

Tuesday, April 9, 2024, 2:00 p.m. - 5:15 p.m.							
Start	Finish	Duration	Room / Presentation Topic & Presenters				
			Moderator:	Person 1	Person 2	Person 3	Person 4
				Napoleon D1-D2	Napoleon D3	Borgne	Maurepas
2:00 PM	2:30 PM	30	A Brief History of Nickel Pick Up in Evaporators	Risk Management Resources for Security and Resilience	The Importance of Electrode Coating Diagnostics for Extended Safe Operations	Best Practices for Bolted Flange Joint Root Cause Analysis	
<i>Presented By:</i>			William Sandra and Fernando Galiani; Transclor SA	Ashley Pennington (Dr.) and Kimberly Heyne, David Gonyea Jr.; CISA, DHS	Josh Kelley; De Nora Tech	Tim Rice; VSP Technologies	
2:35 PM	3:05 PM	30	Impact of Lithium Market to the Chlor-Alkali Industry	Questions Leaders Should Ask About Cybersecurity	Future of Refrigeration in Chlorine Manufacture	How to Detect Short Circuits and Damaged Membranes in Chlor-Alkali Cells before Powering On?	
<i>Presented By:</i>			Fiorella Sist and Scott Cooper; Hargrove Engineers and Constructors	Dan Latvala; Hawkins, Inc.	John Tummons and Emily Cooper; OxyChem	Helmut Lademann; R2	
3:10 PM	3:40 PM	30	Decarbonizing the Chemicals Industry: The Role of Small Modular Reactors in an Electrified Future	Best Practices For Brine Analysis	Increased Oxygen Liberation from Electrolyzers in Chlorine Gas	Metallic Chlorine Hose Assemblies: Design, Testing, and Installation	
<i>Presented By:</i>			Alexander Koukoulas and Kinley Moore; AFRY Engineering USA	Azade Zaretabibi and David Miyamoto; Kuhne Company	Muzzamil Shahzad and Waqas Butt; Engro Polymer and Chemicals Limited	Matthew Smith and Timothy Wilkinson; Omega Flex, Inc.	
3:40 PM	4:10 PM	30	Break				
4:10 PM	4:40 PM	30	Technical Approach for Membrane Care	A Materials & Corrosion Knowledge Management Hub for the Chlor-Alkali Industry	Technology Sustainability in Chlor-Alkali	Enhancing Bolted Flange Joint Reliability with ASME PCC-1 - 2022	
<i>Presented By:</i>			Michael Pope and Ryouta Nagatomo; Asahi Kasei	Charles Young and Kirk Richardson; Tricor Metals / Materials Technology Institute	Jack Williams and Robert Craig; INEOS Electrochemical Solutions	Ben Waterland; VSP Technologies	
4:45 PM	5:15 PM	30	Piping in Membrane Electrolyzer Catholyte Circulation Loops	Hypochlorite Storage Tanks – Design and Fabrication in Titanium	Improper Materials of Construction-How Small Errors Cause Operational Disruptions.	The Success of Blended Chlorobutyl-Natural Rubber Lining for the Vapor Space in HCl-Carrying Rail Cars	
<i>Presented By:</i>			Steven Ottobre; k2 Pure Solutions	Charles Young and Peter Philippon; Tricor Metals	Folashade(Sade) Healy; NYC DEP	Joseph Khouri and Ted MacMillan; Polycorp	

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Wednesday, April 10, 2024							
Start	Finish	Duration	Room / Presentation Topic & Presenters				
Moderator			Robyn B. Maurepas	Daniel S. Southdown (4th Floor)	Jack P. Borgne	Robyn K. Napoleon D1-D2	Member Volunteer Napoleon D3
8:00 AM	8:30 AM	30	Benchmarking for More Sustainable Supply Chains	Sampling liquid Chlorine at low temperature: choosing the best technology	Safe Evacuation of Chlorine from Chlorine Tonners	Emergency Shut-off Systems for Chlorine Bulk Transfer - A Pamphlet 57 Overview	The Importance of Electrode Coating Diagnostics for Extended Safe Operations
Presented By:			Katie Mencke and Kinley Moore; AFRY Management Consulting	Yvan Masson; BIAR Sampling Systems	Rajasekar Jayanandhan and Balasubramanian Elamaran; Al Kout Industrial Projects Ltd	Steve Bursmith; CHEMFLOW Products, LLC	Josh Kelley; De Nora Tech
8:40 AM	9:10 AM	30	Decarbonizing the Chemicals Industry: The Role of Small Modular Reactors in an Electrified Future	Safety & Quality Analytical Technology in Chlor-Alkali	Chlorine Container Leak Mitigation for Small End Users	Metallic Chlorine Hose Assemblies: Design, Testing, and Installation	Increased Oxygen Liberation from Electrolyzers in Chlorine Gas
Presented By:			Alexander Koukoulas and Kinley Moore; AFRY Engineering USA	Damon Smith and Christel Leroux; FC Tech	Dan Thompson and Rudy Caparros, Jr.; Dan Thompson PE LLC	Matthew Smith and Timothy Wilkinson; Omega Flex, Inc.	Muzzamil Shahzad and Waqas Butt; Engro Polymer and Chemicals Limited
9:20 AM	9:50 AM	30	Future of Refrigeration in Chlorine Manufacture	Wireless Chlorine Monitoring	Lessons Learned in Nonmetallic Construction Equipment Reliability	PFA Lined Ball Valve and Chlorine Valve Offerings	Coating Application and Lifetime
Presented By:			John Tummons and Emily Cooper; OxyChem	Bud Dungan; Gastronics, Inc.	Michael Yee; RT CONSULTS PLLC	Joe Becherer and Emanuel Guerreiro; TransQuip USA	Terry Powell and Erik Zimmerman; Permascand
9:50 AM	10:20 AM	30	Break				
10:20 AM	10:50 AM	30	Counter Drone Technology and the Legal Landscape	Impact of Lithium Market to the Chlor-Alkali Industry	Best Available Technology for Sodium Hypochlorite Storage Tanks	Best Practices for Bolted Flange Joint Root Cause Analysis	Diaphragm Cell Room Safety Considerations
Presented By:			Gary Davis; AirLiquide	Fiorella Sist and Scott Cooper; Hargrove Engineers and Constructors	Michael Stevens and Kevin Lambrych; INEOS Composites	Tim Rice; VSP Technologies	Karen Hueda; De Nora Tech
11:00 AM	11:30 AM	30	Technology Sustainability in Chlor-Alkali	Best Practices For Brine Analysis	Improper Materials of Construction: How Small Errors Cause Operational Disruptions.	UHMW Solutions that are Born from Innovation	Implementation of ASME FRP Tank and Piping Standards for Maximum Benefit and Performance
Presented By:			Robert Craig; INEOS Electrochemical Solutions	Azade Zaretabibi and David Miyamoto; Kuehne Company	Folashade(Sade) Healy; NYC DEP	Brandon Becherer and David Bass; TransQuip USA	Jeff Eisenman; Maverick Applied Science, Inc.
11:30 AM	1:00 PM	90	Performance Recognition Lunch				
1:00 PM	1:30 PM	30	Demonstration of Remediation of Mercury-Contaminated Soil and Groundwater Sources	Optimum Brine Softening – Lewatit® Chelating Resins for Membrane Cell Electrolysis.	Safe Operation of Chlorine Compressors	The Total FRP QA Program – A Proven Plan for Reliability	Development of Low Voltage Membranes
Presented By:			Jon Miller; Albemarle Corp.	Wilson Nova Ruiz and Gerard Venema; LANXESS Corp	Andreas Fischer and Derk Jan Bolks; Siemens Energy Global	Darryl Mikulec; Maverick Applied Science, Inc.	Katie Jarvis; AGC
1:40 PM	2:10 PM	30	Scope 3 Accounting	Filtering Brine for Chlor-Alkali Service	The Importance of Industrial Data Engineering	Extended FRP Lifetimes With ECTFE Veil In Corrosive Environments	Technical Approach for Membrane Care
Presented By:			Jonathan Hollander and Oxy Person; OxyChem and CarbonSig	Stefan Strasser and John Astle; Lenzing Filtration & AV-Group joint presentation	Flávio Maeda and Kinley Moore; AFRY Engineering USA	Rafic Moubarac and Ray Whitby; Rafic Moubarac and Monadnock Non Woven LLC	Michael Pope and Ryouta Nagatomo; Asahi Kasei
2:20 PM	2:50 PM	30	A Materials & Corrosion Knowledge Management Hub for the Chlor-Alkali Industry	HCl Synthesis Performance Recovery Project	Mist Eliminators in Chlor-Alkali Service	Aim Closer to Zero: Unlocking the Collective Power of Consistent Communication and Collaboration	Electrical Isolation Design & Monitoring for Membrane Cell Electrolyzers
Presented By:			Charles Young and Kirk Richardson; Tricor Metals / Materials Technology Institute	Rob Grooms; CG Thermal	Doug Azwell; Essent Clean Technologies	Kathy Green; CargoCheck	Billing (Ruby) Nojiri and Ismail Boussag; thyssenkrupp nucera USA Inc.
2:50 PM	3:20 PM	30	Break				
3:20 PM	3:50 PM	30	Risk Management Resources for Security and Resilience	How to Detect Short Circuits and Damaged Membranes in Chlor-Alkali Cells before Powering On?	Hypochlorite Storage Tanks – Design and Fabrication in Titanium	The Success of Blended Chlorobutyl Natural Rubber Lining for the Vapor Space in HCl-Carrying Rail Cars	Piping Materials of Construction in the Chlor-Alkali Environment
Presented By:			Ashley Pennington (Dr.) and Kimberly Heyne, David Gonyea Jr.; CISA, DHS	Helmut Lademann; R2	Charles Young and Peter Philippon; Tricor Metals	Joseph Khouri and Ted MacMillan; Polycorp	Michael Stevens and Lisa Adkins; INEOS Composites
4:00 PM	4:30 PM	30	Questions Leaders Should Ask About Cybersecurity	Chlorine Gas Sampling in Cell Room	New Chlorine Storage Material Based on Polychlorides	Enhancing Bolted Flange Joint Reliability with ASME PCC-1 - 2022	Piping in Membrane Electrolyzer Catholyte Circulation Loops
Presented By:			Dan Latvala; Hawkins, Inc.	Adeline Christmas; INEOS Electrochemical Solutions	Sebastian Hasenstab-Riedel; Freie Universität Berlin	Ben Waterland; VSP Technologies	Steven Ottobre; k2 Pure Solutions
4:40 PM	5:10 PM	30	A Brief History of Nickel Pick Up in Evaporators	Accelerated Corrosion Of Iron With Dry Chlorine At Elevated Temperatures	Combating Corrosion In Hydrochloric Acid Synthesis	Manual and Pneumatic Dual Valves for Chlorine and AHCl Rail and Road transport	Fitness for Service Assessment of FRP and Composite Assets
Presented By:			William Sandra; Transclor SA	Steven Ottobre and JJ Hiemenz; k2 Pure Solutions	Mark Grasso; APEX Engineered Products	Mark Fuchich and Ross Aguilar; Descote	Tom Shewfelt; UT Comp

