SILICA IN THE OILFIELD SUMMIT 2.0 AGENDA

April 13, 2021

Time (ET)	Speaker	Organization	Presentation Title
12:00–12:05 pm	Bradley King	NIOSH	Welcome
12:05-12:15 pm	John Howard	NIOSH	Opening Remarks
12:15–12:45 pm	Todd Jordan	OSHA	OSHA Update on Respirable Crystalline Silica Activities
12:45–1:15 pm	John Snawder	NIOSH	Update on NIOSH Silica Exposure Assessment Field Work
BREAK (5 minutes)			
1:20–1:50 pm	Emanuele Cauda	NIOSH	In-Field Silica Sample Analysis Methods
1:50–2:20 pm	Budd Phillips	WorkSafeBC	Silica Exposures in the Oil and Gas Industry in British Columbia, Canada - A Historic Perspective
2:20–2:50 pm	Robert Waterhouse	Energy Safety Canada	A Human and Organizational Performance Perspective on Silica Exposures in the Oil and Gas Industry
BREAK (10 minutes)			
3:00–3:30 pm	Andy Cecala	NIOSH	Mining Dust Control Technology with Potential Application for the Oil and Gas Industry
3:30–4:00 pm	Jim Deister	Calfrac Well Services	Calfrac's 10 Year Journey in Responding to Silica Regulations and the Need for Controls in the Oilfield

April 14, 2021

Time (ET)	Speaker	Organization	Presentation Title
12:00–12:05 pm	Bradley King	NIOSH	Welcome
12:05–12:30 pm	Tom Thorn	Arkema-Arrmaz	The Benefits of a Proppant Dust Control Coating to Reduce Silica Exposure
12:30–12:55 pm	Brian Dorfman	PropX	Here's the Dirt on Silica Dust Mitigation
12:55–1:15 pm	Bradley King	NIOSH	Introduction to www.silica-safe.org
BREAK (10 minutes)			
1:25–1:50 pm	Brendan Gilbert	Solaris Oilfield Infrastructure	Driving Compliance through Automation & Integration
1:50–2:15 pm	Greg Bierie	Benetech	Cutting Edge Technologies for Silica Dust Control
2:15–2:40 pm	Shawn Furlong	Source Energy Services	Source Energy's Solution to Wellsite Silica Dust
BREAK (5 minutes)			
2:45–3:15 pm	Kalie Boot and Ian Wilson	Ovintiv USA Inc.	Wet Sand as a Silica Dust Control: Performance and Logistics Compared to Existing Controls
3:15–4:00 pm	*Moderator:* Kyle Krueger *Panelists:* Anna Omsberg James Coleman	Probability Matters host Ovintiv USA Inc. Pioneer Natural Resources	Panel Discussion: Implementation of Controls from Management Perspective

SILICA IN THE OILFIELD SUMMIT 2.O ABSTRACTS

Todd Jordan, Director, OSHA Health Response Team: "OSHA Update on Respirable Crystalline Silica Activities"

- *Abstract*: This presentation will provide an update of OSHA activities and initiatives related to respirable crystalline silica (RCS). This will include an overview of the OSHA Directive issued in 2020 that establishes OSHA's field inspection and enforcement procedures for the RCS standards. This will also include a discussion of the obligation to implement engineering controls to limit silica exposures to the new PEL in hydraulic fracturing operations in the oil and gas industry by June 23, 2021. Additionally, an overview of the current National Emphasis Program to identify and reduce worker exposures to RCS in specific industries (including oil and gas) which are expected to have the highest exposures to RCS. Finally, a brief summary of inspection activities and OSHA sampling data for RCS in the oil and gas industry will also be shared.

John Snawder, Toxicologist, Co-Director NIOSH Center for Direct Reading and Sensor Technologies, NIOSH: "Update on NIOSH Silica Exposure Assessment Field Work"

- *Abstract*: NIOSH has been conducting field studies to evaluate worker exposures to respirable crystalline silica (RCS) during hydraulic fracturing for more than ten years. Early findings from this research identified several sources of airborne RCS and demonstrated that hydraulic fracturing operations present a substantial risk for exposure to RCS for some workers. The oil and gas industry has been taking positive steps to reduce exposures through administrative and engineering controls. NIOSH research is continuing to evaluate effectiveness of these control solutions using a comprehensive approach of real-time and traditional occupational exposure assessment methods.

