WORKPLACE

Resolving matters of the workplace.

Our industrial/workplace safety group includes engineers, occupational safety specialists and certified industrial hygienists. We are well versed in federal and state safety standards such as OSHA. In addition to investigating workplace incidents, we examine chemical exposures and indoor air quality.

Investigating worker and non-employee matters.

While workers compensation laws were designed to protect certain aspects pertaining to employees and employers, several states allow suits on either side for "intentional" acts. We provide specific guidance with these "intentional tort" matters. Claims among site visitors and subcontractors are also commonly investigated.

Related Disciplines

Biomechanical Engineering
Biomedical Engineering
Civil Engineering
Construction Equipment
Environmental Engineering
Fires & Explosions
Heating, Ventilating & Air Conditioning
Human Factors
Industrial Engineering
Materials Science
Mechanical Engineering
Products Liability
Professional Liability
Slips, Trips & Falls

Sample Reports

Electrical Equipment Shock – Decontamination Vacuum Electrocution

A machinist with a firm hired to do decontamination/demolition on a factory was shocked by a piece of equipment used to vacuum lead dust. The client, Domenick DiCicco of Law Offices of J. Mark Pecci, III, Philadelphia, PA, asked Robson Forensic, Inc. to determine if the services of a safety consultant were performed in a manner that was competent and consistent with safety consulting practices.

Epoxy Handling – Safety & Warnings

An employee received skin irritations and sensitization from exposure to epoxy materials at work. The client, David Carriger of Stuart Calwell PLLC, Charleston, WV, asked Robson Forensic, Inc. to determine if the safety information provided by the manufacturer contributed to the incident, if the employer created an unsafe working environment by requiring workers to handle the epoxy and if the unsafe action violated any state or federal safety statute, rule, or regulation, or any commonly accepted and well known safety standard in the composite manufacturing industry.

Industrial Safety – Machine Jam

An employee was using a breaker slitter machine when rubber material became jammed. While removing the material, the employee injured his neck. The client, Ralph Cessario of Law Offices of John Quackenbush, Buffalo, NY, asked Robson Forensic, Inc. to determine if the arrangement of the breaker slitter machine was defective in a manner that caused the incident.

INVESTIGATION of the BALSAMA INCIDENT

ENGINEER'S REPORT **NOVEMBER 15, 2001**

A. INTRODUCTION

On 22 March 1999, Jeremiah Balsama was a union machinist working out of Local 348 in Philadelphia. Balsama was hired by Anzon Lead to perform activities associated with the decontamination / demolition of the factory located at 2545 Aramingo Avenue in Philadelphia, PA. Balsama received an electrical shock from equipment that was used to vacuum lead dust.

The purpose of my investigation was to determine if the services of a safety consultant, Ferenchak Associates, Inc. were performed in a manner that was competent and consistent with safety consulting practices.

B. INFORMATION AVAILABLE

1. Responses of SPC Divestiture, Inc., to Plaintiff's Interrogatories, Request for Production of Documents, and Supplemental Request for Production of Documents.
2. Responses of Additional Defendant, Cookson Investments, Inc., to Plaintiff's Request for Production of documents.
3. Plaintiff's Responses to Defendant, Ferenchak & Associates, Inc.'s, Interrogatories.
4. Responses of Additional Defendant, Cookson Investments, Inc. to Plaintiff's Interrogatories and Request for Production of Documents.
5. Complaint and Joinder complaint.
6. Plaintiff's Settlement Memorandum.
7. Medical Records from Mercy Fitzgerald Hospital (volumes one through four).
8. Medical Records from Pennsylvania Hospital.
9. Medical records from Dr. Marc Zimmerman.
10. Medical records from Hahnemann University Hospital.
11. Medical records from Dr. Richard Lackman.
12. Medical records from Dr. Anthony Lobianco.
13. Medical records from Jefferson University Hospital (volumes one through four).
14. Deposition of Frank Ferenchak taken 17 September 2001.
15. Deposition of Anthony Lobianco, D.O. taken 3 October 2001.
16. Deposition of Eugene Drabkoski taken 8 October 2001.
17. Deposition of Peter N. Balsama taken 13 September 2001.
18. Deposition of John Pirnie taken 28 September 2001.
19. Deposition of Jeremiah Balsama taken 10 September 2001.
20. Deposition of Phillip Van Veen taken 11 October 2001.
21. Expert report of Robert Bratcher dated 5 November 2001.

C. BACKGROUND AND DESCRIPTION OF THE INCIDENT

Jamie Kalanta, of Anzon Lead and SPC Divestitures, contracted with Ferenchak Associates, Inc. to provide safety consulting services during various phases of work over time at various buildings at the Philadelphia location. Frank Ferenchak t/a Ferenchak Associates, Inc. and Mega Safety, developed a Site Safety Plan dated 1 August 1999 that dealt with the various health and safety issues at this hazardous waste operations site, specifically, the hazards associated with the decontamination and demolition of a facility that made lead-based products.

