

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



Academia Panel Discussion on Process Safety

October 23, 2019

Louisa A. Nara, CCPSC, CCEP
CCPS Global Technical Director
louna@aiiche.org



Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



Panel members include:

- **Ms. June Wispelwey**, Executive Director & CEO, AIChE, USA
- **Dr. Kristen Kulinowski**, Interim Executive Authority, Chemical Safety Board (CSB), USA
- **Mr. Tetsuo Fuchino**, Associate Professor, Tokyo Institute of Technology, Japan
- **Assoc. Prof. Lim Kok Hwa**, Deputy Cluster Director, Singapore Institute of Technology (SIT), Singapore
- **Assoc. Prof. Sin Siang Meng Ivan**, Dept. of Chemical & Biomolecular Engineering, National University of Singapore (NUS)
- **Madam Sulo Belawan**; Head, HSSE PETRONAS Gas & New Energy, Malaysia
- **Dr. Liu Yi**, Professor, College of Chemical Engineering, China University of Petroleum, China

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



Ms. June Wispelwey
Executive Director and CEO
American Institute of Chemical
Engineers (AIChE)



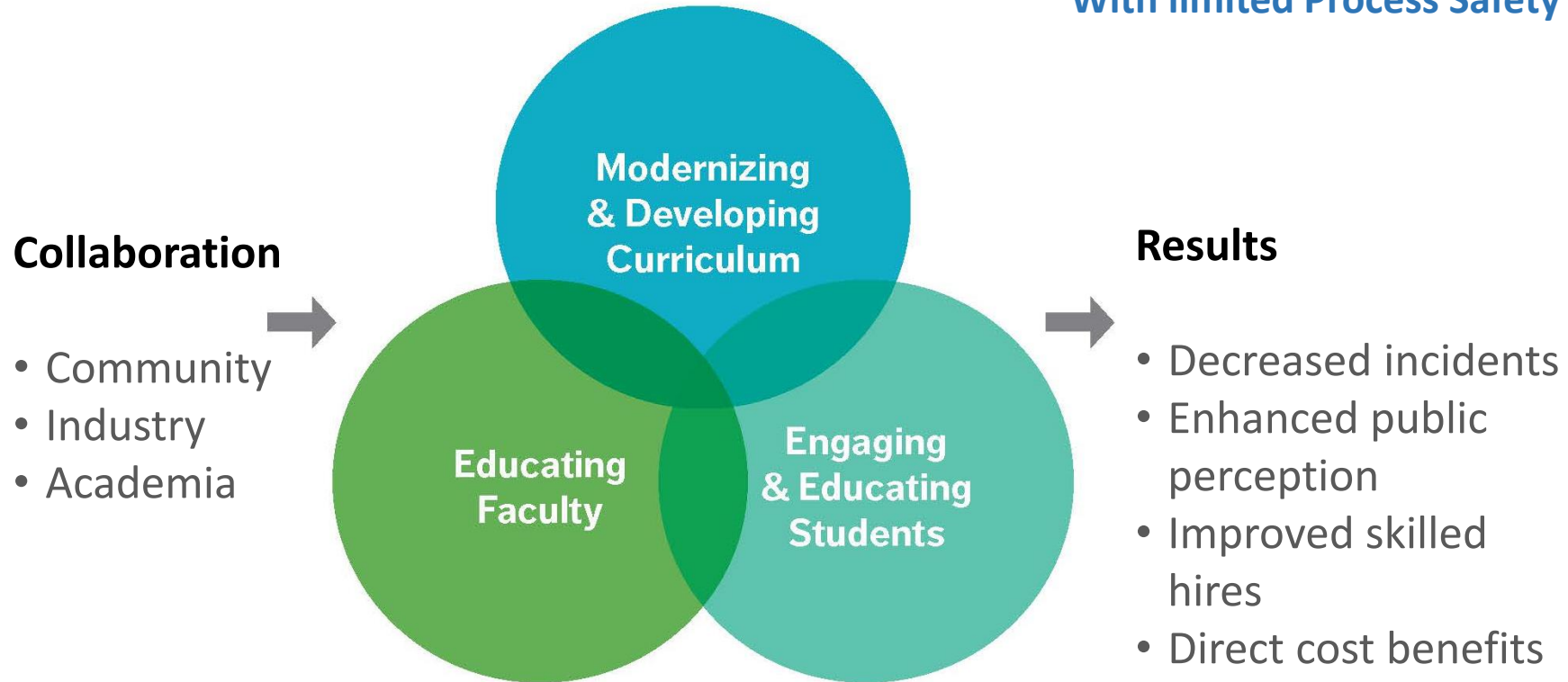
USA

PANELIST

Undergraduate Process Safety Learning Initiative Program Overview

3 major elements:

