OCTAVE

Integrated analysis solutions for safe and sustainable operations

eBook

Why analysis?

Although the analysis phase of a project is subsequent to the design phase, it is equally, if not more important. Analysis for piping, pressure vessels, tanks and structures is the only way to ensure designs not only adhere to the latest safety standards, but also withstand the test of time with the design data you need to streamline workflows, collaborate effectively and deliver on time and within budget.

A connected analysis ecosystem helps avert failures and guarantees reliable equipment operation, thereby avoiding potential disasters. This is made possible by its capacity to integrate seamlessly with other disciplines across operations.

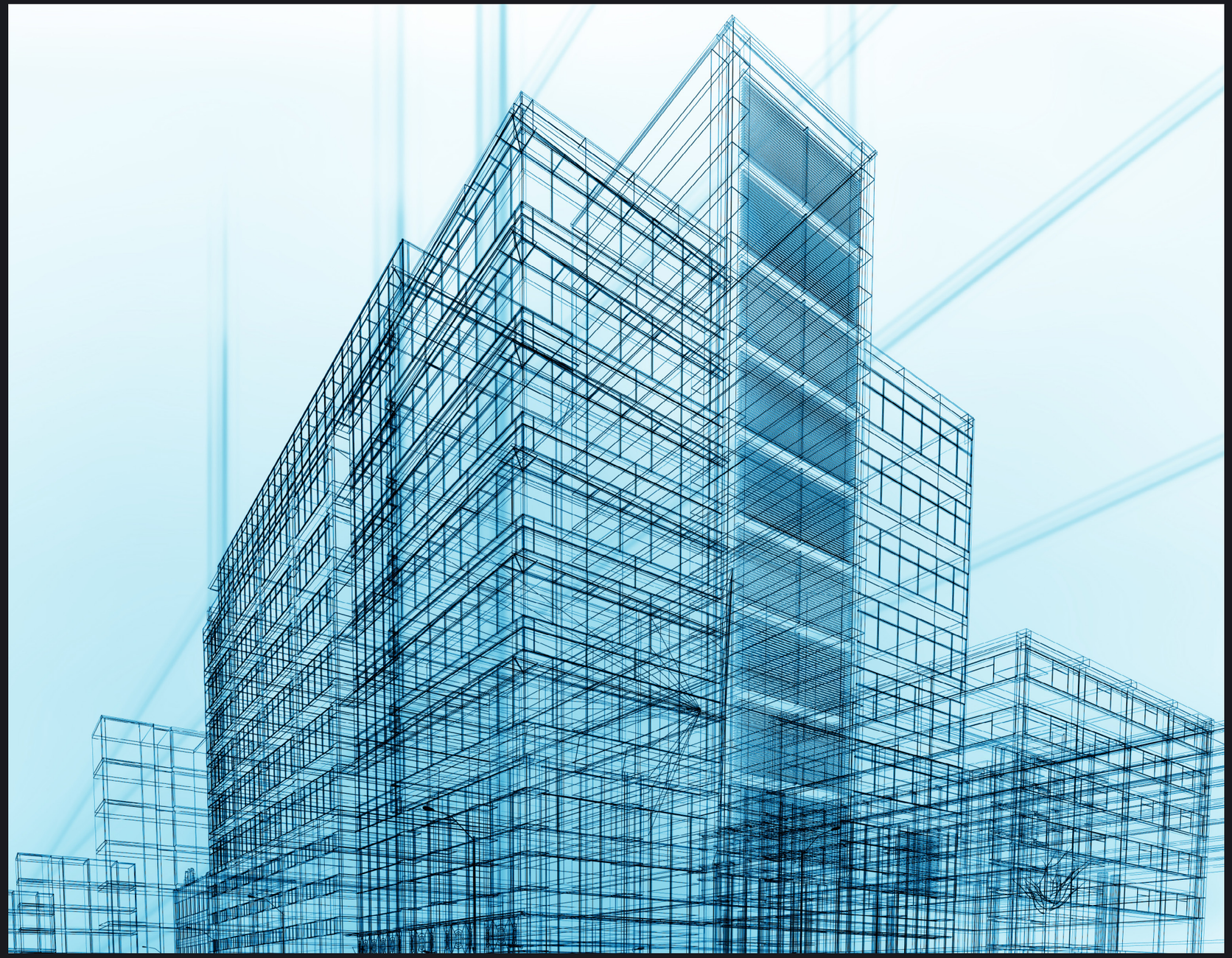
Common types of analysis:

- Static and dynamic piping analysis
- Seismic and wind analysis
- Subsea and offshore analysis
- Finite element analysis (FEA)
- Heat exchanger analysis
- Pressure vessel design and analysis
- Beam analysis

While there are many types of analysis, each is designed with safety, quality and code compliance in mind, verifying designs are adhering to the same standards companies across the globe are using to ensure safety and reliability in their facilities.

