NAEM International ESH Workshop

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NAEM International ESH Workshop

ENVIRONMENT, SAFETY & HEALTH POLICY TRENDS

PRODUCT FOCUS

NAEM International ESH Workshop

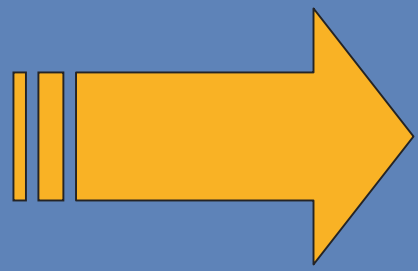
Agenda:

Regulations and Trends (US, EU, China)

Tools to Meet the Requirements (ITT Example)

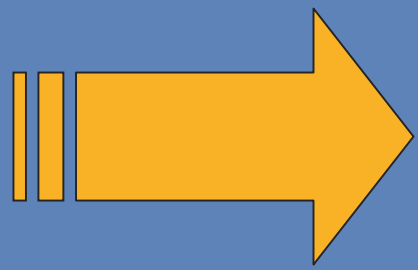
ENVIRONMENTAL POLICIES

End-of-Pipe



Input Drivers, Engineering & Business Process

Reactive- Monitor output



Proactive- Insure output/ Insure success

OVERARCHING TRENDS

Ban on Chemicals

- Inputs to product

End-of-Life Management

- Extended Producer Responsibility
- Product Take-Back/Recycling Targets

Design for Environment (DfE)

- Life Cycle Analysis

Automobiles
EU End-of-Life Directive – Sept. 2000

Ban on Chemicals

- Restricted substances – lead, mercury, cadmium, hexavalent chromium.

End of Life Management/Extended Producer Responsibility

- Producer pays for collection/take-back/recycling
- Mandatory targets for recycling and reuse

By Jan. 1, 2006	**By Jan. 1, 2015**
Recovery – 85%	Recovery – 95%
Reuse/Recycling – 80%	Reuse/Recycling – 85%

- **Forces Design for Environment Thinking**

Supply-Chain Considerations

Impacts to Supply Chain

Design for disassembly

- Design without banned substances
- Provide product information to producers
  *International Material Data System
- Component coding standards to facilitate the identification of components suitable for reuse/recycling.

Note: 8 of 15 EU Countries have failed to implement legislation by April 2002. As of April 2003, referred to European Court of Justice.

The WEEE Directive: Overview and Compliance Issues

WEEE Directives: Background and Starting Points

WEEE identified as problematic as early as 1990

- 1997, EU Council recommends adoption of a Directive
- six drafts between 1998-2000
- proposal made in June 2000, adopted 27 January 2003
- 3 readings in EU Parliament, Conciliation Committee

Entry into force

- 13 February 2003
- transposition into national law by 13 August 2004
- national laws will dictate the content of producers' obligations

Modification

- 8 December 2003 by Directive 108/EC (producer liability)

Inspired in part by existing schemes, e.g., NL-ICT, Recupel (Netherlands, Belgium)

