ioVIEW

Winter 2020

1-844-ioMosaic sales@iomosaic.com www.ioMosaic.com

Presented by Neil Prophet,
Senior Partner, ioMosaic

Reynosa Gas Explosion Consequence Modeling Case Study

- Reynosa incident summary
- Motivation to perform consequence modeling
- Reynosa incident recreated using PSO SuperChems™

ioVision 2020

Hindsight to Foresight

14th Annual Global Software Users Group Meeting

ioMosaic®

How We Connect the Dots

As a certified ISO 9001:2015 Quality Management Systems (QMS) company, ioMosaic offers integrated process safety and risk management solutions to help you manage episodic risk, improve efficiency, and maintain compliance. Our multiple areas of expertise connect all the dots to protect the things that matter most: people, planet and shareholder value.

Other companies specialize in only one or two areas of process safety and risk management. ioMosaic connects all the process safety dots.

About Our Team

Our team is renowned worldwide for their expertise and experience. Their credentials include doctoral degrees, expert testimony experience, international experience, software development leadership and risk management proficiency for companies both in the U.S. and abroad. Call us today at 1.844.ioMosaic with your questions. We would love to hear from you.

A Big Thank You to Our Speakers

Our sincere appreciation for the outstanding presentations you've made to the 2020 Users Group Meeting. This event was informative and successful because of your efforts.

Download the Presentations

To view all the presentations from this year's users group meeting, follow this link:

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Meet Our Keynote Speaker

Rick Engler

Mr. Engler has spent more than four decades helping to prevent hazards, including to ensure that workers and the public had a "right to know" about chemical dangers.

The Future of the U.S. Chemical Safety and Hazard Investigation Board: Opportunities and Challenges

Presented by Rick Engler, Board Member, U.S. Chemical Safety Board

As a Member of the United States Chemical Safety Board (CSB), I talk with the families of loved ones who have lost their lives in horrific chemical disasters. Families want to know what caused their loss. And they often want to discuss how to prevent future tragedies.

These conversations prompt reflection on the major national changes needed to achieve CSB's vision of "a nation safe from chemical disasters".

Thus, my purpose today, is to address some central challenges for chemical safety — and how CSB is addressing them.

The concept of an independent federal agency to investigate the causes of major chemical incidents was prompted...

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Use of AEGL Dosage in Safety and Risk Studies

Presented by Georges A. Melhem, Ph.D., President and CEO, ioMosaic

Because Acute Exposure Level Guidelines (AEGL) limits are provided for specific durations, they can be used to establish nonlinear dose response criteria to be used with transient dispersion models to develop safe exclusion zones for emergency response planning. With increasing airborne concentrations above each AEGL, there is a progressive increase in the likelihood of occurrence and the severity of effects described for each corresponding AEGL. This is shown in Figure 1. We assign a probability of 1% of being exposed to a "dangerous dose" to the dose-response implied by AEGL-1, 50% to AEGL-2 and 99% to AEGL-3. Once these probabilities are assigned, a probit model can be developed based on the published AEGL data. The developed probit model can be used with a transient dispersion model such as the Gaussian puff model to determine safe separation distance at AEGL-1 by specifying a probability of receiving a dangerous dose...

