



USA DEBUSK

REAX™ REACTOR TURNOVER SERVICES

Single-Source Solution, Multi-Service Value

SAFETY



From the first steps in planning to the final step in demobilization, USA DeBusk is committed to the highest standards of safety for people on the jobsite and in the communities where we work.

Our best-in-class HSE program includes comprehensive safety procedures, intensive training, and innovative automated systems.

- Best-in-class training and Mentoring/SSE
- “Stop Work Obligation” process intrinsic to all work
- Senior leadership engagement, with Safety Scorecards documenting in-person site safety audits
- Comprehensive auditing process
- Advanced HSE Management System; all-inclusive data availability for customers
- Extensive statistical analyses with trending data
- Engineering/technology investments for risk reduction
- Commitment to automation
- Site-specific safety plans
- More complete cleaning of hazardous materials from the equipment
- USA DeBusk shared resources improves safety by adhering to the safety plan, increasing understanding of hazards in the area, and lowering risks associated with work handover between vendors

SMART SAFETY BADGING

Each company badge includes a QR code that provides mobile, cloud-based, on-demand access to safety information via mobile devices. Scanning a badge allows users to view the employee’s current training record, a company phone directory, a safety professional contact list, water cut cards, company handbooks, and much more.

HSE MANAGEMENT SYSTEM

Our EHS Management System is an all-inclusive source of safety information. Accessible from any mobile device, it includes standard operating procedures, training classes, incident reports, SDS, safety meeting sign-in sheets, recognition program, and unlimited report options.

SAFETY ORGANIZATIONS

USA DeBusk is an active member of safety organizations, such as the Houston Business Roundtable, the National Association of Reciprocal Safety Councils, and Water Jet Technology Association, as well as a participant in auditor compliance groups.



CONSTRUCTSECURE

NCMS 25th ANNIVERSARY



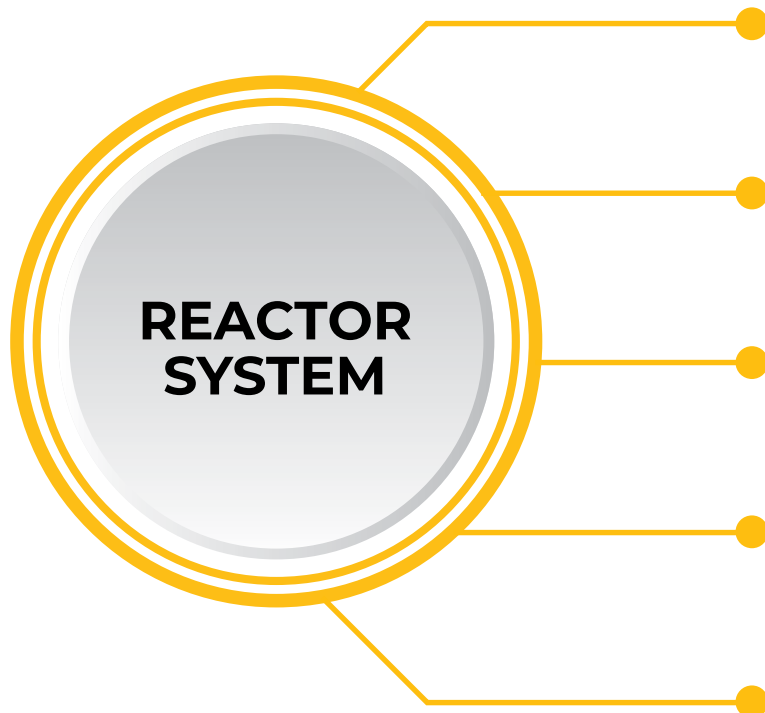
Collect. Verify. Connect.



Avetta



REAX™ TURNKEY REACTOR SUPPORT



Unit Decontamination



Chemical Cleaning



Nitrogen



Inert Catalyst Services



Emission Controls



For the first time, the critical services and support needed for safe, efficient hydrotreating, reformer, and hydro-cracking reactor turnovers are available from a *single* source: REAX™ services from USA DeBusk.

MULTI-SERVICE VALUE

- Rigorous, uniform safety
- Faster timeline
- Schedule dependability
- Single-source efficiency and accountability
- Cost savings
- Best-practice integration
- Effective communication
- Planning and execution expertise
- Patented chemistries and systems
- Automated technologies
- Complete emission control

USA DeBusk offers best-in-class services for cleaning and clearing reactors, along with catalyst services, nitrogen, and emission controls to facilitate safe, fast, cost-efficient turnovers.

Functioning as one team allows tasks to proceed seamlessly and transitions to be managed more effectively. As a result, delays can be eliminated and overall project timelines minimized. What's more, synergies and efficiencies in time, equipment, and manpower lead to quantifiable project cost savings.