WEEE Directive: Objectives

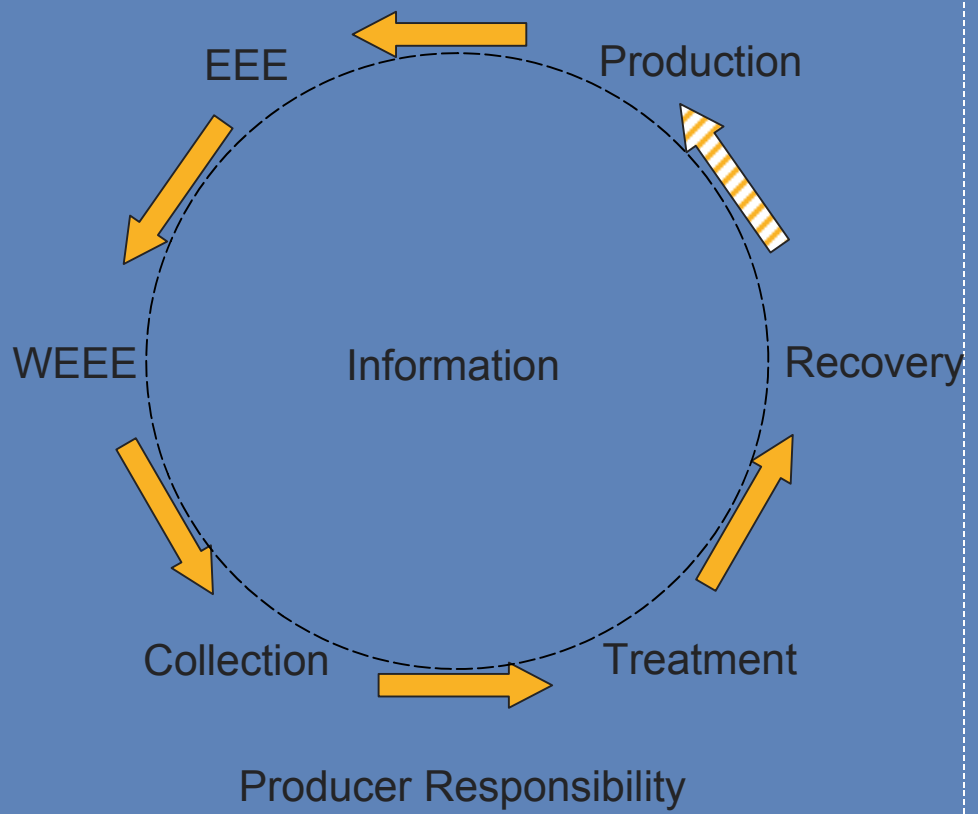
Reduce WEEE

Promote re-use, recycling and other forms of recovery of WEEE

Improve the environmental performance of economic operators involved in the life cycle of EEE, particularly treatment

Producer responsibility

Harmonisation of national systems



WEEE Directive: Scope and Definitions

All categories of EEE within Annex IA & IB

- EEE designed for use with a voltage rating not higher than 1000V for ac and 1500V for dc
- IT, telecomm and consumer electronic equipment (solar panels not yet included)

Household WEEE

- "WEEE which comes from private households and from commercial, industrial, institutional and other sources which, because of its nature and quantity, is similar to that from private households" e.g. televisions used by small co

Producers

- "manufacture and sell under own brand-name"
- "including by means of distance communication"
- not manufacturers of individual components, subassemblies or consumables

WEEE Directive: Key Features

- Product Design
- Separate Collection
- Treatment
- Recovery
- Financing
- Information

WEEE Directive: Product Design

Incentives

- MS shall encourage design and production of EEE which takes account and facilitates recycling

Recycling-“unfriendly” designs

- MS to take measures so that producers do not prevent, through specific design features, WEEE being reused
  - e.g., reusable / refillable batteries

WEEE Directive: Separate Collection

WEEE from private households

- MS to establish separate, and accessible, collection system by 13 August 2005
  - consumers and distributors to return WEEE to collection facilities “at least free of charge”
  - distributors to take back WEEE “at least free of charge” when supplying a new equal product
- binding collection targets of 4 kg per inhabitant per year of WEEE by 31 December 2006 (new targets to be decided by 31 December 2008)
- producers can set up their own individual or collective take-back schemes

WEEE Directive: Treatment

All types of WEEE

- MS shall ensure that producers or third parties acting on their behalf set up individual or collective WEEE treatment systems

- treatment and storage must as a minimum be in conformity with Annex II – e.g., physical removal of LCDs > 100sq.cm or backlit by gas lamps

  - some concerns that LCDs may contain substances of potential carcinogenic effect
  - doubts as regards composition of certain imported LCDs
  - Commission to evaluate the treatment of LCDs “as a matter of priority”

WEEE Directive: Recovery

All types of WEEE

- MS shall ensure that producers or third parties acting on their behalf set up individual or collective recovery systems
  - recovery targets for producers by 31 December 2006 for IT, telecoms and consumer equipment: 75% by ave weight of appliance
  - reuse and recycling targets for components, material and substances: 65% by ave weight of appliance
- Commission to establish detailed rules for monitoring compliance with targets by 13 August 2004
- new targets to be established by 31 December 2008

WEEE Directive: Financing

WEEE from private households

- MS shall ensure that producers provide financing for at least collection, treatment, recovery and environmentally friendly disposal of WEEE by 13 August 2005

- "historical" WEEE (put on market before 13 August 2005), to be financed by all producers proportionately (e.g., market share by type of equipment)
  - producers will finance operations for more than just their own products

WEEE Directive: Reporting

Register of producers

- MS to create a register of producers (including distance producers) and collect information on quantities and categories of EEE placed on the market

- information transmitted to Commission on a two yearly basis, first set of information is to cover 2005-2006

WEEE Directive: Other Points

Penalties for non-compliance

- MS to determine penalties applicable
- must be effective, proportionate and dissuasive

Greece and Ireland

- may have their collection and recovery targets extended by 24 months

WEEE Directive: In Summary

No mandatory obligations until MS have transposed laws into national legal systems (max. 13 August 2004)

Individual or collective schemes possible

Producer responsibility for “historical” WEEE up to 13 August 2005, financed proportionately (or less)

Producer responsible only for own WEEE marketed after 13 August 2005

No recycle-”unfriendly” products

- further assessment of treatment of LCDs “priority”
- for now, solar panels not considered WEEE, but issue to be considered

EU WEEE and RoHs Directives 2000

Ban on Chemicals - By July 1, 2006

- Metals - Lead, Mercury, Cadmium, Hexavalent chromium
- Flame retardants – polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE)

End-of-Life Management/Extended Producer Responsibility

- Collective financing for historic waste by Aug. 13, 2005.
- Individual responsibility for products introduced after Aug. 13, 2005.