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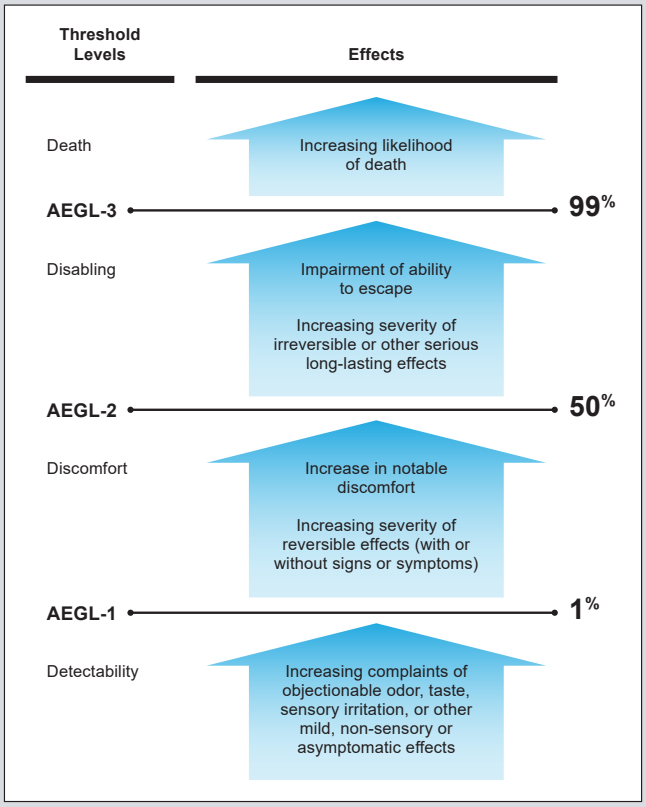
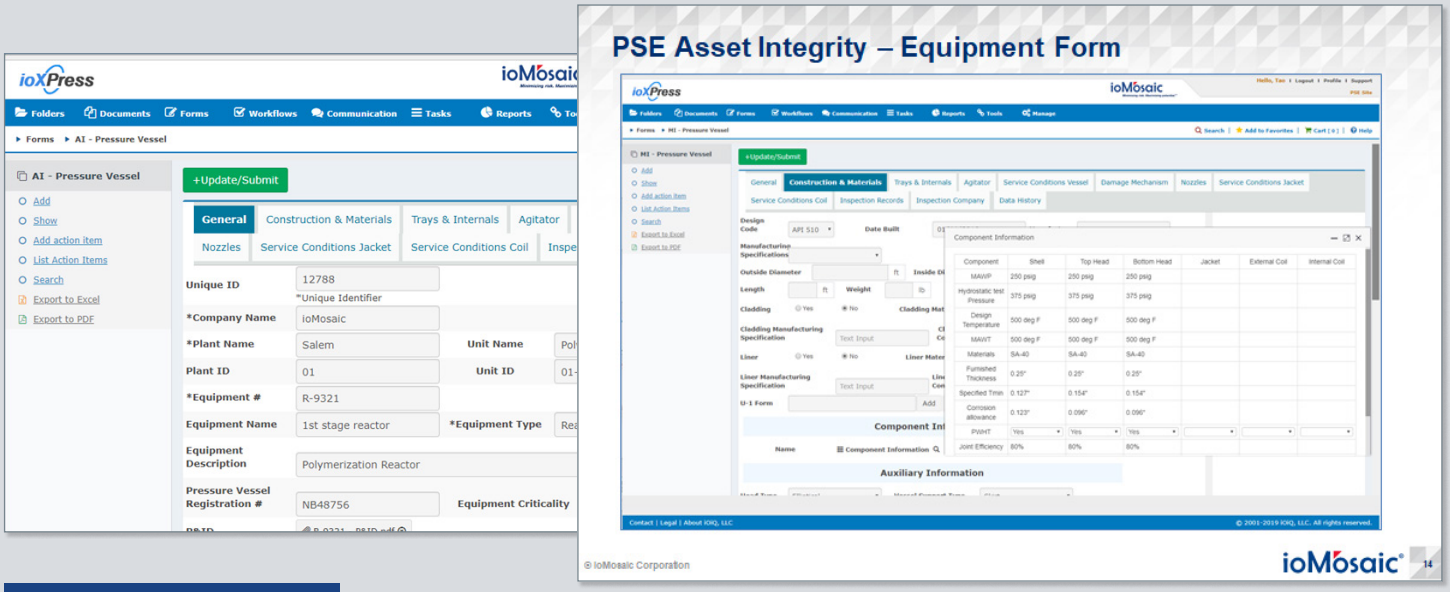


Source: ioMosaic Corporation.

Process Safety Enterprise® – Newest Features and Upgrades

Presented by Tao Yao, Senior Partner, ioMosaic

An overview of enhancements, including screenshots, to Process Safety Enterprise® (PSE), an enterprise system that administers workflows, manages data and documents, enables knowledge sharing, and enhances communication and collaboration — all on one platform. Moreover, PSE can manage with ease any legacy data, regardless of form and tool.



