MONTHLY NEWSLETTER OF THE VIRTUAL LOCAL SECTION OF AICHE
DEC 2020 - VOLUME 10, ISSUE 12

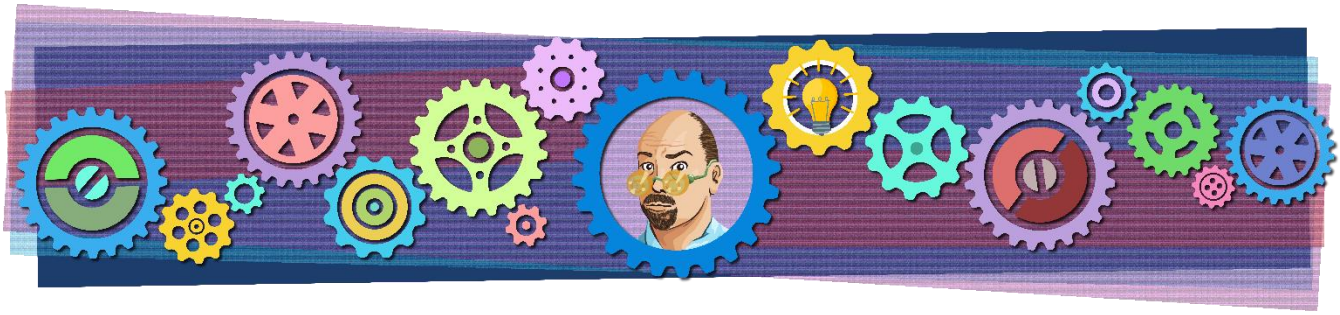
This month's meeting:
Primary (with live discussion/live chat) Wednesday, Dec 16 at 9 pm ET (US) / 1 am GMT
Alternate 1 (with live discussion/live chat) Thursday, Dec 17 at 6 am ET (US) / 10 am GMT
Alternate 2 (with live discussion/live chat) Thursday, Dec 17 at 1 pm ET (US) / 5 pm GMT

Power of the Dork Side -- A Night of Comedy

Presented by Dr. Pete Ludovice
Engineering Professor by day and standup comedian by night

Dr. Pete Ludovice is the world's only engineering professor by day and stand-up comedian by night. In addition to the application of computer simulation to synthetic and biological macromolecules and plant alkaloids, he carries our research on the application of humor to enhance technical education, communication and innovation. His humorous and educational outreach occurs in many forms including: stand-up comedy, improvisation workshops, seminars, technical consulting, a weekly radio show, and his nationally touring one-man show Feel the Power of the Dork Side.

http://www.drpetecomedy.com/



Note that registration for VLS meetings is required.
Our meetings are still free to attend and open to all.

December Meeting Registration Information

Primary	**Alternate 1**	**Alternate 2**
(Live Presentation/Live Chat)	(Recorded Presentation/Live Chat)	(Recorded Presentation/Live Chat)
Dec 16 at 9 PM EST / 1 AM GMT	Dec 17 at 6 AM EST / 10 AM GMT	Dec 17 at 1 PM EST / 5 PM GMT
Register in advance for the Primary Meeting	Register in advance for the Alternate 1 Meeting	Register in advance for the Alternate 2 Meeting

After registering, you will receive a confirmation email containing instructions for joining the meeting, along with add-to-calendar links.

Introducing Our September Meeting Raffle Winner!

Every month, a dues-paying member who signed in for the duration of the monthly webinar is selected at random to win a free year of VLS membership (Executive Committee members and previous winners during the current year are ineligible). We are pleased to introduce our September winner – Kotti Rama Raghava Kumar.

Q: : what school did you go to?
A: I am a Graduate (B.Tech) in Chemical Engineering from Andhra University, Visakhapatnam, India

Q: What kind of jobs have you held?
A: I worked as Head of Plant Operations at IG Petrochemicals ltd (IGPL) for 2 years. Main product of IGPL is Phthalic Anhydride(PA) along with two other byproducts. There are a total of 7 plants are there with all associated offsites and utilities.
Before that, I worked with Nagarjuna Fertilizers and Chemicals LTD (NFCL) for 28 years. Before leaving NFCL, I was General Manager (Projects) and heading projects at NFCL complex. I led project activities end-to-end from conceptualization to execution including technical specifications, stage inspections, progress monitoring, site management, Contracting, Proposal Management, Constructability Review, Budgeting & Cost Control manpower planning, Change Management, Quality Auditing and Safety Management.
I worked as Urea and Ammonia Section head Production when the plant installed and commissioned S-300 Ammonia Converter in parallel to existing Ammonia converter.
In case of further details are required, please refer to my attached CV.

Q: Where do you live?
A: Town: Kakinada, State: Andhra Pradesh, Country: India

Q: Why did you join the Virtual Local Section?
A: It is an good platform for meeting people (especially during this pandemic stage), discuss the technical issues, find solutions, discuss latest developments, networking with people, sharing experiences, contributing to others by providing solutions wherever possible, learning new things and self updating with time.