- Telecom Targets By Dec. 31, 2005
  - Recovery rate of 75%
  - Reuse/Recycling rate of 65%

- **Forces Design for Environment Thinking**

WEEE and RoHs
Impacts to Supply Chain

Design for disassembly

Design without banned substances

- Connectors – higher temperatures

Design for different market requirements

- Supply both lead and lead free customers

Provide Product Information to Producers

ROHS Directive: Objectives & Entry into Force

To reduce the content and heavy metals and flame retardants in WEEE, to reduce waste and facilitate recycling

Substitution of specified heavy metals and flame retardants with environmentally friendlier substances

Complementary to the WEEE Directive

Harmonisation of the hazardous waste laws of the MS

Entry into force and transposition same as for WEEE

ROHS Directive: Scope & Obligations

Scope

- applies to IT, telecomms and consumer equipment
- does not apply to spare parts for the repair, or to the reuse of, EEE placed on the market before 1 July 2006

Main obligations

- MS to ensure that from 1 July 2006, new EEE does not contain: lead, mercury, cadmium, hexavalent chromoim (chromium VI), polybrominated biphenyls (PBBs) or polybrominated dipheny ether (PBDE).
- existing national prohibitions can be maintained until 1 July 2006
  - exceptions: e.g. lead in glass of cathode ray tube

EU DRAFT - INTEGRATED PRODUCT POLICY (IPP)

Governs Entire Product Process

– Inputs and Outputs

- Ban on Chemicals
- End-of-Life Management
- Requires Design for Environment
  - "Environmental Soundness" Standard
  - Supply Chain Information Systems
- Favorable taxation/funding
- Environmental Labeling
- Public Procurement Policies

US on WEEE

NEPSI – National Electronics Product Stewardship Initiative.

- Drafting Federal Legislation
- Product stewardship vs. Enhanced Producer Responsibility
  - Front-end financed system
  - Will it drive Design for Environment?

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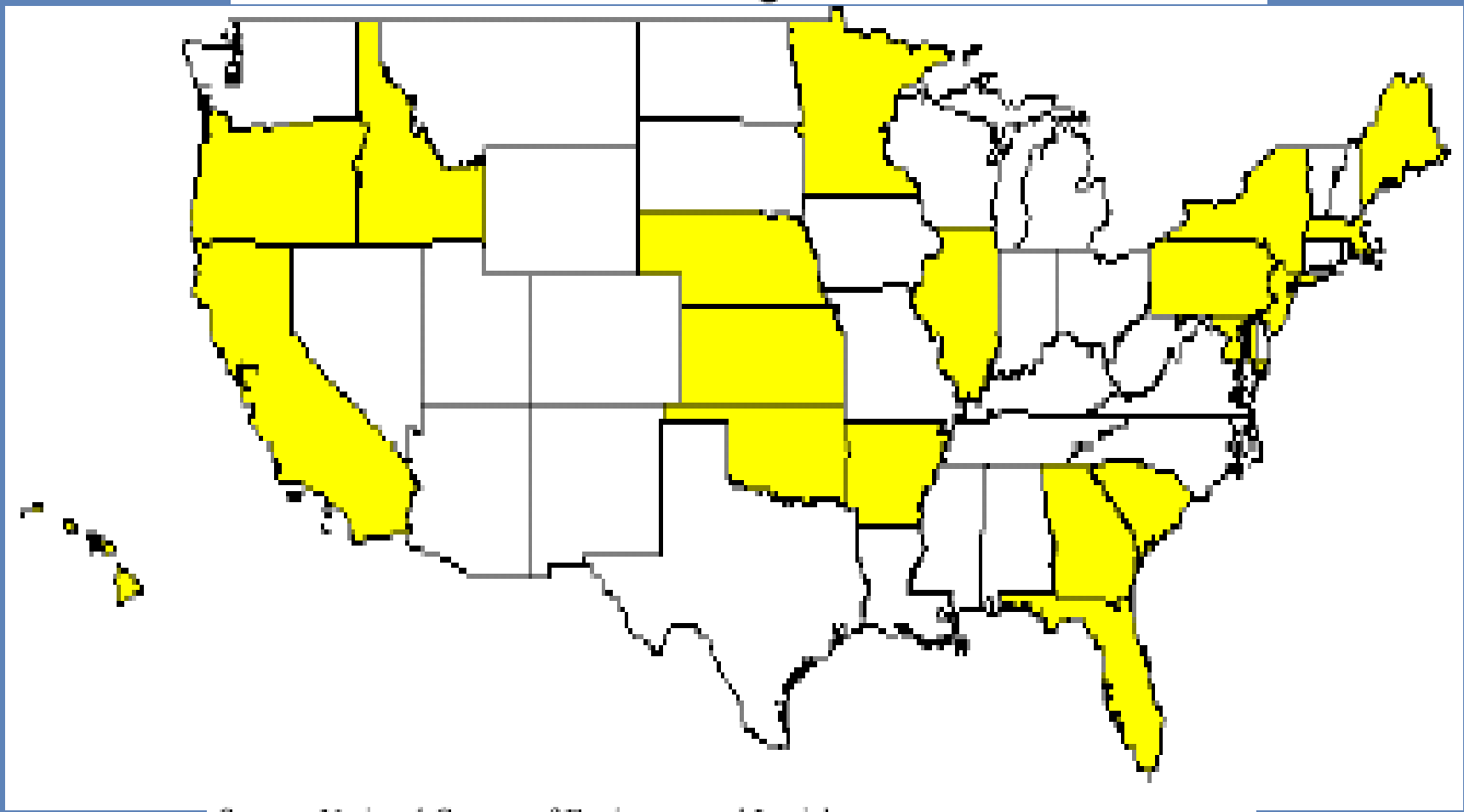
U.S. States With WEEE Legislation

