INDUSTRIAL INSIGHTS

a publication of the SMACNA Industrial Contractors Council

INDUSTRIAL EXPERTISE
PERFORMANCE • TRAINING • STANDARDS

Volume 13, Issue Number 2 November 17, 2009

Industrial Forum Reveals Wealth Of Power Plant Opportunities

“Getting into nuclear or coal powered plant construction is a long−term decision,” Terry George, of Bechtel Construction Company, told the Industrial Contractors Forum at SMACNA’s 66th Annual Convention, in Palm Desert, Calif., in October. It’s not always a level playing field, but right now there’s a wealth of opportunity, he added. When a firm decides to get into nuclear power today, they are making the decision for the next generation of the company.

The forum also included presentations on topics affecting the industrial market, such as the International Training Institute’s (ITI) new industrial training curriculum, safety issues, welding safety, updates to SMACNA’s “Guide for Steel Stack Construction,” and Leadership in Energy and Environmental Design (LEED)/green building applications in the industrial sector.

Mr. George, eastern/southern state regional labor relations manager with the Bechtel Construction Co., discussed the expanding industrial market opportunities in the nuclear market, including qualifications and available resources for SMACNA members.

Mike Harris from the ITI presented the ITI’s new industrial training module and showed sections of the module’s training video. Also included was an update on training methods and structural welding.

Michael McCullion, SMACNA’s director of safety and health, presented a summary of welding safety and health issues, and emphasized preventing overexposure to welding fumes. He covered the proper use of respirators, effective engineering controls, and a regulatory update including hexavalent chromium.

The forum concluded with a discussion about such topics as equipment maintenance and repair, service work in industrial plants, updates and changes to SMACNA’s “Guide for Steel Stack Construction” and LEED/green building applications in the industrial sector.

Sheet Metal Contractor Takes On Winter To Clean Up Wisconsin's Fox River

Hardy sheet metal workers with Tweet/Garot Inc. of Green Bay, Wis., braved Wisconsin’s notorious winter weather and subzero temperatures to install ductwork for the lower Fox River Cleanup project’s remediation facility in Green Bay. The sediment remediation program, which will clean up four million cubic yards of sediment along the river contaminated by polychlorinated biphenyls (PCBs), is one of the largest sediment

remediation programs in the world.

At the Fox River Cleanup Project remediation facility, 90–inch 10–gage galvanized exhaust ductwork leads from Building B to activated charcoal canisters.

As a subcontractor to design–build firm Tetra Tech Inc., Tweet/Garot installed ductwork and related equipment to filter and clean the air before it leaves the 247,800–square–foot processing facility, which sits on 25–acre site along the edge of the river. Tweet/Garot workers labored through the winter months starting last November with no protection from the wind chill and cold weather to meet an aggressive schedule for the facility's scheduled start–up in May. The company peaked out with 16 sheet metal workers on–site and another 12 working in the shop.

The 90–inch diameter duct on the exhaust side leading from charcoal canisters.

The Fox River Cleanup project includes cleaning up sediment tainted by PCBs stemming from earlier industrial uses, including pulp and paper production and recycling mills. The river flows alongside the highest concentration of pulp and paper mills in the world, starting at Lake Winnebego and traveling 39 miles past communities of 270,000 inhabitants, and empties into Lake Michigan. Tetra Tech performed engineering design and construction services for a large–scale membrane filter press facility for sediment desanding and dewatering.

Close up of ductwork and 12x12x3/8–galvanized

hangers.

The $1.4 million Tweet/Garot project to install ductwork and equipment took approximately 11,000 man−hours. Materials used included 134,000 pounds of heavy steel, 60,000 pounds of spiral and flanges, and 25,000 pounds of TDC duct. The type of metal used was PVC coated and stainless steel duct. Fabrication consisted of 4,500 man−hours of 90−inch round duct with heavy steel hangers. The benefits to the client included meeting dust and odor emission standards.

Duct from charcoal canisters to the 70−foot elevation into the facility's Building A.

