US EPA & Federal Partners Efforts to Understand & Promote the Safe Use of Polyurethane Products &
EPA’s Proposed Regulatory Actions under the Toxic Substances Control Act (TSCA) for Diisocyanates

SPFA Convention & Expo
January 29, 2015

Presented by:
Carol Hetfield, Environmental Protection Agency
Katherine Sleasman, Environmental Protection Agency
Presentation Outline

- Concern for Isocyanates, SPF and other Polyurethane Products
- Partnerships & Stewardship Goals
- Best Practices
- Background on TSCA Isocyanates Actions
- Other Activities
  - Information Gathering Approaches
  - Voluntary Information Request Letter on Curing Rates of PU Products
  - Test Method Development
  - Significant New Use Rule (SNUR)
- Summary
- Information Sources
EPA’s Concerns for Isocyanates and Polyurethane Products

- SPF and other polyurethane products can be mixed, applied, and/or manufactured on-site in a home, school, or other buildings.
- Concern for vapors, aerosols, dust, or product emissions containing:
  - Side A - Diisocyanates (i.e., MDI, pMDI), known respiratory and dermal sensitizers
  - Side B – Polyol Blend
    - amine and/or metal catalysts,
    - flame retardants,
    - blowing agents,
    - surfactants,
    - other proprietary ingredients, and
    - reaction products, such as aldehydes
Partnerships

- **Federal Partnership:**
  - US Environmental Protection Agency (EPA)
  - Occupational Safety and Health Administration (OSHA)
  - National Institute for Occupational Safety and Health
  - The Consumer Product Safety Commission (CPSC)
  - The Agency for Toxic Substances and Disease Registry (ATSDR)
  - National Institute of Standards & Technology (NIST)

- **Engagement with Industry Representatives:**
  - American Chemistry Council (ACC)
  - ACC’s Center For Polyurethanes Industry (CPI)
  - Spray Polyurethane Foam Alliance (SPFA), representing applicators
  - Individual Chemical and Polyurethane Product Manufacturers
SPF Stewardship Goals

- Avoidance of misleading or deceptive marketing claims.
- Communication of hazards, as well as benefits of SPF.
- Develop & adopt practices to prevent harmful exposures:
  - Ensure workers are trained on hazards, processing and equipment, curing rates, performance, as well as communicating with others.
  - Ensure worksite isolated and restricted to workers wearing appropriate personal protective equipment (PPE).
  - Provide guidance on safe re-occupancy times and ventilation.
- Address research needs and data gaps.
EPA’s Approach to Best Practices

- Identify established practices for engineering or process efficiencies & control technologies to reduce exposures and environmental releases,
- Review existing worker training materials & practices addressing the use of PPE and control technologies, and
- Solicit recommendations for innovative practices from industry and field experts, capturing the following:
  - Identify job related tasks.
  - Safe work practice(s).
  - Exposure reduction/prevention potential of the safe work practice.
  - Other relevant information (i.e., pros and cons) associated with the safe work practice.
EPA Guidance

- ENERGY STAR Residential Insulation Partners
- Ventilation Guidance for SPF Applications/Automotive Shops.
- Checklists for SPF installers and communicating with homeowners.
- Self-evaluation tool for contractors of practices and strategies to protect workers and promote the safe use of polyurethane products.
  - Periodic assessment tool of current practices to identify areas for improvement over key-operation phases.
  - Includes the following:
    - Over 175 Activities (safer workplace practices).
    - Potential for exposure & impact on worker exposure.
MDI and TDI Actions

- **Diisocyanates:**
  - Recognized as dermal and inhalation sensitizers
  - May cause asthma, lung damage, and in severe cases, fatal reactions

- EPA is concerned about potential exposures to consumers and/or those commercial workers not covered under OSHA regulations, and the general population that could result from the use of products containing unreacted MDI, TDI, and related compounds.
  - e.g., application of spray-applied sealants and coatings when such products are used in or around buildings such as homes or schools
Information Request Authority

