OCCUPATIONAL SAFETY AND HEALTH IN THE IRON AND STEEL INDUSTRY pdf

1: Occupational Safety and Health in the Iron and Steel Industry - Google Books

This new code, which reflects the many changes in the industry, its workforce, the roles of the competent authorities, employers, workers and their organizations, and on the development of new ILO instruments on occupational safety and health, focuses on the production of iron and steel and basic.

A safe and healthy working environment for all employees is the number one priority for every worldsteel member. Our policy is to help all our members reach our goal of an accident-free workplace. Historically, steelmaking was a dangerous process and accidents were inevitable. Today, many steel companies recognise that this is no longer appropriate for a modern and technically advanced industry. There is no area, process or type of work that cannot be accident-free. Most importantly, it requires a strong commitment from top management and all levels of managements, which should set the culture in which safety and health is the number one priority and must not be compromised for any other objective. Steel companies are improving their safety and health performance and some businesses have gone without any lost time injuries or fatalities for many years. These companies know that such performance requires excellence in all aspects of their operations. This excellence also produces superior business performance - the most successful steel companies are also the safest. In , the Board of Directors issued a set of principles that clearly outline the industry philosophy on safety and health. Six safety and health principles for the industry: All injuries and work-related illness can and must be prevented. Management is responsible and accountable for safety and health performance. Employee engagement and training is essential. Working safely is a condition of employment. Excellence in safety and health supports excellent business results. Safety and health must be integrated in all business-management processes. More details on these principles are available in our Guidance booklet see to the right of this page, Safety and Health Principles and Definitions. Three areas need to be considered to manage safety and health comprehensively: Occupational Safety Management Occupational safety management promotes the safety of employees, contractors and visitors by preventing personal injuries in the workplace, and has a strong focus on primary prevention of exposure to hazards. Occupational Health Management In its widest definition, occupational health management encompasses the physical, mental and social well-being of the people working in the company. The focus is placed on long-term effects on exposure to hazards. The health of workers has several determinants, including risk factors at the workplace leading to cancers, musculoskeletal diseases, respiratory diseases, hearing loss, circulatory diseases, stress related disorders and others. Process Safety Management Process safety is a blend of engineering and management skills focused on preventing catastrophic accidents and near misses, particularly explosions, fires, structural collapse and damaging releases associated with a loss of containment of energy or dangerous substances such as molten metals, fuels and chemicals. The manufacturing of steel involves processes with intrinsic hazards that need careful management. The measures needed to control these hazards are often complex. The focus of process safety management is not limited to protecting the people within the company but also includes the environment, assets and surrounding community. The foundation of our activities are the worldsteel safety and heath principles see publication on the right of this page.

OCCUPATIONAL SAFETY AND HEALTH IN THE IRON AND STEEL INDUSTRY pdf

2: PPT - Safety and health in the iron and steel industry PowerPoint Presentation - ID

The basic steel products industry is involved in manufacturing hot metal, pig iron, and silvery pig iron from iron ore and iron and steel scrap. It also converts pig iron, scrap iron, and scrap steel into steel, and hot rolls iron and steel into basic shapes such as plates, sheets, strips, rods, bars, and tubing.

