



A Yokogawa Company

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Five key questions for Turnarounds during COVID-19

Many refineries and petrochemical plants worldwide are altering their turnaround schedules as a means of reducing COVID-19 impact. However, there is critical work that cannot be postponed without jeopardizing assets' loss of "license to operate". Therefore, these companies will have to limit work to the essential must-do items only, add COVID 19 Personal Protective Equipment (PPE), follow Center For Disease Control (CDC) or equivalent guidance on disinfection of all potentially contaminated surfaces. Not to mention, rewrite job methods to allow social distancing and smaller teams.

Some oil refiners have tried to proceed with their turnaround activities; they indicated that contractor availability was less than 10% of what was required, and highlighted impacts of COVID-19 in the supply chain for parts and materials. Some parts manufacturers have closed their shops impacting the availability and delivery of both off-the-shelf items as well as custom made components (e.g., flare tips, compressor and turbine parts, vessel internals, etc.).

Here we pose five key questions for Turnarounds during COVID-19.

1.0 Is the underlying premise of your Turnaround still valid?

Industry economics have been impacted significantly by COVID-19. The effects of balancing supply and demand are still playing out. Crude prices have fallen. The value of gasoline and jet fuel have fallen drastically. What's the impact of value chain optimization on Turnaround strategies?

- Plants only make money when they are running. With site-wide Turnaround strategies being the biggest influencer of mechanical availability, it's vital to incorporate consideration of the value of different molecules in Turnaround planning. Notwithstanding equipment condition/integrity, in a very different business environment can you afford to shut down certain units?



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- Whilst individual unit Turnaround frequency/cycle and capital cost is important, the value of “lost” molecules is of high importance and carries high economic impact. The units down are not only out-of-service and unable to produce their various products/intermediate streams, but so too are their downstream units.
- Therefore, there needs to be focus on selectivity/sequencing of which units are being taken down at which time – based on molecular value – because availability of different material stream manufacturing capabilities are worth different amounts of money.
- This is why Turnaround strategies need to incorporate asset-wide process simulation scenarios to incorporate considerations of stream routing and material flows. The use of rigorous asset-wide process simulation in determining Turnaround strategies could be a major factor in determining the overall survival of asset.

2.0 Can you postpone the Turnaround?

Every decision carries some element of risk. The key to making the best decisions involves using a structured risk assessment methodology that enables identification of the minimum scope of work. As well as enabling the development of alternative and contingency plans that allow the company to be prepared for ramping up once the Pandemic recedes. Key points are listed below.

- Decision to progress or postpone the turnaround must be based on Risk Assessment of the original scope (usually defined 12-24 months before the turnaround date) identifying those compliance items that cannot be completed on the run or deferred through waivers. High and medium-high risks need careful evaluation through a structured risk analysis using the latest condition assessment reports (integrity, Health Safety and Environmental (HSE), business impact, and resource availability).
 - The risk assessment should be conducted using an approved risk tolerance matrix for screening purposes and if more detailed assessments are needed, they could include the use of risk management software applications.



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- For those medium risk discretionary tasks that will not be worked in the turnaround, place the job packages with the proper priority in the ready to schedule backlog for execution during the next maintenance opportunity window (e.g., logistic shutdown, exchanger cleaning, etc.).
- Consider the following COVID-19 risks:
 - Travel restrictions for specialty contractors (e.g., welders, or in-house subject matter experts (SMEs)).
 - Closure of fabrication and repair shops.
 - Delays in ocean freight schedules.
 - Shortage of customs personnel for clearing equipment being imported for the turnaround (e.g., robotic weld overlay equipment, decontamination equipment and chemicals, etc.).
 - Hotel and restaurant closures.
 - Need for man camps in certain locations as they could pose a high risk for virus spread.
 - Increased crime in depressed areas as the business environment becomes more negatively impacted.
- Adjust the turnaround premise and work list (scope) as appropriate and communicate to the Turnaround Executive Committee.

3.0 Can you execute the Turnaround?

The turnaround execution strategy may need significant adjustments in order to re-sequence the work with the reduced scope and introducing the constraints derived from working under COVID-19 (e.g., social distancing, new delivery dates for critical materials and services, etc.)

