage point with water and reduce and absorb H_2S. 用水冲洗泄漏点地面、平台，降低和吸收H_2S。	
	Contact with the HSE department and ask for disposing substances which may pollute the environment. 与HSE部门联系，请求处理现场可能造成环保污染的物质。	
Receive the rescue force	Arrange reception personnel at the entry of unit to receive personnel from the gas protection station and hospital.	On-duty operator

Steps 步骤	Disposal 处　　置	Person in charge 负责人
接应救援	在装置入口安排接应人员，迎接气防和医院人员。	当班人员
Recycling of leakage 泄漏物的回收	Collect pollutions in the open trench together with the professional disposal personnel to prevent them flowing into downstream units or the open trench outside the unit. 与专业处理人员一起，将明沟内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注意	1、 Wear air respirators in the possible poisoning area. Personnel for valve closing, recovery and leakage stoppage who contact with poisonous medium must wear protective clothes. 进入可能中毒区域戴空气呼吸器。接触有毒介质的关阀人员、回收人员和堵漏人员须穿防护服。 2、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 3、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 While giving an alarm, tell the leakage location, leakage medium, severity, casualties and fire condition. 报警时，须讲明泄漏地点、泄漏介质、严重程度、人员伤亡情况、有无火情。	

5.3.13 Emergency disposal of gas leakage of 2.2 MMTPA hydrocracking unit (see Table 34)

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Table 34Emergency disposal of gas leakage

表 34　瓦斯泄漏事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	1、 The combustible gas alarm near D202 and D303 give an alarm. D202、D303附近可燃气报警仪报警。 2、 There was a heavy gas odor near the leakage point on site. 现场泄漏点附近瓦斯味较重。 3、 There will be a puff of white smoke accompanied by a jarring sound if there is a lot of leakage. 如果大量泄漏会出现白烟并伴有刺耳声音。 4、 The gas flow (FT30301) and gas pressure (PV30301) are dropping. 瓦斯流量FT30301及瓦斯压力PV30301下降。	Indoor operator taking the accident disposal post 事故岗位内操

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	5、 The temperatures of F101 hearth and outlet are dropping. F101炉膛温度及出口温度下降。 Discover an alarm of DCS system, report to the team leader and ask the outdoor operator taking the post to wear the air respirator correctly and quickly for confirmation at site. 发现DCS 系统报警时：汇报班长，同时要求岗位外操正确、迅速佩戴好空气呼吸器现场确认。	Indoor operator taking the accident disposal post 事故岗位内操
Discover the abnormity 发现异常	After discovering the accident through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable flammable gas detector and go to the site for confirmation; and operators taking other posts shall move to a safe area to observe and report to the main control room at any time. 巡检发现，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式可燃气体检测仪前往确认；其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	The first leak finder 发现泄漏第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable flammable gas detector, go to the site for confirmation, and report to the main control room. 班长或岗位外操佩戴空气呼吸器并携带便携式可燃气体检测仪现场确认，向主控室报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Close automatic valves in front of and behind the leakage source remotely. 远程切断泄漏源前后的自控阀门。	On-duty operator 当班人员
	Close manual valves in front of and behind the leakage point (if possible). 切断泄漏点前后的手动阀门（若可能）。	On-duty operator 当班人员
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader 班长
	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长
Emergency treatment procedure 应急处理程序	1、 Arrange at least two outdoor operators to confirm the leakage point at site wearing protective equipment, such as protective clothing and air respirators, and explosion-proof objects and tools and report to the indoor operator and the team leader. 至少 2 名外操人员，穿防护服、戴空气呼吸器等防护用品，佩戴防爆物品、工具到现场确认漏点并给内操、班长汇报。 2、 The team leader shall report to the department leader and the dispatcher and call the fire brigade for alarm. 班长给部门领导及调度汇报，并给消防队打电话报火警。 3、 The indoor operator shall lower the temperature and	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	reduce the feeding flow of the heating furnace according to its state. 内操视加热炉情况，适当降温降量操作 4、 One operator to spray steam towards the leakage point to dilute and disperse the gas. Spray water mist to dilute and reduce the concentration of combustible gas to avoid fire and explosion after the arrival of fire fighters. 一人用蒸汽对准泄漏点喷蒸汽，进行稀释和驱散，待消防人员到达后，喷雾状水稀释降低可燃气体浓度，防止着火爆炸。 5、 The other operator shall immediately evacuate the operating personnel on site from the uptake and arrange warning lines for isolation. 另一人紧急疏散现场作业人员，从上风口撤离，并拉警戒绳隔离。 6、 If it is a valve that leaks, one operator shall shield with steam and the other shall immediately close the leaking valve. 如果是阀门泄漏，一人用蒸汽掩护，一人立即关闭泄漏阀门。 7、 If it is a pipeline that leaks, close the valves at its both ends and remove the pipeline. And shield with steam. 如果是管线泄漏，关闭该管线两端阀门，切除此管线。同时用蒸汽掩护。 8、 Prevent sudden leakage expanding, fire and explosion in the process of treatment. If there are symptoms of fire and explosion or fire suddenly bursts out during treatment, immediately arrange the rescuers to be evacuated from the dangerous area. 处理中要防止突然泄漏加大，并发生着火爆炸，若有发生火灾爆炸征兆或处理中突然发生火灾，应立即组织现场抢险人员撤离危险区。 9、Personnel for accident treatment and rescue shall perform rescue operations, such as process conversion, under the cover of fire fighters. 事故处理、抢险人员应在消防人员掩护下进行转换流程等抢险作业。 10、 The indoor operator shall properly lower the temperature and reduce the feeding flow if the leakage point can be handled in a short time. 如泄漏点短时间可以处理，内操则适当降温降量操作。 11、 If the leakage point is big and can not be handled in a long time, emergency shutdown shall be adopted for treatment. Ask leaders for instructions, close the main gas valve at the boundary of the unit, lower the temperature and reduce the feeding flow, implement emergency shutdown as per feeding interruption depending on the situation. 如果泄漏点较大，长时间无法处理，紧急停炉处理，请示领导，切断装置边界瓦斯总阀，装置降温降量，视情况按照进料中断停工处理。	
Personnel evacuati	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。	On-duty operator

Steps 步骤	Disposal 处　　置	Person in charge 负责人
on 人员疏散	The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	当班人员
Provide fire-fighting appliances and steam facilities 消防、蒸汽设施保障	Check whether the nearby fire water monitor, fire standpipe and fire hydrant can be used in case of emergency (use only when required, do not use in case of oil leakage and fire due to oil). 检查就近消防水炮、消防竖管、消防栓等设施是否能够紧急投用（只在需要时投用，油品泄漏、火灾禁用）。	On-duty operator 当班人员
	Purge with steam at nearby service point for shielding. 就近用服务点蒸汽在四周进行吹扫掩护	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector, establish a warning range, and arrange an obvious warning area mark. 携可燃气检测仪测试，划定警戒范围，设立明显警戒区域标识。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and back up the fire fighting truck, and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Attention 注意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Carry with special anti-explosion tools to the site for operation. 携带专用防爆工具进入现场作业。 3、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 4、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 5、 While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。 6、In case of leakage of LPG, isolate it to prevent poisoning of hydrogen sulfide and open fire at site. If the leakage is big, extinguish the hearth fire, dilute it with steam, keep the site wet, and close the road to prevent access of vehicles. 瓦斯泄漏要隔离，防止硫化氢中毒和现场出现明火，量大时灭炉，用蒸汽稀释，保持现场湿润环境，封路防止车辆经过。	

5.3.15 Emergency disposal of lack or interruption of fresh hydrogen of 2.2 MMTPA hydrocracking unit (see Table 36)

220 万吨/年加氢裂化装置新氢不足或中断事故应急处理见表 36

Table 36 Emergency disposal of lack or interruption of fresh hydrogen

表 36 新氢不足或中断事故应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	1、 The FI-13101 flow indication of fresh hydrogen unit quickly decreases to zero. 新氢进装置流量指示 FI-13101 迅速减小或回零。 2、 The system pressures (PI12109 and PIC12108) drop and the purity of circulating hydrogen decreases. 系统压力 PI12109 和 PIC12108 下降，循环氢纯度下降。 3、 The pressure PI13101 of the one-grade inlet of the knockout drum D111 drops sharply. 新氢一级入口分液罐 D111 压力 PI13101 迅速下降。 4、 The FI-13301 outlet flow indication of fresh hydrogen compressor quickly decreases to zero. 新氢压缩机出口流量指示 FI-13301 迅速减小或回零。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the dispatcher and find out the cause of fresh hydrogen interruption. 联系调度，查明新氢中断原因。	Main operator taking the post 岗位主操
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the emergency rescue to the safe isolation area or central control room. 组织现场与应急无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	
Alert 警戒	Test with the flammable gas alarm at site, establish a warning range based on the condition, arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，根据情况划定警戒范围并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	If the supply of fresh hydrogen is insufficient for the reaction system, the following steps shall be followed: 反应系统如果新氢供应不足，则按下述步骤处理: Reaction system: 反应系统： 1、 Lower the temperature and reduce the feeding flow of the unit. Adjust the temperature of catalyst beds (R101 and R102), lower the conversion rate and hydrogen consumption, and prevent the pressure from dropping. 装置降温降量。调整 R101、R102 催化剂床层温度，降低转化率，降低耗氢，防止压力下降。 2、 Reduce the feed quantity to balance it with the fresh hydrogen provided and to maintain the pressure of the reaction system. 降进料量，使其与提供的新氢平衡，维持对反应系统的压力。 3、 If there is any discharge of waste hydrogen, close the waste hydrogen drain valve FIC-12903. 如果有废氢排放，关闭废氢排放阀 FIC-12903。 4、 If the fresh hydrogen compressor K-102 is shut down, inform the outdoor operator to use a spare compressor to restore a normal hydrogen supply. 如果是新氢机K-102停机，则应通知外操立即启用备用压缩机，恢复正常供氢。 Fractionation system: 分馏系统： 1、 If the supply of fresh hydrogen is insufficient, correspondingly adjust the operation of towers, maintain their liquid levels and maintain product qualification as far as possible according to the reaction temperature, pressure and the changes of reaction conversion. 新氢供应不足，应根据反应温度、压力、反应转化率变化情况，相应调整塔的操作，保持各塔的液面，尽量维持产品合格。	On-duty operator 当班人员
	If the supply of fresh hydrogen is interrupted completely, the following steps shall be followed: 如果新氢全部中断，则按下列步骤处理： Reaction system: 反应系统： 1、 Shut down the heating furnace F101 and maintain the pilot burner. Properly open the subline TV11801 of E105, subline TV11601 of E101-E104 and subline TV11603 of E104/E102. Make sure that the outlet temperature of A101 shall not exceed 60°C and lower the inlet temperature of F101. Open the cold hydrogen lines to cool each bed, lower the temperature of CAT to 60°C (its normal value) and control the speed of cooling to avoid leakage due to	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	rapid temperature changes of the high pressure part. 加热炉 F101 熄火，保留长明灯；适当打开 E105 副线 TV11801、E101-E104 副线 TV11601 和 E104/E102 副线 TV11603，注意 A101 出口温度不超过 60℃，降低 F101 入口温度。开各路冷氢降低各床层的温度，降 CAT 低于正常值 60℃，控制合适的降温速度，避免高压部分温度变化过快造成泄漏。 2、 Shut down fresh hydrogen compressor K102 in case of complete interruption of fresh hydrogen. 新氢全部中断，停新氢机 K102。 3、 Shut down feed pumps (P102 and ST101) and guide the circulating hydrogen to purge the raw oil pipeline. 停进料泵 P102、ST101，引循环氢吹扫原料油管线。 4、 Maintain the normal operation of K101 to ensure the system circulation and cool the reactor to 260°C with maximum circulating hydrogen. 维持 K101 正常运转，保证系统循环，以最大量的循环气量冷却反应器至 260℃。 5、 Stop water injection of HP air cooler. 停止高压空冷注水。 6、 If the fresh hydrogen supply can not be restored in 8 hours, lower the temperature of reactor to 205°C (to maintain the circulation of hydrogen gas). Try to maintain the system pressure and wait for the fresh hydrogen restoration. Increase its temperature and pressure for restoring feed. 如果新氢在 8 小时内无法恢复，反应降温至 205℃（维持氢气循环）。尽可能维持系统压力，等待新氢恢复，升温升压恢复进料。 Fractionation system: 分馏系统： 1、 The fractionation system shall be subject to shutdown due to feed interruption if the fresh hydrogen is completely interrupted for a long time and the reactor shut off the feed. Redirect the fractionation systems (C201 and C204) to a short circulation and keep the liquid levels of each tower and vessel stable according to incoming oil of reactor. Redirect it to the unqualified line according to the situation. Stop the reflux pump when the normal liquid level of each reflux pump can not be assured. Keep the liquid level of each reflux tank stable, maintain the pressure of each fractionator and wait for the reactor to restore fresh hydrogen supply and feed. 如果是新氢长时间全部中断，反应切断进料，分馏系统按照切断进料停工处理。分馏系统 C201、C204 改短循环，根据反应来油情况，控制各塔、容器液位平稳。根据情况改不合格线，当各回流罐无法保证正常液面时，停回流泵，控制各回流罐的液位平稳，各分馏塔保压，等待反应恢复新氢和进料。 2、Stop feeding C203 and C206. Maintain the MDEA circulation for the desulfurizer and keep its liquid level stable. C203 和 C206 的进料切断，脱硫塔继续维持 MDEA 循环，控制平稳脱硫塔液位。	On-duty operator 当班人员
Field safety protection 现场安全防	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area.	On-duty operator

Steps 步骤	Disposal 处　　置	Person in charge 负责人
护	无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 During emergency shutdown of the unit, strictly prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，严防高压窜低压事故发生。 2、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 3、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.3.16 Emergency disposal of interruption of water injection of 2.2 MMTPA hydrocracking unit (see Table 37)

220 万吨/年加氢裂化装置注水中断事故应急处理见表 37

Table 37Emergency disposal of interruption of water injection

表 37　注水中断事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	1、 The low-low interlock of outlet flow FI14508A/B/C of HP water injection pump gives an alarm. The outlet shutoff valve UV14505 is closed and lights on the screen of DCS and SIS give alarms. 高压注水泵出口流量 FI14508A/B/C 低低联锁报警，出口切断阀 UV14505 关闭，DCS、SIS 灯屏报警。 2、 The water injection flow FI11906 of HP air cooler (A101) and water injection flow FIC12002 of LP air cooler (A102) drop to zero.	Main operator 主操

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	高压空冷 A101 注水流量 FI11906 和低压空冷 A102 注水流量 FIC12002 下降至零。 3、 The HP water injection pump is stopped and the DCS changes its color to give an alarm. 高压注水泵停泵，DCS 色变报警。	
Discover the abnormity 发现异常	4、 The interface levels of the cold HP separator D106 and the cold LP separator D107 drops rapidly. 冷高分 D106 和冷低分 D107 界面迅速下降。 5、 The outlet temperatures (TI12102 and TI12103) of HP air cooler A101 rise. 高压空冷 A101 出口温度 TI12102，TI12103 上升。 6、 The purity of circulating hydrogen decreases. 循环氢纯度下降。	Main operator 主操
Confirm at site and report 现场确认、报告	Find out the cause for the interruption of water injection. 查明注水中断原因。	On-duty operator 当班人员
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the emergency rescue to the safe isolation area or central control room. 组织现场与应急无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas alarm at site, establish a warning range based on the condition, arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，根据情况划定警戒范围并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment	Reaction system: 反应系统：	On-duty operator

Steps 步骤	Disposal 处　　置	Person in charge 负责人
steps 应急处理步骤	1、 Confirm the accident causes. 确认事故原因。 Confirm that the stop valve UV14505 is closed if the pump stoppage is due to failure. The main operator shall close the outlet valve FIC14507 to prepare for changing to a spare water injection pump. If the water injection is interrupted for a short time (no more than 3-4 hours), the normal production can be maintained. 若是注水泵故障停泵，确认切断阀 UV14505 是否关闭，主操关闭出口控制阀 FIC14507 做好切换注水备用泵准备。如果为短期停水(不超过 3～4 小时)，可维持正常生产。 2、 If there is sufficient fresh hydrogen, adjust PV12903 to discharge the waste hydrogen and supplement fresh hydrogen to maintain the purity of circulating hydrogen. 如果新氢量充足，调节 PV12903 排废氢，补充新氢尽可能维持循环氢纯度。 3、 Enhance the operation of C101 to remove hydrogen sulfide from circulating hydrogen so as to increase its purity. 加强对 C101 操作，尽可能脱出循环氢中硫化氢，以提高循环氢纯度。 4、 Increase the outlet temperature of reactor appropriately if the conversion rate drops due to reduced purity of circulating hydrogen. 循环氢纯度下降，将造成转化率的下降，适当提高反应器入口温度。 5、 Pay attention to the adjustment of outlet temperature of A101 and the liquid level of knockout drum at the inlet of circulating hydrogen. 注意调整 A101 出口温度，注意循环氢入口分液罐液位。 6、 If the water injection is stopped for a long time, the operator taking the reaction post shall cut off feeding. 如果注水长期中断，则反应岗位按照切断进料处理。 Fractionation system: 分馏系统： 1、 If the water injection is stopped for a short time, strengthen the operation of C201, try to remove the hydrogen sulfide diluted in the bottom oil, avoid disqualification caused by naphtha corrosion and maintain normal operation. 若为短期停注水。应加强 C201 操作，尽可能把塔底油溶解的硫化氢脱除，避免石脑油腐蚀不合格，维持正常操作。 2、 If the water injection is stopped for a long time, cut off reaction feeding. Redirect the fractionation systems (C201 and C204) to a short circulation, maintain the liquid level of the reflux tank of each overhead and each tower and keep the pressure of C201, C202, C203, C204, C205 and C206 stable. The MDEA system circulation shall be maintained for desulfurization unit and the liquid level of each desulfurizer shall be kept stable. 如果注水长期中断，按照切断反应进料处理。则分馏系统C201、C204改短循环，尽量维持各塔顶回流罐、各塔液面，C201、C202、C203、C204、C205和C206保压。脱硫单元维持MDEA系统的循环，控制平稳各脱硫塔液位。	当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 During emergency shutdown of the unit, strictly prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，严防高压窜低压事故发生。 2、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 3、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.3.17 Emergency disposal of interruption of reaction feed of 2.2 MMTPA hydrocracking unit (see Table 38)

220 万吨/年加氢裂化装置反应进料中断事故应急处理见表 38

Table 38Emergency disposal of interruption of reaction feed

表 38　反应进料中断事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity	1、 DCS and SIS give an alarm. DCS 和 SIS 报警。	Main operator

Steps 步骤	Disposal 处 置	Person in charge 负责人
发现异常		主操
Discover the abnormity 发现异常	2、 FIC11005 and FI11006A/B/C display value is reduced a lot or is back to zero. FIC11005，FI11006A/B/C 指示大幅度下降或回零。 3、 Temperature of R101 and R102 catalyst beds has an obvious rising trend. R101 和 R102 催化剂床层温度有明显上升趋势。 4、 D102 liquid level rises quickly. D102 液面迅速上升。 5、 A low-low flow FALL-11006 alarm of outlet of feeding pump P102 of reactor is given. 反应器进料泵 P102 出口流量低低 FALL-11006 报警。 6、 FIC11803 and FI11804A/B/C display value is reduced a lot or is back to zero. FIC11803，FI11804A/B/C 指示大幅度下降或回零。	Main operator 主操
Confirm at site and report 现场确认、报告	Contact the dispatcher and find the cause of feed interruption. 联系调度，查明进料中断原因。	Main operator 主操
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the emergency rescue to the safe isolation area or central control room. 组织现场与应急无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas alarm at site, establish a warning range based on the condition, arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，根据情况划定警戒范围并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	In case of feed interruption due to failure of feeding pump P102, start the standby pump. If the standby pump cannot be started in a short time, conduct the following steps: 如果因进料泵 P102 故障停运引起进料中断，必须立即启动备用泵，备用泵在短时间内不能启动的按下述步骤处理： Reaction system: 反应系统： 1、 In case of shutdown of feeding pump P102 due to failure, confirm that UV11012 at the outlet of interlocking pump and LV12105A to hydraulic turbine are closed. Close FV11803 and TV11801. 进料泵 P102 故障停，确认联锁泵出口 UV11012 关，去液力透平 LV12105A 关。关闭 FV11803 及 TV11801。 2、 Confirm that main fuel gas interlocking valves UV14801 and UV14802 of heating furnace F-101 of reaction feed are closed, manually close the fuel gas control valve FV14801, confirm at site, close the ventilation door and flue baffle, control the negative pressure of hearth, and prevent the pilot burner being extinguished. If all pilot burners are extinguished, close shutoff valves UV14803 and UV14804 of pilot burners, fully open the ventilation door and flue baffle of furnace F-101 after closing the master valve of pipeline of pilot burner, and completely replace and cool the hearth. 确认反应进料加热炉 F-101 主燃料气联锁阀 UV14801 和 UV14802 关闭，燃料气调节阀 FV14801 手动关闭，进行现场确认，关小风门及烟道挡板，控制好炉膛负压，防止长明灯熄灭。若长明灯全部熄灭，关闭长明灯切断阀 UV14803 和 UV14804，关闭长明灯管线总阀后，全开炉 F-101 的风门及烟道挡板，对炉膛进行彻底置换降温。 3、 Cool R101 and R102 to the temperature lower than the normal operation temperature of 28℃ quickly with quenching hydrogen and cool R102 first. 用急冷氢快速将 R101 和 R102 温度降至低于正常操作温度 28℃以下，优先冷却 R102。 4、 Circulate with the maximum amount of hydrogen and maintain the system pressure. 最大量氢气循环，保持系统压力。 5、 Ensure that the liquid level and interface level of all vessels and towers of reaction part are normal. 控制反应部分各容器及塔液位和界位正常。 6、 Close the pressure control valve PV12301A of the LP separated gas desulfurizer and open the pressure control valve PV12301B to the flare and control the pressure of C102 by using PV-12301B. 进低分气脱硫塔的压控阀 PV12301A 关闭，打开去火炬压控阀 PV12301B，用 PV-12301B 控制 C102 压力。 7、 If the raw material is processed for more than 10 days with catalyst, the temperature of all reactors is lower than the normal operation temperature and stable and the reaction feeding pump can be recovered in about 30 min, then start the pump, control the bed temperature stably, and adjust the unit to meet the normal operation condition. 如果催化剂加工原料已经超过 10 天，所有反应器温度低于正常操作	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	温度且稳定，反应进料泵可在 30 分钟左右恢复，那么启动泵，平稳的控制床层温度，然后将装置调至正常操作条件。 8、 During disposal of feed interruption, if the temperature of any reactor exceeds the normal operation temperature by 18℃, start the 0.7MPa/min unit for emptying and dispose as per the emergency pressure reduction procedure. Monitor the temperature of all reactors and catalysts closely. If any temperature exceeds the normal temperature by 28℃ or exceeds the design temperature of reactor, start the 2.1MPa/min unit immediately to release the pressure. 在进料中断处理中,任何反应器温度超过正常操作温度 18℃，则启动 0.7MPa/min 放空，按紧急降压程序处理。严密监测所有反应器和催化剂温度。如果任何温度超过正常温度 28℃，或超过反应器设计温度，立即启用 2.1MPa/min 的装置泄压。 9、 Strengthen the inspection, maintain normal operation of K101, cool the reactor to 260-300℃ with the maximum amount of circulating gas, and stop water injection when the reactor is cooled to 260℃. 加强检查，维持 K101 的正常运转，以最大量的循环气量冷却反应器至 260～300℃；当反应器冷却到 260℃时停止注水。 10、 Maintain the reactor temperature at 260-300℃, keep the system pressure and wait for feeding. 维持反应器 260～300℃，保持系统压力，等待进料。 11、 Change P101 to small-flow circulation and close the material-feeding valve within the battery limit. P101 改小流量循环，关闭界区原料进装置阀。 12、 Wash the pipeline, heat exchanger and materials in the reactor with circulating hydrogen. 用循环氢冲洗管线、换热器和反应器内的物料。 13、 If the raw material is processed for less than 10 days with catalyst, the feeding pump cannot be recovered in a long time or any temperature of the reactor exceeds the normal value, continue to cool the reactor to 150℃ and start work as per low-nitrogen oil. 如果催化剂加工原料时间少于10天或进料泵长时间不能恢复或反应器任一温度超过正常值，那么继续冷却反应器温度至150℃，按低氮油开工。	
Emergency treatment steps 应急处理步骤	Fractionation system: 分馏系统： 1、 Keep a stable liquid level of towers and vessels according to incoming oil of reactor. Redirect it to the unqualified line according to the situation. Stop the reflux pump when the normal liquid level of each reflux pump can not be assured. Keep the liquid level of each reflux tank stable, maintain the pressure of each fractionator and wait for the reactor to restore feed. 根据反应来油情况，控制各塔、容器液位平稳。根据情况改不合格线，当各回流罐无法保证正常液面时，停回流泵，控制各回流罐的液位平稳，各分馏塔保压，等待反应恢复进料。 2、 Short-time interruption of reaction feed: maintain the fractionation operation as far as possible to ensure the product quality.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	反应进料短时间中断：尽量维持分馏操作以保证产品质量合格。 3、 Long-time interruption of reaction feed: stop product delivery, stop the bottom steam supply of stripper C201 and fractionator C204 and stop the electric heater EH201. 反应长时间进料中断：产品停止外送，停汽提塔 C201 和分馏塔 C204 底蒸汽及电加热器 EH201。 4、 Keep the liquid level and pressure of C-201 and C-204 stable, change to a closed short cycle in time, control the temperature of residual tail oil below 80℃, and discharge the oil out of the unit through the pipeline of heavy sump oil. 维持 C-201、C-204 液位、压力稳定，适时改为闭路短循环，多余尾油控制温度小于 80℃，走不合格重污油线送出装置。 5、 Try to ensure the backflow of each tower and control the overhead temperature. When the normal liquid level of each reflux tank can not be maintained, stop the reflux pump to ensure the liquid level of each reflux tank. Stop the overhead reflux pump (P-202) and delivery pump (P201) of the stripper and keep the liquid level of the reflux tank around 50%, according to the liquid level of the reflux tank (D201) of the stripper. The bottom liquid level of the absorber (C-202) shall be kept at about 50%. Stop lean oil pump (P-204) as appropriate and close the control valve (FV-20801) by which the lean oil can flow into the absorber. 尽量保证各塔回流，控制好顶温，当各回流罐无法保证正常液面时，停回流泵，保证各回流罐的液位。根据汽提塔顶回流罐 D201 液位情况，停运汽提塔顶回流泵 P-202 及外送泵 P201，保持回流罐液位在 50%左右。控制吸收塔 C-202 底液位 50%左右，视情况停贫油泵 P-204，关闭贫油进吸收塔控制阀 FV-20801。 6、 Stop the operation of overhead reflux pump (P-208) and the condensate pump (P-209) according to the liquid level of the overhead reflux tank (D203) of the fractionator C204. 根据分馏塔 C204 顶回流罐 D203 液位，停运分馏塔顶回流泵 P-208、凝结水泵 P-209。 7、 Maintain the pressure of C201, C202 and C203. Close the pressure control valve PV20703 by which the dry gas can be discharged out of the unit. If the pressure of C-201 can not be guaranteed, supplement the pressure with nitrogen. C201、C202、C203 保压。关闭干气出装置压控阀 PV20703，如果 C-201 压力无法保证，氮气补压。 8、 Maintain the pressure of C205. Close the overhead pressure control valve PV21803 of the reflux tank D204 of the debutanizer. C205 保压。关闭脱丁烷塔回流罐 D204 顶部压控阀 PV21803。 9、 Keep the liquid level of bottom of the debutanizer C-205 stable. Close FV-21610 when the liquid level of bottom of the debutanizer C-205 is 50%. When the liquid level of D204 cannot be maintained, control the liquid level and interface level of reflux tank at 50% and stop the pump P-212. 保持脱丁烷塔 C-205 底液位稳定。当脱丁烷塔 C-205 底液位在 50%时，关闭 FV-21610。当 D204 液位无法保持时，控制回流罐液位和界位 50%，停泵 P-212。 10、 Maintain the pressure of C206. Close the pressure control valve PV22106 by which LPG is discharged out of the unit.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	C206 保压。关闭液化气出装置压控阀 PV22106。 11、 Stop feeding C203 and C206. Maintain the MDEA circulation for the desulfurizer and keep its liquid level stable. C203 和 C206 的进料切断，脱硫塔继续维持 MDEA 循环，控制平稳脱硫塔液位。 12、 Contact the dispatcher to redirect the naphtha product to the light sump oil pipeline through which it will be discarded out of the unit. Close the valves by which the acceptable products will flow out of the unit to the tank farm. Close the battery limit valves for direct supply to reformer. Control the bottom liquid level of light/heavy naphtha separator C-207. Stop the pump P-217 and close LV22306 when its liquid level can not be maintained. Stop the pump P-215 and close battery limit valve FV22703 by which the naphtha is discharged out of the unit when the liquid level of the reflux tank D-208 of C-207 can not be maintained. 联系调度将重石脑油产品改走轻污油线退出装置，关合格产品出装置去罐区界区阀和直供重整装置界区阀。控制轻重石脑油分离塔 C-207 底液位，无法保持液位时，停泵 P-217，关闭 LV22306；当 C-207 回流罐 D-208 液位无法保持时，停泵 P-215，关闭轻石脑油出装置界区阀 FV22703。	
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 During emergency shutdown of the unit, strictly prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，严防高压窜低压事故发生。 2、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 3、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.3.18 Emergency disposal of shutdown of circulating hydrogen compressor of 2.2 MMTPA hydrocracking unit (see Table 39)

