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CENTER FOR MIDSTREAM
MANAGEMENT & SCIENCE

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LAMAR UNIVERSITY

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 and partner relationships and educating tomorrow's leaders through:

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

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WWW.LAMAR.EDU/MIDSTREAM

Meet Our New Assistant Director



CANDACE TOLBERT

Assistant Director
Center for Midstream Management & Science

Ms. Tolbert has over 5 years of experience working with higher education sponsored programs, which include managing budgets, coordinating with stakeholders, and implementing strategies to achieve program goals. Her 10 years of experience in marketing provides her with a strong understanding of online marketing strategies, social media management, search engine optimization, content creation, and graphic design principles. Her background in these areas will be valuable for developing effective marketing campaigns and creating visually appealing content for the CMMS.

Meet Our New Board Members



TODD PATTERSON

Senior Manager of Enterprise Asset Management
Buckeye Partners, L.P.
Houston, Texas

Dr. Patterson is Senior Manager of Enterprise Asset Management at Buckeye Partners, LP. His current responsibilities include strategic and tactical asset-related data management to provide accurate and reliable monitoring of asset performance particularly with a focus on condition-based maintenance and predictive analytics. Todd has more than 20 years of Geographic Information Systems experience spanning multiple industries and diverse applications, including academic support, landcover mapping, imagery classification, CAD integration, environmental remediation, software development, and pipeline operations. He has been associated with the Pipeline Open Data Standard (PODS) for several years and has served as its President for the last two.

Todd holds degrees from the State University of New York, University of South Carolina, Villanova University, and an M.B.A. from Norwich University. He also serves as an adjunct instructor at Lehigh University, East Stroudsburg University, and Northampton Community College.



RAVI KIRAN DASARI

Process Engineering Manager
Audubon Engineering Companies
Houston, Texas

Mr. Dasari has over 15 years of qualitative experience as a process/facilities engineering manager in upstream, midstream and downstream industries where he has worked on numerous technologies including hydrogen, petrochemicals, refineries, and LNG. He has both greenfield and brownfield work experience in feasibility studies, pre-FEED, Front End Engineering Design (FEED), and Detailed Engineering (DE). He is a registered professional engineer in Texas and Louisiana and holds a project management certification (PMP).

Mr. Dasari holds a Master of Engineering in Chemical Engineering from Lamar University in Beaumont, Texas and a Bachelor of Technology in Chemical Engineering from J.N.T. University, Hyderabad, India where he graduated in the top 5% of his class.



MITCH SMOLIK

Vice President - Engineering
Howard Energy Partners
San Antonio, Texas

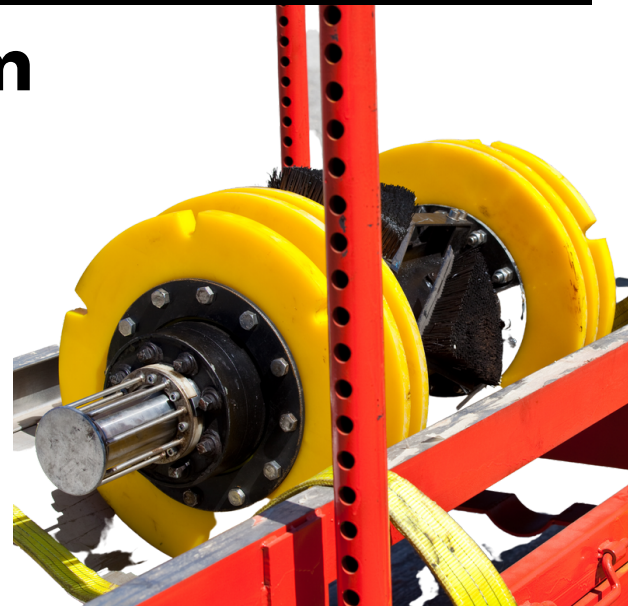
Mr. Smolik is Vice President - Engineering at Howard Energy Partners (HEP) where he previously served as Director of Operations. Prior to joining HEP, Mr. Smolik worked over 18 years in various engineering and operations roles at MPLX, MarkWest, OneSubsea, and the Southwest Research Institute.

Mr. Smolik is a 2005 graduate of Texas A&M University - Kingsville where he earned a BSc, Mechanical Engineering.

CMMS - Summit Midstream Joint Development

CMMS is sponsoring a design project with Summit Midstream Partners and Dr. Denizhan Yavas, Assistant Professor in the Mechanical Engineering Department at LU, that is focused on mitigating methane venting from "pig" catchers in remote locations. Traditionally, high pressure natural gas was vented to atmosphere to enable removal of the pig from the catcher. Due to changing regulations, companies must now mitigate methane venting in operations, including pigging, which has led to expensive and time consuming processes required for pig catchers in remote locations. The challenge of this project is to develop a simple, inexpensive method to remove




pigs from pig catchers while avoiding venting. Discussions among CMMS, Summit, and Dr. Yavas resulted in a couple of prospective designs that substantially reduce methane emissions in pigging operations. Dr. Yavas' team is developing a preliminary engineering design that, if deemed acceptable by Summit, will lead to commercial development of a design that will solve a common problem plaguing the midstream industry.