Enacted or Pending as of March 2002



Source: National Caucus of Environmental Legislators

Draft EU Electronics Directive

Elements of Integrated Product Policy (IPP)

Design for Environment Required

- Banned Substances
- End-of-Life Management
- Environmental Soundness Standard

Entry into EU Market prohibited without certified marking.

Supply-chain management

- Detailed component info needed for input/output analysis.

CHINA CLEANER PRODUCTION LAW

Exact Same Elements as IPP

- Ban on Chemicals
- End-of-Life Management
- Requires Design for Environment
  - "Environmental Soundness" Standard
  - Supply Chain Information Systems
- Favorable taxation/funding
- Environmental Labeling
- Public Procurement Policies

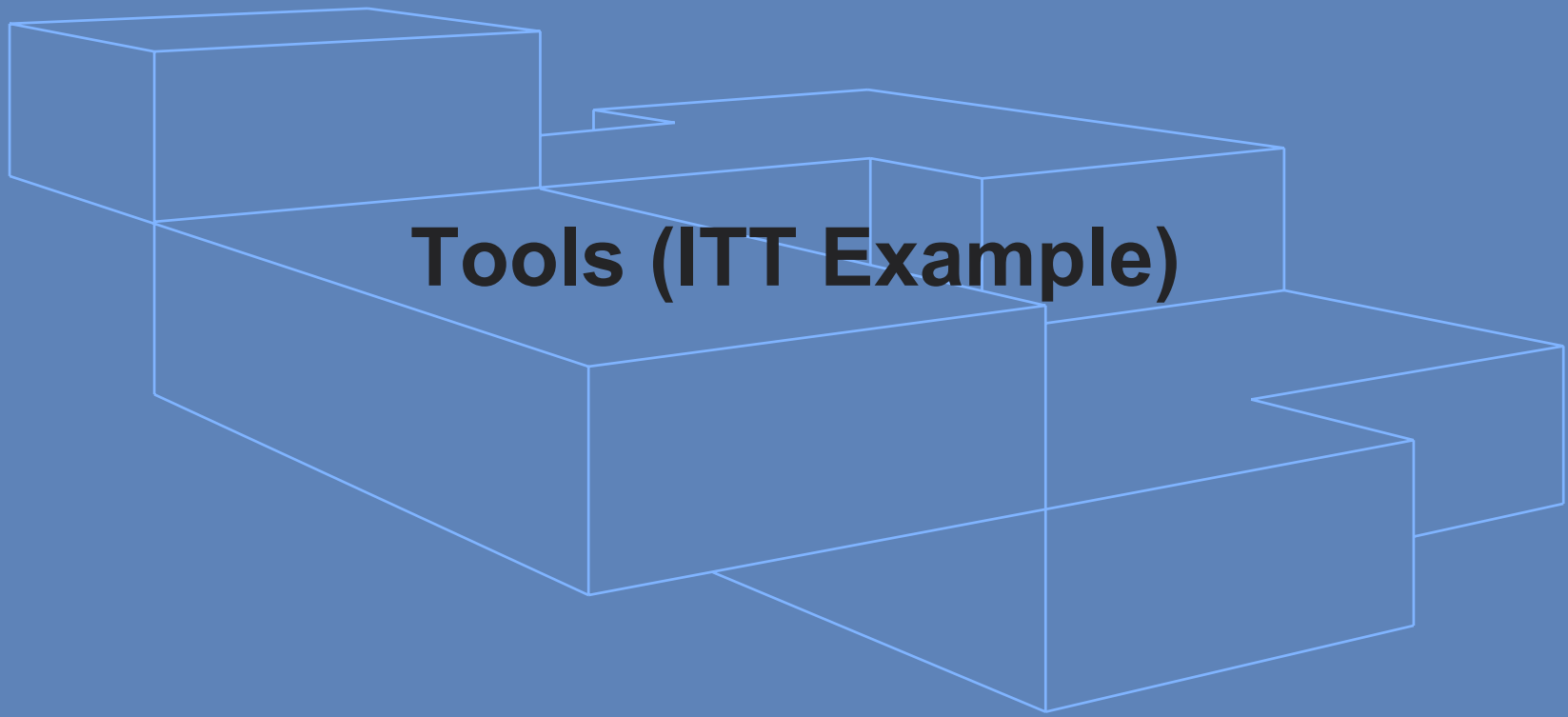
- Also – commendation/reward system

Regulatory Trends

Impacts on Product Design	US	EU	JAPAN	CHINA
Banned Substances	*	***	*	
Extended Producer Responsibility	-	****	**	**
Recycling Targets	*	****	**	*
Design for Environment	-	****	***	***
Economic Incentives	*	***	**	***
Packaging		****	**	
Eco-Labeling	*	***		***
Energy Efficiency Requirements	*	*	**	

ENVIRONMENTAL POLICIES

"Know where you are going before you get there."