220 万吨/年加氢裂化装置循环氢压缩机停机事故应急处理见表 39

Table 39 Emergency disposal of shutdown of circulating hydrogen compressor

表 39 循环氢压缩机停机事故应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	The central control room and field control instrument panel give an interlocking shutdown alarm and DCS and SIS systems give an alarm. 中控室和现场控制仪表盘停机联锁报警，DCS 和 SIS 系统报警。 The indication value of circulating gas flow and quenching hydrogen to the reactor is zero. 进反应器循环气流量和急冷氢指示无。 The rotate speed of circulator K101 is reduced sharply. The bed temperature of reactor increases quickly. 循环机 K101 转速急降。反应器各床层温度迅速上升。	Main operator 主操
Confirm at site and report 现场确认、报告	Contact the dispatcher to find the cause of shutdown of circulator. 联系调度，查明循环机停机原因。	Main operator 主操
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the emergency rescue to the safe isolation area or central control room. 组织现场与应急无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Alert 警戒	Test with the flammable gas alarm at site, establish a warning range based on the condition, arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，根据情况划定警戒范围并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	Reaction system: 反应系统： 1、 Open the 0.7MPa/min emergency pressure relief valve, extinguish the reaction heating furnace, maintain the pilot burner, confirm the interlocked action of 0.7MPa/min emergency pressure relief and furnace F101 shutdown. When the main nozzle of F-101 flames out, manually close the main fuel gas regulating valve FV14801 and its subline valve, the front shutoff valve, all hand valves of the main nozzles in front of furnace, as well as the hand valves in front and behind PCV14801. 0.7MPa/min紧急泄压阀联锁开启，反应加热炉联锁熄火，留长明灯，确认0.7MPa/min紧急泄压和F101停炉联锁动作。 F-101主火嘴熄火，手动关闭主燃料气调节阀FV14801及副线阀和前截止阀并关闭全部炉前主火嘴手阀，关闭PCV14801前后手阀。 2、 Find the cause of shutdown of circulating hydrogen compressor and restart K101 as soon as possible. 调查循环氢压缩机停车的原因，尽可能快的重启 K101。 3、 During pressure relief at 0.7MPa/min, observe all temperatures of the reactor and confirm whether the temperature is reduced or unchanged. If the bed temperature of reactor still increases obviously, start pressure relief at 2.1MPa/min immediately. During pressure relief, ensure the pressure drop of each bed is not high. Monitor and ensure that the pressure drop of any bed of R101 and R102 is not higher than 0.3MPa and that of the whole reactor is not higher than 0.6MPa. 0.7MPa/min 泄压开始后，观察所有的反应器温度，确认所有温度下降或不变。如果反应器床层温度仍继续明显上升，立即开启 2.1MPa/min 泄压。泄压时，须保证各床层压降不超高。监控 R101、R102 任一床层压降≯0.3MPa，整个反应器压降≯0.6MPa。 4、 Manually close the temperature control valves (TV11336, TV114185, TV114183, TV114182, TV11503 and TV11504) of quenching hydrogen pumps (R101 and R102) instead. R101、R102 急冷氢温控阀 TV11336、TV114185、TV114183、TV114182、TV11503、TV11504 改手动关闭。 5、 Confirm that P102 is stopped and LV-12105A and shutoff valve UV11012 at the outlet of P102 are closed, and close the small-flow control valve FV11015, feed control valve FV11803 and TV11801. 确认 P102 停、LV-12105A 关闭及 P102 出口切断阀 UV11012 关闭，关闭小流量控制阀 FV11015、进料控制阀 FV11803 及 TV11801。 6、 Shut down P101 and close the material-feeding control valve within the battery limit. 停 P101，关闭界区原料进装置控制阀。 7、 Confirm K102 is shut down and outlet shutoff valve UV13011 is closed.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	确认 K102 停机、出口切断阀 UV13011 关闭。 8、 Control the liquid levels of cold and hot HP and LP separators to prevent full tanks and pressure cascade. In order to prevent the liquid level of HP separator from being excessively high during pressure relief process, open the liquid control valves in parallel of the HP separator to speed up oil discharge. 控制好冷热高低分液位，防止满罐或窜压。为了防止在泄压的过程中高分液位超高，打开高分的并联液控阀，加快排油速度。 9、Confirm that the pump P103 is stopped and the outlet shutoff valve UV14505 is closed. Close the water injection control valve. 确认 P103 停泵及出口切断阀 UV14505 关闭，关闭注水控制阀。 10、 Confirm that the lean amine liquid pump P104 is stopped and outlet shutoff valve UV12510 for controlling high-pressure lean amine liquid to circulating hydrogen desulfurizer is closed. Close control valve FV12508. 确认贫胺液 P104 停泵、高压贫胺液至循环氢脱硫塔出口切断阀 UV12510 关闭，关闭控制阀 FV12508。 11、 Maintain the liquid level of circulating hydrogen desulfurizer C-101 and close LV-12603. 维持循环氢脱硫塔 C-101 液位，关闭 LV-12603。 12、 Close the pressure control valve PV12301A of the LP separated gas desulfurizer C102 and open the pressure control valve PV12301B to the flare and control the pressure by using PV-12301B. Keep the liquid level of C102 stable and stop pump P-105 or establish amine liquid circulation based on the actual condition. 将低分气脱硫塔 C102 的压控阀 PV12301A 关闭，打开去火炬压控阀 PV12301B，用 PV-12301B 控制压力。维持 C102 液位稳定，视情况停泵 P-105 或建立胺液循环。 13、 If the circulating hydrogen compressor cannot be recovered in a short time: 假如循环氢压缩机短时间恢复。 13.1 Start hydrogen circulation of compressor K101 for cooling (fully open the anti-surge valve). Establish hydrogen circulation of reaction system carefully (note that the hot HP separator shall not be full). When all bed temperatures is lower than the normal operation temperature by 28℃, close the emergency pressure relief valve UV12203. 启动 K101 压缩机氢气循环降温（防喘振阀全开）。小心建立反应系统的氢气循环（注意热高分不要满罐），当所有床层温度低于正常操作温度 28℃以下时，关闭紧急泄压阀 UV12203。 13.2 Control the bed temperature with cold hydrogen, control the liquid level of HP separator, recover the system pressure with a speed not higher than 1.5MPa/h, increase the temperature with a speed not higher than 8℃/h, and recover the feed. 用冷氢控制好床层温度，控制好高分液面，以不大于 1.5MPa/h 的升压速度，恢复系统压力，以不大于 8℃/h 的速度提温，恢复进料。 14、 If the circulating hydrogen compressor cannot be recovered in a long time: 假如循环氢压缩机长时间不能恢复。 14.1 When the unit pressure is equal to or lower than 1.0MPa,	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	introduce nitrogen of 2.5MPa, continue venting and cool the reaction system. Discharge residual oil in the heat exchanger and pipeline to the fractionation part. 当装置的压力达到或低于 1.0MPa 时，引入 2.5MPa 氮气，继续放空，反应系统降温。将换热器和管线内残余的油排至分馏部分。 14.2　Continue pressure relief to the flare until the unit pressure is lower than 0.7MPa (gauge pressure) and close the emergency pressure relief valve. Fill with nitrogen until the pressure is 1.0MPa, open 0.7MPa/min pressure relief valve to take away heat, and cool to a temperature below 260℃. 继续向火炬泄压至装置的压力小于 0.7 MPa(表压)，关闭紧急泄压阀。充氮气至 1.0MPa，开 0.7MPa/m in 泄压带走热量，反复降温至 260℃以下。 14.3　After confirming that the system temperature is lower than 260℃ and the bed temperature does not increase obviously, increase the pressure to 2.1MPa with nitrogen, wait for starting the circulator K-101, and resume production. Control the rotate speed of circulator while starting K101, pay attention to the liquid level of hot HP separator and increase the speed slowly if the liquid level increases quickly, so as to prevent the HP separator being full. After starting the circulator, increase the temperature and pressure of reaction system and resume production. 确认系统温度低于 260℃时，且床层温度无明显上升，用氮气升压到 2.1MPa， 等待启动循环机 K-101 恢复生产。K101 启动注意控制循环机转速，在逐步提转速的过程中，密切注意热高分液面，若上升较快，可慢提转速，防止高分满罐。循环机启动恢复正常后，反应系统升温升压恢复生产。 Fractionation system: 分馏系统： 1、 Keep a stable liquid level and pressure of towers and vessels based on the oil return situations. 根据反应退油情况，控制各塔、容器液位、压力平稳。 2、Stop product deliver. Stop the stripping steam of the stripper C201 and the bottom stripping steam of the fractionator C204, and shut down electric heater EH201. 产品停止外送，停汽提塔 C201 汽提蒸汽及分馏塔 C204 底汽提蒸汽及电加热器 EH201。 3、 Keep the liquid level and pressure of C-201 and C-204 stable, redirect the circulating oil from D101 to C201 in due time and redirect it in a short fractionation circulation: C201→C204→C201. Keep the temperature of surplus tail oil under 80°C and discharge it out of the unit through the pipeline of heavy sump oil. 维持 C-201、C-204 液位、压力稳定，适时把循环油由 D101 改进 C201，改通分馏短循环： C201→C204→C201，多余尾油控制温度小于 80℃，走不合格重污油线送出装置。 4、 Try to ensure the backflow of each tower and control the overhead temperature. When the normal liquid level of each reflux tank can not be maintained, stop the reflux pump to ensure the liquid level of each reflux tank. Stop the overhead reflux pump (P-202) and delivery pump (P201) of the stripper and keep the liquid level of the reflux tank around 50%, according to the liquid	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	level of the reflux tank (D201) of the stripper. The bottom liquid level of the absorber (C-202) shall be kept at 50%. Stop lean oil pump (P-204) as appropriate and close the control valve (FV-20801) by which the lean oil can flow into the absorber. 尽量保证各塔回流，控制好顶温，当各回流罐无法保证正常液面时，停回流泵，保证各回流罐的液位。根据汽提塔顶回流罐 D201 液位情况，停运汽提塔顶回流泵 P-202 及外送泵 P201，保持回流罐液位在 50%左右。控制吸收塔 C-202 底液位 50%，视情况停贫油泵 P-204，关闭贫油进吸收塔控制阀 FV-20801。 5、Stop the operation of overhead reflux pump (P-208) and the oily water pump (P-209) according to the liquid level of the overhead reflux tank (D203) of the fractionator C204. 根据分馏塔 C204 顶回流罐 D203 液位，停运分馏塔顶回流泵 P-208、含油水泵 P-209。 6、 Maintain the pressure of C201, C202 and C203. Close the pressure control valve PV20703 by which the dry gas can be discharged out of the unit. If the pressure of C-201 can not be guaranteed, supplement the pressure with nitrogen. C201、C202、C203 保压。关闭干气出装置压控阀 PV20703，如果 C-201 压力无法保证，氮气补压。 7、 Maintain the pressure of C205. Close the overhead pressure control valve PV21803 of the reflux tank D204 of the debutanizer. C205 保压。关闭脱丁烷塔回流罐 D204 顶部压控阀 PV21803。 8、 Keep the liquid level of the debutanizer C-205 stable. Close FV-21610 when the liquid level of the debutanizer C-205 is around 50%. Keep the liquid and interface levels of the reflux tank D204 around 50%. Stop the overhead pump P-212 of the debutanizer when the liquid level can not be maintained. 保持脱丁烷塔 C-205 液位稳定。当脱丁烷塔 C-205 液位在 50%左右，关闭 FV-21610。控制回流罐 D204 液位和界位 50%左右，当液位无法保持时，停脱丁烷塔顶泵 P-212。 9、 Maintain the pressure of C206. Close the pressure control valve PV22106 by which LPG is discharged out of the unit. C206 保压。关闭液化气出装置压控阀 PV22106。 10、 Stop feeding C203 and C206. Maintain the MDEA circulation for the desulfurizer and keep its liquid level stable. C203和C206的进料切断，脱硫塔继续维持MDEA循环，控制平稳脱硫塔液位 11、 Contact the dispatcher to redirect the naphtha product to the light sump oil pipeline through which it will be discarded out of the unit. Close the valves by which the acceptable products will flow out of the unit to the tank farm. Close the reforming battery limit valves for direct supply. Control the bottom liquid level of light/heavy naphtha separator C-207. Stop the pump P-217 and close LV22306 when its liquid level can not be maintained. Stop the pump P-215 and close battery limit valve FV22703 by which the naphtha is discharged out of the unit when the liquid level of the reflux tank D-208 of C-207 can not be maintained. 联系调度将重石脑油产品改走轻污油线退出装置，关合格产品出装置去罐区阀和直供重整界区阀。控制轻重石脑油分离塔C-207底液位，无法保持液位时，停泵P-217，关闭LV22306；当C-207回流罐	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	D-208液位无法保持时，停泵P-215，关闭轻石脑油出装置界区阀FV22703。	
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 During emergency shutdown of the unit, strictly prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，严防高压窜低压事故发生。 2、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 3、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.3.19 Emergency disposal of temperature runaway of reactor of 2.2 MMTPA hydrocracking unit (see Table 40)

220 万吨/年加氢裂化装置反应器飞温事故处理事故应急处理见表 40

Table 40Emergency disposal of temperature runaway of reactor

表 40　反应器飞温事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	The bed temperature of catalyst and surface temperature of reactor exceed the normal value by 28℃ and the indication value of temperature increases quickly. 催化剂床层温度及反应器表面温度超过正常值 28℃,温度指示值迅速上升 The temperature at any point of the reactor bed exceeds 454℃ and increases quickly. 反应器床层任意点温度超过 454℃且继续快速上升。 The outlet temperature of reactor increases quickly and cannot be controlled. 反应器出口温度迅速上升，且不受控制。	Main operator 主操
Confirm at site and report 现场确认、报告	Contact the dispatcher and find the cause of temperature runaway of reactor. 联系调度，查明反应器飞温的原因。	Main operator 主操
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the emergency rescue to the safe isolation area or central control room. 组织现场与应急无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas alarm at site, establish a warning range based on the condition, arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，根据情况划定警戒范围并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步	Reaction system: 反应系统： 1、 When the bed temperature of catalyst exceeds the required value and abnormal temperature rise occurs, reduce the reactor temperature to the normal value by immediately lowering the outlet temperature of furnace F101 and increasing the amount of	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
骤	quenching hydrogen. Open TV11801 of auxiliary line E105, TV11601 of auxiliary line E101-E104 and TV11603 of auxiliary line E102/E104 properly and reduce the inlet temperature of F101. 当催化剂床层超温出现异常温升时，立即用降低 F101 炉出口温度和加大急冷氢量来降低反应器温度到正常。适当打开 E105 副线 TV11801、E101-E104 副线 TV11601、E102/E104 副线 TV11603，降低 F101 入口温度。 2、 If the temperature at any point of the hydrocracking reactor bed exceeds the normal value by 18℃, manually initiate the 0.7MPa/min emergency pressure relief procedure and dispose as per the emergency pressure relief procedure. 如果裂化反应器床层任一点温度超过正常值 18℃，手动启动 0.7MPa/min 紧急泄压，按紧急泄压程序处理。 3、 Initiate the 0.7MPa/min emergency pressure relief procedure: cut off UV14801 and UV14802 of main fuel gas of reaction heating furnace F-101 and continue to maintain the pilot burner; stop the reaction feeding pump P-102 and close LV12105A; stop the fresh hydrogen compressor K102 and close UV13011; stop the HP lean amine pump P-104 and close UV12510; and stop the HP water injection pump P-103 and close UV14505. 0.7MPa/min 紧急泄压启动：联锁切断反应加热炉 F-101 主燃料气 UV14801 和 UV14802，长明灯继续保持；停反应进料泵 P-102，关闭 LV12105A；停新氢机 K102，关 UV13011；停高压贫胺泵 P-104，关 UV12510；停高压注水泵 P-103，关 UV14505 4、 If the temperature exceeds the normal value by 28° C or reaches the maximum allowable bed temperature of 454° C, initiate the 2.1MPa/min emergency pressure relief procedure and dispose as per the emergency shutdown procedure. The circulating hydrogen compressor shall be automatically shut down after the 2.1 MPa/min pressure relief system is started. Confirm that other relevant interlocking actions are operated normally. 如果温度继续上升超过正常值 28°C 或达到床层最高允许温度 454°C，则开启 2.1MPa/min 泄压，按紧急停工处理。启动 2.1 MPa/min 泄压系统后，循环氢压缩机将自动停车。确认其他相关联锁动作到位。 5、 Initiate the 2.1MPa/min pressure relief system and close the pressure relief valve only after the pressure is reduced to a value below 0.07MPa. 2.1MPa/min 泄压系统启用，泄压至 0.07MPa 以下才可关闭泄压阀。 6、 When the pressure of reaction part reaches 1.0MPa, discharge the residual oil in the heat exchanger and pipeline to the fractionator or sump oil system. 当反应部分压力达到 1.0 MPa，将换热器和管线内残余的油排至分馏塔或污油系统。 7、 Continue pressure relief to the flare until the pressure is lower than 0.07MPa. Purge the reaction part with nitrogen. Pressurize to at least 2.1MPa with nitrogen and initiate the circulating hydrogen compressor. 继续向火炬泄压至低于 0.07 MPa。用氮气吹扫反应部分。氮气充压 2.1MPa 以上，启动循环氢压缩机。 8、 Cool the reactor to 150℃ with circulating nitrogen.	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	用循环氮气将反应器冷却至 150℃。 9、 Relieve the pressure of unit, replace the unit and pressurize to the normal operation pressure with hydrogen. During pressurization, circulate hydrogen and control the reaction temperature not higher than 150℃. If the bed temperature at any point exceeds 175℃, monitor the temperature closely. 装置泄压置换，然后用氢气充压至正常操作压力，在充压期间氢气循环并将反应温度控制不超过 150℃。如果任何一点床层温度开始升至 175℃以上，严密监视温度。	
Emergency treatment steps 应急处理步骤	Fractionation system: 分馏系统： 1、Keep a stable liquid level of towers and vessels based on the oil return situations. 根据反应退油情况，控制各塔、容器液位平稳。 2、 Stop product deliver. Stop the bottom steam supply of the stripper C201 and fractionator C204 and shut down electric heater EH201. 产品停止外送，停汽提塔 C201 和分馏塔 C204 底蒸汽及电加热器 EH201。 3、 Keep the liquid level and pressure of C-201 and C-204 stable and change to a closed short cycle in time. Control the temperature of residual tail oil below 80℃ and discharge the oil out of the unit through the pipeline of heavy sump oil. 维持 C-201、C-204 液位、压力稳定，适时改为闭路短循环。流程，多余尾油控制温度小于 80℃，走不合格重污油线送出装置。 4、 Stop the overhead reflux pump (P-202) and delivery pump (P201) of the stripper and keep the liquid level of the reflux tank around 50%, according to the liquid level of the reflux tank (D201) of the stripper. The bottom liquid level of the absorber (C-202) shall be kept at about 50%. Stop lean oil pump (P-204) as appropriate and close the control valve (FV-20801) by which the lean oil can flow into the absorber. 根据汽提塔顶回流罐 D201 液位情况，停运汽提塔顶回流泵 P-202 及外送泵 P201，保持回流罐液位在 50%左右。控制吸收塔 C-202 底液位 50%左右，视情况停贫油泵 P-204，关闭贫油进吸收塔控制阀 FV-20801。 5、Stop the operation of overhead reflux pump (P-208) and the oily sewage pump (P-209) according to the liquid level of the overhead reflux tank (D203) of the fractionator C204. 根据分馏塔 C204 顶回流罐 D203 液位，停运分馏塔顶回流泵 P-208、含油污水泵 P-209。 6、 Maintain the pressure of C201, C202 and C203. Close the pressure control valve PV20703 by which the dry gas can be discharged out of the unit. If the pressure of C-201 can not be guaranteed, supplement the pressure with nitrogen. C201、C202、C203 保压。关闭干气出装置压控阀 PV20703，如果 C-201 压力无法保证，氮气补压。 7、 Maintain the pressure of C205. Close the overhead pressure control valve PV21803 of the reflux tank D204 of the debutanizer. C205 保压。关闭脱丁烷塔回流罐 D204 顶部压控阀 PV21803。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	8、 Keep the liquid level of the debutanizer C-205 stable. Close FV-21610 when the liquid level of the debutanizer C-205 is 50%. Keep the liquid and interface levels of the reflux tank D204 around 50%. Stop the overhead pump P-212 of the debutanizer. 保持脱丁烷塔 C-205 液位稳定，当脱丁烷塔 C-205 液位在 50%时，关闭 FV-21610；控制回流罐 D204 液位和界位 50%左右，停脱丁烷塔顶泵 P-212。 9、Maintain the pressure of C206. Close the pressure control valve PV22106 by which LPG is discharged out of the unit. C206 保压。关闭液化气出装置压控阀 PV22106。 10、 Stop feeding C203 and C206. Maintain the MDEA circulation for the desulfurizer and keep its liquid level stable. C203 和 C206 的进料切断，脱硫塔继续维持 MDEA 循环，控制平稳脱硫塔液位。 11、 Contact the dispatcher to redirect the naphtha product to the light sump oil pipeline through which it will be discarded out of the unit. Close the valves by which the acceptable products will flow out of the unit to the tank farm. Close the battery limit valves for direct supply to reformer. Control the bottom liquid level of light/heavy naphtha separator C-207. Stop the pump P-217 and close LV22306 when its liquid level can not be maintained. Stop the pump P-215 and close battery limit valve FV22703 by which the naphtha is discharged out of the unit when the liquid level of the reflux tank D-208 of C-207 can not be maintained. 联系调度将重石脑油产品改走轻污油线退出装置，关合格产品出装置去罐区界区阀和直供重整装置界区阀。控制轻重石脑油分离塔C-207底液位，无法保持液位时，停泵P-217，关闭LV22306；当C-207回流罐D-208液位无法保持时，停泵P-215，关闭轻石脑油出装置界区阀FV22703。	
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 During emergency shutdown of the unit, strictly prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，严防高压窜低压事故发生。 2、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	3、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.3.22 Emergency disposal of blank screen of DCS of 2.2 MMTPA hydrocracking unit (see Table 43)