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Source: ioMosaic Corporation.

Process Safety Office® – Newest SuperChems™ Upgrades

Presented by Daniel Nguyen, P.E. and PMP, Senior Partner and CTO, ioMosaic

PRV object accommodates opening characteristics and backpressure options for different phase / services in SuperChems™ v9.0.

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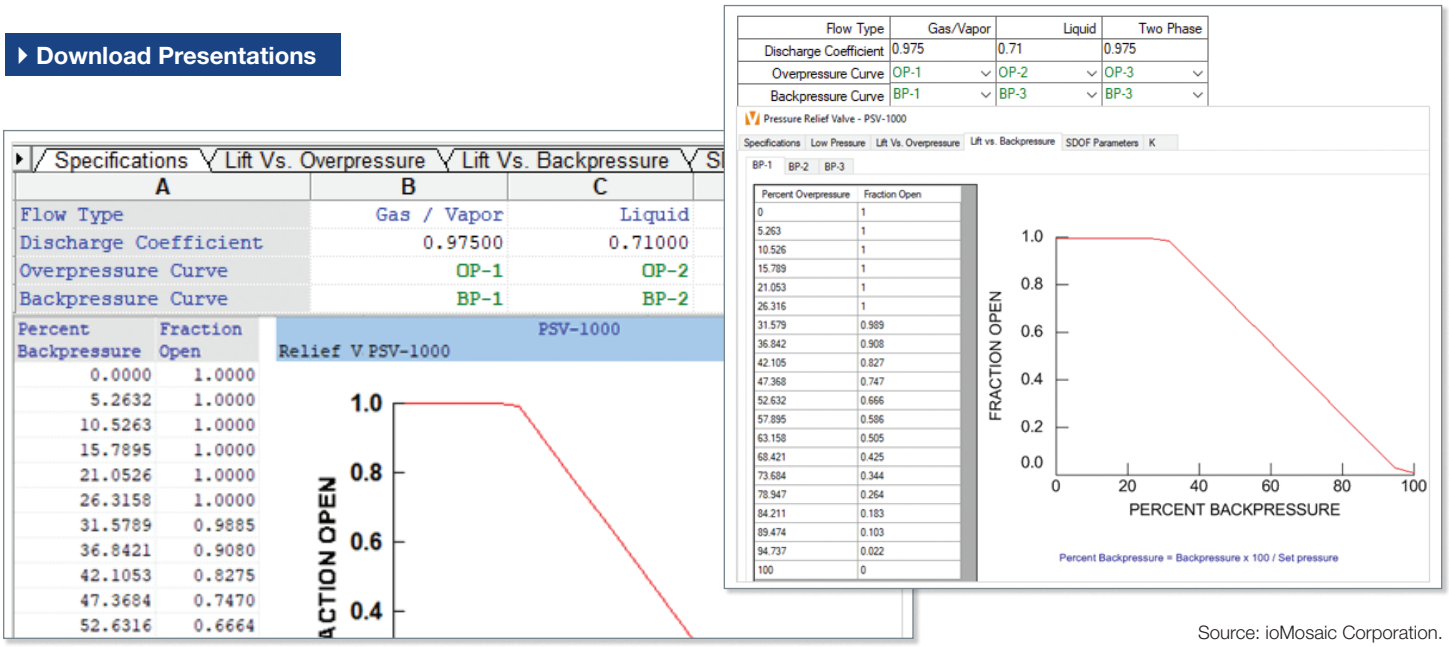

Source: ioMosaic Corporation.

Simplify Calculations With ioVent

Presented by Viren Patel, ITIL, CSSC, Chief Information Officer, ioMosaic

ioVent is your go-to-tool for quick flow estimates and simplified relief sizing calculations for everyday scenarios. ioVent integrates with SuperChems™ allowing you to carry data over to SuperChems™ to perform even more complex calculations, if needed.