Tools (ITT Example)

Environmental Decision-Support Tool for Products

Dr. Erasmia Kitou, Professor Arpad Horvath

Department of Civil and Environmental Engineering
Consortium on Green Design and Manufacturing (CGDM)

University of California, Berkeley

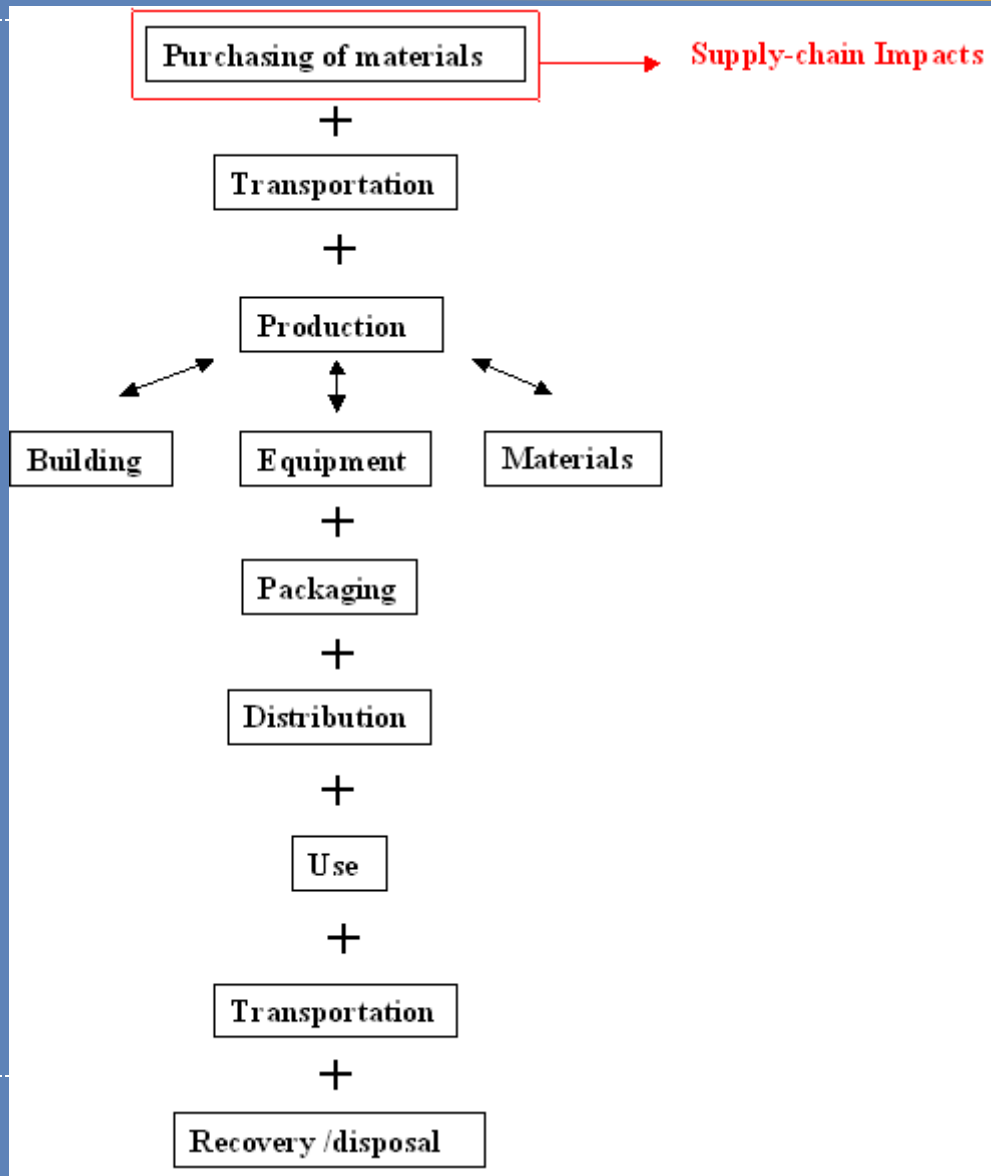
ITT's Value Based Product Development
Environment, Safety and Health Design Considerations

- safety risk during product's life cycle
- banned or potentially banned chemicals or materials
- introduction of harmful material (manufacturing, supply chain)
- manufacturing waste
- minimization of natural resources
- hazardous materials into air or water
- minimization of packaging
- "take back" laws
- disassembly, recyclability
- contamination concerns (disposal)
- environmental or safety advantages.

