



CR3 Decoking Technology



YOUR CHALLENGES

A common by-product of industrial plant processes, the build-up of coke and scale in furnace tubings and pipelines is a widespread issue. As these deposits impact operational efficiency, cleaning the tubes thoroughly, quickly and safely the first time, every time, is a key concern. Traditionally, Steam Air Decoking (SAD) has been employed as the preferred cleaning method. There are, however, a number of drawbacks with SAD including the incomplete removal of coke, an increased risk of tube erosion, heat damage, potential fire hazards and environmental issues. SAD also involves longer shutdown times and decreased run lengths.

OUR DECOKING SOLUTION

These issues can all be resolved with CR3 Decoking Technology (CDT). Proven to be a safe, efficient and cost-effective cleaning technology, CDT does not require high temperatures, high pressure or toxic chemicals. Instead, water is applied at a low pressure, typically 150 psi, to drive the pig along the tube so that metal studs can scrape all

the coke and scale loose. By permitting water to flow around the pig and through the cleaning studs, the loosened deposits are flushed ahead of the pig and into a collection tank. This process is repeated several times as the size of the pig is increased incrementally, removing more deposits with each run.

HOW WE SUPPORT YOUR BUSINESS

A proprietary technology from CR3, the region's leading one-stop provider of specialised industrial services, CDT is designed specifically to remove all coke and scale deposits. CDT is typically used to clean furnace tubings and pipelines in Cokers, Cogeneration Units, RDS, VBU, Vacuum Heaters, Naphtha Heaters and Crude Heaters.

To complement our in-house capabilities, we work closely with Intelligent Pigging providers. Our strategic partners support us with ultrasonic technology to check the integrity of the furnace tubings and pipelines. As ultrasonic inspections are only possible when the tubes are completely clean, this approach guarantees all coke and scale is removed.

THE CR3 DIFFERENCE

CR3's large in-house team of highly trained technicians is subject to regular audits and a stringent safety passport scheme. We invest heavily in the latest equipment and SMART systems to maintain our reputation as the region's leading one-stop provider of specialised maintenance services.

Advanced equipment and technology

CR3 uses the best piggs in the business. To guarantee fast turnarounds, we ensure a wide range of types and sizes are available onsite. Our experts also have access to multiple single and double pumping units, depending on requirements, to clean two or more furnaces simultaneously. Throughout the cleaning process, a chart recorder reading is used to pinpoint both the pigg's location as well as any fouled areas. We also team up with specialist inspection companies to perform intelligent pigging to determine the remaining life of tubes to help optimise operation and maintenance of your furnaces.

Outstanding QHSE track record

From the start of operations until today, we have never suffered an onsite accident. Our technicians undergo the industry's most rigorous training. By maintaining the highest standards of professionalism, communication and collaboration on every project, we receive consistently high customer satisfaction ratings.

Unrivalled experience

CR3 has successfully performed more than 300 decoking projects across the region. By cascading this knowledge and

experience internally to our project technicians, we are able to maintain a large pool of pigging operators who are ready to deploy at a moment's notice. MCTN, HPCL, Reliance Industries, IOCL, ExxonMobil, Shell, Petronas, Formosa, PTTGC and Thai Oil are just some of the industry leaders that have contracted our cleaning services.

Exceptional service

CR3 offers a complete 'blind to blind' approach that includes all mechanical services. As part of our comprehensive service offering, we also provide technical support and advice along with planning, scheduling and project management. To ensure smooth project delivery, strong working relationships are maintained with all the main inspection companies. Professionalism and service excellence are key aspects of the training regime our technicians undergo. To ensure minimal disruption and downtime, they are also trained to perform regular maintenance on our pigging processing units and are capable of troubleshooting any fault onsite.



OUR SOLUTIONS

- Furnace / HRSG / pipeline decoking and descaling
- Furnace decoking for refineries
- Pipeline cleaning / descaling
- Checking the integrity of the furnace tubings and pipelines

YOUR BUSINESS BENEFITS

Minimise downtime and cost – compared to SAD, as the CDT solution is proven to be faster and more effective, and is delivered by highly trained, service-oriented experts.

Benefit from customised solutions – as CDT works with any pigging system, enabling us to select the pigg best suited to your requirements and your facilities.

Restore operational efficiency – by completely removing all coke or scale from tubes. By using piggs of various sizes with different stud configurations and ensuring the optimum number of runs, we thoroughly clean tubes with reducers and changing diameters.

Safeguard your plant and people – as the CDT system is a safer, quicker and more environmentally friendly cleaning technology.