- For the purposes of carrying out TSCA, EPA requested companies voluntarily provide certain information:
  - EPA specifically requested information in their possession on the curing time required to chemically react all diisocyanate functional groups, and
  - The amount of time required to safely re-occupy or use an area where diisocyanates have been reacted
- The Agency is reviewing the information to determine what it tells us about consumer and worker exposure to polyurethane products.
- EPA received the following types of data as a result of our request including; see MDI Docket @ EPA-HQ-OPPT-2011-0182:
  - Formulation Data
  - Safety Data Sheets
  - Industrial Hygiene Studies
  - Curing information
ASTM D22.05 Indoor Air & Test Methods to Measure Emissions

- Need methods and data that paint the picture of “source-to-exposure,” over the product life-cycle capturing “normal” cure phase emissions as a benchmark for evaluating emissions and off-spec conditions, wherein –
  - A methodology is a tool that industry uniformly uses to evaluate product formulations, providing reliable data to better assess the potential for exposures.
- EPA’s Office of Research and Development, in collaboration with NIST, CPSC, NIOSH, and industry is developing test methods and protocols to generate reliable data to fill knowledge gaps, including
  - What is emitted and for how long and factors that may impact emissions?
  - This work supports the ASTM Committee D 22.05 SPFI emissions test method development task. (ASTM Symposium April, 2015)
Significant New Use Rules (SNURs)

- TSCA section 5(a) authorizes EPA to determine that a use of a chemical substance is a “significant new use.” EPA must make this determination by rule after considering all relevant factors, including:
  - The projected volume of manufacturing and processing of a chemical substance.
  - The extent to which a use changes the type or form of exposure of human beings or the environment to a chemical substance.
  - The extent to which a use increases the magnitude and duration of exposure of human beings or the environment to a chemical substance.
  - The reasonably anticipated manner and methods of manufacturing, processing, distribution in commerce, and disposal of a chemical substance.

- A SNUR requires that manufacturers and processors of the chemical subject to the SNUR notify EPA at least 90 days before beginning any activity that EPA has designated as a "significant new use"
The Agency published a significant new use rule for TDI and related compounds in January of 2015.

- The proposed significant new use is for any use in a consumer product except for use in coatings, elastomers, adhesives, binders, and sealants that results in less than or equal to 0.1 percent by weight.
- For this proposed rule, the general SNUR article exemption for persons who import or process TDI and related compounds would not apply.
- There is a 60 day comment period.
Summary

- The SPF industry needs to ensure:
  - There is comprehensive and clear hazard communication for all SPF users – applicators, assistance, other trades, do-it-yourselfers, consumers, and other decision-makers (i.e., building managers, etc.).
  - Consumers need clear hazard and use warnings, such as through product labeling and communications with commercial contractors.
  - The work site is restricted to only those wearing appropriate personal protective equipment.
  - Quality control - avoid installation of off-spec, poor performance polyurethane materials. (see saferproducts.gov for complaints of off-gas persistence).
  - Guidance is provided on re-occupancy time & long-term ventilation (H-VAC) needs.
  - Marketing claims are accurate and balanced.
Where to Get More Information?

- EPA’s DfE SPF website: search “EPA SPF”
- FTC Green Guides: [http://www.ftc.gov/os/2012/10/greenguides.pdf](http://www.ftc.gov/os/2012/10/greenguides.pdf)
- International Research Conference (Isocyanates & Health: Past, Present, & Future, April 2013, Bolger Center in Potomac, MD), [http://www.isocyanates2012.org/content/home.cfm](http://www.isocyanates2012.org/content/home.cfm)
- ASTM Methods (D22.05) for measuring chemical emissions from Spray Polyurethane Foam.
- Project Coordinators: Carol Hetfield; 202-564-8792; hetfield.carol@epa.gov
  & Katherine Sleasman; 202-564-7716; sleasman.katherine@epa.gov
Isocyanate National Emphasis Program – An Enforcement Overview

Sven Rundman
Directorate of Enforcement Programs
Office of Health Enforcement
Washington, DC

January 29, 2015
Outline

- Background review
  - Isocyanates and the National Emphasis Program
- Enforcement update (federal data only)
  - Inspection summary
  - Top violations cited
- Federal/State Surveillance Hazards Review
  - controls (engineering, PPE, administrative, housekeeping)
- Future Steps – what’s next?
National Emphasis Program (NEP) Highlights

