



The Solution Buyers' Guide

Pipeline Encroachment & Crossings

Table of Contents

How to Use This Guide

Encroachment in Pipeline Network Design

Planning Pipeline Networks and Accommodating
Neighbors

Calculation Tools for Crossing Engineers

Dimensions in Service Crossing Calculations

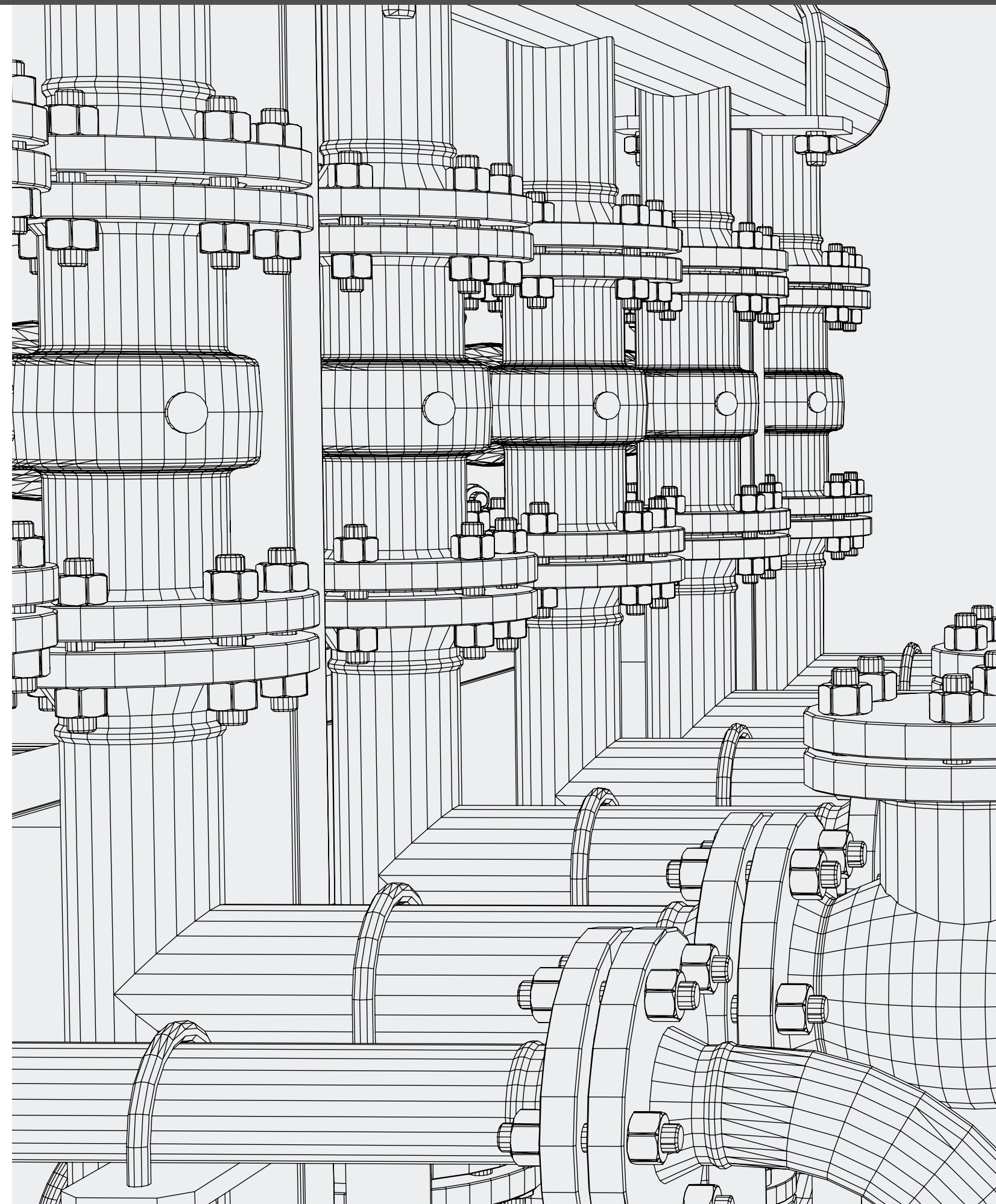
Improving the Highest Engineering Company or
Regulatory Standards

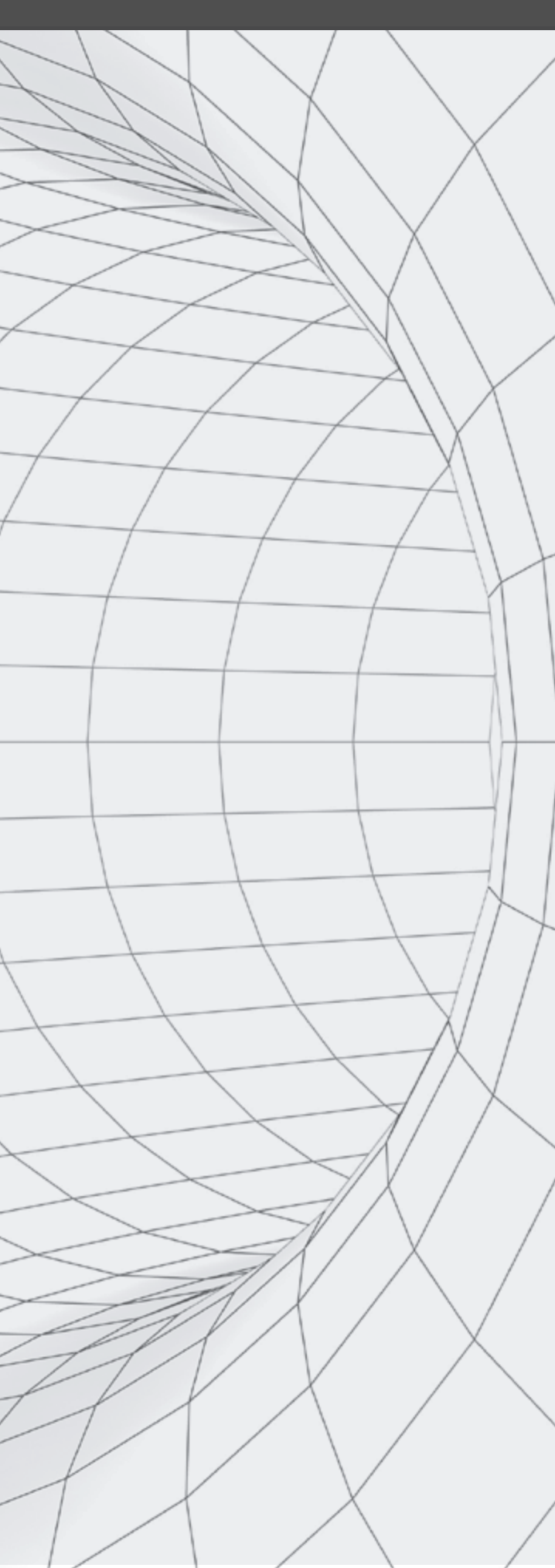
Improving Engineering Calculation Quality

