



NEWSLETTER

BY: THOMAS KALB, DIRECTOR

The Midstream Center continues to fulfill its mission to build its value proposition and become a trusted partner with the midstream industry by developing industry relationships and educating tomorrow's leaders through:

- Practical research driven by industry needs
- Enhancing faculty knowledge and understanding of the midstream industry and related issues
- Educating students about the midstream industry, its opportunities, and course of study relevance
- CMMS's Information Clearing House, which promotes industry knowledge and offers industry a portal to search and access most midstream-centric academic papers.
- Webinars and industry and campus events designed to educate and bring industry, faculty, and students together

CONTENTS

New Board Member

GPA Midstream Course

Elevator Pitch Workshop

Top 10 Issues

EIDS Shares Microbe Database

PSRG Training Collaboration

Midstream Essay Contest

Awarded Research Grants

New Board Member



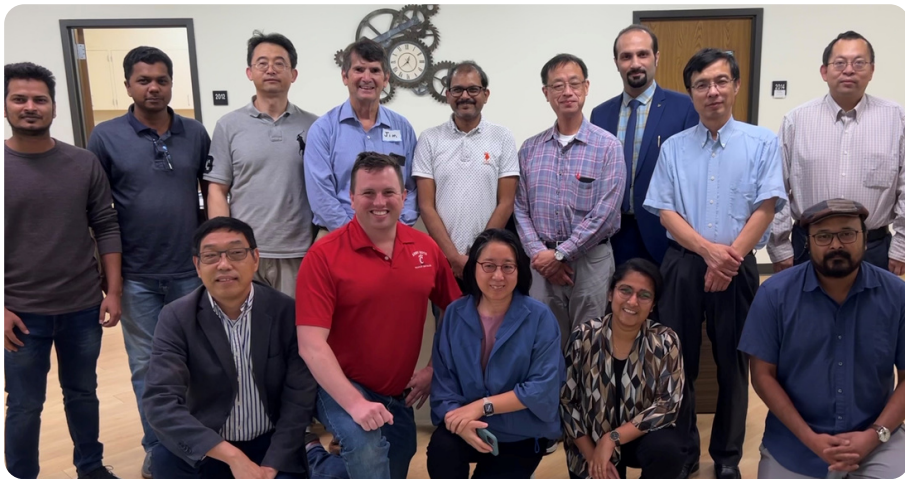
Wesley Carter

Vice President of Environmental,
Health, and Safety
Kinetik
Houston, Texas

Mr. Carter is a Process Safety Professional with a diverse background spanning onshore natural gas E&P, midstream Gas Processing, and the Chemical Processing industry. Throughout his career, he has excelled in overseeing regulatory compliance and internal programs covering Environmental/GHG, Occupational Health & Safety, Process Safety, and Pipeline Integrity Management. He currently holds the AIChE - CCPS Certified Process Safety Professional (CCPSC) certification.

Wesley received his Bachelor of Science in Chemical Engineering and the Mary Kay O'Connor Process Safety Engineering Certificate from Texas A&M University in College Station, TX. He is currently pursuing an Executive MBA in Energy from the University of Oklahoma, Price College of Business.

CMMS Sponsors 3 Day GPA Midstream Course



CMMS sponsored a 3-day midstream industry course for LU faculty, graduate students, and industry personnel that was delivered on the LU campus by instructors from GPA Midstream. This training covered midstream products and equipment typically found in midstream facilities, and the processes that turn natural gas liquids into valuable products. The course was designed to immerse attendees in the midstream industry, show the scope of operations,

and assist faculty in bridging their academic competencies and interests to real-world industry operations and issues. Thomas Kalb, Director of CMMS, commented "CMMS is a proud member of GPA Midstream and this event was the second time we have brought in GPA Midstream instructors to deliver this valuable course as part of our faculty education efforts in the midstream arena."