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Napoleon D1-D2					
2:00 PM	A Brief History of Nickel Pick Up in Evaporators	William Sandra and Fernando Galiani	Transclor SA	In chlor-alkali facilities, the occurrence of nickel pickup in evaporators presents a challenge, especially when utilizing 50% caustic in the production of sodium hypochlorite. Nickel works as a catalyst for hypochlorite decomposition, meaning that even trace amounts of nickel in the solution can lead to a significant increase in the decomposition rate. Amidst the time pressures associated with fast-tracked projects, critical aspects can often be overlooked. This presentation will share a valuable lesson learned from the development of a new evaporator plant, shedding light on nickel pickup issues and the approach taken to identify the causes and implemented solutions	Napoleon D1-D2
2:35 PM	Impact of Lithium Market to the Chlor-Alkali Industry	Fiorella Sist and Scott Cooper	Hargrove Engineers and Constructors	With the growing demand of critical minerals for manufacturing battery-grade materials for the electric vehicle industry, there has been a rise in DLE (direct lithium extraction) projects worldwide. This rise has increased the demand for certain chlor-alkali products. In this presentation, we explore the potential size and geographical areas of the growing lithium market and correlate how it will impact the demand for chlor-alkali products.	Napoleon D1-D2
3:10 PM	Decarbonizing the Chemicals Industry: The Role of Small Modular Reactors in an Electrified Future	Alexander Koukoulas and Kinley Moore	AFRY Engineering USA	Hard-to-abate industries are increasingly seeking electrification solutions to reduce their carbon emissions and thus achieve corporate sustainability goals. This poses a critical question: where will this low-carbon electricity be sourced? Small modular nuclear reactors (SMRs) offer a potential opportunity for decarbonization by providing a reliable and low-carbon source of electricity. To illustrate, the energy demand of a large chlor-alkali plant requiring a base load of 120 MW could be readily met with a SMR. Use of SMRs could contribute to a sustainable and environmentally responsible energy transition for the chlor-alkali and other hard-to-abate industries.	Napoleon D1-D2
3:40 PM	Break	Break	Break	Break	Napoleon D1-D2
4:10 PM	Technical Approach for Membrane Care	Michael Pope and Ryouta Nagatomo	Asahi Kasei	This presentation outlines a comprehensive technical strategy to prevent membrane damage in industrial applications. We introduce mechanisms of membrane damage that can occur through flushing and acidification, and how to prevent them. We hope that these methods will allow for stable, long-term use of the membranes and the continuation of high performance in your plant.	Napoleon D1-D2
4:45 PM	Piping in Membrane Electrolyzer Catholyte Circulation Loops	Steven Ottobre	k2 Pure Solutions	Common piping in catholyte loops is either expensive (nickel) or not reliable and possibly dangerous (plastic). Many chlor-alkali plants are commonly built with the less expensive options, but this can lead to unplanned failures and potentially dangerous releases of caustic and hydrogen gas. This presentation is aimed at exploring the existing options used in the industry, their effectiveness, and the advantages/disadvantages.	Napoleon D1-D2
Napoleon D3					
2:00 PM	Risk Management Resources for Security and Resilience	Ashley Pennington (Dr.) and Kimberly Heyne, David Gonyea Jr.	CISA, DHS	As the Chemical Sector Risk Management Agency and the National Coordinator for Critical Infrastructure Resiliency and Security, the Department of Homeland Security's Cybersecurity and Infrastructure Security Agency (DHS CISA) works to enhance resiliency and security through collaborative capacity building, training, tabletop exercises, publications, voluntary programs, and no-cost resources. This briefing will cover resilience, physical security, and cybersecurity measures of interest to the chlor-alkali industry and interdependent industries. The discussion will include services that the DHS CISA regional offices can provide individual sites, how facilities can leverage ChemLock to enhance their chemical security posture in a way that works for their business model; information sharing through the Homeland Security Information Network (HSIN), the Effective All-Hazards Chemical Sector Response Playbook, quick refreshers through informational mini webinars, and other DHS CISA resources of interest to the chlor-alkali community.	Napoleon D3
2:35 PM	Questions Leaders Should Ask About Cybersecurity	Dan Latvala	Hawkins, Inc.	Cybersecurity is a hot topic for executive management and in the board room. This presentation will cover the basics of a good cyber security program and equip chemical facility leadership with questions the should be asking about their cybersecurity programs.	Napoleon D3

