

Technical Engineering Consultancy

Smarter thinking.
Safe, smart, sustainable
operations.





04 **WORKING WITH CUSTOMERS**
Total dedication to your needs.

06 **OIL AND GAS**
Producing results.

Worldwide experience delivers world class performance. In today's global process industries there is no room for outmoded practices or cherished traditions. Results count.

Companies in the process industries need to deliver results. The driving forces are customer satisfaction, profitability, performance, competitiveness and regulation.

For many companies there is a fine line between success and failure. Staying on the right side of this line takes experience, knowledge and determination – and sometimes expert assistance.

WHAT WE OFFER

As part of TÜV Rheinland we can draw on extensive business and technical experience of working with customers worldwide in the chemical, petrochemical, oil and gas, pharmaceutical, power and other process industries. This helps us to meet an operator's particular manufacturing or asset management challenges.

We are passionate about the service we provide and are totally committed to giving genuine value for money every step of the way.

Whether we're delivering technical engineering consultancy, advice, project management, engineering design services, project services or ongoing operation and maintenance support, our innovative approach and familiarity with best practices ensures a rapid and effective response.

This allows us to add unique value to all stages of an assignment, particularly the early definition.

Whatever the challenge, the chances are we've come across it before – achieving world class performance quickly, squeezing the most from older established facilities without major new investment, or adapting to new market and regulatory conditions. The demands vary from industry to industry and from country to country.

They have more in common than is often acknowledged.



07 **CHEMICALS**
Satisfying the demands of a diverse and demanding industry.



09 **PHARMACEUTICALS**
Managing performance – managing risk.

WHY TÜV RHEINLAND?

TÜV Rheinland technical engineering consultancy is focused on delivering results. Our strengths can be found in our people and their world class experience, gained from providing the most appropriate solutions to world leading companies. These are supported by proven methodologies and tools.

Being at the heart of a global enterprise we understand the need for delivering business benefits – the outcomes we have committed to from the outset.

We are an organisation with a delivery culture. Our job is not just to advise but to ensure that this advice produces the required results.

We are practical people, experts with a background in our industries and real enthusiasm for what we do. Finding solutions to all problems, large and small, demands team work.

We work with clients to make the best use of their expert knowledge, focusing on meeting the agreed goals and deliverables in a sustainable way.

In the following pages we will cover more about what we do, how we do it, and above all, how our customers benefit.

Our clear, understandable and well-proven methodologies help identify new and innovative ways of delivering improvement.

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Working with customers

What sets TÜV Rheinland technical engineering consultancy apart from other technical consultancies?

We have something more to offer our customers. We bring together proven expertise in technical engineering consultancy analysis, defining appropriate solutions and best practice implementation. This one-stop approach combines the best of both worlds: world class business advice and full technical support.

The culture throughout our organisation is to behave as part of the client's team and not as outsiders. This commitment builds up a considerable degree of understanding and confidence between the client and our specialists.

We are flexible; no assignment is too large or too small. What matters is working with our clients as a key partner to achieve their business goals. What starts as a one-off priority task often turns into a long-term relationship.

CUSTOMER SATISFACTION – OUR GOAL

Nothing matters more to us than making sure that our client is completely satisfied with the results we deliver and the way in which we do it.

Their goals are our goals too. We focus on delivering the results, exceeding expectations and making sure that they have been provided with the service and support expected.

DELIVERING RESULTS

This results-driven culture, breadth of experience and confidence in our ability to do what we say is clearly demonstrated by our willingness to work in gainshare partnerships where appropriate.



The technical engineering consultancy of TÜV Rheinland focuses world-class expertise when and where it is needed.

We meet needs for:

- Inspection
- Integrity management
- Operations improvement
- Process safety
- Project services
- Site and asset regeneration
- Technical engineering
- Technical software
- Technical training and competency

Our assignments range from small, targeted priority tasks to providing a full range of services for the execution of significant business improvement programmes.

Whatever their size our work is frequently business-critical. It can make the difference between success and failure, growth and stagnation, continuity and closure.