72% of Chemical Engineering Students enter the workforce With limited Process Safety Education



Industry & University Collaboration

Accelerating the Program



Available Curriculum

e-Learning Modules



*Translated into either Spanish, or Mandarin

www.aiche.org/sache

The Impact

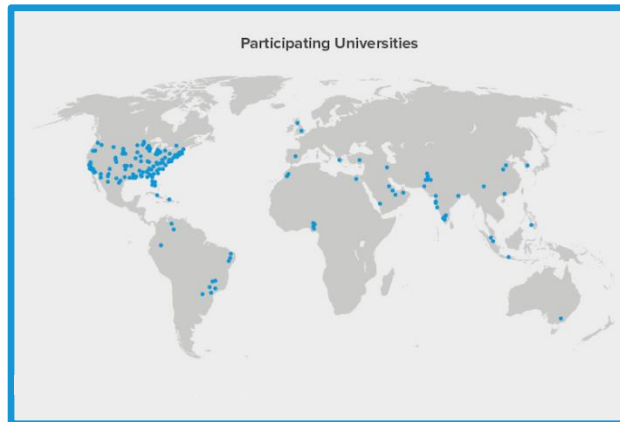
374

UNIVERSITIES PARTICIPATING
in undergraduate process safety
learning initiative curriculum



+25%

**INCREASE IN SAFETY CERTIFICATES
COMPLETED BY STUDENTS**
(since campaign launch)



295

NEW FACULTY MEMBERS
educated on process safety
(since campaign launch)



Broad Support

The AIChE Foundation has raised \$7.2MM towards UPSLI, one of the transformative priorities of AIChE's Doing a World of Good campaign.

FOUNDERS' CIRCLE

Benefactors
\$750,000 and up



Underwriters
\$500,000 - \$749,999



Patrons
\$250,000 - \$499,999

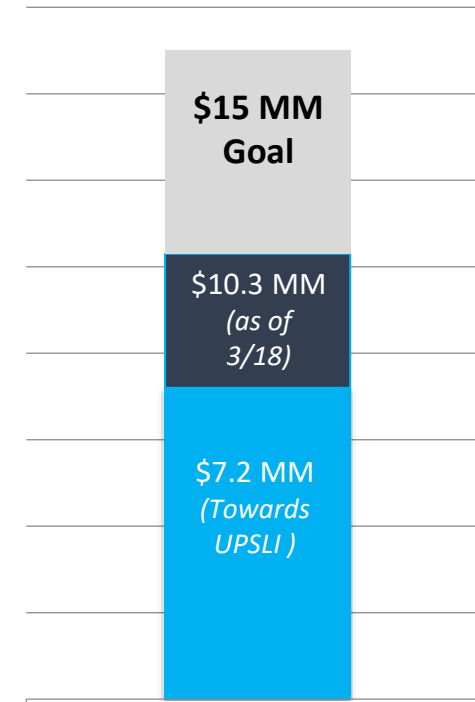


MAJOR CONTRIBUTORS:

Partners - \$100,000-\$249,000

Albemarle
Archer Daniels Midland Co.
Cabot
Covestro LLC
Evonik
ExxonMobil Corporation

FMC
Mitsui & Co. (U.S.A.), Inc.
Olin
PolyOne
Wacker Chemical Corporation



Doing a World of Good
Campaign -- Funds Raised

For a complete list of donors, visit www.DoingaWorldofGood.org

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



Kristen Kulinowski, PhD

Interim Executive Authority
and Board Member

US Chemical Safety Board (CSB)

USA



PANELIST

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



東京工業大学
Tokyo Institute of Technology

Prof. Tetsuo Fuchino
Associate Professor
Tokyo Institute of Technology
JAPAN



PANELIST

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



Associate Professor

Lim Kok Hwa

Deputy Cluster Director

Singapore Institute of Technology (SIT)

SINGAPORE



PANELIST

Accreditation requirement

- Washington Accord
- Students need to demonstrate HSE in their Learning Outcomes
- Process Safety as individual module
- Scaffold PS knowledge across curriculum such as Hazard ID for Lab, design project requirement
- IWSP in company SHE department for students who want to specialize in the area