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3:10 PM	Best Practices For Brine Analysis	Azade Zaretabibi and David Miyamoto	Kuehne Company	This presentation will be about the best lab practices regarding brine analysis. Brine serves as the starting material for the production of both chlorine and sodium hydroxide and the analysis of brine is one of the main keys in the chlor-alkali plants.	Napoleon D3
3:40 PM	Break	Break	Break	Break	Napoleon D3
4:10 PM	A Materials & Corrosion Knowledge Management Hub for the Chlor-Alkali Industry	Charles Young and Kirk Richardson	Tricor Metals / Materials Technology Institute	Reliability, maintenance and process engineers are oftentimes at a loss as to where to get accurate information regarding the correct use of corrosion resistant materials in the chlor-alkali industry. This lack of knowledge of good information has been exacerbated in recent times by the loss of experienced engineers through job changes and retirement. While the Chlorine Institute is one source to review for information, there is another organization that has developed technical information on a large variety of materials that can be used in the chlor-alkali industry and that should be thought of as a "Knowledge Hub" for materials' related information – the Materials Technology Institute (MTI). This presentation will review some of the key research projects and publications developed by the MTI and available to the public. These include publications on Materials Selection for HCl, chlorine & chlorine dioxide, materials selection for caustic soda, risk-based inspection (RBI) in process plants, cleaning of process equipment & piping, managing aging plants, mechanical integrity of flexible hoses and various failure analysis books and presentations, just to name a few. An on-line forum is available to answer material and corrosion related questions without digging through archives and numerous publications. Here MTI members, as well as non-members, can post questions and get answers from subject matter experts from all over the world in as little as an hour. A sample of questions, applicable to the chlor-alkali industry, will be discussed, with examples of the relevance to Chlorine Institute members and their companies. All of the knowledge on materials and corrosion related topics in the MTI library can be considered to be very relevant to the CI members and the chlor-alkali industry in general and this could be of great benefit to all of the engineers in this industry.	Napoleon D3
4:45 PM	Hypochlorite Storage Tanks – Design and Fabrication in Titanium	Charles Young and Peter Philippon	Tricor Metals	In the last several years, titanium has seen increasing usage as the corrosion-resistant material of construction (MOC) for bleach (hypochlorite) API storage tanks in the chlor-alkali industry as well in public utilities' water treatment facilities. One reason is that titanium has excellent corrosion resistance and offers extremely long life in this service. While the initial cost of a titanium storage tank may be higher than alternative MOCs, the life cycle cost can be shown to be much lower, thus leading to a lower cost for the life of the plant or facility. This presentation will discuss the design and fabrication of a typical titanium tank used for bleach storage, including a review of tanks with flat tops, coned tops and open-top tanks, all with flat bottoms designed to be set on a concrete pad. Designing to ASME Code requirements will be discussed, as will common fabrication techniques – for both shop-fabricated and on-site, field-fabricated tanks. Numerous photographs will be used to show some of these steps. In addition, a discussion of the methods for comparison of life cycle costs (on a ratio basis), for a titanium tank versus another common MOCs, will show that titanium should really be considered for all bleach storage tanks -- where long, maintenance free life is required. Finally, a number of actual titanium tank installations, both shop fabricated and on-site-field fabricated, will be described with photographs showing design and fabrication details.	Napoleon D3
Borgne					
2:00 PM	The Importance of Electrode Coating Diagnostics for Extended Safe Operations	Josh Kelley	De Nora Tech	This presentation will cover an overview of the tools and theories behind anode and cathode electrode coating diagnostics. We will discuss the specialized equipment used during in-field, non-destructive testing, in addition to more destructive testing reserved for a laboratory setting. We will help explain the ideology and knowledge the user can gain from each of these investigation tools and methods. This understanding of the electrode condition will help the user continue a prolonged, safe operation of their electrolyzers, or can be utilized as a retroactive investigative mechanism to help future operations.	Borgne

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Start Time	Presentation	Presenter	Company	Abstract	
2:35 PM	Future of Refrigeration in Chlorine Manufacture	John Tummons and Emily Cooper	OxyChem	The chlor-alkali industry has relied on chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs) as the primary refrigerants for liquid chlorine manufacture. The American Innovation and Manufacturing (AIM) Act imposes limitations on future availability of HFC refrigerants, including HFC-134a. In pursuit of refrigerant options, a critical focus must be placed on sustainability and process compatibility. Key considerations include minimizing global warming and ozone depletion effects, optimizing thermal efficiency, assuring suitability for non-vacuum conditions, eliminating freeze risk, and maintaining inertness with chlorine. While acknowledging the absence of a perfect refrigerant, we will explore and discuss alternative options for future use in chlor-alkali.	Borgne
3:10 PM	Increased Oxygen Liberation from Electrolyzers in Chlorine Gas	Muzzamil Shahzad and Waqas Butt	Engro Polymer and Chemicals Limited	This paper delves into the new-found findings during start-up EPCL's Electrolyzers and their membranes after a technology upgrade (from finite gap to Zero Gap). In the startups of newly installed Zero Gap technology electrolyzers a notable increase in oxygen content within chlorine was observed, reaching 18%. This raised concerns as such high oxygen levels posed a potential explosion risk in the downstream Low Temperature Chlorination (LTC) Reactor within the Vinyl Chloride Monomer production chain. In the investigation of the anomalous phenomenon, it was found that the increase of oxygen at the LTC reactor with Zero Gap Cells energization is a "Startup phenomenon" with new membranes of Zero Gap cells, where due to unconditioned membranes, brine outlet pH remains high at 12 even with 3 KAs of load on the Electrolyzer. This means that during this interval of new membranes commissioning with Zero Gap cells, oxygen will abnormally increase towards the LTC reactor. Hence the controlling of oxygen in this case, is only possible by load reduction at the LTC reactor to minimum only when "New membranes installed Zero Gap cell" is commissioned.	Borgne
3:40 PM	Break	Break	Break	Break	Borgne
4:10 PM	Technology Sustainability in Chlor-Alkali	Jack Williams and Robert Craig	INEOS Electrochemical Solutions	There is a continued drive to reduce the power consumption of chlor-alkali technology not only to mitigate against increasing power prices but also to support global Net Zero targets. This presentation will explore the benefits of technology advancements, notably coatings, on power and green house gas emissions as well as provide an insight into the sustainability of the chlor-alkali industry, focusing on sustainable practices throughout the lifecycle of a cell room, the achievements so far and the challenges ahead.	Borgne
4:45 PM	Improper Materials of Construction-How Small Errors Cause Operational Disruptions.	Folashade(Sade) Healy	NYC DEP	We will review back to the basic lessons learned of material incompatibility in highly chlorinated water. A secondary review of design, construction, and preventative maintenance can avert future incidents.	Borgne
Maurepas					
2:00 PM	Best Practices for Bolted Flange Joint Root Cause Analysis	Tim Rice	VSP Technologies	In the chlor-alkali industry, the significance of proper root cause analysis for bolted flange joint failures/leaks cannot be overstated. These failures pose considerable risks, making practical analysis crucial. This presentation underscores the importance of identifying common failure modes and limiting factors through experience, enabling the development of best practices for more robust engineering and assembly techniques. By leveraging this knowledge, the chlor-alkali industry can enhance root cause analysis and overall reliability, mitigating the impact of failures on future similar applications and contributing significantly to the industry's safety and operational integrity.	Maurepas

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2:35 PM	How to Detect Short Circuits and Damaged Membranes in Chlor-Alkali Cells before Powering On?	Helmut Lademann	R2	When chlor-alkali cells are in operation, it is possible to detect short circuits and damaged membranes with the analysis of the single cell voltages. An autonomous SIL2 certified safety instrumented systems is available that analyzes the cell integrity in real-time and automatically triggers the shutdown of the power supply. Unfortunately, this strategy is only applicable when the electrolyzer is in normal operation. This presentation focuses on different methods for detecting cells with internal or short circuits to ground or with damaged membranes while the electrolyzer is idled or not in normal operation, to prevent explosions or cell damage when switching on power or increasing the load.	Maurepas
3:10 PM	Metallic Chlorine Hose Assemblies: Design, Testing, and Installation	Matthew Smith and Timothy Wilkinson	Omega Flex, Inc.	This presentation will discuss the design with Monel and Hastelloy, including schedule 80 end fittings, Type A lap joints, and 300 Class ASME flanges. Additionally, there will be a discussion on hose testing and proper paperwork certification. The presentation will conclude by discussing the correct installation of chlorine hose assemblies and the recommendations from Pamphlet 6) Piping Systems for Dry Chlorine.	Maurepas
3:40 PM	Break	Break	Break	Break	Maurepas
4:10 PM	Enhancing Bolted Flange Joint Reliability with ASME PCC-1 - 2022	Ben Waterland	VSP Technologies	Proper training is fundamental to maximizing bolted flange performance and long-term reliability. Expecting optimal operational efficiencies through procedure proclamations is both unrealistic and unsafe. End users have experienced the pitfalls of prescriptive procedures that fail to incorporate first-hand training and consistent on-site process review. Training has the most significant impact on the reliability of bolted flange joints, and it starts with the plant's Subject Matter Experts. The recently issued ASME PCC-1 – 2022, Pressure Boundary Bolted Flange Joint Assembly Standard, offers clear direction and guidance regarding the prerequisites for an effective and practical hands-on bolted flange joint training program. By developing and implementing an ASME PCC-1 training program, End Users have eliminated the majority of bolted flange joint leaks. This presentation shows how an End User can set up a successful ASME PCC-1 training program.	Maurepas
4:45 PM	The Success of Blended Chlorobutyl-Natural Rubber Lining for the Vapor Space in HCl-Carrying Rail Cars	Joseph Khouri and Ted MacMillan	Polycorp	Natural rubber linings are integral for the transportation of hydrochloric acid in rail cars across North America. The linings harden from a chlorination reaction which improves HCl absorption resistance. Natural rubber, however, does not offer the best gas permeation resistance and HCl vapors can harm the ceiling at a faster rate than the rest of the car. The HCl vapors can lead to the rubber cracking and chunking from the liquid grazing the ceiling during transportation. In this presentation we discuss how a blended chlorobutyl – natural rubber solves the chunking problem in the vapor space of rubber lined rail cars.	Maurepas