Emanuele Cauda, Engineer, Co-Director NIOSH Center for Direct Reading and Sensor Technologies, NIOSH: "In-Field Silica Sample Analysis Methods"

- *Abstract*: Monitoring the exposure and concentration of respirable crystalline silica in the Oil and Gas industry is the first step in the effort to reduce and minimize the exposure of workers for this hazard and the associated health effects. Traditional monitoring techniques are accurate, but they don't provide timely information to the user for prompt interventions. Field-based monitoring approaches can be considered complementary tools for industrial hygienists and health & safety professionals to generate needed information and knowledge on this hazard. This presentation will describe a number of field-based monitoring tools developed and in-use at NIOSH during field studies.

Budd Phillips, Regional Service Manager, WorkSafeBC: "Silica Exposures in the Oil and Gas Industry in British Columbia, Canada - A Historic Perspective"

- *Abstract*: Budd Phillips will provide a regulators' perspective of silica exposures experienced in the northeast portion of British Columbia over the past decade. This region contains the majority of oil and gas deposits in the province. The evolution of silica exposures and resulting controls created by industry will be explored. From raising awareness during routine inspections utilizing a NIOSH bulletin on silica, to identification of the primary issues, engagement with industry, monitoring and oversite, to understanding industry's positive response and ownership to create effective controls.

Robert Waterhouse, Industry Development Program Manager, Energy Safety Canada: "A Human and Organizational Performance Perspective on Silica Exposures in the Oil and Gas Industry"

- *Abstract*: Robert Waterhouse will provide a brief overview of Human and Organizational Performance and review a number of case studies involving silica exposure where workers seemingly made poor choices in the control of silica. The audience will be encouraged to reflect on how they can setup frontline workers to be more successful in the control of silica exposures for their oil and gas exploration activities.

Andrew Cecala, Mining Engineer, NIOSH: "Mining Dust Control Technology with Potential Application for the Oil and Gas Industry"

- *Abstract*: The mining program within NIOSH conducts research to develop and evaluate control technologies that can reduce the respirable dust exposure of mine workers. A handbook published by NIOSH in 2019 summarizes these control technologies. A number of these controls have the potential for reducing respirable silica dust levels for workers in the oil and gas industry. A brief overview of the handbook and more in-depth discussions of specific controls (including filtration/pressurization systems for enclosed operator cabs, Helmet-CAM technology, dust sensor technology and smart systems (on-going research)) will be presented.

James Deister Jr., HSE Manager US and Global Operations, Calfrac Well Services: "Calfrac's 10 Year Journey in Responding to Silica Regulations and the Need for Controls in the Oilfield."

- *Abstract*: Jim Deister will provide a service company's perspective on incorporating silica regulations while working with the hierarchy of controls. The OSHA regulations passed in 2016 were tied to deadlines for the hydraulic fracturing industry in 2018 and 2021, causing a multitude of challenges. Many of those challenges took place with different sand delivery systems and customers at times controlling which systems were deployed, which resulted in variances with employee silica exposures. Calfrac moved its 3rd party silica sampling program in house, developed silica exposure control plans, a medical surveillance program, written exposure assessments and assessed changes in PPE all while evaluating different engineering controls. Employee training became critical on the why and how of reducing silica exposures.

Tom Thorn, Commercial Manager, Energy Division, Arkema-ArrMaz: "The Benefits of a Proppant Dust Control Coating to Reduce Silica Exposure."

- *Abstract*: Hydraulic fracturing operations in the oil and gas industry must implement engineering controls to limit worker exposure to respirable crystalline silica by June 23, 2021. This presentation will help companies prepare for the implementation date by discussing:
    - Important criteria that must be considered to effectively evaluate different engineering control options
    - The benefits of an engineered proppant coating to help meet silica dust permissible exposure limits
    - The impact of sand characteristics on the selection and performance of proppant coatings

Brian Dorfman, Vice-President–Operations, PropX: "Here's the Dirt on Silica Dust Mitigation"

- *Abstract*: PropX is a technology company that provides unique equipment & services to support the oilfield frac sand logistical demands. The PropX system removes all pneumatic transfer of sand and delivers the product via gravity feed to an enclosed conveying system. Recent PropX developments related to reducing or eliminating entirely the employee exposure to silica dust at the wellsite include enclosed positive air displacement operator booths & automated box open/close systems. Furthermore, PropX is the only company in the space that has a commercial solution to using wet sand at the wellsite. This process removes the energy intensive and operationally complex process of drying the product while eliminating silica dust exposure from the mine to the wellhead. This is a definitive solution to the silica dust exposure challenge the industry faces.

