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VIEWPOINT: THE HALLMARKS OF OPERATIONAL EXCELLENCE IN THE ENERGY AND CHEMICAL INDUSTRY

All about **EXCELLENCE**

THE HALLMARKS OF OPERATIONAL EXCELLENCE IN THE ENERGY AND CHEMICAL INDUSTRY: WHAT SETS TRUE INDUSTRY LEADERS APART FROM THE PACK OF MERELY GOOD, AND HOW CAN OTHERS GET THERE AND STAY THERE?

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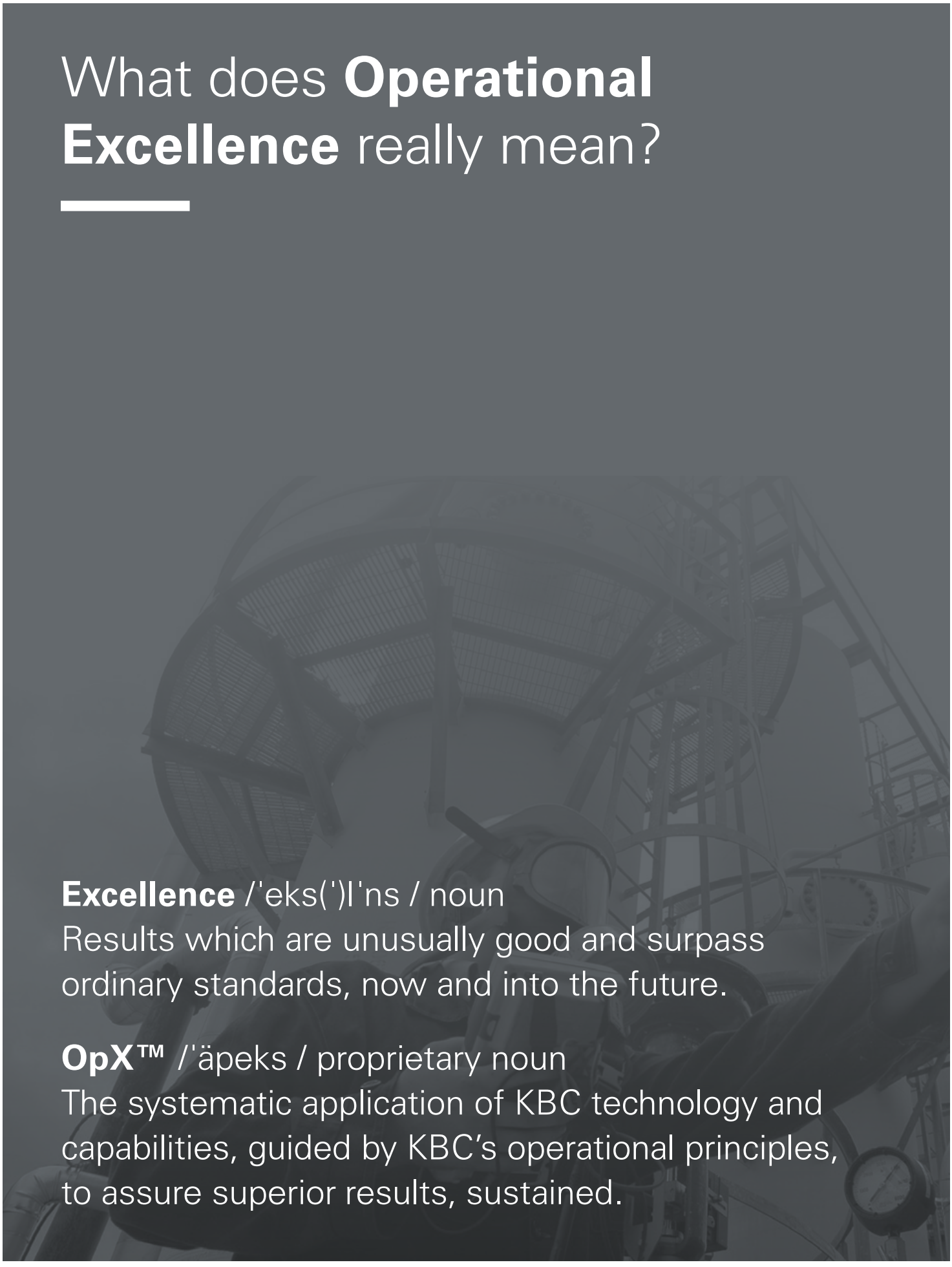
What does **Operational Excellence** really mean?