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Maurepas					
Start Time	Presentantion	Presenter	Company	Abstract	
8:00 AM	Benchmarking for More Sustainable Supply Chains	Katie Mencke and Kinley Moore	AFRY Management Consulting	Decisions regarding the choice of suppliers has historically revolved around trade-offs between performance and cost. However, companies are now being held accountable for environmental impacts across entire value chains. The decision-making process has arguably become more complex as a result. As sustainability becomes an increasingly critical aspect of business practices, how can companies choose suppliers that will enable the achievement of sustainability goals? In this presentation, we will explore how suppliers can use sustainability benchmarking to help identify best-in-class sourcing partners and use those same benchmarks to identify gaps to being best-in-class suppliers for chlor-alkali customers.	Maurepas
8:40 AM	Decarbonizing the Chemicals Industry: The Role of Small Modular Reactors in an Electrified Future	Alexander Koukoulas and Kinley Moore	AFRY Engineering USA	Hard-to-abate industries are increasingly seeking electrification solutions to reduce their carbon emissions and thus achieve corporate sustainability goals. This poses a critical question: where will this low-carbon electricity be sourced? Small modular nuclear reactors (SMRs) offer a potential opportunity for decarbonization by providing a reliable and low-carbon source of electricity. To illustrate, the energy demand of a large chlor-alkali plant requiring a base load of 120 MW could be readily met with a SMR. Use of SMRs could contribute to a sustainable and environmentally responsible energy transition for the chlor-alkali and other hard-to-abate industries.	Maurepas
9:20 AM	Future of Refrigeration in Chlorine Manufacture	John Tummons and Emily Cooper	OxyChem	The chlor-alkali industry has relied on chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs) as the primary refrigerants for liquid chlorine manufacture. The American Innovation and Manufacturing (AIM) Act imposes limitations on future availability of HFC refrigerants, including HFC-134a. In pursuit of refrigerant options, a critical focus must be placed on sustainability and process compatibility. Key considerations include minimizing global warming and ozone depletion effects, optimizing thermal efficiency, assuring suitability for non-vacuum conditions, eliminating freeze risk, and maintaining inertness with chlorine. While acknowledging the absence of a perfect refrigerant, we will explore and discuss alternative options for future use in chlor-alkali.	Maurepas
9:50 AM	Break	Break	Break	Break	Maurepas
10:20 AM	Counter Drone Technology and the Legal Landscape	Gary Davis	AirLiquide	Unwanted and unsolicited drones pose a security risk to chemical facilities. Hobbyists or groups with nefarious intent could fly drones over chemical facilities to conduct surveillance, attempt to steal intellectual property, or in the worst case, drop items within the fence line. Gary Davis, former chair of the Chemical Sector Coordinating Council, now chairs the Domestic Counter-Unmanned Aircraft System (UAS) National Task Force, which is working with government entities to create a solution to legally implement counter-drone (also called c-UAS for counter-unmanned aerial systems) solutions. Mr. Davis will explain the current legal restraints in removing drones from private airspace, proposed solutions, and interim actions to increase facilities' security posture.	Maurepas
11:00 AM	Technology Sustainability in Chlor-Alkali	Robert Craig	INEOS Electrochemical Solutions	There is a continued drive to reduce the power consumption of chlor-alkali technology not only to mitigate against increasing power prices but also to support global Net Zero targets. This presentation will explore the benefits of technology advancements, notably coatings, on power and green house gas emissions as well as provide an insight into the sustainability of the chlor-alkali industry, focusing on sustainable practices throughout the lifecycle of a cell room, the achievements so far and the challenges ahead.	Maurepas
11:30 AM	Break	Break	Break	Break	Maurepas
1:00 PM	Demonstration of Remediation of Mercury-Contaminated Soil and Groundwater Sources	Jon Miller	Albemarle Corp.	MercLok P-640, a novel amendment, has been developed by Albemarle to sustainably address soil and groundwater impacts from mercury contamination. The product is a powder-based amendment for the in-situ remediation of mercury-contaminated mining, chlor-alkali, manufacturing, and munitions sites. Using MercLok P-640, rapid sequestration of mercury and long-term stability was validated in bench and field studies in a wide range of soils and subsurface conditions. Multiple species of mercury such as ionic, elemental, and methylmercury were present in the studies and MercLok P-640 showed a high level of efficacy to capture and sequester all species tested in soil and groundwater.	Maurepas

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Wednesday, April 10, 2024					
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1:40 PM	Scope 3 Accounting	Jonathan Hollander and Oxy Person	OxyChem and CarbonSig	In order to accurately calculate product carbon footprints or report on Scope 3 upstream categories, it is necessary to track embodied carbon as interactions between value chain participants. In this session, Occidental Chemicals will show how they use the sustainability software platform CarbonSig to create dynamic carbon footprints of chlorine products manufactured at several facilities, and coordinate informational exchange within their value chain. We will demonstrate how better understanding the carbon intensity of purchased goods and services can provide a cost-efficient carbon reduction strategy alongside traditional decarbonization of Scope 1 and Scope 2 categories. We will finally discuss the emerging regulatory landscape related to product carbon intensity and the corporate benefits of a comprehensive carbon resource management strategy.	Maurepas
2:20 PM	A Materials & Corrosion Knowledge Management Hub for the Chlor-Alkali Industry	Charles Young and Kirk Richardson	Tricor Metals / Materials Technology Institute	Reliability, maintenance and process engineers are oftentimes at a loss as to where to get accurate information regarding the correct use of corrosion resistant materials in the chlor-alkali industry. This lack of knowledge of good information has been exacerbated in recent times by the loss of experienced engineers through job changes and retirement. While the Chlorine Institute is one source to review for information, there is another organization that has developed technical information on a large variety of materials that can be used in the chlor-alkali industry and that should be thought of as a "Knowledge Hub" for materials' related information – the Materials Technology Institute (MTI). This presentation will review some of the key research projects and publications developed by the MTI and available to the public. These include publications on Materials Selection for HCl, chlorine & chlorine dioxide, materials selection for caustic soda, risk-based inspection (RBI) in process plants, cleaning of process equipment & piping, managing aging plants, mechanical integrity of flexible hoses and various failure analysis books and presentations, just to name a few. An on-line forum is available to answer material and corrosion related questions without digging through archives and numerous publications. Here MTI members, as well as non-members, can post questions and get answers from subject matter experts from all over the world in as little as an hour. A sample of questions, applicable to the chlor-alkali industry, will be discussed, with examples of the relevance to Chlorine Institute members and their companies. All of the knowledge on materials and corrosion related topics in the MTI library can be considered to be very relevant to the CI members and the chlor-alkali industry in general and this could be of great benefit to all of the engineers in this industry.	Maurepas
2:50 PM	Break	Break	Break	Break	Maurepas
3:20 PM	Risk Management Resources for Security and Resilience	Ashley Pennington (Dr.) and Kimberly Heyne, David Gonyea Jr.	CISA, DHS	As the Chemical Sector Risk Management Agency and the National Coordinator for Critical Infrastructure Resiliency and Security, the Department of Homeland Security's Cybersecurity and Infrastructure Security Agency (DHS CISA) works to enhance resiliency and security through collaborative capacity building, training, tabletop exercises, publications, voluntary programs, and no-cost resources. This briefing will cover resilience, physical security, and cybersecurity measures of interest to the chlor-alkali industry and interdependent industries. The discussion will include services that the DHS CISA regional offices can provide individual sites, how facilities can leverage ChemLock to enhance their chemical security posture in a way that works for their business model; information sharing through the Homeland Security Information Network (HSIN), the Effective All-Hazards Chemical Sector Response Playbook, quick refreshers through informational mini webinars, and other DHS CISA resources of interest to the chlor-alkali community.	Maurepas
4:00 PM	Questions Leaders Should Ask About Cybersecurity	Dan Latvala	Hawkins, Inc.	Cybersecurity is a hot topic for executive management and in the board room. This presentation will cover the basics of a good cyber security program and equip chemical facility leadership with questions the should be asking about their cybersecurity programs.	Maurepas
4:40 PM	A Brief History of Nickel Pick Up in Evaporators	William Sandra	Transclor SA	In chlor-alkali facilities, the occurrence of nickel pickup in evaporators presents a challenge, especially when utilizing 50% caustic in the production of sodium hypochlorite. Nickel works as a catalyst for hypochlorite decomposition, meaning that even trace amounts of nickel in the solution can lead to a significant increase in the decomposition rate. Amidst the time pressures associated with fast-tracked projects, critical aspects can often be overlooked. This presentation will share a valuable lesson learned from the development of a new evaporator plant, shedding light on nickel pickup issues and the approach taken to identify the causes and implemented solutions	Maurepas
Southdown (4th Floor)					