Improved Engineering and Company Productivity

The Case for Technical Toolboxes

Conclusions





How to Use This Guide

You are the leading engineer in your company, or a senior manager responsible for operations. Alternatively, you may be an oil and gas pipeline operator, a consultant working within the industry, or an inspection service or supply chain service provider. This guide assumes that you have a working understanding of midstream pipeline operations.

The foundations of the guide build upon an intensive study of the relevant factors. Our research drew on our knowledge of the industry, combined with the input of industry insiders. These are engineers who understand midstream oil and gas pipelines. Like you, they make crossing permission determinations and design pipeline networks.

The best solutions deliver results in terms of standards, quality, and productivity. These solutions help you minimize the risk associated with encroachment on your pipeline, consistency, and compliance with Federal regulations. Finally, they dramatically improve the return on investment for the pipeline operators and service providers that implement them.

The risks associated with errors are more than financial: The worst incidents devastate the environment and cause injuries or deaths. It pays to have the best-in-class solution on tap when you design your pipeline or determine service crossing permissions.

This Service Crossing Buyers' Guide explains and explores the dimensions in your decision to purchase. It looks at what is involved in service design, crossing calculations, and risk analysis. When you have read this guide, you will understand how to choose software for pipeline design and crossing calculations.

“The risks associated with errors are more than financial: The worst incidents devastate the environment and cause injuries or deaths.”



“You consider stresses, strains, and vibrational loads on the pipeline. The answers you receive have to be timely and accurate.”

Encroachment in Pipeline Network Design

In this Buyers' Guide, we will use the term Service Crossing to include all of the encroachment activities that impinge on oil and gas pipelines. As the owner or operator of gas or liquid pipelines, your organization has to work with neighbors, the community, and internal customers to control how and where they encroach on your pipeline assets.

Proper pipeline design and crossing permission determinations minimize risks throughout the lifecycle of your midstream assets. The designs, permissions, and conditions that you issue depend on the accuracy and reliability of the calculations and analyses performed by your engineering team. You consider stresses, strains, and vibrational loads on the pipeline. The answers you receive have to be timely and accurate.

Planning Pipeline Networks and Accommodating Neighbors

Your neighbors or other third-party entities will come to you when their activities impinge on your pipeline assets, requesting permission. In many cases, the time it takes for you to respond causes additional cost to them.

Third-party construction crews may seek to cross or encroach on your assets with heavy equipment. They may intend to trench over or drill horizontally under your buried pipeline. How you respond to their requests depends on your capacity to produce the right wheel and track computations, and to do it rapidly.

Alternatively, you may be designing a new pipeline network or extension. While the urgency may not be as great as crossing scenarios, there are miles of regulatory red tape and rigorous standards that define how your pipeline has to perform. The software you use should be a force multiplier, freeing your engineers to tackle the other urgent challenges of your business.