FROM INNOVATION TO IMPROVEMENT

We can help to design, develop and install new processes, improve existing ones and reduce or eliminate downtime. We support plant operation at every level; establish essential procedures, train employees, monitor standards and achieve regulatory approvals.

Our clear, understandable and well-proven methodologies help identify new and innovative ways of delivering improvement.



Oil and gas

The technical engineering consultancy of TÜV Rheinland works with the major international oil and gas companies, providing leading edge technical solutions.

The knowledge and experience we have built up through working with world leaders in oil and gas enables us to ensure that we can deliver powerful solutions for:

- LNG/LPG
- Offshore
- Oil and gas processing
- Refining
- Storage and distribution

Our technical engineering consultancy and support services deliver the results needed, helping to lower process safety risks, improve reliability, raise operational efficiency, guarantee legislative compliance, maintain integrity and ensure that operators are getting the most from their capital investment.

COST SAVING, PROBLEM SOLVING

Whether operators are planning new investments, upgrading or renewing existing assets or striving to get the most from existing equipment, we have the knowledge and experience that can save time, money and hassle. In the oil and gas sector time really is money. Our role is to help maximise the return on investment through asset reliability assessment, risk-based inspection and maintenance, plant performance and asset integrity studies.

We can support the drive to get the most from existing installations, initiate new ones and ensure that the highest safety, environmental and performance standards are both achieved and maintained.

RETURN ON INVESTMENT

As an industry that comes into the media and political spotlight, it is critical that operations perform at maximum reliability with the highest possible operational efficiency. At the same time they must deliver optimum return on investment.

Our expertise can help minimise downtime, optimise plant efficiency, carry through hazard and risk assessment programmes – in short, advise, plan and implement programmes that contribute to greater efficiency, productivity, safety and profit.



Chemicals

A strong regulatory environment combined with ever-growing commercial and operating pressures makes the chemicals industry one of the most challenging.

Throughout the chemicals industry under-performance is the most serious threat to survival and growth. Add to this the challenge of strong regulation and increasing commercial and operating pressures and this is an industry facing significant challenges.

The technical engineering consultancy of TÜV Rheinland understands the need for continuous improvement and innovation. Equally we recognise the factors that can impose severe restraints on the use of new technologies.

For us, the chemicals sector is not one industry but several. Each faces distinct, but often related issues. We work with leading chemical, petrochemical, speciality and fine chemicals companies.

CHEMICALS AND PETROCHEMICALS

In chemicals and petrochemicals the drive is on to reduce costs by cutting downtime, increasing operational reliability and efficiency while meeting an ever-growing array of legislative requirements.

Continuous improvements in manufacturing efficiencies are vital and we know how to provide support at every stage using benchmarking studies, inspection support and maintenance improvement methods.

SPECIALITY AND FINE CHEMICALS

The priority in speciality and fine chemicals manufacture can be summarised in just one word – flexibility. In this batch production environment handling multiple products, the abilities to introduce new products quickly and easily, and achieve efficient change overs are key.

RELEVANT SOLUTIONS FROM PRINCIPLE TO PRACTICE

The technical engineering consultancy of TÜV Rheinland delivers solutions at every level. We supply a range of consultancy services in risk management, manufacturing, engineering, project implementation and management to customer companies across the world. We can support every facet of plant performance during its lifetime.

Our understanding of global industry and regulatory matters, as well as international experience of safety and environmental requirements, means that we deliver solutions that are relevant, timely and highly cost effective.

We can not only advise on meeting requirements, we can also act as an independent auditor, helping plant operators to obtain the necessary standards.

We can help deliver better manufacturing performance, more flexible operation, improved return on capital and more reliable plant and equipment.

ACHIEVING WORLD CLASS STANDARDS

We can show where operations stand in relation to world class performance, benchmarking every step of the processes from supply chain and manufacturing through to safety, quality and environment.

Our tried and tested manufacturing improvement process delivers step change improvements to the performance of your plant, equipment and people. Whether continuous or batch processing, we can help reduce downtime and improve productivity.