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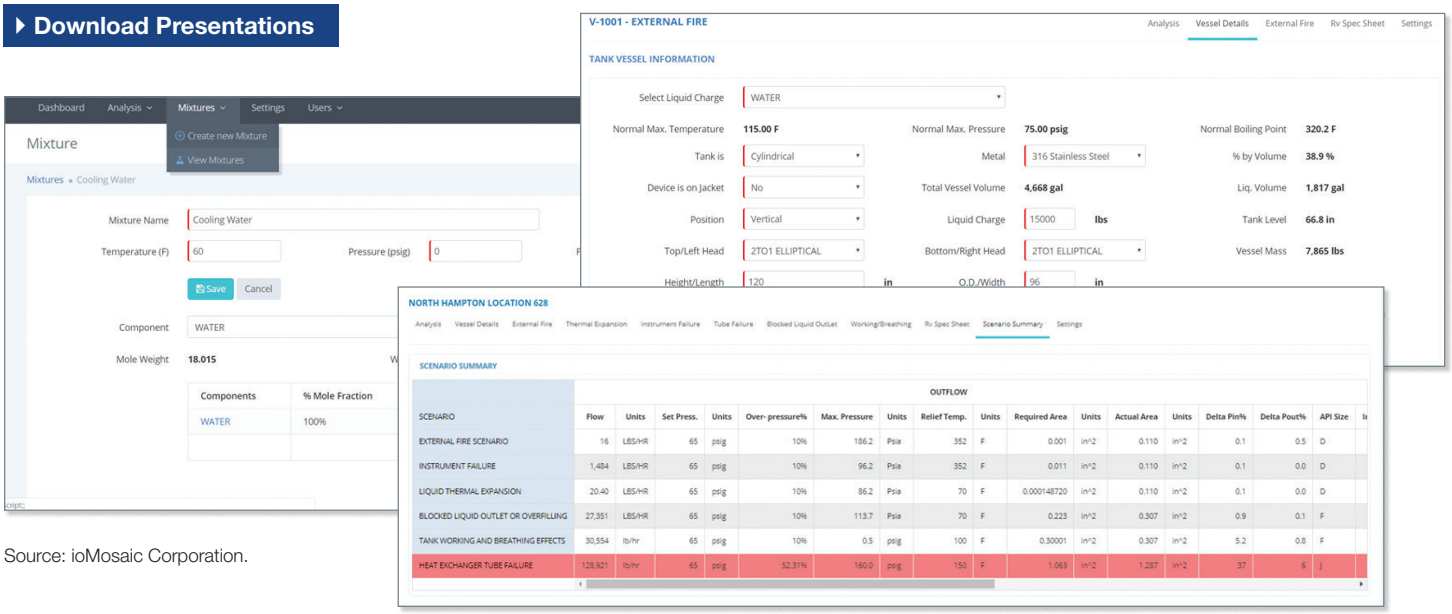

Source: ioMosaic Corporation.

Reynosa Gas Explosion Consequence Modeling Case Study

Presented by Neil Prophet, Senior Partner, ioMosaic

This presentation examined the Reynosa incident, provided the rationale for performing consequence modeling, and recreated the incident using Process Safety Office® SuperChems™.