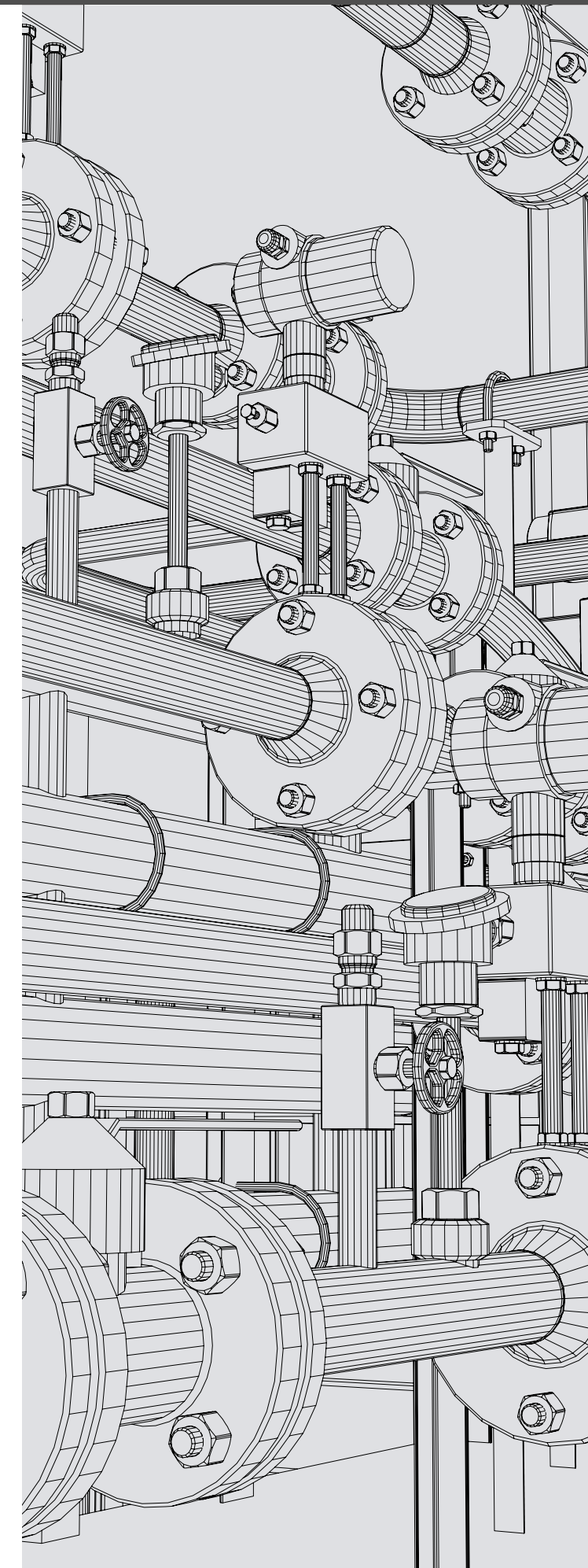
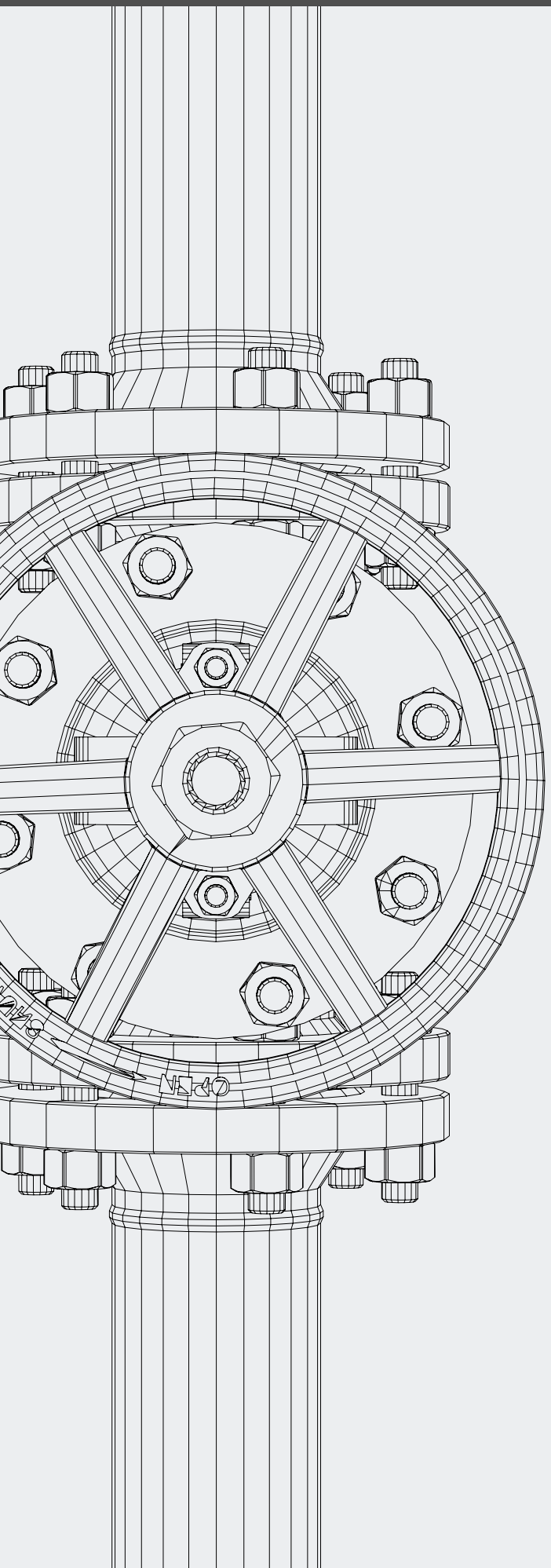


Image provided by  Mears Group, Inc. HDD/DP Division.





Calculation Tools for Crossing Engineers

Acquiring the best software solution is critical to your daily operations in the short-term and your competitive survivability in the long-term. The right choice of calculation tools has the potential to improve your business operations related to service crossings drastically. It makes the difference between fast decisions and costly delays. What kind of software application do you use?

Spreadsheets — These are perhaps the least disciplined medium in which to conduct service crossing analyses. The files can be copied and modified by users, with the best of intentions, leading to conflicting decisions and hazardous errors. While engineers have been working miracles with tools like these for many years, there are more efficient options now.

Finite Element Analysis Tools — Manual calculations that require engineering expertise and mathematical rigor come in many forms. This legacy approach employs general-purpose engineering applications such as Mathcad, or by developing an in-house software solution. As a class of solutions, these tools rely on the talents and time spent by dedicated engineers, who, with a better solution, could focus elsewhere more productively.

Dedicated Pipeline Analysis Software — A dedicated industry-specific software solution, like Technical Toolboxes, has the advantage of integrating the professional knowledge of regulations and industry standards accumulated by the engineers that designed it. Such a solution facilitates the critical factors in successful pipeline design and service crossing calculations.

“The software you use should be a force multiplier, freeing your engineers to tackle the other urgent challenges of your business.”



“The best-in-class dedicated pipeline analysis solution for service crossing delivers determinations in six dimensions.”

Dimensions in Service Crossing Calculations

The question for service crossing software buyers is optimizing the solution for pipeline design and crossing determinations, and the pipeline as an asset in your business. To determine decisions and any prescribed conditions, you must first understand the definition and features that you can bring together in one application. The best-in-class dedicated pipeline analysis solution for service crossing delivers determinations in six dimensions.

Three dimensions that are fundamental to the industry:

Standards are the quantitative, measurable metric ranges set by the company or industry.

Quality is a measurement of the minimum qualitative level of excellence the company sets for metrics.

Productivity is the quantitative measure of output for a person, department, or company.