Excellence /'eks(')l'ns / noun
Results which are unusually good and surpass ordinary standards, now and into the future.

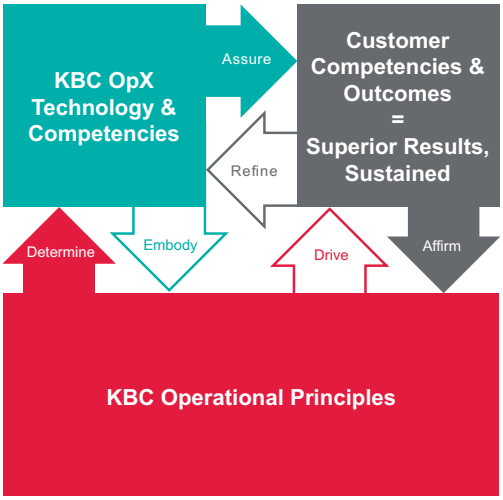
OpX™ /'äpeks / proprietary noun
The systematic application of KBC technology and capabilities, guided by KBC's operational principles, to assure superior results, sustained.

The distinguishing characteristics which lead to competitive advantage

Operational excellence is a function of three inter-connected areas.

- Superior Results, Sustained – visible in the marketplace, achieving higher return on capital employed and persistent growth.
- A bedrock of cultural DNA, which quickly aligns employees around sound operational principles, and projects the company ethos, vision and values.
- Application of world-class technologies and competencies, to consistently and effectively deliver the day-to-day habits and actions that comprise excellence.

These characteristics are self-reinforcing as illustrated in the KBC Excellence Assurance Framework diagram.



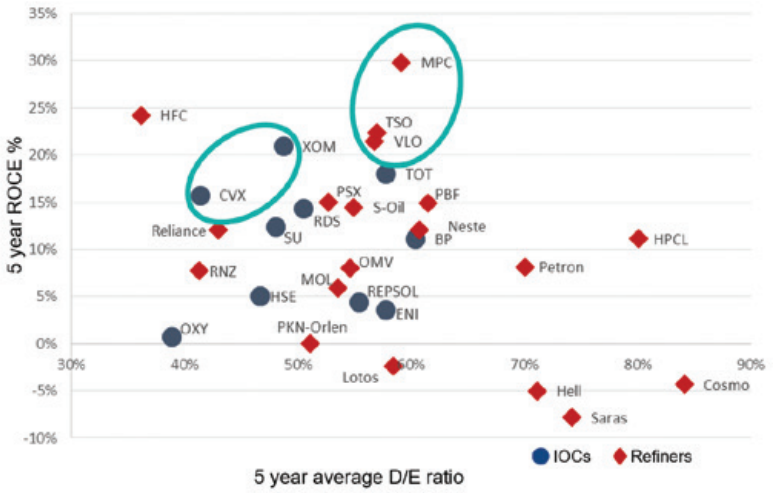
1. Operational Principles determine the OpX technology and competencies to be applied.
2. OpX technology and competencies assure superior results, sustained.
3. Superior results, sustained affirm our operational principles.

What does superior results, sustained look like?

The average return on capital employed in the oil and gas industry has been in low single figures for decades. However, a small group are able to sustainably achieve a return on capital employed of over 20%. In turn, they are rewarded with a lower cost of capital to fuel growth.

Additionally, industry performance is diverging. Advances in technology and the globalization of crude and products markets are opening up new opportunities for leaders to exploit, while volatility and overcapacity are leading to operating challenges for more vulnerable operators. In this environment, we identify three broad types of operator:

BREAKTHROUGH PERFORMANCE



Note: 2011-2015 data; ROCE defined as EBIT divided by long term debt plus total equity minus cash Source: Company websites; KBC analysis