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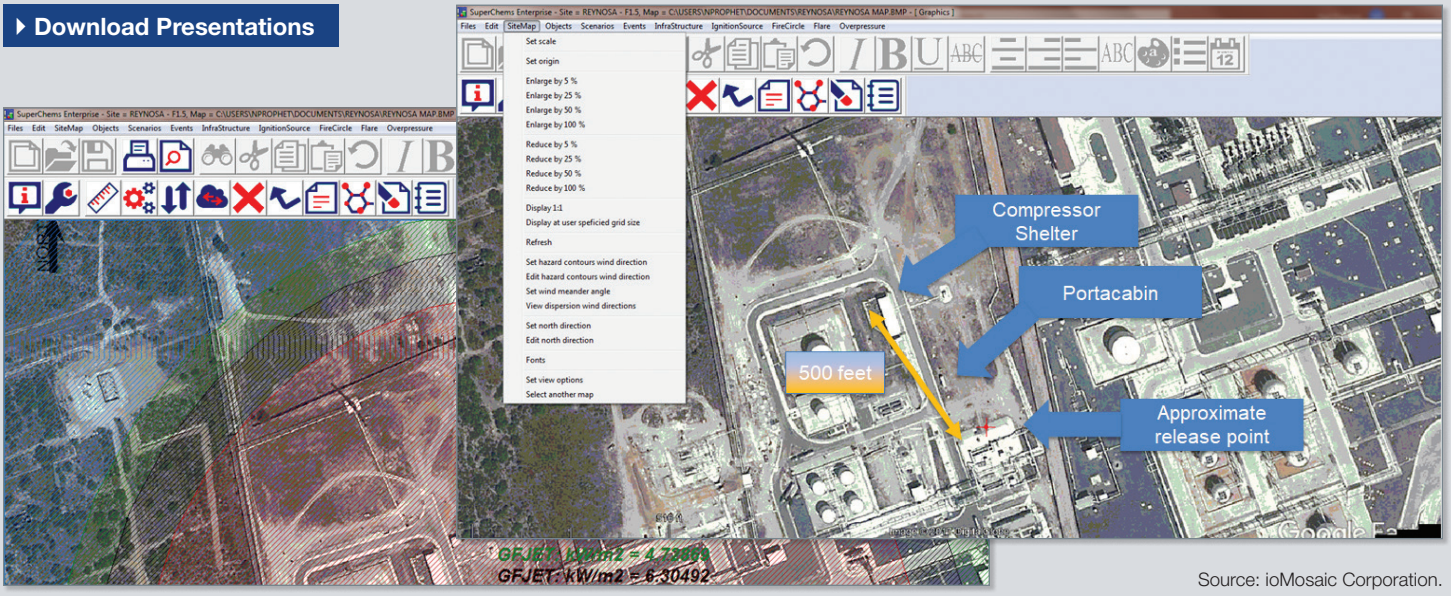

Source: ioMosaic Corporation.

Improve Compliance and ITPM Tracking Using Process Safety Enterprise® Asset Integrity Module

Presented by Neil Prophet, Senior Partner, ioMosaic

ioMosaic's Asset Integrity module can help companies improve their compliance with asset integrity regulations and improve tracking of the required equipment ITPM. The module has excellent built-in workflow and will send emails reminding personnel of next steps.

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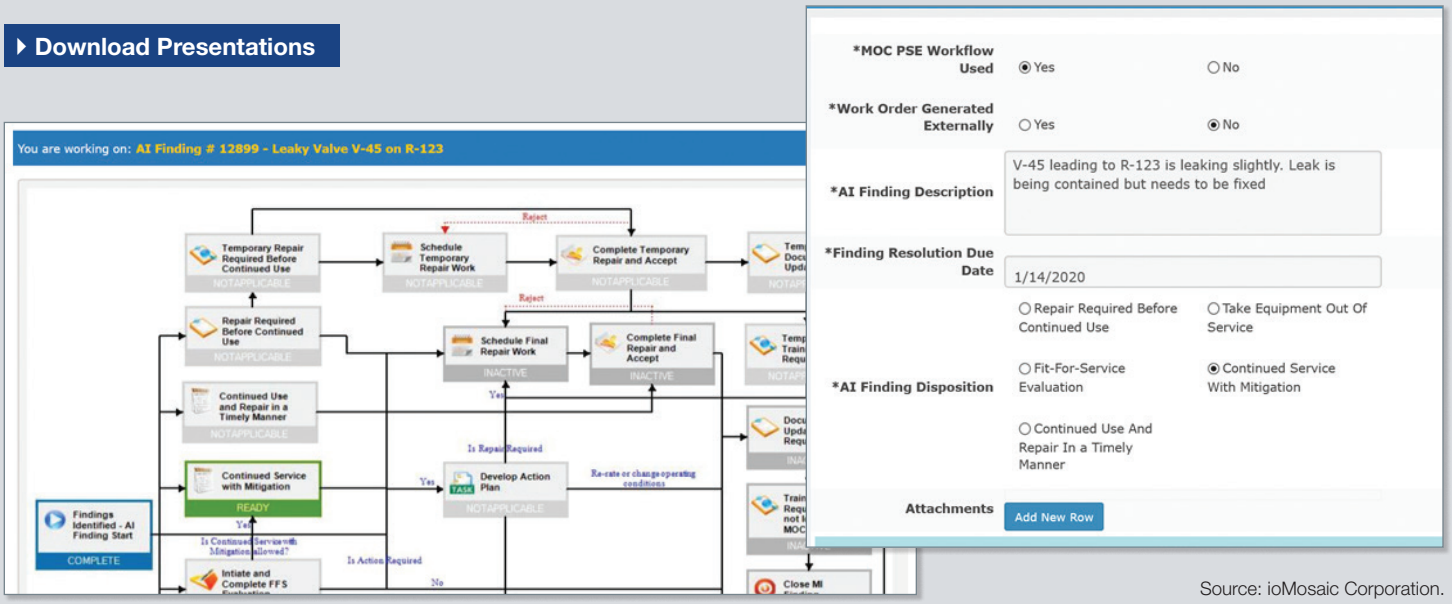