Static and dynamic analysis are some of the most common types of analysis. Static analysis is typically used to analyze the design's behavior under multiple situations, such as varying loads, internal/external pressures, elevated temperatures and more. Dynamic analysis is used for analyzing how an asset might respond to rapidly changing conditions or loads such as fatigue, changing fluid flow, earthquakes, wind or other environmental effects.

Both types of analysis are essential for evaluating the performance and reliability of a new processing system in varying conditions while also ensuring designs are optimized. An optimized design can reduce upfront costs, maintenance costs in the future and improve revenue for stakeholders. Over time, new situations may develop once the equipment is in use, and additional analyses can be performed to analyze acquired flaws and course-correct through rerates, repairs or retirement/ replacement of that equipment with updated designs.



Facing the challenges of design and analysis projects

Analysis can be one of the most critical parts of a project for an organization, while also being the most complex. Owners, operators, EPC firms and engineering organizations consistently struggle with meeting deadlines due to a lack of collaboration between the various disciplines, departments and solutions involved. Not every asset in an operation may be operating at maximum capacity or to standards, depending on how accurate the initial analysis is, how old the asset is or how integrated the solutions are.

While there are many analysis solutions on the market, analysis efforts are often siloed and fractured, preventing opportunities for an efficient and integrated ecosystem. This siloed approach often leads to miscommunication, bottlenecks, frustration and potential overspending due to a lack of oversight for projects. How can you avoid these pitfalls and achieve faster and more accurate analysis results? Adopt an integrated analysis ecosystem that provides you with the design data you need to streamline workflows, collaborate effectively and deliver on time and within budget.

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Drive projects with an all-encompassing suite

The most important aspect of digital transformation is its ability to connect all facets of operations and project deliverables within a single digital ecosystem. Octave's team strives to enhance not only the software within this ecosystem but also engineers' efficiency through contributions to regulatory bodies such as ASME Section VIII, Rules for Construction of Pressure Vessels; ASME Section II Materials and ASME FFS-1/API 579 - Fitness-For-Service.

By entrusting Octave with design and analysis projects, organizations ensure their assets adhere to high standards of performance and operate safely through code compliance.

Octave offers a full suite of analysis tools for structures, piping, pressure vessels and tanks. Combining these tools through intricate but easy-to- use integrations can help organizations break silos and achieve better decision-making through a more complete view of assets.

Octave's analysis solutions are part of a digital ecosystem that connects every aspect of your asset lifecycle. You can unify your analysis data with Octave's data and document management system, that manages all your engineering information. This unification enables the integration of analysis data in your organization, boosting collaboration among various teams and departments.

Tackle complex design projects with powerful analysis tools

Main benefits:

- Better project management and insights into performance
- Reduced risk of cost and schedule over-runs
- Accurate and actionable information to enable course corrections
- Consistent updates to the latest codes and regulations
- Contextual guidance to fuel better decision making

By using solutions for:

- Pressure vessel design and analysis
- Structural design and analysis
- Piping design and analysis
- Tank design and analysis

While complex projects are a mainstay in process industries, cumbersome software doesn't need to be. It's no secret that organizations struggle when deadlines are extended due to design complications or when the context of the analysis isn't fully understood. Easy-to-use, accurate and detailed analysis solutions are paramount to ensuring the safety and reliability of designed assets.

Organizations must adhere to the latest codes and standards to achieve regulatory compliance throughout the design and analysis process. Not meeting these regulations can lead to penalties, schedule delays and inefficient or dangerous designs.

The innate cyclic nature of process industries does not wait for analysis software. It's organizations like Octave and the teams behind our analysis solutions that empower owners and the overall effectiveness of their assets.

