REGULATORY HISTORY

The regulations cited in this report, especially the testing and reporting rules, have a direct impact on the chemical manufacturers of these isocyanates. However, the impact of these regulations goes beyond manufacturers and extends to wholesale distributors of paint products, paint jobbers, and operators of autobody shops. At each of these operations (manufacture, distribution, and use) it is important to evaluate how regulatory activity affects the transport of these chemicals, the disposal of hazardous wastes resulting from the use of these chemicals, and the releases of VOCs. Regulatory activity was investigated for 18 isocyanate chemicals in the following areas:

- Federal Environmental Regulations (to include TSCA, SARA, CAA, SDWA, and CWA)
- Dept. of Transportation Regulations
- OSHA Regulations
- State Regulations (CA, CO, NJ, OR, TX, and WA)
- International Regulations
- TSCA PMN Actions

Some regulatory activity was found for almost all the chemicals in this group. In fact, of the 18 chemicals examined only three had absolutely no regulatory activity (058067-42-8, 083748-30-5, and 028679-16-5). The regulatory activity was focused primarily in TSCA and EPCRA. Specifically within TSCA the regulations were either 8(a) reporting rules under CAIR and PAIR, 8(d) Health and Safety Reporting, and ITC actions were the most prevalent. Within the SARA regulatory area, the regulations, dealt primarily with adding chemicals to the Toxic Release Reporting Inventory or to the Extremely Hazardous Substances list.

In the occupational exposure regulation area, OSHA has promulgated permissible exposure limits (PELs) for toluene diisocyanate (TDI) and methylene bisphenyl isocyanate (MDI). Individual states can also establish a more stringent exposure limits. Outside of regulatory activity, NIOSH and ACGIH have recommended their respective exposure limits for some of the diisocyanates. NIOSH's recommended limits are called the Recommended Exposure Limit (REL) while the ACGIH calls their exposure limits as the Threshold Limit Value (TLV). Both these recommended exposure limits are not legally enforceable. The PEL, REL, and TLV can be established for a daily TWA (either as 8-hour or 10-hour TWA), a Short Term Exposure Limit (STEL), or as a ceiling limit. The following is a summary of these values.

CAS #	Name	OSHA PEL (ppm) 8-hr TWA	OSHA PEL (ppm) 15-min Ceiling	NIOSH REL (ppm) 10-hr TWA	NIOSH REL (ppm) 10-min Ceiling	ACGIH TLV (ppm) 8-hr TWA	ACGIH TLV (ppm) STEL	California PEL (ppm) 8-hr TWA	California PEL (ppm) 15-min Ceiling
000101-68-8	MDI	--	0.02	0.005	0.02	0.005	--	0.005	--
000504-84-9	TDI	--	0.02	0.005	0.02	0.005	--	0.005	--
000822-06-0	HDI	--	--	0.005	0.02	0.005	--	0.005	--
004098-71-9	IPDI	--	--	0.005	0.02	0.005	--	0.005	--
005124-30-1	Methylenebis (4-cyclohexyliso-cyanate)	--	--	0.005	0.02	0.005	--	0.005	--
028679-16-5	Trimethylhexa-methylene diisocyanate	--	--	--	--	--	--	0.005	--

Of the states investigated, California, Colorado, and New Jersey had the more extensive regulations on these chemicals. The regulatory actions for isocyanates identified in these six states can be organized into four broad categories: 1) those that identify and list the chemical as a hazardous air pollutant or substance; 2) those setting emission standards; 3) those subjecting the chemical to reduction goals; 4) those that establish worker safety standards (similar to or more stringent than OSHA/NIOSH standards).

Summary of findings by type of regulation is presented below:

1. There was more regulatory activity under TSCA than any other regulatory area. Most of the activity involved listing a chemical under section 8(a) or 8(d) or deleting a chemical from the requirements under these sections. In total, there were 10 chemicals with 8(a) information gathering activity and 13 chemicals with 8(d) health and safety reporting activity.

