Texas A&M Engineering Experiment Station

Mary Kay O'Connor Process Safety Center

MAKING SAFETY SECOND NATURE

About the Center

The Mary Kay O'Connor Process Safety Center (MKOPSC) was established in 1995 in memory of Mary Kay O'Connor, who was killed in a fatal and tragic industrial accident in 1989. The incident ultimately increased awareness of the importance of process safety. The center's mission is to improve process safety performance in industry through research, education and outreach activities. The center collaborates with academic institutions, government agencies and industry partners to conduct research, develop best practices and provide training in process safety.

The center conducts research projects to address various aspects of process safety, such as risk assessment, hazard identification, incident investigation, safety management systems and human factors. The findings from these research projects contribute to the development of guidelines and tools that help organizations enhance their process safety practices.

In addition to research, the center offers educational programs and courses to students, professionals and industry personnel. These programs cover topics related to process safety engineering, risk management and regulatory compliance. The center also hosts conferences, symposiums and workshops to facilitate knowledge sharing and networking among process safety professionals.

The Mary Kay O'Connor Process Safety Center plays a vital role in advancing process safety engineering and promoting a culture of safety in industries that handle hazardous materials and processes. Its efforts contribute to preventing accidents, protecting workers and the public, and minimizing the impact of incidents on the environment and communities.

Director's Note

The Mary Kay O'Connor Center serves as a residence for both students and researchers, currently accommodating 20 doctoral and master's students. Over the years, the center has welcomed more than 3,000 undergraduate and 200 graduate students who have embraced our vision of fostering process safety as a fundamental personal value. In May 2021, a collaboration agreement was established between Texas A&M Engineering Experiment Station (TEES), the U.S. Department of the Interior's Bureau of Safety and Environmental Enforcement and the Department of Energy to create the Ocean Energy Safety Institute (OESI) consortium. Along with OESI initiatives, our quarterly steering committee collaborates with our industry partners, such as Samsung, Chevron, Exxon, Aramco and many more. Overall, these initiatives ingrain the concept of "making safety second nature."

Research and Service

Areas of Expertise

Center researchers have in-depth knowledge and experience in these areas:

- Process Safety
- Energy Safety
- Cyber Systems

The center can provide expertise to assist in reducing the undesired effects to an acceptable level by suggesting changes in the process design, operating specification and maintenance procedures.

Services include, but are not limited to:

- Independent incident investigation and analysis
- Advice and consulting
- Risk assessment/management

The center has provided counsel to federal, state and local governmental agencies, as well as corporate boards and process industries.

Lab Experiment Capabilities

Areas of expertise in experimental safety

Aerosols, Mists and Dust Explosions

Flammability, Fire and Explosion

Reactive Chemicals

Corrosion and Materials Safety

Large-Scale LNG Experiments

The center houses six laboratories with state-of-the-art equipment, which enables center researchers to conduct research and set up tailored experiments and develop safer processes, equipment, techniques, tools, procedures and management strategies to minimize losses.

State-of-the-art lab equipment includes:

- Reaction Calorimetry & In-situ FTIR Analysis (RC1e)
- Automatic Pressure Tracking Adiabatic Calorimeter (APTAC)
- 36-L vessel for dust explosion testing

Contact the center for more information.

Academic Degrees

The center offers a Master of Science in Safety Engineering and a doctoral degree in chemical engineering with a specialization in safety engineering. Students pursuing doctoral degrees and Master of Science in Safety Engineering degrees under the guidance of the Mary Kay O'Connor Process Safety Center come from various fields of study, including chemical engineering, mechanical engineering, petroleum engineering and materials science and engineering.

Master of Science in Safety Engineering

The M.S. in Safety Engineering is administered by the Artie McFerrin Department of Chemical Engineering at Texas A&M University. The objective of this program is to teach the principles and practices of safety engineering for leadership careers in industry, academia, and government. The prerequisite for the M.S. in Safety Engineering program is a bachelor's degree in engineering.