Source: ioMosaic Corporation.

Is Your PSM Program Effectively Implemented? – A Case Study

Presented by Gemma Dunjó, Ph.D., Manager of EHS Services, ioMosaic

Audit findings and related data from a sample of Chemical Process Industry (CPI) facilities (ioMosaic's client) are compiled and analyzed in this case study.

Common audit findings are identified and compared with the results of those analyzed by OSHA (Refinery NEP and Chem NEP).

Determining how process safety culture improvements minimize or avoid these audit findings can effectively inform ways to improve and optimize process safety management systems.

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Major Incident	Fatalities (F)/Injuries (I)
sion in oxidation of hexane process	F: 28 workers I: 36 on-site, 53 off-site
release of TCDD 7,8-achlorodibenzo-p-dioxin)	F: 0 I: 477 people reported skin injurie (burns & chloracne)
ic release of methyl cyanate (MIC)	F: 3,787+ workers and near-by Residents
platform explosion and	F: 167 workers
olyethylene plant xplosion and fire	F: 23 workers I: 130 to 300
as plant explosion and	F: 2 workers I: 8

Source: ioMosaic Corporation.

Enhancing Process Safety to 20/20 With PSL and PStv®

Presented by Viren Patel, ITIL, CSSC, Chief Information Officer, ioMosaic

Competency Based Learning are learning events with the goal of mastering specific pre-determined individual knowledge, skills, attitudes, and / or other characteristics required to meet a specific standard / proficiency. The following table compares Competency Based Learning with traditional training approaches:

Competency Based Learning	Traditional Training Approaches
Achieves outcomes and demonstrates mastery	Earns credit via attendance
Achieves competency via a variety of informal and formal learning activities	Attends classes
Focus is on specific outcomes	Focus is on the subject matter
Learner-centric	Instructor-centric and lecture-centric
Self-paced	Time-bound

Source: ioMosaic Corporation.

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Rupture Disk Design for Runaway Reactions in Tempered Systems: Concepts and Analysis Using SuperChems™

Presented by Matteo Maestri, Ph.D., Associate Professor, Politecnico di Milano

Dr. Maestri was recently named to the Industrial & Engineering Chemistry Research 2019 Class of Influential Researchers for his work in chemical engineering.