- Effective June 2013
  - 3-year period

- NEP coverage:
  - General Industry, Construction, and Maritime

- Goals:
  - 1) reduce occupational illnesses, injuries, and deaths associated with exposure to isocyanates; and
  - 2) raise employer and employee awareness of the health effects to exposure to isocyanates.
Isocyanate NEP Inspections
6/19/13 – 12/31/14

386 total NEP inspections

188 Programmed Inspections
- Inspection initiated by NEP primary or secondary list

198 Unprogrammed Inspections
- Inspection initiated by other means (complaint, other NEP, referral)
Isocyanate NEP Inspections by Industry Type

- General Industry: 335
- Construction: 37
- Maritime: 14
<table>
<thead>
<tr>
<th>Industry</th>
<th>NAICS Code</th>
<th>Number of Inspections</th>
<th>Major Associated Isocyanates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive Body, Paint, and Interior Repair and Maintenance</td>
<td>811121*</td>
<td>104</td>
<td>HDI, 1,6-hexamethylene diisocyanate homopolymer, MDI, TDI, toluene-2,6-diisocyanate</td>
</tr>
<tr>
<td>All Other Plastics Product Manufacturing</td>
<td>326199</td>
<td>19</td>
<td>n/a</td>
</tr>
<tr>
<td>Drywall and Insulation Contractors</td>
<td>238310*</td>
<td>17</td>
<td>MDI</td>
</tr>
<tr>
<td>Urethane and Other Foam Product (except Polystyrene) Manufacturing</td>
<td>326150**</td>
<td>12</td>
<td>MDI, HDI, TDI, toluene-2,6-diisocyanate</td>
</tr>
<tr>
<td>Boat Building</td>
<td>336612</td>
<td>7</td>
<td>MDI, HDI, aliphatic isocyanate</td>
</tr>
<tr>
<td>General Automotive Repair</td>
<td>811111**</td>
<td>6</td>
<td>HDI, 1,6-hexamethylene diisocyanate homopolymer, MDI</td>
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<tr>
<td>Paint and Coating Manufacturing</td>
<td>325510*</td>
<td>6</td>
<td>n/a</td>
</tr>
<tr>
<td>All Other Motor Vehicle Parts Manufacturing</td>
<td>336399</td>
<td>6</td>
<td>HDI, 1,6-hexamethylene diisocyanate homopolymer, MDI, TDI, toluene-2,6-diisocyanate</td>
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<tr>
<td>New Car Dealers</td>
<td>441110</td>
<td>6</td>
<td>MDI, HDI, toluene-2,6-diisocyanate, isophorone diisocyanate</td>
</tr>
<tr>
<td>Plastics Plumbing Fixture Manufacturing</td>
<td>326191**</td>
<td>3</td>
<td>aliphatic isocyanate</td>
</tr>
<tr>
<td>Carpet and Rug Mills</td>
<td>314110</td>
<td>1</td>
<td>polymeric MDI</td>
</tr>
<tr>
<td>Reconstituted Wood Product Manufacturing</td>
<td>321219**</td>
<td>1</td>
<td>MDI, MDI 2 ring, MDI 3 ring</td>
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<tr>
<td>Glass Product Mfg Made of Purchased Glass</td>
<td>327215</td>
<td>1</td>
<td>MDI</td>
</tr>
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# Total Violations Issued – 6/19/13 – 12/31/14

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<thead>
<tr>
<th>Category</th>
<th>Count</th>
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<tbody>
<tr>
<td>Total violations</td>
<td>1351</td>
</tr>
<tr>
<td>Serious</td>
<td>986</td>
</tr>
<tr>
<td>Willful</td>
<td>1</td>
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<tr>
<td>Repeat</td>
<td>16</td>
</tr>
<tr>
<td>Other</td>
<td>348</td>
</tr>
</tbody>
</table>

(all hazards)
Top Standards Cited

1910.134 Respiratory Protection
1910.1200 Hazard Communication
1910.132 Personal Protective Equipment
1910.107 Flammable & Combustible Liquids
1910.305 Electrical Wiring Methods
1910.134 - Respiratory Protection Standards Violated