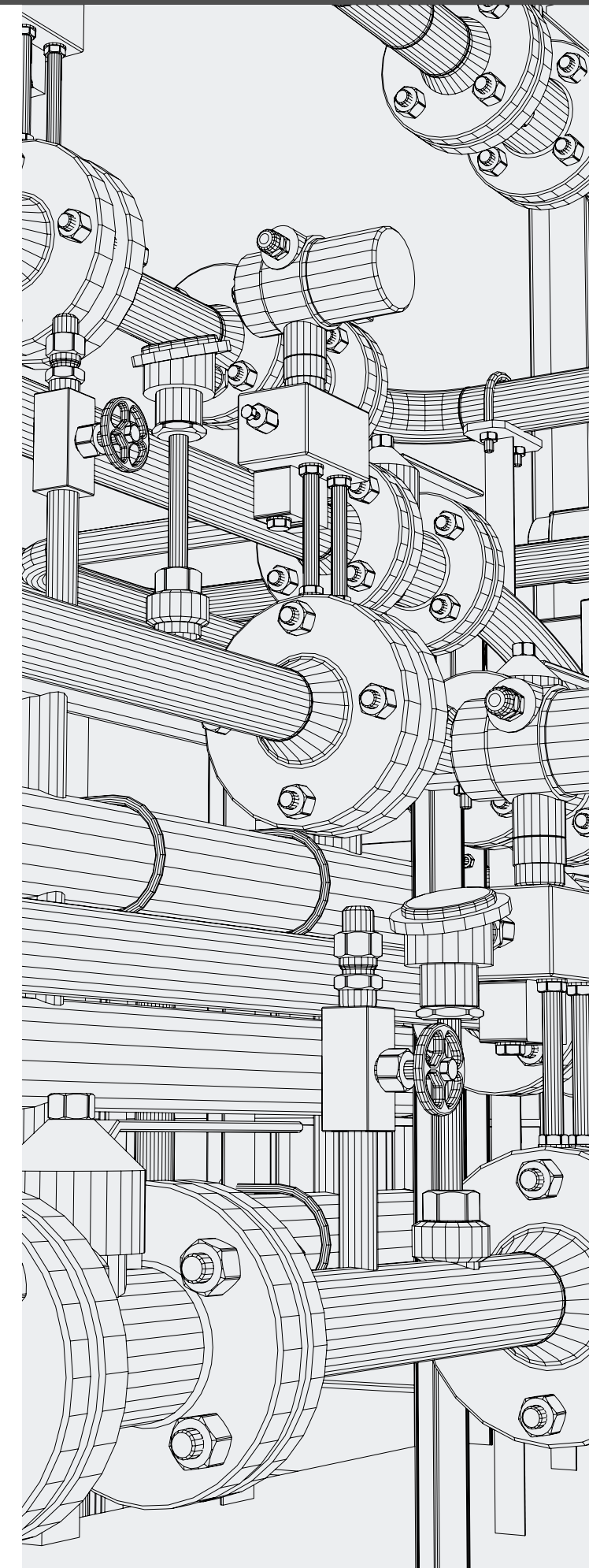
Combined with three dimensions of practical considerations:

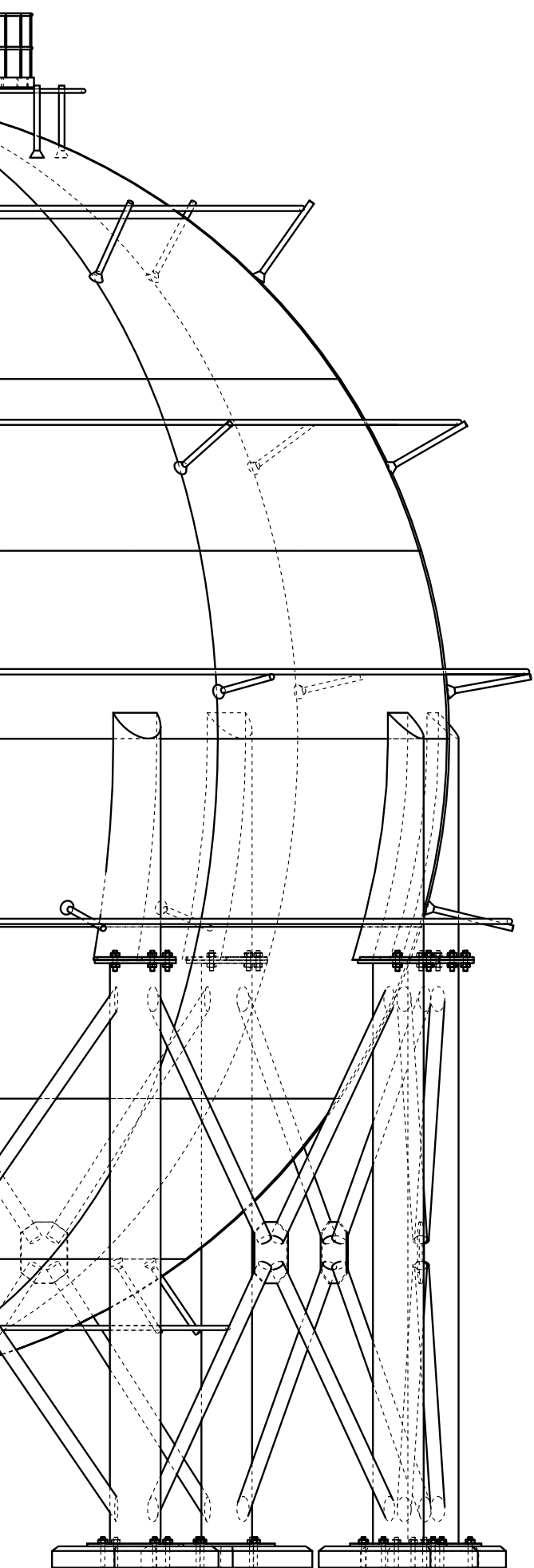
Consistency means that calculations will remain constant and vary in proportion to significant variables.

Availability means that once you have gathered all of the necessary data, it is quickly accessible and remains persistent.

Reliability means that you can trust that the results yielded by calculation will be free of errors.

The next section looks at how these sets of dimensions are deeply interrelated. They are the critical factors that define the criteria for a best-in-class dedicated pipeline analysis solution for design and service crossing calculations.





Improving the Highest Engineering Company or Regulatory Standards

As you surely already know all too well, standards dominate the oil and gas industry. Additionally, the stakes are high. Potential earnings for a successful enterprise are vast, but the risks posed by accidents, leakages, and explosions can be devastating in extreme cases.