Life-cycle Phases

- Product development
- Production and supply of materials
- In-house production
- Distribution
- Use, operation, servicing
- Disposal, recovery, recycling

Focus Areas



The Design-Support Tool (MS Access-based)

Consists of the following modules:

Supplier-related information

In-house production:

- Products (Materials)
- Processes
- Packaging
- Building

Usage

Transportation

- Procurement
- Distribution
- Returns

End-of-Life

Processes

- Wattage
- No. of products/hr (normalize)
- Air consumption
- Source of water
- Categorize type of waste and amount
- Recycling and incinerator: break-down quantities and materials
- Other operational or maintenance requirements (amounts)
- Avg. California mix

Usage

- Wattage for each product
- Average lifetime
- Hours used
- Carbon Dioxide
- Other requirements?

Building usage

- Heating
- Cooling
- Lighting
- Wattage/hours of operation
- No. of products (normalize)
- Other requirements?

Transportation Inputs

- VMT
- Amount transferred
- Mean of transportation
- Type of part/component

Transportation

- Identify means of transportation
- Information per part/component

End-of-Life

- Types and amounts of materials
- Recycling, disposal, incineration
- Type of information available

Supply Chain

- Information available
- ITT's interests
- Similar to Products module

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STRATEGIC IMPORTANCE OF PRODUCT SAFETY

ITT Industries' ESH Mission

ITT Industries is committed to developing a culture of ESH excellence throughout its operations.

ITT Industries' Design Engineering and ESH 2004 Top Priority

Product Safety

Product Liability Law

Liability of any or all parties along the chain of distribution of any product for damage caused by that product.

This includes:

- Manufacturer of component parts
- Assembling manufacturer
- Wholesaler
- Retail store owner

Products containing *inherent* defects that cause harm to a consumer of the product, or someone to whom the product was loaned, given, etc., are the subjects of product liability suits.

Table of Contents

2. Do Preliminary Hazards Analysis (PHA)

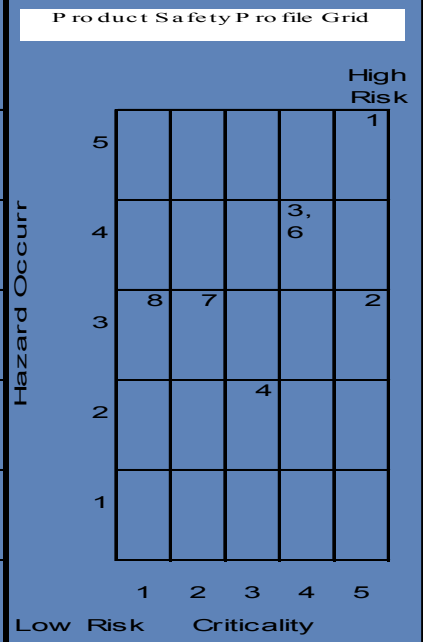
Household Product Example: Electric Rotary Coffee Mill

Hazard	*Occurrence (Cause) Description*	*Effect*	*Probability (With No Safeguard)*	*Possible Safeguard*	*Remarks and References*
Skin injury	Sharp edges, corners, or rough surfaces either from poor manufacture or from breakage.	Sharp edges and points could cause cuts and scratches to skin.	Reasonably Probable	1a.Require that all sharp edges, points, and rough surfaces be rounded. b. Make mill of material which will not break easily to create sharp edges and points.	1a. Most liable to be a production defect. Monitor production and quality control.

PSR GUIDEBOOK: RISK ASSESSMENT METHODOLOGY

3.3-3.5 Assess occurrence rate and criticality for each hazard and do Product Safety Profile & Grid.

Product: remote fuel valve		Occurrence / Criticality				Worst Case Ratings				Serial No. 1234-4321
Hazard No.	Hazard	Normal Operati	Failure	Overload	Damage	Condition	Hazard Occurr	Hazard Criticali	Comment	
1	Electric Shock	1	5	2	4					
		3	5	2	1	Failure	5	5		
2	Fire	1	1	3	1				Overload can result in igniting fuel.	
		3	1	5	1	Overl	3	5		
3	Explosion	4	1	1	1					
		4	3	1	2	Norme	4	4		
4	Toxic Fumes	1	1	2	2					
		1	1	1	3	Damag	2	3		
5	Radiation	1	1	1	1				There is no risk of radiation.	
		1	1	1	1	N/A				
6	Harmful Substances	1	2	1	4					
		1	2	2	4	Damag	4	4		
7	Physical Harm (Cutting or Crushing)	2	2	3	1					
		1	1	2	1	Overl	3	2		
8	Environmental Impact	2	3	1	1					
		1	1	1	1	Failu	3	1		