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Wednesday, April 10, 2024					
List By Room					Room ↓
8:00 AM	Sampling liquid Chlorine at low temperature: choosing the best technology	Yvan Masson	BIAR Sampling Systems	Sampling chlorine is not an easy task. Sampling liquid chlorine is even more difficult. And sampling liquid chlorine at low temperatures is one of the most challenging job operators must deal with. This presentation will look at different technologies for grabbing samples of liquid chlorine at low temperatures, with a focus on the challenges that need to be overcome. When the operator extracts chlorine from the process line, not only we have to deal with a highly volatile toxic product, but we must also consider pressure, product expansion and mechanical challenges linked with extreme temperatures reaching lows of -40's.	Southdown (4th Floor)
8:40 AM	Safety & Quality Analytical Technology in Chlor-Alkali	Damon Smith and Christel Leroux	FC Tech	This presentation will discuss Safety Critical equipment H2 (Wet Cl2/Dry Cl2), NCl3 (Ammonia), Measurement of hydrogen in wet chlorine, along with brine analysis (ammonia, Ca/Mg, caustic, and carbonate).	Southdown (4th Floor)
9:20 AM	Wireless Chlorine Monitoring	Bud Dungan	Gastronics, Inc.	Our discussion will address considerations for the implementation of a wireless gas detection system in the plant environment. I will address radio technologies (UHF vs. ISM), interferences, such as high-power lines, metal structures, weather, etc. Communicating with DCS systems as well as notification systems. We have been providing these systems since year 2000 to large chlorine producers.	Southdown (4th Floor)
9:50 AM	Break	Break	Break	Break	Southdown (4th Floor)
10:20 AM	Impact of Lithium Market to the Chlor-Alkali Industry	Fiorella Sist and Scott Cooper	Hargrove Engineers and Constructors	With the growing demand of critical minerals for manufacturing battery-grade materials for the electric vehicle industry, there has been a rise in DLE (direct lithium extraction) projects worldwide. This rise has increased the demand for certain chlor-alkali products. In this presentation, we explore the potential size and geographical areas of the growing lithium market and correlate how it will impact the demand for chlor-alkali products.	Southdown (4th Floor)
11:00 AM	Best Practices For Brine Analysis	Azade Zaretabibi and David Miyamoto	Kuehne Company	This presentation will be about the best lab practices regarding brine analysis. Brine serves as the starting material for the production of both chlorine and sodium hydroxide and the analysis of brine is one of the main keys in the chlor-alkali plants.	Southdown (4th Floor)
11:30 AM	Break	Break	Break	Break	Southdown (4th Floor)
1:00 PM	Optimum Brine Softening – Lewatit® Chelating Resins for Membrane Cell Electrolysis.	Wilson Nova Ruiz and Gerard Venema	LANXESS Corp	Membrane Cell Electrolysis requires increasingly higher quality feed brine as the current density (kA/m2) increases, electricity costs escalate, and membrane useful service life expectations push the performance envelope. Brine Softening Process Technology can provide brine quality to optimize electrolyzer performance. Optimum Brine Softening requires pretreatment, pH control, temperature control, and residual free chlorine removal prior to a polishing ion exchange unit. Ion exchange polishing removes only soluble and ionic hardness cations coming from pretreatment. Careful attention to process design, operating conditions, and a higher performance resin for the application can produce electrolyzer brine quality with < 5 PPB residual hardness.	Southdown (4th Floor)
1:40 PM	Filtering Brine for Chlor-Alkali Service	Stefan Strasser and John Astle	Lenzing Filtration & AV-Group joint presentation	Presentation details a pilot project for Lenzing-Filtration's CakeFil technology. Existing filtration is performed by two parallel plate filters. Due to coarse support of filter cake, the need for precoat is imperative. Manual operation and occasional power outages would interrupt the filter cake and lead to fouling of the downstream IX-System. CakeFil is a fully automatic system with a patent pending backwash process that allows for unmanned operation and efficient backwash of a fine filter cloth, sufficient to support particles even without precoat. The paper describes the experiences during a pilot phase with various operation modes that include filtration with and without filter aid.	Southdown (4th Floor)

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Wednesday, April 10, 2024					
List By Room					Room ↓
2:20 PM	HCl Synthesis Performance Recovery Project	Rob Grooms	CG Thermal	CG Thermal was approached by a chlor-alkali plant that regularly produces sodium hypochlorite bleach for use in a variety of applications including laundry bleach, swimming pool applications, and industrial use. In addition to the hypochlorite, the facility also has an HCl synthesis system to utilize Cl ₂ not used by the hypochlorite process. Their original HCl synthesis produced 15 STPD @ 32 % wt but over time, the output was greatly reduced. With disassembly and refurbishment looming, the plant was desperate for alternate solutions, in hopes of avoiding the inevitable unforeseen issues and costly downtime associated with a shutdown. The CG Thermal Systems Group designed and manufactured a successful solution to eliminate the need for disassembly of the unit by providing a combination of process design, equipment design, the addition of a Umax Advanced Ceramic heat exchanger, and thorough project management. The result allowed for the plant to regain its lost capacity, increase product concentration, avoid refurbishment, and increase unit stability.	Southdown (4th Floor)
2:50 PM	Break	Break	Break	Break	Southdown (4th Floor)
3:20 PM	How to Detect Short Circuits and Damaged Membranes in Chlor-Alkali Cells before	Helmut Lademann	R2	When chlor-alkali cells are in operation, it is possible to detect short circuits and damaged membranes with the analysis of the single cell voltages. An autonomous SIL2 certified safety instrumented systems is available that analyzes the cell integrity in real-time and automatically triggers the shutdown of the power supply. Unfortunately, this strategy is only applicable when the electrolyzer is in normal operation. This presentation focuses on different methods for detecting cells with internal or short circuits to ground or with damaged membranes while the electrolyzer is idled or not in normal operation, to prevent explosions or cell damage when switching on power or increasing the load.	Southdown (4th Floor)
4:00 PM	Chlorine Gas Sampling in Cell Room	Adeline Christmas	INEOS Electrochemical Solutions	Understanding the composition of chlorine cell gas in a chlor-alkali electrolyzer is vital for both performance evaluation and ensuring plant safety. Due to the gas composition, precise analysis and sensitivity require the use of a gas chromatograph. However, acquiring accurate and reliable data on chlorine gas is a challenging endeavor. Obtaining high-quality chlorine gas data is often beset with numerous obstacles. To address these challenges and promote best practices, the presentation aims to offer insights into sample port design, gas chromatograph equipment options, sampling procedures, and result validation. Online equipment will not be covered in the presentation.	Southdown (4th Floor)
4:40 PM	Accelerated Corrosion Of Iron With Dry Chlorine At Elevated Temperatures	Steven Ottobre and JJ Hiemenz	k2 Pure Solutions	Is 300°F (150°F) the true limit for dry Cl ₂ in steel service, or are there other things to consider? This is a presentation previously given at Cl by JJ (author) and myself, but a good reminder about the importance of established operating limits, the (sometimes) ambiguity of these limits, and the dangerous potential of our decision-making. This is a presentation told in the form of a case study and breaking down the fundamentals of chemistry and engineering to determine if it's safe to operate at certain limits.	Southdown (4th Floor)
Borgne					
8:00 AM	Safe Evacuation of Chlorine from Chlorine Tonners	Rajasekar Jayanandhan and Balasubramanian Elamaran	Al Kout Industrial Projects Ltd	Filled chlorine ton container (tonner) valves get corroded, choked and become inoperable due to various reasons at the customer sites. In order to release the chlorine, various methods tried to release the chlorine to a closed suction loop inside a safe evacuation room. The various safe innovative methods tried for emptying the tonners inside our company will be discussed.	Borgne
8:40 AM	Chlorine Container Leak Mitigation for Small End Users	Dan Thompson and Rudy Caparros,	Dan Thompson PE LLC	A typical chlorine manufacturer, repackager or larger end user of chlorine often will have available a scrubbing system. These systems serve many purposes, but one of them is often scrubbing of chlorine that is either purposely purged, or possibly during mitigation of a chlorine leak. These systems are often too expensive and beyond the capabilities of a small end users staff to operate and maintain. A potential option for these small users is total containment of their container. This presentation is to raise awareness of the total containment option of chlorine supply containers that is available for smaller chlorine users.	Borgne