220 万吨/年加氢裂化装置 DCS 黑屏见表 43

Table 43Emergency disposal of blank screen of DCS

表 43 DCS 黑屏应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	DCS is subject to blank screen and failure of refreshing of process data. DCS 屏幕发生黑屏、工艺数据不刷新等现象。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the dispatcher and instrument engineer, find the reason of blank screen, and initiate the emergency plan if power supply cannot be restored in a short time. 联系调度、仪表，查明黑屏原因，若短时间无法恢复电源供应，则启动应急方案。	Main operator taking the post 岗位主操
	Report to the team leader and on-duty operator of department immediately. 立即报告班长和部门值班人员。	
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	
Alert 警戒	Determine the warning area. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	1、 Disposal for blank screen or no response of screen of DCS: DCS 屏幕发生黑屏或屏幕不响应的处理： If DCS operation station is failed but it will not affect positioning of field valve, use another operation station to maintain operation. Or confirm whether the engineer station can operate. If so, monitor the unit operation. DCS 操作站死机，不影响现场阀门定位，可用另一台操作站维持操作。或者确认工程师站是否可以操作，若可以正常操作，则监控装置运行。 Contact DCS instrument operator to dispose quickly. If normal production cannot be maintained before recovering control, dispose as per emergency shutdown. 联系 DCS 仪表人员迅速处理。恢复控制以前，不能维持正常生产，则按紧急停工处理。 2、 Disposal for failure of refreshing of process data: 工艺数据不刷新的处理： Contact the instrument operator immediately for disposal. 立即联系仪表人员，由仪表人员进行处理。 The indoor operator may refer to relevant measurement points as per procedures and immediately ask the outdoor operator to observe the field instrument for monitoring, and maintain production. 内操可以根据流程，参考相关测点，并立即叫外操看现场仪表进行监控，维持生产。 If normal production cannot be maintained before recovering control, dispose as per emergency shutdown. 恢复控制以前，不能维持正常生产，则按紧急停工处理。	On-duty operator 当班人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	
Attention 注　　意	1、 During emergency shutdown of the unit, shut down safely within half an hour and prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，必须在半小时以内时装置安全停下来，同时严防高压串低压事故发生。 2、 In case of power failure of air separation/compression device and circulating water yard, dispose together with the hydrotreating unit and start the liquid nitrogen vaporizer especially. 空分空压和循环水场停电后，应和加氢装置同步安全处理，特别启动液氮汽化器。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of heavy oil smell, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在油气味较重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 During emergency shutdown of the unit and operation of heavy sump oil removal system, contact the dispatcher and storage and transportation department, use deodorization facilities timely and eliminate odor in the unit area. 装置紧急停工，外甩重污油系统时，要联系好调度和储运部，及时投用除臭设施，避免厂区产生恶臭。	

5.3.23 Emergency disposal of instantaneous power failure (electric-dazzling) of 2.2 MMTPA hydrocracking unit (see Table 44)

220 万吨/年加氢裂化装置瞬间电源故障(晃电)见表 44

Table 44Emergency disposal of instantaneous power failure (electric-dazzling) of unit

表 44　装置瞬间电源故障(晃电)应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	Most motors are provided with automatic restart function against instantaneous power failure. However, P102 and K102 cannot be started automatically and shall be started manually. In addition, these motors shall be started without load. It will take certain time to recover normal operation. Therefore, even instantaneous power failure may cause production interruption. 大部分电动机都设计有电源瞬间故障时能自动重新启动的功能，但是P102、K102 不能自动启动，故须人为启动，同时这些电动机要在无负荷下起动，恢复到正常运转还需有一定时间。因此，即使是瞬间电源故障，生产亦可能中断。	Main operator taking the post 岗位主操

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Confirm at site and report 现场确认、报告	Contact the dispatcher and electrician, find the reason of electric-dazzling, and initiate the emergency plan if power supply cannot be restored in a short time. 联系调度、电修，查明晃电原因，若短时间无法恢复电源供应，则启动应急方案。	On-duty operator 当班人员
	Report to the team leader and on-duty operator of department immediately. 立即报告班长和部门值班人员。	
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在响应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Determine the warning area. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	Reaction system: 反应系统： 1、 K101 lubricating oil pump is not stopped. Maintain K101 operation as far as possible and keep the reaction temperature stable. K101 润滑油泵没有停掉，尽量维持 K101 运行，保持反应温度稳定。 2、 If HP air cooler A101 is stopped, start A101 as soon as possible, ensure the normal inlet temperature of K101, and operate K101 for a long time to cool the system. 若高压空冷 A101 停，尽快启 A101，保证 K101 入口温度正常，尽可能长时间运转 K101 以冷却系统。 3、 In case of electric-dazzling and shutdown of the following rotating equipment, start timely. 若以下转动设备晃停及时启用。 3.1、 Start the feeding pump to recover feeding. 启动进料泵以恢复进料。 3.2、 Ignite the reaction heating furnace (after stopping of furnace). 反应加热炉点火（联锁停炉后）。 3.4、 Start the make-up hydrogen compressor.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	启动新氢压缩机。 3.5、 Start the overhead reflux pump and air cooler. 启动塔顶回流泵和空冷器。 3.6、 Start the product pump and air cooler. 启动各产品泵和空冷器。 3.7、 Start the water injection pump. 启动注水泵。 3.8、 Start the HP lean amine liquid pump. 启动高压贫胺液泵。 3.9、 Start other pumps and electrical equipment. 启动其他泵和电动设备。 4、 If the usage period of cracking catalyst is less than 10 days (for full feeding), do not feed again but conduct shutdown disposal. If the usage period is more than 10 days and the feeding pump can be restarted within 5min, feed again and increase the reactor temperature to the normal value gradually. 如果裂化催化剂使用期少于 10 天(全进料时)，不要重新进料而按停工处理。如果使用期在 10 天以上，且进料泵能在 5 分钟内重新开动起来，可考虑重新进料，逐渐把反应器温度升回到正常温度。	
	Fractionation system: 分馏系统： 1、 In case of production recovery for the reaction post, maintain normal operation. Pay attention to balance of liquid level of all towers and control the product quality. 如果反应岗位恢复生产，则维持正常操作。注意平衡各塔液位，控制好产品质量。 2、 Check whether all pumps (especially the tower bottom pump) are started. If not, contact relevant personnel timely and start manually (contact the electrician). 检查各泵(特别是塔底泵)是否自启动，不启动的及时联系,人为启动(联系电修)。 3、 In case of failure of production recovery for reaction post, dispose as per the plan of “reaction feed interruption”. 如果反应岗位不能恢复生产，则按“反应进料中断”方案处理。	
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Attention 注　　意	1、 During emergency shutdown of the unit, shut down safely within half an hour and prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，必须在半小时以内时装置安全停下来，同时严防高压串低压事故发生。 2、In case of power failure of air separation/compression device and circulating water yard, dispose together with the hydrotreating unit and start the liquid nitrogen vaporizer especially. 空分空压和循环水场停电后，应和加氢装置同步安全处理，特别启动液氮汽化器。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of heavy oil smell, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在油气味较重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 During emergency shutdown of the unit and operation of heavy sump oil removal system, contact the dispatcher and storage and transportation department, use deodorization facilities timely and eliminate odor in the unit area. 装置紧急停工，外甩重污油系统时，要联系好调度和储运部，及时投用除臭设施，避免厂区产生恶臭。	

5.4 Various accident scenes of 0.6 MMTPA LPG fractionation unit (1041)

60 万吨/年气体分馏装置（装置代号 1041）各类事故场景

5.4.1 Field emergency disposal of leakage of much LPG of 0.6 MMTPA LPG fractionation unit (see Table 45)

60 万吨/年气体分馏装置液化气大量泄漏人员现场应急处理见表 45

Table 45Emergency disposal of leakage of much LPG

表 45　液化气大量泄漏应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	1、 Discover an alarm of flammable gas detection system of DCS system, report to the team leader and ask the outdoor operator taking the post to wear the air respirator correctly and quickly for confirmation at site. 发现DCS系统可燃气检测系统报警时：汇报班长，同时要求岗位外操正确、迅速佩戴好空气呼吸器现场确认。 2、 There is white fog at the field leakage point. 现场泄漏点一片白雾。 3、 The pressure of equipment in the leakage area drops sharply. 泄漏区域设备压力急剧下降。	On-duty operator 当班人员
	After discovering the accident through routing inspection, report to the main control room immediately and correctly with an interphone. The operator taking the post shall return immediately, wear the air respirator quickly and correctly, carry with the portable flammable gas detector and go to the site for confirmation; and operators taking other posts shall move to a safe area to observe and report to the main control room at any time. 巡检发现，立即用对讲机向主控室准确报告，本岗位操作员应立即返回，正确、迅速佩带空气呼吸器并携带便携式可燃气体检测仪前往确认；其它岗位操作员应退至安全区域进行观察并随时向主控室报告。	The first leak finder 发现泄漏第一人
Confirm at site and report 现场确认、报告	The team leader or outdoor operator taking the post shall wear the air respirator, carry with the portable flammable gas detector, go to the site for confirmation, and report to the department leader. 班长或岗位外操佩戴空气呼吸器并携带便携式可燃气体检测仪现场确认，向部门领导报告。	Team leader, the first leak finder 班长、发现泄漏第一人
Cut off the leakage source 切断泄漏源	Close automatic valves in front of and behind the leakage source remotely. 远程切断泄漏源前后的自控阀门。	Indoor operator taking the accident disposal post 事故岗位内操
	Close manual valves in front of and behind the leakage point (if possible). 切断泄漏点前后的手动阀门（若可能）。	On-duty operator 当班人员
Take measures based on actual conditions 视情况采取措施	Stop the operation procedure when possible. Reroute or stop normal production locally. 在可能的情况下关闭作业流程。通过流程改线或局部终止正常生产操作。	On-duty operator 当班人员
	In case of no need to stop the operation procedure, reduce the system pressure of leakage part to eliminate leakage. 若不需要关闭作业流程，应采用降低泄漏部分系统压力的方法消除泄漏。	
	In case of high possibility of serious secondary accident, initiate the emergency feed cutting-off and shutdown procedure. 若极有可能发生严重恶性次生事故，启动紧急切进料停工程序。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Give an alarm 报警	Give a fire alarm (9119 or 9995). Call the first aid telephone (9120). 火警9119或者9995报警。急救9120报警。	Team leader 班长
	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader 班长
Ask to initiate the emergency procedure 请求启动应急程序	The team leader commands emergency rescue and asks irrelevant personnel and construction personnel to stop operation immediately and leave the site along the upwind direction. 由班长指挥开展应急抢险，请无关人员及施工人员立即停止作业沿上风向、离开装置现场。	Team leader 班长
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to rescue at site (including construction personnel). 组织现场与抢险无关的人员(含施工人员)疏散。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	1、 Report to the production dispatcher quickly and inform the on-duty operator of operation department, unit leader and relevant personnel of adjacent units; 迅速向生产调度汇报有关情况，及时通知运行部值班、装置领导及附近装置等相关人员； 2、 Conduct self-production, confirm the leakage point and quickly close the nearest valves at both ends connected to the leakage point; 做好自身防护，确定泄漏点，迅速关闭与泄漏点连通的两端最近阀门； 3、 The dangerous area is delimited with the leaking point as the center. Arrange the evacuation of personnel from the dangerous area and isolate the dangerous area. The radius of isolated area for a small leakage is 150m and the radius of isolated area for a big leakage is 300m; 根据检测数据划定泄漏点为中心的危险区域，安排疏散危险区域内人员，并做好隔离工作，小泄漏隔离150米，大泄漏隔离300米；	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	4、Quickly evacuate the personnel from the dangerous area to a place of uptake. Forbid irrelevant personnel from entering the dangerous area and isolate this area until the gas dissipates. Cut off the source of ignition and set up warning line around the unit; 迅速撤离危险区人员至上风处，禁止无关人员进入危险区，并隔离直至气体散尽，切断火源，装置四周拉警戒绳； 5、 Call 9119 or 9995 to seek firefighting support and gas control support. Tell the accident place, poisoning condition, cause and type of leakage while giving the alarm, so as to take corresponding measures. Ask the adjacent workshop to provide personnel protection and detection; 拨打“9119或者9995”寻求消防支援与气防救护。报警时应讲清事故的地点、是否有人中毒、起因及泄漏物种类，以便及时采取相应的措施；通知联系相邻车间做好人员防护及检测； 6、 Arrange personnel to receive the firefighting truck and ambulance and make telephone records. While the workshop leader arrives at the site, the team leader shall report the site condition to the workshop leader immediately and give the command right to the workshop leader; 安排员工迎接消防车和救护车，做好对外联系的电话记录，车间领导到达现场后，班长立即向车间领导汇报现场情况，交由车间领导指挥； 7、 After cutting off, dilute and remove LPG with much steam immediately, prevent LPG accumulation, and arrange specially-assigned personnel to guard at each intersection to prevent access of motor vehicles; 切断后立刻用大量蒸汽稀释、驱散液化气，防止聚集，并派专人在装置各路口把守，严防机动车驶入； 9、 Extract residual material in the equipment at the leakage point or discharge to the flare pipe network; 将泄漏点设备内的残留物料，尽快抽出或放火炬管网； 10、 Do not use any non-explosion-proof tools at site; 现场严禁使用非防爆工具； 11、If leakage cannot be controlled effectively, dispose as per emergency shutdown of unit. Cut off the power in the distribution room for all pumps. 若不能有效地控制泄漏，则应按装置紧急停工处理，各机泵均应在配电间断电。	On-duty operator 当班人员
Provide fire-fighting appliances and steam facilities 消防、蒸汽设施保障	Check whether the nearby fire water monitor, fire standpipe and fire hydrant can be used in case of emergency (use only when required, do not use in case of oil leakage and fire due to oil). 检查就近消防水炮、消防竖管、消防栓等设施是否能够紧急投用（只在需要时投用，油品泄漏、火灾禁用）。	On-duty operator 当班人员
	Purge with steam at nearby service point for shielding. 就近用服务点蒸汽在四周进行吹扫掩护	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Blocking and recycling of leakage 泄漏物的封堵与回收	Block through reducing or eliminating the pressure. 应采用降低压力、撤压等手段进行封堵。	On-duty operator 当班人员
Alert 警戒	Test with the flammable gas detector, establish a warning range, and arrange an obvious warning area mark. 携可燃气检测仪测试，划定警戒范围，设立明显警戒区域标识。	On-duty operator 当班人员
Receive the rescue force 接应救援	Open the fire fighting access and receive the fire fighting truck, gas protection vehicle and environmental monitoring vehicle and external emergency rescue force. 打开消防通道，接应消防、气防、环境监测等车辆及外部应急增援力量。	On-duty operator 当班人员
Environmental disposal 环境处理	Block the floor drain of LPG in the leakage area as well as the outlet of surrounding open trench. 将泄漏区液化气地漏封堵起来，周围明沟出口封堵起来。	On-duty operator 当班人员
	Purge the leakage area of LPG with steam and reduce the concentration of LPG in the environment. 用蒸汽吹扫液化气泄漏区域，降低环境中液化气浓度。	
	Contact with the HSE department and ask to dispose substances which may pollute the environment. 与HSE部联系，请求处理现场可能造成环保污染的物质。	
Attention 注意	1、 Wear the air respirator correctly while entering the area where poisoning may occur. 进入可能中毒区域要正确佩戴空气呼吸器。 2、 Carry with special anti-explosion tools to the site for operation. 携带专用防爆工具进入现场作业。 3、 Evacuate personnel to the emergency assembly point at the uptake as per the wind indicator, and count the number of personnel. 人员疏散应根据风向标指示，撤离至上风口的紧急集合点，并清点人数。 4、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场火源，切断临时用电电源。 5、 While giving an alarm, tell the leakage location, leakage medium, casualties and requirements of field protection. 报警时，须讲明泄漏地点、泄漏介质、人员伤亡情况，并说明要求现场防护。 6、In case of leakage of LPG, isolate it to prevent poisoning of hydrogen sulfide and open fire at site, extinguish the hearth fire, dilute with steam, keep the site wet, and close the road to prevent access of vehicles. 液化气泄漏要隔离，防止硫化氢中毒和现场出现明火，量大时灭炉，用蒸汽稀释，保持现场湿润环境，封路防止车辆经过。	

5.4.2 Emergency disposal of power failure of 0.6 MMTPA LPG fractionation unit (see Table 46)

60 万吨/年气体分馏装置停电事故应急处理见表 46

Table 46Emergency disposal of power failure

表 46 停电事故应急处置表

Steps 步骤	Disposal 处 置	Person in charge 负责人
Discover the abnormity 发现异常	1、 The lighting lamp is turned off and UPS is used. 照明灯熄灭，UPS 启用。 2、The indicator lamp is on when the accident alarm is sounded. 事故报警响，指示灯亮。 3、 Each pump is stopped; the noise is reduced suddenly; and each flow indicator is back to zero. 各机泵停运，噪音突降，各流量指示回零。 4、Liquid level of all vessels and towers are fluctuating. 各容器、塔液面波动。 5、Temperatures of all overheads and air cooler outlets have risen. 各塔顶、各空冷器出口温度升高。 6、 All parameters on the DCS give an audible and visual alarm and the pumps are stopped and discolored, etc. DCS 上各类参数声光报警，机泵停泵色变等。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the dispatcher, find the reason of power failure, and initiate the emergency plan if power supply cannot be restored in a short time. 联系调度，查明停电原因，若短时间无法恢复电源供应，则启动应急方案。 Report to the team leader and on-duty operator of department immediately. 立即报告班长和部门值班人员。	On-duty operator 当班人员
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	
Alert 警戒	Test at site with the combustible gas alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	1、 In case of power failure of the whole unit, shut down electricity-consuming equipment except the equipment connected to the emergency power generator (if any). The DCS still works because the DCS and SIS are connected with UPS power supply. The team leader shall ask each post holder to dispose the unit at site to the most safe state as per emergency shutdown procedures. 出现整个装置电力故障，除与紧急发电机相连的设备（如果有）其他用电设备将全部停止。DCS和SIS与UPS电源相连，DCS能继续工作。班长应协调各岗位到现场将装置按紧急停工步骤处理到最安全的状态。 2、 Immediately close temperature control valves of reboilers and preheaters E-101 and E-201 of each tower, let the temperature control valve E102 bypass, and cut off the heat source (manual control at site). 立即关闭各塔重沸器、E-101、E-201预热器的温控阀门，E102温控阀全部走旁路，切断热源（现场人工控制）。 3、Contact the supply unit and tank farm timely to cut off feed, stop delivery of unit product, close the feeding valve and discharge valve of each tower, and maintain the pressure and liquid level of each tower as per the field instrument. 及时联系供料装置及罐区，切断进料，装置产品停止外送，关闭各塔进料和出装置阀门，根据现场仪表，保持各塔压力和液位； 4、 Close the delivery valve at tower bottom and prevent light component from entering the next tower. 关闭各塔底输出线阀，防止轻组分带入下一个塔。 5、 Pay attention to the temperature and pressure of each tower and release the pressure to the fuel gas or flare pipe network in case of emergency. 密切注意各塔温度、压力，紧急情况下，则向燃料气或火炬管网排放泄压。 6、 Close the outlet valve of each pump immediately and press the pump stopping button at site. 第一时间关闭各泵出口阀，现场按停泵按钮。 7、 After stopping the pump, maintain the work as per the normal pump stopping procedure. 机泵停运后，维护工作按正常停泵程序进行。 8、 Check any abnormal leakage of the unit. 检查装置有无异常泄漏。	On-duty operator 当班人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 During emergency shutdown of the unit, shut down safely within half an hour and prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，必须在半小时以内时装置安全停下来，同时严防高压窜低压事故发生。 2、In case of power failure of air separation/compression device and circulating water yard, dispose as per emergency shutdown. 空分空压和循环水场停电后，按紧急停工处理。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.4.3 Emergency disposal of circulating water supply failure of 0.6 MMTPA LPG fractionation unit (see Table 47)

60 万吨/年气体分馏装置停循环水事故应急处理见表 47

Table 47Emergency disposal of circulating water supply failure

表 47　停循环水应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	The flow and pressure of circulating water drop. 循环水流量及压力下降。 The cooling water of pump is interrupted and bearing temperature increases. 机泵冷却水中断，轴承温度升高。 The cooling water of cooler and condenser is interrupted; the temperature after cooling increases; the tower pressure rises; and the temperature of product out of the unit increases. 各冷却器及冷凝器冷却水停，冷后温度升高，塔压上升，各产品出装置温度上升。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the dispatcher, find out the reason of circulating water supply failure, and initiate the emergency plan if the supply of circulating water cannot be restored in a short time. 联系调度，查明停循环水原因，若短时间无法恢复循环水供应，则启动应急方案。 The outdoor operator confirms the pressure of circulating water on site and reports it to the indoor main operator and the team leader immediately. 外操现场确认各冷却器循环水压力，立即报告室内主操和班长。	On-duty operator 当班人员
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test at site with the combustible gas alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	In case of circulating water supply failure for a short time: 若短时间停循环水则： 1、 Stop feeding each tower and change each tower to single circulation to maintain operation. 应停止各塔进料，各塔可改单塔循环维持操作； 2、Contact the supply unit and tank farm timely to cut off feed, stop delivery of unit product, close the feeding valve and discharge valve of each tower, and maintain the pressure and liquid level of each tower as per the field instrument. 及时联系供料装置及罐区，切断进料，装置产品停止外送，关闭各塔进料和出装置阀门，根据现场仪表，保持各塔压力和液位； 3、 Lower the bottom temperature of C-101, C-102, C-201, C-202, C-203 and C-301 properly, reduce feed of C102 and C202 properly, release pressure to the gas system while the pressure of reflux tank is high, and maintain operation. 适当降低C-101、C-102、C-201、C-202、C-203、C-301底温，适当降低C102、C202进料；回流罐压力高时向瓦斯系统泄压，维持操作；	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	4、 Maintain production on the premise that operation of each pump will not generate heat, connect a temporary water pipeline to spray and cool when necessary. 各机泵运转以不发热为前提维持生产，必要时接临时水线对泵体进行喷淋降温。 5、 Adjust the load of A101, A201, A202 and A301 and stabilize the tower pressure as far as possible. 调整A101、A201、A202、A301负荷，尽量稳定塔压。 In case of circulating water failure for a long time and heat generation from the pump, dispose the unit as per emergency shutdown. 若长时间停循环水，机泵发热，装置按紧急停工步骤处理。	On-duty operator 当班人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Attention 注　　意	1、During emergency shutdown of the unit, shut down safely within half an hour and prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，必须在半小时以内时装置安全停下来，同时严防高压窜低压事故发生。 2、 In case that any problem occurs or the air separation or any big leakage occur to the circulating water pipeline of the system, implement emergency shutdown. 若因为空分装置出现问题或者系统循环水管线出现大的泄漏，则按紧急停工处理。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.4.4 Emergency disposal of instrument air supply failure of 0.6 MMTPA LPG fractionation unit (see Table 48)