OpX Maturity Characteristics

	Vulnerable	Typical	Excellent
Performance	Struggling to maintain stable operation.	Maintaining position relative to peers. Pockets of excellence but this is not consistent.	Agile and nimble, able to exploit short and long term opportunities to achieve superior returns.
Expertise and capability	Vulnerable operators struggle with demographics and are unable to replace expertize as fast as it is lost.	Building capability to keep up with losses, but have gaps in emerging areas such as Industrial Internet of Things (IIoT) technology.	Robust and systematic capability development leading to institutional bench strength. Able to incorporate new technology and techniques to become leaders in emerging areas.
Capital allocation	Historic under-investment means that all capital spend is focused on stay-in-business investments, typically related to asset integrity with little prospect of growth.	Investments to stay in business and keep pace with competition, but not delivering competitive advantage or growth. Capital projects often underperform.	Investment in high value growth initiatives. Efficient and timely delivery of projects.
Corporate strategy	Almost entirely reactive, principally responding to regulation.	Inward facing, and looking to maintain position rather than embrace new opportunities.	Able to profit from new technologies and market opportunities at the expense of peers.
Management focus	Fire-fighting and recovery.	Internal - embedding and sustaining effectiveness.	External - Agility and flexibility.
Position	One shock away from closure.	Running to stand still, unable to breakthrough.	Sustained value creation, secure, leading position.

The top performers are moving further ahead of the rest as they ride the wave of opportunities and technology, whereas the vulnerable are slipping further back as a convergence of forces overwhelms the formerly comfortable business environment.The majority of operators are not seeing any meaningful growth.

Only a small number of operators are truly achieving excellent results. Many of the characteristics of 'leading practice' such as continuous improvement programs and management initiatives are in reality only serving to maintain the status quo, with underlying operational excellence performance determining the success or failure of the surface-level initiatives and programs.

Excellence is never an accident. It is always the result of high intention, sincere effort, and intelligent execution; it represents the wise choice of many alternatives - choice, not chance, determines your destiny. - Aristotle

Anatomy of superior results, sustained

Superior results are achieved by making better decisions, faster than the competition; and then flawlessly executing those decisions, every time.

But what is meant by 'better'?
There are three dimensions to better decisions:

- Accuracy of data and analysis: stemming from better measurements, more precise engineering models, and more detailed and comprehensive analytics.
- Consistency in both data and models: with all stakeholders sharing a single version of the truth, with transparency of data manipulation and processing, such that all tools are in alignment, and any discussion focuses on solutions, not where the numbers came from.
- Holistic consideration of all implications, inputs and outputs of the decision: including making asset-level decisions in the context of the whole supply chain, understanding the interplay and trade-offs between production, reliability and operating cost, asset-wide rather than unit level evaluations and understanding the human factors required to implement any business strategy.

Time is of the essence
But making great decisions is futile if they are not timely. Agility at a tactical level (for example dramatically changing operation to react to a market dislocation) or strategic level (such as making a major investment decision) relies on making the decision rapidly.

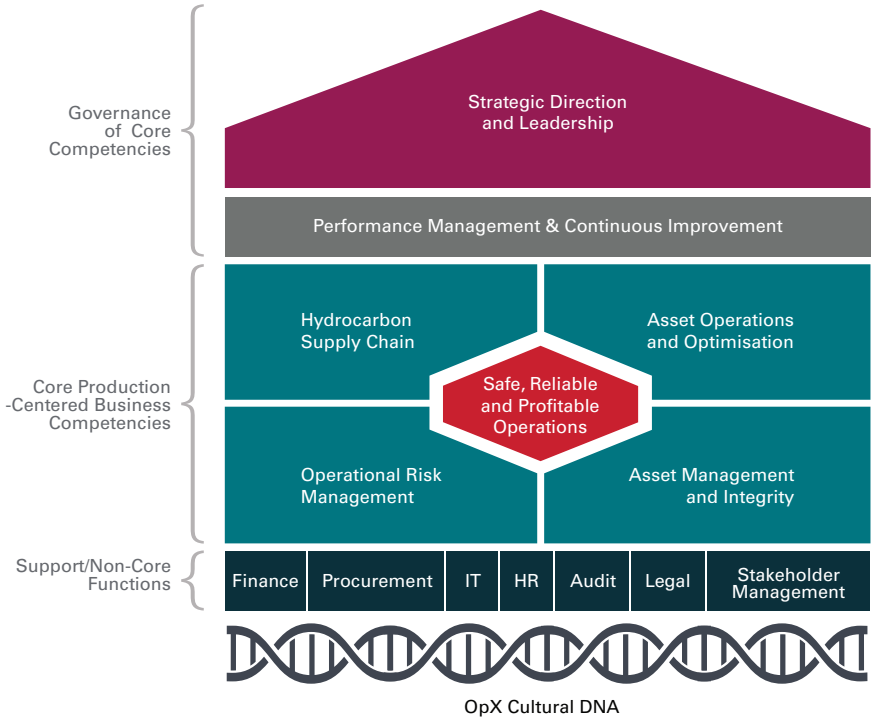
This leads to a conundrum, where the imperative for a fast decision often leads to short cuts in the accuracy and breadth of the analysis. Typical businesses are forced to compromise but operationally excellent enterprises harness better technologies and competencies to make a rigorous decision in the time required. This is facilitated through greater accuracy of the tools used, fully integrated data and decision support systems and a high degree of automation of data processing and analytics.