Students interested in obtaining a master's degree in Safety Engineering should:

- First apply through the Texas A&M Graduate Application System in their desired engineering field.
- Once accepted, they may contact the director of the Mary Kay O'Connor Process Safety Center to discuss their field of study and advisor selection options.
- Students may apply to obtain the master's degree in Safety Engineering via the Distance Learning option available through the application system.

Doctoral Degree

The Mary Kay O'Connor Process Safety Center supports many students conducting research related to process safety. The research spans a wide field, including several engineering fields, organizational psychology and human factors. Engineering fields are typically chemical, mechanical, industrial and materials science. Multidisciplinary Engineering offers an opportunity to develop a customized curriculum.

Students interested in pursuing a Ph.D. focusing on Process Safety and/or Risk Management should:

- First apply through the Texas A&M Graduate Application System in their desired engineering field.
- Students from all engineering disciplines can work on process safety and related research areas.
- Once accepted, they may contact the director of the Mary Kay O'Connor Process Safety Center to discuss their field of study and funding opportunities offered by the center.

All center graduate students are encouraged to participate in internship opportunities with industry.

Continuing Education and Certificates

Continuing Education

The center offers continuing education courses online and in Houston year-round. Continuing education classes are taught by experienced engineers with years of industrial, chemical, research and process safety knowledge. The center strives to deliver the courses and topics that are important and vital to the ever-changing environment and industrial audiences.

These courses can be taken for continuing education credit and can be applied toward the Safety Practice Certificate.

Process Safety Practice Certificate for Industry

The Process Safety Practice Certificate is a program that allows engineers in industry to gain greater knowledge in process safety.

The certificate requires 125 Professional Development Hours (PDHs) for completion within a three-year timeframe.

Cost of Certificate

The approximate cost to complete the certificate is **$5,400-$6,470**.

Semester-long Safety Engineering (SENG) courses: **$1,800** *(42 PDHs)*

On-Site Training

(On-site for industry professionals, over 50 courses available)

The Mary Kay O'Connor Process Safety Center can provide structured training programs aimed at specific objectives. On-site courses are available for any course in our Comprehensive Course Catalog and have proven to be very successful. The instructor travels to the facility, thus eliminating travel time and costs for the facility employees. In addition, the short course can be tailored for 8-25 people.

For more information, visit our website or email **mkopsc@tamu.edu**

MKOPSC - Qatar

On July 1, 2013, Qatar Petroleum and Texas A&M University at Qatar officially launched the MKOPSC extension in Qatar. The extension works to replicate all academic programs and activities of the center at Texas A&M's main campus in College Station, Texas. The center is honored to be under the patronage of Dr. Mohammed Bin Saleh Al-Sada, Minister of Energy and Industry, chairman and managing director of Qatar Petroleum, who played a central role in establishing the center in Doha.

Process Safety Practice Certificate Course Requirements

Certificate can be obtained online by completing three Safety Engineering courses

Required Courses	PDHs
Distance learning/online ONLY	
SENG 655: Process Safety Engineering	42
SENG 660: Advanced Risk Engineering	42
Electives	
Distance learning/online ONLY	
SENG 680: Fundamentals of Safety	42
SENG 674: System Safety Engineering	42
SENG 670: Safety Management Systems	42
SENG 677: Consequence and Impact Analysis	42
International Symposium — *located in College Station*	15
Engineering Ethics — *onsite at symposium only*	1
Elective Short Courses	
Distance learning/online ONLY	
Management of Change	7
Process Safety Management — Fundamentals	14
Layers of Protection Analysis	14
Process Hazard Analysis Leadership Training	14
Safety Instrumented Systems Implementation	21
Safety Integrity Level Verification	14
Pressure Relief Systems — Best Practices	14
Reactive Chemical Hazards Assessment	7
Engineering Decision Making	7
Gas Explosion Hazards on Offshore Facilities	14
Gas Explosion Hazards for LNG Facilities	14
Dust Explosion Hazards	14

Annual Symposia

The center hosts three symposia each year in College Station, Texas. These symposia bring together members of industry, government and academia in one place to share the latest research, developments and technology. The symposia program includes keynote lectures, technical paper sessions, workshops, expert panels, poster presentations, networking events and an exhibition of industry companies.