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ITT Policy

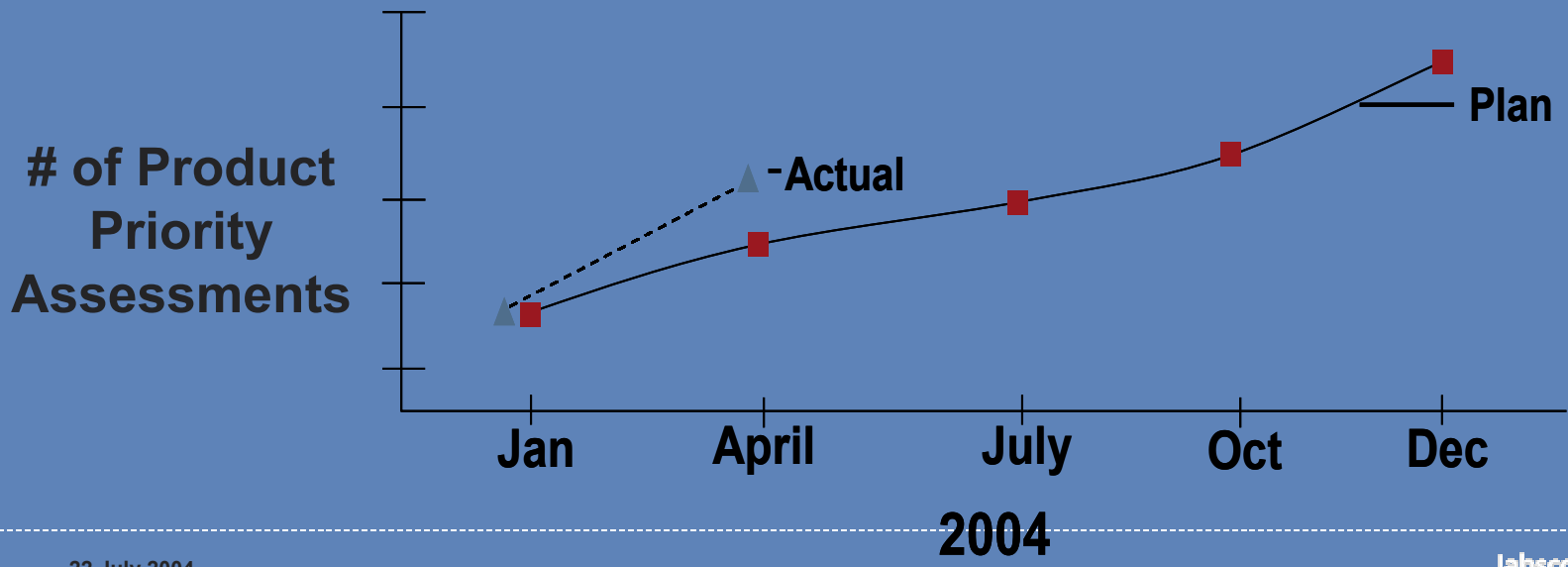
All VC Product Safety Assessment Processes that conduct PSRs on new products shall include review of all products, components, and materials furnished by vendors, suppliers or other third parties.

PSR GUIDEBOOK: METRICS

Product Priority Assessments

Purpose: To assess all existing products to determine if a more in-depth PSR is required. Assessment is based on past safety reports, recent regulatory changes, new technology and the product's life cycle. It is done by MC/VC mgmt.

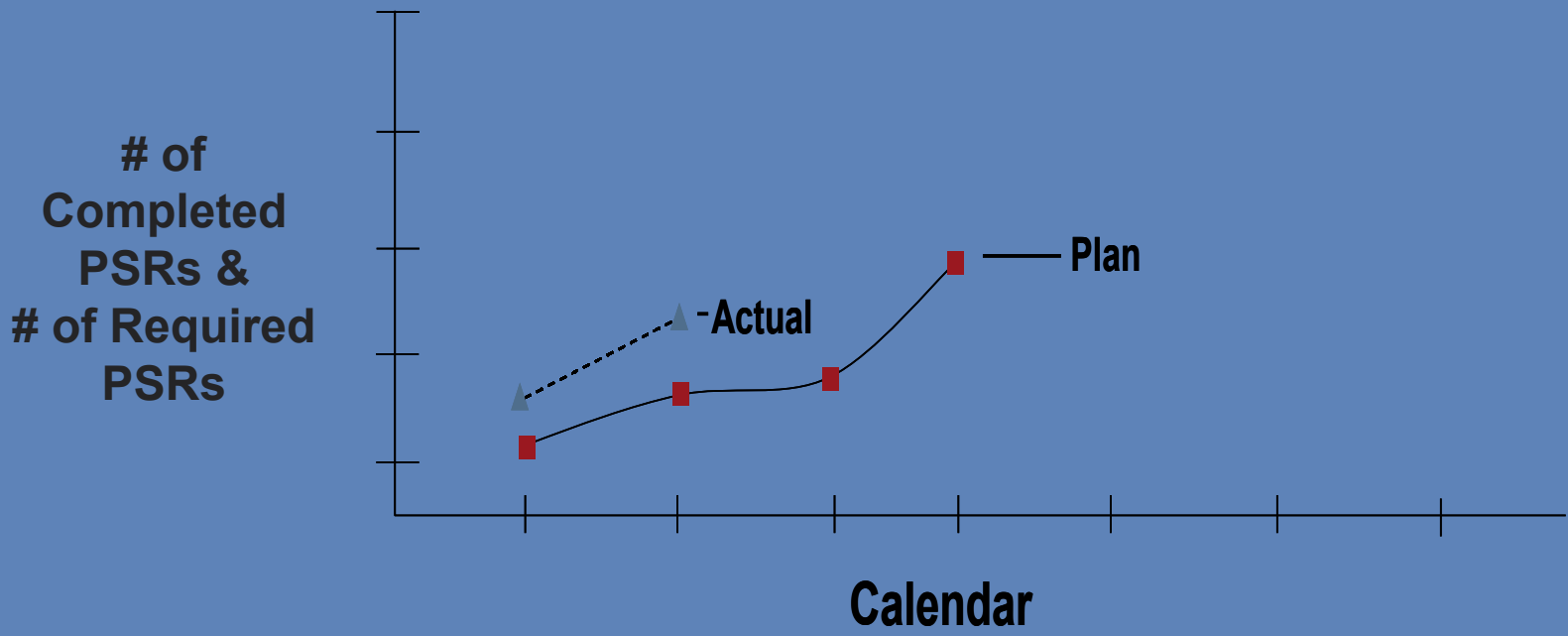
Objective: To complete all assessments by the end of 2004.