We Were Virtual Before It Was Cool

by Dan Lambert

Thanks to all of you for being members of the virtual local section. Thank you for investing your time and your $10 in supporting the VLS. Let me give you some of my thoughts about the VLS and to take time to thank our leadership team, which has been so effective in 2020. In a year when virtual has been one of the most useful tools everywhere, we are fortunate that little has changed for us in supporting you.

The VLS is finishing its tenth year of fulfilling our mission to leave no chemical engineer behind. We set out to help those chemical engineers who didn't have a local section and find new ways to support them. We started out as an experiment and continue to experiment as we try to better serve. This has led us to grow from a handful of people with a vision to the strong organization that we call the VLS. So, we truly were using virtual long before it was cool.

The VLS had a dozen meetings each year over the last decade. We've had great speakers since anyone, anywhere can come and speak to us without traveling or leaving home. Some of our speakers have included AIChE presidents, brilliant professors, visionary leaders, industry giants, process safety leaders and so much more. We've had great support from AIChE staff and leaders. The VLS now includes 742 dues paying members and 5,472 members of our LinkedIn group. We are the second largest AIChE local section, with only South Texas (Houston area) Section being larger.

The VLS has been blessed with great leadership. The current leadership team works extremely well to try to support not just VLS members but chemical engineers everywhere. I wanted to thank this year's leadership team for their great ideas and efficient execution. We improved our communication by switching to Gmass for our email communication and improved the quality of our meetings and webinars by switching from WebEx to Zoom, both visionary ideas led by past chair Kirsten Rosselot. Our senior vice chair Paul Adamson is trying to establish a bootcamp for Python to teach chemical engineers the skills they need to make the best use of Python in solving real world problems. We've tried some new ways to improve the interactivity of our meetings using the communication skills of vice chair Aaron Sarafinas. We have had great programming led by Directors Scott Clarke and Rich Evans. We've had a great newsletter edited by Director Mario Arce. We have learned what you wanted and needed through the use of Polls developed by Director Paul Wissman. Director Paul Shuey has been keeping the website up to date. Director Louis Mielke kept up with our members and taught us more about our members. Our treasurer Jennifer Brand has greatly improved our ability to quickly pay our bills by working with AIChE and by developing and documenting how we manage VLS finances. And our secretary Laura Gimpelson, who has served continuously since VLS inception in 2009, keeps us on track, documents our executive committee meetings and so much more to ensure we support you.

Next year should be an even better year for the VLS, led by 2021 chair Paul Adamson. We have a new vice chair, Steve Treese and two new directors, Kirsten Rosselot and Fred Fischl. This is going to be a great team to continue to improve the VLS, test out new ideas for making the meetings more interactive and continue to serve our members and guests.

Death of Neil Yeoman

Neil Yeoman who was a VLS founder and a longtime AIChE supporter, passed away during November 2020. Neil had a B.Ch.E. from Polytechnic Institute of NYU and an M.S. from Columbia University. He was a Fellow of AIChE; a registered professional engineer in Kansas, Louisiana, New York, and Texas; and a listed inventor on 28 US patents among others Flexeramic® (ceramic) structured packing, HcKp™ high capacity random packing, Fleximax® high performance random packing, the MaxFrac® high capacity tray, the BiFrac® high capacity tray, Flexipac® HC™ super high capacity structured packing, and KG's unique then state-of-the-art vapor distribution technology. We join his family in their loss and leave a short remembrance to this great Chemical Engineer. Learn more.

We're in this Together

The ongoing COVID-19 situation has provided us with a reminder that even in uncertain times, AIChE is a diverse community of people who lead, create, inspire and learn—together. AIChE is here to help. Knowing that many of our members are working virtually, AIChE has created this page to act as a hub for online content, access to communities, and communication updates. Learn more.

First COVID-19 Saliva Test in US Launched by NJ-Based Accurate Diagnostic Labs and Rutgers University

South Plainfield-based laboratory, Accurate Diagnostic Labs, partnered with Rutgers University Cell & DNA Repository (RUCDR) Infinite Biologics and Robert Wood Johnson (RWJ) Barnabas Health, to design, deploy and analyze the new COVID-19 saliva test, the first of its kind in the country. Review here.

New Career Search Section

Looking to help our community, we will share regularly a set of tips and some resources from OnCareerSuccess that will help our community.

Launch your Career Search

by Dr. Lucia Feng, President & CEO
OnCareerSuccess Inc.

Introduction

For most working professionals the value of your career over your lifetime is worth millions. Unless you are born into wealth, most of us make our living by applying our skills working in a job. As the principal source of income for the majority of working professionals, the salary – and possibly some extras such as stock options and bonuses – we earn from our jobs primarily provides for the family and savings for retirement, enabling the life we want to have for ourselves and our family.

This is why investing in yourself is a crucial pillar to YOUR career management because your career success – and your ability to provide for yourself and your family - depends on your ability to get a job, acquire "hard" and "soft" skills in a continuous lifelong learning mode to stay relevant to maintain a job, and be more effective in your job as you assume more responsibilities when your career grows and earns more. Simply put, you - not your employer(s) - are responsible to invest in yourself to learn new skills and knowledge in order to stay employed, develop career resilience, and prosper in your career successes that result in career satisfaction and financial security.