CMMS 2023 Student Essay Contest

CMMS launched its inaugural, annual midstream essay contest open to people who are currently students at a 4-year, public university in Texas. The deadline for submissions is July 31, 2023 and awards will be made on or about September 29, 2023. The invitation was sent to 134 deans, generally engineering, arts and sciences, and business schools but some others too, at all 35 qualifying Texas universities.

The top three winners of the 2023 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

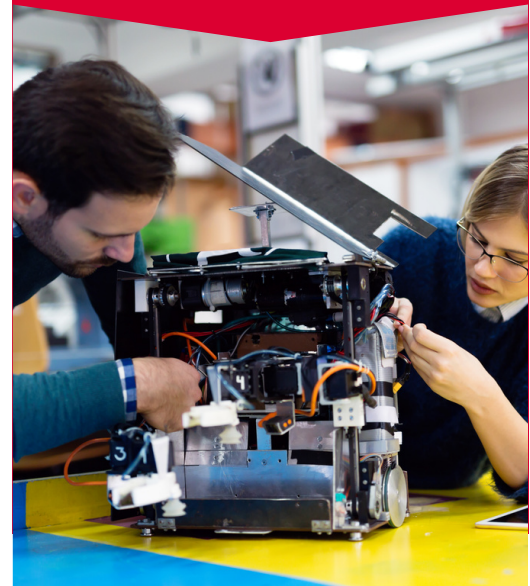
The essay assignment is to present a view on *Energy Transition in the Midstream Industry*. The essay may address any aspect of energy transition and its impact or relevance to the midstream industry, including, but not limited to the following topics:

- corporate structure
- corporate finance
- corporate behavior
- financial
- capital markets
- assets
- acquisition and divestment
- operations
- maintenance
- data acquisition and/or management
- engineering
- political dynamics
- government policy
- government regulation
- societal desires and/or needs
- history
- ESG (Environmental, Social, Governance)
- human capital
- supply chain
- permitting
- intrastate issues
- interstate issues
- domestic or international issues

These topics are quite broad and the hope is to not only expose students of many degree programs to the midstream industry, but to also find and highlight some really interesting perspectives from tomorrow's leaders.

Modules Program Update

In partnership with faculty, the CMMS has been developing midstream focused, one week course modules that are inserted into undergraduate and graduate courses to highlight relevance of coursework in the midstream industry. As of the end of the Spring Semester 2023, over 27 course modules have been developed and inserted into courses by LU faculty members and have taught over 900 students about the relevance of their course of study in the midstream industry.

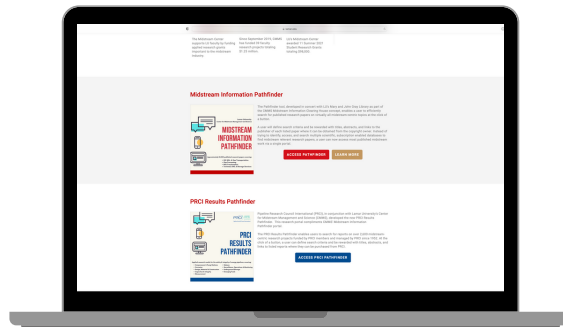


Buckeye \$100,000 Grant to Fund CMMS Sponsored Research

Buckeye Partners, L.P. ("Buckeye") has funded \$100,000 for the continuation and expansion of a research project led by Lamar University professors Dr. Mariam Hamidi and Dr. Jing Zhang, with Dr. Sushill Duranga and Dr. Xinyu Liu, that is focused on deep learning-based defect classification and prediction. This research project was initially funded by CMMS under its annual RFP research program. In partnership with Buckeye, this new funding will drive data collection, analysis, and understanding of pump vibration with the ultimate objective of developing predictive algorithms helpful in maintenance and operations of large, industrial pumping systems in the midstream industry.

Buckeye is a premier infrastructure and logistics provider based in Houston, Texas. It is one of the largest independent liquid petroleum products pipeline operators in the United States with operations in 27 states, Puerto Rico, St. Lucia, and the Bahamas.

CMMS Midstream Information Pathfinder now accesses over 26,000 Academic Papers



The Midstream Information Pathfinder search engine, which enables a user to efficiently search for published academic research papers on virtually all midstream-centric topics at the click of a button and can be found on the CMMS website. A user will define search criteria and be rewarded with titles, abstracts, and links to the publisher of each listed paper where it can be obtained from the

copyright holder. Instead of trying to identify, access, and search multiple scientific, subscription enabled databases to find midstream relevant research papers, a user can now access most published midstream work via a single portal. Continual updating of this search engine has increased the number of identified midstream-centric academic research papers to over 26,000.