Since that time, new data have become available, which have been incorporated in this Monograph, and taken into consideration in the present evaluation. Manufacturing process Foundries produce shaped castings from re-melted metal ingots and scrap. Although foundry work is assumed to start with re-melting of ingots and scrap and to end with the fettling of castings, the industry is often so integrated that the distinction is not obvious. Machine shops are not normally part of the work environment where castings are produced; however, simple and accessory machining may be carried out, and these activities may be part of small foundry operations. The processes in iron and steel founding generally comprise pattern-making, moulding and core-making, melting, pouring and shake-out, and fettling. A detailed description of these production steps can be found in IARC Human exposures The iron and steel industry is very diverse in materials and processes, resulting in occupational exposures to a wide variety of substances. Substantial exposures to silica and carbon monoxide continue to occur in many foundries. Occupational exposures to airborne polycyclic aromatic hydrocarbons PAHs are also present, resulting mainly from the thermal decomposition of carbonaceous ingredients commonly added to foundry sand. In addition, some steel-foundry workers e. The introduction of organic binder materials in the late s has resulted in exposures of foundry workers to other chemicals, including phenol, formaldehyde, isocyanates and various amines. Earlier exposure studies have been reviewed previously IARC, Exposures of workers in the iron and steel founding industry. Respirable dust and respirable quartz Nearly all production workers in iron and steel foundries are exposed to silica dust and other mineral constituents of foundry sand IARC, Major improvements with respect to occupational hygiene in the foundries showed maximum average concentrations of respirable dust being almost equal to the minimum average concentrations for various jobs in the past Andersson et al. A study from Taiwan, China in a continuous steel-casting plant showed similar respirable dust levels Chen et al. Carbon monoxide Carbon monoxide CO is formed whenever there is incomplete combustion of carbonaceous material. In the foundry environment, CO is mainly produced by cupola melting and casting operations. Other sources of CO exposure are oil burners used for charge and ladle preheating, furnaces for annealing and carburizing, transport equipment powered by internal combustion engines and fettling operations such as welding and flame cutting. Workers in the furnace area may be exposed to gases leaking from the charging and bottom levels of the cupolas IARC, Results of recent measurements of exposure levels to CO in iron and steel foundries were not available to the Working Group. Binder compounds Organic binder materials for cores and moulds include furan, phenol-formaldehyde, urea-formaldehyde and urethane resins as well as oleo-resinous oils. These ingredients may volatilize into the workplace air during mixing, blowing, ramming, drying or baking operations. Curing reactions and thermal decomposition give rise to formation of additional compounds, which are released during pouring and shake-out. When organic binders are subjected to high temperatures, pyrolysis may produce gases and smoke aerosols. Only a few components of these emissions have been identified: Nitrogen compounds such as ammonia, cyanides and amines may be formed from the nitrogen-containing urea, ammonium salts and hexamethylenetetramine that are used as binder chemicals. Urethane resins may emit free isocyanates under moulding and pouring conditions. No-bake catalysts, based on arylsulphonic acids, may produce sulfur dioxide and hydrogen sulphide by thermal processes. If phosphoric acid is used as a catalyst, phosphine can be formed in the strongly reducing atmosphere of the hot emissions. In air, phosphine rapidly oxidizes to phosphorus oxide. Furan binders contain free furfuryl alcohol, which can volatilize during mixing, moulding or core-making. Similarly, furan and phenolic resins may emit formaldehyde, phenol and other derivatives by volatilization or thermal decomposition. Core oils and

