



Date of Incident



30th May 2024
(Thursday)

Time of Incident

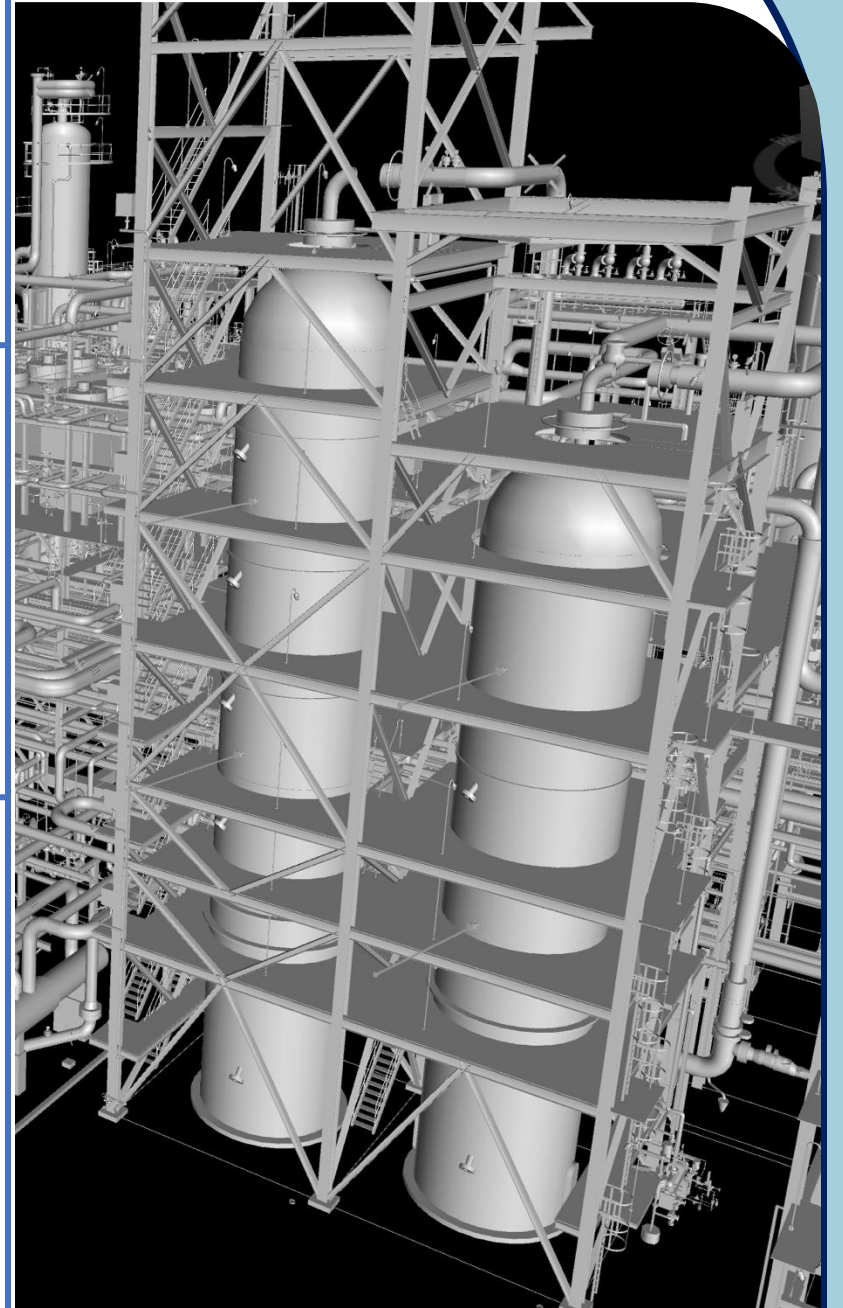


05:46 AM

Location



Refinery Zone 2
Hydrocracking Unit
(HCU)
Reactor R-102



Accident Category



Fire
Accident

Accident Level



Company
Level

Casualties

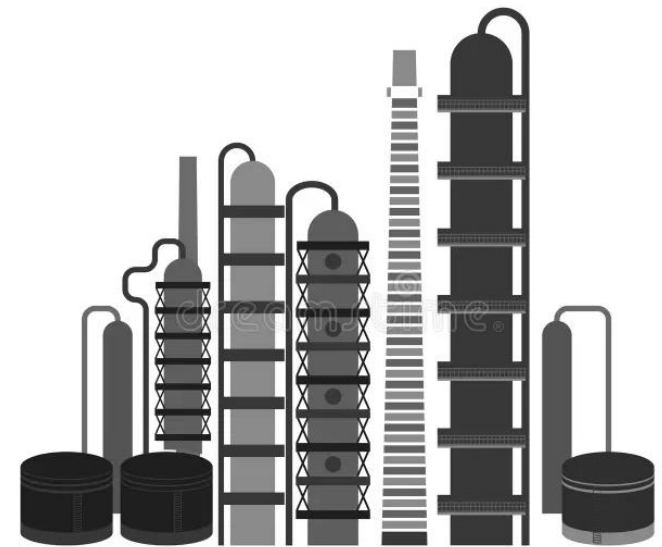


None

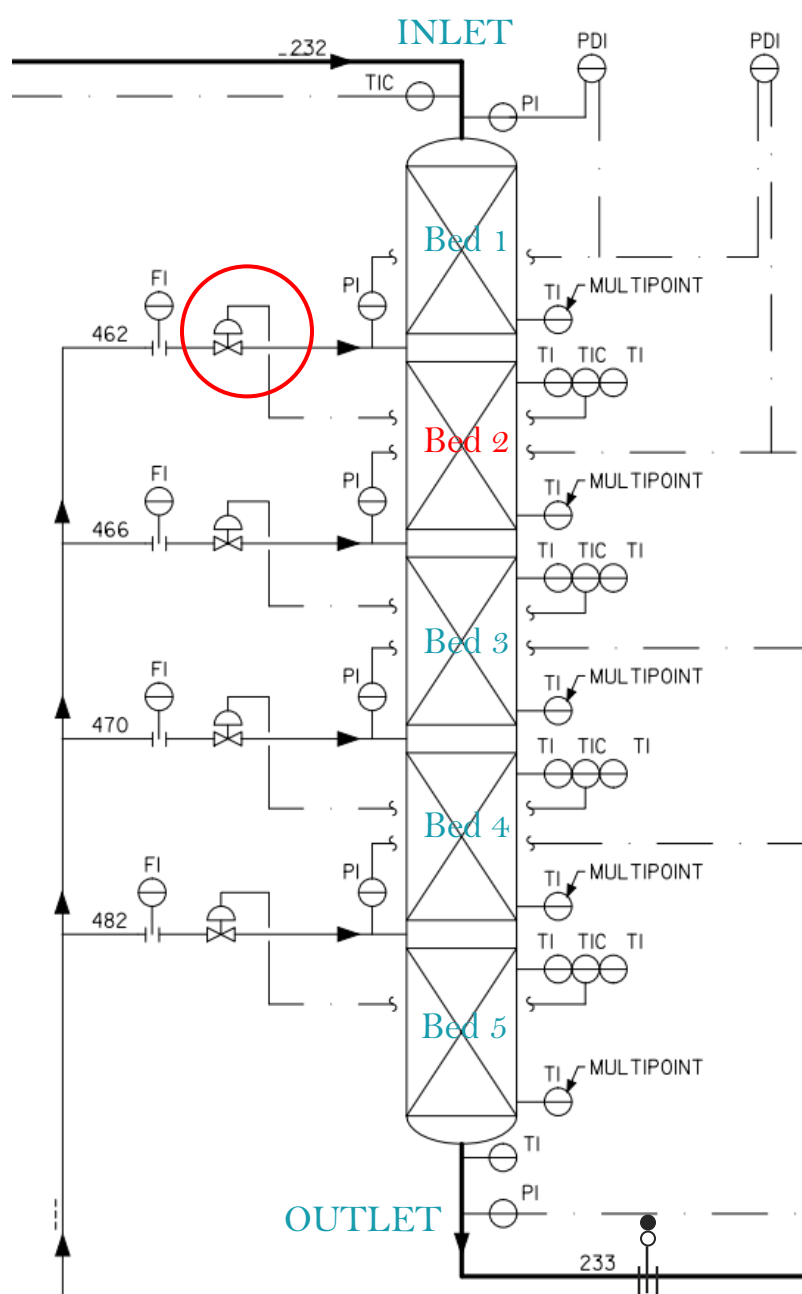


Hydrocracking Process

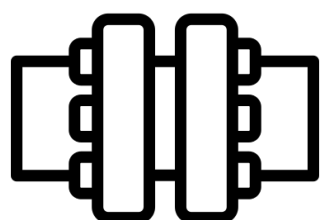
It is a process that breaks down heavy oil molecules into lighter, more valuable products — like diesel, jet fuel, and gasoline, using hydrogen gas and a catalyst under high pressure and temperature.



Incident Description



The main operator was adjusting both the liquid level control valve of Scrubber Tower C102 and the temperature control valve for the second bed of Reactor R102 at the same time. On the DCS interface, both control valves were displayed on the same screen. During the adjustment process, he inadvertently closed the temperature control valve of the second bed of R102 while attempting to adjust the C102 level control valve. This led to an increase in the reaction temperature in the second bed of the reactor. During the shift operation, a series of violations were carried out by the operator, leading to the failure of multiple layers of protective barriers. As a result, at 5:46 AM, inspection personnel discovered smoke and a fire in the reactor area.



The fire occurred at the first flange of the bottom outlet pipeline of the Hydrocracking Unit R-102



On-site Rescue Efforts



Firefighting efforts took up to approximately 10 hours, with 13 fire engines and 73 pax deployed to scene