For reactor owners and operators, project oversight is simplified with a single point of accountability, streamlined communication, and simplified project administration, billing, and reporting.

Most importantly, safety becomes a unified commitment, with focused leadership and all participants following the same stringent, clearly delineated standards.

REACTOR CHEMICAL CLEANING



PATENTED ONLINE PROCESS

REAX™ services include patented, proven technology to clean hydroprocessing unit reactor systems. Our process uses specially engineered chemistries to remove hydrocarbon deposits and degas reactors online, during the early stages of a process unit shutdown.

The process removes LEL, H₂S, benzene, and other noxious gases from catalyst reactor systems. It is effective with hydrotreaters, hydrocrackers, and many media-containing vessels with dry gases.

EFFECTIVE, EFFICIENT

The cleaning process is designed by reactor specialists to integrate seamlessly into high-pressure catalyst reactor shutdown procedures and produce results that are efficient, effective, and predictable. The process decreases flushing and sweeping, eliminates hydrogen hot stripping before cooldown, and minimizes subsequent nitrogen purging.

CATALYST FRIENDLY

REAX™ reactor cleaning has no harmful effects on catalysts and removes hydrocarbon contaminants from the catalyst surfaces. If the catalyst is to be removed and regenerated, it improves the dumping process by increasing spent catalyst fluidity. If the catalyst is left in place, enhanced cleaning can decrease pressure drops and increase catalyst activity.

A SAFER OPTION

The process enhances safety and compliance by reducing total time on site, decreasing or eliminating confined space entry for cleaning, and minimizing

Advantages

- Fast, dependable shutdown
- Superior cleaning of high-pressure equipment
- Eliminates or reduces flushing and hydrogen hot stripping
- Decreases nitrogen usage
- Reduces venting and flaring
- No harm to catalysts
- Chemistry is compatible as feedstock
- Improves catalyst regeneration
- Increases spent catalyst fluidity

venting and flaring. Optional no-exotherm chemistry enhances safety in potentially volatile applications.

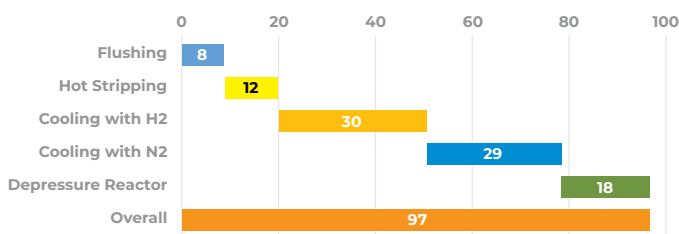
SAVES TIME & MONEY

As an online process with fast-acting chemistries, the process yields substantial cost savings from shorter cleaning times and reduced usage of hydrogen and nitrogen. It produces cleaner high-pressure equipment compared to traditional methods, reducing the delays and costs of further mechanical cleaning once the unit is opened.

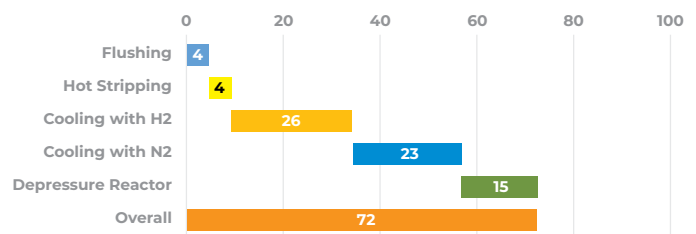
VETERAN EXPERTISE

Reactor cleaning projects are planned and executed by teams of experts with extensive experience in chemical cleaning, reactive chemistry, and plant operations. From degreed engineers in project planning to veteran supervisors and technicians in the field, we apply decades of experience to ensure your reactor shutdown proceeds safely and efficiently.

Original Reactor Shutdown Timeline



REAX™ Reactor Shutdown Timeline



INERT CATALYST SERVICES

Advantages

- Best-in-class safety
- Unloading and loading of catalyst, wet or dry, under inert or non-inert conditions
- Robotic catalyst removal
- Purpose-built vacuum units and support equipment
- Multi-crew, round-the-clock capabilities
- Reliable, modern, company-owned equipment

TOTAL CATALYST SUPPORT

Specialists provide turnkey catalyst services, including mechanical isolation and closure, surface preparations, unloading/loading of catalyst, separation of spent material for regeneration, tray replacement and revamps, and transportation services. Our management team and crews have decades of catalyst-handling experience.