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Wednesday, April 10, 2024					
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9:20 AM	Lessons Learned in Nonmetallic Construction Equipment Reliability	Michael Yee	RT CONSULTS PLLC	Nonmetallic materials such as FRP/GRP, rubber linings, and lining used in industrial plants pertaining to piping and tanks can perform well in a corrosive environment with proper oversight. The design, fabrication, inspection, and maintenance of nonmetallic construction are important key requirements. Furthermore, the qualification of materials and testing is necessary to complement the specification and material selection for optimum performance. In addition, the presentation will go into case studies and lessons learned from successful projects covering the importance of inspection and quality assurance for reliable service life.	Borgne
9:50 AM	Break	Break	Break	Break	Borgne
10:20 AM	Best Available Technology for Sodium Hypochlorite Storage Tanks	Michael Stevens and Kevin Lambrych	INEOS Composites	Sodium hypochlorite disinfection has become the most common chemical treatment for waste water in North America. With the ever-heightening scrutiny around transportation of chlorine, manufacturers are choosing to transport concentrated bleach instead. Waste water treatment facilities and sodium hypochlorite manufacturers have a variety of construction materials from which to choose when designing storage tanks for this corrosive chemical liquid. Fiber reinforced thermoset polymers (FRP) have become the industry standard for hypo storage tanks as it is quite economical and gives remarkably long service life. When the best resin and cure system are selected, and the fabrication design is optimized, FRP tanks will often last for decades. This paper will demonstrate best available technology for FRP tanks in sodium hypochlorite service based upon laboratory testing and extensive field service in multiple locations.	Borgne
11:00 AM	Improper Materials of Construction-How Small Errors Cause Operational Disruptions.	Folashade(Sade) Healy	NYC DEP	We will review back to the basic lessons learned of material incompatibility in highly chlorinated water. A secondary review of design, construction, and preventative maintenance can avert future incidents.	Borgne
11:30 AM	Break	Break	Break	Break	Borgne
1:00 PM	Safe Operation of Chlorine Compressors	Andreas Fischer and Derk Jan Bolks	Siemens Energy Global	Safe operation of chlorine compressors starts with considering the life cycle and understanding how chlorine compressors can be operated safely and what steps should be taken to avoid incidents during operation. Important topics are compressor solutions and services which include maintenance, inspections and repairs, overhauls, customer technical support, remote diagnostic service, customer training, revamps and retrofits, and spare parts management. Use of compressor solutions and services for continuous and uninterrupted operation allowing inspection and maintenance to be synchronized with general plant or asset maintenance schedules. Plant personnel should know how to operate chlorine compressors safely and what measures should be taken to avoid	Borgne
1:40 PM	The Importance of Industrial Data Engineering	Flávio Maeda and Kinley Moore	AFRY Engineering USA	Data has become the most important resource of the new digital economy in the so-called fourth industrial revolution. However, like oil, this resource is only valuable if it is efficiently extracted, processed, stored, and distributed. Studies show that only 20% of the huge volumes of data generated by industrial operations are effectively used and transformed into actionable information. In the presentation the importance of Industrial Data Engineering will be highlighted to increase reliability, quality, and safety of chlor-alkali and related plants.	Borgne
2:20 PM	Mist Eliminators in Chlor-Alkali Service	Doug Azwell	Elessent Clean Technologies	In chlor-alkali production, MECS® Brink® mist eliminators are used to remove soluble salt and acid mist carryover to protect downstream process equipment, thereby reducing maintenance and improving product quality. These passive devices often reveal the first signs of process deviations and can provide early detection of pending process woes. MECS® contributes more than a half century of process and installation troubleshooting experience. In this presentation, we will examine root causes and potential solutions related to equipment, installation, and operational issues in chlor-alkali production.	Borgne
2:50 PM	Break	Break	Break	Break	Borgne

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Wednesday, April 10, 2024

List By Room

Room ↓

3:20 PM	Hypochlorite Storage Tanks – Design and Fabrication in Titanium	Charles Young and Peter Philippon	Tricor Metals	In the last several years, titanium has seen increasing usage as the corrosion-resistant material of construction (MOC) for bleach (hypochlorite) API storage tanks in the chlor-alkali industry as well in public utilities' water treatment facilities. One reason is that titanium has excellent corrosion resistance and offers extremely long life in this service. While the initial cost of a titanium storage tank may be higher than alternative MOCs, the life cycle cost can be shown to be much lower, thus leading to a lower cost for the life of the plant or facility. This presentation will discuss the design and fabrication of a typical titanium tank used for bleach storage, including a review of tanks with flat tops, coned tops and open-top tanks, all with flat bottoms designed to be set on a concrete pad. Designing to ASME Code requirements will be discussed, as will common fabrication techniques – for both shop-fabricated and on-site, field-fabricated tanks. Numerous photographs will be used to show some of these steps. In addition, a discussion of the methods for comparison of life cycle costs (on a ratio basis), for a titanium tank versus another common MOCs, will show that titanium should really be considered for all bleach storage tanks -- where long, maintenance free life is required. Finally, a number of actual titanium tank installations, both shop fabricated and on-site-field fabricated, will be described with photographs showing design and fabrication details.	Borgne
4:00 PM	New Chlorine Storage Material Based on Polychlorides	Sebastian Hasenstab-Riedel	Freie Universität Berlin	In the last years, our workgroup developed new ionic liquids which are able to store chlorine. Based on alkyl ammonium chloride salts, a safe and sustainable chlorine storage media can be prepared. The most promising candidate, [NEt3Me]Cl, stores up to 0.79 kg chlorine/kg storage material, is readily prepared, and stable against chlorination for extended times. The ionic liquid can also be handled on air. Chlorine release can be achieved by applying heat or vacuum, or, alternatively, by the addition of water, etc. The combination of these properties emphasizes [NEt3Me]Cl as a suitable storage medium to facilitate the flexibilization of industrial chlorine production. As polychlorides can be used for various chlorination reactions, a combined industrial process is envisaged utilizing [NEt3Me]Cl as the storage medium and the loaded system, as the reagent for industrial chlorination's as e.g. shown by the synthesis of phosgene.	Borgne
4:40 PM	Combating Corrosion In Hydrochloric Acid Synthesis	Mark Grasso	APEX Engineered Products	This presentation will address potential failures owing to corrosion, factors attributing corrosion, nature of corrosion, prevention of corrosion in HCl unit, precautionary measures to check corrosion with a focus on graphite a material, expedient to combat corrosion in down stream chlorination.	Borgne
Napoleon D1-D2					
8:00 AM	Emergency Shut-off Systems for Chlorine Bulk Transfer - A Pamphlet 57 Overview	Steve Bursmith	CHEMFLOW Products, LLC	Chlorine bulk transfer is a critical operation for the chlorine producer, consumer and re-packager. This presentation will review the components that make up a Pamphlet 57 (Emergency Shut-Off Systems for Bulk Transfer of Chlorine) system, with emphasis on the proper application of each component. The attendee will come to better understand Pamphlet 57 and leave with ideas for improving / upgrading their system.	Napoleon D1-D2
8:40 AM	Metallic Chlorine Hose Assemblies: Design, Testing, and Installation	Matthew Smith and Timothy Wilkinson	Omega Flex, Inc.	This presentation will discuss the design with Monel and Hastelloy, including schedule 80 end fittings, Type A lap joints, and 300 Class ASME flanges. Additionally, there will be a discussion on hose testing and proper paperwork certification. The presentation will conclude by discussing the correct installation of chlorine hose assemblies and the recommendations from Pamphlet 6) Piping Systems for Dry Chlorine.	Napoleon D1-D2