Challenges

- Lack of Extensive industry knowledge

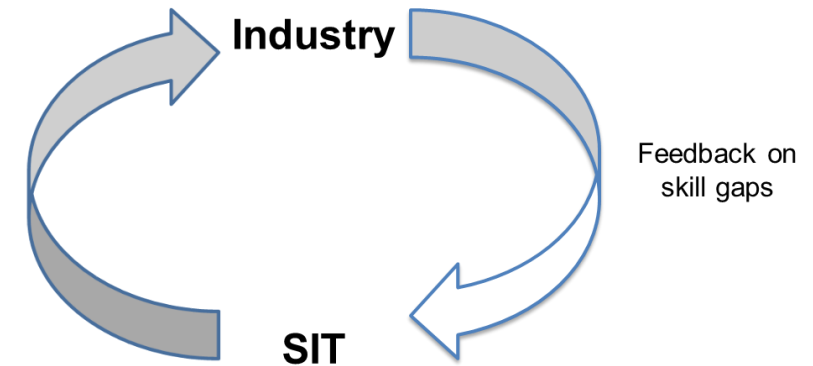
SIT

- Students work or intern in chemical or pharmaceutical company before
- Opportunity for Industry Induction program before IWSP



Bridging Gaps

- To bridge current industry gaps via CET and talent pipeline through UG programmes
- Meet industry needs through applied learning pedagogy



Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



Assoc. Professor

Sin Siang Meng Ivan

Department of Chemical and
Biomolecular Engineering

National University of Singapore (NUS)

SINGAPORE



PANELIST



Bachelor of Engineering Chemical Engineering

Focus: Chemical Engineering Foundation



Core Module

CN3135

Process Safety,
Health & Environment

Hazard Identification &
Risk Assessment

Consequence
Analysis

Specialization in
Process Safety



Focus:

Academic-Industry Balanced

Master of Science
Safety, Health &
Environmental Technology

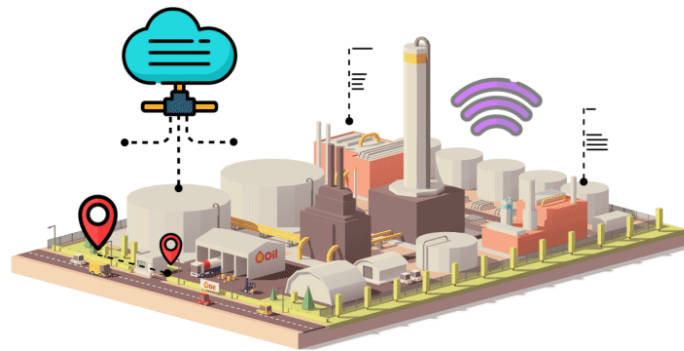
Process Safety Education

Impact of I4.0:
Future Workplace
in 2028

(Boston Consulting Group, 2017)



IoT Is
Ready for
the Process
Industry



Graduate Certificate
Process Safety



5TH CCPS
GLOBAL
SUMMIT
ON PROCESS SAFETY



OCTOBER 22-23, 2019 • SINGAPORE

Resorts World Sentosa

An AIChE Technology Alliance
CCPS
Center for Chemical Process Safety

AIChE
The Global Home of Chemical Engineers

SCIC
SINGAPORE CHEMICAL
INDUSTRY COUNCIL

NUS
National University
of Singapore

Department of Chemical & Biomolecular Engineering
Faculty of Engineering

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



PETRONAS

Madam Sulo Belawan
Head, HSSE PETRONAS Gas
& New Energy

MALAYSIA



PANELIST

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



Dr. Liu Yi
Deputy Dean
College of Chemical Engineering
China University of Petroleum
CCPS China Section
Qingdao, CHINA



PANELIST

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



1. The GDP is 90.03 trillion yuan in 2018, China. The petrochemical industry contributes 12.1% of total GDP in 2018.
2. In 2018, 176 incidents occurred, and 223 people died in petrochemical industry in China. The numbers of incidents and fatalities decrease 19.6% and 16.2% compared with the numbers and fatalities in 2017, respectively.
3. According to statistics of State Administration of Work Safety in 2016, the petrochemical industry needs 30, 000 chemical safety graduates each year. However, only 3000 qualified graduates meet the requirements.
4. In China, about 500 universities or colleges have the undergraduate program of chemical engineering and process, but only 16% of them teach process safety courses as required or elective courses.

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



5. In 2017, China University of Petroleum applied for the first undergraduate program of Chemical Safety Engineering to Ministry of Education, which was approved in 2018. Sixty students were enrolled from 2018 on.
6. From 2006 to now, China University of Petroleum collaborates with CCPS closely. CCPS China Section (CCPS-CS) was established in 2007. CCPS-CS has hold 11 trainings and 6 Conferences and translated 4 CCPS guideline books. The 7th CCPS China Conference on Process Safety will be held at the end of this month from October 31 to November in Suzhou. The conference is organized by CCPS, China Chemical Safety Association, and China University of Petroleum.

Organized By

Center for Chemical Process Safety
(CCPS)



Singapore Chemical Industry
Council



QUESTIONS AND ANSWERS

1. FROM THE MODERATOR
2. FROM THE AUDIENCE

