

## CASE STUDY

# NCOC Completes Historic First Turnaround with Roser Suite from Prometheus Group





## COMPANY



North Caspian Operating  
Company (NCOC)



Atyrau,  
Kazakhstan



Oil Industry

## Challenges

- The first turnaround at a new facility, so no previous scopes to draw on.
- The only way to import work orders is through the established scheduling tool, which cannot be used for the project scope.
- Needed contractors only available for a specific window of time.
- Extensive scope, including modifications to offshore facilities, needed to increase production.

## Results

- Successfully completed initial turnaround, providing scopes and timelines for next event.
- Roser interface seamlessly integrates with scheduling solution, allowing easy import of scope.
- Turnaround completed on time with excellent safety record.
- Successful completion of turnaround and modifications **increased oil production by 7%.**

## NCOC Completes Historic First Turnaround with Roser Suite from Prometheus Group

### ABOUT NCOC

NCOC is an operating company formed by ExxonMobil, Shell, Eni, KazMunayGas, Total S.A., China National Petroleum Corporation, and Inpex under the North Caspian Sea Production Sharing Agreement (NCSPSA). Based in Atyrau, Kazakhstan, NCOC operates four offshore oil fields in the North Caspian Sea: Kashagan, Kairan, Aktoty, and Kashagan South West.

Production in the Kashagan oil field started in 2016. After modifications made during NCOC's first turnaround in 2019, production has climbed to approximately 380,000 barrels per day.

The oil recovered from Kashagan is "sour," with high levels of hydrogen sulfide ( $H_2S$ ). It must be processed to remove the  $H_2S$ , a process that produces elemental sulfur, which is then sold for industrial purposes. Not only is  $H_2S$  a highly flammable, explosive gas, but breathing even small concentrations can lead to serious health effects or death. All workers at NCOC, including contractors, are issued breathing equipment to help ensure personal safety.

Shutdowns, turnarounds, and outages (STO) in the oil and gas industry are challenging. The project scope, the timing of the event, and health and safety concerns must all be considered when planning a turnaround. The presence of large concentrations of hazardous gas means even more care must be taken to ensure the safety of workers.



NCOC conducted the first-ever turnaround of its onshore and offshore facilities in June 2019, requiring years of effort in the planning stages. The turnaround needed to achieve the following goals:



1. Complete an ambitious program of modifications to increase production.



2. Establish basic project scopes and timelines for future turnarounds.



3. Ensure worker health and safety during the turnaround event.



4. Protect data integrity and ensure scopes and work orders can only be changed by authorized personnel, while remaining visible to all required stakeholders.



5. Abide by very strict timelines to account for the limited availability of contractors in the region during certain periods of the year.

To achieve these goals, NCOC needed a solution that would solve three main challenges:

1. Allow testing of scopes to ensure they fit into the time allotted.
2. Planning and scheduling of production-critical modifications into turnaround scope.
3. Seamless data integration with both SAP and Primavera scheduling tool.

## CHALLENGES

Andreas Schwarz is Lead Planning and Scheduling Engineer for NCOC and oversaw planning the scope for the 2019 turnaround. Lyudmila Ulyanova is NCOC's Information Management WEB Management Advisor and was instrumental in providing IT support to the turnaround team. Using Roser's Scope-IT, Systems-IT, and Supply-IT software tools, NCOC wanted to address the following challenges:

- **New facility with no turnaround history:** For their first turnaround, Andreas and his team had to design all the project scopes from scratch. It was essential to have a tool that would allow them to test the schedule before execution. Since NCOC had a set deadline to complete the turnaround, many teams worked seven days a week, with two 12-hour shifts per day. As Andreas noted: "You can't put 10 people on two- or three-square meters! At the end, it will come to a point where even more manpower will not help you to reduce the time of the turnover." Taken together, these factors meant the turnaround had to be thoroughly planned and tested before execution.
- **Scheduling tool only method to import work orders:** Andreas and Lyudmila placed work order information into SAP, operations determined its priority level, and then added selected work orders to the turnaround scope. Under their previous method, work orders were manually added into Primavera (P3 at the time) which would then generate a work schedule. The turnaround team couldn't build the scope for the turnaround within Primavera P6.