Empower Yourself and Take Charge of Your Career Management and Job Search Essential Knowledge

OnCareerSuccess Inc. leverages cloud-based technology platform to bring domain experts nationwide in job search, career management, LinkedIn, and leadership and professional development to provide proven, high-quality and highly affordable learning by on-demand streaming of recorded webinars to enable college students/new graduates/Early Career and Mid-Career individuals to start, maintain and grow a career for career success and financial security. The cloud platform offers convenient on-demand access by individuals anywhere in the United States or internationally.

The "Job Search Essential" webinars are developed to teach fundamental knowledge that are insightful and actionable. It's designed to teach a professional comprehensive job search knowledge so they can conduct an effective job search that produces results – analogous to the proverbial teaching someone "how to fish" instead of giving someone a fish.

OnCareerSuccess proudly partnered with the Northern California section of AIChE in conducting three live webinars followed by live Q&A questions submitted by the attendees during fall of 2020. The webinars were attended by college students interested in seeking internships, college and postgraduate students graduating as Class of 2021, and mid-career individuals with work experience spanning 6-35 years. Ms. Pat Cross, a highly sought after Career Coach and Career Management Consultant, conducted the three live webinars. Archived recordings for the three webinars are now available to the Virtual Local Section (VLS) members for unlimited on-demand access.

The three AIChE webinar titles and links to access these archived recordings on-demand are listed on the Events | OnCareerSuccess page as well as below. Simply click on the "View Archived Recording On-Demand" for each of the AIChE webinar on the Events page, enter the case-sensitive password listed below, and register with your name and email address to view the archived webinar recording. Here is the first one:

1. "**Launching Your Job Search**"
   Direct Link to password-protected page:
   Launching Your Job Search Live Webinar AIChE 2020-10-14 (oncareersuccess.com)
   Case-sensitive password: NorCalAIChE

Past VLS Meetings

The VLS records its monthly meetings and archives them on the AIChE Academy website in case you missed a meeting or are looking for a particular topic. See below for current recordings.

Date	Event
Sep 2020	September VLS Meeting - Internships and Undergraduate Education
Aug 2020	Physical Property Models to Design Better Chemical Products
Jul 2020	Julia - A Fresh Approach to Technical Computing
Jun 2020	The Next Digital Leap to AI (An Interactive Webinar)
May 2020	Challenges and Benefits of Remote Operator Training using Cloud-Deployed High-Fidelity, First-Principles Based Standard Operator Training Simulators (SOTS)
Apr 2020	NASEM Chemical Engineering in the 21st Century Study: Give your input!
Mar 2020	Is Your Focus Your Magic!
Feb 2020	DIERS data/standards in HAZOPS of two phase flow
Jan 2020	A Brief History of Measurement
Nov 2019	Using Thermal Imaging to Guard Industrial Facilities
Oct 2019	Python for chemical engineers: Getting started
Aug 2019	Reactive Chemical Hazards
Jul 2019	Should I Py or Should I Fortran?
Jun 2019	Design Considerations for Organic Electronic Materials and Devices
May 2019	Why Can't You Compete Without Virtual/Augmented Reality in Your Plant
Apr 2019	The Chemistry of Bourbon: The "spirit" of molecules
Mar 2019	Demystifying Professional Engineering Licensure and How to Put it to Work for you
Feb 2019	Municipal Wastewater and Sludge Are a Resource, Not a Waste: Coping with Tightening Water Supplies and Limited Landfill Availability

Upcoming VLS Meetings

The VLS has monthly meetings. The following meetings have firm dates and speakers.

Dates	Topic
January 2021	DIERS Technology Fundamentals 2 - Runaway Reactions

AIChE News

The AIChE hosts technical conferences around the world. Check www.aiche.org/conferences for registration and presentation information for this year's events.

Dates	Event
Dec 7 – 9	3rd International Conference on Microbiome Engineering
Dec 7 – 8	Virtual International Mammalian Synthetic Biology Workshop (mSBW)
Dec 8	2020 Industry 4.0: Digital Transformation Conference
Dec 10 – 11	2020 Chemical Ventures Conference, Germany
Dec 10	Business Case for Resilience by Design

Dec 10	2020 AIChE Virtual Gala
Dec 15 – 17	2nd Engineering Sustainable Development Conference
Dec 15	RAPID Technology Showcase: StenCo, LLC
Dec 16	Active-learning cell-free protein production optimization
Jan 6 – 9	ICBE 2021 – 11th International Conference on BIiomolecular Engineering
Jan 7 – 8	2020 Competititve Energy Systems Symposium
Jan 13	Don't be Blind 'Sited': Facility Siting Insights

Best Voter Turnout Ever!

by Kirsten Rosselot, Immediate Past Chair and Chair of the Nominating Committee

This year, we had the best turnout ever for a VLS election. Thanks to everyone who voted!

It was a nail-biter, but all of the candidates who ran for VLS election this year won their seat. They are Aaron Sarafinas, current Vice Chair Pro Tem, who ran for Senior Vice Chair; Steve Treese who ran for Vice Chair; Jennifer Brand, who was reelected to Treasurer; and Kirsten Rosselot and Fred Fischl, who ran for Director. These positions begin in 2021.