PSR GUIDEBOOK: METRICS

Existing Product PSRs

Purpose: To track the number of completed PSRs vs. the number of required PSRs.

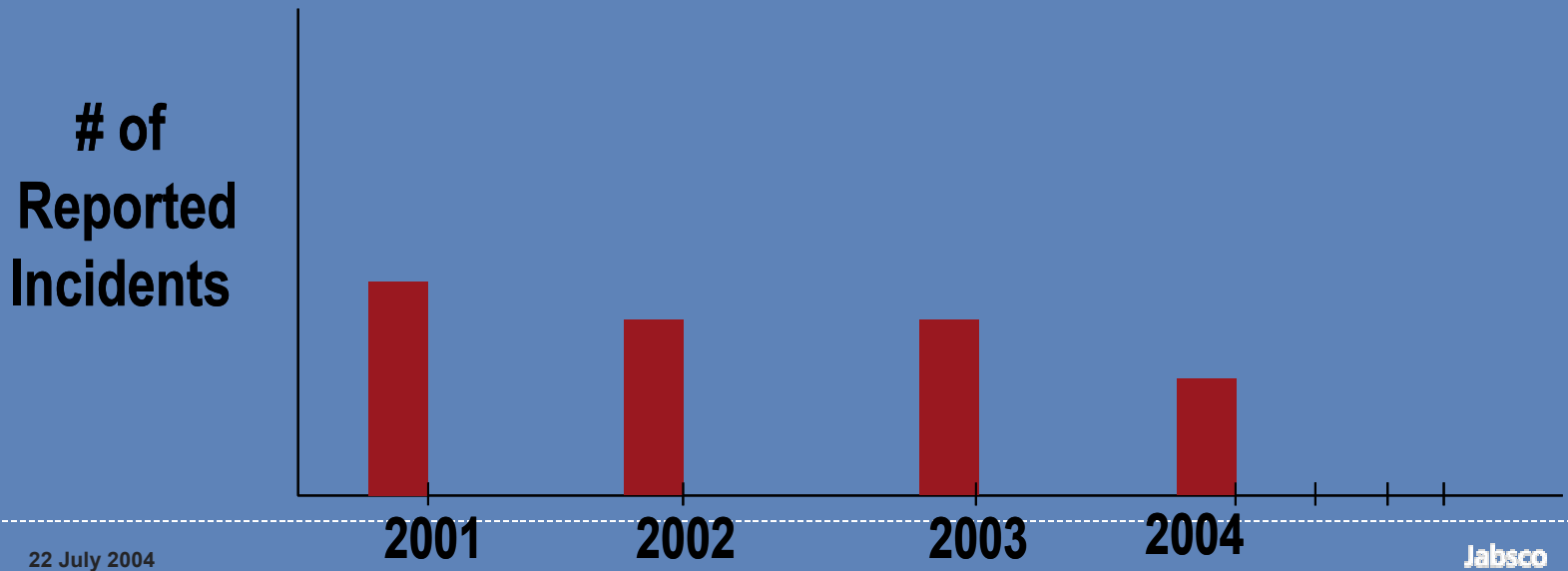


PSR GUIDEBOOK: METRICS

Product Safety Performance

Purpose: To track long-term product safety trend. VC PSRBs will collect and maintain records on # of internal and external incidents.

"Incident" = an unexpected outcome from the use (or misuse) of our products resulting in injuries,damage, loss of property, or a negative impact on our environment.



PSR GUIDEBOOK: AUDIT PROTOCOL

Who, When & Where	Used by an audit team during the ITT Industries' ESH Compliance Audit conducted at ITT Industries' units worldwide.
How	Same protocol used by ITT Industries' U.S. Audit: I. Introduction II. Pre-Visit Preparation III. Rulebook providing the audit questions and detailed supporting guide notes IV. Score Sheet used by auditors to record their notes during the audit

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