Tweet/Garot has more than 300 employees, and more than 70,000 square feet of fabrication space and facilities in Green Bay, Wisconsin Rapids, Milwaukee, and Menominee, Mich. Tweet/Garot provides process piping, sheet metal and plate fabrication, industrial ventilation, HVAC, and plumbing to industrial, commercial, education, health care, and food processing equipment to customers in Wisconsin, upper Michigan, and the Midwest.

Is Aluminum A Proper Material Choice?

The following is one of many frequently asked questions of SMACNA's Technical Resources Department regarding content in SMACNA's publication "Round Industrial Duct Construction Standard," second edition, 1999, an American National Standard.

Question:
I'm in the process of installing a ventilation system that will be ventilating an area that will have the potential for hydrogen gas releases. I selected 3003 aluminum as the material of choice, as it is a non−ferrous and non−sparking material. The fans that were procured were constructed to meet AMCA Standard 99−0401−86 Type A, for a spark−resistant construction (all aluminum fan housing, inlet cone, and wheel).

In Section 3.2.6 (Aluminum), the note at the bottom states: "Aluminum is not recommended for the fabrication of systems operating at temperatures above 400° F, or systems conveying corrosive, flammable, or explosive vapors, fumes, mists, or particulates of any type."

I'm confused about the statement concerning "not recommended…for explosive vapors." Since I chose 3003 aluminum as it is a non−ferrous and non−sparking material, I would like to understand the rationale of the note regarding passing a potentially explosive gas through the aluminum duct.

Answer:
SMACNA's Industrial Ventilation and Power Industry Task Force that wrote this standard meant to recommend aluminum for Class 1 applications only. Whether flammable or explosive fumes, vapors, and mists are included in Class 1 can be debated. But, certainly, the Task Force did not intend to issue construction recommendations dealing with such specialized and hazardous applications; therefore the note

excluding them.

We recognize that for such applications the choice of materials is severely limited, and therefore it is the designer/specifier who is called upon to make an informed decision.

Guarding Against Welding Fumes And Safety Hazards

“It is important to understand the behavior of welding fumes, which can have harmful health effects,” said Michael McCullion, SMACNA director of safety and health, at the Industrial Contractors Forum at SMACNA’s 66th Annual Convention in Palm Desert, California in October.

His presentation covered understanding the contents of welding fumes and how they “behave” as a mixture of chemicals. He also discussed the importance of related safety hazards, avoiding the risk of fire, regulations on hexavalent chromium, proper use of respirators, and effective engineering controls. Following is a summary of Mr. McCullion’s remarks.

Welding fumes are a mixture of gases and fine particles, including nanoparticles, particles that are too small to be seen with the naked eye, which are generated from the combustion process of welding.

Fumes generally come from base and filler material, coatings and paints, shielding gases and chemical reactions, the process and consumables being used, and contaminants in the air. Welding fumes contain such chemicals as chromium, nickel, arsenic, asbestos, manganese, silica, beryllium, carbon monoxide, cobalt, copper, lead, ozone, selenium, and zinc.

Gases and particles rise as they are heated and released at the welding point of operation. As they cool, the gases and most of the fumes dissipate and the particles fall to the ground and onto surrounding surfaces.

The individual components of welding “smoke” can have short−term or long−term health affects and affect nearly every part of the body including the lungs, heart, kidneys, and central nervous system. Short−term effects happen at or very soon after exposure. Long−term, or chronic, affects may occur after repeated overexposures, or after an extended time after the exposure.

It is also critical to guard against other hazards, including heat exposure (heat stress, heat stroke) and burns from hot slag, sparks, and hot electrodes. Eye injuries can occur from flying metal slag and chips, and UV light can cause “arc eye” or “welders’ flash.” Additional hazards include slips, trips, and falls; hearing loss from noise, and electric shock in wet work areas and in cramped work spaces. Ergonomic−related injuries include back injuries, shoulder pain, tendonitis, carpal tunnel syndrome, white finger, and knee joint diseases. Injuries may also be caused or influenced by overhead work, vibration, and heavy lifting.