A big welcome to Fred Fischl and Steve Treese, who are joining the VLS Executive Committee for the first time.

We have Paul Wissmann, Director and Chair of Member Feedback, to thank for the high turnout. He ran the ballot.

Subscription Information

Current fully paid members of the Virtual Local Section receive this newsletter. If you wish to update your email address, contact the AIChE's New York Office for Permanent Address Corrections at xpress@aiche.org or 1-800-242-4363

Did You Know?

You can visit the VLS website for more information on the Virtual Local Section's mission, activities, and membership. Also at this website, AIChE student members and VLS members can watch previous webinars for free.

The Virtual Local Section's Executive Committee Officers

Chair:	Dan Lambert
Senior Vice Chair:	Paul Adamson
Vice Chair Pro Tem:	Aaron Sarafinas
Immediate Past Chair:	Kirsten Rosselot
Secretary:	Laura Gimpelson
Treasurer:	Jennifer Brand
Directors	
Member Care	Louis Mielke
Publicity	Paul Shuey
Newsletter	Mario Arredondo
Programming	Richard Evans
	Scott Clarke
Member Feedback	Paul Wissmann

Continuing Education Credits

Members of AIChE can receive 1 hour of continuing education/professional development credit for attending Virtual Local Section webinars. Send your name, the certificate number on your professional engineer's license, and the licensing entity (state or country) in which you are licensed to our Secretary, Laura Gimpelson, to receive one hour of continuing education credit for attending this meeting.

Protecting Lives and Livelihoods:
Hazardous Materials Classification and Its Impact to the Supply Chain

AIChE Virtual Local Section Presentation – Questions and Answers

(We enjoyed our discussion. Connect with presenters Sarah Eck and Jena Dorrin if you have more questions!)

1. **Regarding regulation, what is the accountability of a client or HAZMAT purchaser / producer in case of an accident during transportation, even it is not the owner of the transportation equipment? Is there or must be a shared responsibility/liability?**

   As with any situation involving the government, "it depends." DEKRA has noticed that there is an industry trend where, if more than one organization is involved in the incident, then both organizations can be investigated for potential liability and/or citation. This may be why there is a trend where many larger chemical suppliers choose to audit their customers to ensure they are transporting and processing hazardous materials in a safe, responsible manner.

2. **Which code is used in US- UN or the NFPA?**

   In the United States, the Department of Transportation (DOT) governs the transport of goods (materials) and uses the United Nations (UN) Manuals and Procedures for support for compliance with US Requirements.

   US Local Authorities Having Jurisdiction (AHJs) such as a local fire inspector or fire marshal often adopt NFPA Standards. This is managed on a state, township, parish, or city level.

3. **From handling spent catalysts, where do you draw the line between self-heating and pyrophoric hazards?**

   A solid material is determined to be a pyrophoric solid if a very small sample (1-2 ml of dry powder) ignites within 5 minutes after being exposed to air. If the material does not ignite within 5 minutes, it's not classified as being a class 4.2, packing group 1 pyrophoric solid. That does not mean that it will not self-heat. A material is tested for oxidative self-heating by exposing a larger sample (25 mm or 100 mm wire mesh cube) to elevated temperatures between 100-140C. The test is considered positive if spontaneous ignition is observed under these conditions, or if the temperature of the sample exceeds the oven temperature by 60C over a test period of 24 hours. The material may fall under class 4.2 PG II or III depending on the exact results of the sample.

4. **How would you classify styrene in a rail car - the inhibitor in the styrene is good for only a certain number of days? There will be a runaway reaction and explosion.**

   Focusing on the UN classification system – Styrene has its own designated UN number and special provisions applied to it and falls under class 3 flammable and combustible liquids. Per 49 CFR, one provision is that the shipper is responsible for ensuring that the material will be stabilized until it reaches its destination[1]. There are also limitations on the quantity that may be shipped by rail if passengers are also present. DEKRA has worked with clients in the past with time sensitive materials. In cases such as these, precautions are put into place to prevent the degradation of materials when possible. Materials

are moved to the front of the queue in laboratory testing and analysis. DEKRA has relationships with several companies that transport materials and can work with clients to ensure the material arrives as quickly as possible. When this is not possible, DEKRA has sent experts to client locations to test on-site, even in line with batch testing when required.

1. "When materials are stabilized by temperature control, the provisions of § 173.21(f) of this subchapter apply. When chemical stabilization is employed, the person offering the material for transport shall ensure that the level of stabilization is sufficient to prevent the material as packaged from dangerous polymerization at 50 °C (122 °F). If chemical stabilization becomes ineffective at lower temperatures within the anticipated duration of transport, temperature control is required and is forbidden by aircraft. In making this determination factors to be taken into consideration include, but are not limited to, the capacity and geometry of the packaging and the effect of any insulation present, the temperature of the material when offered for transport, the duration of the journey, and the ambient temperature conditions typically encountered in the journey (considering also the season of year), the effectiveness and other properties of the stabilizer employed, applicable operational controls imposed by regulation (*e.g.* requirements to protect from sources of heat, including other cargo carried at a temperature above ambient) and any other relevant factors. The provisions of this special provision will be effective until January 2, 2023, unless we terminate them earlier or extend them beyond that date by notice of a final rule in the **Federal Register**.
[172.102(c)(1)]"

5. What circumstance that you have a new material other than a research facility?

Typically, there are three reasons a person would challenge material classifications:
(1) A new material is created (indicated in this question).
(2) An existing material has limited documentation or information
(3) An incident, audit or inspection raises a question regarding an existing material

DEKRA receives inquiries regarding all three cases. If the situation involves a new material, it is typically due to research or development activities. The facility itself is not necessarily designed to do research, but it may be authorized to make the new product.