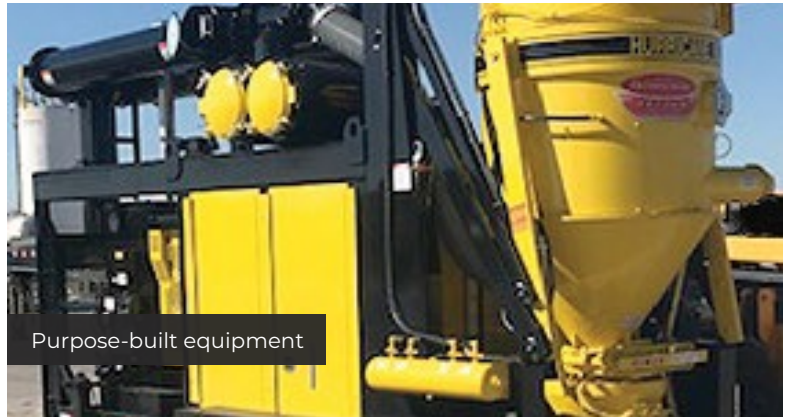
Technical innovations include remotely controlled robotic catalyst removal, CO₂ gas expansion fracturing to dislodge fused catalyst deposits, purpose-built vacuum units, and unitized support equipment for fast mobilization. Our industry-leading safety systems feature Life Support Units with biometric personnel monitoring for technicians entering confined spaces.



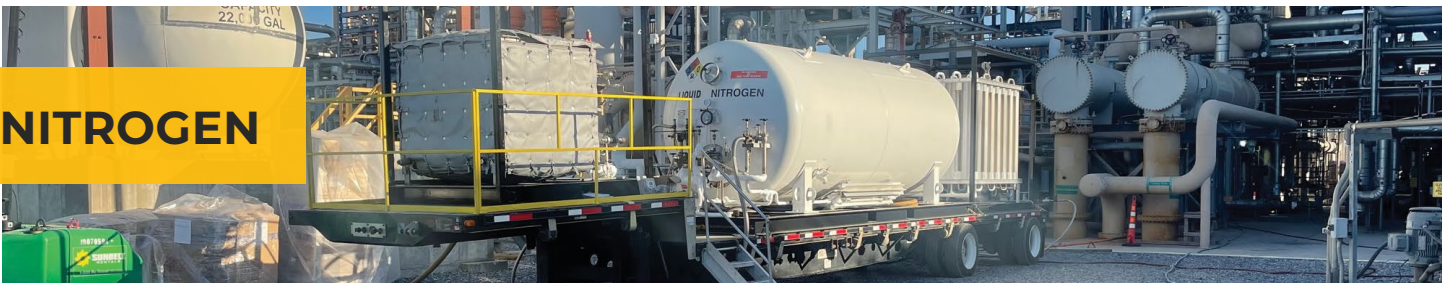
Advanced safety technologies



Robotic catalyst removal



Purpose-built equipment



NITROGEN

Advantages

- Liquid and membrane technologies
- Provides any volume, flow rate, pressure, or temperature
- SMVU has zero carbon emissions
- Large, diverse fleet
- Qualified and experienced teams
- Transportation and storage units

MOBILE N₂ SUPPLY

Nitro-Lift services support reactor turnovers with mobile nitrogen systems to produce hot and cold nitrogen for unit decontamination, chemical cleaning, and catalyst changeouts.

Our proprietary Skid Mounted Vaporizer Units (SMVU) produce nitrogen gas at flow rates of 90,000 SCFH and pressures up to 225 psi. This “Green Technology” vaporizes liquid nitrogen using steam to eliminate diesel fuel usage and ensures zero carbon emissions. These units have a smaller footprint than traditional pumpers and require less manpower to operate. In some applications, they eliminate the need for hot work permitting.

EMISSION CONTROLS

COMPLETE VOC MANAGEMENT

Our teams provide vapor control and processing during all phases of reactor decontamination and cleaning. Each project is custom engineered, and our equipment fleet includes the most advanced mobile thermal oxidation units and vapor scrubber systems. To assure regulatory compliance, our coupled thermal oxidizers/scrubbers exceed the requirements of both NSPS Subpart Ja & Ja, BACT, and state agencies.

Vapor Control SMEs remain onsite for the entire project to ensure all systems remain vapor tight and all emissions are mitigated. Comprehensive environmental compliance reporting and support is included. Packets and certifications are provided to the client or environmental agency at the completion of the project.

Advantages

- Controls all potential vapor hazards, including LEL, H₂S, and high pressures
- Reduces client's carbon footprint
- Meets or exceeds regulatory requirements
- Reduces risks of damage to equipment and infrastructure
- Allows turnover activities to proceed efficiently

REAX™ ADVANTAGES



MULTI-SERVICE VALUE

REAX™ Reactor Turnover Services are part of our full portfolio of industrial service solutions. Contact us today to learn how our advanced technologies will increase safety and savings for you.



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ADVANCED TECHNOLOGIES FOR SAFETY & SAVINGS

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