Confined spaces, a work area with limited access and little or no air flow, may also have a dangerous atmosphere, hazardous configurations and other hazards. It is imperative that all employees working in or around such confined spaces must be properly trained.

Keep Welding Areas Free Of Combustible Materials

Fires from intense heat and sparks are a risk management concern. Heat sparks can cause fires or explosions, especially if near combustible or flammable materials or combustible dusts. Welding and cutting should only be performed in areas free of combustible materials such as trash, wood, paper, textiles, plastics, chemicals, and flammable liquids and gases.

A “hot work” program is a written program that takes a proactive approach and includes the recommendations that workers should never weld or cut on containers that have held a flammable or combustible material, unless the container is thoroughly cleaned or filled with an inert gas, and to know what is under and near the welding area. A fire inspection should be performed before leaving a work area and for at least 30 minutes after the operation is completed. Fire extinguishers of proper size for the type and number of hazards involved should be nearby.

Hexavalent Chromium

The initial exposure determination and monitoring requirements for hexavalent chromium exposure was addressed. OSHA may increase the enforcement through National and Local / Regional Emphasis Programs. There are many issues to be aware of when conducting air monitoring for hexchrome and most welding–relating contaminants.

The hierarchy of controls for engineering controls, administrative controls, and personal protective equipment (PPE), respirators, and ventilation were noted. It is essential to get ventilation to the source via electrostatic air cleaners and fume extraction systems, as well as with push–pull ventilation. Personal protective equipment includes respirators, welding helmets with face shields, protective flame–retardant clothing, safety glasses, safety helmets, fire–resistant gauntlet gloves, hearing protection, and high–top hard–toed shoes.

Mr. McCullion, SMACNA’s director of safety and health, has more than 25 years of safety and health experience including 12 years of experience in industrial hygiene.

2010 Partners In Progress Conference

Sessions Tell How To Meet Industry Training And Leadership Needs

The 2010 Partners in Progress Conference “Driving Change, Creating Opportunities,” March 18–20, will address important issues affecting the industrial market. In addition to sessions on growth markets and market retention, there will be several sessions focused on how we can meet the industries’ training and leadership needs in order to keep up with the demand created by the retiring baby–boomer generation.

An Emerging Growth Market session will cover power generation and nuclear opportunities. Hear first–hand from contractors who’ve had success in these markets.

Preparing new and inexperienced workers to step into your company’s open positions as foremen, estimators and project managers will be the focus of three sessions at the 2010 Partners in Progress Conference led by the industry’s most noted trainers and contractors. These sessions will focus on our industry’s specific training needs in preparing workers to fill these roles and in addressing the challenges we face, the resources available, and the changes needed going forward to meet that challenge.

Keynote speaker Mark Breslin will also tackle the topic “Are Leaders Born or are They Made?” in a dynamic session involving contractors, apprentices, union officials, JATC coordinators and chapter leadership. Together they will identify the skills, attitudes and knowledge necessary to grow a generation of successful leadership, how contractors can identify that potential in their workforce, and what training and support are necessary to foster the leadership of the future.

Register today for 2010 Partners in Progress Conference, March 18–20, 2010 at Caesars Palace in Las Vegas. Our goal is to improve industry relations and create work opportunities that will benefit both labor and management.

More information about session speakers and topics will be forthcoming on the Partners in Progress Web site, in the SMWIA Loop newsletter, in SMACNews, on the SMACNA Web site, on the SMWIA Web site, and in Partners in Progress magazine.

Register now at the Partners in Progress Conference registration Web site.

AIHA Proposes New Standards For Industrial, Laboratory Ventilation Systems

SMACNA contractors constructing and installing industrial ventilation systems and test and balance contractors may have an interest in recently announced standards from the American Industrial Hygiene Association (AIHA).

AIHA produces industrial ventilation handbooks and standards, and are often referenced in SMACNA's industrial publications. A portion of what AIHA covers involves the design and airflow patterns in and into flow hoods used in industrial and institutional buildings.