DEKRA often receives inquiries regarding existing materials but with different ratios of components. This can cause the material to behave differently and fall into (or out of) a hazard class. One example of this could be shown with methanol. Methanol is considered a class 3 material. If a site is attempting to transport a methanol solution with a very low percentage of methanol, they may conduct the necessary testing to see if their particular solution does not meet the requirements of a class 3 material.

6. Where do solid materials such as zeolites or molecular sieves fall within the hazards? These zeolites contain quaternary amines during the synthesis of the zeolites.

While zeolites and molecular sieves are generally not regulated as hazardous materials (this should be evaluated on a case by case basis), contaminants, like amines, could potentially cause them to fall under the purview of a hazardous material. There are situations in which a material that, by definition, falls under a particular hazard, but the proper testing can exclude that particular material from being classified. In this case, testing must be completed to prove that the material is not hazardous. General amines have their own designated UN number. "UN2735 Proper Shipping Name AMINES, LIQUID, CORROSIVE, N.O.S. Hazard Class 8".

7. **How does the DOT Classification Process Differ from the Classification Process Required for Hazardous Materials in the Building and Fire Codes?**

    - DOT typically relies upon the classification of a material into one or more Hazard Classes based on the requirements of the United Nations Recommendations on the Transport of Dangerous Goods Model Regulations and the related Manual on Tests & Criteria.
    - Building and Fire Codes typically use testing methods for classification that are required by OSHA-based or NFPA-based standards.
    - While there is overlap in certain areas (like Explosives), each approach has nuances that must be understood.
    - To ensure that the most cost effective testing plan is established, it is essential to target the end objectives of the testing, and the regulatory audience involved.

8. **Can you provide an example of where a Packing Group assignment conflicts with the requirements of the Building and Fire Code?**

    - Packing Group Assignments are usually aligned with container selection that is commensurate with the nature of the hazard of the hazardous material being evaluated.
    - In most situations, the proper container selection from the UN/DOT methods will be aligned with the Controls required by Building and Fire Codes.
    - The most notable exception relates to Flammable and Combustible Liquids transported and stored in Composite IBCs. Many Composite IBCs are rated as a Packing Group II container, which allows Class IB and IC (flammable) liquids to be transported. Most of the model Fire Codes do not allow the storage of flammable liquids in Composite IBCs in the built environment.

9. **Is there a maximum number of hazard classes a material can have?**

    A single material can fall under several hazard classes. There is no maximum limit, although in some cases it is not possible (by definition) for a single material to fall into two of them at once. For example, a material cannot be both a solid and liquid and a gas at the same time, with respect to material classification. Gas classification is class 2; liquids are class 3; and solids are class 4.

10. **Is a generic drum closure instruction sufficient? Is a manufacturer specific required?**

    Pursuant to the requirements of the Department of Transportation in CFR 49 Part 178.2 (c)(1), container closure instructions must align and be specific to the manner in which the container was tested to pass applicable specification testing. This method of closure should be used to ensure that you containers have been closed in the same manner as when they were initially tested.

11. **Can you define incidental storage?**

    Incidental storage, or “storage incidental to movement,” for a hazardous material includes storage by any person between the time that a carrier takes physical possession of a material for the purpose of transporting it until the package is delivered to its final destination as indicated on the shipping documents. Please note that once the material is at its (final) destination, “incidental storage” no longer applies – it is being stored by the receiving party.

12. **Where is your lab to conduct the UN Series 1 or 2 tests for explosive material? Can you conduct these tests onsite (mobile lab)? Who is the proper DEKRA contact for explosive material classification?**

    DEKRA operates a DOT Approved explosive testing laboratory in Forreston, Illinois (near Chicago). We can test at a Client location but it must be approved (the location/tools and technician doing the work) by a DOT qualified Examiner. DEKRA has DOT qualified examiners and can talk to you about your needs. You can contact us by calling the number or using the email in the footer of this document or by following this link to our website request form.

13. **When we have an active pharmaceutical ingredient (API) or intermediates of the synthesis and we need to transport it, do we need always to do testing to classify? Is there any limit/amount of powder that we can transport before doing testing? Which is usually the procedure for new synthesized products?**

    If the transport is off-site on public transportation road, water or railways – yes, the material needs to be classified and have appropriate shipping documentation to be shipped legally in the United States. It does not matter if it's a final product or ingredient. Even small quantities shipped via the post / mail need to be declared as hazardous and legally shipped. 49 CFR does allow exceptions to this rule for very small quantities, but a certified shipper needs to review the material and ensure the packaging is in line with the exception. Typically, during development of a new material, hazard testing is completed to get the necessary information to populate the Safety Data Sheet and classify it for transport.