Federal regulations define the limits, as do industry best practices and the internal Standard Operating Procedures (SOP) for your company. The best solution expedites the attainment of standards through consistency, availability, and reliability in pipeline design and service crossing calculations.

Standards: Consistency
A dedicated solution integrates all of the regulations, equations, and calculations as consistent parts of the company SOP. Ideally, only authorized managers can change formulas and procedures. It means that all engineers are on the same channel, which simplifies compliance and audit processes.

Standards: Availability
Availability means that the data remains on the platform until you remove it. The company SOP ensures that the correct equations and data are available for present and future use. The solution should check your key asset data for quality and compliance the first time it uploads to the library.

“...the data becomes part of the company information system and minimizes your dependence on personnel for their expertise.”

Once acquired, the data becomes part of the company information system and minimizes your dependence on personnel for their expertise. In practice, this means that designs comply with all relevant rules and requests for permission to encroach on pipelines receive swift responses.

Standards: Reliability
Analyses and calculations that deliver reliable answers give your engineers control. They put SOPs into action and foster compliance within the framework of industry and Federal rules. Reliability makes audits less stressful and protects your company from the risks that result from erroneous decisions. It minimizes the liabilities that could arise from less-disciplined methods.

“Reliability gives you confidence in the quality of your data.”

Improving Engineering Calculation Quality

Quality: Consistency

The right solution ensures that high-quality analyses lead to optimized pipeline designs and efficient service delivery. The term quality itself implies consistency, high availability, and reliability. Think of it as a disciplined framework for consistent engineering controls embedded in the application. It limits the potential for failures, releases, or incidents caused by excessive loads or strain on pipelines.