Ferenchak and his representatives were retained to provide hazardous waste operations training required under 29 CFR 1910.120 and 29 CFR 1926.65. Ferenchak submitted the Site Safety Plan and training proposal to Kalanta for review and approval. Kalanta approved the Plan. Kalanta exercised detailed control over all aspects of the job. Anzon employees performed the work, along with union machinists that Anzon hired out of Local 348.

There had been reports of static electricity shocks before Balsama's incident, and before Ferenchak was retained to perform work in June, 1997. Before June, 1997, Kalanta had arranged for Allstate Vacuuming Company to provide a vacuum truck and operator. Employees reported static electricity shocks from the Allstate truck while vacuuming lead dust. A serious static electricity shock incident occurred to Sam Doman in December 1998 while using the Allstate equipment.

Ferenchak covered the topic of electrical safety, including static electricity, in the employee training sessions, and at many of the twice daily safety meetings held for the union workers. After Doman's incident, Ferenchak emphatically advised Anzon representatives (Kalanta and Samson) to immediately cease vacuuming until the hazard of static electricity could be resolved. Ferenchak advised that an electrical engineer was needed to solve the problem because an engineering solution was not in his area of expertise. Kalanta had the ultimate decision making authority, and did not take Ferenchak's advice.

In January, 1999, Kalanta made the economic-based decision to dismiss Allstate from the job and to purchase their own vacuum truck from Vacuum Sales in New Jersey. Kalanta negotiated the purchase of the new vacuum truck. Ferenchak was not involved in the transaction. At least monthly during the first quarter of 1999, Ferenchak emphatically recommended to Kalanta and others at Anzon that static control hoses should be used on the vacuum trucks to eliminate or minimize the static electricity problem. Kalanta again refused to make equipment changes because of costs. On 22 March 1999, Balsama was about to begin cutting down a piece of pipe. He stepped onto the work platform of a scissors lift and received a shock from static electricity on or about his head from a nearby vacuum hose that was used to collect lead dust. After Balsama's incident, Kalanta relented and agreed to Ferenchak's use of an electrical engineer to resolve the static electricity shock hazard.

D. ANALYSIS

The Anzon decontamination / demolition project covered by Ferenchak's Site Safety Plan dated 1 August 1999 included different types of workers, such as:

a. Anzon employees;
b. Union machinists from Local 348 that were hired by Anzon to perform work;
c. Contractors hired by Anzon, such as Allstate Vacuuming and Ferenchak Associates, Inc.; and
d. Subcontractors (e.g., Phil VanVeen, etc.).

The Anzon decontamination / demolition project was a multi-employer worksite. Under the Occupational Safety and Health Administration's "Rules of Construction" found in §1926.16, the prime contractor is responsible for all aspects of safety and health, whether or not he subcontracts any part of the work.

Anzon and SPC, as the host employer and exposing employer, had the responsibility to ensure that all employees on the job were protected, whether they be temporary or "leased" employees. Anzon and SPC also had the responsibility to inform contract workers (the union machinists) of the identified safety and health hazards to which they may be exposed at the worksite, and to explain to them the applicable provisions of the host employer's safety and health program at the worksite. Ferenchak was hired by Anzon and SPC to fulfill these responsibilities. In my opinion, he did fulfill them.

Anzon employees were obligated to follow their company's safety and health procedures. Contract employers were obligated to follow the safety and health rules of the worksite. They were also to advise the host employer of any hazards presented by the contract employer's work. They were also to advise the host employer how the contract employer was addressing those hazards, and of any other hazards identified by the contract employer at the worksite. Ferenchak's Site Safety Plan and employee training addressed these responsibilities. Further, Ferenchak operated in conformance with the Site Safety Plan that Kalanta reviewed and approved.

Pages 2 through 4 of the Site Safety Plan that Kalanta approved dealt with responsibilities and safety assignments. Specifically, page 4 of the Plan stated, in part:

> **IV. SAFETY ASSIGNMENTS**
> Each person is responsible for his/her own safety within the Anzon worksite. However, Anzon will advise employees and contractors in safety related matters. If safety concerns cannot be resolved quickly, professional safety consultants have been retained to advise Anzon Lead employees, contractors, and subcontractors in safety related matters.

This wording is consistent with the obligations of the host employer under OSHA §1910.16.

With respect to multi-employer worksite safety criteria, and the hazard involved with Balsama's incident:

1. Ferenchak did not create the hazard of static electricity shocks.

The vacuuming of lead dust through PVC hoses created the hazard. Conductive hoses, grounded throughout, should have been used to dissipate the static electricity. The type of hoses or grounding systems used with the vacuum trucks was the responsibility of the truck suppliers (e.g., Allstate and Vacuum Sales) using their knowledge of the work top be performed. This knowledge should have come from Anzon representatives who negotiated the purchase of the new vacuum truck from Vacuum Sales. Ferenchak did not know that a new truck was being purchased. Ferenchak was not consulted about static electricity safety features that should have been considered in the purchase decision.