60 万吨/年气体分馏装置停仪表风事故应急处理见表 48

Table 48Emergency disposal of instrument air supply failure

表 48 停仪表风事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	1、 The instrument air pressure shows a low pressure alarm of instrument PI-40104. 仪表风压显示仪表 PI-40104 低压报警； 2、 Operation is out of control and each control valve is fully open or fully closed. 操作失控，各控制阀处于全开或全关状态。 3、 The FIQ-40104 flow indication of instrument air gradually decreases to zero. 仪表风流量指示 FIQ-40104 指示逐渐减小，直至为零。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the production dispatcher, find out the reason of instrument air supply failure, and initiate the emergency plan if the instrument air supply cannot be restored in a short time. 联系生产调度，查明停风原因，若短时间无法恢复供风，则启动应急方案。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	Report to the team leader and on-duty operator of department immediately. 立即报告班长和部门值班人员。	
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test at site with the combustible gas alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	The team leader shall coordinate with each post holder to arrive at site for emergency disposal as per emergency shutdown: 班长应协调各岗位到现场按紧急停工进行应急处理： 1、 Check each pneumatic valve timely and change to manual operation timely. 及时检查各气动阀动作情况，及时改手动操作； 2、 Control all air-to-open control valves with subline valve, control air-to-close control valves with upstream valve, and maintain normal production. 所有风开阀用副线阀控制，风关阀用上游阀控制，维持正常生产。 3、 Keep the temperature, pressure and liquid level of each tower normal and prevent over-temperature and over-pressure. 注意保持各塔的温度、压力、液面正常，严防超温超压。 4、 Dispose as per normal shutdown in case of air supply failure for a long time, cut off each heat source, contact each feeding unit to cut off feed, reduce the overhead reflux gradually as per the temperature in tower till stopping the pump, and close each bottom draw-off valve. 长时间停风按正常停工处理，切断各热源，联系各供料装置切断进料，视塔内温度逐步降低各塔顶回流量，直至停泵，最后关闭各塔底抽出阀；	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	5、 Maintain the pressure and liquid level of each tower and start work as per normal steps upon recovery of air supply. 维持各塔的压力、液位，等恢复送风后，按正常步骤开工。	
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、During emergency shutdown of the unit, shut down safely within half an hour and prevent the accident of high/low pressure cascade. 装置紧急停工整个过程，必须在半小时以内把装置安全停下来，同时严防高压窜低压事故发生。 2、 Perform emergency shutdown on the air separation unit in case any problem occurs to it. 若因空分装置出现问题，则按紧急停工处理。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.4.5 Emergency disposal of 0.5Mpa steam supply failure of 0.6 MMTPA LPG fractionation unit (see Table 49)

60 万吨/年气体分馏装置停 0.5MPa 蒸汽事故应急处理见表 49

Table 49Emergency disposal of 0.5MPa steam supply failure

表 49　停 0.5 MPa 蒸汽事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	The heat source of bottom reboiler of C-101 and C-201 is interrupted and the bottom temperature and pressure drop. C-101、C-201 底重沸器热源中断，塔底温度下降，压力下降。 The pressure gauge PI40201 gives a low pressure alarm of 0.5MPa steam to unit. 进装置 0.5MPa 蒸汽压力 PI40201 压力低报。 The flowmeter FIQ40201 gives a low flow alarm of 0.5MPa steam to unit. 进装置 0.5MPa 蒸汽流量 FIQ40201 流量低报。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the production dispatcher, find out the reason of steam supply failure, and initiate the emergency plan if the steam supply cannot be restored in a short time. 联系生产调度，查明停汽原因，若短时间无法恢复供汽，则启动应急方案。 Report to the team leader and on-duty operator of department immediately. 立即报告班长和部门值班人员。	On-duty operator 当班人员
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test at site with the combustible gas alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Emergency treatment steps 应急处理步骤	The team leader shall coordinate with each post holder to arrive at site for emergency disposal as per the emergency plan: 班长应协调各岗位到现场按应急预案进行应急处理； 1、 Reduce the feed and reflux of C-101 and C-201 properly. 适当降低C-101、C-201的进料及回流量； 2、 In case of steam supply failure for a short time, cut off the feed, reduce the circulation volume, maintain self-circulation of each tower, keep the bottom liquid level, and recover normal operation upon steam supply. 若短时间停汽，则可以切断进料，降低循环量，各塔维持自身循环，保持塔底液面，待来汽后恢复正常操作。 3、In case of steam supply failure for a long time, shut down as per normal shutdown steps: 若长时间停汽，则按正常停工步骤停工： 3.1 Close the control valve of bottom reboiler of C-101 and C-201 and reduce the bottom heat source of other towers gradually. 关闭C-101、C-201底重沸器控制阀；逐步降低其余各塔塔底热源； 3.2 Close the feed valve to cut off feed. 关闭进料阀，切断进料； 3.3 Close the delivery valve of overhead and bottom products. 关闭各塔顶、底产品外放阀； 3.4 Reduce the reflux of each tower gradually as per the tower pressure and liquid level of reflux tank till stopping reflux of each tower, and ask the outdoor operator to stop the pump. 根据塔压及回流罐液面情况，逐渐降低各塔回流量，直至停止各塔回流，通知外操停泵； 3.5 Close the overhead distillate valve, keep the pressure and temperature in the tower, prevent over-temperature and over-pressure, and start work as per the normal steps upon steam supply. 关闭塔顶馏出阀，保持塔内压力、温度，防止超温，超压，待来汽后按正常开工步骤开工。	On-duty operator 当班人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Attention 注　　意	1、 Conduct unit emergency disposal as per the emergency plan to prevent any secondary accident. 装置应急过程，要按照应急预案有条不紊进行，防止发生次生事故。 2、 In case of power problem, dispose as per normal shutdown procedure. 若动力出现问题，则按正常停工处理。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.4.6 Emergency disposal of hot water supply failure of 0.6 MMTPA LPG fractionation unit (see Table 50)

60 万吨/年气体分馏装置停热水事故应急处理见表 50

Table 50Emergency disposal of hot water supply failure

表 50　停热水事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	The feeding temperature of C-101 and C-201 decreases. C-101、C-201 进料温度降低。 The bottom temperature and pressure of C-102, C-202, C-203 and C-301 drop. C-102、C-202、C-203、C-301 底温下降，压力降低。 The indication value of pressure gauge PI40105 and flowmeter FIQ40105 of hot water to unit is reduced quickly. 进装置热水压力 PI40105、流量 FIQ40105 快速下降。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the production dispatcher, find out the reason of hot water supply failure, and initiate the emergency plan if the hot water supply cannot be restored in a short time. 联系生产调度，查明停热水原因，若短时间无法恢复供热水，则启动应急方案。 Report to the team leader and on-duty operator of department immediately. 立即报告班长和部门值班人员。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test at site with the combustible gas alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	The team leader shall coordinate with each post holder to arrive at site for emergency disposal as per the emergency plan: 班长应协调各岗位到现场按应急预案进行应急处理； Reduce the feed and reflux of C-102, C-203 and C-301 and reduce the disposal quantity of unit properly. 降低C-102、C-203、C-301的进料量及回流量，适当降低装置处理量； In case of hot water supply failure for a long time, dispose as per emergency shutdown procedure. 若长时间停热水，则按紧急停工处理。	On-duty operator 当班人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、Conduct unit emergency disposal as per the emergency plan to prevent any secondary accident. 装置应急过程，要按照应急预案有条不紊进行，防止发生次生事故。 2、 If hot water cannot be recovered for a long time, dispose as per emergency shutdown procedure. 若热水长时间无法恢复，则按紧急停工处理。 3、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 4、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 5、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.4.7 Emergency disposal of DCS failure of 0.6 MMTPA LPG fractionation unit (see Table 51)

60 万吨/年气体分馏装置 DCS 失效事故应急处理见表 51

Table 51Emergency disposal of DCS failure

表 51　DCS 失效事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	The instrument control circuit is failed but the screen image of DCS still displays. 仪表控制回路失灵，DCS 屏幕画面仍存在。 The screen image of DCS disappears suddenly but the control function is still normal and the power supply and lighting of unit is normal. DCS 屏幕画面突然消失，但控制功能仍存在，装置供电、照明正常。 The screen image of DCS disappears suddenly and the control function is unavailable but the power supply and lighting of unit is normal. DCS 屏幕画面突然消失，并失去控制功能，装置供电、照明正常。	Main operator taking the post 岗位主操

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Confirm at site and report 现场确认、报告	Contact the production dispatcher and tell the condition of DCS failure and ask the instrument operator immediately for disposal. 联系生产调度讲明 DCS 失效现象，并第一时间联系仪表人员处理 Immediately report to the team leader. 立即报告班长。	On-duty operator 当班人员
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用6301构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test at site with the combustible gas alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	Disposal for failure of DCS control circuit and no response of screen: DCS控制回路故障，屏幕不响应的处理： 1、 Contact the instrument operator to dispose quickly. 联系仪表人员到场迅速处理。 2、Closely monitor parameters such as pressure and liquid level of each tower and change the failed regulating valve to control by auxiliary line. 密切关注现场各塔压力、液面等参数，失灵调节阀可改副线控制。 3、 After removing the controller failure, recover the failed regulating valve to main line. 控制器故障排除后，将失灵调节阀改回正线。	On-duty operator 当班人员
	Disposal for blank screen of DCS and available control function: DCS黑屏，控制功能仍在的处理： 1、 Contact the instrument operator immediately for disposal and report to the operation department, production dispatcher and feeding department for preparation of emergency disposal; (2) Confirm the openness of each regulating valve at site is unchanged and the control function is still available.	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	立即联系仪表人员，由仪表人员进行处理，汇报作业部、生产调度及供料等有关单位做好应急准备；(2)检查现场各调节阀阀位开度保持不变，判断控制功能仍存在； 2、 Ask the outdoor operator to monitor with the pressure gauge, liquid level meter and thermometer at site, communicate with the main operator timely, and maintain production. 通知外操通过现场现场压力表、液面计、温度计，进行监控，及时和主操沟通，维持生产。 3、 If the computer of control console cannot display for a long time, dispose the unit as per emergency shutdown procedure. 若操作台计算机较长时间不能恢复显示，装置按紧急停工处理；	
	Disposal for sudden disappearing of screen image of DCS and unavailable control function: DCS屏幕画面突然消失，并失去控制功能的处理： 1、 Report to the operation department and production dispatcher and contact the instrument maintenance personnel immediately. 立即汇报作业部、生产调度等有关单位，联系仪表维修人员； 2、 Quickly check whether the field regulating valve is at fully open (pneumatic on-off valve) or fully closed (pneumatic on-off valve) and judge that DCS is failed and lose the control function. 迅速检查现场调节阀处于全开（气关阀）或全关（气开阀）状态，判断DCS系统失灵，失去控制功能； 3、 Conduct emergency shutdown as per the plan of instrument air supply failure. 按仪表风停预案，紧急停工处理。	
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop operations at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场事故，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Purge the leakage point and provide shield with steam once the leakage point is spotted. 若发现泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 Conduct unit emergency disposal as per the emergency plan to prevent any secondary accident. 装置应急过程，要按照应急预案有条不紊进行，防止发生次生事故。 2、 During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	3、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.4.8 Disposal plan of material pump failure of 0.6 MMTPA LPG fractionation unit (see Table 52)

60 万吨/年气体分馏装置原料泵故障事故处理预案见表 52

Table 52Emergency disposal of failure of material pump

表 52　原料泵故障事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	A large amount of leakage of the material pump P101A/B (P201A/B) has occurred, its bearings have frosted, its pump noise is big, the pump body is vibrating and the current declines. 原料泵 P101A/B（P201A/B）大量泄漏，轴承结霜，机泵噪声大，泵体振动，电流下降。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the production dispatcher and inform him/her that the material pump of the unit is abnormal and can not be started. 联系生产调度，装置原料泵异常无法启动	On-duty operator 当班人员
	Contact with the maintenance department and relevant departments in time. 及时联系维修部及有关单位	
	Report to the indoor and main operators of main control room and team leader immediately. 立即报告主控室内主操和班长。	
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301 构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用 6301 构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test at site with the combustible gas alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	The team leader shall coordinate with each post holder to arrive at site for emergency disposal as per emergency shutdown: 班长应协调各岗位到现场按紧急停工进行应急处理； 1、 Close the block valve at the inlet of P-101 (P-201) immediately. 立即关闭 P-101（P-201）入口切断阀。 2、 Immediately close (saturated LPG) material-feeding valve of the gas fractionation series I, maintain the normal production of another gas fractionation series and C-301 and timely adjust the operating load of C301. Close the valves at the inlet and outlet of the material pump P-101(P-201), maintain the normal pressure and liquid level of the tower and maintain the circulation within each tower. 应立即关闭气分一系列（饱和液化气）原料入装置阀，气分另一系列及 C-301 维持正常生产，及时调整 C301 操作负荷；关闭原料泵 P-101（P-201）出入口阀，尽量维持塔的正常压力液位，各塔维持自身循环。 3、Release the pressure of P-101 (P-201) immediately for safe disposal before overhaul and contact the bench worker for its emergency repair. 立即对 P-101（P-201）进行检修前的泄压安全处理；联系钳工紧急抢修 P-101（P-201）； 4、 Close the feed valve to cut off the feed and lower the temperature of heat source of each tower. 关闭进料阀，切断进料；降低各塔热源； 5、 Close the delivery valve of overhead and bottom products. 关闭各塔顶、底产品外放阀； 6、 Maintain the pressure and temperature of each tower to avoid over temperature and overpressure and maintain its circulation. 维持塔内压力、温度，防止超温，超压，保持各塔循环；	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	7、 Dilute the leaking LPG with steam immediately; 立即用蒸汽稀释泄漏出的液化气； 8、 The operation can be resumed as per the normal steps of operation after the material pump is repaired. 待原料泵修复好后，即可按照正常开工步骤恢复操作.	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop construction at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场施工，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Use the fire sprinkling system in time, purge and the leakage point and provide shield with steam timely. 及时投用泵区消防喷淋，泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 Emergency shutdown shall be adopted in the process of emergency disposal of unit. 装置应急过程，要按照紧急停工处理。 2、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 3、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

5.4.9 Disposal plan of material pump failure of 0.6 MMTPA LPG fractionation unit (see Table 52)

受限空间人员触电、中毒事故处理预案见表 53

Table 52Emergency disposal of failure of material pump

表 53　受限空间人员触电、中毒事故应急处置表

Steps 步骤	Disposal 处　　置	Person in charge 负责人
Discover the abnormity 发现异常	A large amount of leakage of the material pump P101A/B (P201A/B) has occurred, its bearings have frosted, its pump noise is big, the pump body is vibrating and the current declines. 监护人发现受限空间内有作业人员倒下。	Main operator taking the post 岗位主操
Confirm at site and report 现场确认、报告	Contact the production dispatcher and inform him/her that the material pump of the unit is abnormal and can not be started. 联系生产调度，装置原料泵异常无法启动	On-duty operator 当班人员
	Contact with the maintenance department and relevant departments in time. 及时联系维修部及有关单位	
	Report to the indoor and main operators of main control room and team leader immediately. 立即报告主控室内主操和班长。	
Give an alarm 报警	Report to the emergency response center of the plant and department leader. 向公司应急响应中心及部门领导报告。	Team leader or main operator 班长或主操
Initiate the emergency procedure 应急程序启动	Report to the emergency response center, issue action commands to professional action groups, and rush to the accident site for rescue coordination. 在向应急中心报告的同时，向各专业行动组下达行动指令，迅速赶赴事故现场进行抢险协调。	On-duty operator 当班人员
Personnel evacuation 人员疏散	Organize evacuation of personnel unrelated to the rescue to the safe isolation area or central control room. 组织现场与抢险无关的人员向安全隔离区疏散或集中到中控室。 The 6301 structure is a non-emergency refuge, and there are accidents such as fire, explosion, and hydrogen sulfide leakage. It is strictly forbidden to use the 6301 structure as a refuge. People inside the structure must be evacuated. 6301 构筑物是非紧急避难所，出现着火、爆炸、硫化氢泄漏等事故状态，严禁使用 6301 构筑物作为避难所使用。在构筑物内部人员必须撤离。	On-duty operator 当班人员
Alert 警戒	Test at site with the combustible gas alarm and establish a warning range. Arrange personnel at the periphery to keep a watch and prevent irrelevant personnel from entering. 携可燃气报警仪现场测试，划定警戒范围。并安排人员在外围警戒，防止人员无关人员进入。	On-duty operator 当班人员
Emergency treatment steps 应急处理步骤	The team leader shall coordinate with each post holder to arrive at site for emergency disposal as per emergency shutdown: 班长应协调各岗位到现场按紧急停工进行应急处理； 1、 Close the block valve at the inlet of P-101 (P-201) immediately. 立即关闭 P-101（P-201）入口切断阀。 2、 Immediately close (saturated LPG) material-feeding valve of the gas fractionation series I, maintain the normal production of another gas fractionation series and C-301 and timely adjust the operating load of C301. Close the valves at the inlet and outlet of	On-duty operator 当班人员

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	the material pump P-101(P-201), maintain the normal pressure and liquid level of the tower and maintain the circulation within each tower. 应立即关闭气分一系列（饱和液化气）原料入装置阀，气分另一系列及 C-301 维持正常生产，及时调整 C301 操作负荷；关闭原料泵 P-101（P-201）出入口阀，尽量维持塔的正常压力液位，各塔维持自身循环。 3、Release the pressure of P-101 (P-201) immediately for safe disposal before overhaul and contact the bench worker for its emergency repair. 立即对 P-101（P-201）进行检修前的泄压安全处理；联系钳工紧急抢修 P-101（P-201）； 4、 Close the feed valve to cut off the feed and lower the temperature of heat source of each tower. 关闭进料阀，切断进料；降低各塔热源； 5、 Close the delivery valve of overhead and bottom products. 关闭各塔顶、底产品外放阀； 6、Maintain the pressure and temperature of each tower to avoid over temperature and overpressure and maintain its circulation. 维持塔内压力、温度，防止超温，超压，保持各塔循环；	
Emergency treatment steps 应急处理步骤	7、 Dilute the leaking LPG with steam immediately; 立即用蒸汽稀释泄漏出的液化气； 8、 The operation can be resumed as per the normal steps of operation after the material pump is repaired. 待原料泵修复好后，即可按照正常开工步骤恢复操作.	On-duty operator 当班人员
Field safety protection 现场安全防护	Evacuate all irrelevant personnel in order, prevent fire and electrostatic spark particularly, establish a dangerous area immediately, stop construction at site, and prevent motor vehicles entering the dangerous area. 无关人员要有秩序地全部撤出，要特别注意防火、防静电火花，要立即划出危险区域，停止一切现场施工，禁止机动车辆进入危险区域。	On-duty operator 当班人员
	Use the fire sprinkling system in time, purge and the leakage point and provide shield with steam timely. 及时投用泵区消防喷淋，泄漏点应及时用蒸汽吹扫、掩护。	On-duty operator 当班人员
Receive the rescue force 接应救援	Arrange reception personnel at the intersection to receive fire fighting trucks into the unit and shield the fire fighting truck. 在装置路口安排接应人员，迎接消防车进入装置掩护。	On-duty operator 当班人员
Environmental disposal 环境处置	Collect pollutants in the unit such as wastes and waste water generated during rescue together with professional disposal personnel, and prevent these pollutants from flowing into the downstream unit or open trench outside the unit. 救援处置所产生的废弃物、废水与专业处理人员一起，将装置内污染物回收起来，严禁流入下游装置或进入装置外明沟。	On-duty operator 当班人员
Attention 注　　意	1、 Emergency shutdown shall be adopted in the process of emergency disposal of unit. 装置应急过程，要按照紧急停工处理。	

Steps 步骤	Disposal 处　　置	Person in charge 负责人
	2、During evacuation of construction personnel, check and shut off the on-site fire source and switch off the temporary power supply. 施工人员疏散时，应检查关闭现场的用火火源，切断临时用电电源。 3、 In case of severe leakage, do not start or stop all pumps at site. Open and close valves with copper tools and check and confirm that phones are turned off while entering the site. 在现场发生泄漏较严重时，严禁开、停现场各机泵，开关阀门时要使用铜制工具，进入现场前注意检查确认手机等要关机。 4、 Contact the dispatcher and the flare system in time in case of any abnormal discharge during the emergency shutdown of the unit. 装置紧急停工，若有异常排放，及时联系调度及火炬系统。	

6 Attachments

附录

6.1 Address book for emergency disposal

应急处置联络通讯录

6.1.1 Frequently used work number (see Table 53)

常用工作联系电话见表 53

Table 53Frequently used work number

表 53 常用工作联系电话

Series number 序号	Department/Bureau 单位/局	Contact number 联系电话	Contact Person 联系人
1	EIDPMO 文莱能源局	+673 8715261	Personnel on duty 值班人员
2	Bomba 文莱消防局	995	Personnel on duty 值班人员
3	MPA 文莱海事局	+673 2773088 2773099	Personnel on duty 值班人员
4	DEPR 文莱环保局	+673 2241262　2241290	Personnel on duty 值班人员

5	Polis 文莱警察局	993 or +673 2772253 993或 +673 2772253	Personnel on duty 值班人员
6	Royal brunei hospital 文莱皇家医院	+673 2242424	Personnel on duty 值班人员
7	NSCC National security coordination centre 文莱国家安全协调中心	+673	Personnel on duty 值班人员
8	Fire alarm office of the Company 公司火警	9119 and 9995 9119 和 9995	Personnel on duty 值班人员
9	First aid office of the Company 公司急救	9120	Personnel on duty 值班人员
10	Dispatching office of the Company (temporary) 公司调度（临时）	8170766 and 2610192 8170766 和 2610192	Personnel on duty 值班人员

6.2 Hazard information and emergency disposal principles of key hazardous chemicals referred in the accident (see Table 54 to Table 62)

事故所涉及的重点监管危险化学品危害信息、应急处置原则见表 54~表 62

Table 54Hazard information and emergency disposal principles of hazardous chemicals

表 54 危险化学品危害信息和应急处置原则

Material description 物质名称	Hydrogen sulfide 硫化氢	Main component 主要成份	H_2S	State under standard condition 标况下状态	Gas 气体
Density 密度 kg/m^3	1.19	Color 颜色	Colorless 无色	Boiling point 沸点 ℃	-60.4
Flash point 闪点	/	Spontaneous ignition point	/	Explosion limit 爆炸极性	4-46

℃		自燃点 ℃		(V/V)%	
Toxicity 毒性	Highly toxic 剧毒	Flammable and explosive 易燃易爆性	Extremely flammable 极易燃	Allowable concentration 允许浓度 mg/m^3	10

Hazard properties:
危险特性：

Combustion and explosion hazard: it is flammable and strong irritative and capable of forming an explosive mixture, causing combustion and explosion in the event of open fire and high temperature. It can react with concentrated nitric acid, fuming nitric acid or other strong oxidants violently, causing explosion. The gas is heavier than the air, can spread to remote places in low areas, and can be on fire and back-burn in the presence of a fire source.

燃爆危险：本品易燃，具强刺激性，与空气混合能形成爆炸性混合物，遇明火、高热能引起燃烧爆炸。与浓硝酸、发烟硝酸或其它强氧化剂剧烈反应，发生爆炸。气体比空气重，能在较低处扩散到相当远的地方，遇火源会着火回燃。

Environmental hazard: harmful to the environment, may cause pollution to water bodies and atmosphere.

环境危害：对环境有危害，对水体和大气可造成污染。

Health hazard:
健康危害：

It is a strong neurotoxic substance, and has a strong irritating effect on the mucous membranes. Acute poisoning: inhalation of high-concentration hydrogen sulfide in a short time will cause tears, ophthalmodynia, foreign body sensation in eyes, photaesthesia, blurred vision, running nose, burning heat sensation of throat, cough, chest tightness, headache, dizziness, weakness and clouding of consciousness. Some patients may suffer cardiac damages. The serious patient may suffer encephaledema and pulmonary edema. Extremely high concentration (above 1,000mg/m^3) will cause sudden coma, respiration and cardiac arrest in a few seconds and cause rapid death. Contact of eye conjunctiva with high concentration will cause edema and keratohelcosis. Long-term contact with low concentration will cause neurasthenia syndrome and vegetative nerve functional disturbance. Invasion way: inhalation.