Main columns and platforms were deformed

Pipelines, instrument and electrical wiring were damaged

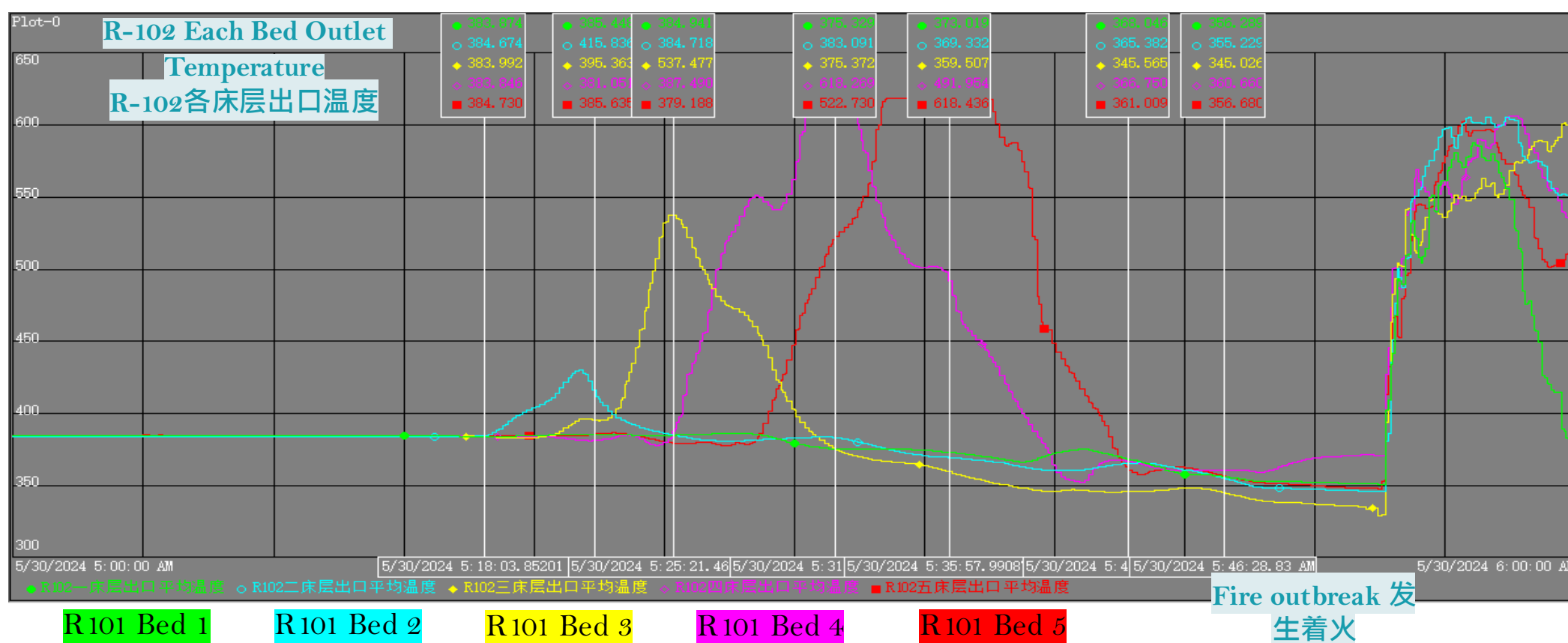


After restoration



Direct Reason

R102 outlet temperature underwent a rapid and significant change within a short period. This sudden temperature drop at the reactor outlet flange caused the seal to fail, resulting in leakage and combustion of high-temperature medium inside the reactor.