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9:20 AM	PFA Lined Ball Valve and Chlorine Valve Offerings	Joe Becherer and Emanuel Guerreiro	TransQuip USA	PFA Lined Ball Valve Fort Vale has taken its very successful ISO PFA lined ball valve and brought it to the AAR. Designed using a two-piece 316 stainless body, this PFA lined valves comes with a choice of a Zirconium ball & stem (specifically engineered for HCl and abrasive services) or the more fungible (chemically compatible) PFA lined ball & stem. Offered in a 2- and 3-inch bodies, this valve offers higher flow rates the alternative designs and improved loading/ unloading times, which in turn improves safety. These valves include innovative sealing systems and have been designed to reduce repairs and overall maintenance and scheduled repairs. Chlorine Package Fort Vale in conjunction with the leading AAR chlorine shippers has designed a new chlorine package. Uniquely this design meets Pamphlet 166 & 049, Eurochlor GEST 17 492 e2 and EU fugitive guidance. This package (angle, check & safety valves) resolves all the known structural and operational weakness with existing options, numerous safety features, and increased loading and unloading flow rates for greater efficiencies. These valves have also been designed to reduce repairs and overall maintenance and scheduled repairs.	Napoleon D1-D2
9:50 AM	Break	Break	Break	Break	Napoleon D1-D2
10:20 AM	Best Practices for Bolted Flange Joint Root Cause Analysis	Tim Rice	VSP Technologies	In the chlor-alkali industry, the significance of proper root cause analysis for bolted flange joint failures/leaks cannot be overstated. These failures pose considerable risks, making practical analysis crucial. This presentation underscores the importance of identifying common failure modes and limiting factors through experience, enabling the development of best practices for more robust engineering and assembly techniques. By leveraging this knowledge, the chlor-alkali industry can enhance root cause analysis and overall reliability, mitigating the impact of failures on future similar applications and contributing significantly to the industry's safety and operational integrity.	Napoleon D1-D2
11:00 AM	UHMW Solutions that are Born from Innovation	Brandon Becherer and David Bass	TransQuip USA	Corrosion is something that is inherent for chlorine derived chemicals. For years, the industry has resorted to lining or coating metallic fittings to provide protection against corrosion. Such linings and coatings can be expensive, labor intensive, and have not always performed as expected. As technology has evolved, we have developed more non-metallic core fittings into the transportation industry to provide safer, longer lasting solutions. By incorporating a new, patented interlocking system of metallic reinforcements, PolyPetroChem has developed a solid, non-metallic core manway for rail and tank trailer transportation. The UHMD Products are designed to provide a safer and secure transportation package.	Napoleon D1-D2
11:30 AM	Break	Break	Break	Break	Napoleon D1-D2
1:00 PM	The Total FRP QA Program – A Proven Plan for Reliability	Darryl Mikulec	Maverick Applied Science, Inc.	FRP, "Fiberglass Reinforced Plastic", is the material of choice for many chlor-alkali services. This is due to its natural corrosion resistance in acidic and alkali media. Additionally, FRP offers significant cost benefits compared to other high alloy material options. Still, because of its unique material construction and behavior, it demands a broader understanding of these materials to achieve consistent performance and expectations. The presentation drills down on the execution for FRP projects and lays out a roadmap for FRP project execution that has proven to consistently achieve project success and extended service life for FRP equipment and piping systems. This discussion will begin with development of quality specifications and carry through construction and startup with an objective of long-term reliable performance.	Napoleon D1-D2
1:40 PM	Extended FRP Lifetimes With ECTFE Veil In Corrosive Environments	Rafic Moubarac and Ray Whitby	Rafic Moubarac and Monadnock Non Woven LLC	Surface veils such as C-glass veil or polyester (PET) veil have been used in corrosion barriers for Fiberglass Reinforced Plastic (FRP) equipment. In severe aggressive environments, a fluoropolymer Ethylene chlorotrifluoroethylene (ECTFE) veil can provide a better and longer corrosion resistance with an increased physical properties retention for the corrosion barriers of FRP equipment. This should result in extended life of the FRP corrosion barrier. Case histories will be shown, comparing corrosion data between veil types in aggressive chemical environments have shown evidence that the ECTFE veil outperforms other veils.	Napoleon D1-D2

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Wednesday, April 10, 2024					
List By Room					Room ↓
2:20 PM	Aim Closer to Zero: Unlocking the Collective Power of Consistent Communication and Collaboration	Kathy Green	CargoCheck	Through interactive scenarios, real-world case studies, and hands-on discussions, we explore how communication breakdowns often lie at the core of chemical safety and security incidents, such as accidental mixing during bulk unloading. Achieving 'aim for zero' incidents within a single organization can be challenging, and it becomes even more complex when communicating between shippers, carriers, and receivers -- many of whom experience high employee turnover. This session offers a platform for collaborative learning to unlock the problem-solving potential of collective action. Join the conversation to help drive best practices at the intersection of physical/digital safety and security.	Napoleon D1-D2
2:50 PM	Break	Break	Break	Break	Napoleon D1-D2
3:20 PM	The Success of Blended Chlorobutyl-Natural Rubber Lining for the Vapor Space in HCl-Carrying Rail Cars	Joseph Khouri and Ted MacMillan	Polycorp	Natural rubber linings are integral for the transportation of hydrochloric acid in rail cars across North America. The linings harden from a chlorination reaction which improves HCl absorption resistance. Natural rubber, however, does not offer the best gas permeation resistance and HCl vapors can harm the ceiling at a faster rate than the rest of the car. The HCl vapors can lead to the rubber cracking and chunking from the liquid grazing the ceiling during transportation. In this presentation we discuss how a blended chlorobutyl – natural rubber solves the chunking problem in the vapor space of rubber lined rail cars.	Napoleon D1-D2
4:00 PM	Enhancing Bolted Flange Joint Reliability with ASME PCC-1 - 2022	Ben Waterland	VSP Technologies	Proper training is fundamental to maximizing bolted flange performance and long-term reliability. Expecting optimal operational efficiencies through procedure proclamations is both unrealistic and unsafe. End users have experienced the pitfalls of prescriptive procedures that fail to incorporate first-hand training and consistent on-site process review. Training has the most significant impact on the reliability of bolted flange joints, and it starts with the plant's Subject Matter Experts. The recently issued ASME PCC-1 – 2022, Pressure Boundary Bolted Flange Joint Assembly Standard, offers clear direction and guidance regarding the prerequisites for an effective and practical hands-on bolted flange joint training program. By developing and implementing an ASME PCC-1 training program, End Users have eliminated the majority of bolted flange joint leaks. This presentation shows how an End User can set up a successful ASME PCC-1 training program.	Napoleon D1-D2
4:40 PM	Manual and Pneumatic Dual Valves for Chlorine and AHCl Rail and Road transport	Mark Fucich and Ross Aguilar	Descote	Descote is a French valve manufacturer (CI Member since 1985) with a long and deep history in the North American supplying dry chlorine and dry HCl process valves and transportation valves to producers and consumers since 1985. In the early nineteen nineties, Descote completed service trials on its range of bellows seal globe type valves in the Chlorine Institute mission chemicals and other "TIH" - Toxic by Inhalation Chemicals. Descote received the updated M-1002 certification as well as passed the M-1003 audit in September 2023. The purpose of this presentation is to update the CI Members and guest on the technology of "POV" – Pneumatically Operated Valves dual valves for rail and road service (P-168). This presentation will also provide updates on Descote's manually operated dual valves and well as a standard angle valve all utilizing bellows seal technology.	Napoleon D1-D2
Napoleon D3					
8:00 AM	The Importance of Electrode Coating Diagnostics for Extended Safe Operations	Josh Kelley	De Nora Tech	This presentation will cover an overview of the tools and theories behind anode and cathode electrode coating diagnostics. We will discuss the specialized equipment used during in-field, non-destructive testing, in addition to more destructive testing reserved for a laboratory setting. We will help explain the ideology and knowledge the user can gain from each of these investigation tools and methods. This understanding of the electrode condition will help the user continue a prolonged, safe operation of their electrolyzers, or can be utilized as a retroactive investigative mechanism to help future operations.	Napoleon D3