本品是强烈的神经毒物，对粘膜有强烈刺激作用。急性中毒：短期内吸入高浓度硫化氢后出现流泪、眼痛、眼内异物感、畏光、视物模糊、流涕、咽喉部灼热感、咳嗽、胸闷、头痛、头晕、乏力、意识模糊等。部分患者可有心肌损害。重者可出现脑水肿、肺水肿。极高浓度(1000mg/m^{3}以上)时可在数秒钟内突然昏迷，呼吸和心跳骤停，发生闪电型死亡。高浓度接触眼结膜发生水肿和角膜溃疡。长期低浓度接触，引起神经衰弱综合征和植物神经功能紊乱。侵入途径：吸入。

Personal protection measures: protection for respiratory system: When the concentration is out of limits in the air, filtered gas masks shall be worn. It is suggested to wear oxygen respirators or air respirators in emergency rescue or evacuation. Eye protection: Wear safety protection glasses. Physical protection: Wear anti-static work clothes. Hand protection: Wear chemical gloves.

个体防护措施：呼吸系统防护: 空气中浓度超标时，佩戴过滤式防毒面具。紧急事态抢救或撤离时，建议佩戴氧气呼吸器或空气呼吸器。眼睛防护: 戴安全防护眼镜。身体防护: 穿防静电工作服。手防护: 戴防化学品手套。

Disposal method:
操作处理方法：

Operation shall be carried out in a rigorously airtight environment provided with fully local ventilation and comprehensive ventilation. Operators must receive special training and comply with operation specification strictly. It is suggested that the operator shall wear filtered gas mask, chemical safety protection glasses, anti-static work clothes and chemical gloves. Keep away from fire and heat source and strictly prohibit smoking in the workplace. Use anti-explosion ventilation system and equipment. Prevent gas from leaking into the workplace.

严加密闭，提供充分的局部排风和全面通风。操作人员必须经过专门培训，严格遵守操作规程。建议操作人员佩戴过滤式防毒面具，戴化学安全防护眼镜，穿防静电工作服，戴防化学品手套。远离火种、热源，工作场所严禁吸烟。使用防爆型的通风系统和设备。防止气体泄漏到工作场所。

Leakage treatment:
泄漏处理：

Rapidly evacuate personnel from the leakage contaminated area to upwind places, immediately isolate by 150m for minor leakage and 300m for large-scale leakage, and strictly restrict entry. Fire sources shall be cut off. It is suggested that emergency treatment personnel wear oxygen respirators and anti-static clothing. Enter the site from the upwind place. Leaking sources shall be promptly cut off. The leakage contaminated area shall be ventilated properly to accelerate spread. Spray water mist to dilute and dissolve. Leaking vessels can be reused after proper treatment, repair and inspection.

迅速撤离泄漏污染区人员至上风处，并立即进行隔离，小泄漏时隔离150m，大泄漏时隔离300m，严格限制出入。切断火源。建议应急处理人员戴氧气呼吸器，穿防静电工作服。从上风处进入现场。尽可能切断泄漏源。合理通风，加速扩散。喷雾状水稀释、溶解。漏气容器要妥善处理，修复、检验后再用。

Firefighting measures:
灭火措施：

Firefighters must wear full-body protective clothing, and extinguish a fire in the upwind direction. Air sources shall be cut off. If air source can not be cut off, it is not allowed to put out flame at the leaking point. Cool vessels by spraying water. Fire extinguishing agents: water spray, water-resistant foam and dry chemical powder.

消防人员必须穿全身防火防毒服，在上风向灭火。切断气源。若不能切断气源，则不允许熄灭泄漏处的火焰。喷水冷却容器。灭火剂：雾状水、抗溶性泡沫、干粉。

First aid measures:
急救措施：

Eye contact: thoroughly wash with a large amount of flowing water or normal saline for at least 15 min. Seek medical treatment.

眼睛接触：用大量流动清水或生理盐水彻底冲洗至少 15 分钟。就医。

Inhalation: quickly remove the sufferer from the scene to a place with fresh air, and keep the respiratory tract open. In case of respiratory arrest, conduct artificial respiration immediately until medical personnel arrive.

吸入：迅速脱离现场至空气新鲜处，保持呼吸道通畅。如呼吸停止，立即进行人口呼吸，直至医务救援人员赶到。

Table 55Hazard information and emergency disposal principles of hazardous chemicals

表 55 危险化学品危害信息和应急处置原则

Material description 物质名称	Liquefied petroleum gas 液化石油气	Main component 主要成份	Propane, propylene, butane and butene 丙烷、丙烯、丁烷、丁烯	State under standard condition 标况下状态	Gas 气体
Density 密度 g/cm^3	/	Color 颜色	Colorless 无色	Boiling point 沸点 ℃	/
Flash point 闪点 ℃	-74	Spontaneous ignition point 自燃点 ℃	426	Explosion limit 爆炸极性 (V/V)%	5-33
Toxicity 毒性	Toxic 有毒	Flammable and explosive 易燃易爆性	Extremely flammable and explosive 极易燃易爆	Allowable concentration 允许浓度 mg/m^3	100

Hazard properties:
危险特性：

It is extremely flammable and can mix with air to form an explosive mixture. It has risks of combustion and explosion in the presence of heat source and open fire. It can react with fluorine and chlorine violently. Its vapor is heavier than the air, can spread to remote places in low areas, and can be on fire and back-burn in the presence of a fire source.

极易燃，与空气混合能形成爆炸性混合物。遇热源和明火有燃烧爆炸的危险。与氟、氯等接触会发生剧烈的化学反应。其蒸气比空气重，能在较低处扩散到相当远的地方，遇火源会着火回燃。

Health hazard:
健康危害：

The chemical has anesthetic effects. Acute poisoning will cause dizziness, headache, excitement or sleepiness, nausea, vomit and moderate pulse, etc.; the severely poisoned persons may suddenly fall, have urinary incontinence, lose consciousness, or even stop breathing. The skin can be frostbitten. Chronic effects: long-term contact with low concentration will cause headache, dizziness, poor sleepiness, fatigue, unstable emotion and vegetative nerve functional disturbance.

本品有麻醉作用。急性中毒：有头晕、头痛、兴奋或嗜睡、恶心、呕吐、脉缓等；重症者可突然倒下，尿失禁，意识丧失，甚至呼吸停止。可致皮肤冻伤。慢性影响：长期接触低浓度者，可出现头痛、头晕、睡眠不佳、易疲劳、情绪不稳以及植物神经功能紊乱等。

Invasion way: inhalation.

侵入途径：吸入。

Personal protection measures:
个体防护措施：

Protection for respiratory system: It is suggested to wear filtered gas masks in high-concentration environment.

呼吸系统防护: 高浓度环境中，建议佩戴过滤式防毒面具。

Eye protection: special protection is not necessary generally, and safety protection glasses must be worn when in contact with high concentration.

眼睛防护: 一般不需要特殊防护，高浓度接触时可戴安全防护眼镜。

Physical protection: Wear anti-static work clothes. Hand protection: Wear general protective gloves.

身体防护: 穿防静电工作服。手防护: 戴一般作业防护手套。

Disposal method:
操作处理方法：

Operate in an enclosed and well-ventilated environment. Good natural ventilation conditions shall be provided in enclosed operation. Operators must receive special training and comply with operation specification strictly. It is suggested that operators wear filtered gas masks and anti-static work clothes. Keep away from fire and heat source and strictly prohibit smoking in the workplace. Use anti-explosion ventilation system and equipment. Prevent gas from leaking into air in the workplace. When transmitting, steel cylinder and vessels need grounding and bridging to prevent static electricity. Load and unload lightly to prevent breakage of steel cylinder and accessories. The fire-fighting appliances with corresponding quantities shall be provided.

密闭操作，全面通风。密闭操作，提供良好的自然通风条件。操作人员必须经过专门培训，严格遵守操作规程。建议操作人员佩戴过滤式防毒面具，穿防静电工作服。远离火种、热源，工作场所严禁吸烟。使用防爆型的通风系统和设备。防止气体泄漏到工作场所空气中。在传送过程中，钢瓶和容器必须接地和跨接，防止产生静电。搬运时轻装轻卸，防止钢瓶及附件破损。配备相应品种和数量的消防器材。

Leakage treatment:
泄漏处理：

Personnel shall be quickly evacuated from the leakage contaminated area to upwind places, and then the leakage contaminated area shall be isolated, and its access shall be strictly prohibited. Fire sources shall be cut off. It is suggested that emergency treatment personnel wear oxygen respirators and anti-static clothing. Direct exposure to leakage is strictly prohibited. Leaking sources shall be promptly cut off. The leakage contaminated area shall be ventilated properly to accelerate spread. Spray water mist to dilute. Leaking vessels can be reused after proper treatment, repair and inspection.

迅速撤离泄漏污染区人员至上风处，并进行隔离，严格限制出入。切断火源。建议应急处理人员戴氧气呼吸器，穿防静电工作服。不要直接接触泄漏物。尽可能切断泄漏源。合理通风，加速扩散。喷雾状水稀释。漏气容器要妥善处理，修复、检验后再用。

Firefighting measures:
灭火措施：

Air sources shall be cut off. If air source can not be cut off, it is not allowed to put out flame at the leaking point. Cool vessels by spraying water. Fire extinguishing agents: water spray, foam and carbon dioxide.

切断气源。若不能切断气源，则不允许熄灭泄漏处的火焰。喷水冷却容器。灭火剂：雾状水、泡沫、二氧化碳。

First aid measures:
急救措施：

Skin contact: If frostbitten, seek medical treatment.

皮肤接触: 若有冻伤，就医治疗。

Inhalation: quickly remove the sufferer from the scene to a place with fresh air, and keep the respiratory tract open. In case of respiratory arrest, conduct artificial respiration immediately until medical personnel arrive.

吸入: 迅速脱离现场至空气新鲜处，保持呼吸道通畅。如呼吸停止，立即进行人口呼吸，直至医务救援人员赶到。

Table 56Hazard information and emergency disposal principles of hazardous chemicals

表 56 危险化学品危害信息和应急处置原则

Material description 物质名称	Dry gas 干气	Main component 主要成份	H_2, CH_4 H_2、CH_4	State under standard condition 标况下状态	Gas 气体
Density 密度 g/cm³	/	Color 颜色	Colorless 无色	Boiling point 沸点 ℃	/
Flash point 闪点 ℃	/	Spontaneous ignition point 自燃点 ℃	/	Explosion limit 爆炸极性 (V/V)%	4.1-74.1
Toxicity 毒性	Non-toxic 无毒	Flammable and explosive 易燃易爆性	Extremely flammable 极易燃	Allowable concentration 允许浓度 mg/m³	/
Hazard properties: 危险特性： It can mix with air to form an explosive mixture and cause an explosion in the presence of heat or open fire. 与空气混合能形成爆炸性混合物，遇热或明火即爆炸。					
Health hazard: 健康危害： The chemical is basically non-toxic to humans and only has simple suffocation effects. Invasion way: inhalation. 本品对人基本无毒，只有单纯性的窒息作用。侵入途径：吸入。					
Personal protection measures: 个体防护措施： Protection for respiratory system: special protection is not necessary generally, and personnel must wear oxygen (air) respirators when in contact with high concentration. 呼吸系统防护: 一般不需要特殊防护，高浓度接触时可佩戴氧气(空气)呼吸器。 Eye protection: Special protection is not necessary generally. Physical protection: Wear anti-static work clothes. 眼睛防护: 一般不需特殊防护。身体防护: 穿防静电工作服。 Hand protection: Wear general protective gloves. 手防护: 戴一般作业防护手套。					

Disposal method: 操作处理方法： Operate in an enclosed environment and strengthen ventilation. Operators must receive special training and comply with operation specification strictly. It is suggested that operators wear anti-static work clothes. Keep away from fire and heat source and strictly prohibit smoking in the workplace. Use anti-explosion ventilation system and equipment. Prevent gas from leaking into air in the workplace. When transmitting, steel cylinder and vessels need grounding and bridging to prevent static electricity. Load and unload lightly to prevent breakage of steel cylinder and accessories. The fire-fighting appliances with corresponding quantities shall be provided. 密闭操作，加强通风。操作人员必须经过专门培训，严格遵守操作规程。建议操作人员穿防静电工作服。远离火种、热源，工作场所严禁吸烟。使用防爆型的通风系统和设备。防止气体泄漏到工作场所空气中。在传送过程中，钢瓶和容器必须接地和跨接，防止产生静电。搬运时轻装轻卸，防止钢瓶及附件破损。配备相应品种和数量的消防器材。
Leakage treatment: 泄漏处理： Personnel shall be quickly evacuated from the leakage contaminated area to upwind places, and then the leakage contaminated area shall be isolated, and its access shall be strictly prohibited. Fire sources shall be cut off. It is suggested that emergency treatment personnel wear oxygen respirators and anti-static clothing. Leaking sources shall be promptly cut off. The leakage contaminated area shall be ventilated properly to accelerate spread. Leaking vessels can be reused after proper treatment, repair and inspection. 迅速撤离泄漏污染区人员至上风处，并进行隔离，严格限制出入。切断火源。建议应急处理人员戴氧气呼吸器，穿防静电工作服。尽可能切断泄漏源。合理通风，加速扩散。漏气容器要妥善处理，修复、检验后再用。
Firefighting measures: 灭火措施： Air sources shall be cut off. If air source can not be cut off, it is not allowed to put out flame at the leaking point. Cool vessels by spraying water. Fire extinguishing agents: water spray, foam, carbon dioxide and dry chemical powder. 切断气源。若不能切断气源，则不允许熄灭泄漏处的火焰。喷水冷却容器。灭火剂：雾状水、泡沫、二氧化碳、干粉。
First aid measures: 急救措施： Inhalation: quickly remove the sufferer from the scene to a place with fresh air, and keep the respiratory tract open. In case of respiratory arrest, conduct artificial respiration immediately until medical personnel arrive. 吸入: 迅速脱离现场至空气新鲜处，保持呼吸道通畅。如呼吸停止，立即进行人口呼吸，直至医务救援人员赶到。

Table 57Hazard information and emergency disposal principles of hazardous chemicals

表 57 危险化学品危害信息和应急处置原则

Material description 物质名称	Hydrogen 氢气	Main component 主要成份	H_2	State under standard condition 标况下状态	Gas 气体
Density 密度	0.07	Color 颜色	Colorless 无色	Boiling point 沸点	/

kg/m^3				℃	
Flash point 闪点 ℃	/	Spontaneous ignition point 自燃点 ℃	400	Explosion limit 爆炸极性 (V/V)%	4.1-74.1
Toxicity 毒性	Non-toxic 无毒	Flammable and explosive 易燃易爆性	Extremely flammable 极易燃	Allowable concentration 允许浓度 mg/m^3	/

Hazard properties:
危险特性：

It can mix with air to form an explosive mixture and cause an explosion in the presence of heat or open fire. It is lighter than air, when it is used and stored indoors, leaking gas rises, is trapped at the roof, can not be vented easily, and can cause an explosion in the presence of spark. Hydrogen can react with fluorine, chlorine and bromine violently.

与空气混合能形成爆炸性混合物，遇热或明火即爆炸。气体比空气轻，在室内使用和储存时，漏气上升滞留屋顶不易排出，遇火星会引起爆炸。氢气与氟、氯、溴等卤素会剧烈反应。

Health hazard:
健康危害：

The chemical is inert gas viewing from physiology. High-concentration hydrogen will cause suffocation since the oxygen partial pressure in air is reduced. Under a high partial pressure, hydrogen will present anesthetic effects.

本品在生理学上是惰性气体，仅在高浓度时，由于空气中氧分压降低才引起窒息。在很高的分压下，氢气可呈现出麻醉作用。

Invasion way: inhalation.

侵入途径：吸入。

Personal protection measures:
个体防护措施：

Protection for respiratory system: special protection is not necessary generally, and personnel must wear oxygen (air) respirators when in contact with high concentration.

呼吸系统防护: 一般不需要特殊防护，高浓度接触时可佩戴氧气(空气)呼吸器。

Eye protection: Special protection is not necessary generally. Physical protection: Wear anti-static work clothes.

眼睛防护: 一般不需特殊防护。身体防护: 穿防静电工作服。

Hand protection: Wear general protective gloves.

手防护: 戴一般作业防护手套。

Disposal method:
操作处理方法：

Operate in an enclosed environment and strengthen ventilation. Operators must receive special training and comply with operation specification strictly. It is suggested that operators wear anti-static work clothes. Keep away from fire and heat source and strictly prohibit smoking in the workplace. Use anti-explosion ventilation system and equipment. Prevent gas from leaking into air in the workplace. Avoid exposure to oxidant and halogen. When transmitting, steel cylinder and vessels need grounding and bridging to prevent static electricity. Load and unload lightly to prevent breakage of steel cylinder and accessories. The fire-fighting appliances with corresponding quantities shall be provided.

密闭操作，加强通风。操作人员必须经过专门培训，严格遵守操作规程。建议操作人员穿防静电工作服。远离火种、热源，工作场所严禁吸烟。使用防爆型的通风系统和设备。防止气体泄漏到工作场所空气中。避免与氧化剂、卤素接触。在传送过程中，钢瓶和容器必须接地和跨接，防止产生静电。搬运时轻装轻卸，防止钢瓶及附件破损。配备相应品种和数量的消防器材。

Leakage treatment: 泄漏处理： Personnel shall be quickly evacuated from the leakage contaminated area to upwind places, and then the leakage contaminated area shall be isolated, and its access shall be strictly prohibited. Fire sources shall be cut off. It is suggested that emergency treatment personnel wear oxygen respirators and anti-static clothing. Leaking sources shall be promptly cut off. The leakage contaminated area shall be ventilated properly to accelerate spread. Leaking vessels can be reused after proper treatment, repair and inspection. 迅速撤离泄漏污染区人员至上风处，并进行隔离，严格限制出入。切断火源。建议应急处理人员戴氧气呼吸器，穿防静电工作服。尽可能切断泄漏源。合理通风，加速扩散。漏气容器要妥善处理，修复、检验后再用。
Firefighting measures: 灭火措施： Air sources shall be cut off. If air source can not be cut off, it is not allowed to put out flame at the leaking point. Cool vessels by spraying water. Fire extinguishing agents: water spray, foam, carbon dioxide and dry chemical powder. 切断气源。若不能切断气源，则不允许熄灭泄漏处的火焰。喷水冷却容器。灭火剂：雾状水、泡沫、二氧化碳、干粉。
First aid measures: 急救措施： Inhalation: quickly remove the sufferer from the scene to a place with fresh air, and keep the respiratory tract open. In case of respiratory arrest, conduct artificial respiration immediately until medical personnel arrive. 吸入: 迅速脱离现场至空气新鲜处，保持呼吸道通畅。如呼吸停止，立即进行人口呼吸，直至医务救援人员赶到。

Table 58Hazard information and emergency disposal principles of hazardous chemicals

表 58 危险化学品危害信息和应急处置原则

Material description 物质名称	Naphtha 石脑油	Main component 主要成份	C_4-C_{12} alkanes 烷烃的 C_4～C_{12}	State under standard condition 标况下状态	Liquid 液体
Density 密度 g/cm^3	0.78	Color 颜色	Colorless and transparent 无色透明	Boiling point 沸点 ℃	20
Flash point 闪点 ℃	-2	Spontaneous ignition point 自燃点 ℃	350	Explosion limit 爆炸极性 (V/V)%	1.1-8.7
Toxicity 毒性	Low toxic 低毒	Flammable and explosive 易燃易爆性	Extremely flammable 极易燃	Allowable concentration 允许浓度 mg/m^3	/

Hazard properties:
危险特性：

Its vapor can form an explosive mixture with the air, cause combustion and explosion in the presence of open fire and high temperature. It can react with oxidants violently. Its vapor is heavier than the air, can spread to remote places in low areas, and can be on fire and back-burn in the presence of a fire source.

其蒸气与空气可形成爆炸性混合物，遇明火、高热能引起燃烧爆炸。与氧化剂能发生强烈反应。其蒸气比空气重，能在较低处扩散到相当远的地方，遇火源会着火回燃。

Health hazard:
健康危害：

The naphtha vapor can cause eye and upper respiratory tract irritation symptoms, and may even cause hypoxia symptoms such as dyspnea and cyanosis within a few minutes in case of high concentration. Invasion way: inhalation and ingestion.

石脑油蒸气可引起眼及上呼吸道刺激症状，如浓度过高，几分钟即可引起呼吸困难、紫绀等缺氧症状。侵入途径：吸入、食入。

Personal protection measures:
个体防护措施：

Protection for respiratory system: When the concentration is out of limits in the air, filtered gas masks shall be worn.

呼吸系统防护: 空气中浓度超标时，佩戴过滤式防毒面具。

Eye protection: Wear safety protection glasses. Physical protection: Wear anti-static work clothes.

眼睛防护: 戴安全防护眼镜。 身体防护: 穿防静电工作服。

Hand protection: Wear rubber oil-resistant gloves.

手防护: 戴橡胶耐油手套。

Disposal method:
操作处理方法：

Operate in an enclosed and well-ventilated environment. Operators must receive special training and comply with operation specification strictly. It is suggested that the operator shall wear filtered gas mask, safety protection glasses, anti-static work clothes and rubber oil-resistant gloves. Keep away from fire and heat source and strictly prohibit smoking in the workplace. Use anti-explosion ventilation system and equipment. Prevent vapor leaking into air in the workplace. Avoid exposure to oxidants. Control flow rate when filling and provide grounding device to prevent electrostatic accumulation. Load and unload lightly to prevent damages of packaging and vessels. The fire-fighting appliances with corresponding quantities shall be provided.

密闭操作，全面通风。操作人员必须经过专门培训，严格遵守操作规程。建议操作人员佩戴过滤式防毒面具，戴安全防护眼镜，穿防静电工作服，戴橡胶耐油手套。远离火种、热源，工作场所严禁吸烟。使用防爆型的通风系统和设备。防止蒸气泄漏到工作场所空气中。避免与氧化剂接触。灌装时应控制流速，且有接地装置，防止静电积聚。搬运时要轻装轻卸，防止包装及容器损坏。配备相应品种和数量的消防器材。

Leakage treatment:
泄漏处理：

Personnel shall be quickly evacuated from the leakage contaminated area to safety areas, and then the leakage contaminated area shall be isolated, and its access shall be strictly prohibited. Fire sources shall be cut off. It is suggested that emergency treatment personnel wear oxygen respirators and anti-static clothing. Leaking sources shall be promptly cut off. Prevent it from flowing into sewer, flood discharge trench and other confined space. Small amount of leakage: small amount of leakage can be absorbed by sand, vermiculite or other inert materials. Large amount of leakage: foam shall be adopted to cover the leakage, so as to reduce disasters caused by vapor.