CMMS Hosts Its First Elevator Pitch Seminar

CMMS worked with Dr. Komal Karani, Professor of Marketing at LU's College of Business, to develop a short seminar on developing a 1-minute elevator pitch. This seminar, delivered by Dr. Karani, is designed to assist faculty in quickly and efficiently presenting their ideas to possible commercial funding sources and other people that they are seeking to influence. The first seminar, which took place in early October, was a success with seven LU faculty members energetically embracing the training with Dr. Karani. Thomas Kalb, Director of CMMS, said "We were fortunate to have Dr. Karani available to partner with us in this effort. We are hopeful that this seminar will be useful to LU faculty and that it will become a regular event."



CMMS conducted its third annual CMMS survey of issues facing the midstream industry. This survey drew on opinions of friends of the Midstream Center in executive management, engineering, operations, consulting, and academia, and its Industry Advisory Board. The Top Ten issues facing the midstream industry in 2024, force ranked, are:

1. Attracting New Talent
2. Political Environment
3. New Regulations (tie)
4. Government Energy Policy (tie)
5. Aging Infrastructure
6. Business Outlook
7. Emerging Engineering Issues
8. Permitting
9. Capital Availability
10. Supply Chain

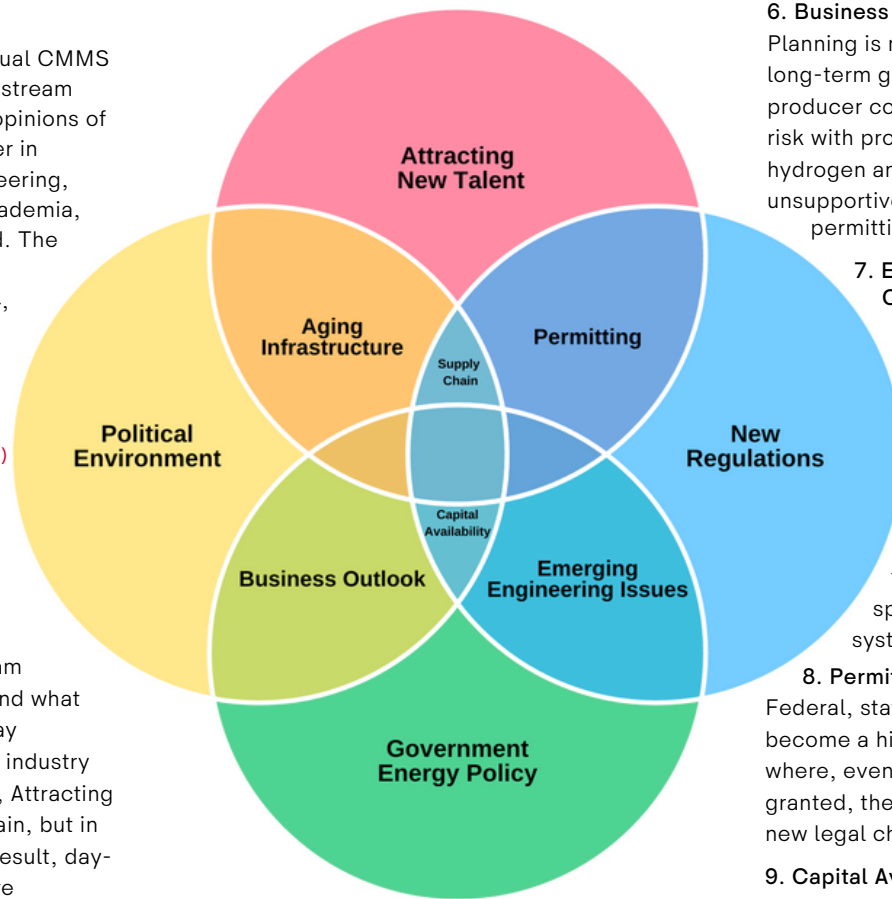
In last year's Top Ten midstream issues survey, human capital and what might be considered day-to-day operating concerns dominated industry concerns. In this year's survey, Attracting New Talent took first place again, but in an astonishing and disturbing result, day-to-day operating concerns were replaced by Political Environment. Interestingly, Attracting New Talent and Political Environment were not only very close in scoring but were also significantly more important than the remaining eight issues. The next two issues, New Regulations and Government Energy Policies, were tied in scoring and materially more important than the remaining six issues.

1. Attracting New Talent (same in 2023 survey)

Many young people are not interested in working in a politically vilified industry seen as dirty, undesirable, and low tech where long-term employment prospects are uncertain.