- Update the scope of work as needed.
- Review the schedule considering:
 - Business demand (the turnaround critical path may not need to be worked 24/7, allowing a reduction in contractor headcount through resequencing parallel activities planned for execution in congested areas as sequential, when social distancing is not possible)



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- Availability of all critical spare parts as delivery of custom made parts (e.g., equipment parts, flare tips, vessel internals) may have been impacted by shop closures or reduced staffing. Also, the availability of parts that normally would be considered off-the-shelf could have been impacted by the Pandemic.
- Review labor availability, in particular for crafts requiring highly qualified personnel (e.g., welders, equipment technicians, manufacturer representatives, etc.)
- General mechanical contractor.
- Specialty contractors (in particular service provided by overseas companies).
- Confirm the availability of materials, tools and machinery (e.g., cranes, bundle pullers, etc.).
- Review site access protocol and logistics to implement actions for social distancing and COVID-19 testing as directed by company protocol and/or requirements from local authorities (e.g. CDC in the USA).
- Review turnaround onboarding and meetings protocol for compliance with the established COVID-19 prevention guidelines.
- Review and update logistics (turnstiles, worker transportation, meals, breaks, showers, permits, lodging, etc.) and safety rescue plans as necessary to ensure proper PPE to protect rescue crew against COVID-19 infection.

4.0 Can you complete a safe Turnaround?

Once the schedule has been optimized for the new turnaround premise scope and safe work practices, update the necessary procedures and instructions to reflect the following changes:

- Check the health condition of all personnel entering and leaving the facility for COVID-19 symptoms. Use COVID-19 test kits that are approved by the local authorities or endorsed by the World Health Organization (WHO) or the CDC.
- Ensure adequate supplies and enforce the use of COVID-19 PPE (e.g., face masks, latex or nitrile gloves to be worn under work gloves, etc.).



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- Safety Chats
 - Perform safety chats in small groups (shift safety topic – common practice) adjusting the room layout so that a 6 feet minimum social distancing is always observed (unless indicated otherwise by local authorities). Provide hand sanitizer and/or antibacterial wipes for added protection.
 - Perform safety chats at the crew level maintaining the social distancing guidelines indicated above.
- Hygiene
 - Conduct deep cleaning of all breathing air (SCBA) respirators, face masks, and any other reusable PPE at the end of each shift.
 - Establish a continuous disinfection routine for all common area touch point surfaces (e.g., tables, permit desks, buses, toilets, kitchens, handrails, elevators, elevator pushbuttons, door handles, push plates/bars, light switches, etc.).
- Work permits
 - Permit area layout to satisfy social distancing requirements. Avoid sharing pens for signing permits.
 - Review permit issuing protocol to apply social distancing.
 - Implement an electronic permitting system, if possible.
- Field guidelines for support groups
 - Maintain social distancing and wear face masks as directed by the company COVID-19 prevention policy.
 - Communicate by radio (or mobile phone where allowed).
 - Wear latex or nitrile gloves at all times, check for wear at fingertips.
 - Avoid touching any frequently touched surfaces (e.g., elevator buttons, equipment start buttons, handrails, etc.) with bare hands.
- Evacuation routes and assembly points – review these for the revised head count and social distancing requirements.
- Limit face-to-face shift handover meetings to major issues and key stakeholders, maximizing electronic communications to non-essential personnel (e.g., video conferencing, or mobile phone – not radio as it is not a secure channel).
- Hands on – crew recommendations
 - Minimize proximity (some jobs do not allow that).
 - Review break areas.
 - COVID-19 safety moments to drive the importance of following safe practices.



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5.0 What can you learn from your Turnaround?

After the turnaround has been completed conduct a post turnaround review including lessons learnt regarding the COVID-19 prevention effectiveness and what can be done to further improve the measures.

- Capture the learnings into the plant's emergency and contingency plans, in order to be prepared in case of another outbreak in the future.
- Re-evaluate the turnaround long term strategy for the impact postponing the turnaround.

We all want to come through this current COVID-19 pandemic safely and emerge able to resume our normal activities. Focus on maintaining the license to operate is critical and the application of recommended practices should smooth the disruption and provide a safer turnaround for all.

Ultimately it is up to you as to how you go about your Turnarounds. But with deep domain knowledge and leading-edge technology, KBC can help. Please contact us at info@kbc.global to discuss your Turnaround situation and how we can improve your asset's safety, reliability and profitability.

Stay safe.