Power

The technical engineering consultancy of TÜV Rheinland supports successful operations in the power sector, in the areas of gas fired generation, coal fired generation, Energy from Waste (EfW), Combined Heat and Power (CHP), gas storage, renewables, biomass generation, nuclear generation, hydroelectric and transmission & distribution.

One of the big challenges for the power sector is maintaining the flexibility and availability of assets when many sites are operating outside of their initial design intent. Pressures arising from public concern over security of gas and electricity supply and climate change are often in conflict with the market demand patterns and fluctuating energy costs.

Long term planning is difficult in this climate, yet ensuring the on-going safety, integrity and reliability of operations is paramount. One increasingly critical factor is for assets to have the capability to respond to variations in the market demand and to be available and reliable in operation.

Our work with leading power companies has helped them to resolve some of the potentially conflicting pressures they face, and have provided:

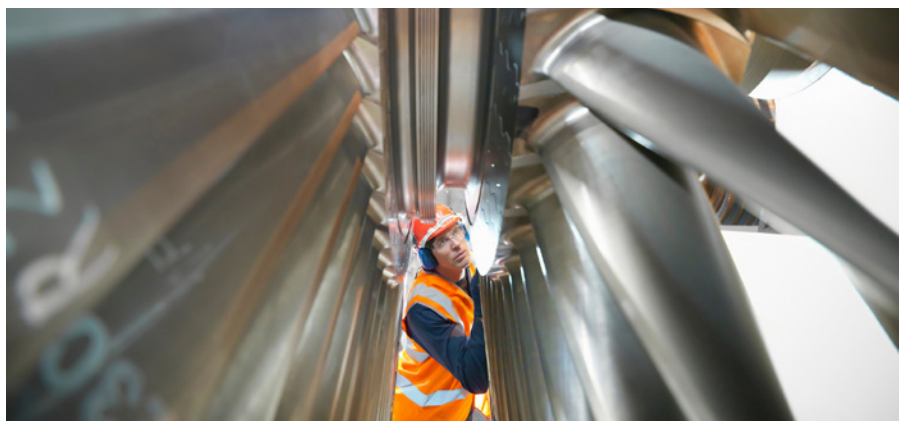
- Confidence in the current integrity and safety of operations
- Help in improving the availability of generation assets
- Help in both understanding the implications of COMAH and in finding the best path forward
- Longer term strategies and investment plans for sustaining assets
- Assistance with meeting current legislation and societal expectations

INTEGRITY, SAFETY AND RELIABILITY

Some of the ways in which the technical engineering consultancy of TÜV Rheinland has delivered improvements include completing system design reviews, maintenance criticality and periodicity assessments, revisiting existing process hazard analysis studies, analysing incidents through root cause analyses and reassessing stress analysis on critical systems and pipework. We have the experience to support the Power sector in delivering reliable and safe operation of their assets, with a wide range of functional engineering expertise in fired equipment, pressure systems, civil & structural, machines, process, control & instrumentation, materials & corrosion and electrical.

FLEXIBILITY

In order to achieve flexibility of operations asset must have flexible people, flexible plant and flexible processes. TÜV Rheinland can help in a number of ways, for example in ensuring that operators and maintenance personnel are trained and have suitable procedures. Another area is in reviewing or modifying the design of equipment and systems to ensure assets can operate efficiently across a range of operating modes. We can also assess and improve the systems to ensure start-ups and shut-downs are performed effectively and efficiently.



Pharmaceuticals

Developing new medicines and getting them to market quickly and safely is vital to the success of pharmaceutical companies.

Pharmaceutical companies must be able to manage performance and risk throughout the product lifecycle. The safety and quality of drug manufacture must be enhanced while increasing efficiency. They must also remain agile in the face of growing competition.

The industry is under continuous pressure to invest in new technologies to achieve and demonstrate regulatory compliance and improve productivity. This is driven by increasing competition, an ever-changing regulatory environment and growing economic pressures from healthcare providers.

Engineering based safety and integrity management, rooted in well understood and robust processes will help to improve manufacturing performance, understand risk profiles and improve competence.

Keeping on top of production quality and manufacturing is the main focus for operating companies. Site infrastructure and utilities are typically given less attention, which can sometimes lead to unnecessary risks or lost improvement opportunities.