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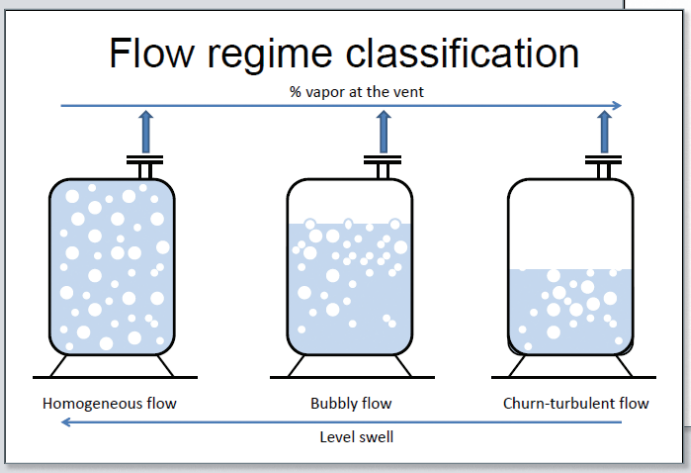
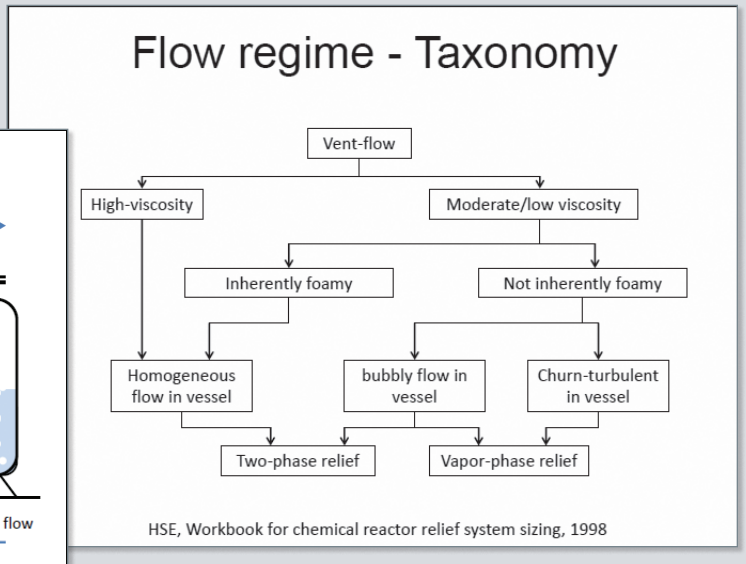


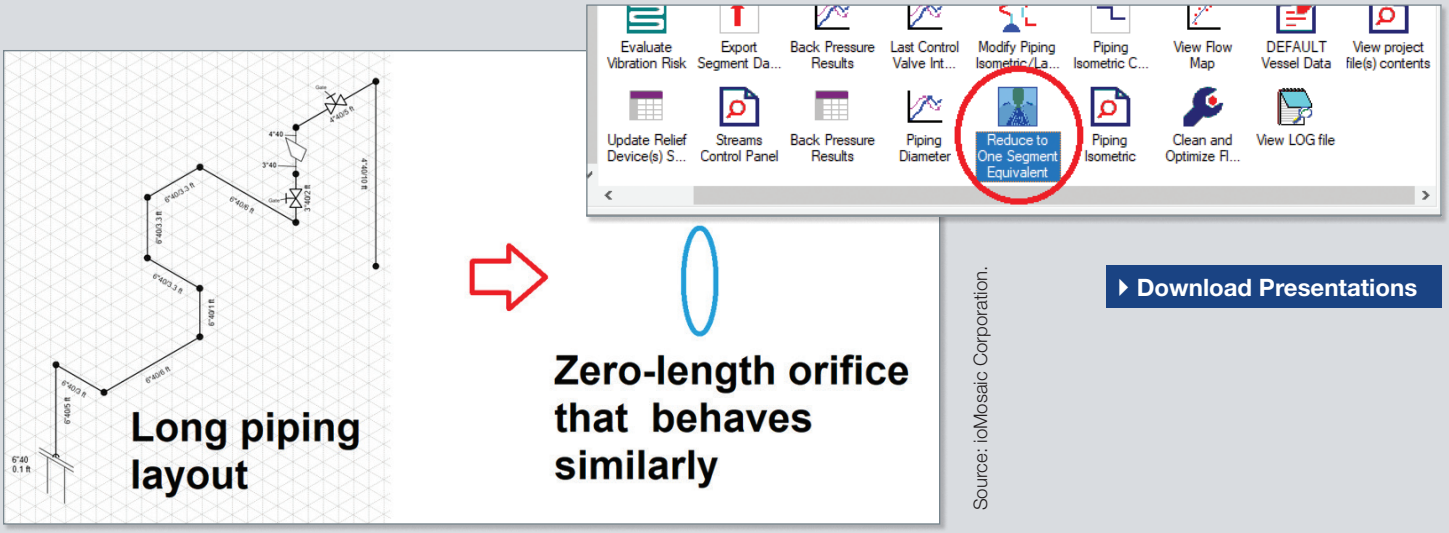


Source: Politecnico di Milano

Process Safety Office® SuperChems™ Tips

Presented by Senior Consultants Tzu Lin, P.E., Anna Shinkawa, Micah Wessels, and Ying Zhang, P.E., ioMosaic

- Net Flow = Pipes Containing models
- Automatically calculates an equivalent discharge coefficient for a zero-length orifice to approximate flow through a longer piping layout
- Speeds up flowsheet calculations involving multiple dynamic models connected to each other



Source: ioMosaic Corporation.