    In order to ship the sample to a hazards laboratory (or in the case that the sample is hazardous waste from a spill), the DOT allows special instructions under 49 CFR 172.101(c)(11) for tentative determination. Please read the scope and exemptions carefully, especially for energetic materials (explosives, oxidizers). DOT allows this material to be classified by the shipper by assigning a tentative shipping description based on their knowledge of the material, using the DOT hazard table/classification system.

14. **The UN Orange Book Appendix indicates that explosives hazard screening should include (among others) a DSC screening test. It is imperative that closed-cell, high-pressure, Au-plated DSC pans are used to ensure accurate measurements of decompositions - we always screen in-house with these. However, all such DSC crucibles that we could find are only rated to 400 C whereas the screening testing is prescribed to 500 C. Can you recommend a path forward for this for us?**

    If the chemical/energetic reaction does not start below 400 C, a different apparatus is necessary. Contact us if you want to discuss making modifications to your apparatus or would like us to conduct the testing for you using a different device.

15. **In off-loading a bulk material into a storage tank, at what point does DOT authority end and OSHA or other agency authority begin?**

    DOT authority typically ends when the motive force (e.g. locomotive or tractor) are removed. When removed from DOT authority, OSHA and/or local Fire codes typically apply and rely on variants of Codes and Standards (like NFPA 30 and NFPA 58). DOT requirements for what must be prepared and inspected on the bulk container prior and during filling apply as the container must meet applicable requirements before entering the transportation chain.

16. **Any one page handout that quickly classify material to its Hazardous Area?**

    This question may be related to hazardous area classification, sometimes called “electrical classification” assessments. This is conducted in the United States per NFPA 497 (Liquids, Gases and Vapors) and NFPA 499 (Combustible Dust). The classification system for hazardous materials for NFPA standards is different than those used by UN/DOT. As the presentation explained, it is important to read the scope of the standard or regulation you are using and match the correct definitions (or hazardous material classification) with the correct application. Refer to the NFPA website for a free view of the mentioned standards, www.nfpa.org.

17. **Does classification methodology matter for e.g. that classification is done on what basis GHS or EPA-Chemical Compatibility matrix?**

    Yes, the definition by which a code, standard or regulation classifies a material matter. Sometimes they align, and sometimes they do not. GHS is not always the same as DOT which is not always the same as the NFPA classification systems. It’s not clear to me what the EPA-Chemical Compatibility matrix is, so if you could reach out and clarify your question, we can give you a better answer. It’s likely the compatibility matrix you are referencing is independent of material classification, and there are definitions that explain the output of the Application or Matrix that gives a result. For example, you can read some of the history of the CCPS Chemical Reactivity Worksheet (which is a project that includes EPA, NOAA, and more), here. https://www.aiche.org/ccps/resources/chemical-reactivity-worksheet

18. **Is 172.101 used outside US & CANADA also? Is this system followed in Europe or not?**

    The US-DOT bases its requirements on the UN model regulation. There are differences between countries, including the United States, from this model regulation. Europe and Canada follow requirements close to the UN model regulation. To understand the differences, you must read the regulations for each country based on the material and shipment method you intend to use.

If you enjoyed our presentation, we offer several training services, including webinar/remote-workforce options. We provide training various process safety topics including, combustible dust, flammable liquid, electrostatics & ignition sources, and much more. Contact us if you would like to speak to a consultant about arranging customized training at your site.
https://www.dekra.us/en/contact-us/

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PROFESSIONAL PROFILE

Head- Plant Operations | Head-Projects

(Fertilizer | Chemicals | Agrochemicals | Pesticides | Petrochemicals | Projects/Consultancies | Paper/Sugar/Steel Plants)

- **Senior Plant Operations & Projects Leader with a rich experience of overseeing large and complex Plant Operations. Successfully commissioned several projects of large magnitude within a strict time schedule and stringent cost measures. Achieved production targets, increased plant capacity utilization and reduced down time.** Spearheaded capacity enhancement, energy revamp and feedstock conversion (from Naphtha to Natural gas) in Ammonia and Urea Complex.
- **Led project activities end-to-end from conceptualization to execution** including technical specifications, stage inspections, progress monitoring, site management, Contracting, Proposal Management, Constructability Review, Budgeting & Cost Control manpower planning, Change Management, Quality Auditing and Safety Management.
- **Focused on continuous improvement in terms of production yield improvement, process, safety, fuel consumption, reducing emissions, implementing PSM practices, environmental safety while lowering operating costs significantly.**
- **Identified deviations and performed relevant modifications to stabilize processes for Petrochemical & Fertilizer Projects. Implemented operational strategies for incident free plant operations**
- **Delivered strong cost savings by completely eliminating previously occurring plant shutdowns caused by water scarcity, equipment leaks as well as electrical tripping at IGPL.** Headed the production department including 7 process plants (3no's of PAN- Phthalic Anhydride plants, 3 no's of MA-Maleic Anhydride and one BA-Benzoic Acid plants) with all auxiliaries of Boilers, DM plants, ETP, Cooling Towers, Nitrogen Plants, I.A Plants.
- **Revamped fertilizer complex and increased capacity by 25% without a consultant at Nagarjuna Fertilizers. Simultaneously, installed new 450 MTPD carbon dioxide recovery plant at a minimum cost of Rs. 198 Cr., two months ahead of schedule. Company received the prestigious CII Environmental Best Practices Award in the "Most Innovative Environmental Project" category for the year 2012.**
- **Internal Auditor - Responsible Care Management System (RC14001:2008).**
- **Delivered Health, Safety & Environment (HSE) compliance**, FICC related matters, Fire and Safety systems and Zero Effluent/discharge facilities.
- **Thought Leadership-** Senior Member- American Institute of Chemical Engineers (AIChe). Published over 12 papers on Ammonia Plant Operation using Natural Gas, process, performance and quality improvement as well as Carbon Dioxide Recovery Plant Commissioning.