Perfect execution, every time
Making good decisions is only the first step of a longer process. History is littered with cases where fine intent is not translated into delivery. The elements of flawless execution include the following:

- Information distribution and transfer, which is increasingly being facilitated by cloud technology.
- Capabilities, including skills and overall organizational capacity, both to replace existing skillsets threatened by industry demographics and build new skills for the digital era.
- Governance, to ensure leaders understand what's going on and to align and constantly re-align motivation and incentives to act the right way.

Focus on Perfect Execution of Core Business Competencies

Operational Excellence in the Energy and Chemicals industry requires flawless execution of several core, production centered business competencies. These areas form the focus for driving value and delivering competitive advantage. The rest of the organization's support functions, management and leadership exist to support and guide these core competencies, which are end-to-end business processes covering many different parts of the organization. KBCs Operations Management System illustrates this:



Supply Chain

Optimize management of supply, whether oil in the ground or feedstocks for a refinery or chemical asset, in light of product market demands.This provides operators with the agility to take full advantage of market conditions.

Asset Operation and Optimization

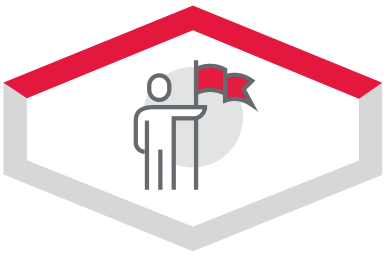
- Optimize the potential of physical assets, by pushing throughput and maximizing the production of the highest value products, whilst minimizing variable costs such as energy.
- Deliver small and large capex projects, on time and on budget, to deliver growth and meet environmental requirements.
- These competencies deliver the excellence to take full advantage of the physical hardware you own.

Operational Risk Management

Reliably control safety, health and environmental risk at a personal and process level.This assures the robustness required to avoid catastrophic losses.

Asset Management and Integrity

Confidently ensure asset reliability and availability, whilst controlling maintenance costs. This assures the asset always meets expectations and is always available to capitalize on short term market opportunities.



Journey to Operational Excellence

The design of operational excellence programs should be tailored to each asset's starting point and aligned to the targeted outcomes. An operational excellence program should focus on specific tangible goals and evolve over time. We recommend executives consider the following when shaping an operational excellence program.

Build in results assurance and sustainability from the start

Often sustainability is considered at the end of initiatives as the effort and focus winds down. Instead the entire program should be built around sustainability, which relies on capability transfer and results assurance. You should simplify strategic objectives into actionable and measurable indicators, and then track them visibly and transparently from the start of the program. Be sure to make every effort to increase the accuracy, timeliness and visibility of indicators to drive adoption. At the same time, create opportunities for capability transfer at every stage – getting results now is less important than equipping your people to keep driving results in the future.