alkyd-isocyanate resins are partly composed of natural drying oils, and heating of these materials gives rise to acrolein, various aldehydes, ketones, acids and esters as well as aliphatic hydrocarbons. A study from Sweden by Westberg et al. All four Swedish foundries using the Hot Box core-binder system were included in this study. Polycyclic aromatic hydrocarbons PAHs result from thermal decomposition of carbonaceous ingredients in foundry sand. During casting, PAHs are formed and partly vapourised under the extremely hot and reducing conditions at the mould-metal interface. They are then adsorbed onto soot, fume or sand particles and spread throughout the workplace during shake-out and other dusty operations. Although the mechanism of PAH formation is complex and variable, the reactions proceed via pathways that involve free radicals. This pyro-synthesis is influenced by many variables, such as the composition of the gaseous atmosphere and the chemical structure of the carbonaceous material. Organic binders, coal powder and other carbonaceous additives are the predominant sources of PAHs in iron and steel foundries. In some cases, exhaust gases from engines, furnaces and ovens may increase the exposure of workers to these compounds IARC, Studies from the late s in Denmark showed low levels of exposure to PAHs in the foundry workplace atmosphere Hansen et al. Metals Metal fumes are formed by evaporation, condensation and oxidation of metals in air. Furnace tenders, melters, casters, ladle-men, pourers and crane drivers are exposed to fumes from molten metal; fettlers are exposed to metal fumes and dusts from grinding, welding and flame-cutting operations IARC, These workers were potentially exposed to coke dust. In a study from the United Kingdom, concentrations of 14 elements in the blood of workers with low-alloy steel and stainless steel, and of workers exposed to lead- and cadmium-containing dusts were measured and compared with values of similar measurements in an unexposed control group. Concentrations of 20 elements in dust samples were also measured. The only elements that showed significantly elevated levels in whole blood were cadmium in workers with non-ferrous metals and lead in all workers. The values for lead were The high concentrations cadmium and lead in the dusts confirmed the exposure of the workers Triger et al. In a Danish study conducted over a month period in â€”, manganese concentrations were measured in air, and in blood from 24 furnace-men employed in three small-size foundries and from 21 scrap-recycling workers at another plant. Furnace-men who work in poorly ventilated smelting departments were found to have higher levels of manganese in their blood approx. In a Taiwan, China study among 63 steel-production workers, Horng et al. Mean concentrations of the metals were elevated: Age and duration of employment were correlated with the urinary concentrations of these metals. Refractory ceramic fibres In a study on refractory ceramic fibres RCF from Belgium, ferruginous bodies mimicking asbestos were detected in nine of bronchoalveolar lavage samples collected during â€” Dumortier et al. The nine individuals from whom these samples originated had been employed either as foundry worker, steel worker, or welder and the majority had worked on furnace insulation. Two Finnish steel plants, three foundries and a repair shop were studied for the presence of airborne ceramic fibres under normal production and maintenance conditions i. Results from nasal sampling were found to correlate with the airborne fibre concentrations at the group level. Cancer in Humans 2. Cohort studies There are 13 cohort studies available on iron and steel founding workers in various parts of the world. Nearly all of these show a significantly increased risk for lung cancer, either in the entire cohort or in high-exposed subgroups Koskela et al. In the cohort study from the United Kingdom Sorahan et al. A study from the USA showed a significantly increased lung-cancer risk after adjustment for smoking Andjelkovich et al. There are two additional cohorts, based on proportional mortality, that provide supporting evidence for an excess of lung cancer in foundry workers Egan-Baum et al. Synthesis Considering the consistent findings in the available cohort studies and the positive evidence from two caseâ€”control studies, the epidemiological data clearly support the notion that work in iron and steel foundries is associated with an increased risk for lung cancer. Chance, bias and confounding are not likely to explain the excess risk. Other Relevant Data 4. Mechanistic evidence relevant to the carcinogenic hazards from occupational exposures during iron and steel founding 4. Experimental systems In several studies extracts of particulates from samples collected at a steel foundry were mutagenic in Salmonella typhimurium strain TA98 in the presence or absence of an exogenous metabolic activation system. In another

study filter extracts were mutagenic in Salmonella typhimurium strains TA98 and TA in the presence or absence of an exogenous metabolic activation system IARC, Exposures in the iron and steel founding industry are complex and include a wide variety of known genotoxic and carcinogenic substances including PAHs, metals e. These agents have been previously reviewed by IARC , , , Humans Workers in a Finnish iron foundry with occupational exposure to PAHs and control subjects without occupational exposure were examined for the presence in peripheral white blood cells of aromatic DNA adducts by use of 32P-postlabelling. There was a significant correlation between the estimated exposures and DNA-adduct levels Phillips et al. The competitive ELISA assay was used to study another population of foundry workers with respect to the presence of aromatic DNA-adducts, which showed a positive trend with exposure Santella et al. Foundry workers studied over a period of five years were evaluated for aromatic DNA adducts in their leukocytes. In the total group exposure was related to the level of DNA adducts Perera et al. Synthesis There is moderate evidence that extracts of particles collected from a steel foundry act via a genotoxic mechanism, based on bacterial mutation studies. There is weak evidence for a genotoxic mechanism of action for exposures during iron and steel founding, based on DNA-adduct studies. Evaluation There is sufficient evidence in humans for the carcinogenicity of occupational exposures during iron and steel founding. Occupational exposures during iron and steel founding cause cancer of the lung. No data on the carcinogenicity to experimental animals of mixtures present in iron and steel founding were available to the Working Group. Occupational exposures during iron and steel founding are carcinogenic to humans Group 1. Cancer mortality in a cohort of male German iron foundry workers. Am J Ind Med. Quartz and dust exposure in Swedish iron foundries. J Occup Environ Hyg. Mortality of iron foundry workers: Analysis of a subcohort exposed to formaldehyde. J Occup Environ Med. Mortality of iron foundry workers. Analysis by work area. Lung cancer case-control study. Lung cancer, smoking, and employment in foundries. Scand J Work Environ Health. Lung cancer among long-term steel workers.