2. SARA had the second most regulatory activity. Within the SARA regulatory area, the regulations dealt primarily with adding chemicals to the Toxic Release Inventory (TRI) or to the Extremely Hazardous Substances list. Of the chemicals under investigation, 12 are listed under the TRI and three are listed as Extremely Hazardous Substances.

3. No CWA or SDWA regulations exist on these chemicals, according to EPA sources including the Safe Drinking Water Hotline, and the Wastewater Treatment Information Exchange.

4. There were only three chemicals that were regulated under the Clean Air Act's Hazardous Air Pollutant regulations. These chemicals are MDI (101-68-8), TDI (584-84-9), and HDI (822-06-0). However, general CAA VOC regulations significantly affect the automotive refinishing industry in spurring the development of lower VOC isocyanates in paint formulations.

5. DOT regulatory activity was uncovered for four chemicals. These regulations require special shipping and handling requirements for these chemicals.

Appendix G summarizes the type of regulatory activity for each of the isocyanate CAS Numbers.

APPENDIX G

SUMMARY OF REGULATORY ACTIVITY FOR EACH OF THE ISOCYANATE CAS NUMBERS

CAS Number and Chemical Name	Summary
000091-97-4 3,3'-dimethyl-4,4'-biphenylene diisocyanate	This chemical is regulated under the 8(a) PAIR rule and the 8(d) Health and Safety Data Reporting Rule. In addition, releases of this chemical must be reported under the TRI. Lastly, while NIOSH has Recommended Exposure Limits there are no OSHA regulations for worker protection.
000101-68-8 Methlylene bisphenyl isocyanate (MDI)	This chemical has been regulated under the 8(a) PAIR rule and the 8(d) Health and Safety Data Reporting Rule. However, the ITC, in its 37th Report (2/2/96) recommended that this isocyanate be removed from its Priority Testing List. In addition, releases of this chemical must be reported under the TRI. Air emissions are also listed as a Hazardous Air Pollutant under the CAA. The DOT also identifies this chemical as a both a hazardous chemical and poisonous. In the area of worker safety, OSHA has issued Permissible Exposure Limits and the ACGIH has made recommendations for Threshold Limit Values.
000104-49-4 1,4-Phenylene diisocyanate	This chemical was regulated under the 8(a) PAIR rule and the 8(d) Health and Safety Data Reporting Rule. However, in 1993 the EPA terminated reporting requirements under section 8(d) for this chemical. In addition, releases of this chemical must be reported under the TRI.
000584-84-9 Toluene-2,4-diisocyanate (TDI)	This chemical has been regulated under the 8(a) PAIR rule and the 8(d) Health and Safety Data Reporting Rule. This chemical was also subject to the 8(a) CAIR rule. However, the ITC, in its 37th Report (2/2/96) recommended that this isocyanate be removed from its Priority Testing List. In addition, releases of this chemical must be reported under the TRI. Further regulatory action under SARA has also been taken -- since 1989 this chemical has been listed as an Extremely Hazardous Substance. The CAA also identifies this chemical as a Hazardous Air Pollutant. In the area of worker safety, OSHA has issued Permissible Exposure Limits and the ACGIH has made recommendations for Threshold Limit Values.
000822-06-0 Hexamethylene diisocyanate (HDI)	This chemical was regulated under the 8(a) PAIR rule and the 8(d) Health and Safety Data Reporting Rule. However, in 1995 the EPA terminated reporting requirements under section 8(d) for this chemical. In 1989 the ITC recommended that EPA remove this chemical (HDI) from the priority list because the EPA proposed a Notice of Proposed Rulemaking. In addition, in 1992 the EPA put HDI on its Master Testing List (negotiations are currently underway between EPA and industry to develop an enforceable testing agreement for HDI under TSCA section 4). Releases of this chemical must be reported under the TRI. Air emissions are also listed as a Hazardous Air Pollutant under the CAA. The DOT also identifies this chemical as a both a hazardous chemical and poisonous. In the area of worker safety, both NIOSH and the ACGIH have made recommendations for exposure.