2. Ferenchak did not have the authority to correct the hazard or to have it corrected.

Kalanta exercised detailed control over every aspect of the decontamination / demolition project. Kalanta routinely gave specific instructions to Ferenchak, often on a daily basis, about what would occur next on the job. Ferenchak's contract included providing advice and recommendations, but not the supplying of equipment. Ferenchak made recommendations to

Kalanta before Balsama's incident, but Kalanta did not authorize the recommendations to be implemented until after Balsama's incident.

3. Ferenchak made diligent efforts to persuade Kalanta (as the responsible management official responsible for the violation) to correct it.

Everyone at the worksite knew of the static electricity shock hazard because of the frequency of reported mild incidents. Ferenchak made frequent written notations on safety meeting minutes, and then verbally communicated those concerns about the static electricity hazard to Kalanta, Samson, and other Anzon representatives. Ferenchak emphatically made verbal recommendations to Kalanta about the need for static control hoses on the vacuum trucks, and the need for an electrical engineer to evaluate the situation and recommend an appropriate grounding system.

4. Ferenchak instructed employees how to avoid or minimize the dangers of the hazard and, where feasible, provided alternative protection for them.

Ferenchak made certain that rubber gloves and other necessary personal protective equipment was available and used. When it was found that the static electricity shocks continued, Ferenchak emphatically recommended the use of static control hoses, and that Anzon retain the services of an electrical engineer.

E. FINDINGS

To a reasonable degree of professional certainty, and subject to modification if additional information becomes available, it is my professional opinion that:

1. Balsama was injured when he received a static electricity shock from a vacuum hose.
2. Ferenchak did not create the static electricity hazard.
3. Ferenchak did not have the authority to correct the hazard.
4. Ferenchak made diligent efforts to persuade Kalanta, who was responsible for worksite operations, to correct the hazard.
5. Ferenchak informed employees of the hazards of static electricity, and provided alternative protection. Ferenchak also recommended that additional expertise be sought to solve the exposure problem.
6. Anzon and SPC failed to proactively heed the advice of the safety consultant that they hired. They also failed to use Ferenchak in the decision making process when they purchased the new vacuum truck.
7. The failure of Anzon and SPC to eliminate or control the known hazards from the lead vacuuming process, and the failure of Anzon and SPC to implement proper engineering controls and work procedures, created a dangerous static electricity shock exposure from the vacuuming process. This combination of hazard and risk was the direct and proximate cause of Balsama's injuries.

Ronald D. Schaible, CIH, CSP, P.E.

INVESTIGATION of the BARBARA MARTIN INCIDENT

TECHNICAL REPORT **JUNE 7, 2002**

A. INTRODUCTION

Barbara Martin was an employee of B.F. Goodrich Aerospace (Goodrich) in Union, WV from June, 1998 until November, 11, 1998. She worked with various epoxy compounds in the course of building aircraft components. CIBA Specialty Chemicals and its successor Vantico, Inc. (herein CIBA) manufactured and supplied some epoxy compounds to Goodrich. Her exposure to the epoxy materials caused severe skin irritation and sensitization.

The purpose of my investigation was to determine if:

1. The safety information provided by CIBA was defective in a manner that contributed to the incident;
2. Dermal exposure to epoxy potting compounds in the composite manufacturing department at the Goodrich facility created a specific unsafe working condition that created a high risk of serious injury to employees such as Martin;
3. The specific, unsafe condition violated
   (a) any state or federal safety statute, rule, or regulation, or
   (b) if it violated any commonly-accepted and well-known safety standard in the composite manufacturing industry.

B. INFORMATION AVAILABLE

1. Complaint (11/9/00).
2. Plaintiff Response to CIBA Discovery Requests (10/25/01).
3. Plaintiff Response to Goodrich Discovery (8/22/01).
4. Plaintiff Rule 26(a)(1) Disclosures (12/14/01).
5. CIBA Response to Plaintiff First Discovery (12/14/01).
6. CIBA Supplemental Response to Plaintiff First Discovery (12/28/01).
7. Goodrich Response to Plaintiff First discovery (9/21/01).
8. Goodrich Supplemental Response to Plaintiff First Discovery (10/3/01).
9. Goodrich Response to Plaintiff Second Discovery (11/26/01).
10. Goodrich Second Supplemental Response to Plaintiff First Discovery (12/13/01).
11. Responses of Defendant CIBA Specialty Chemicals Corporation to Plaintiff's Second Interrogatories and Requests for Production (1/14/02).
12. Attached responses with Bates stamp CIB000372 to CIB000398.
13. Items referenced in Response #2, Goodrich Response to Plaintiff's Second Discovery (11/26/01).
    a. Conform Premium Natural Rubber Latex Exam Gloves
    b. Laboratory Handies Super Heavyweight Vinyl Gloves
    c. Disposable Powder Free Vinyl gloves
    d. Ambidex Disposable Vinyl Gloves
    e. Mapa Staziol gloves
    f. Green nitrile gloves
    g. White nylon gloves
    h. White cotton gloves
14. Chart: Ms. Martin's inspection of gloves.
15. Defendant Goodrich Corporation's Second Supplemental Responses to Plaintiff's First Request for Production of documents to Defendant B.F. Goodrich Company.