The Process Safety International Symposium

In Association with (IChemE)

This symposium is held every October and serves as the crossroads for process safety, where experts from around the world gather as part of this two-and-a-half-day event to share the latest information on the safety topics aimed at making the process industry a safer place.

Visit **mkosymposium.tamu.edu** for more information.

The Instrumentation and Automation Symposium

Representatives and stakeholders from around the Gulf Coast oil and gas industries gather to share the latest innovations and developments for the process industries. Topics include but are not limited to Cybersecurity, Process Automation, Instrument Reliability, Safety Instrumented Systems, Technology, Fire and Gas.

Ocean Energy Safety Institute

The Ocean Energy Safety Institute (OESI) is a consortium of industry, national labs, nongovernmental organizations and academia created to develop the technology and workforce needed for increased energy production that is safer, more sustainable and more cost-effective.

OESI'S Objectives

- Increase the United States' energy security, enabling jobs and increasing economic activity through responsible and sustainable ocean energy production.
- Develop knowledge, technologies and training that increase the U.S. ability to produce ocean energy resources safely and sustainably.
- Engage the best technologists, managers, facilities, and standard and policy developers who have the greatest chance to achieve our goals in the most efficient, collaborative environment possible.

Consortium Membership

The Mary Kay O'Connor Process Safety Center (MKOPSC) membership is open to operating firms, engineering firms, small businesses and individual members.

The funds raised from membership dues are dedicated to supporting the center's graduate students and research facilities.

As part of the membership, companies also have access to a pool of high-quality graduate students trained in process safety and risk management for internship and employment opportunities.

Membership Levels and Benefits

PARTNER

Operating Firms (25+ employees)

- $20,000 annual membership dues
- Membership on the Steering Committee of the center
- Nominate technical specialists to the Technical Advisory Committee
- Voting rights regarding the direction of center programs through representation on the MKOPSC Steering Committee
- Facilitated access to a pool of skilled graduate students and faculty experts in areas related to process safety and risk management technology
- One complimentary symposium registration for steering committee member
- 40% discount for symposium registrations, exhibit booths and continuing education courses for all member company employees
- MKOPSC library access

SPONSOR

Engineering Firms (25+ employees)

- $10,000 annual membership dues
- Membership on the Steering Committee of the center
- Appoint technical specialists to the Technical Advisory Committee
- Voting rights regarding the direction of center programs through representation on the MKOPSC Steering Committee
- Facilitated access to a pool of skilled graduate students and faculty experts in areas related to process safety and risk management technology
- 20% discount for symposium registrations, exhibit booths and continuing education courses for all member company employees
- MKOPSC library access

ASSOCIATE

Entities (Less than 25 employees)

- $5,000 annual membership dues
- Serve on the Steering Committee as non-voting member
- Eligible to serve on the Technical Advisory Committee
- 10% discount for symposium registrations, exhibit booths and continuing education courses for all member company employees
- MKOPSC library access

INDIVIDUAL

- $1,000 annual membership dues
- Serve on the Steering Committee as non-voting member
- Eligible to serve on the Technical Advisory Committee
- MKOPSC library access

For information on how to become a consortium member,
contact **mkopsc@tamu.edu**

Current Member Companies

CONTACT INFORMATION

Mary Kay O'Connor Process Safety Center

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College Station, TX 77843

mkopsc@tamu.edu

psc.tamu.edu | mkosymposium.tamu.edu | tx.ag/instrumentationsymposium

TEES

Mary Kay O'Connor
Process Safety Center

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