Indirect Reason

The operator mistakenly closed the temperature control valve of R102's second bed while adjusting the level of C102 level, resulting in overheating of R102 beds and outlet temperature.

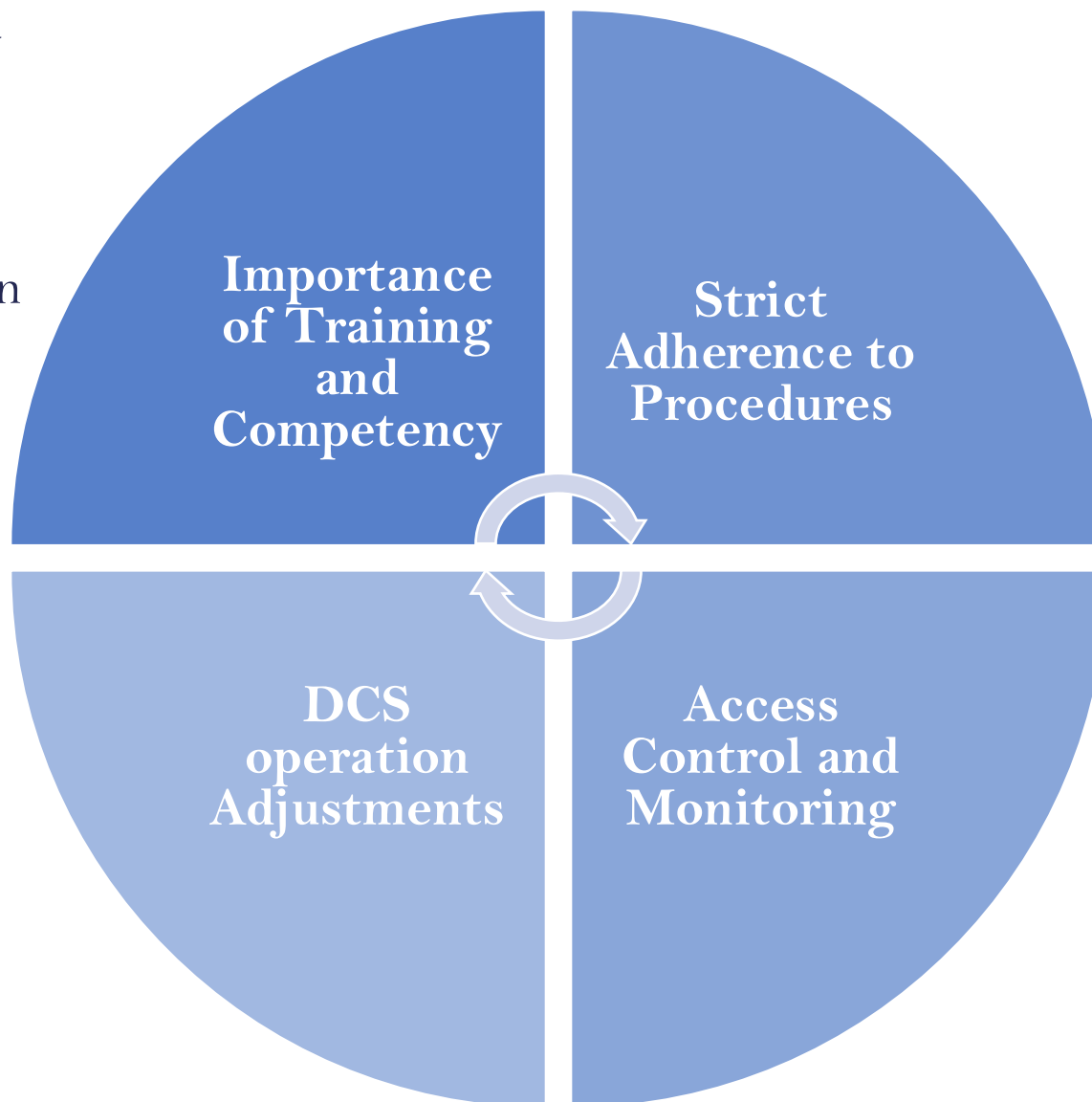
The operator violated the procedures outlined in the "Hydrocracking Unit Technical & Operation Process Specification" for dealing with reactor runaway temperature accidents.