16. "Epoxy Resin Systems Safe Handling Guide" from the Epoxy Resin Systems Task Group of the Society of the Plastics Industry, Inc.
17. Protective Order.
18. CIBA Specialty Chemical Corporation's Responses to Plaintiff's Third Set of Interrogatories and Requests for Production.
19. CIBA Specialty Chemical Corporation's Responses to Plaintiff's Fourth Set of Interrogatories and Requests for Production.
20. CIBA Specialty Chemical Corporation's Responses to Plaintiff's Fifth Set of Interrogatories and Requests for Production.
21. B.F. Goodrich Corporation's Responses to Plaintiff's Fourth Set of Interrogatories and Requests for Production.
22. B.F. Goodrich Corporation's Responses to Plaintiff's Fifth Set of Interrogatories and Requests for Production.
23. Deposition of William Brian Morrison taken May 21, 2002.
24. Deposition of Bernard Blake Jackson taken May 20, 2002.
25. Deposition of Lucy Taylor taken May 20, 2002.

C. BACKGROUND AND DESCRIPTION OF THE INCIDENT

Goodrich in Union, WV took over the manufacture of aircraft parts using two-part epoxy resin systems from its Marlboro, MA plant. The epoxy systems involved one part (-A) that is the epoxy resin. The epoxy resin system may contain solvents, accelerators, fillers, and reactive diluents. The second part (-B) is the curing or hardening agent.

Epoxy resins may be liquid, solid, or modified liquid. The properties of each ingredient in each resin system determine its potential for toxic exposure. Many of these systems are potent skin irritants in the uncured state, and may even cause sensitization in some individuals.

The process began by bonding pre-preg material to a honeycomb material with epoxy. In the honeycomb area, employees mixed the two epoxy components in a cup, and applied the mixture using tongue depressors, spatulas, putty knives, or other means, into the honeycomb structures of aircraft components. After the epoxy cured and hardened, additional processing was required to fill remaining voids. This work was performed in the final finishing area, also known as the "dirty room," because of the routers used to sand or grind the cured surfaces.

The manufacturing process, raw materials, Material Safety Data Sheets (MSDS), and personal protective equipment were sent from the Marlboro facility to the Union facility. Goodrich provided latex and vinyl gloves for employees to use with the two-part epoxy resin systems because those gloves had also been used at the Marlboro facility allegedly without incident (Taylor; p. 25) . Lucy Taylor and Karen McDaniel approved the use of latex and vinyl gloves for use at the Union facility (Taylor; p. 24) and provided orientation training that included personal protective equipment issues. Green nitrile gloves were also available at the Union facility, but they were designated for use with "chemicals." The latex and vinyl gloves used in the honeycomb area frequently tore due to abrasion, and due to the sharp edges of the honeycomb material. Testimony exists that the vinyl and latex gloves also dissolved from contact with the epoxy materials. Employees were exposed to the epoxy materials because the gloves dissolved. Heavier lay-up gloves were tried, but they were not considered suitable by Goodrich because they left a residue on the parts.

Martin worked with the following CIBA Epocast two-part epoxy resin systems: 1617, 1618, 1625, and 1636, and Epibond 89537. Martin also worked with Methyl Ethyl Ketone (MEK) and release agents. Goodrich relied on the MSDS and product label information provided by CIBA for their epoxy resin systems. Every MSDS and product label that I reviewed for the CIBA materials that Martin used stated only that "impervious" gloves should be worn. Specific glove recommendations were absent from the MSDS and product labels. CIBA was a member of a trade organization, The Society of the Plastics Industry, Inc. (herein, SPI), from the 1980's until May, 1999. Thereafter, CIBA continued to participate as a non-dues-paying member with representation on the SPI Epoxy Resin Systems Task Force (herein, Task Force). CIBA also had a participating role since 1992 in the "Badge (Bisphenol A DiGlycidal Ether) Group," which is a subgroup of the Task Force. It has also participated since the early 1980's, and continues to participate, in the Thermoset Technology/Epoxy Resin Formulators Division of SPI. CIBA is also a 25-year member of the Chemical Manufacturers Association (herein, CMA; now known as the American Chemistry Council).

The Task Force published a "Safe Handling Guide" (herein, Guide) in September, 1997. The Guide contained information for safe handling of epoxy resin systems in processing. Although the "Note to Users" indicates that the information contains "general guidelines" and is "not exhaustive," it does provide glove selection criteria for users of epoxy resin systems. The Guide was not restricted in its distribution since it was not a controlled document. There is no indication that CIBA ever provided a copy of the Guide to Goodrich, or that CIBA ever routinely sent the Guide to its customers with product shipments. The Guide was provided only after a customer inquired to CIBA, and when circumstances indicated a need for the document.