KEY SKILLS/CORE COMPETENCIES

Project Execution & Operations | Technical Services | Resource Allocation | Process Enhancements

Quality Control & Assurance | Risk Management | Budgetary & Cost Control | Mentoring & Knowledge Sharing

Team Building & Leadership | Process Engineering | Project Management

PROFESSIONAL EXPERIENCE & SELECT ACCOMPLISHMENTS

HEAD- Plant Operations | IG Petrochemicals Ltd. Navi Mumbai, Feb 2018 - March 2020

IG Petrochemicals Ltd in technical collaboration with Lurgi Gmbh, Germany is the largest producer of PAN (Phthalic Anhydride) with a capacity of 169250 MTPA. The public listed company commands 55% of market share in India with ~Rs. 1250 Cr in annual revenues

Hired to implement operational strategies for incident free operations, undertake continuous improvements, reduce down time, bring improvement in procedures and process safety. Led Plant Operations with annual budget of Rs. 32 Cr.

Kotti Rama Raghava Kumar

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Plant Operations Responsibilities- Oversaw Continuous Improvement in Operations of Phthalic Anhydride plants(3 no's), Maleic Anhydride plants(3 no's), Benzoic Acid plant including all off sites facilities of Auxiliary Boilers (3 no's), Instrument Air plants, Nitrogen plants, Cooling towers, DM plants (3 streams), ETP, Zero Liquid Discharge (UF cleaning with RO plants)

DELIVERING STRONG COST SAVINGS BY DRASTICALLY ELIMINATING PLANT SHUTDOWNS

- **Completely eliminated 25 days plant shutdown caused by severe water crisis saving** Rs. 1.5 Cr. Conducted necessary modification to run plant operations for 15 days with the rest 10 days met by other means.
- Swiftly addressed equipment leaks (Switch Condenser) preventing two plant shut downs and saving 20 Lakh.
- Drastically reduced **frequent high emissions from Stacks & Boilers**
- Conducted root cause analysis and successfully addressed the electrical problem of main raw material feed pump to reactor that had tripped several times causing shutdowns. Saved around 50 Lakh per annum (~600T PA production & 120 T of F.O)
- Improved Cooling Tower efficiency by ~15% (appx.) by changing the blade angle saving ~Rs. 0.6 Cr.

DEMONSTRATING STRONG PLANT OPERATIONS LEADERSHIP

- **Delivered Rs. 1 Cr+ in cost savings by resolving high fuel consumption related issues caused by heavy rains.** Replaced damaged insulation with improved techniques which is expected to save ~ 100 T of fuel per year.
- Digitized entire technical documentation (77,000 documents including manuals) and made available for all technical personnel
- Fostered safe & healthy work environment by enforcing safety, health & environment (HSE) regulations, standards & procedures
- International Paper Presentation-Wrote a paper on Catalyst Replacement with Next Generation Catalyst for Production of Phthalic Anhydride which was accepted for presentation at the 2020 AIChE Annual Meeting at Houston, Texas.
- **Client brands worked with-**BASF - Germany, Thermax, Chembond Chemicals, Elof Hansson, Armstrong, Aker Solutions, CR Asia, Forbes Marshall, Yokogawa, Crown et al.

General Manager-Projects | Nagarjuna Fertilizers & Chemicals Ltd Apr 2015 - Jan 2018

Completed feasibility study for projects worth Rs.2000 Cr. working with international consultants. Developed the 5 year business plan focussed on improving plant performance and energy efficiency of plants.