The operator violated the provisions of the "Process Technology Management System" by unauthorized bypassing interlocks.



Lessons Learnt

- Train employees how to operate machinery correctly and responds appropriately in emergency situations.
- Prohibits against opening multiple operation panels simultaneously and conducts regular inspections and assessments



- Regular review and inspection of SOPs help maintain high safety standards and prevent errors
- Implement access control authorization for any safety-critical equipment, including interlocks



Department organize trainings regarding the incident

HSE Dept. organize company-wide incident training

Learn, Apply, Prevent



事故日期



2024年5月30日
(周四)

事故发生时间

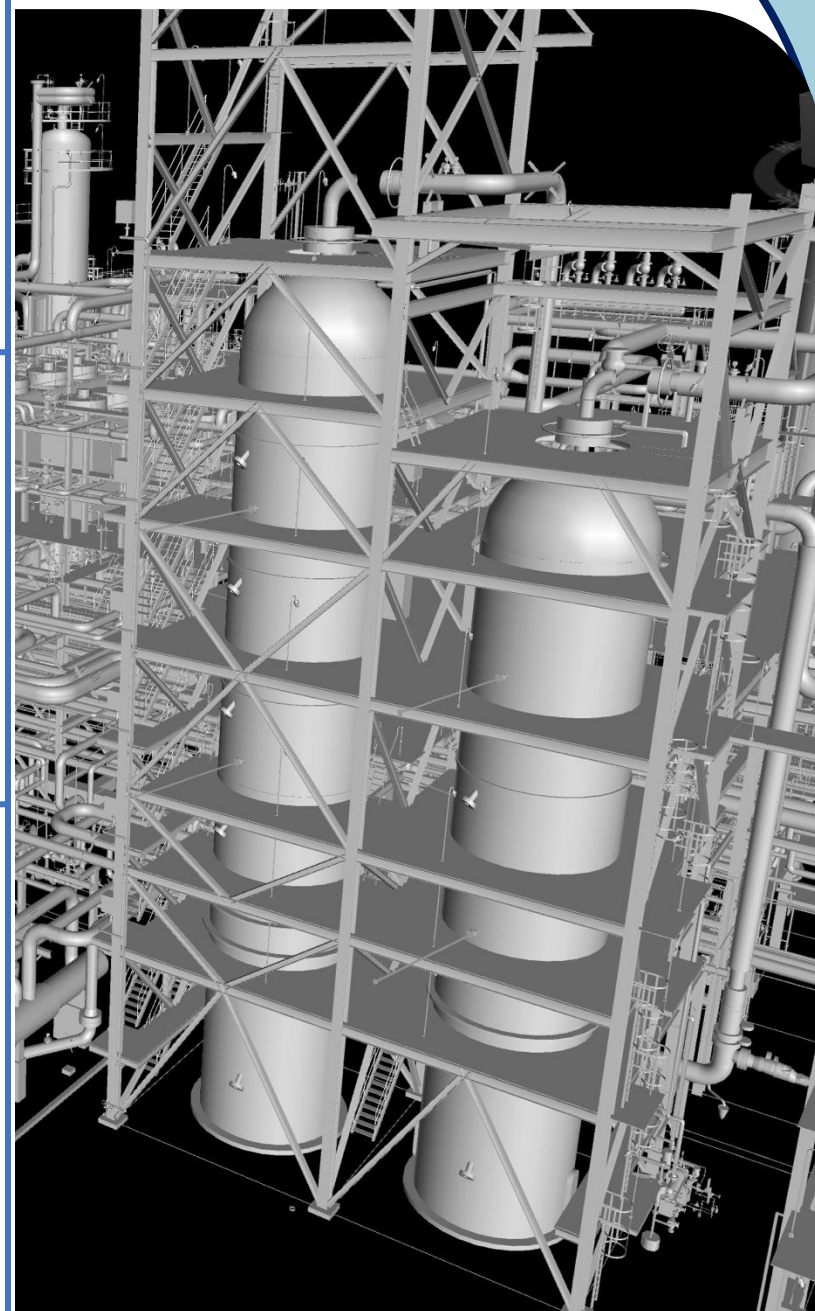


凌晨05:46

事故发生地点



炼油二部
加氢裂化装置
R-102



事故类别



着火事故

事故级别



公司级



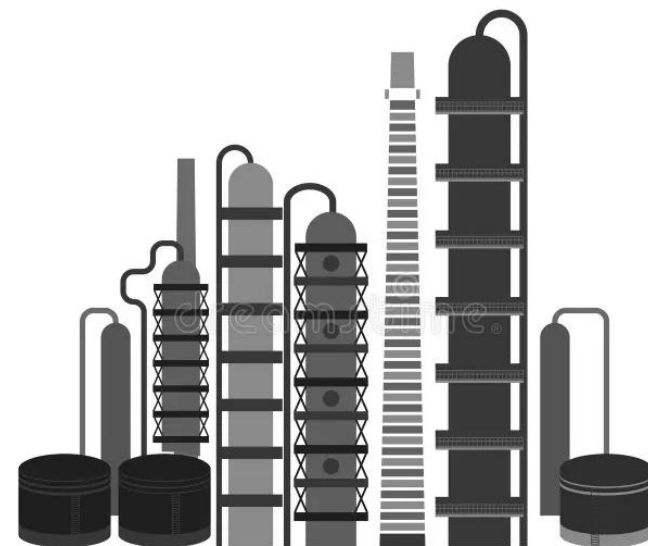
伤亡情况

无



加氢裂化工艺描述

通过在高温高压下，利用氢气和催化剂，将重质油分子分解成更轻、更有价值的产品，例如柴油、航空煤油和汽油。

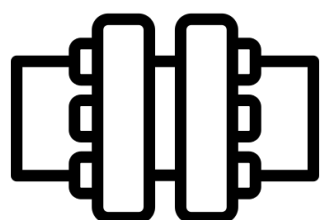
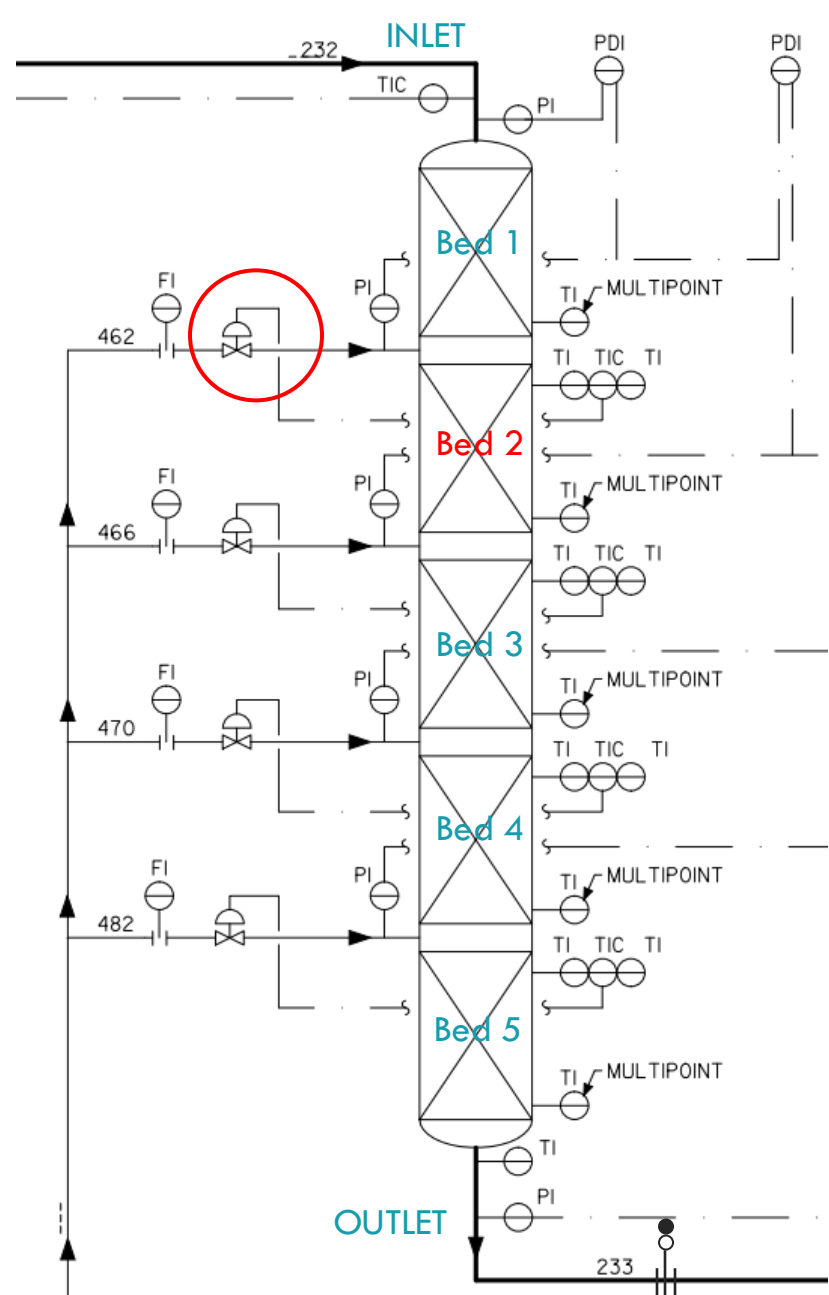