D. ANALYSIS

1. Working with Chemicals, and Especially Epoxy Materials, Without Proper Personal Protective Equipment, Is A Dangerous Condition.

A. Epoxy Resins

The literature on uncured epoxy resin systems clearly illustrates the hazards of these materials.

1.4.3 Irritation of Surface Tissues and Sensitization

Irritation of the skin and respiratory tract are the most commonly encountered toxic manifestations of contact with epoxy compounds. The degree of irritancy depends on the molar fraction of epoxy groups, the volatility, the solubility in both fats and water, and the viscosity of the material.[1]

Sensitization of Surface Tissues. Sensitization reactions in man caused by repeated exposure to epoxy compounds may be manifested by skin reactions or by asthma-like reactions to the respiratory tract.

Full-blown sensitization reactions can be elicited from much less agent than is required for an irritative response. Because this condition is difficult to treat, sensitized individuals may require transfer to other working areas. In this regard, it is now believed that on occasion vapors not present in sufficient concentration to cause irritation cause sensitivity.[2]

Sensitization dermatitis. This type results from an allergic reaction to a given substance. The sensitivity becomes established during the induction period, which may be a few days to a few months. After the sensitivity is established, exposure to even a small amount of the sensitizing

material is likely to produce a severe reaction. Some substances can produce both primary irritation dermatitis and sensitization dermatitis. Among them are organic solvents, chromic acid, and epoxy resin systems.[3]

CIBA

MSDS and product labels published by CIBA indicate the sensitization potential of their products. CIBA used the nonspecific term "impervious" to describe what gloves to wear, despite the fact that they had knowledge of specific glove materials that provided suitable protection. CIBA failed to provide their customers with specific glove material recommendations that would have effectively protected users from sensitization.

Goodrich

Goodrich possessed MSDS that specifically indicated that dermal exposure to epoxy materials would create unsafe working conditions. Taylor, as the Union, WV facility environmental, health, and safety representative/coordinator, stated that she reviewed the MSDS. Goodrich failed to properly act on this information.

B. Hazard Communication, and The Use of Personal Protective Equipment

CIBA

CIBA was a chemical manufacturer and subject to the provisions of regulations promulgated by the Occupational Safety and Health Administration (OSHA), specifically 29 CFR 1910.1200. The purpose of this regulation is:

§1910.1200 Hazard communication.
(a) Purpose. (1) The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

Hazard communication ("HAZCOM") was promulgated in 1985. Since 1985, guidelines have been developed for the structure and content contained in MSDS and product labels. The most important document regarding MSDS preparation is ANSI Z400.1 and its revisions.[4] The ANSI Standard is a commonly accepted and well-known safety standard in industry for the development of MSDS. This ANSI Standard provides guidance "for developing MSDS [that] reflects the best practices of many different companies represented on the working group as well as significant input from outside parties and consultants".[5] The Health and Safety Committee of the CMA sponsored and directed the development of the 1993 standard.[6]

A Material Safety Data Sheet describes the hazards of a material and provides information on how the material can be safely handled, used, and stored. It is a summary of material safety information. For completeness and clarity, it should contain information on chemical product and supplier identification, chemical or hazardous components, hazards identification, first aid, fire-fighting measures, accidental release measures, handling and storage, exposure controls, personal protection, physical and chemical properties, and reactivity. It may also include toxicological, ecological, disposal, transport, regulatory, and other useful information. MSDSs cannot include information on every unique application of the material, although they should

consider the hazardous exposures resulting from customary and reasonably foreseeable occupational use, misuse, handling, and storage. The MSDS is only one source of information on a material; as such, it is best used along with technical bulletins, labels, training, and other communications.[7]

Specifically concerning skin protection, the ANSI standard states the following:

8.2.2 Skin protection
Recommend when known, the best barrier material (such as butyl rubber or neoprene) for PPE. Where other factors, such as thickness of the material (heavy duty vs. light) or durability are important, they should be included in the guidance. Base the recommendation on laboratory permeation data, or appropriate field experience.[8]

MSDS were never intended to serve as a primary literature surrogate for assessing and treating occupational exposures to hazardous substances. For this reason, they should not be held to the level of detail existing in the scientific literature. However, the material presented in the MSDSs should be correct and provide adequate information on the product so that individuals will be aware of the hazards and know what precautions to take.[9]

Every MSDS (and their revisions), and every product label for the CIBA epoxy products that Martin used, and that I reviewed, consistently used the phrase "impervious gloves" in the portion of the MSDS that addressed personal protection information. The use of the word "impervious" does not refer to the specific, best barrier material based on laboratory permeation data or appropriate field experience.

CIBA had specific knowledge of the best barrier material for these compounds, as expressed in the SPI Guide. Table 3 on page 8 of the Guide summarizes generalizations about chemical resistance of glove materials. Even a cursory glance at the table shows that although vinyl gloves are rated "excellent" for liquid or solid epoxy resins, they are rated "poor" for modified epoxy resins, hardeners/curing agents, and solvents. Since the CIBA epoxy systems required the use of the latter group of materials, it is clear that vinyl gloves are inappropriate for use with the full range of epoxy resins systems and components. Neoprene or nitrile (which Goodrich had available at their facility) are the minimum acceptable glove materials.