The Accredited Standards Committee Z9 on Ventilation Systems has proposed several new standards for development – BSR AIHA Z9.12 Design, Operation and Maintenance of Combustible Dust Collection Systems and BSR AIHA Z9.13 Design, Operation, Testing and Maintenance of Laminar Flow Fume Hoods. A draft standard ANSI/AIHA Z9.5 Standard on Laboratory Ventilation is available for public view in November 2009, as well.

BSR AIHA Z9.12 Design, Operation and Maintenance of Combustible Dust Collection Systems

This standard will apply to dust control systems with combustible solids that are a fire, deflagration, explosion or detonation hazard. This standard will augment the content of other Z9 standards. This standard will offer prudent practice regarding: analysis of systems for combustible dust hazards, design guidance to mitigate combustible dust hazards, and maintenance recommendations to insure systems operate per original design intent.

BSR AIHA Z9.13 Design, Operation, Testing and Maintenance of Laminar Flow Fume Hoods

This standard will apply to laminar flow fume hoods (LFFHs) that use filtered supply air and ducted exhaust to protect products inside the hood from external contamination and exhaust hazardous effluents from the building. This standard will provide guidelines for design, operation, testing and maintenance of laminar flow fume hoods. Laminar flow fume hoods are complicated exposure control devices that must be designed and operated properly to provide both product and personnel protection.

At present, there are no standards that provide guidelines for design, operation and testing. As such, there is little consistency between LFFHs and how they operate. In addition, there is no guidance on methods to conduct tests to ensure proper performance or monitor and maintain reliable operation. This standard will provide the necessary guidelines to improve performance of LFFHs and ensure better protection for personnel working with potentially hazardous materials.

ANSI/AIHA Z9.5 Standard on Laboratory Ventilation
The draft standard is currently being balloted and will be available for public review in November 2009.

Notable changes to this revision of ANSI/AIHA Z9.5 standard include:

- Adding energy considerations within the scope of standard
- Reverting back to use of the term "fume hood," which the committee tried to banish with the 2003 standard because the technical AIHA definition of "fume" is a solid particle
- Replacing the current lower limit on air flow through a fume hood (25 cfm/ft^2) with a range of values and guidance on how to select the minimum flow
- Increasing emphasis on a Laboratory Ventilation Management Plan
- Increasing information on capabilities and limitation of ductless fume hoods
- Designing information relative to emergency modes of operation (e.g., ensuring that emergency mode operations do not prevent emergency egress due to extreme pressure differentials)
- Incorporating new information about the "hazardous exhaust" designation
- Updating the Preventive Maintenance section

To view the announcement, visit the AIHA Web site.

It's OK To Blow Your Own Horn – About Your Industrial Projects

Are you proud of your large–scale industrial projects or dedicated service work to a certain plant over the years? The Industrial Insights online newsletter can help you promote your work.

We want to know about your industrial projects for future issues. Your project will be featured in the Industrial Insights newsletter, and could also be highlighted on SMACNA's Industrial Expertise Web site. This added Web site exposure is a chance to be seen by potential customers, who are visiting the site in greater numbers.

For your project to be considered, send us your photographs and project details using our online submittal form. The form is located on the Industrial Contractors Council page on the SMACNA Web site. Please send your completed form and digital photos by e–mail to Cynthia Young, SMACNA communications manager, at cyoung@smacna.org.

Or mail your submittal form and digital photos on CD to Cynthia Young, SMACNA, 4201 Lafayette Center Dr., Chantilly, Va. 20151. Let us share your industrial success stories!

Editor: Rosalind P. Raymond rraymond@smacna.org | Asst. Editor/Writer: Cynthia Young cyoung@smacna.org

Sheet Metal and Air Conditioning Contractors' National Association
4201 Lafayette Center Drive Chantilly, Virginia 20151–1219
Tel (703) 803–2980 Fax (703) 803–3732 info@smacna.org