2. Political Environment (up from #6)

This apparent cry of frustration can be observed in the October 2023 cancellation of Navigator's \$3.4 billion, 1300-mile pipeline project designed to take CO₂ from ethanol plants across five states to be sequestered in Illinois. It is clear that a dog's breakfast of untenable, conflicting, and expensive energy policy dictates has created an environment where even those projects officially supported by federal policy and funding cannot get done.



3. New Regulations – tie with #4 (up from #4) Considerations around public safety continue to be a focus for all regulatory agencies. That said, billions of dollars in investments have been lost or canceled due to political and governmental activism relating to existing and new regulations at the federal and state levels.

4. Government Energy Policy – tie with #3

A significant part of the electorate and public officials are not supportive of carbon energy, which informs policy that impacts New Regulations, Business Outlook, Permitting, and Capital Availability.

5. Aging Infrastructure (down from #3)

Many of the major pipelines that are relied on to move products across the country are substantially over their original 25-year design life. In too many cases, operators' efforts to keep these assets operating safely are being challenged by proponents of green energy who see such work as merely extending the life of carbon-based energy.

6. Business Outlook (new)

Planning is more difficult due to fewer long-term growth opportunities, producer consolidation, re-contracting risk with producers, and building out hydrogen and CO₂ infrastructure in an unsupportive political, legal, and permitting environment.

7. Emerging Engineering Challenges (new)

Legacy pipeline infrastructure was designed to transport and process methane. Substantial effort is going into figuring out how to economically ship CO₂ and hydrogen without trying to permit and build new, special-purpose, pipeline systems.

8. Permitting (down from #4)

Federal, state, and local permitting has become a highly uncertain process where, even after permits have been granted, they can be canceled due to new legal challenges.

9. Capital Availability (down from #7)

Political activism related to carbon energy has bled into many federal and state agencies, adversely impacting capital markets, lending institutions, funding costs, and midstream asset valuation.

10. Supply Chain (down from #5)

Delayed delivery and increased costs are making simple maintenance, much less new project development, difficult to evaluate and manage.

Identification of problems is traditionally the first step in solving problems. Given the 2024 survey results, in combination with the recent Exxon and Chevron acquisitions, dampening of EV fervor among American car companies, their customers, and unions, and the failure of green energy policy projects like Navigator's CO₂ project, one could argue that we may be approaching Peak Green Energy Expenditures or "Peak G." It may be time for the midstream industry to reassess its limited interaction with the public, perhaps through positive educational initiatives targeting energy consumers and students.

EIDS Shares Microbe Database With CMMS

In July 2020, EnerG-ID Solutions Corporation (EIDS) of Denver, Colorado, teamed up with CMMS to pursue EIDS's Data Advancement Program, designed to help finalize the development of EIDS's man-portable rapid DNA testing equipment and build information on damaging microbes living in energy systems across the United States.

EIDS uses rapid DNA analysis in real-time to bio-identify microbes that cause corrosion and harm hydrocarbon production, transportation, storage, refining, and consumption.

"When we learned of EIDS's new, man-portable, rapid DNA sequencing technology and its potential to help dramatically reduce microbe-driven corrosion in hydrocarbon systems, we wanted to know more," Thomas Kalb, director of Lamar University's Midstream Center said.

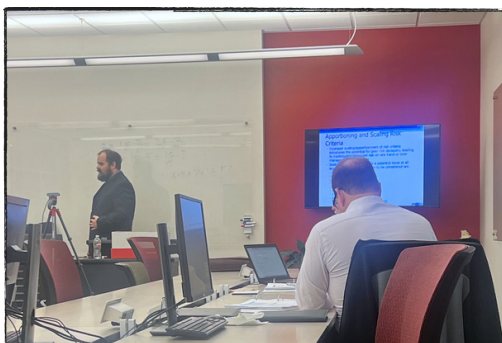
Since its inaugural year of field operations, a large catalog of corrosion-causing flora and fauna in hydrocarbon systems has been identified by EIDS as it collected data and mapped microbes in upstream, midstream, and downstream hydrocarbon systems.