CIBA did not distribute the Guide to their customers, except in direct response to requests for it, or in response to specific requests for dermal protection recommendations. Document number 11 in Section B of this report states on page 3 that "*Customers are further advised that latex gloves are usually not suitable and that butyl rubber or nitrile gloves could be suitable depending on the circumstances. Customers are also told to have their employees wear clothing to cover their skin and to avoid direct skin contact with these Epocast products.*"

Goodrich

§1910.1200(d) requires chemical manufacturers and importers to evaluate chemicals produced by them to determine if they are hazardous. Epoxy materials have known specific hazards that pose a high risk of injury. Information on those hazards was published in available, peer reviewed literature, and in the MSDS in Goodrich's possession.

Goodrich did not perform competent HAZCOM training for their employees that used epoxy materials, per 1910.1200(h)(2)(iii) of HAZCOM which states that training shall include:

(iii) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used;

The training advocated the use of the "approved" latex or vinyl gloves for epoxy work, and the use of the green nitrile gloves for use with "chemicals". Epoxies are chemicals. However, the HAZCOM training specifically did not require the use of nitrile gloves for use with epoxies. Vinyl and latex gloves were known to not protect workers from epoxy materials. Therefore, the training provided incorrect information causing Martin to be unnecessarily and repeatedly exposed to the hazards of epoxy materials.

Goodrich's training and their use of latex and vinyl gloves that tore, dissolved, and exposed Martin to direct dermal contact with the known specific hazards of epoxy materials violated the OSHA HAZCOM standard.

OSHA's 29 CFR 1910.132 also applies to Goodrich. Its requirements are:

Subpart I – Personal Protective Equipment
§1910.132 (d) *Hazard assessment and equipment selection.* (1) The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or are likely to be present, the employer shall:
(i) Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;
(ii) Communicate selection decisions to each affected employee; and,
(iii) Select PPE that properly fits each affected employee.

Taylor stated (P. 46) that Goodrich did not train each worker on how to properly don and doff the gloves until approximately one month after workers started experiencing problems. Proper procedures for donning and doffing personal protective equipment are important especially if, as in this type of operation, the external surfaces of the personal protective equipment are contaminated with the hazardous material that the personal protective equipment is supposed to protect against. Improper doffing can cause exposure to the contaminants. All employees should have received this important training and instruction whether or not they were experiencing problems.

Goodrich supplied and advocated the use of latex and vinyl gloves that tore, dissolved, and exposed Martin to the epoxy materials and the known specific hazards of allergic skin reactions and sensitization. Goodrich did so despite the fact that it possessed MSDS that recommended only impervious gloves be used with epoxy materials. Properly selected gloves, and proper employee training in their use, would not have exposed Martin to those hazards. Goodrich violated OSHA regulations regarding personal protective equipment.

2. This Dangerous Procedure Was Likely To Cause Serious Injury.

The basic measures for preventing accidental injury, in order of effectiveness and preference, are:

1. Eliminate the known hazards from the machines, methods, materials, and plant structure.
2. Control the hazard by enclosing or guarding it at its source.

3. Train personnel to be aware of the hazard and to follow safe job procedures to avoid it.
4. Prescribe personal protective equipment for personnel to shield them against the known hazard.[10]

CIBA

Accepted industry standards existed for communicating competent personal protection information. However, CIBA failed to provide clear and precise glove selection information in their MSDS and product labels for the epoxy products that Martin used. CIBA also failed to provide this information although they knew the proper glove materials. CIBA knew or should have known this information based on their own manufacturing experience, their participation on the Task Force, and the contents of the Guide to which CIBA's representatives contributed. CIBA's failure to provide clear and competent personal protection guidance on their MSDS and their product labels, and by their failure to freely distribute the Guide, deprived users of valuable information that would have protected them from the hazards of the epoxy materials.

Goodrich

Goodrich possessed and reviewed MSDS that stated the hazards of epoxy materials, and the need to use impervious gloves. Goodrich failed to provide gloves that positively protected Martin from contact with the epoxy materials. The known hazards are inherent in the epoxy materials. Substitute materials were not available because the use of these epoxy materials was determined by customer specifications. Prescribing proper personal protective equipment was the only way Goodrich could protect Martin from the known specific hazard of allergic reactions and sensitization. Goodrich failed to provide proper skin protection.

3. Incorrect Instructions and Improper Safety Equipment That Martin Was Given for Her Work With Epoxy Resins Caused Her Injuries.

To a reasonable degree of professional certainty, and subject to modification if additional information becomes available, it is my professional opinion that Martin was injured due to the lack of proper personal protective equipment for her exposure to epoxy materials at the Goodrich facility in Union, WV.