OCCUPATIONAL SAFETY AND HEALTH IN THE IRON AND STEEL INDUSTRY pdf

3: SAFETY AND HEALTH | worldsteel

This new code, which reflects the many changes in the industry, its workforce, the roles of the competent authorities, employers, workers and their organizations, and on the development of new ILO instruments on occupational safety and health, focuses on the production of iron and steel and basic iron and steel products.

Occupational injury and illness statistics Occupational injury and illness statistics Where does your manufacturing job rank? January 29, By: Vicki Bell In December the U. A total of 4. Among goods-producing categories, incidence rates ranged from 4. These numbers are overall averages of subsets in each major category. Statistics also were reported for cases that resulted in days away from work, a job transfer, or restriction and are grouped in two categories: The latter category may involve shortened hours; a temporary job change; or temporary restrictions on certain regular duties, such as no heavy lifting. Separately, the overall rate for cases with days away from work was 1. The overall average for manufacturing cases with job transfer or restriction 2. In all other divisions recorded, the rate for days-away-from-work cases was higher than the rate for cases with job transfer or restriction. Metal Industry Breakdown Where do metalworking industries stand in terms of these averages? Primary-metal industries recorded Of this number, 5. Transportation equipment manufacturers recorded The fabricated metal products industry recorded 9. Industrial machinery and equipment manufacturers recorded 6. However, trends are consistent with previous years. Steel Mills Steel mills and other primary-metal industries routinely rank high in terms of recorded injuries and illnesses when compared to other industries. Steel mills evoke images of strenuous, hot, and potentially dangerous work. While many dangerous and difficult jobs remain in the steel industry, modern equipment and facilities have helped to change this. The most strenuous tasks were among the first to be automated. For example, computer-controlled machinery helps to monitor and move iron and steel through the production processes, reducing the need for heavy labor. In some cases, workers now monitor and control the equipment from air-conditioned rooms. Nevertheless, large machinery and molten metal can be hazardous, unless safety procedures are observed. Hard hats, safety shoes, protective glasses, earplugs, and protective clothing are required in most production areas. Cases of occupational injury and illness in the industry were 9. Motor Vehicle and Equipment Manufacturing While the primary-metal industry ranked higher than the transportation equipment industry in the statistics, this was not the case in In that year, cases of work-related injury and illness averaged Working conditions, outlined in the Occupational Outlook Handbook, contributed to the high incidence rate: In , 38 percent of motor vehicle and equipment manufacturing workers worked, on average, more than 40 hours per week. Overtime is especially common during periods of peak demand. Although working conditions have improved in recent years, some production workers are still subject to uncomfortable conditions. Heat, fumes, noise, and repetition are not uncommon in this industry. In addition, many workers come into contact with oil and grease and may have to lift and fit heavy objects. Employees also may operate powerful, high-speed machines that can be dangerous. Accidents and injuries usually are avoided when protective equipment and clothing are worn and safety practices are observed. Newer plants are more automated and have safer, more comfortable conditions. Workers may function as part of a team, doing more than one job, and thus reducing the repetitiveness of assembly line work. As in other industries, professional and managerial workers normally have clean, comfortable offices and are not subject to the hazards of assembly line work. Improved ergonomics help clerical support workers avoid repetitive-strain injuries, but employees using computer terminals for long periods may develop eyestrain and fatigue. Metal Fabrication The working conditions for metal fabricators, the third-highest at-risk group in the report, vary from plant to plant. Plants can be noisy. Many workers may have to sit or stand for long periods. Welding fumes and sparks, metalworking lubricants, and other potentially hazardous materials contribute to worker injury and illness. Protective equipment must be provided and used judiciously to avoid injury and illness. And plants should have adequate ventilation systems to protect workers. Workers also may have to lift and fit heavy objects. In

