Piping Induced Vibration Services

wkcgroup.com

WKC

WKC

WKC Group is an award-winning, international **environmental consultancy firm**. Through specialist, science-based study we advise clients in various sectors including;

- Planning & Infrastructure
- Power & Water
- Mining, Minerals & Metals
- Manufacturing
- Oil & Gas
- Chemicals

We operate out of strategically located offices in the Middle East, Africa and Europe.

Our services are broadly categorised as follows;

- Air Quality
- Noise & Vibration
- Marine Modelling
- Ecology
- Environmental and Social Impact Assessment
- Assurance
- Environmental, Social and Corporate Governance
- GIS & Remote Sensing

While supporting developments that make our lives stronger, safer and richer, our mission is to promote a healthy future for our world and all of us that call it home.

10 YEARS OF SERVICE EXCELLENCE

Piping Induced Vibration Services

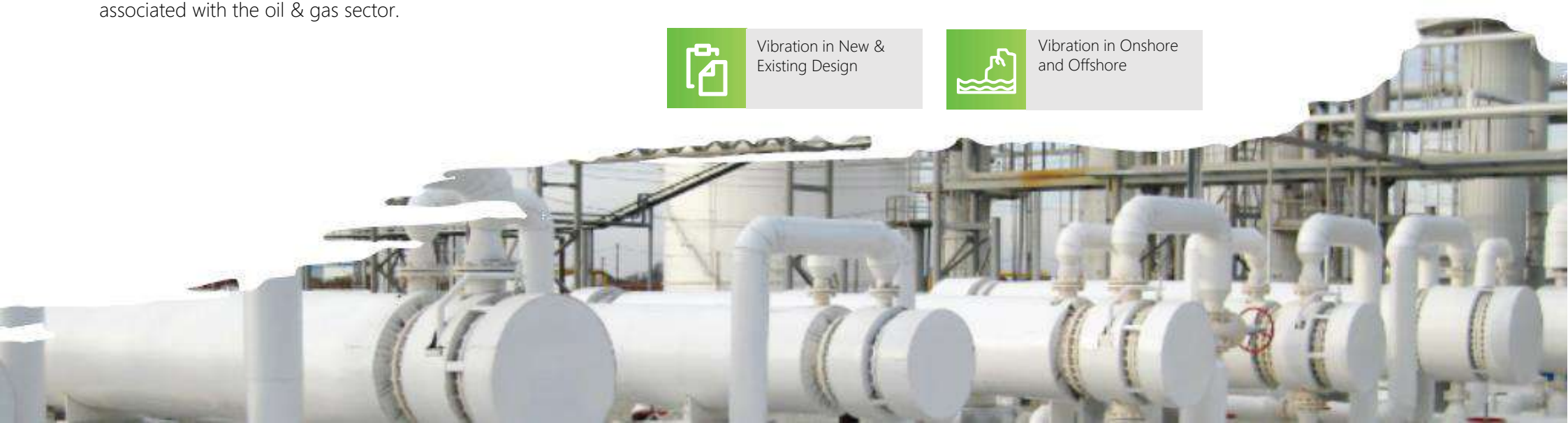
WKC offer a wide range of noise and vibration services. With our professional associations, international experience, and utilising our specialist assessment tools our consultants and engineers offer efficient and robust solutions to meet our client's needs.

Why us?

We have a global reach, with experience across several types of assets across Europe, the Middle East, the Americas, Africa and East Asia. Many of our key clients include FEED and EPC contractors associated with the oil & gas sector.

WKC is a leading provider of piping induced vibration services including:

- Acoustic Induced Vibration (AIV) Assessment
- Flow Induced Vibration (FIV) Assessment
- Small Bore Connection (SBC) Assessment
- Mechanical Induced Vibration
- Induced Vibration Training Workshops
- Cavitation Checks
- Entire Systems Check
- Surge Analysis
- Vibration in Retrofit Design
- Vibration in New & Existing Design
- Vibration in Onshore and Offshore



About Our Induced Vibration Services

Acoustic Induced Vibration (AIV) Assessment

A common problem in high pressurised gas systems are the rapid depressurisation of systems resulting in high mass flow rates and large pressure drops which result in sound pressure waves transmitting through the system and attenuating to atmosphere, sometimes causing significant vibration to transmit through the pipe.