CIBA

CIBA, as the chemical manufacturer of the products that Martin used, possessed critical safety information necessary to the safe use and handling of epoxy materials. CIBA failed to communicate this information in their MSDS as required by OSHA and ANSI standards, and by withholding the Guide from free and routine distribution to customers. This could have been accomplished, for example, by having the Guide and MSDS accompany shipments of epoxy products to customers, or by mailing them to the ship-to address. The existence of the Guide could have also been mentioned in CIBA's MSDS with reference to an Internet site where users could access and download the information.

Goodrich

The unsafe condition created by Martin's dermal exposure to epoxies from degraded gloves was the direct and proximate cause of Martin's injuries.

E. FINDINGS

To a reasonable degree of professional certainty, and subject to modification if additional information becomes available, it is my professional opinion that:

1. Working with epoxy materials, without proper training and personal protective equipment (e.g., nitrile or other effective glove materials), caused Martin's injuries.
2. This dangerous procedure was certain to cause serious injury in a substantial portion of exposed workers.
3. CIBA negligently failed to communicate competent information on personal protection in their MSDS and product labels. Information on proper glove material selection was in CIBA's possession. CIBA's nonspecific glove selection criteria deprived Goodrich and Martin of critical safety information. The lack of this critical information was a cause of Martin's injuries.
4. Martin received dermal exposure to epoxy potting compounds in the composite manufacturing department of Goodrich. This exposure was due to Martin's having to wear gloves that tore and dissolved when in contact with the epoxy materials, and caused Martin to be exposed to the epoxy materials. Goodrich knew this exposure was occurring. This specific unsafe working condition created a high risk of serious injury to Martin.
5. The unsafe working conditions at Goodrich violated specific and applicable OSHA regulations.
6. These unsafe working conditions were a cause of Martin's injuries.

Ronald D. Schaible, CIH, CSP, P.E.

ENDNOTES TO THE TECHNICAL REPORT OF THE BARBARA MARTIN INCIDENT

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[1] Clayton, George D., Florence E. Clayton, Editors. *Patty's Hygiene and Toxicology, 3rd Revised Edition, Volume 2A, Toxicology.* John Wiley & Sons, New York. 1981. P. 2145.
[2] Ibid. P. 2147.
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INVESTIGATION of the KASPRZAK INCIDENT

REPORT **MAY 2, 2003**

A. INTRODUCTION

On the date of the incident, July 19, 1998, Stephen Kasprzak was employed by Goodyear Dunlop Tires North America, Ltd. ("Dunlop"), in Tonawanda, NY. In 1988, Dunlop purchased a breaker slitter machine from VMI Americas, Inc. VMI subsequently sold Dunlop a slitter attachment in 1997. Kasprzak used a long-handled hook to remove rubber material that was jammed in a component of the slitter in a below-grade pit. Kasprzak injured his neck while pulling the rubber material out of the machine.

The purpose of my investigation was to determine if the arrangement of the breaker slitter machine was defective in a manner that caused the incident.

B. INFORMATION AVAILABLE

1. Summons and Complaint.
2. Verified Bill of Particulars.
3. Deposition of Stephen C. Kasprzak taken February 26, 2001.
4. Deposition of Arie Kroeze taken February 26, 2001.
5. My site inspection of November 14, 2000.
6. Various photographs of the machine.
7. Various documents pertaining to the machine sold to Dunlop Tire, including all drawings, correspondence, costs, and other construction information.
8. VMI Manual No. 1800, dated December 6, 1997, for the Breaker slitter Model 250 constructed for Dunlop.

C. BACKGROUND AND DESCRIPTION OF THE INCIDENT

Dunlop purchased a breaker slitter machine from VMI in 1988. The Model 250 breaker slitter machine is used in the manufacture of tires. It slits rubberized steelcord fabric into strips and at specific angles, splices the pieces together, and rolls it onto steel belting that is also processed through the same machine. VMI built the machine. Dunlop installed the machine in their factory.

Dunlop subsequently purchased a slitter in 1997 that was also built by VMI. The slitter was added to the breaker slitter at the end of the original machine. Dunlop installed the slitter. Dunlop chose not to have VMI train their workers on the use of the machine because it was installed during shutdown, and Dunlop's workers were not available for training.

A pit was required for all slitter installations. The pit provides a buffer for the "looping" of the rubber to accommodate operating the machine at different speeds for different product. In its drawings and related documents, VMI specified the need for a below-grade pit, where the pit needed to be located with respect to the breaker slitter machine, the minimum depth and other dimensions of the pit. VMI does not install pits for their machines. At some point, and for reasons unknown to VMI, Dunlop modified the slitter part of the system by replacing some photoeyes. The photoeyes are safety devices located in the pit. They detect expected material build-up around the knives so it can be manually cleared by the machine operator. Other machine modifications were made by VMI that dealt with improving the manner in which material was guided through the machine to obtain a more consistent product width. Those changes were unrelated to the issue of jammed material.

Dunlop installed the slitter, and either installed the pit themselves or arranged for the pit to be installed by a subcontractor. Workers entered the pit by removing fasteners that secured the covers, opening the access covers, and descending a rigid ladder affixed to one wall of the pit. Workers could enter the pit to remove jammed, or "balled up", material and to perform housekeeping duties.