many cases, developments in ergonomics have improved working conditions through changes in workstation design and the increased use of robots or other pneumatically powered machinery to lift heavy objects. The Occupational Outlook Handbookdoes not contain injury and illness numbers for the fabricated metals industry, nor does it contain numbers for industrial machinery and equipment manufacturing, an industry in which working conditions mirror those of metal fabrication. What the Statistics Mean to You Although working conditions may have improved in many occupations over the years, you can never be too safe, particularly if you are employed in one of these higher-risk occupations. You need to be ever vigilant and diligent when it comes to making sure that you and your co-workers follow safety procedures. Take all possible steps to prevent injury and illness. Follow safe practices and operate machinery only when all safeguards are functioning and when you are alert. It takes only a second of inattention to receive a potentially serious injury. And working on malfunctioning equipment is asking for trouble. Report malfunctioning equipment immediately. If you are in charge of maintaining equipment, follow the proper procedures and document the maintenance. Employers, make sure that workers comply with safe work practices and wear proper protective equipment. Post operating instructions and warnings as mandated by OSHA. Make sure that all employees receive the proper training for operating equipment and for handling work-related tasks safely. Have the air quality and noise levels in your operations checked periodically, and take steps to improve both if necessary. Follow all guidelines for handling industrial lubricants and solvents. Set up a safety committee that includes members of your work force. Encourage workers to come to you with their safety and health concerns. Make safety and good health practices ongoing priorities, and make sure your employees perceive them as such. You May Also Like.

4: occupational diseases in iron and steel industry

occupational health and safety management systems is OHSAS A new international standard, ISO Safety and Health in the Steel Industry, Position Paper.

5: NIOSHTIC-2 Publications Search - - Iron and Steel Foundries. Occupational Hazards.

This Memorandum of Understanding ("MOU") sets forth the agreement of the Occupational Safety and Health Administration ("OSHA") and the American Iron and Steel Institute ("AISI") regarding the interpretation and application of various requirements of the Construction Asbestos Standard, 29 CFR , and the General Industry Asbestos.

6: Safety and health in the iron and steel industry â€“ MisrSteel

For organizations in the iron and steel industry to effectively manage health and safety, requires joint commitment between the government, employers, workers and their representatives and this co-operation and commitment is found in the spirit of the Act and its regulations.

7: Occupational injury and illness statistics - The Fabricator

Occupational Safety and Health in the Iron and Steel Industry. International Labour Office, - Technology & Engineering - pages. 0 Reviews From inside the.

8: Safety and health in the iron and steel industry

The Occupational Safety and Health Administration (OSHA) is amending its existing standards for. OSHA has determined that employees exposed to respirable crystalline silica at the previous permissible exposure limits face a

significant risk of material impairment to their health.

9: Risk Assessment Guidelines | IOH Solutions

Human exposures. The iron and steel industry is very diverse in materials and processes, resulting in occupational exposures to a wide variety of substances.

OCCUPATIONAL SAFETY AND HEALTH IN THE IRON AND STEEL INDUSTRY pdf

XI The House of Defense 144 Evolutionary approach to Jesus of Nazareth The Red Rover. A tale. By J. Fenimore Cooper. The perfect seam Toni Morrison The Bible Promise New International Version Vest Pocket Divine grace and man Nationalism and the Drive For Sovereignty in Tatarstan, 1988-92 Php codeigniter tutorial step by step Jekyll and hyde this is the moment sheet music Written Communications That Inform and Influence (Results-Driven Manager) Sacred Diary of Adrian Plass, on Tour, The Scotlands place-names Trigger Janet Deaver-Pack The Mundaka Upanishad Which Dismisses The Old Religion Pamphlet Customs Tariff Schedule of the Peoples Republic of China The Brimstone Network How to raise a street-smart child Religion and the sciences of life 24. History, language and the sciences in medieval Spain Eleazar Gutwirth. Definition of the sequence Servsafe manager 6th edition book Her Own Words to the Nuclear Age Northwest mileposts Republican paradoxes and liberal anxieties Flower in the Cold Read-Alouds With Young Children Volumetric estimation of breast density for breast cancer risk prediction Morals and Dogma of the Ancient and Accepted Scottish Rite of Freemasonry Volume 2 Pea-pod man: Raven the creator Purine and pyrimidine metabolism in man VII Potatoes in 60 Ways (In 60 Ways) Financial Mean-Variance Problems and Stochastic LQ Problems: Linear Stochastic Hamilton Systems and Backw A telephone call for Genevieve Snow Carmel Bird The Future of Foundations Whiskeytown National Recreation Area History begins at sumer Policy of emancipation Salt of the Earth: The Church at the End of the Millennium Research in library and information science Abiding in the Middle Leads to Attaining the Way