- **Short window of execution with little flexibility:**

There are two major reasons why NCOC scheduled turnarounds in April and May. First, Kazakhstan experiences extreme temperature fluctuations over the course of a year. Outdoor temperatures range from minus 31°F (-35°C) during the winter to over 122°F (50 °C) during the hottest points of the summer. Working outdoors in those conditions ranges from difficult to impossible, depending on the activity being performed. Second, the region has many oil producers, but experienced contractors are shared between all the regional gas and oil companies, resulting in a shortage of contract labor. As a remedy, the region's oil producers have a non-contractual agreement to only call on those contractors at each facility's agreed-upon time. NCOC's allotted time window was April to May. Shifting the turnaround to another time would mean there would be no contractors available to undertake the work.

- **Production-critical modifications needed to offshore facilities:** One of the principal goals for NCOC's first turnaround event was to safely complete critical modifications needed to increase production without extending the project's time window. This significantly expanded the scope of the turnaround and posed a major challenge to the turnaround team.

## SOLUTION

Scope creep is always a concern for a plant or facility during a turnaround. Organizations spend massive amounts of money on a turnaround event but there's no production taking place, which means no revenue.

Extending the scope past its deadline is costly and can lead to a delay in restarting the site or facility; for NCOC, extending past deadline wasn't an option.

NCOC knew they would need a turnaround management solution that would allow teams to build and test the scope, guarantee the availability of all materials when needed, and interface with existing systems. They turned to the Roser Suite from Prometheus Group. Each element of the Roser Suite integrated seamlessly with SAP, NCOC's ERP system, and other modules in the Roser Suite. By integrating Roser's Scope-IT into their turnaround process, Andreas could automate file exports from SAP into Scope-IT, prepare work packages, freeze scope, and then import the work packages into P6 to identify critical path.

Work orders were exported from SAP and into Scope-IT. From there, Scope-IT was used to gather and establish project scopes and provide insight into all scope information on one screen. Once all the scope information was gathered, Scope-IT was also used to make decisions about the execution of the scope. Once approved, the scope could be moved into Systems-IT.

The turnaround team at NCOC relied on Roser's Systems-IT application for preparation of the work packages. One of the advantages of Systems-IT is that it allowed specialists from multiple disciplines to work in the same scope simultaneously, thus ensuring that the knowledge of each specialist is put to the best use. Systems-IT was then used to export the work packages into Primavera for execution.

Supply-IT from Roser ConSys was used to manage and release needed materials. Like other parts of the Roser Suite, Supply-IT integrated directly with NCOC's ERP system. This allowed their team to import all materials' information directly from SAP and then add more details. Supply-IT manages the Bill of Materials, tools, and any consumables needed for a turnover. Once complete, material details needed for each activity can be attached directly to work packages.

"Lyudmila and I are responsible for bringing all of the information together," Andrea says. "Work orders are nominated for execution, then operations must decide if it's possible to execute this work order on the run. If so, it goes to daily maintenance. If it's not possible, then it moves to the turnaround. When the work preparation is ready, we freeze the scope. We then load it in to bring it all together and check to see if it's possible to do within that time window. The integrated interface of the Roser Suite made it much simpler than the previous method."

NCOC leveraged Roser's Scope-IT, Systems-IT, and Supply-IT to establish:

- Extremely close alignment with the turnaround schedule.
- Outline of all needed materials, and links to work packages.
- Real-time progress updates over the course of the turnaround.
- Control over scope budget, including estimated costs before turnaround.
- Proven integration with SAP and Primavera P6, including multiple import and export options.
- Parent-child functionality, allowing turnaround team to combine related scopes.

## RESULTS

After implementing Roser's Scope-IT, Systems-IT, and Supply-IT, NCOC received several benefits, including:

- The first-ever turnaround for the facility, completed on-time and under budget.
- Complete integration between ERP, scheduling tool, and Systems-IT.
- Project scopes and timelines now available to build plan for next planned turnaround in 2022.
- Excellent safety record, as ranked internationally against other turnaround events.
- Oil production increased by 7% thanks to modifications put in place during turnaround.



*"We have much more control over the entire schedule, because only the administrators can see and effect the big picture. This makes our life much easier because we can control everything through project milestones."*

— Lyudmila Ulyanova, Information Management WEB Management Advisor, NCOC

## About Prometheus Group

Prometheus Group is a leading global provider of comprehensive and intuitive enterprise asset management software solutions that work within ERP systems and span the full work management life cycle for both maintenance and operations. Developed jointly with end users, Prometheus software enhances the customer experience for planning, scheduling, and executing work for both routine maintenance and shutdowns and turnarounds, all while protecting the workforce with safety solutions and electronic permit to work. Our straight-forward functionality, graphical visualization, and simple processes enable customers to increase productivity, reduce costs, and improve reporting. For more information, please visit [www.prometheusgroup.com](http://www.prometheusgroup.com).