Kasprzak was working alone on the machine on the date of the incident. Kasprzak became aware that material was jammed around the knives because either the photoeyes functioned as they were designed to operate, or Kasprzak saw the jammed material. Jammed material was not a normal occurrence. Kasprzak stopped the machine using an emergency stop control on the machine. He did not climb down into the pit. Instead, he opened the pit covers, and reached in with a hot knife to cut off the slit stock. A hot knife is a long, flat piece of metal kept in a heated box. The hot knife is removed from the heated box, and the hot knife tip is manipulated to cut the rubber and let it drop down into the pit. Kasprzak usually either squatted or knelt down on both knees to use the hot knife and cut off the material and let it fall into the pit. He then used a T-handled hook provided by Dunlop to clear the jammed material from the knives. Standing on the closed right pit cover, he used the T-handled hook to remove the material. While pulling on the material with the T-handled hook in his left hand, his left foot slipped into the opening created by the open, left pit cover, and he was injured.

D. INSPECTION

I inspected the site on November 14, 2000. Various photographs and measurements were taken. The installed pit measured 5.5 feet deep, and 60 inches by 70 inches overall. Two hinged, steel access covers measuring 11 inches by 15.75 inches covered the pit opening.

E. ANALYSIS

1. VMI Built the Machine, But Not the Pit

Available documentation indicates that VMI designed and built the breaker slitter machine. VMI supplied numerous warning decals on appropriate portions of their equipment regarding electrical safety and guarding. Dunlop installed the original machine and the subsequent slitter. VMI specified the need for a pit to Dunlop as a necessary part of the slitter installation to ensure satisfactory operation at various machine speeds. VMI never installed pits for their machines. VMI left that responsibility to its customers. VMI incorporated the use of photoeyes in the design of their slitter. The photoeyes detect the accumulation of material build-up or other nonconforming condition that needs to be cleared, removed or remedied. The performance of the photoeyes was unrelated to the manner in which Kasprzak tried to remove the jammed material.

2. The Pit Was Constructed By Dunlop, Or By A Third Party As Directed by Dunlop

Design criteria for the pit was provided by VMI. Dunlop either built the pit, or contracted with a third party to build the pit according to the design criteria. The pit allowed for material accumulation in a defined area. A place was needed for material accumulation because of the need to accommodate various production speeds. The photoeyes were located in the pit. However, the location of the photoeyes in the pit was unrelated to the manner in which Kasprzak tried to remove jammed the material.

The pit constructed by Dunlop, or by a third party at the direction of Dunlop, was a "confined space". Therefore, as Kasprzak's employer, Dunlop was responsible under OSHA 1910.146(c) to "evaluate the workplace to determine if any spaces are permit-required confined spaces" as defined in 1910.146 (b). It was Dunlop's responsibility to include this confined space as part of their overall safety program, and to provide worker training and post signage appropriate for this confined space. VMI was not responsible for initiating or controlling a confined space safety program at the Dunlop factory.

3. Kasprzak Created The Hazard By Standing Near a Floor Opening

Kasprzak tried to remove jammed material using the T-handled hook while in a standing position with one of the pit covers open. His foot slipped out from under him during this process.

There are safety requirements in OSHA to protect walking and working surfaces to prevent injuries. OSHA states the following in the July 1, 1997 edition of the regulations:

> **1910.22 General requirements.**
> (c) *Covers and guardrails.* Covers and/or guardrails shall be provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc.
>
> **1910. 23 Guarding floor and wall openings and holes.**
> (a) (5) Every pit and trapdoor floor opening, infrequently used, shall be guarded by a floor opening cover of standard strength and construction. While the cover is not in place, the pit or trap opening shall be constantly attended by someone or shall be protected on all exposed sides by removable standard railings.

The pit was equipped with suitable covers by whoever constructed the pit. Kasprzak opened one hinged cover while he tried to remove the jammed material. For whatever reason, Kasprzak fell partially into the pit. Regardless of what caused Kasprzak to fall, VMI was not responsible for the condition that contributed to the fall because VMI had nothing to do with the design of the pit, the covers, or the manner in which Kasprzak performed his work.

G. FINDINGS

To a reasonable degree of professional certainty, and subject to modification if additional information becomes available, it is my professional opinion that:

1. Kasprzak's foot slipped into an unguarded floor opening while trying to remove jammed material in a floor pit.
2. VMI designed the breaker slitter machine and the subsequently installed slitter. VMI specified the need for a pit, but did not construct the pit or control its use. There is no indication that any part of the VMI machine failed to operate as it should have, or that a hazard was created by VMI's equipment.
3. Dunlop either built the pit and covers, or caused the pit and covers to be built by a third party.
4. Dunlop was responsible for providing worker training, appropriate tools, and a safe working environment.
5. Kasprzak fell, but VMI did not contribute to the circumstances of his fall.

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