Organizations seeking scalable and easy-to-use analysis software that can handle any complex project in the process industries, need look no further.

Octave's analysis solutions are designed to help you create safe and efficient assets that comply with the latest codes and standards.

See improved results across multiple design and analysis disciplines by combining data with the power of Octave's data and document management system to integrate and manage all your data and analysis workflows. Benefit from the synergy and insights that come from breaking silos and combining data.

An integrated suite for all design and analysis projects

Perform detailed analysis of structures, piping, pressure vessels and tanks using intuitive and powerful features that save you time and money. Whether you need to design a new asset, retrofit an existing one or optimize your operations, Octave's suite of analysis solutions can do it all.

Integrate analysis solutions with other products, such as Forte 3DWorx (formerly CADWorx) and Forte 3D design (formerly Intergraph Smart 3D) products for more streamlined workflows and better communication across departments and disciplines.

See the benefits of sharing data between products such as Aspect Pressure Vessel (formerly PV Elite) and Forte 3DWorx, enabling pressure vessels to be designed in either program and analyzed in Aspect Pressure Vessel.

Changes to the design can be made in either product and updated in both, eliminating the need for re-work.

Want to learn more about what Octave's suite of analysis products can do?

Aspect Pipe Stress (formerly CAESAR II)

The engineer's standard in pipe stress analysis

- Industry-leading solution with an international, trained user base.
- Quickly analyze piping with 50+ codes and standards.
- Analyze various loads like pressure, thermal, wind, seismic and more.
- Analyze multiple equipment load conditions and equipment types, aiding in critical flange evaluation against specific code standards.
- Design and analyze in-ground piping, above ground, subsea and more.
- Advanced 3D model graphics with real-world representations.
- Integrates with CAD software, enabling quick model imports and reduced errors between CAD and stress analysis divisions.

Aspect Pressure Vessel (formerly PV Elite)

Industry-leading pressure vessel analysis software

- Every major code and standard engineers need to innovate their design approach for vessels and heat exchangers.
- Automated 2D and 3D visualization for easier design and analysis.
- Easily analyze older equipment for life extension.
- Equations and substitutions for easy verification of report accuracy.

Aspect Structure (formerly GT STRUDL)

Award-winning structural analysis software

- Quickly design and analyze structures in accordance with more than 150+ codes and standards, including American Institute of Steel Construction (AISC), American Concrete Institute (ACI), Canadian, European, Indian, Chinese and NF codes.
- Analyze loads while taking into account weight, pressure, thermal, seismic and other static or dynamic conditions.
- Engineers have everything they need at their fingertips and in one robust package, including beam and FEA analysis.
- Aspect Structure's complete range of design codes enables engineers to validate the viability and integrity of their project work.

Aspect Nuclear Pipe Stress (formerly PIPESTRESS)

Efficient and streamlined nuclear pipe stress calculation software

- Certified for use in the nuclear industry – RCC and ASME class 1, 2 and 3.
- Continuously maintained in compliance with ASME NQA-1.
- Optimized for Class 1 nuclear piping (not available in Aspect Pipe Stress).
- Rigorous dynamic analyses for demanding nuclear seismic requirements.
- Offers a variety of analysis types, including linear and non-linear calculations, heat transfer, thermal gradients, fatigue analysis, strain energy-weighted composite modal damping and time history analysis.

Aspect Tank (formerly TANK)

Tank design and analysis for product storage

- Ensures assets meet the latest American Petroleum Institute (API) standards, in addition to withstanding wind, seismic and settlement conditions. This also includes air venting requirements.
- Context-sensitive help guides engineers to perform their best, providing code references and technical advice throughout the design and analysis steps.
- Provides engineers with many databases, including a number of U.S. and international structural steel databases, enabling the solution to fit the needs of the chemical, petrochemical, power and water treatment industries.
- Graphical representations of analysis models help ensure confidence in inputs and results.

“The advanced capabilities of Octave’s easy-to-use and proven Forte 3DWorx and analysis solutions provided fast project set up and a quick learning curve with almost immediate productivity. We also benefited from the easy customization of databases and efficient coordination among specialties.”

Antonis Markogiannakis,
CEO, PipeServ Engineering

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property, and assets– for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency, and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.

Learn more about our analysis solutions

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