TOTAL SUPPORT

The technical engineering consultancy of TÜV Rheinland helps pharmaceutical companies to obtain the full value of their investments – in product, processes and people.

We deliver innovative risk-based solutions that reduce cycle time, minimise waste, reduce risks in a sustainable way and provide results that are 'right first time'.

We have the skills and resources to see through every project to satisfactory implementation. Underpinning all this is a thorough knowledge of emerging regulations, an understanding of their impact on pharmaceutical companies and proven success in risk management as a route to better quality and productivity in the development and manufacture of drugs.

Our expertise provides solutions that enable customers to achieve continuous improvement and competitive performance while reducing process safety and integrity related risks.



Other industries

The manufacturing industry across the world is having to contend with a wide variety of challenges.

The pressures and priorities facing manufacturing industries differ greatly across the globe. In fast growing economies, the race is on to achieve world class standards quickly. In the more mature economies the priority is to find ways of making better use of existing assets without necessarily embarking on major new investment programmes.

The technical engineering consultancy of TÜV Rheinland works with organisations at every stage of development and creates solutions that meet their precise requirements.

APPROPRIATE SOLUTIONS

We deliver cost effective and pragmatic solutions to challenging situations such as over capacity, health and safety, manufacturing continuity, maintenance and downtime, environmental protection and future planning.

WORLD STANDARDS

We are deeply involved in the regulatory environment, working with the regulatory bodies as well as manufacturing companies. Understanding the global regulatory environment can help clients meet international standards in the most economic way and apply principles which set the standard for world class performance.



Our services

INSPECTION

- Civil and structural inspection
- Pressure systems inspection management

INTEGRITY MANAGEMENT

- Ageing plant
- Asset health checks
- Asset life studies and extension
- Risk Based Inspection (RBI)
- Safety critical elements
- Technical auditing
- Technical Due Diligence (TDD)

OPERATIONS IMPROVEMENT

- Maintenance and reliability improvement
- Manufacturing improvement
- Turnaround improvement
- Waste and water minimisation

PROCESS SAFETY

- Alarm management
- ATEX/DSEAR compliance
- Auditing and monitoring
- Fire and explosion
- HAZOPs and Process Hazard Review (PHR)
- Hazards and effects management
- Human factors
- Occupied buildings
- Pressure relief and flares
- Process Safety Management (PSM)
- Risk assessments
- Safety study action implementation
- SIL/LOPA/IEC 61508/61511

PROJECT SERVICES

- Detailed engineering and design
- Front End Engineering and Design (FEED)
- Process safety engineering
- Process studies
- Project Management Consultancy (PMC)

SITE AND ASSET REGENERATION

- Asset mothballing
- Demolition management
- Demolition risk assessment
- Ground and groundwater protection
- Land remediation
- Permit management

TECHNICAL ENGINEERING

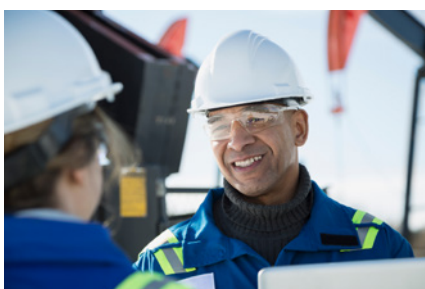
- Civil and structural
- Control and instrumentation
- Design verification
- Electrical
- Fired equipment
- Machines
- Materials
- Pressure systems
- Process engineering

TECHNICAL SOFTWARE

- Process engineering tools (PEL)
- Trip Requirement and Availability Calculator (TRAC)

TECHNICAL TRAINING AND COMPETENCY

- Competency assessment and assurance
- In-house programmes
- Open courses



TÜV Rheinland Arabia LLC
2nd Floor, Al-Mousa (Blue) Tower A
King Faisal Road, Al-Yarmouk Dist.
P.O Box 3769, Al-Khobar 31952
Kingdom of Saudi Arabia
Phone: +966 13 866 4900
is@sa.tuv.com
www.tuv.com/technical-engineering-consultancy

www.tuv.com