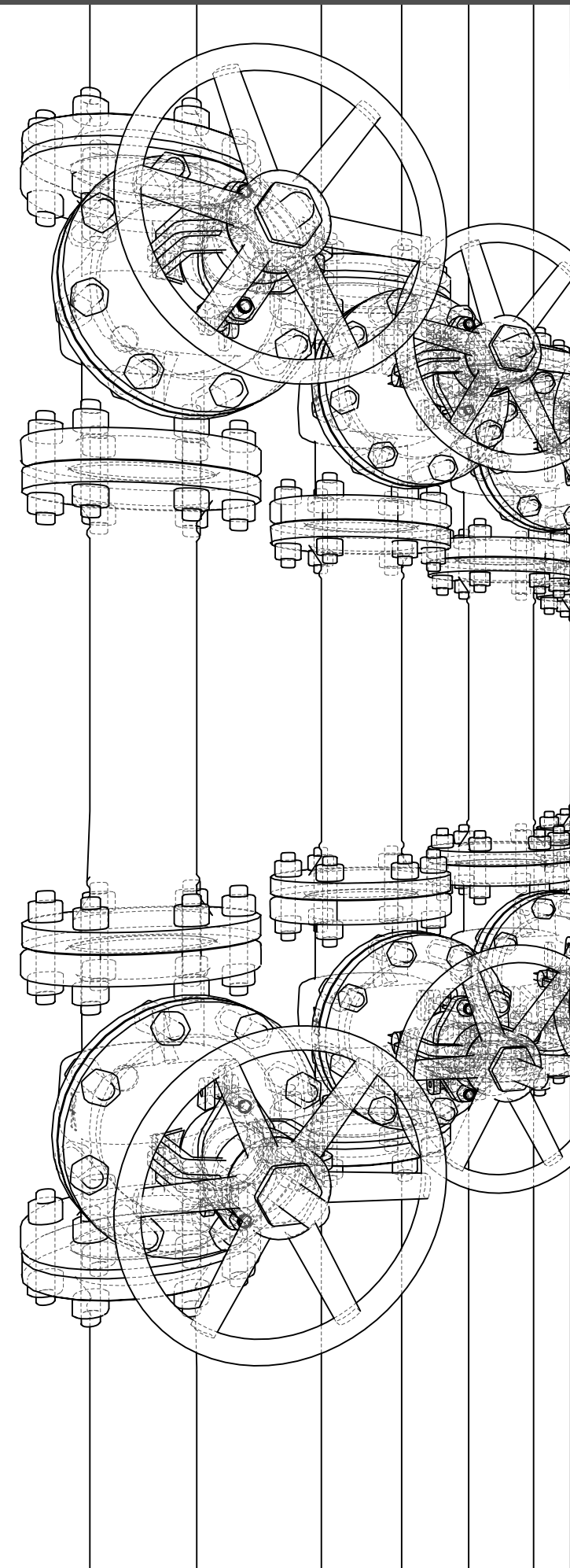
Quality: Availability

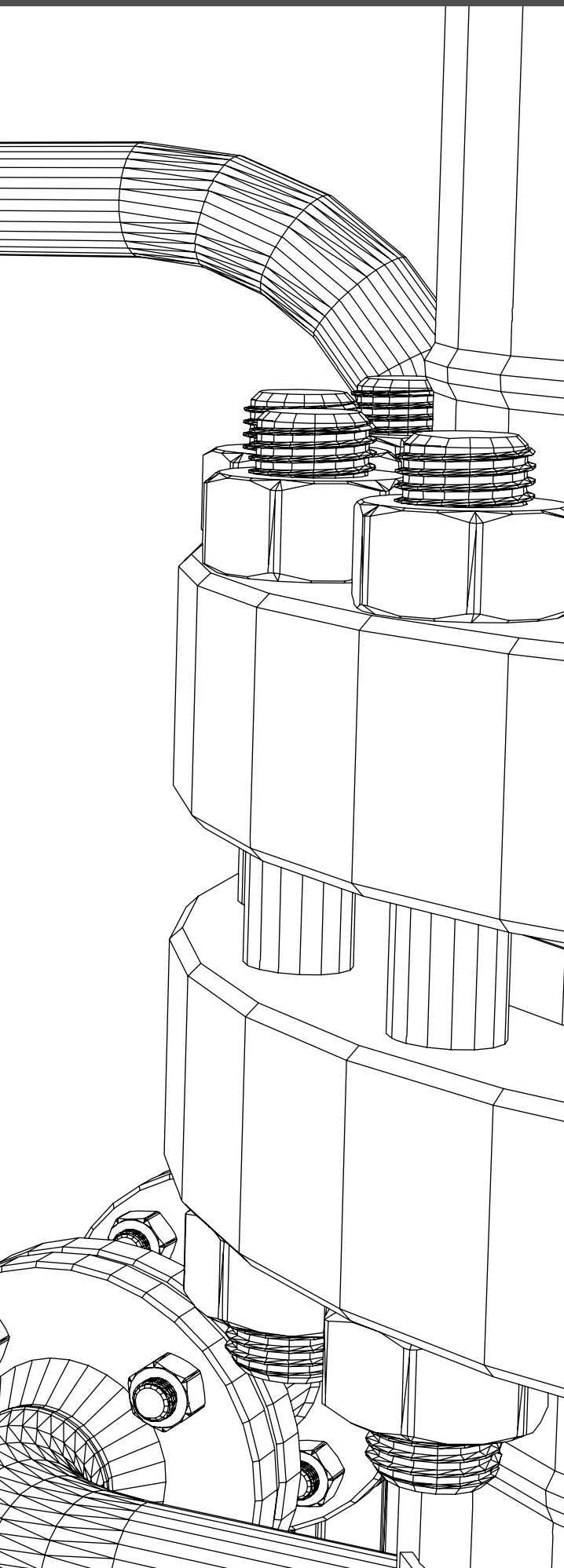
A solution that works with a software-controlled set of equations and a central library of key asset data maximizes quality by facilitating availability. A solution that leverages an integrated data library retains data integrity regardless of the number of users. It adapts quickly to changing requirements for design or crossing route considerations.

The best solution accounts for parameters set by federal regulations, industry standards, and company SOP. The ideal solution automates all of this and delivers the report fast by auto-populating the relevant analysis fields. Excellent data availability provides the basis for high-quality calculations that update without the friction of delays, errors, or duplications.

Quality: Reliability

Reliability gives you confidence in the quality of your data. The best solution is the one that provides a library of trusted data for the engineers that need it. A dedicated solution eliminates much of the follow-up QC work of spreadsheets, which saves labor costs and reduces delays. Unlike many in-house solutions, it is frictionless and forgives errors and changing specifications.





Improved Engineering and Company Productivity

Productivity: Consistency

The oil and gas industry is capital intensive and highly competitive. If you wish your company to survive, it is imperative that you maximize productivity. Midstream engineers have to squeeze efficiency and value out of every activity.

The most productive solution aggregates data and analyses performed for each asset to build an easily searchable library of prior work. The most productive solution is the one that is most consistent in retaining or recalling engineering calculations from previous projects.

High productivity means capturing data and site histories consistently, for all users, without duplicated efforts or losses. The result is that the information remains with the company as engineers move in and out of their roles. It does not depend on the knowledge and memories of individual employees.

Productivity: Availability

With the right solution, critical pipeline calculations are easy to use and readily available to those that need them. A dedicated pipeline analysis solution produces availability by storing the relevant data in one database and automating the processes involved in distributing it to users. It responds flexibly and rapidly to changes in pipeline design and service crossing requirements.

Data availability ensures that teams do not duplicate work already performed by another part of the organization previously created. The result is an accelerated process that minimizes risk due to improved consistency.

For example, if a request was initially for tracked vehicles, but changed to wheeled vehicles, engineers should be able to adapt the analysis. Legacy calculation methods take time and effort to reset and recalculate for each set of changes. The ideal solution responds by updating the report to reflect the new conditions almost instantly.

“A solution that works with a software-controlled set of equations and a central library of key asset data maximizes quality by facilitating availability.”

Productivity: Reliability

A solution that delivers results reliably maximizes productivity for your engineers. Highly trained technical professionals spend less time checking results and troubleshooting errors. With the right dedicated solution, engineers spend less time on non-engineering tasks such as data mining, creating graphs, and data entry. It means they can redeploy to address the issues where they maximize value to your organization.

The Case For Technical Toolboxes

Technical Toolboxes is the best-in-class solution for pipeline calculations and analyses. It integrates the tools that deliver fast determinations that conform to all of the regulations and demands of the industry.

The service crossing solution from Technical Toolboxes was designed by pipeline engineers for pipeline engineers. The Pipeline Toolbox crossing module and widgets deliver calculations and design parameters that meet or exceed all standards. The data you gather once is immediately available to all users with the certainty that they can trust the results.

Uphold Standards — Technical Toolboxes gives you automation that works. Use it to comply automatically with regulations, industry standards, and your SOP. Pursue compliance proactively and respond to audits without disruption to your daily operations. With it, you have the confidence to work in the most restrictive regulatory environments.