DELIVERING LARGE PROJECTS AHEAD OF SCHEDULE

- Installed and commissioned the Carbon Di Oxide Removal Plant (CDR). Completed revamp of Ammonia & Urea Plants within scheduled period of 24 months and CDR project 2.5 months ahead of scheduled time. Contributed in enhancing overall production capacity by around 2 lakh MT of Urea for the complex.
- Spearheaded "Energy Reduction Project" fom 5.6 G.Cals to 5.41 G.Cals/MT of Urea at NFCL.
- Completed the internal and external audits successfully for Responsible Care (RC 14001), Quality (ISO 9001:2008), Environment (ISO14001), Safety (OHSAS) management systems.
- Part of the team that implemented the Process Safety Management System (PSMS).
- Delivered presentations to Andhra Pradesh Pollution Control Board for pollution clearance. Wrote a paper on "Need of hour – Survival of Urea Industry" the contents of which were presented to Fertilizer Ministry by Director & COO.
- Conducted several welfare programmes successfully as a CSR team leader at NFCL Site
- **Client brands worked with-**Haldor Topsoe Denmark, KBR- US, Saipem Chennai, PDIL - Noida, Snamprogetti Italy, Ammonia CASALE & Urea CASALE, Chembond Chemicals Ltd, Thermax , L&T

DETAILS OF KEY PROJECTS WORKED ON

- Full cycle implementation of Urea Plant-1 with 5 lac MTPA Capacity
- Commissioning of Urea Plant-2 with 5 lac MTPA Capacity
- Full cycle implementation of 1.5 lac MTPA Carbon Dioxide Recovery Plant (From flue gases of Primary reformer stack)
- Increasing Production Capacities of 2 nos. Ammonia Plants & Urea Plants each by around 25%
- Full cycle implementation of New Ammonia Converter Installation, Catalyst Loading, Commissioning & Operation of (S-300) of 1350 MTPD capacity 6) Commissioning & GTR of NFL- Nangal Urea Plants

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Deputy General Manager | Nagarjuna Fertilizers and Chemicals (NFCL), Andhra Pradesh 2009 - 2015

Project Head full cycle implementation of Fertilizer Projects. Worked as Head of the Department (HOD) for Technical Services during year 2009-2010

KEY ACCOMPLISHMENTS

- Saved 28 MT/Hr LP Steam required by Carbon dioxide Recovery (CDR) Plant at the design stage itself by implementing necessary modifications. Delivered Rs. 6 Cr per annum in cost saving. **Company was awarded prestigious CII Environmental Best Practices Award in "Most Innovative Environmental Project" category for the year 2012.**
- Revamped larger fertilizer complex plant without a consultant along with the set up carbon dioxide recovery facility at a minimum cost of Rs.198 Cr. two months ahead of the scheduled 24 months.
- Successfully conducted detailed study for the Rs.2000 Cr. super revamp project to increase existing plant capacity by 40%. (16 Lakh MT to 22 Lakh MT of Urea per Annum) with technology supply from CASALE, Switzerland.
- Worked as site coordinator for Rs.5000 Cr. project new Ammonia & Urea Plant project of 3860 MTPD capacity(Licensors: M/s.KBR & Stamicarbon)
- Conducted feasibility study for 55 MW power project including quantifying potential costs and returns for improvements.
- International Experience –Visited Denmark to conduct technical discussions with M/s. Haldor Topsoe for implementation of HTER (Haldor Topsoe Exchanger Reformer) scheme to increase Ammonia Plant capacity from 1325 MTPD to 1400 MTPD.
- **Award & Recognition-Won an Appreciation Letter & Cash Award from the Director & COO for successful project implementation in 2009 with interview broadcasted on TV (ETV2)**

AGM (PRODUCTION) - Ammonia Plant I & Urea Plant | NFCL, Andhra Pradesh 1989 - Sep 2009

Oversaw budget of Rs. 35 Cr as AGM with ~140 staff. Achieved production target, reduced ammonia losses, improved product quality, modified major H.P loop equipment and surpassed production and energy targets. Implemented Process Safety Management System (PSMS). Responsible Care (RC), QMS, EMS and OHSAS as a core team member. Started as Graduate Engineer Trainee.

KEY ACCOMPLISHMENTS

- Improved installation of new ammonia converter (S-300) which included detail engineering, erection, catalyst loading, commissioning and GTR. Managed parallel operation of S300+ S200, resulting in savings of 30,000 G.Cals/annum ~Rs. 5.3 Cr.
- Recovered ammonia from M.P off gases in both Urea Plants saving 31000 G.Cals per annum i.e. around ~Rs. 6 Cr
- Core team member for Business Process Re-Engineering(BPR) and SAP deployment in Production and Technical services
- Represented NFCL (deputed by FICCI) as part of European fertilizers plants for study in energy efficiency
- Installed fluid coupling for primary reformer ID fan at Ammonia Plant-I, saving ~50 Lakhs per annum in costs

EDUCATION | CERTIFICATIONS | PAPER PRESENTATIONS/PUBLICATIONS

Internal Auditor - Responsible Care Management System (RC14001:2008)

QMS / EMS / OHSAS systems

B.Tech | College of Engineering, Andhra University 1988

PUBLICATIONS/PAPER PRESENTATIONS

Catalyst Replacement with Next Generation Catalyst for Production of Phthalic Anhydride accepted for presentation at the 2020 AIChE Annual Meeting at Houston, Texas.

"Need of hour – Survival of Urea Industry" - (Contents of which were presented to Fertilizer Ministry by Director & COO)

Published several papers on Ammonia and Urea Plant performance improvements (process, performance and quality) and revamping of fertilizer complex, Ammonia Plant Operation using Natural Gas as well as Carbon Dioxide Recovery Plant Commissioning