"To date, we have specifically identified over 100 genera of damaging microbes, which exist in the hydrocarbon production to consumption chain, fine-tuned rapid field-testing equipment and are delivering this new capability to industry and government," John Mork, EIDS chief executive officer said. "Earlier in development, to ensure that the broadest range of microbes was detected, we partnered with a select group of companies and universities for the development of the initial field-testing equipment. We continue to be truly pleased to work with LU's Midstream Center in this effort." The second chapter of the relationship between EIDS and CMMS has now begun with EIDS sharing a portion of its enormous database of energy system microbes with Lamar University. This information has been provided to LU in a manner sufficient to protect identities and confidential sources of the data. The Midstream Center has funded Dr. James Henry from the LU College of Engineering in an effort to data-mine this information in the search for facts and implications exposed by this never-before-available scientific database. The partnership fits with the Midstream Center's mission to promote dialogue



and collaboration between industry and Lamar University, and to advance practical scientific discovery. "This collaboration advances scientific inquiry in the midstream and broader energy domain, and so we sought and won this expanded opportunity to work with EIDS," Kalb said. "The Midstream Center appreciates this opportunity to be involved in the launching and evaluation of a new and important technological advancement in the energy field." Dean of the College of Engineering Dr. Brian Craig, whose support was critical to the development of this opportunity, commented that, "The College of Engineering looks forward to Dr. James' evaluation of EIDS's DNA testing data, information that has never before been available to study. It is truly a great opportunity for us."

PSRG Training Collaboration



During the second half of 2023, Process Safety and Reliability Group ("PSRG") and Lamar University's Center for Midstream Management and Science ("CMMS") collaborated to deliver several of PSRG's Process Safety, Risk and Process Plant Reliability training courses at facilities on the Lamar University campus in Beaumont, Texas.

This training collaboration was implemented to better enable industry in Southeast Texas, along with LU faculty and students, to access important and often required training from well-experienced, highly qualified PSRG instructors. This training collaboration is expected to carry on through 2024 to provide important professional training opportunities to industry and LU.

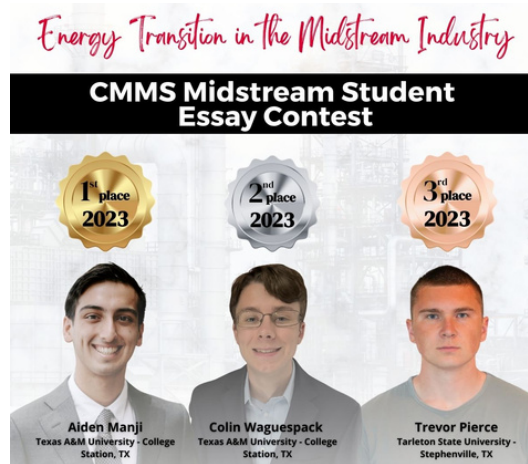
PSRG (www.psrg.com) is a premier, global, Houston-based company providing process safety, risk management, and process plant reliability consulting and training services and solutions since 1997. "Employers depend heavily on highly skilled workers and employees obtaining regular training and professional credentials to operate safely in a globally competitive environment.

PSRG's collaborative relationship with LU will better enable achievement of this necessary workforce training and development while serving industry in Southeast Texas" said Robert J. Weber, P.E., President/CEO and Founder of PSRG. Thomas Kalb, Director of CMMS, said "Our collaboration with PSRG will not only serve Lamar University's interest in providing training and education to our friends and neighbors in industry, but will also enhance faculty and student knowledge through participation in training courses. This real world training will enable faculty to be more thoughtful about identifying and solving real industry issues and make students more job-ready on graduation."

Midstream Essay Contest

2023 Winners Named

CMMS and College of Engineering are pleased to announce the winners of the first annual CMMS Midstream Essay Contest. The essay assignment was **Energy Transition in the Midstream Industry** and it was open to all undergraduate and graduate students at all 35 4-year, public universities in Texas. The essay competition generally sought the perspective of students engaged in degree programs in the colleges of Business, Engineering, and Arts & Sciences, but all students in all disciplines were encouraged to submit an essay. Topics were wide open, including but not limited to, corporate finance and structure, capital markets, engineering, operations, regulation, ESG, and human capital.