事故描述

当班主操在同一时间对**C102**洗涤塔液位调节阀和**R102**反应器第二床层温度调节阀进行操作。在DCS界面中，这两个调节阀显示在同一个画面上。

在操作过程中，当班主操在调整**C102**液位调节阀时，不小心关闭了**R102**第二床层的温度调节阀，导致第二床层反应温度上升。

在当班操作过程中，当班主操进行了一系列违规操作，导致多层防护屏障失效。结果，在凌晨**5:46**，巡检人员在反应器区域发现了冒烟和着火的情况。



着火部位为加氢裂化装置R-102底部出口管线第一道法兰



现场救援工作



灭火工作持续了约 **10** 小时，共出动 **13** 辆消防车 和 **73** 名人员参与救援



塔及操作平台发生
变形

管线、仪表及电气
线路受损

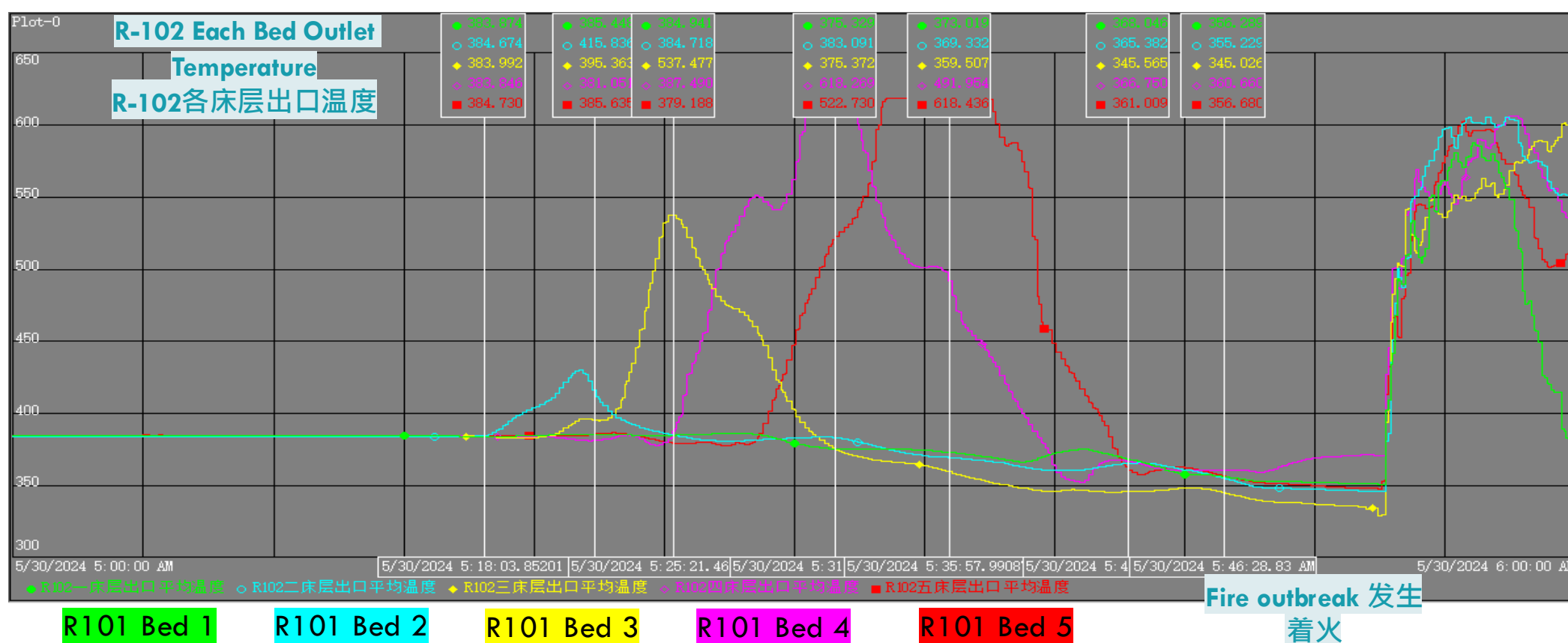


恢复情况



直接原因

R102出口温度在短时间内急剧大幅度变化，短时间内反应器出口法兰温度骤降导致密封失效，造成反应器内高温介质泄漏燃烧。



间接原因

当班主操在调整C102液位控制阀时，错误地关小R102第二床层温度控制阀，导致R102床层及出口温度超温。

操作工在未按《加氢裂化装置工艺技术操作规程》中反应器飞温事故处理方法进行操作。

操作工在处置过程当中，违反《工艺技术管理制度》规定，违章摘除联锁。



经验教训

- 培训所有相关人员都知道如何正确操作并在紧急情况下做出适当反应

- 定期审查和检查SOP有助于保持高安全标准并防止错误

培训和能力的重要性

严格遵守SOP

- 禁止同时打开多个操作面板，并定期进行检查和考核

- 为任何安全关键设备（包括联锁装置）设置访问控制权限

DCS运行操作

权限控制监控



部门组织关于该事件的培训



HSE部门组织全公司范围的事件培训

学习, 应用, 预防