迅速撤离泄漏污染区人员至安全区，并进行隔离，严格限制出入。切断火源。建议应急处理人员戴氧气呼吸器，穿防静电工作服。尽可能切断泄漏源。防止进入下水道、排洪沟等限制性空间。小量泄漏：用砂土、蛭石或其它惰性材料吸收。大量泄漏：用泡沫覆盖，降低蒸气灾害。

Firefighting measures: 灭火措施： Cool vessels by spraying water. Personnel must be evacuated immediately if the vessels are discolored in a fire or sounds are generated from safety relief devices. Fire extinguishing agents: foam, carbon dioxide, dry chemical powder and sand. Extinguishing fires with water is of no use. 喷水冷却容器。处在火场中的容器若已变色或从安全泄压装置中产生声音，必须马上撤离。灭火剂：泡沫、二氧化碳、干粉、砂土。用水灭火无效。
First aid measures: 急救措施： Skin contact: take off contaminated clothing, and thoroughly wash the skin with soapy water and clean water. 皮肤接触: 脱去污染的衣着，用肥皂水和清水彻底冲洗皮肤。 Eye contact: wash with flowing water or normal saline and seek medical treatment. 眼睛接触: 用流动清水或生理盐水冲洗后就医。 Inhalation: quickly remove the sufferer from the scene to a place with fresh air Keep the respiratory tract open. In case of respiratory arrest, conduct artificial respiration immediately until medical personnel arrive. 吸入: 迅速脱离现场至空气新鲜处。保持呼吸道通畅。如呼吸停止，立即进行人工呼吸直至医务救援人员赶到。 Ingestion: Rinse mouth with water, drink milk or egg white, and seek medical treatment when necessary. 食入: 用水漱口，给饮牛奶或蛋清,必要时就医。

Table 59Hazard information and emergency disposal principles of hazardous chemicals

表 59 危险化学品危害信息和应急处置原则

Material description 物质名称	Fuel gas 燃料气	Main components 主要成分	H_2、C_3、C_4	State under standard condition 标况下状态	Gas 气体
Density 密度 g/cm³	1-1.5	Color 颜色	Colorless 无色	Boiling point 沸点 ℃	/
Flash point 闪点 ℃	/	Ignition point 引火点 ℃	/	Explosion limit 爆炸极限 （V/V）%	2-10
Toxicity 毒性	Low toxic 轻毒	Flammable and explosive 易燃易爆性	Flammable and explosive 易燃易爆	Allowable concentration 允许浓度 mg/m³	/
Hazard properties: 危险特性： It is an extremely flammable and explosive mixture; the ignition energy is low; and the destructive power is big. Prevent contact with air and avoid replacement of oxygen in air to cause suffocation. 极易燃易爆混合物，且引燃能量小，破坏力大。操作上防止与空气的接触，并防止置换空气中的氧气以致于有窒息危险。					

Health hazard: 健康危害： It is odorless but smells like rotten eggs due to the content of sulfide. The mixture is a low toxic agent and an anesthetic. The toxic symptoms include drowsiness, nausea and dizziness. 本无气味，但往往含有硫化物，有少量臭鸡蛋味，混合物是轻毒剂、麻醉剂，中毒症状表现为困倦、恶心、眩晕。
Personal protections 个人防护： Wear work clothes. 全身穿戴好工作用服。
Disposal method: 操作处理办法： Operators must receive training and comply with operation specification strictly. During operation, keep away from open fire, spark and oxidants and do not strike. Replace the system with nitrogen and control the oxygen content less than 0.5% (V). 操作人员必须经过培训，严格遵守操作规程。操作时远离明火、火花、氧化剂，不允许敲打。系统必须经氮气置换合格，控制氧含量小于 0.5%（V）。
Leakage treatment: 泄漏处理： Block and prevent that the leakage forms an explosive mixture. Release the system pressure and prevent external air entering the system. 堵漏并防止泄漏物成为爆炸混合物。系统泄压排放处理，但又要防止外界空气倒入系统中。
Firefighting measures: 灭火措施： Air sources shall be cut off. If air source can not be cut off, it is not allowed to put out flame at the leaking point. Cool vessels by spraying water. Fire extinguishing agents: water spray, foam, carbon dioxide and dry chemical powder. 切断气源。若不能切断气源，则不允许熄灭泄漏处的火焰。喷水冷却容器。灭火剂：雾状水、泡沫、二氧化碳、干粉。
First aid measures: 急救措施： Physical contact seems harmless. However, in case of suffocation, quickly remove the sufferer from the scene to a place with fresh air, and keep the respiratory tract open. In case of respiratory arrest, conduct artificial respiration immediately until medical personnel arrive. 身体接触无大害，万一因其窒息，迅速脱离现场至空气新鲜处，保持呼吸道通畅。如呼吸停止，立即进行人工呼吸，直至医务救援人员赶到。

Table 60Hazard information and emergency disposal principles of hazardous chemicals

表 60 危险化学品危害信息和应急处置原则

Material description 物质名称	Nitrogen 氮气	Main component 主要成份	N_2	State under standard condition 标况下状态	Gas 气体
Density 密度 kg/m³	0．97	Color 颜色	Colorless 无色	Boiling point 沸点 ℃	/
Flash point	/	Spontaneous ignition	/	Explosion limit	/

闪点 ℃		point 自燃点 ℃		爆炸极性 (V/V)%	
Toxicity 毒性	Non-toxic 无毒	Flammable and explosive 易燃易爆性	Non-combustible 不燃	Allowable concentration 允许浓度 mg/m³	/

Hazard properties:
危险特性：

Pressure in the vessel increases at high temperature, resulting in possible risk of burst and explosion.

若遇高热，容器内压增大，有开裂和爆炸的危险。

Health hazard:
健康危害：

Excessive nitrogen content of air causes the partial pressure of oxygen in inspired gas to drop, resulting in asphyxia for lack of oxygen. When the concentration of inhaled nitrogen is low, patients suffer from chest tightness, shortness of breath, fatigue and weakness in the early stage, and then suffer from fidget, excessive excitement, blind running, shout, trance and unsteady gait (which is called as “nitrogen drunkenness”), and even go into lethargy or coma. Patients can quickly develop coma, respiratory and cardiac arrest, and even death in case of inhaling high concentration nitrogen.

空气中氮气含量过高，使吸入气氧分压下降，引起缺氧窒息。吸入氮气浓度不太高时，患者最初感胸闷、气短、疲软无力；继而有烦躁不安、极度兴奋、乱跑、叫喊、神情恍惚、步态不稳，称之为“氮酩酊”，可进入昏睡或昏迷状态。吸入高浓度，患者可迅速昏迷、因呼吸和心跳停止而死亡。

Personal protection measures:
个体防护：

Protection for respiratory system: Special protection is not necessary generally. When the oxygen concentration in air at the workplace is lower than 18%, wear air respirators, oxygen respirators or long-tube masks.

呼吸系统防护: 一般不需特殊防护。当作业场所空气中氧气浓度低于18％时，必须佩戴空气呼吸器、氧气呼吸器或长管面具。

Physical protection: Wear general work clothes. Hand protection: Wear general protective gloves.

身体防护: 穿一般作业工作服。手防护: 戴一般作业防护手套。

Disposal method:
操作处理方法：

Good natural ventilation conditions shall be provided in enclosed operation. Operators must receive special training and comply with operation specification strictly. Prevent gas from leaking into air in the workplace. Provide leakage emergency treatment facilities.

密闭操作，提供良好的自然通风条件。操作人员必须经过专门培训，严格遵守操作规程。防止气体泄漏到工作场所空气中。配备泄漏应急处理设备。

Leakage treatment:
泄漏处理：

Personnel shall be quickly evacuated from the leakage contaminated area to upwind places, and then the leakage contaminated area shall be isolated, and its access shall be strictly prohibited. It is suggested that emergency treatment personnel wear oxygen respirators and general work clothes. Leaking sources shall be promptly cut off. The leakage contaminated area shall be ventilated properly to accelerate spread. Leaking vessels can be reused after proper treatment, repair and inspection.

迅速撤离泄漏污染区人员至上风处，并进行隔离，严格限制出入。建议应急处理人员戴氧气呼吸器，穿一般作业工作服。尽可能切断泄漏源。合理通风，加速扩散。漏气容器要妥善处理，修复、检验后再用。

Firefighting measures: 灭火措施： The chemical is non-combustible. Cool by spraying water until the fire is extinguished. 本品不燃。喷水保持火场容器冷却，直至灭火结束。
First aid measures: 急救措施： quickly remove the sufferer from the scene to a place with fresh air Keep the respiratory tract open. Give oxygen in case of dyspnea. In case of respiration and cardiac arrest, give artificial respiration and closed cardiac massage promptly. Seek medical treatment. 迅速脱离现场至空气新鲜处。保持呼吸道通畅。如呼吸困难，给输氧。呼吸心跳停止时，立即进行人工呼吸和胸外心脏按压术。就医。

Table 61Hazard information and emergency disposal principles of hazardous chemicals

表 61 危险化学品危害信息和应急处置原则

Material description 物质名称	Jet fuel 航煤	Main component 主要成份	$CH_3(CH_2)nCH_3$ (n is 8-16) $CH_3(CH_2)nCH_3$(n 为 8～16)	State under standard condition 标况下状态	Liquid 液体
Density 密度 g/cm³	0.8-1.0	Color 颜色	Colorless 无色	Boiling point 沸点 ℃	175-325
Flash point 闪点 ℃	43-72	Spontaneous ignition point 自燃点 ℃	210	Explosion limit 爆炸极性 (V/V)%	5.0-0.7
Toxicity 毒性	Low toxic 低毒	Flammable and explosive 易燃易爆性	Flammable 易燃	Allowable concentration 允许浓度 mg/m³	/
Hazard properties: 危险特性： Its vapor can form an explosive mixture with the air, cause combustion and explosion in the presence of open fire and high temperature. It can react with an oxidizer, and produce and accumulate static electricity at fast flow rate. Its vapor is heavier than the air, can spread to remote places in low areas, and can be on fire and back-burn in the presence of a fire source. Pressure in the vessel increases at high temperature, resulting in possible risk of burst and explosion. 其蒸气与空气可形成爆炸性混合物，遇明火、高热能引起燃烧爆炸。与氧化剂可发生反应。流速过快，容易产生和积聚静电。其蒸气比空气重，能在较低处扩散到相当远的地方，遇火源会着火回燃。若遇高热，容器内压增大，有开裂和爆炸的危险。					

Health hazard:
健康危害：

Acute poisoning: inhalation of high-concentration kerosene vapor will cause excitement and inhibition, hypodynamia, headache, drunkenness sense, wandering, muscle vibration and locomotor ataxia. The serious patient will suffer disorientation, delirium and confusion. Vapor may cause irritation to eyes and respiratory tract and the serious patient will suffer chemical pneumonia. Inhalation of liquid kerosene can cause aspiration pneumonia or even pulmonary edema. Ingestion will cause irritation to mouth, throat and gastrointestinal tract and symptoms of central nervous system which are same as that of inhalation. Chronic effects: neurasthenic syndrome, irritation to eyes and respiratory tract, contact dermatitis and dry skin.

急性中毒：吸入高浓度煤油蒸气，常先有兴奋，后转入抑制，表现为乏力、头痛、酩酊感、神志恍惚、肌肉震颤、共济运动失调；严重者出现定向力障碍、谵妄、意识模糊等；蒸气可引起眼及呼吸道刺激症状，重者出现化学性肺炎。吸入液态煤油可引起吸入性肺炎，严重时可发生肺水肿。摄入引起口腔、咽喉和胃肠道刺激症状，可出现与吸入中毒相同的中枢神经系统症状。慢性影响：神经衰弱综合征为主要表现，还有眼及呼吸道刺激症状，接触性皮炎，皮肤干燥等。

Personal protection measures:
个体防护：

Protection for respiratory system: It is suggested to wear self-priming filtered gas mask (half mask) when the concentration in the air exceeds the standard. It is suggested to wear air respirators in emergency rescue or evacuation. Eye protection: Personnel must wear chemical safety protection glasses. Physical protection: Wear anti-static work clothes. Hand protection: Wear rubber oil-resistant gloves.

呼吸系统防护: 空气中浓度超标时，建议佩戴自吸过滤式防毒面具（半面罩）。紧急事态抢救或撤离时，应该佩戴空气呼吸器。眼睛防护: 戴化学安全防护眼镜。身体防护: 穿防静电工作服。手防护: 戴橡胶耐油手套。

Disposal method:
操作处理方法：

Operate in an enclosed and well-ventilated environment. Operators must receive special training and comply with operation specification strictly. It is suggested that the operator shall wear self-priming filtered gas mask (half mask), chemical safety protection glasses, anti-static work clothes and rubber oil-resistant gloves. Keep away from fire and heat source and strictly prohibit smoking in the workplace.

密闭操作，全面通风。操作人员必须经过专门培训，严格遵守操作规程。建议操作人员佩戴自吸过滤式防毒面具（半面罩），戴化学安全防护眼镜，穿防静电工作服，戴橡胶耐油手套。远离火种、热源，工作场所严禁吸烟

Leakage treatment:
泄漏处理：

It is suggested that emergency treatment personnel wear self-contained positive pressure respirators and anti-static clothing.

建议应急处理人员戴自给正压式呼吸器，穿防静电工作服。

Firefighting measures:
灭火措施：

Fire fighters must wear gas masks and full-body protective clothing, and extinguish a fire in the upwind direction. Vessels shall be removed from the scene of a fire to open space. Cool by spraying water until the fire is extinguished. Personnel must be evacuated immediately if the vessels are discolored in a fire or sounds are generated from safety relief devices. Fire extinguishing agents: water spray, foam, dry chemical powder, carbon dioxide and sand.

消防人员须佩戴防毒面具、穿全身消防服，在上风向灭火。尽可能将容器从火场移至空旷处。喷水保持火场容器冷却，直至灭火结束。处在火场中的容器若已变色或从安全泄压装置中产生声音，必须马上撤离。灭火剂：雾状水、泡沫、干粉、二氧化碳、砂土。

First aid measures:
急救措施：
Skin contact: take off contaminated clothing, and thoroughly wash the skin with soapy water and clean water. Eye contact: hold the skin of eyelid, wash with flowing water or normal saline. Seek medical treatment. Inhalation: quickly remove the sufferer from the scene to a place with fresh air Keep the respiratory tract open. Give oxygen in case of dyspnea. Ingestion: Conduct gastric lavage as soon as possible. Seek medical treatment.
皮肤接触: 脱去污染的衣着，用肥皂水和清水彻底冲洗皮肤。眼睛接触: 提起眼睑，用流动清水或生理盐水冲洗。就医。吸入: 迅速脱离现场至空气新鲜处。保持呼吸道通畅。如呼吸困难，给输氧。如呼食入: 尽快彻底洗胃。就医。

Table 62Hazard information and emergency disposal principles of hazardous chemicals

表 62 危险化学品危害信息和应急处置原则

Material description 物质名称	Gasoline 汽油	Main component 主要成份	C_4-C_{12} fatty hydrocarbons and naphthenic hydrocarbons C_4～C_{12} 脂肪烃和环烷烃	State under standard condition 标况下状态	Liquid 液体
Density 密度 g/cm³	0.67-0.71	Color 颜色	Colorless or faint yellow 无色或淡黄色	Boiling point 沸点 ℃	40-200
Flash point 闪点 ℃	＜ -18	Spontaneous ignition point 自燃点 ℃	415	Explosion limit 爆炸极性 (V/V)%	6.0-1.3
Toxicity 毒性	Toxic 有毒	Flammable and explosive 易燃易爆性	Extremely flammable 极易燃	Allowable concentration 允许浓度 mg/m³	/
Hazard properties: 危险特性： Its vapor can form an explosive mixture with the air, easily cause combustion and explosion in the presence of open fire and high temperature. It can react with oxidants violently. Its vapor is heavier than the air, can spread to remote places in low areas, and can be on fire and back-burn in the presence of a fire source. 其蒸气与空气可形成爆炸性混合物，遇明火、高热极易燃烧爆炸。与氧化剂能发生强烈反应。其蒸气比空气重，能在较低处扩散到相当远的地方，遇火源会着火回燃。					

Health hazard:
健康危害：

Acute poisoning: anesthetic effect on the central nervous system. Mild poisoning symptoms include dizziness, headache, nausea, vomiting, instability of gait and ataxia. Inhalation of high concentration will cause encephalopathia toxica. Inhalation of extremely high concentration will cause sudden loss of consciousness and reflex respiratory arrest. It may cause toxic peripheral neuropathy and chemical pneumonia. Some patients will suffer toxic psychosis. Inhalation of liquid to respiratory tract may cause aspiration pneumonia. Splashing into eyes will cause keratohelcosis, corneal perforation and even blindness. Skin contact will cause acute contact dermatitis and even burns. Swallowing will cause acute gastroenteritis and the serious patients will suffer acute symptoms similar with inhalation poisoning, and liver and renal damages. Chronic poisoning: neurasthenic syndrome, vegetative nerve functional disturbance and peripheral neuropathy. Serious poisoning will cause encephalopathia toxica with symptoms similar with schizophrenia. Skin will suffer damages.

急性中毒：对中枢神经系统有麻醉作用。轻度中毒症状有头晕、头痛、恶心、呕吐、步态不稳、共济失调。高浓度吸入出现中毒性脑病。极高浓度吸入引起意识突然丧失、反射性呼吸停止。可伴有中毒性周围神经病及化学性肺炎。部分患者出现中毒性精神病。液体吸入呼吸道可引起吸入性肺炎。溅入眼内可致角膜溃疡、穿孔，甚至失明。皮肤接触致急性接触性皮炎，甚至灼伤。吞咽引起急性胃肠炎，重者出现类似急性吸入中毒症状，并可引起肝、肾损害。慢性中毒：神经衰弱综合征、植物神经功能紊乱、周围神经病。严重中毒出现中毒性脑病，症状类似精神分裂症。皮肤损害。

Personal protection measures:
个体防护：

Protection for respiratory system: Special protection is not needed generally. Wear self-priming filtered gas masks (half mask) in case of contact with high concentration. Eye protection: special protection is not necessary generally, and personnel must wear chemical safety protection glasses when in contact with high concentration. Physical protection: Wear anti-static work clothes. Hand protection: Wear rubber oil-resistant gloves.

呼吸系统防护: 一般不需要特殊防护，高浓度接触时可佩戴自吸过滤式防毒面具（半面罩）。眼睛防护: 一般不需要特殊防护，高浓度接触时可戴化学安全防护眼镜。身体防护: 穿防静电工作服。手防护: 戴橡胶耐油手套。

Disposal method:
操作处理方法：

Operate in an enclosed and well-ventilated environment. Operators must receive special training and comply with operation specification strictly. It is suggested that operators wear anti-static work clothes and rubber oil-resistant gloves. Keep away from fire and heat source and strictly prohibit smoking in the workplace. Use anti-explosion ventilation system and equipment. Prevent vapor leaking into air in the workplace. Avoid exposure to oxidants. Control flow rate when filling and provide grounding device to prevent electrostatic accumulation.

密闭操作，全面通风。操作人员必须经过专门培训，严格遵守操作规程。建议操作人员穿防静电工作服，戴橡胶耐油手套。远离火种、热源，工作场所严禁吸烟。使用防爆型的通风系统和设备。防止蒸气泄漏到工作场所空气中。避免与氧化剂接触。灌装时应控制流速，且有接地装置，防止静电积聚。

Leakage treatment:
泄漏处理：

Personnel shall be quickly evacuated from the leakage contaminated area to safety areas, and then the leakage contaminated area shall be isolated, and its access shall be strictly prohibited. Fire sources shall be cut off. It is suggested that emergency treatment personnel wear self-contained positive pressure respirators and anti-static clothing. Leaking sources shall be promptly cut off. Prevent it from flowing into sewer, flood discharge trench and other confined space.

Small amount of leakage: small amount of leakage can be absorbed by sand, vermiculite or other inert materials. Or, it can be burnt locally while safety is ensured. Large amount of leakage: cofferdam shall be constructed or holes shall be dug for receiving large amount of leakage. Foam shall be adopted to cover the leakage so as to reduce disasters caused by vapor. Then the leakage shall be transferred to tank cars or special collectors by explosion-proof pumps for recovery or then be transported to the disposal site for treatment. 迅速撤离泄漏污染区人员至安全区，并进行隔离，严格限制出入。切断火源。建议应急处理人员戴自给正压式呼吸器，穿防静电工作服。尽可能切断泄漏源。防止进入下水道、排洪沟等限制性空间。小量泄漏：用砂土、蛭石或其它惰性材料吸收。或在保证安全情况下，就地焚烧。大量泄漏：构筑围堤或挖坑收容。用泡沫覆盖，降低蒸气灾害。用防爆泵转移至槽车或专用收集器内，回收或运至废物处理场所处置。
Firefighting measures: 灭火措施： Spray water to cool the vessel and move it to an open space from fireground if possible. Fire extinguishing agents: foam, dry chemical powder and carbon dioxide. Extinguishing fires with water is of no use. 喷水冷却容器，可能的话将容器从火场移至空旷处。灭火剂：泡沫、干粉、二氧化碳。用水灭火无效。
First aid measures: 急救措施： Skin contact: take off contaminated clothing immediately, and thoroughly wash the skin with soapy water and clean water. Seek medical treatment. Eye contact: hold the skin of eyelid immediately, thoroughly wash with a large amount of flowing water or normal saline for at least 15 min. Seek medical treatment. Inhalation: quickly remove the sufferer from the scene to a place with fresh air Keep the respiratory tract open. Give oxygen in case of dyspnea. Perform artificial respiration immediately in case of respiratory arrest. Seek medical treatment. Ingestion: Drink milk or conduct gastric lavage and clysis with vegetable oil. Seek medical treatment. 皮肤接触: 立即脱去污染的衣着，用肥皂水和清水彻底冲洗皮肤。就医。眼睛接触: 立即提起眼睑，用大量流动清水或生理盐水彻底冲洗至少 15 分钟。就医。吸入: 迅速脱离现场至空气新鲜处。保持呼吸道通畅。如呼吸困难，给输氧。如呼吸停止，立即进行人工呼吸。就医。食入: 给饮牛奶或用植物油洗胃和灌肠。就医。

6.3 List of emergency facilities and rescue supplies (see Table 63)

应急设施及抢险物资一览表见表 63

Table 63List of emergency supplies of Refining Dept. #2

表 63 炼油二部应急物资清单表

S/N 序号	Description 物资名称	Unit 单位	Qty. 数量	Storage location 存放位置
1	Hand-held explosion-proof searchlight 手提式防爆探照灯	Pcs. 盏	4	Warehouse of emergency supplies 应急物资库

2	Explosion-proof strong light flashlight 防爆强光手电	Nr. 把	12	Warehouse of emergency supplies 应急物资库
3	Fire blanket 防火毯	Pcs. 张	80	Warehouse of emergency supplies 应急物资库
4	Copper shovel 铜锹	Nr. 把	4	Warehouse of emergency supplies 应急物资库
5	Copper bucket 铜桶	Nr. 个	4	Warehouse of emergency supplies 应急物资库
6	Explosion-proof wrench 防爆扳手	Set 套	2	Warehouse of emergency supplies 应急物资库
7	Explosion-proof crowbar 防爆撬棍	Pcs. 根	4	Warehouse of emergency supplies 应急物资库
8	Oil absorbent felt PP-1 吸油毡 PP-1	Set 套	20	Warehouse of emergency supplies 应急物资库
9	Oil absorbent felt 吸油毡	Kg 公斤	300	Warehouse of emergency supplies 应急物资库
10	Asbeston 防火布	Coil 卷	20	Warehouse of emergency supplies 应急物资库
11	Woven bag 编织袋	Nr. 个	200	Warehouse of emergency

				supplies 应急物资库
12	14#\10# steel wire 14#\10#铁线	Coil 卷	4	Warehouse of emergency supplies 应急物资库
13	Explosion-proof submerged pump 防爆潜水泵	Set 台	4	Warehouse of emergency supplies 应急物资库
14	Shovel 铁锹	Nr. 个	2	Warehouse of emergency supplies 应急物资库
15	Explosion-proof portable power supply 防爆移动电源	Nr. 个	2	Warehouse of emergency supplies 应急物资库

6.4 Plan of emergency evacuation route and assembly point

应急疏散线路和紧急集结点平面图

See Appendixes 1, 2 and 3

见附件 1、附件 2、附件 3

6.5 Unit plan and layout plan of firefighting facilities

装置平面图和消防设施平面布置图

6.5.1 Layout plan of fire water system

消防水系统布置图

See Appendixes 4, 5 and 6

见附件 4、附件 5、附件 6

6.5.2 Fixed combustible and toxic gas alarm of unit

装置固定式可燃、有毒气体报警仪

See Appendixes 7, 8 and 9

见附件 7、附件 8、附件 9

6.5.3 Layout plan of eye washer of unit

装置洗眼器布置平面图

See Appendixes 10 and 11

见附件 10、附件 11

6.5.4 Layout plan of manual fire alarms

火灾手动报警仪平面布置图

See Appendixes 12, 13 and 14

见附件 12、附件 13、附件 14

7 Appendices

附件

Appendix 1 Plan of emergency evacuation route and assembly point of kerosene & diesel hydrotreating unit

附件 1 煤柴油加氢装置应急疏散线路和紧急集结点平面图

Appendix 2 Plan of emergency evacuation route and assembly point of hydrocracking unit

附件 2 加氢裂化装置人员应急疏散线路和紧急集结点平面图

Appendix 3 Plan of emergency evacuation route and assembly point of LPG fractionation unit

附件 3 气体分馏装置人员应急疏散线路和紧急集结点平面图

Appendix 4 Layout plan of fire water system of kerosene & diesel hydrotreating unit

附件 4 煤柴油加氢装置消防水系统布置图

Appendix 5 Layout plan of fire water system of hydrocracking unit

附件 5 加氢裂化装置消防水系统布置图

Appendix 6 Layout plan of fire water system of LPG fractionation unit

附件 6 气体分馏装置消防水系统布置图

Appendix 7 Layout plan of fixed combustible and toxic gas alarm of kerosene & diesel hydrotreating unit

附件 7 煤柴油加氢装置装置固定式可燃、有毒气体报警仪平面布置图

Appendix 8 Layout plan of fixed combustible and toxic gas alarm of hydrocracking unit

附件 8 加氢裂化装置固定式可燃、有毒气体报警仪平面布置图

Appendix 9 Layout plan of fixed combustible and toxic gas alarm of LPG fractionation unit

附件 9 气体分馏装置固定式可燃、有毒气体报警仪平面布置图

Appendix 10 Layout plan of eye washer of kerosene & diesel hydrotreating unit

附件 10 煤柴油加氢装置装置洗眼器布置平面图

Appendix 11 Layout plan of eye washer of hydrocracking unit

附件 11 加氢裂化装置洗眼器布置平面图

Appendix 12 Layout plan of manual fire alarm of kerosene & diesel hydrotreating unit