CR3 IN ACTION

The challenge

Tubing corrosion in a HRSG Cogen unit was causing frequent emergency shutdowns for bypassing repairs that resulted in significant downtime and huge production losses.

The solution

The CDT solution virtually eliminated the need for unplanned maintenance.

The outcome

After comparing our cleaning maintenance cost with the previously lost production, the client identified significant savings and awarded us with 2 x 5-year service contracts.

CR3 is a leading provider of energy engineering solutions. Established in 1991, we provide specialised maintenance, plant upgrade, revamp and engineering services with a sharp focus on **Energy Efficiency, Engineering Excellence, and Sustainable Solutions.**

To learn more, visit CR3.Group

Leading one-stop provider of specialised maintenance services

CR3 supports your business with extensive contracting experience in the delivery of catered service packages, 'blind to blind' jobs and turnkey maintenance services during major shutdowns and turnarounds. Our business upholds a culture and track record of integrated management systems that are certified to multiple international standards.

Our Solutions

We offer a comprehensive portfolio of maintenance services that are grouped into six business lines. Our experts deliver these services – onshore and offshore – on time and on budget.

Our complete 'blind to blind' solution ensures more streamlined and efficient projects, as we maintain direct, single-source control of all critical path elements. We cater to projects of widely varying scope and complexity, and can deliver multiple shutdowns concurrently.

Related services:

- Static & Rotating Equipment Maintenance
- Industrial Scaffolding
- Mechanical Services
- Column Modifications & Repairs
- Total Heat Exchanger Maintenance
- Flare Tip Replacements & Repairs
- Cleaning & Decontamination Services
- Mercury Management Services
- Catalyst Handling Services
- Nitrogen Services
- Waste Handling
- Decommissioning Services
- Insulation Services
- Valve Maintenance
- Storage Tank Cleaning & Maintenance

SHUTDOWNS & TURNAROUNDS

MECHANICAL & PLANT MAINTENANCE SERVICES

Our investment in training, equipment and SMART systems combined with our focus on safety and rigorous planning, preparation and execution of work underpins our track record as a leading provider of mechanical & plant maintenance services.

Related services:

- Static Equipment Maintenance
- Rotating Equipment Maintenance
- Specialist Cutting Services
- Online Leak Sealing
- Controlled Bolting
- Reactor Repairs & Maintenance
- Plant Change & Piping Modifications
- In-situ Flange Facing & Machining
- Industrial Scaffolding
- Insulation Services
- Valve Maintenance
- Continuous Plant Maintenance
- Storage Tank Cleaning & Maintenance

CATALYST HANDLING SERVICES

Our experts meet your demands for shorter change-outs, leaner project teams and superior quality standards for all reactor types with end-to-end solutions that reduce downtime and increase profitability.

Related services:

- Catalyst & Adsorbent Handling Services
- Tubular Reactor Services
- Dense Loading
- 'Blind to Blind' Mechanical Services
- Reactor Internals Replacement & Repairs
- Nitrogen Services
- Waste Handling

PIPELINE & PROCESS SERVICES

REVAMP, CONSTRUCTION & EPCC SERVICES

Our extensive portfolio of cleaning services sets the benchmark in terms of technical, environmental and safety standards.

Related services:

- Chemical Cleaning Services
- Mercury Management Services
- Fin Fan Optimisation
- Hydro Jetting Services
- CR3 Decoking Technology (CDT)
- Decontamination Services
- Waste Handling

We clean and inspect virtually all plant vessels, columns, drums and piping systems, both onshore and offshore, with services that can be tailored to requirements.

Related services:

- Pre-Commissioning & Commissioning Services
- Nitrogen Services
- Pipeline Cleaning (Chemical & Mechanical)
- Pipeline Flooding
- Pressure Testing
- Dewatering
- Drying
- Purging

We deliver projects safely, on time and on budget by ensuring single-source control through our multi-disciplinary approach and project management capability.

Related services:

- Process Revamps, Rejuvenations & Retrofits
- Construction & Constructability Reviews
- Engineering, Procurement & Commissioning Services
- Operations & Maintenance
- Dismantling, Demolishing & Removal of Equipment
- Fabrication of structural, Carbon Steels & Pipe Systems
- Fabrication of Stainless Steels & Special Alloys
- Installation of Large Equipment & Pipe Systems
- Welding
- Hot & Cold Cutting
- Scaffolding & Insulation



CR3 is a leading provider of energy engineering solutions. Established in 1991, we provide specialised maintenance, plant upgrade, revamp and engineering services with a sharp focus on **Energy** Efficiency, **Engineering** Excellence, and Sustainable **Solutions**.

Contact us today to learn more

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