Bradley King, Industrial Hygienist, NIOSH: "Introduction to www.silica-safe.org"

- *Abstract*: The website 'Work Safely with Silica' (www.silica-safe.org) is a one-stop source of information to help contractors, workers, and other stakeholders prevent silica-related illnesses. Originally developed specifically for the construction industry by CPWR, a NIOSH partner supporting construction research and training, the website has been expanded with content for the oil and gas industry. This site includes tools and information needed to identify silica hazards, understand the health risk, and find equipment and methods to control the dust. Users will also find information on regulatory and voluntary efforts to minimize silica exposures as well as a central place to share successes and challenges.

Brendan Gilbert, Senior Vice President of Service & Quality, Solaris Oilfield Infrastructure: "Driving Compliance through Automation & Integration"

- *Abstract*: Solaris will lead off its presentation with how we have used Appendix G of OSHA Instruction Directive No. CPL 02-02-080 to guide our engineering & behavior initiatives. We will discuss the specific variables that apply to Solaris' area of operation and control. This will include a brief discussion of our approach to sampling and some aggregated results of testing we have done thus far. Finally, we will discuss how we have aligned our engineering & behavior controls to the principles of the Dust Control Handbook for Industrial Minerals Mining and Processing, with a brief description of the controls we have engineered & designed. Automation and standardization will be themes interwoven throughout.

Greg Bierie, Technical Sales & Marketing Specialist, Benetech: "Cutting Edge Technologies for Silica Dust Control"

- *Abstract*: Benetech, Inc. of Aurora, IL is collaborating with researchers at NIOSH to develop solutions to address the issue of silica dust abatement and personnel safety in the workplace. Cutting-edge technologies manufactured and offered by Benetech are being combined with novel research products developed by NIOSH researchers. These technologies will address silica dust mitigation and meet or exceed regulatory guidelines for silica dust control. These innovative new technologies will focus on engineering controls to accomplish advances in collection, containment, and suppression along with dust sensing, as well as web-enabled sensors and controls to monitor and actuate peripheral equipment. This technology has been dubbed the "Dustinator." Its applications include sand mover dust abatement enhancements and belt conveyor technologies that control and mitigate silica dust issues in frack sand material handling. Silica dust is an issue from the mine site up to and including the last mile dust management at the well site. The Dustinator combines the research and development expertise of NIOSH with the Total Dust Management technologies and patented systems developed by Benetech. This presentation focuses on the design and function of this novel engineering control as well as advanced safety and serviceability enhancements to ensure the safety of personnel in the workplace.

Shawn Furlong, CRSP, Vice-President Health Safety & Environment, Source Energy Services: "Source Energy's Solution to Wellsite Silica Dust"

- *Abstract*: Source Energy Services has been part of the hydraulic fracturing industry for the past 23 years. By focusing on customer service and innovation they meet and exceed the industry's continuous growth demands for proppant supply and services. Source's product offerings include the production, transportation, and logistics management of Northern White proppant, as well as in-basin and well site frac sand storage. With silica sand being a core function of Source's operations, the company has successfully controlled silica dust exposure throughout its entire supply chain through a combination of engineering, administrative, and personal protective equipment controls, as well as an eye for ingenuity. For example, the Sahara Unit that stores and distributes frac sand on the well site has proven to be an industry leader in well site silica dust reduction for Source and their customers. A detailed look at the Sahara's key components will highlight how these improvements were achieved. With current Sahara operations in both Canada and the US, Source is well suited to meet the changing OSHA regulations, both within its own facilities and on client wellsite's.

Kalie Boot, Senior EHS Assurance Advisor, and Ian Wilson, Commodities Manager, Ovintiv USA Inc. Oil and Gas: "Wet Sand as a Silica Dust Control: Performance and Logistics Compared to Existing Controls"

- *Abstract*: At Ovintiv we have been working towards the OSHA action level for a decade. Why? With operations spanning across North America, our company exposure limit is 0.025 mg/m^3 (25 $\mu g/m^3$ – OSHA action level). In this 30-minute session we invite you to learn from our 10-year journey. We will give a brief overview of controls trialed, lessons learned, and then compare those controls to our work with wet sand. Wet sand shifts the infrastructure on site and our own Ian Wilson from our supply chain group will speak to the logistics of working with wet sand.

The findings and conclusions in these presentations are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC), the National Institute for Occupational Safety and Health (NIOSH), and the NORA Oil and Gas Extraction (OGE) Sector Council. Mention of any company or product does not constitute endorsement by CDC, NIOSH, or the NORA OGE Sector Council.