附件 12 煤柴油加氢装置火灾手动报警仪平面布置图

Appendix 13 Layout plan of manual fire alarm of hydrocracking unit

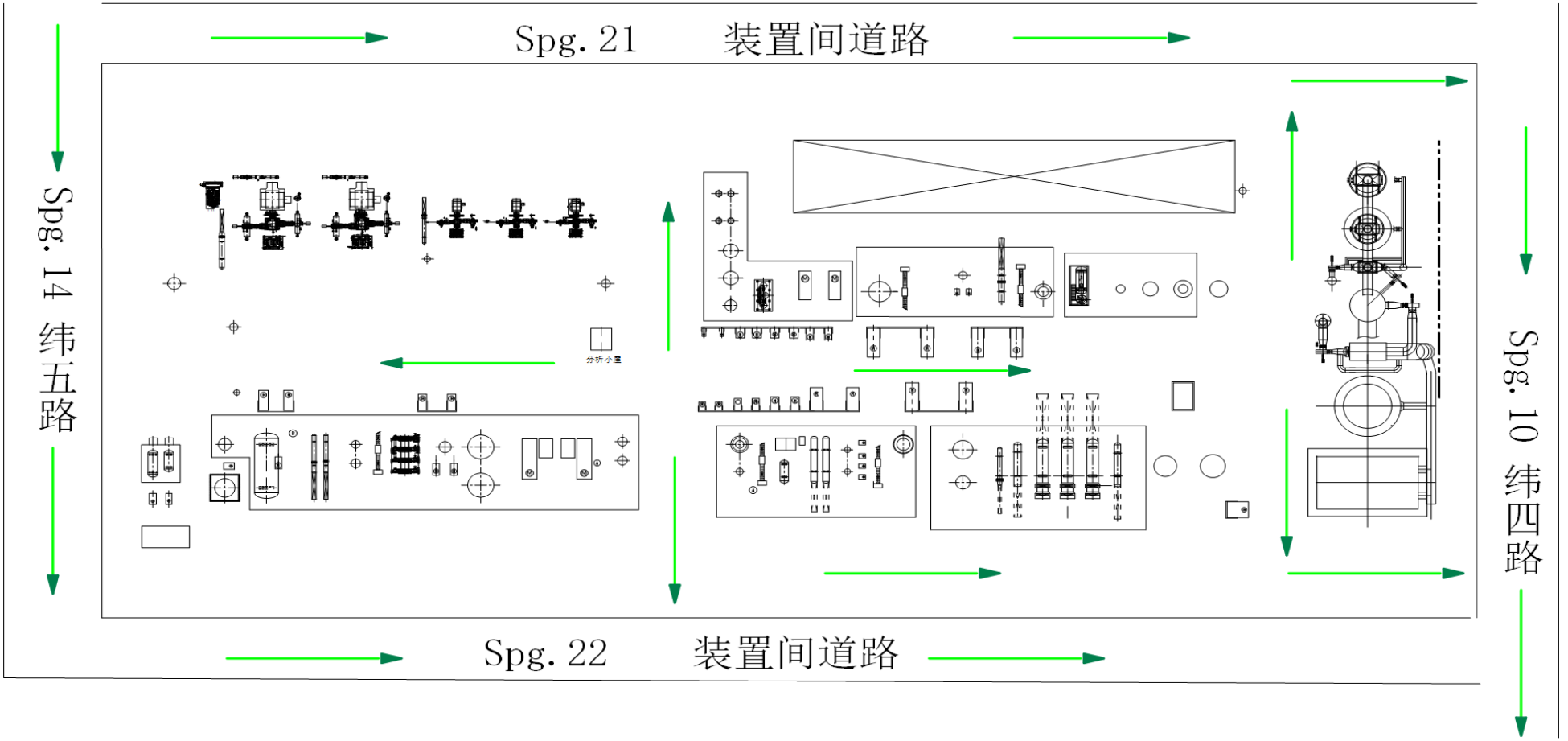
附件 13 加氢裂化装置火灾手动报警仪平面布置图

Appendix 14 Layout plan of manual fire alarm of LPG fractionation unit

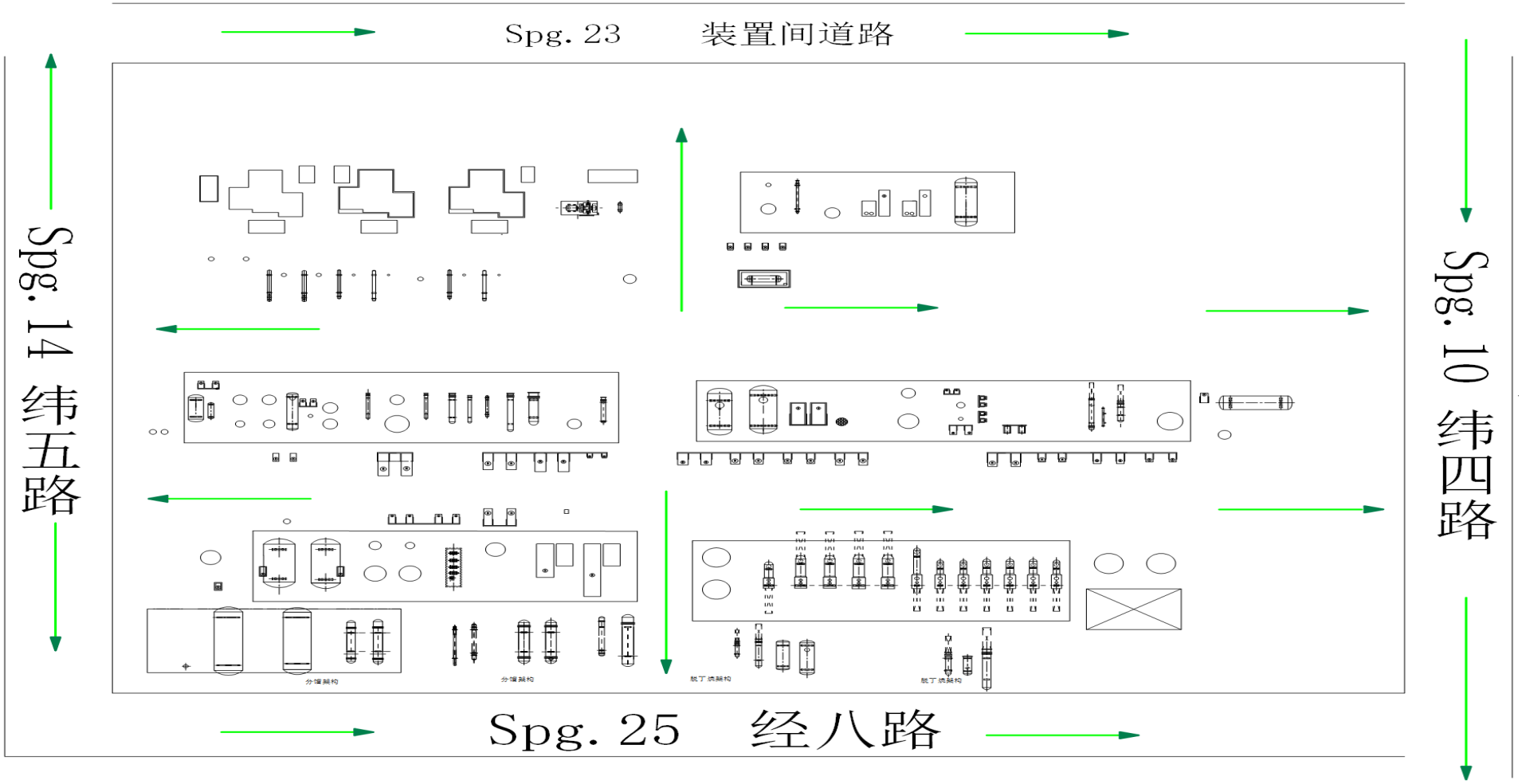
附件 14 气体分馏装置火灾手动报警仪平面布置图

Appendix 1 Plan of emergency evacuation route and assembly point of kerosene & diesel hydrotreating unit

附件 1 煤柴油加氢装置人员应急疏散线路和紧急集结点平面分布图

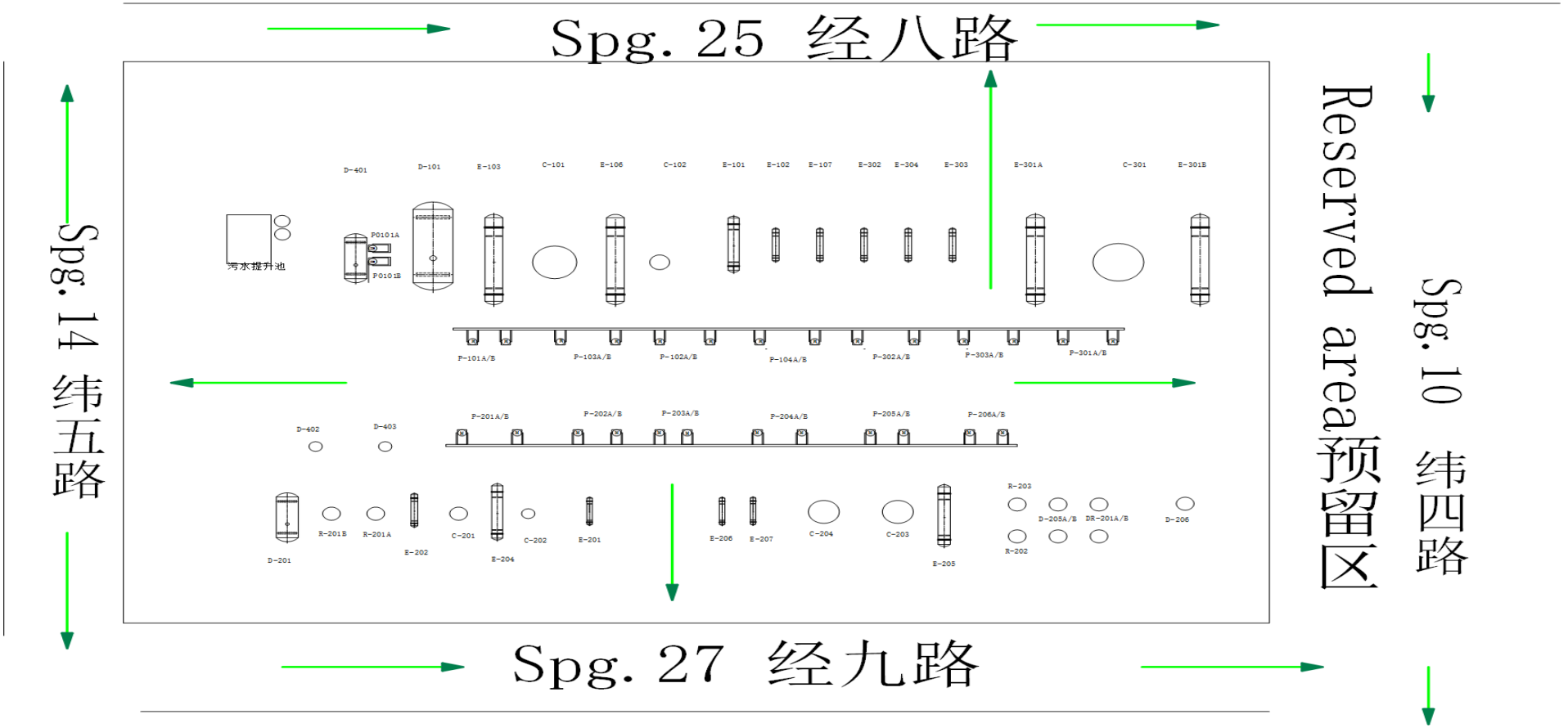


Appendix 2 Layout plan of emergency evacuation route and assembly point of hydrocracking unit
附件 2 加氢裂化装置人员应急疏散线路和紧急集结点平面分布图

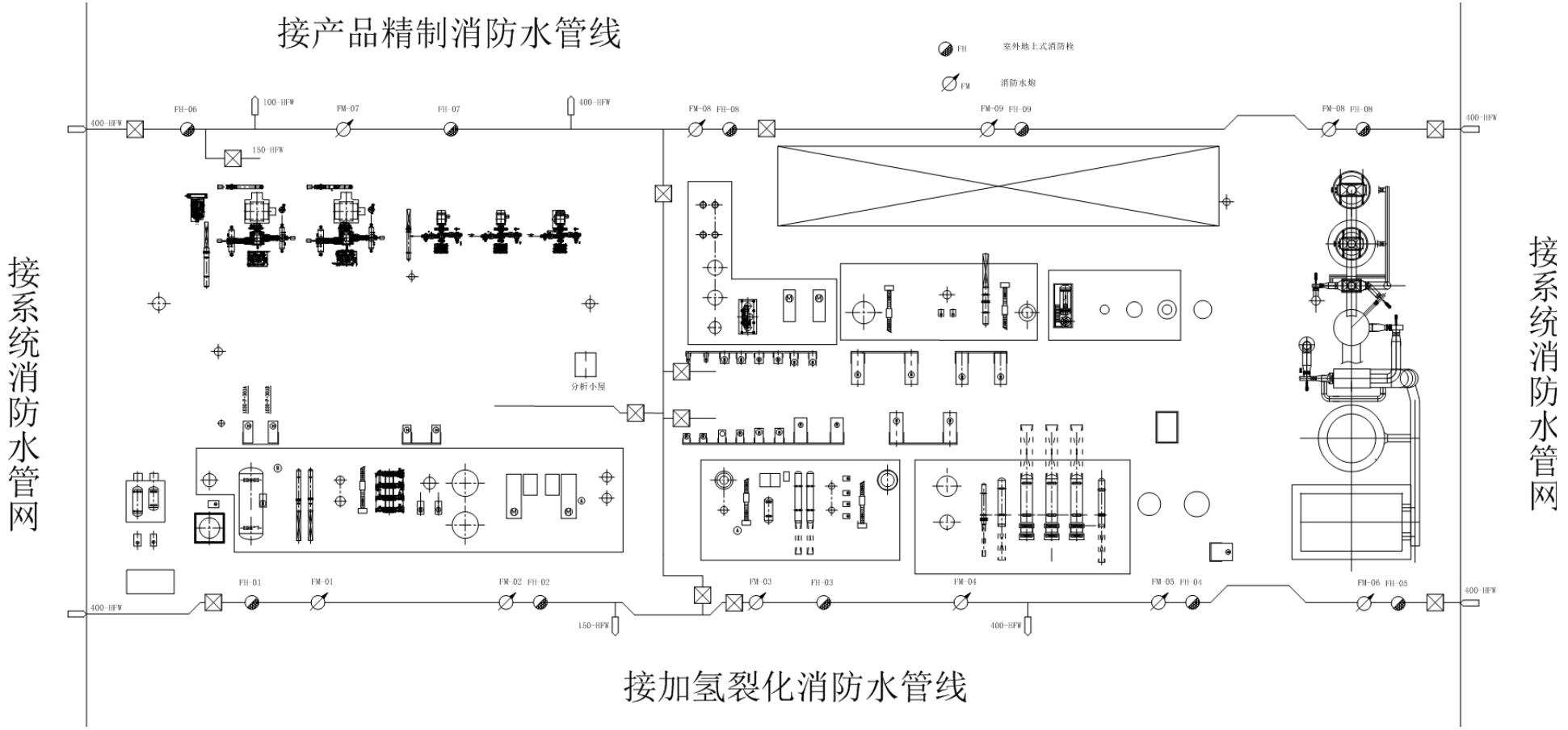


Appendix 3 Layout plan of emergency evacuation route and assembly point of LPG fractionation unit

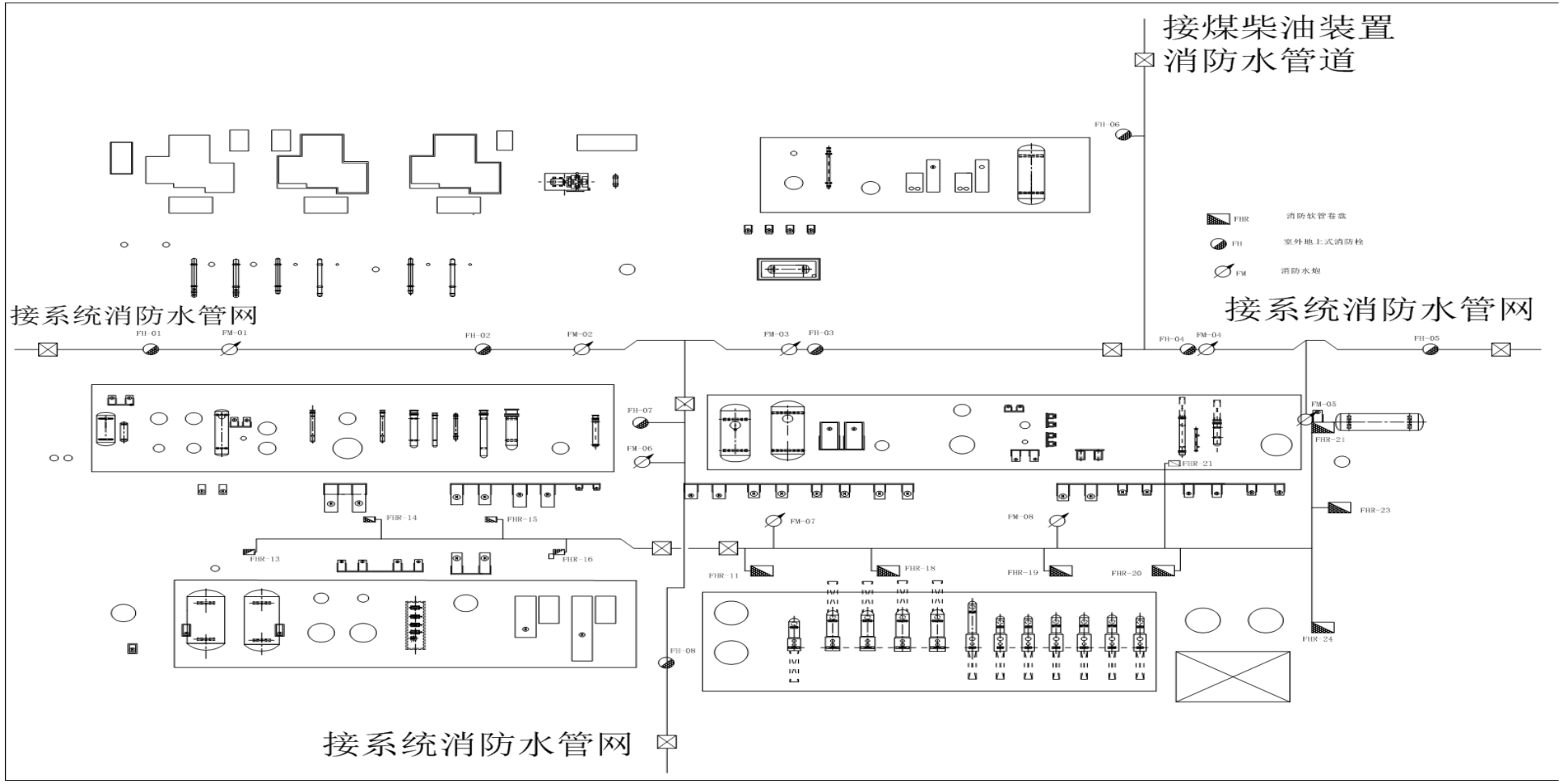
附件 3 气体分馏装置人员应急疏散线路和紧急集结点平面分布图



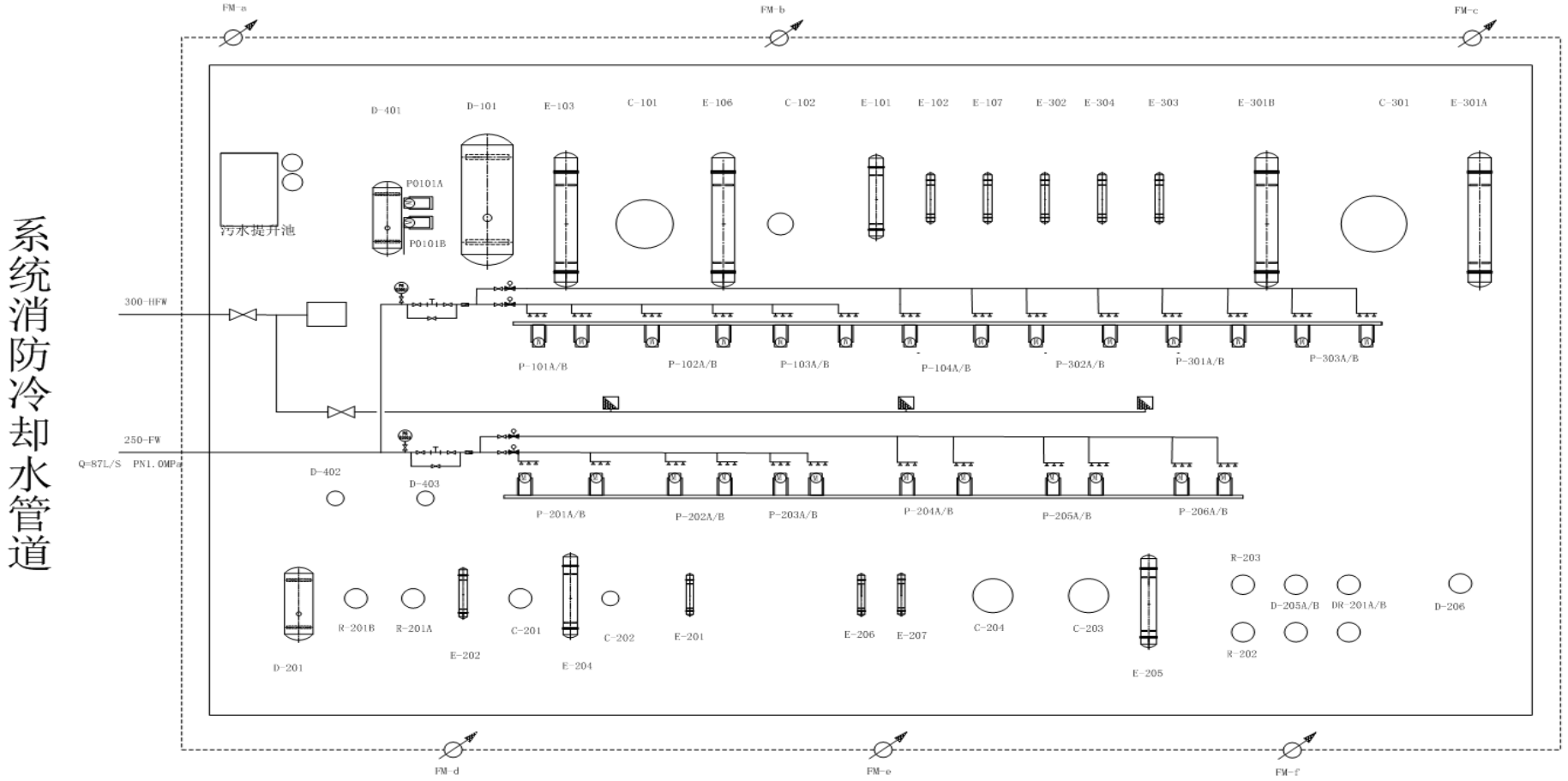
Appendix 4 Layout plan of fire water system of kerosene & diesel hydrotreating unit
附件 4 煤柴油加氢装置消防水系统布置图



Appendix 5 Layout plan of fire water system of hydrocracking unit
附件 5 加氢裂化装置消防水系统布置图

