

‘Recovery’ Phase for Operations in the COVID-19 Pandemic

Awareness-raising for safe start-up

Introduction

This CIA Information Note aims to help raise awareness of the issues that may be involved in ensuring a safe return to full capacity working in the chemicals sector, as the UK begins to move to the ‘Recovery’ phase from the COVID-19 pandemic. The majority of CIA member company sites are fortunate to have continued working through the pandemic, as chemical businesses have been classified as a key/critical work sector. Nevertheless, most sites have been working with reduced site and/or contract workforce, a significant portion of the staff home-working, and some processes either shut down or at risk of needing to shut down, potentially at short notice and for varying lengths of time. In these unusual times, a site’s original plans and procedures for both shut down and start-up operations may need to be adjusted to account for new organisational changes, additional restrictions and controls now in place. Such activities affecting process plant & equipment and staff need to be carefully risk assessed, planned and managed to ensure safe operations.

Process safety incidents related to start up are well documented and unfortunately continue to happen. It was widely reported on 7 May 2020, that a leak of styrene from a chemical plant in southern India resulted in multiple fatalities and hundreds of hospitalisations. While full details of the cause, and indeed the extent of the casualties, have been slow to emerge it has been reported (*BBC article*) that the loss of containment occurred as the plant was re-started for the first time since India went into lockdown in response to the coronavirus outbreak. It was also reported that ‘it looked as though proper procedures and guidelines were not followed when the plant was being re-opened.’

To coincide with the re-start of many chemical plants as different countries emerge from the effects of ‘lockdown’, the International Council of Chemical Associations (ICCA) has recently released an Alert entitled “*Be Smart: Safe Restart*” highlighting this critical aspect of process plant safety. As well as endorsing ICCA’s guidance, in this CIA paper we reference the key aspects from our own experience that companies should pay special attention to. Fortunately, most sites are well used to shutting down and restarting processes occasionally, for example for turnaround and other planned maintenance and installation projects. The same level of attention to detail is essential for safe recovery from Coronavirus - even if your site has continued operating through the restrictions in the UK, there may be aspects of your previous level of operations that have changed; companies need to ensure that all these are effectively managed as you return to normal working.

What can go wrong?

The importance of start-up checks is well recognised. Bow-tie analyses clearly show that some start-up operations rely heavily on procedural controls such as purging and inserting operations for avoidance of flammable atmospheres on re-start for example. Misalignment of valving for start-up, with routes to atmosphere or routes to equipment not designed to hold certain process fluid conditions are classic examples causing losses of containment on re-start underlining the importance of undertaking leak testing activities in conjunction with walking the process lines. Equally, misalignment of valving resulting in isolation of emergency venting systems can lead to subsequent catastrophic failures. Chemical reaction hazards for material left in vessels longer than anticipated, allowed to warm up or cool down with the weather instead of having good temperature control or as unintended inventory not fully drained out on shutdown can cause unexpected situations to arise with unwanted reactions, blockages, or thermal expansion or contraction effects. Corrosion may have occurred faster than expected caused by dilution, condensation or other temperature effects, leading to vessel weaknesses and eventual loss of containment. Instrumentation may have been isolated during shutdown periods so pre-restart trip checking is important to confirm control systems are not compromised.

Questions that leadership teams should be asking

Most businesses are currently facing some level of disruption and uncertainty caused by the effects of the pandemic and its potential impact on markets, supply chains and site operations. For sites with hazardous material inventories and potential for major accident hazards, these must be carefully managed. Whatever the financial pressures from either shutdown, contract staff temporary unavailability, furloughed or homeworking permanent staff, or time-pressured production re-start, there are some questions which the site leadership teams should ask their operations teams:

Questions the site leadership team should have already anticipated in risk assessments

Most CIA member companies have been working through the pandemic, as a recognised key/critical work sector – but often with some processes shut down, reduced site-based staff, many people furloughed or home-working, and contractors no longer working. As such we expect that comprehensive risk assessments for these aspects will have been completed, including some or all of the following issues:

For short notice shutdown

- * What are the potential major accident hazard scenarios, and do we have the right controls in place to prevent these from happening?*
- * If the operational changes are expected to be short term but the situation changes and becomes long term, what else do we need to do to ensure safety and environmental protection?*
- * What are the Environmental, Health and Safety – including process safety - critical tasks and how resilient are we against resource constraints; for example, what if process or maintenance critical staff are not available at the appropriate time?*
- * What procedures will we follow, are they adequate and how will we record plant status for the duration of the changed operations and anticipated future re-start? Have Management of Change controls been implemented and completed?*
- * Have we included Human Factors in our risk assessment and adequately considered operator competency and fatigue issues in relation to operating through COVID-19?*

For short notice staff home-working or furlough

- * For transfer to home-working, can the safety critical duties and tasks be done equally effectively from home?*
- * What EHS critical tasks were these staff undertaking and have we adequately transferred responsibility for these tasks to other staff?*
- * Have we allowed for adequate handover periods between these staff?*

For short notice contract terminations

- * What EHS critical tasks were contractors undertaking and have we adequately transferred responsibility for these to permanent staff?*
- * Have we allowed for adequate handover periods from contract to permanent staff?*
- * Have we adequately trained people for any changeover of roles or responsibilities?*

Questions the site leadership team should consider in risk assessments for Safe Re-start:

- * *Are all maintenance activities that were ongoing through the changed working arrangements properly closed out and is any shut down plant ready for recommissioning?*
- * *Are new socially-distanced shift handover arrangements sufficiently effective for critical start-up activities?*
- * *What are the relevant potential major accident hazard scenarios and do we have the right controls in place to prevent these from happening?*
- * *Are we aware of the causes and learnings from past experience related to start-up on our site and do we still have everything in place to prevent potential incidents?*
- * *Are there any process safety key performance indicators currently causing us a concern and if so, what can we do to address them?*
- * *Have we communicated the relevant major accident hazard scenario consequences to relevant site personnel and site leaders, owners or board of directors to help them understand the importance of ensuring adequate resources at this time?*
- * *Are we using the latest version of our pre-start-up checklist? Are we confident every item on the list is in a suitable state for start-up? Did we take input from our process hazard analyses when compiling our start-up checklists? (i.e. did we miss anything?)*
- * *Are the operations teams adequately trained and competent for re-start?*
- * *Are operations teams empowered to stop if they experience anomalies during start-up that need investigation, rather than continuing regardless due to time pressure?*
- * *Have we considered the Human Factors issues of operator fatigue during future operations?*
- * *What are the EHS critical tasks and how resilient are we against resource constraints (for example if process-critical people are not available at the appropriate time)?*
- * *How can we now build the positive safety culture needed for the site if it's not already there, or how can I safeguard our safety culture going forward if we have it?*

Process Safety Leadership

In the paragraphs above we have alluded several times to the critical importance of the role of Leadership, which cannot be overstated. The checks we have highlighted in this document are based on the foundations of effective *Process Safety Leadership*, delivered through the leadership team and its interaction with safety professionals, technical and operations experts throughout the organisation. The importance of the **Site Leader** role in facilitating this structured approach to managing major hazard risks is essential for operations in relation to recovery from Coronavirus restrictions and changes.

Since our original work on process safety best practice CIA has collaborated over many years through the joint industry/regulator COMAH Strategic Forum (CSF) to contribute awareness-raising guidance for the benefit of CIA members and others in the Sector – this is especially relevant at this important time for chemical businesses. Further information can be found in the following CSF publications and alerts that CIA has helped develop:



Managing Risk – The hazards that can destroy your business’ (2017)



Senior Leaders – What you need to know about major hazard leadership’ (2019)

Further reading



IChemE Safety Centre Safety Lore: Key lessons from incidents during start-up operations, March 2018



Energy Institute: Operational readiness and process start-up: Guidance on meeting expectations of EI process safety management framework



eMARS – Chemical Accident Prevention and Preparedness: Pandemic measures and Chemical Process Safety

Finally, please note that the information in this note serves as CIA guidance which we believe to be both accurate and helpful to chemical businesses. We will keep the content under review and will add any further information from operational and risk assessment experience as we gather it.

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