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List By Room				Room ↓	
8:40 AM	Increased Oxygen Liberation from Electrolyzers in Chlorine Gas	Muzzamil Shahzad and Waqas Butt	Engro Polymer and Chemicals Limited	This paper delves into the new-found findings during start-up EPCL's Electrolyzers and their membranes after a technology upgrade (from finite gap to Zero Gap). In the startups of newly installed Zero Gap technology electrolyzers a notable increase in oxygen content within chlorine was observed, reaching 18%. This raised concerns as such high oxygen levels posed a potential explosion risk in the downstream Low Temperature Chlorination (LTC) Reactor within the Vinyl Chloride Monomer production chain. In the investigation of the anomalous phenomenon, it was found that the increase of oxygen at the LTC reactor with Zero Gap Cells energization is a "Startup phenomenon" with new membranes of Zero Gap cells, where due to unconditioned membranes, brine outlet pH remains high at 12 even with 3 KAs of load on the Electrolyzer. This means that during this interval of new membranes commissioning with Zero Gap cells, oxygen will abnormally increase towards the LTC reactor. Hence the controlling of oxygen in this case, is only possible by load reduction at the LTC reactor to minimum only when "New membranes Installed Zero Gap cell" is commissioned.	Napoleon D3
9:20 AM	Coating Application and Lifetime	Terry Powell and Erik Zimmermann	Permascan d	Electrolysis has been around since the 1800's with the large focus being the concept and the equipment used. An important component of electrolysis is the electrode. The evolution of the chlor-alkali industry can be attributed to the development of the electrode and the introduction of coating systems. Permascan will discuss how the manufacturing and application process of the coating systems can impact performance of your electrolyzers while also including sustainable life cycle considerations, both present and future.	Napoleon D3
9:50 AM	Break	Break	Break	Break	Napoleon D3
10:20 AM	Diaphragm Cell Room Safety	Karen Hueda	De Nora Tech	We will discuss about the critical safety aspects that must be addressed in a diaphragm cell circuit design and operation.	Napoleon D3
11:00 AM	Implementation of ASME FRP Tank and Piping Standards for Maximum Benefit and Performance	Jeff Eisenman	Maverick Applied Science, Inc.	ASME RTP-1, Reinforced Thermoset Plastic – Corrosion Resistant Equipment, was first published in 1991 to establish requirements and guidance for the qualification, design, fabrication, and inspection of FRP tanks. In 2018, ASME published the first edition of NM.2, Fiber-Reinforced Thermosetting-Resin Piping Systems. FRP piping and equipment are essential elements for managing the corrosive services in chlor-alkali processing. In this presentation we will discuss the requirements and the benefits of these standards. These standards are robust and can be very impactful in the execution of an FRP project. We will share the details of these standards to improve specifications, equipment quality and installation for operation. The goal of this discussion is to leverage the benefits of these standards to maximize equipment reliability.	Napoleon D3
11:30 AM	Break	Break	Break	Break	Napoleon D3
1:00 PM	Development of Low Voltage Membranes	Katie Jarvis	AGC	The presentation will cover the development of the FLEMION membrane over the years. It will explain the differences in the different grades and describe their applicability in various settings and in different electrolyzer technologies. The journey in membrane design toward low voltage, high current efficiency, mechanical and chemical durability and stable performance will be discussed. Some basic membrane design & operating condition effects will be covered as a foundation.	Napoleon D3
1:40 PM	Technical Approach for Membrane Care	Michael Pope and Ryouta Nagatomo	Asahi Kasei	This presentation outlines a comprehensive technical strategy to prevent membrane damage in industrial applications. We introduce mechanisms of membrane damage that can occur through flushing and acidification, and how to prevent them. We hope that these methods will allow for stable, long-term use of the membranes and the continuation of high performance in your plant.	Napoleon D3
2:20 PM	Electrical Isolation Design & Monitoring for Membrane Cell Electrolyzers	Biling (Ruby) Nojiri and Ismail Boussag	thyssenkrupp nucera USA Inc.	Electrical isolation (a.k.a. insulation) of membrane cell electrolyzers is a critical factor in the safe operation of this technology, which is too often taken for granted. The key technical requirements of a correctly designed electrical isolation and the results of an actual failure at a site to provide and/or maintain the correct isolation are presented (e.g., fire and explosion). Finally, a detection system to indicate an improper isolation design, or a failure or fault in a correctly designed isolation system, is presented.	Napoleon D3
2:50 PM	Break	Break	Break	Break	Napoleon D3

NOTE: All presentation time slots last for 30 minutes total. There is a 10-minute transition time for consecutive presentation slots.

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Wednesday, April 10, 2024

List By Room

Room ↓

3:20 PM	Piping Materials of Construction in the Chlor-Alkali Environment	Michael Stevens and Lisa Adkins	INEOS Composites	The chlor-alkali process areas are hazardous environments that require close attention to use of the correct materials of construction for piping. These materials must be able to perform in highly acidic and caustic conditions across a wide range of temperatures and pressures. The various types of piping materials are reviewed; advantages and disadvantages discussed; expected lifespans shown; failure mechanisms presented, and case histories of these materials illustrated. The focus of this presentation is on fiberglass resins and dual laminate piping, but metal piping standards are discussed.	Napoleon D3
4:00 PM	Piping in Membrane Electrolyzer Catholyte Circulation	Steven Ottobre	k2 Pure Solutions	Common piping in catholyte loops is either expensive (nickel) or not reliable and possibly dangerous (plastic). Many chlor-alkali plants are commonly built with the less expensive options, but this can lead to unplanned failures and potentially dangerous releases of caustic and hydrogen gas. This presentation is aimed at exploring the existing options used in the industry, their effectiveness, and the advantages/disadvantages.	Napoleon D3
4:40 PM	Fitness for Service Assessment of FRP and Composite Assets	Tom Shewfelt	UT Comp	Fitness for Service of FRP or FFS, can be described as the ability of an asset to continue in service as it was intended by its design. Fitness for Service assessments of FRP have often been overlooked in the chemical manufacturing or processing environments due to a lack of understanding of how to determine this and a lack of codes and standards available that outline the criteria required to determine the FFS of the FRP asset. FFS is integral with reliability of equipment and processes but it also has a major effect on the safety and environment of the facilities, people and surrounding areas. The ability to perform effective FFS assessments has now improved as there are new guidelines recently published in the form of the Welding Research Council's "WRC601 – Assessment of Existing Fiber Reinforced Polymer Equipment for Structural Damage". There are also upcoming additions to API codes outlining Fitness for Service of FRP equipment. This presentation outlines the connections between Fitness for Service, available codes and health and safety.	Napoleon D3

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