- 1910.134(c)(1) – respirator program
- 1910.134(e)(1) – medical evaluation
- 1910.134(f)(2) – fit-tested before use
- 1910.134(d)(1)(iii) – evaluate respiratory hazards
- 1910.134(f)(1) – fit-testing - pass QLFT or QNFT

Respiratory protection-related violations – 428 (31.7%)
1910.1200 – Hazard Communication Standards Violated

- 1910.1200(e)(1) – hazard communication program
- 1910.1200(h)(1) – information and training program
- 1910.1200(h)(3)(iv) – training on details of program, including format of labels and SDSs
- 1910.1200(g)(8) – maintain SDS/MSDS
- 1910.1200(h)(3)(ii) – training on physical and health hazards

Hazard Communication-related violations - 281 (20.8%)
Other Standards Violated

1910.132(d)(2) – PPE hazard assessment and written certification

1910.107(b)(5)(i) – designed, installed, and maintained spray operations

1910.133(a)(1) – provide eye or face protection

1910.132(a) - PPE provided, used, and maintained in sanitary condition
Appendix C
Health Surveillance Form (Non-mandatory) – Isocyanate Exposure

Interviewer: ________________________ Date: ____________________

Worker Name: ____________________________________________

1. What was the month and year that you were hired at this company?
_________________________________________________________________

2. What is your job title?  
____________________________________________

8. Has a doctor ever told you that you have asthma?  
   Yes: YES No: NO
   If YES, when did the doctor tell you this?  
   __________________________

9. Has a doctor ever told you that you have any of the following work-related conditions?  
   a. Work-related asthma -  
      Yes: YES No: NO
      If YES, when did the doctor tell you this?  
      __________________________

   b. Allergies from exposures at work -  
      Yes: YES No: NO
      If YES, when did the doctor tell you this?  
      __________________________
### Appendix C

<table>
<thead>
<tr>
<th>Symptom</th>
<th>YES</th>
<th>NO</th>
<th>If yes, approximately what date did you first notice symptoms?</th>
<th>Do your symptoms occur at work?</th>
<th>Do your symptoms improve when you are away from work such as while on vacation or on the weekends? (Describe):</th>
<th>Do you think your symptoms are brought on by any particular work activity, chemical exposure, or work area? (Describe):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td></td>
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<tr>
<td>Wheezing</td>
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<tr>
<td>Watery or itchy eyes</td>
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<tr>
<td>Nose stuffiness or itching</td>
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<tr>
<td>Skin rash or itching</td>
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<tr>
<td>Shortness of breath</td>
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<tr>
<td>Chest tightness</td>
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<tr>
<td>Fever or chills</td>
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</tbody>
</table>
NIOSH/State Surveillance visits with potential H&S violations to workers
Spray foam insulation

Potential violations: inadequate ventilation, entanglement with air hose (slip/trip/fall); exposure when trimming; inadequate PPE.
Spray foam insulation

Potential violations: lack of PPE, missing filter on air supply pump; inadequate respirator cleaning.
Autobody/spray bedlining

Potential violations: inadequate ventilation, PPE – lack of shoe covers or gloves.
Shoe Gluing

Potential violations: PPE – no gloves, hazard communication.
Manufacturing (aerospace, telecommunications)

Potential violations: PPE, hazard communication
Packing department

Potential violations: PPE – no gloves and respirator; inadequate ventilation, poor housekeeping.
Changing out drums

Potential violations: respirator use, poor housekeeping.
OSHA On-Site Consultation Program

- Free and confidential advice to small and medium-sized businesses in all states.

- On-site Consultation services are separate from enforcement and do not result in penalties or citations.

- Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing injury and illness prevention programs.

https://www.osha.gov/dcsp/smallbusiness/consult.html
Future Steps - What’s Next?

- HALF-WAY THROUGH NEP
  - Inspections on-going
  - Outreach & Education
  - Continue to evaluate NEP
Questions??

Contact Information:
Sven Rundman
202-693-2190