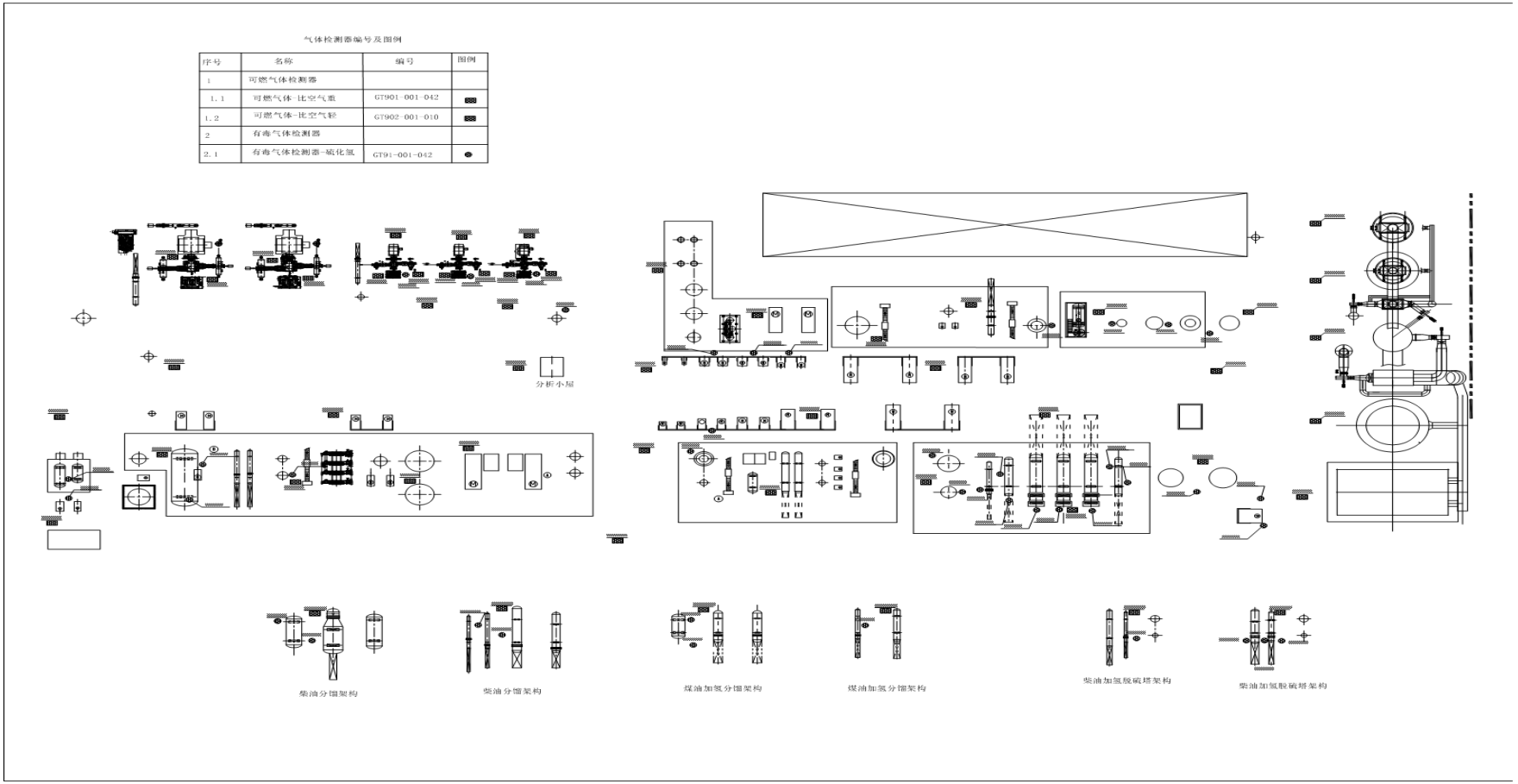


Appendix 6 Layout plan of fire water system of LPG fractionation unit
附件 6 气体分馏装置消防水系统布置图

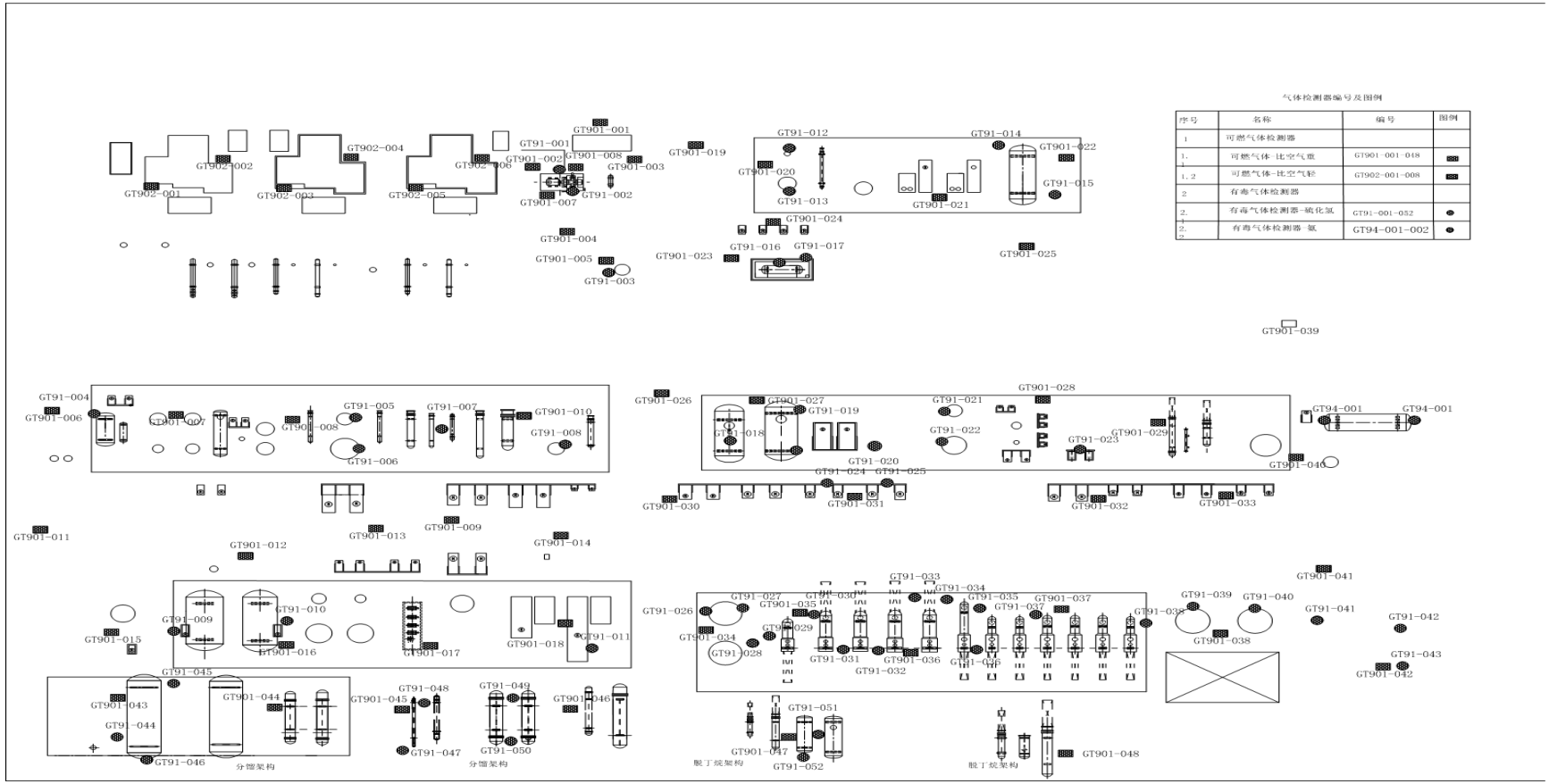


Appendix 7 Layout plan of fixed combustible and toxic gas alarm of kerosene & diesel hydrotreating unit

附件 7 煤柴油加氢装置固定式可燃、有毒气体报警仪平面布置图

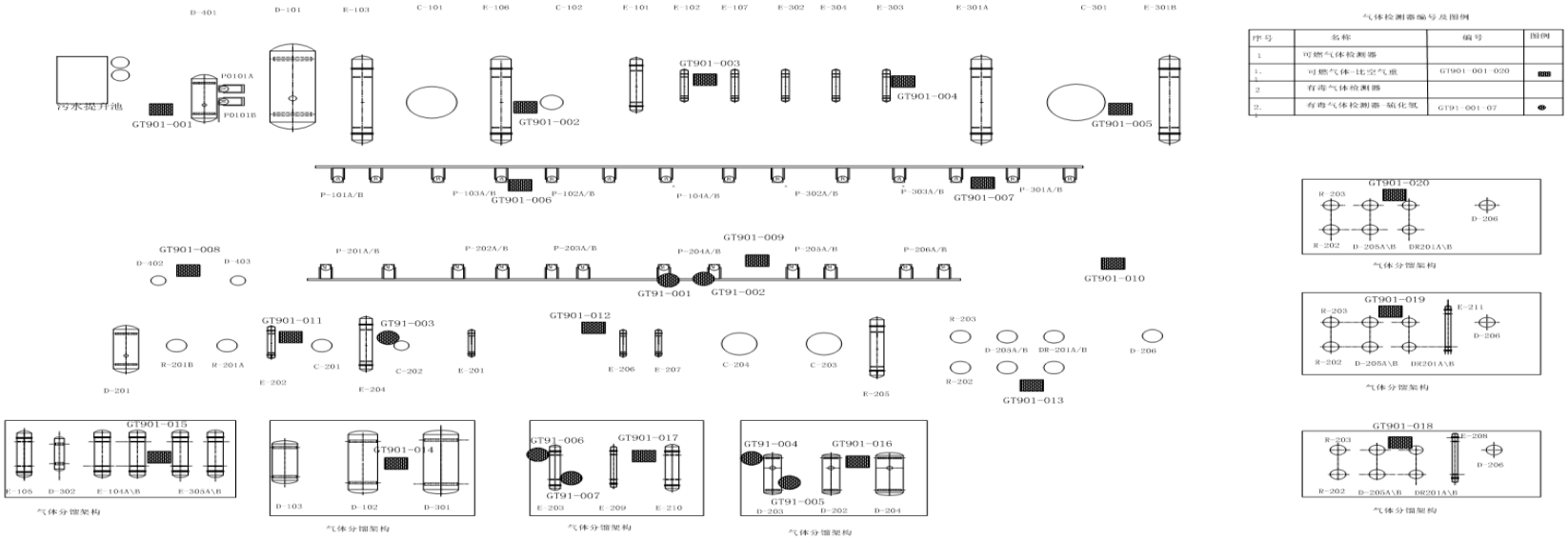


Appendix 8 Layout plan of fixed combustible and toxic gas alarm of hydrocracking unit
附件 8 加氢裂化装置固定式可燃、有毒气体报警仪平面布置图

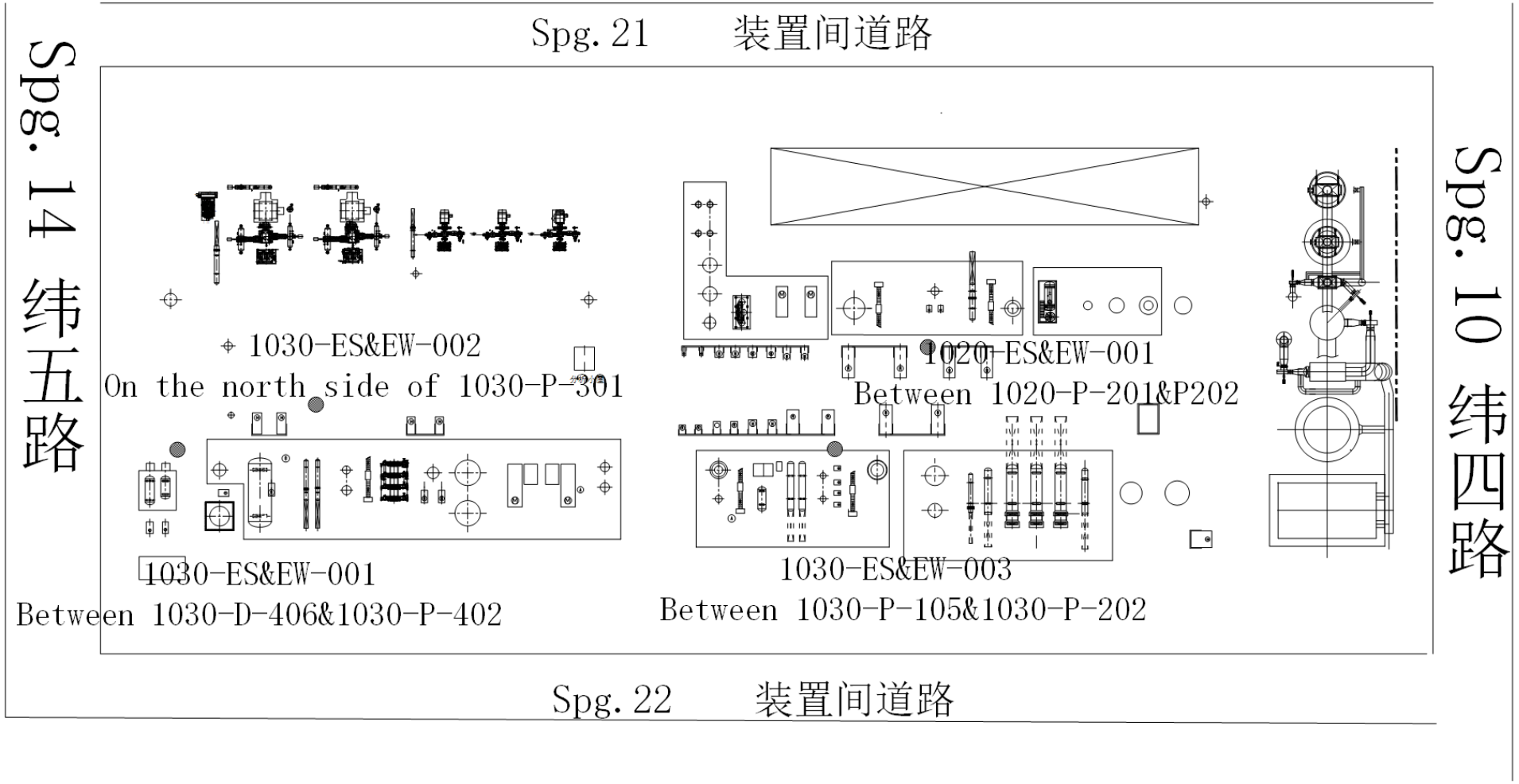


Appendix 9 Layout plan of fixed combustible and toxic gas alarm of LPG fractionation unit

附件 9 气体分馏装置固定式可燃、有毒气体报警仪平面布置图

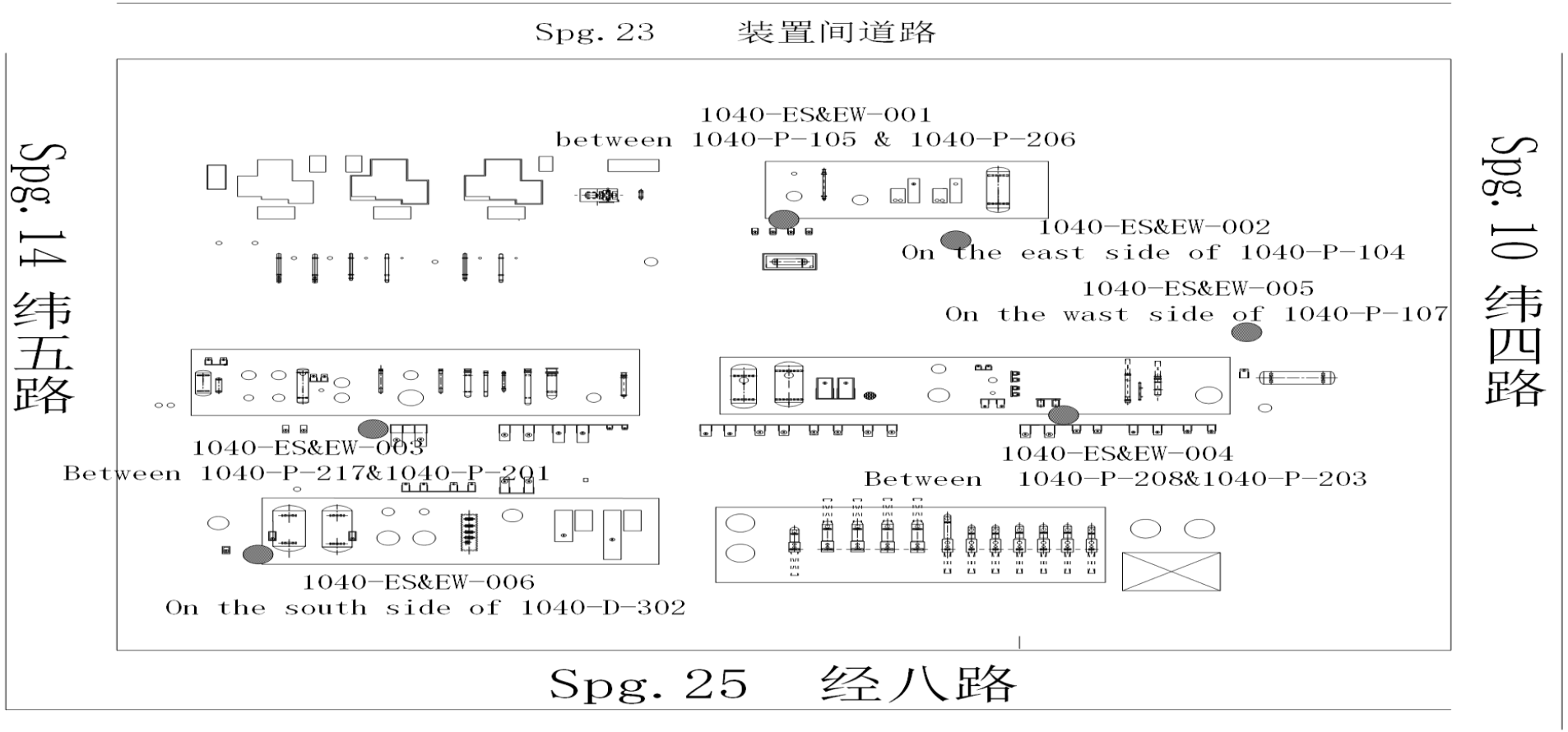


Appendix 10 Layout plan of eye washer of kerosene & diesel hydrotreating unit
附件 10 煤柴油加氢装置洗眼器布置图



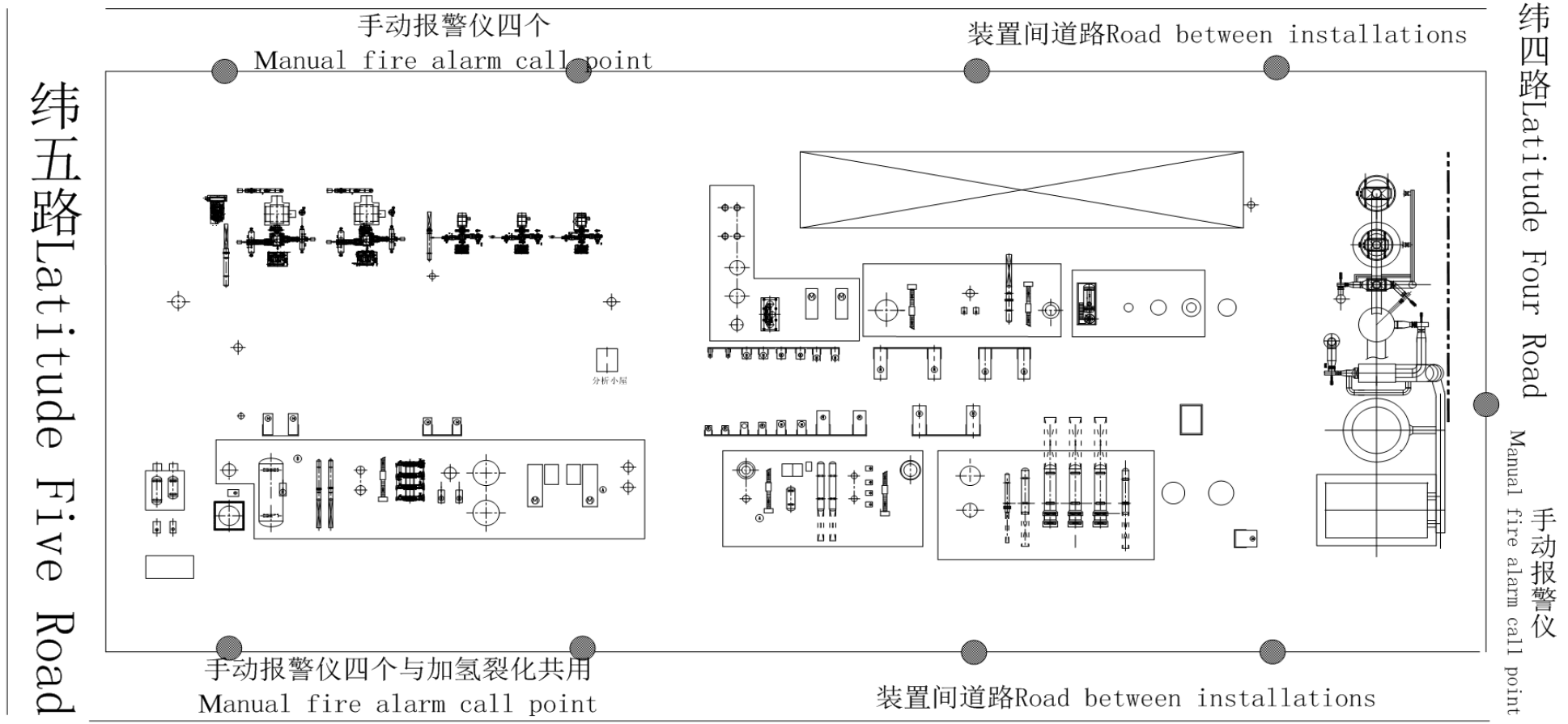
Appendix 11 Layout plan of eye washer of hydrocracking unit (no eye washer for LPG fractionation unit)

附件 11 加氢裂化装置洗眼器布置图 气体分馏装置不设置洗眼器



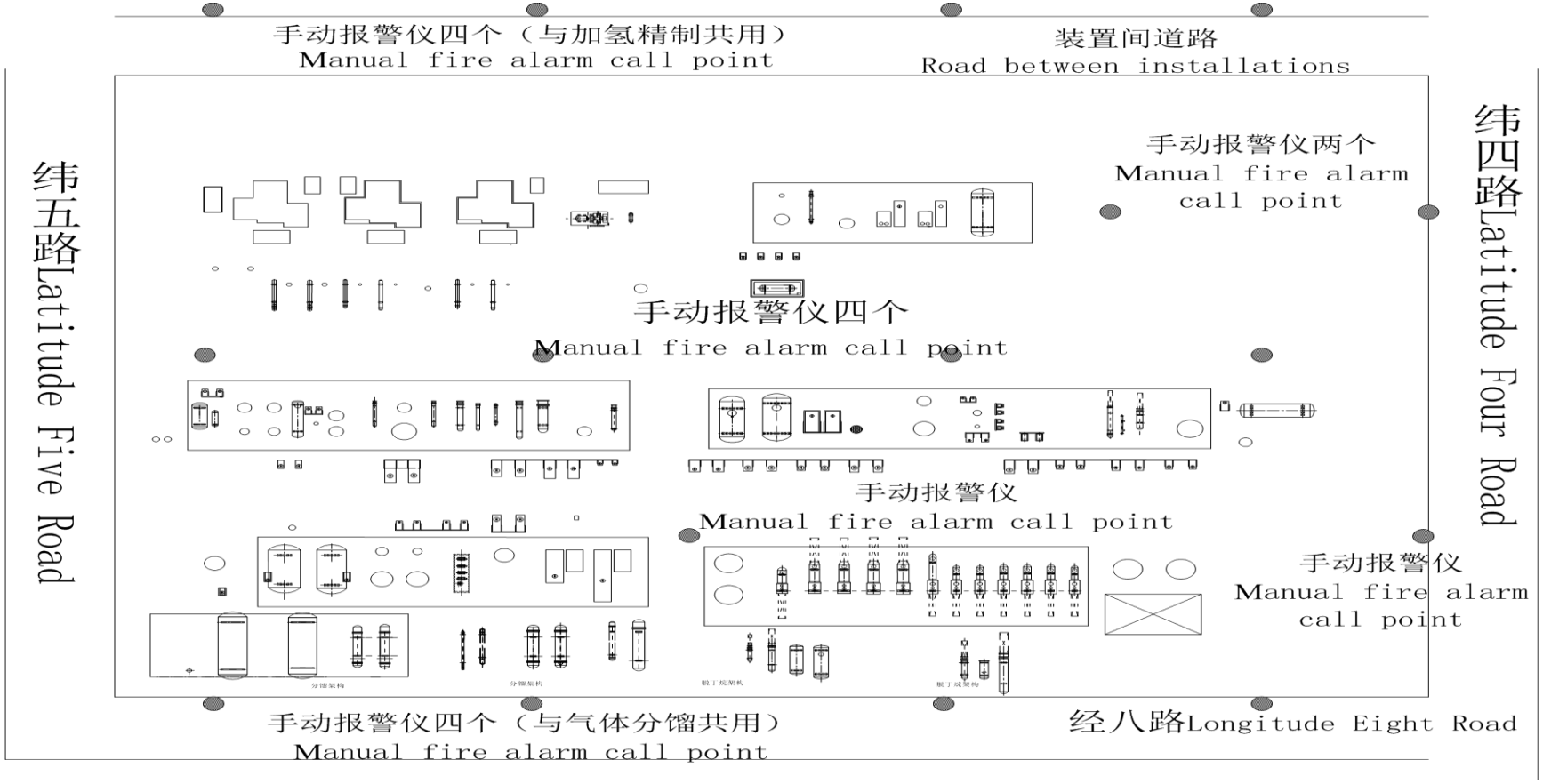
Appendix 12 Layout plan of manual fire alarm of kerosene & diesel hydrotreating unit

附件 12 煤柴油加氢装置火灾手动报警仪平面布置图



Appendix 13 Layout plan of manual fire alarm of hydrocracking unit

附件 13 加氢裂化装置火灾手动报警仪平面布置图



Appendix 14 Layout plan of manual fire alarm of LPG fractionation unit
附件 14 气体分馏装置火灾手动报警仪平面布置图