The broad listing of degree programs and essay topics was designed to not only expose students of many degree programs and interests to the midstream industry but to also find and highlight unique perspectives from tomorrow's leaders.

The 2023 winners of the CMMS Midstream Essay Contest are:

- First Place - Aiden Manji, BBA Business Administration in Finance (Honors), Texas A&M University at College Station (May 2025)
- Second Place - Colin Waguespack, BSc Chemical Engineering (Honors), Texas A&M at College Station (December 2023)
- Third Place - Trevor Pierce, BSc Mechanical Engineering, Tarleton State University at Stephenville (August 2025)

The winners received a Certificate of Achievement and a cash prize of \$3,000, \$2,000, and \$1,000 for first place, second place, and third place, respectively.

2024 Essay Contest Announced



The 2024 CMMS Midstream Essay Contest has been announced by the Center for Midstream Management and Science at Lamar University, Beaumont, Texas. This essay contest is open to undergraduate and graduate students attending a 4-year, public university in Texas and who expect to be in good standing on March 4, 2024. The deadline for submissions is March 4, 2024, and awards will be made by May 31, 2024.

The top three winners of the 2024 CMMS Midstream Essay Contest will receive:

- 1st Place receives a cash prize of \$3,000
- 2nd Place receives a cash prize of \$2,000
- 3rd Place receives a cash prize of \$1,000

The essay assignment is to present a view on ***Aging Infrastructure in the Midstream Industry***. The essay may address any aspect of aging midstream assets and its impact or relevance to the midstream industry, including, but not

limited to the following topics:

- safety
- public good
- corporate structure
- corporate finance
- corporate behavior
- financial
- capital markets
- assets
- acquisition and divestment
- operations
- maintenance
- data acquisition
- data management
- engineering
- political dynamics
- government policy
- government
- regulation
- societal desires
- history
- ESG
- human capital
- supply chain
- permitting
- intrastate issues
- interstate issues
- domestic issues
- international issues

This list of topics is quite broad and CMMS hopes to expose students of many degree programs to the midstream industry and find and highlight some really interesting perspectives from tomorrow's leaders.

Contact Thomas Kalb, Director, Center for Midstream Management and Science at tkalb@lamar.edu with any questions.

CMMS has Awarded Research Grants Totaling \$430,000

Department of PI	Research Project	Faculty
Chemical & Biomolecular Engineering	Improving Sustainability of the Natural-Gas Midstream Value Chain via Advanced Digital Twin Development	Dr. Q. Xu – PI Dr. S. Wang – Co-PI
Chemistry & Biochemistry	Developing and Formulating Metal Dithiolene Near-IR Tracers for Pipeline Leak Detection	Dr. P. Chandrasekaran - PI
Electrical Engineering	Machine Learning based Defect Detection in Automated Ultrasonic Testing for Weld Inspection	Dr. H. Zargarzadeh - PI
Industrial & Systems Engineering	A Prototype Thermoplastic Composite Pipe Support Pad for Preventing Corrosion	Dr. R. Bradley - PI
Electrical Engineering	Phase II: Incipient Leakage Detection Through Embedded Sensors and AI on Drones Based on 5G	Dr. H. Zargarzadeh - PI
Industrial & Systems Engineering	Digital Transformation of Industrial Asset Performance Management: Development of AI/ML Methods & Addressing Challenges to Deployment	Dr. X. Liu – PI Dr. X. Li – Co-PI Dr. Y. Li – Co-PI
Mechanical Engineering	Multi-Scale Modeling of LNG Pipeline Risk Assessment Under Dual Impact of Flow-Induced Vibrations and Severe Weather Events	Dr. J. Zhou – PI Dr. X. Li – Co-PI
Chemical & Biomolecular Engineering	Data Mining of EnerG-ID Site Data to Identify Potential Correlations and Predictive Patterns	Dr. J. Henry - PI
Business	Do Mergers Acquisitions and Corporate Takeovers Benefit Shareholders in Energy Business and Related Industries	Dr. G. Sargsyan – PI Dr. D. French – Co-PI Dr. T. Wang (Beijing University of Technology) – Co-PI