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Analysis of Impacts of Proposed  
Regulation of Children's Sleepwear  
  
FINAL REPORT



Consommation  
et Affaires  
Canada

Consumer and  
Corporate Affairs  
Canada



**Analysis of Impacts of Proposed  
Regulation of Children's Sleepwear**

**FINAL REPORT**

**Program Evaluation Division  
Bureau of Policy Coordination  
Consumer and Corporate  
Affairs Canada**

**October 1986**

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## EXECUTIVE SUMMARY

### BACKGROUND AND RATIONALE

The purpose of the child's sleepwear regulatory proposal is to reduce the incidence and severity of children's sleepwear burns, and thus to reduce the number of deaths and serious injuries from this cause.

Injuries resulting from burns of one kind or another are a major cause of death and serious injury of children in Canada. A number of these incidents, especially for children up to 9 years old, can be directly related to the flammability of their sleepwear.

A study conducted by Dr. R. Stanwick of the University of Manitoba in 1982, indicates that at least 18 to 20 children under the age of 9 are severely burned each year due to the ignition of sleepwear, and that on average one or two of these burned children die each year. Dr. Stanwick's study was based only on burns treated in paediatric burn units and as such does not account for burns treated elsewhere. The results of this study can thus be taken as a lower bound estimate. His estimate of the current total number of sleepwear-related burns for children is the area of 40 annually. This estimate of 40 annual sleepwear burns to children is used as our base case for analysis. We have estimated the number of fatalities at 3 per year.

The principal causes of ignition of children's sleepwear include playing with matches or lighters, and being too close to stoves or other ignition sources. However, once sleepwear has ignited, the two factors which appear to have the major impact on the extent and severity of burn injuries suffered by these children are the style and fabric of the sleepwear. The regulatory proposal will effectively reduce the use of the more flammable fabrics in those styles of children's sleepwear which are involved in the most severe burn injuries.

### REGULATORY PROPOSAL

On October 23, 1985, the Minister of Consumer and Corporate Affairs Canada (CCAC) announced that he was introducing more stringent flammability regulations under the Hazardous Products Act to cover children's nightgowns and robes. He asked that interested parties work together to develop a proposal to deal with the balance of children's sleepwear articles. On June 26, 1986, the Minister further announced that as unanimously recommended by the Children's Sleepwear Advisory Committee, new, more stringent flammability regulations would also be applied to baby-doll and tailored



pajamas (See Annex 1 for list of Committee members). The regulations would cover garments to sizes 14x and come into effect September 30, 1987. Hospital gowns and robes and sleepwear for children up to 7 kg would be exempted from the new regulations.

#### ALTERNATIVES CONSIDERED

Following initial work which looked at a wide variety of alternatives, it was agreed that plausible options all should meet the same flammability standard but differed in terms of: (a) garment coverage; (b) implementation timing. The different scope of style coverage options considered were as follows:

- o Coverage option 1: Covers nightgowns and robes sizes 0 to 14x.
- o Coverage option 2: Covers the above plus tailored and baby doll pajamas sizes 0 to 14x, except those for children 0 to 7kg.
- o Coverage option 3: Covers all children's sleepwear garments sizes 0 to 14x, except those for children 0 to 7kg.

The above style coverage options were considered in conjunction with the following implementation timing options:

- o Timing option 1: Implementation date March 1987.
- o Timing option 2: Implementation date September 1987.
- o Timing option 3: Implementation date March 1988.

An information campaign will accompany the introduction of new regulations to inform parents and children of sleepwear flammability hazards. The impact of allocating different levels of resources to an accompanying information campaign was also considered as a separate option.

#### COSTS AND BENEFITS

Under each style coverage option, the price of affected sleepwear garments would be expected to rise by 15%-20% in the short term, due largely to the use of substitute materials and shortages of low cost imports. In the longer run, prices may subsequently fall somewhat, although remaining higher in real terms than sleepwear prices today.

The estimated social costs of the new regulation stem largely from the expected sleepwear price increases.

Social costs are of two kinds: long run annual costs and short run lump sum costs. Long run social costs are a function of the range of garment styles covered by the regulations, and these costs would accrue primarily to consumers. Short run costs would accrue to industry under each regulatory alternative due to foregone profits and losses on inventories. These costs are a function of both the range of styles covered and the chosen implementation date. While long run costs are recurring annual costs, short run costs are of a lump sum nature.

Using base case estimates, total long run social costs are estimated at \$12 million annually under coverage option 1, \$20 million annually under coverage option 2, and \$59 million annually under coverage option 3. Short run lump sum costs are estimated at \$7 million under timing option 1 (assuming coverage option 1), \$8 million under timing option 2 (assuming coverage option 2), and \$22 million under timing option 3 (assuming coverage option 3).

Each of the coverage options considered would be expected to achieve different levels of benefits through reduction in burn incidence and severity. Successive coverage options (including more garments under regulation) would be expected to have increasing impacts on the incidence and severity of sleepwear burns. It is estimated that coverage option 1 would eliminate 1 fatality per year versus a reduction of 2 fatalities per year for either coverage option 2 or 3. Comparing the reduction of total burn incidence among the options, coverage option 1 might eliminate 9 burns per year, coverage option 2 might result in 11 fewer burns per year, and coverage option 3 might result in 12 fewer burns per year.

In addition to increased costs, there are other potential negative effects, the most important on employment. The estimated loss in employment is 75, 40, 430 respectively under options 1, 2 and 3.