APPENDIX G (cont.)

SUMMARY OF REGULATORY ACTIVITY FOR EACH OF THE ISOCYANATE CAS NUMBERS

CAS Number and Chemical Name	Summary
001321-38-6 Diisocyanatomethylbenzene	This chemical was regulated under the 8(a) CAIR rule and the 8(d) Health and Safety Data Reporting Rule. However, in 1993 the EPA terminated reporting requirements under section 8(d) for this chemical.
002556-36-7 1,4-Cyclohexane diisocyanate	This chemical was regulated under the 8(a) CAIR rule and the 8(d) Health and Safety Data Reporting Rule. However, in 1993 the EPA terminated reporting requirements under section 8(d) for this chemical. In addition, releases of this chemical must be reported under the TRI.
003173-72-6 1,5-naphthalene diisocyanate	This chemical was regulated under the 8(d) Health and Safety Data Reporting Rule. However, in 1995 the EPA terminated reporting requirements under section 8(d) for this chemical. In addition, releases of this chemical must be reported under the TRI.
004098-71-9 Isophorone diisocyanate (IPDI)	This chemical has been regulated under the 8(a) PAIR rule and the 8(d) Health and Safety Data Reporting Rule. This chemical was also subject to the 8(a) CAIR rule. However, the ITC, in its 37th Report (2/2/96) recommended that this isocyanate be removed from its Priority Testing List. In addition, releases of this chemical must be reported under the TRI. Further regulatory action under SARA has also been taken -- since 1989 this chemical has been listed as an Extremely Hazardous Substance. The DOT also identifies this chemical as a both a hazardous chemical and poisonous. In the area of worker safety, the ACGIH has made recommendations for Threshold Limit Values.
005124-30-1 Methylene bis (4-cyclohexylisocyanate)	This chemical has been regulated under the 8(a) PAIR rule and the 8(d) Health and Safety Data Reporting Rule. This chemical was also subject to the 8(a) CAIR rule. However, the ITC, in its 37th Report (2/2/96) recommended that this isocyanate be removed from its Priority Testing List. In addition, releases of this chemical must be reported under the TRI. The DOT also identifies this chemical as hazardous, poisonous, and flammable. In the area of worker safety, the ACGIH has made recommendations for Threshold Limit Values.
009016-87-9 Polymeric diphenylmethane diisocyanate	This chemical was regulated under the 8(d) Health and Safety Data Reporting Rule. However, in 1995 the EPA terminated reporting requirements under section 8(d) for this chemical. In addition, releases of this chemical must be reported under the TRI. The DOT lists this chemical as a bulk hazardous material and noxious liquid.

APPENDIX G (cont.)

SUMMARY OF REGULATORY ACTIVITY FOR EACH OF THE ISOCYANATE CAS NUMBERS

CAS Number and Chemical Name	Summary
015646-96-5 2,4,4-Trimethylhexamethylene diisocyanate	This chemical was regulated under the 8(a) PAIR rule and the 8(d) Health and Safety Data Reporting Rule. However, in 1993 the EPA terminated reporting requirements under section 8(d) for this chemical. In addition, releases of this chemical must be reported under the TRI.
038661-72-2 1,3-Bis(methylisocyanate) cyclohexane	This chemical was regulated under the 8(d) Health and Safety Data Reporting Rule. However, in 1993 the EPA terminated reporting requirements under section 8(d) for this chemical. In addition, releases of this chemical must be reported under the TRI.
002094-99-7 α,α-dimethyl-m-isor\propenyl benzyl isocyanate	There are several international regulations on this chemical but no national regulations exist.
003634-83-1 m-xylene-α,α'-diisocyanate	In 1990 the ITC revised its Priority List and added this chemical to the list. In the area of worker safety, NIOSH has made a recommendation for exposure limits.