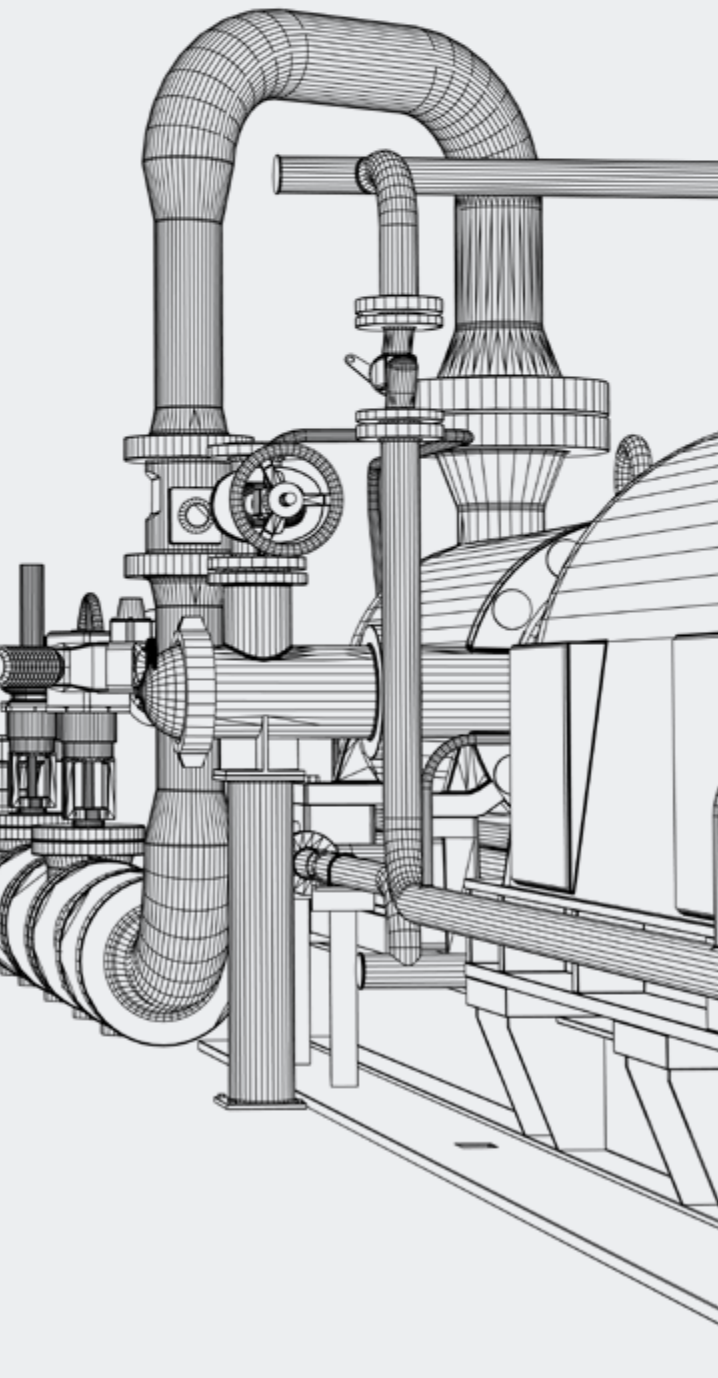
Quality In and Out — With Technical Toolboxes, you add key data about your assets and quality check it in the platform database. So you have consistent data availability and quality that prevents failures, releases, or incidents. The solution provides the tools to produce results that are consistent, available when you need them, and reliable.

Increase Productivity — The critical calculations for designing the lifecycle of the pipeline are easy to use and readily available to those that need them, ensuring that your team does not spend too much time recreating analysis tools or methods that another part of the organization previously created. Once your key asset data loads, it is quality checked and added to the platform database automatically. When called into action, the data auto-populates in relevant analysis fields. A trusted database is instantly available with consistent data quality.

While engineers are more likely to work in offices, the capability to perform analyses in the field can make a critical difference. When engineers need to make expedient crossing determinations onsite, Technical Toolboxes provides the wireless connectivity required so that engineers can maintain their productivity in the field.

“Excellent data availability provides the basis for high-quality calculations that update without the friction of delays, errors, or duplications.”

Image provided by  Mears Group, Inc. HDD/DP Division.



Conclusions

A dedicated pipeline analysis solution is superior to other options such as spreadsheets, in-house software, and manual calculations. Because of the specializations and unique risk profiles faced by designers and operators of pipeline networks, a dedicated solution offers the most consistent, available, and reliable analyses. The best-in-class solution meets or exceeds industry standards. It surpasses the demands for quality and improved productivity.

Standards are the quantitative, measurable metric ranges set by the company or industry. Technical Toolboxes sets the standard for service crossing calculations and automates compliance while delivering determinations.

Quality is a measurement of the minimum qualitative level of excellence the company sets for metrics. The centralized data library in Technical Toolboxes gathers, QCs, and retains all data for all present and future team members that need it.