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Hidden Gems Within Process Safety Office®

Presented by Daniel Nguyen, P.E. and PMP, Senior Partner and CTO, ioMosaic

A few key parameters to consider when specifying the indoor dispersion model:

- Obtain proper air change per hours for each application (while ASHRAE 62.1 provides general guidelines, each industry might have their specific requirements)
- Should consider air infiltration
- Must include nitrogen / oxygen (to represent air) as part of the mixture

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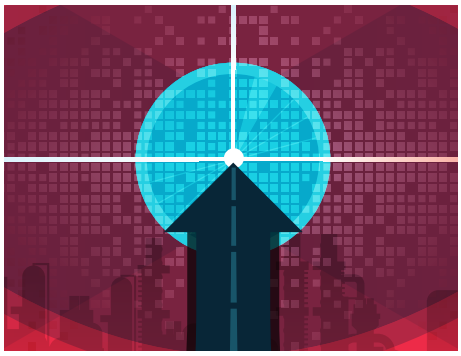
Inputs | Connectivity | Run Parameters | Notes | Data Sets

	A	B
1	Initial temperature. F	77
2	Initial pressure. psig	0
3		
4	Surroundings/back pressure. psig	0
5		
6	Starting time for analysis. min	0
7	Final time for analysis. min	600
8		
9	Maximum allowable simulation pressure. psig	1.00E+38
10	Maximum allowable simulation temperature. F	1.00E+38
11		
12	Number of air changes per hour	4
13	Mixing efficiency. (0.1 to 1)	0.76
14		
15	☑ **Consider air infiltration**	
16		
17	☐ **Allow air ingestion if pressure falls below ambient pressure**	
18	Air ingestion flow area. in2	1000
19		
20	☐ **Use default scenario mixture**	
21	☐ **Use mass fractions**	
22		
23	COMPOUND	USER FRACTION
24	AMMONIA	0.0000
25	WATER	0.0000

Source: ioMosaic Corporation.




Daniel
Kelvin


Daniel
Matteo

Watch the Latest PStv® White Paper Video

Process Safety tv® video white paper, A Guide to the Legal Framework of the PSM Standard for Engineers, provides guidance on how to comply with the three elements most frequently cited by OSHA — process safety information, process hazards analysis, and mechanical integrity — and the consequences of failure.

We Can Help You Understand the Latest Compliance Requirements

A California oil refinery capable of refining 240 thousand barrels of crude oil per day needed to evaluate a vapor break-through scenario from a high-pressure vessel to a low-pressure vessel using dynamics. Read the case study, Pressure Relief System Revalidation and Mitigation of an Oil Refinery, to learn how ioMosaic helped the refinery meet the challenge of OSHA PSM compliance using SuperChems™.

Save the Date for the

15th Annual Global Software Users Group Meeting

Join us January 25 - 26, 2021 in Houston, TX for the next conference. Knowledge gained has real-life application and the potential for remarkable results.

Upcoming Training

PHA Leader Training
March 26, 2020
Houston, TX

Gain a thorough understanding of the essentials of leading PHAs using industry methodologies such as HAZOP, FMEA, What If, Checklist and more, through online and in-person instruction.

See Agenda

Process Safety Management Training
April 5-7, 2020
Bahrain

A hands-on, interactive course on how to effectively develop and implement a process safety management system to prevent catastrophic accidents from covered processes.

See Agenda

Compliance Auditing Training
April 8-9, 2020
Bahrain

Learn the implementation requirements needed to comply with OSHA Process Safety Management (PSM) standards so that process hazards are identified, understood, and controlled.

See Agenda

SuperChems™ Hands-On Training
May 12-14, 2020
Houston, TX

Master techniques for addressing relief sizing for various scenarios, relief piping system design, flare header modeling and consequence modeling.

See Agenda