Understand the balance between tools and capabilities

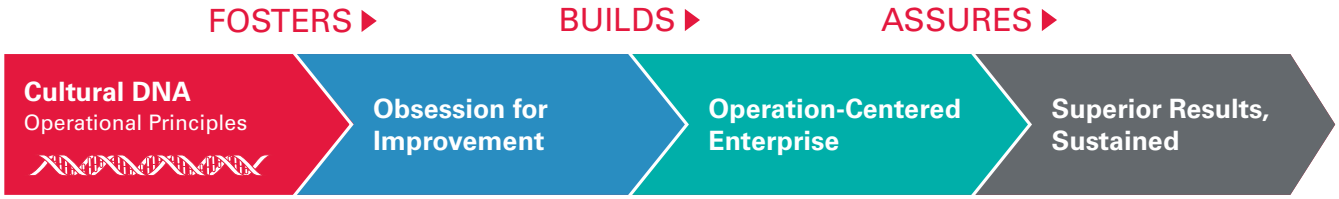
Enterprises with lower organizational maturity often attempt to deploy technology to catch up, since this is perceived to be easier than achieving organizational change. However, this sequence should be reversed – organizational capability is essential to be able to correctly define, implement and then utilize and sustain new tools. We recommend that executives view a technology implementation program as an opportunity to address organization and business process issues, and work to improve both human and technology systems in tandem.

Focus on governance

Use a top-down / bottom-up approach to understanding the gap from the current state to the future state.

Use of benchmarking and stakeholder engagement and alignment can establish the top-down strategic goal setting. Applying Lean techniques to value stream and process mapping at the frontline will identify the key process steps that require redesign or application of specific technology solutions to ensure consistency, accuracy in execution and higher levels of productivity. Assured delivery of results can arise from a combination of software technologies, for example rigorous simulators, optimizers or workflow managers, and competencies that result from consulting engagements and the leading practices expert consultants will leave behind. We recommend establishing a results delivery team with the authority to drive change and defining the program with time-bound expectations and leadership accountability.

For KBC, Operational Excellence is the systematic application of technology and capabilities, guided by operational principles, to assure Superior Results, Sustained.



- Shared vision of excellence driven by business leadership
- Collaborate within & beyond the enterprise boundary
- Anticipate and respond to change
- Recognize the enterprise's responsibilities to its stakeholders

- Create an operation-centered mindset
- Act holistically
- Make process data a corporate asset

- Foster deep technical understanding
- Harness facts and learn from the outcomes
- Assure consistency through strong governance
- Refuse to be satisfied that today's best is tomorrow's best

- Maximize ROCE (return on capital employed)
- Maximize production value
- Risk Management of Safety, Environment and Business performance

Adopt OpX principles into the organizational DNA

Operational excellence often requires a transformation of attitudes and culture throughout the organization. Leaders must recognize both the need for change and the capability and capacity constraints that make this difficult. Alignment in the leadership team is key, since they must speak with one voice to drive the new way of working.

The diagram above illustrates the key principles excellent organizations must adopt. Many of these principles are general across different industry verticals, but we recommend special attention is paid to the following principles which are key to success in the energy and chemical industry.

- Management of health, safety and environmental risk: Recognizing the hazardous nature of our business and the weight of our responsibilities to the communities where we operate.
- Foster deep technical understanding: In our industry, application of technology and engineering knowledge is a key requisite for operational excellence. For the same reason, treating process data as a shared corporate asset, to be governed, managed and upgraded is also a key element in achieving excellence.
- Create an operation centered mindset: The energy and chemical industry is highly capital intensive and largely makes commodity products. Business performance is intrinsically linked to putting effective operation of the production assets at the center of every business process.

Operational Excellence is the systematic application of technology and capabilities, guided by operational principles, to assure Superior Results, Sustained.

The number of truly excellent organizations is small, with increasing divergence between typical and world-class operators. Delivering a real and lasting increase in organizational maturity often requires an infusion of external insight. This provides clarity and focus between conflicting priorities and accelerated capability transfer to build up human capacity to change and adopt the new technologies, tools and competencies needed.

OpX programs should be tailored to your own industry specifics – always aiming to deliver production-centered safe, reliable and profitable operations.

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ALL ABOUT EXCELLENCE

KBC is all about excellence in the Energy and Chemical industry. We make and keep our clients world-class through operational excellence and profitability, enabled by the actions of our people and application of our technology. We create and sustain value by effectively converting strategy to results in client operations through technical and commercial excellence, underpinned by engineering simulation and analytics, powered by the cloud.

Through our winning operating models and best practices we deliver superior results, sustained, surpassing ordinary standards now and into the future.

Contact us to discover how KBC can support your successful journey to Operational Excellence.

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