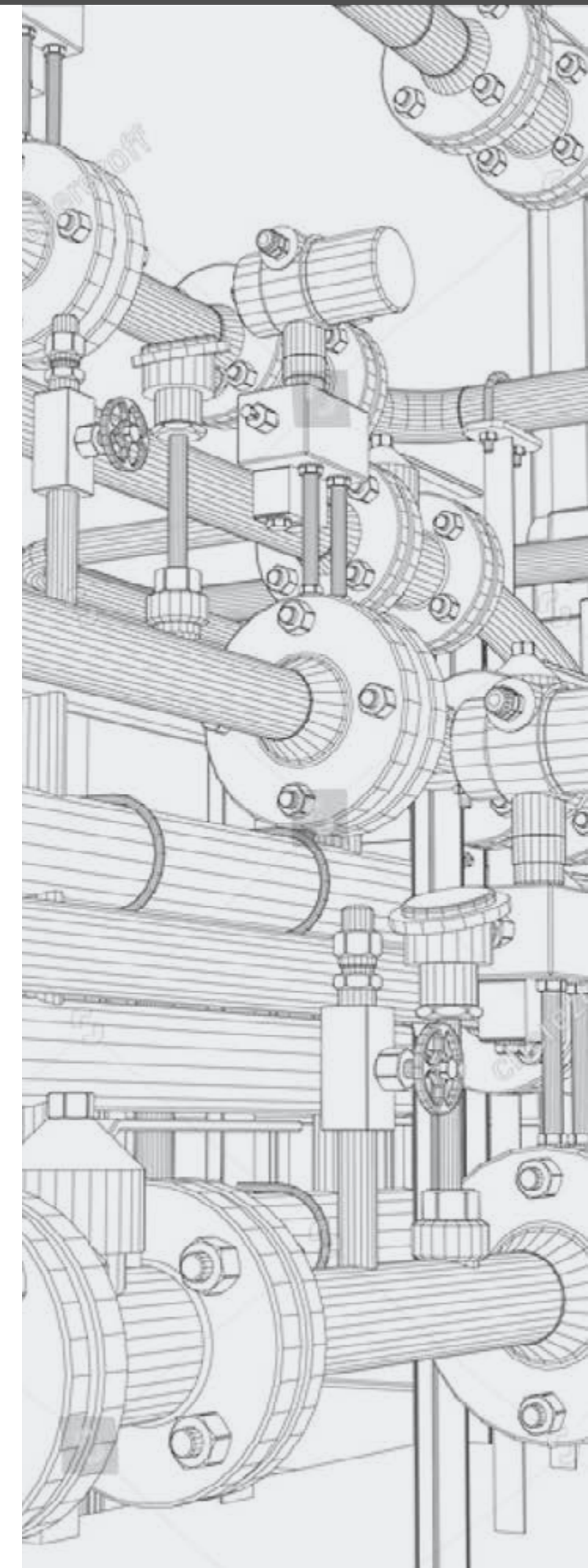
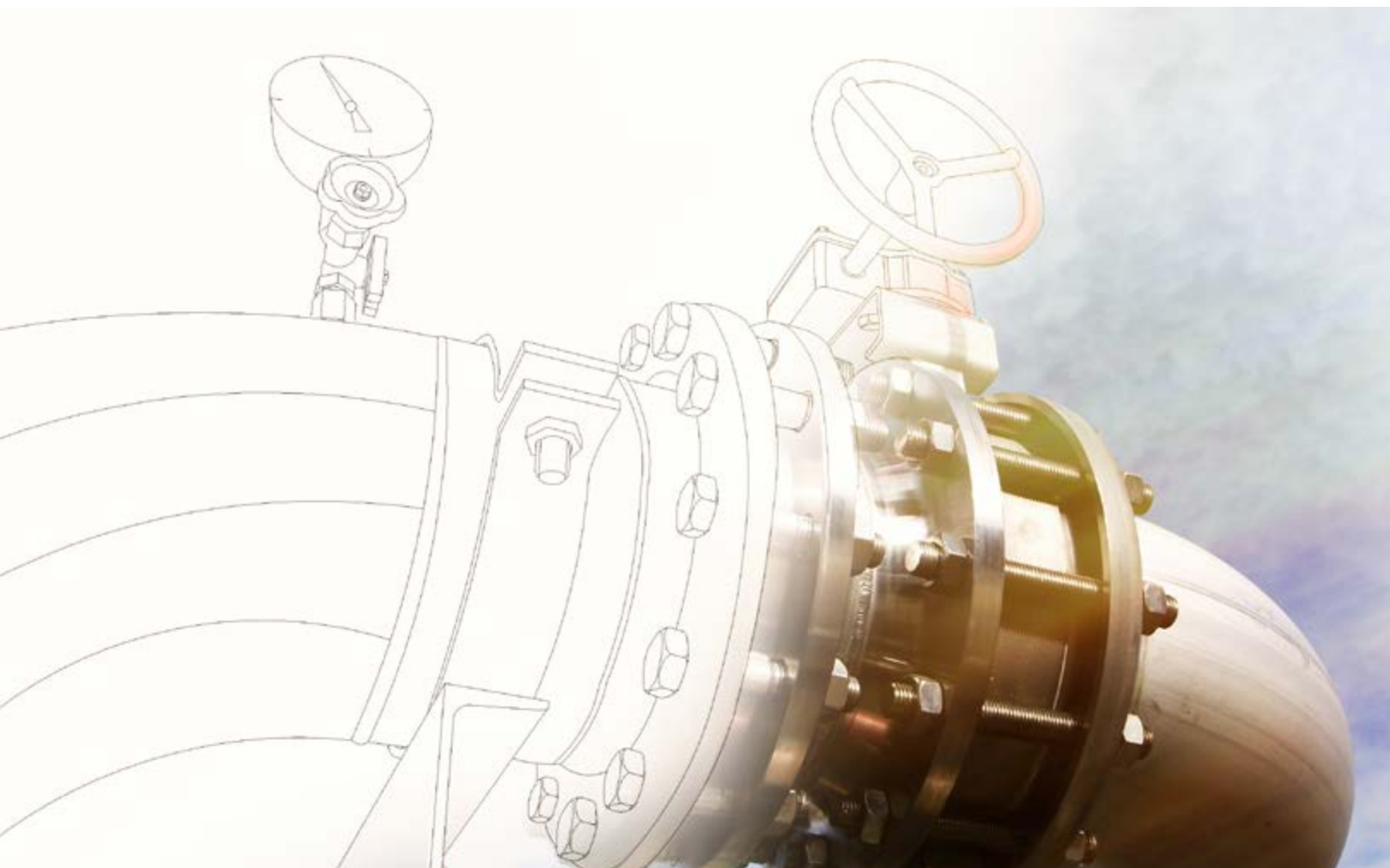
Productivity is the quantitative measure of output for a person, department, or company. Fast access to trusted data in Technical Toolboxes minimizes the valuable time engineers spend delivering the answers can be spent on more important things.

Consistency means calculations will remain predictable and vary in proportionality. However, the time to apply changes will be minimal with Technical Toolboxes.

Availability facilitated by the centralized library of pipeline data in Technical Toolboxes means that all of the necessary data is quickly accessible and remains persistent.

Reliability means you can trust that the results yielded by calculations with Technical Toolboxes modules will be free of errors. Engineers and project managers in regulated or high-risk industries need an extremely reliable solution. Technical Toolboxes is an integrated set of oil and gas tools that deliver the solution.

Technical Toolboxes is the leader in cloud-based and integrated pipeline analysis solutions. We offer it as an affordable investment, so you can reap the potential savings of simplified compliance, improved quality, and increased productivity.





Technical Toolboxes
3801 Kirby Drive, Suite 520
Houston, TX 77098

Toll Free: (866) 866-6766
Phone: (713) 630-0505
Fax: (713) 630-0560

info@technicaltoolboxes.com
www.technicaltoolboxes.com

(C) 2019 Technical Toolboxes. All rights reserved.



Technical Toolboxes is an Authorized Reseller of PRCI products

PRCI Products:
PRCI HDD Toolbox

Technical Toolboxes Products:
Pipeline Toolbox
Workflow automation package for Crossings module in PLTB
HDD PowerTool

About Technical Toolboxes

Technical Toolboxes is a leading provider of integrated and cloud-based pipeline software, online resources, and technical training for pipeline engineering professionals around the world. The integrated software products developed by Technical Toolboxes provide engineering software productivity tools for standardization, and we deliver oil and gas industry training courses covering a breadth of topics with industry-recognized instructors.