

# CYCLOTECH SCARPA

Eductive sand jetting system for managing produced water and sand

## APPLICATIONS

- Sand and solids removal from production separators

## ADVANTAGES

- Decreases pumped flow rate requirement
- Produces no effect on oil-water separation performance
- Maximizes separator water pad residence time
- Eliminates sand carryover to water and oil outlet streams
- Limits residue sand to less than 5% of total
- Reduces potential erosion and corrosion of separator
- Eases sand removal as it has less time to solidify in place
- Minimizes and controls sand concentrations in outlet pipe work, optimizing the availability and performance of downstream sand-handling equipment
- Limits the size and complexity of the downstream receiving equipment
- Minimizes risk of blockage

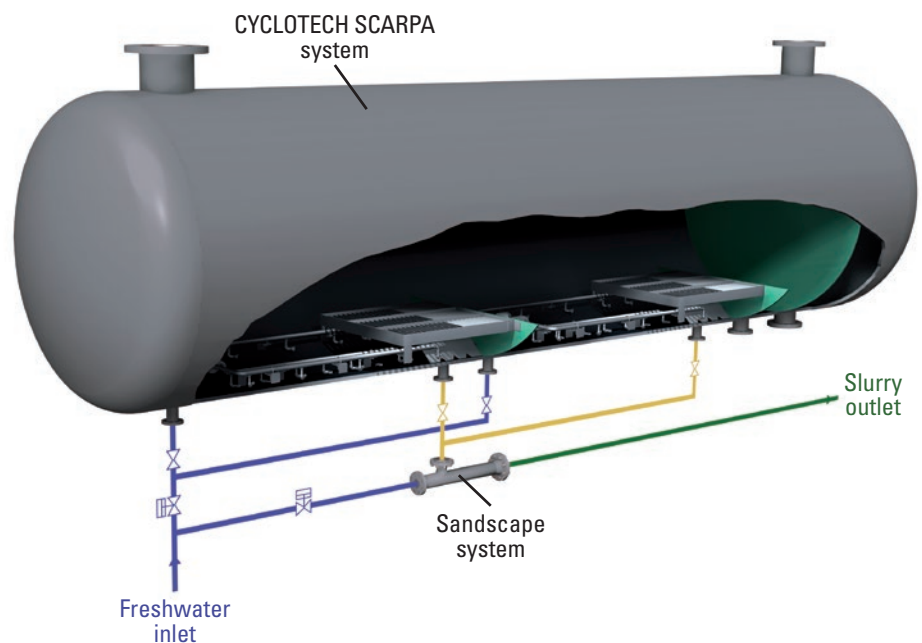
CYCLOTECH\* SCARPA\* eductive sand jetting system removes sand and other solids from a production separator on either a continuous or batch basis. The modular system can be retrofitted into existing separators as well as be incorporated into new-build plants. The SCARPA system can convert a three-phase separator into a true four-phase separator or a two-phase separator into a true three-phase separator. The system was developed for topside and subsea production separators.

In either continuous or batch mode, the SCARPA system needs less water, is much less disruptive of the oil-water separation process, and removes solids more efficiently than a conventional jetting operation. Irrespective of the amount of sand in the separator, the SCARPA system will not allow the discharged sand concentration to rise above a preset peak, thus trading operation time for higher availability and reliability.

## Principle of operation

The SCARPA system creates a low-velocity flow that runs along the bottom of the separator through the use of specialized eductor nozzles. An eductor is an established solids-conveyance device that uses a small flow of high-pressure motive fluid to pump a higher-flow, lower-pressure fluid. The eductors' format of suction from behind and discharge in front enables hydraulic balancing to generate a dynamic layer of water of comparatively low velocity along the bottom of a separator. Such hydraulic balancing prevents sand from settling and acts as an effective solids-transport system with minimal radial (vertical) disturbance.

This hydraulic conveyor can be directed toward one or more discharge outlet nozzles at the bottom of the separator and then routed to the suction of an external CYCLOTECH Sandscape\* solids conveyance and concentration control system, which controls ejection of solids from the separator.



*Hydraulic conveyance of the CYCLOTECH SCARPA eductive sand jetting system can be directed toward one or more discharge outlet nozzles and then routed to a CYCLOTECH Sandscape system.*

# CYCLOTECH SCARPA

## Limitations of conventional technology

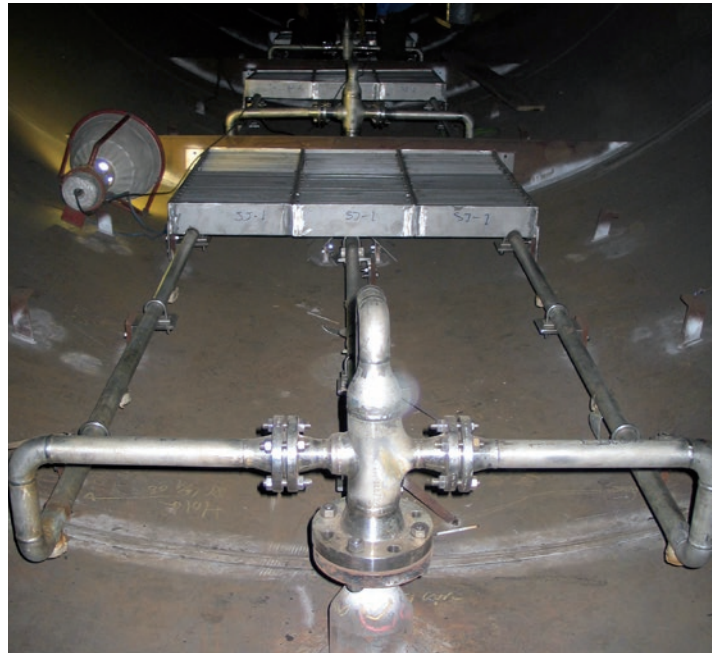
Conventional methods of removing solids from production separators enable solids to settle in the separator, requiring either manual removal during periodic shutdowns or batch jetting using conventional nozzle or swirling-flow-based jetting systems. Conventional nozzle and swirling flow sand jetting systems are batch-operated and provide violent, localized agitation of settled solids for removal through drain points in the bottom of the vessel or through internal outlet manifolding.

These systems can encounter the following problems:

- **Remixing**—Oil and water phases can remix, and sand can be widely dispersed, leading to greatly reduced separator performance and significant sand carryover.
- **Sand residue**—A high proportion of sand residue is generally left behind following the completion of the sand-jetting procedure. This is particularly significant with swirling flow devices because they have a very limited area of influence.
- **Erosion**—Advanced erosion can occur where high-velocity flows make contact with the separator wall.
- **Reliability**—The periodic nature and the limited effectiveness at conventional jetting processes means that sand progressively builds up within the separator. This buildup reduces the effective volume of the water pad, allows time for deposits to consolidate, and results in enhanced corrosion and fluidization problems.
- **High-discharge sand concentrations**—Initial peak sand concentrations in the early stages of a sand-jetting operation can be as high as 70% g/kg. High sand concentrations can cause blockage and sand carryover, which should be avoided to ensure robust, reliable sand management.

## Technical viability testing

Schlumberger offers technical viability testing services using an in-house test rig with the SCARPA system included, where the production separator can be mocked up with correct internals and filled with either sand from the installation or model sand. SCARPA system internals can then be optimally positioned and tests run to prove technical viability.



*SCARPA system limits the complexity of downstream receiving equipment for greater operational efficiency.*

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