CMMS 2023/24 RFP Issued

CMMS issued its RFP to LU faculty for midstream-centric proposals for fiscal year 2023/24. Maximum CMMS grants will be \$50,000 for the fiscal year. The purpose of this grant program is to provide start-up or "seed" funding for new and innovative research with the expectation being that the Principal Investigator will eventually obtain external support for continuation project. The proposed research work must focus on the midstream industrial sector, including but not limited to oil, natural gas, NGL, LNG pipelines, storage and terminals, NGL fractionation facilities, and natural gas processing plants.

Topics of interest include:

- Greenhouse Gas Management
- Advanced Analytics/Big Data/AI Applications/Machine Learning/Predictive Maintenance
- Corrosion Detection/Prevention
- Midstream Optimization
- Midstream Infrastructure Resilience
- Midstream System Cyber Security
- Impact of Regulatory Rules and Permitting

Awards will be made mid-August for the 2023/24 fiscal year.





PSRG - CMMS Training Collaboration Underway

Process Safety and Reliability Group ("PSRG") and CMMS have executed an agreement under which Lamar University will host PSRG's Process Safety, Risk and Process Plant Reliability training courses at facilities on the Lamar University campus in Beaumont, Texas. This training collaboration will 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. PSRG (www.psrg.com) is a premier, global, Houston-based company providing process safety, risk management, and

process plant reliability consulting and training services 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 Lamar University 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."

Contact Thomas Kalb, Director - CMMS at tkalb@lamar.edu for information on upcoming training classes.

CMMS Sponsored NGL Fractionation Optimization Project Ready for Field Application

A research/development digital twin project, led by Dr. Daniel Chen in the Chemical Engineering Department, designed to establish the economic optimization and sensitivity to product price fluctuations of an entire NGL fractionation train has been accomplished using price data available from the Energy Information Administration ("EIA"). It was determined that the de-methanizer is the most profitable column and the de-ethanizer is the least profitable - in general, it is more beneficial to take the 'ethane rejection' route in operating an NGL fractionation train. Using EIA price data from 2017 through 2021, it was found that for a NGL train with a 37,550 pounds per hour feed rate, real market NGL product price fluctuations caused profits to vary from \$700 per hour to \$4,000 per hour and optimization based on product price fluctuations could enhance profits by 11%. The optimization results need to be implemented with column controllers.

To date, dynamic simulations of an NGL fractionation train for tuning the de-methanizer to the de-isobutanizer have been performed with Aspen Hysys under which various controllers are digitally installed for column pressure, reboiler/condenser level, and tray temperature control. This dynamic model can be used to implement set point changes in an NGL fractionation train in response to current market pricing of NGL products. The research team is seeking an industry partner to enable verification of the model with real world process flow and instrument diagrams, equipment sizing, and plant data from an actual NGL fractionation train.

Interested industrial parties should contact Thomas Kalb, Director - CMMS at Lamar University at tkalb@lamar.edu or (203) 803-7677.

CMMS - Business School Study of Vertical/Horizontal Merger Results

CMMS is sponsoring a research project by Dr. Gevorg Sargsyan and Dean Dan French from LU's business school to review evidence regarding the supposed increased profitability and corporate efficiency stemming from horizontal and vertical mergers among corporations with an emphasis on energy companies. Due to recent supply chain issues facing manufacturers, there is a rash of companies acquiring companies in totally unrelated industries with the objective of securing raw materials; e.g., Volvo buying a lithium mine. These kinds of mergers beg the question of whether manufacturing/marketing companies like Volvo will truly benefit from mergers outside management's area of competence. Dr. Sargsyan and Dr. French will update this discussion based on data over the last 40 years.





CMMS Board Meeting At Summit Midstream Headquarters

The second annual CMMS Industry Advisory Board meeting was held in Houston at Summit Midstream Partners board room. Attendance by board members was high with a couple members signing in via MSTeams, and Dr. Brian Craig, Dean of the College of Engineering participated. Thomas Kalb, Director of CMMS, acted as chairman of the meeting delivering to members updates on CMMS activities, achievements, and future plans. Substantial time was spent discussing industry issues such as MegaRule 2 and CCUS/S45 impact on the midstream sector, and where the Midstream Center should focus its efforts. This gathering introduced new board members recruited

since the prior board meeting, including Todd Patterson (Senior Manager, Asset Management - Buckeye), John Tikkanen (Retired Senior Executive - Shawcor), Tim Edward (President - OneBridge Solutions), and Quinn Holub (Director Oil & Gas Development - HUVR data). As a direct result of this meeting, two new board members were recruited, including Mitch Smolik (VP, Engineering - Howard Energy Partners) and Ravi Dasari (Process Engineering Manager - Audubon Engineering Companies). Additionally, the CMMS - Summit Midstream Joint Development Project grew directly out of a meeting discussion.



LOOKING FOR NEW MEMBERS

CMMS is seeking to expand its board from its current 13 members to 20 members, with a focus on executive management at pipeline companies. Interested parties should contact Thomas Kalb, Director - CMMS, at tkalb@lamar.edu or (203) 803-7677.