WKC will identify at-risk pressure-reducing devices including to determine the likelihood of failure at all points of discontinuity downstream of the identified high-risk devices and provide recommendations for their mitigation.

- control valves,
- pressure relief valves,
- blowdown devices,
- restriction orifices, etc.

Piping Induced Vibration Services

Flow Induced Vibration (FIV) Assessment

Piping systems in long term service that have high operating velocities and substantial mass flows generate significant amounts of kinetic energy. If left unchecked the turbulence in the system can lead to plastic deformation through a number of loading cycles, primarily through failure at welds between adjacent pipework.

WKC will identify lines at risk of FIV on the basis of several criteria and conduct a screening assessment to quantify the likelihood of long-term low frequency FIV failure for all high-risk main line pipes. By applying certain principles we are able to make our client's assets safer, and reduce the likelihood of disruptions to production from long-term flow induced vibration failure.

- Identify risk
- Conduct assessment study
- Quantify likelihood of failure
- Optimise support spans
- Provide specific mitigation for high risk lines

About Our Induced Vibration Services

Surge Analysis

Surge is typically the result of flow with a high kinetic energy that is forced to change direction suddenly and is typically a concern within fire water systems for offshore facilities.

WKC can screen lines with high flow velocities and incidental operating conditions for their likelihood of failure in surge conditions.

About Our Induced Vibration Services

Small Bore Connection (SBC) Assessment

Smallbore connections have smaller diameters as opposed to their main line counterparts, making them more susceptible to flow induced vibration. The geometry and location of the SBC is critical in identifying the risk to the connection.

As part of our FIV assessments, WKC will identify high-risk SBCs attached to high-risk main lines and advise on their requirement for two-plane bracing as per recommendations made by the Energy Institute.

Piping Induced Vibration Services

Mechanical Induced Vibration

One of the simpler forms of induced vibration to manage is the result of vibration being transferred to the piping network by operating machinery such as compressors and pumps.

WKC can screen lines in close proximity to rotary or vibrating equipment to determine their likelihood of failure due to mechanical-induced vibration and pulsation.

About Our Induced Vibration Services

Cavitation Checks

Cavitation occurs when the system pressure drops below the vapour pressure, creating a bubble. Cavitation tends to be localised and can therefore be traced back to the operation of a nearby valve or pump.

WKC can analyse localised systems at risk for cavitation, determine their likelihood of occurrence and provide suggestions to avoid or reduce the risk of cavitation.

About Our Induced Vibration Services

Entire Systems Check

Not sure what the risk is? At an early stage of the design process, we can conduct a whole systems audit to identify the potential risk from induced vibration excitation and create an action plan for the necessary studies and quantitative analyses

About Our Induced Vibration Services

Induced Vibration Training Workshops

If you are looking to become more familiar with the assessment of induced vibration analysis, we offer bespoke training courses and workshops that enable participants to become competent in conducting qualitative and quantitative assessments in accordance with the Energy Institute methods and provide them with an understanding of the different mitigation measures that can be applied and when to apply them in a cost-effective manner.

Piping Induced Vibration Services

WKC undertake several induced vibration projects each year across Europe, Africa, the Middle East and Asia for a wide range of clients including FEED and EPC contractors, oil & gas operators, developers and engineering consultancy companies.

enquiries@aivfiv.com

Some of our recent, high profile projects have included:

- Acoustic Induced Vibration (AIV) and Flow Induced Vibration (FIV) analysis and systems check for two separate design packages involving the development of offshore wellhead platforms within the Marjan oil field development in the Arabian Gulf
- AIV and FIV analysis for offshore wellhead platform Engineering Procurement Installation and Construction (EPIC) package in the Idd El Shargi North Dome field located in shallow water in Qatar
- AIV and FIV analysis for onshore sales gas distribution network in the revolutionary King Salman Energy Park (SPARK) Project located between Dammam and Al-Ahsa in the Eastern Province of Saudi Arabia
- AIV and FIV analysis for the Jafurah Field Development (JFD) Natural Gas Liquids (NGL) Fractionation Facility near Shaybah, Saudi Arabia

WKC

Contact Us

info@wkcgroup.com

wkcgroup.com

@wkcgroup

@wkc_group

linkedin.com/company/wkcgroup

@wkcgroup

WKC Group

Office Locations

UK
London

UAE
Abu Dhabi
Dubai

South Africa
Durban