#### FOLLOW-UP ACTION

The regulatory initiative for children's sleepwear that is being proposed, consists of performance requirements for children's robes, nightgowns, baby doll and tailored pyjamas, size 0-14x excluding garments for children weighing

less than 7 kg. The implementation date is planned for September 30, 1987. This regulatory initiative represents option 2 of this study and corresponds to the recommendation of the Children's Sleepwear Advisory Committee established by the Minister in October 1985.

In order for the children's sleepwear regulatory proposal to receive approval, a number of steps must be followed to meet the requirements under the government's new Regulatory Process Action Plan.

A regulatory impact analysis statement (RIAS), a requirement under the new process has been prepared for submission to the Regulatory Affairs Secretariat for approval. This study constitutes the base analysis of the RIAS, assessing the impact of the children's sleepwear regulatory proposal. The Secretariat will forward the regulatory proposal to PCO (Justice) for approval. Consultation with affected parties will then take place through prepublication and publication of the RIAS and the proposal in the Canada Gazette as appropriate.

The study itself can be used to provide a common basis for discussion with interested parties. The underlying analysis is based on in-depth consultation with affected parties, and indeed the regulatory proposal itself was developed through formal consultation with the Children's Sleepwear Advisory Committee.



## **1. BACKGROUND AND PURPOSE OF THE STUDY**

### **1.1 THE MINISTER'S ANNOUNCEMENT**

On October 23, 1985, the Minister of Consumer and Corporate Affairs Canada (CCAC) announced that he was introducing more stringent flammability regulations under the Hazardous Products Act to cover children's nightgowns and robes. These revised regulations would apply to sizes up to 14X and would come into effect in March, 1987. The Minister also noted that the Department would be initiating a campaign to increase public awareness of the hazards associated with fire and children's sleepwear, and to advise parents, guardians, and children of what they can do to eliminate these burn accidents. The Minister asked as well that interested parties including the industry, the Canadian Institute of Child Health, the Canadian Paediatric Society and the Consumers' Association of Canada work together on a Children's Sleepwear Advisory Committee to develop a proposal to deal with the balance of children's sleepwear articles.

On June 26, 1986, the Minister of Consumer and Corporate Affairs Canada further announced that the revised regulations would incorporate in their entirety the unanimous recommendations of the Children's Sleepwear Advisory Committee (See Annex 1 for list of Committee members). As recommended, the new, more stringent flammability regulations proposed in October 1985 for nightgowns and robes would also be applied to baby-doll and tailored pajamas.

The revised regulations will come into effect on September 30, 1987. This will ensure that industry has time to adjust to the new requirements and minimize any adverse economic impact. The Minister also announced that he is launching a national children's sleepwear information campaign. The objective of the campaign is to increase public awareness of the hazards of fire and children's sleepwear and of the steps which can be taken to eliminate burn accidents. As part of the campaign, Consumer and Corporate Affairs, in conjunction with Fire Prevention Canada and the Canadian Paediatric Society, will communicate a series of safety messages to the general public, including parents and individuals involved in child care, as well as to children themselves.

### **1.2 DESCRIPTION OF THE REGULATORY PROPOSAL**

The regulatory proposal consists of flammability performance requirements for children's robes, nightgowns, baby doll and

tailored pyjamas, sizes 0-14X excluding garments for children weighing less than 7 kg. The detailed requirements are included in the consultant report attached as an annex to this report, and have the following main features.

- o Every product treated with a flame retardant shall have a label which is permanently affixed to the product and which displays in a clear and legible manner precautionary care instructions. These include procedures for washing, bleaching, drying, ironing, and dry cleaning. They are intended to protect the product from agents or treatments which are known to cause deterioration of its flame resistance.
- o Every product, when prepared and tested as outlined in the detailed requirements, is restricted to maximum average and individual char lengths.
- o If products are treated with flame retardants, neither the flame retardant nor any breakdown product shall cause dermal irritation or dermal sensitization. In addition, it shall not be genotoxic, chronically toxic, nor shall it cause benign or malignant tumors.

Under the proposed regulations, polo pajamas and sleepers would be exempt from these requirements and would continue to be subject to the current flammability regulations.

### 1.3 PURPOSE OF THE REGULATORY PROPOSAL

The purpose of the regulatory proposal is to reduce the incidence and severity of children's sleepwear burns, and thus to reduce the number of deaths and serious injuries from this cause.

Injuries resulting from burns of one kind or another are a major cause of death and serious injury of children in Canada. A number of these incidents, especially for children up to 9 years old, can be directly related to the flammability of their sleepwear.

The only comprehensive study in Canada, conducted by Dr. R. Stanwick of the University of Manitoba in 1982, indicates that at least 18 to 20 children under the age of 9 are severely burned each year due to the ignition of sleepwear, and that on average one or two of these burned children die each year. Dr. Stanwick's study was based only on burns treated in paediatric burn units and as such does not account for burns treated elsewhere. The results of this

study can thus be taken as a lower bound estimate. His estimate of the current total number of sleepwear-related burns for children is in the area of 40 annually. This estimate of 40 annual sleepwear burns to children is used as our base case for analysis. We have estimated the number of fatalities at 3 per year.

The principal causes of ignition of children's sleepwear include playing with matches or lighters, and being too close to stoves or other ignition sources. However, once sleepwear has ignited, the two factors which appear to have the major impact on the extent and severity of burn injuries suffered by these children are the style and fabric of the sleepwear. In particular:

- o Loose and flowing styles such as nightgowns and robes are usually implicated in the most severe injuries. Not only are they more likely to come into contact with an ignition source, but they burn faster than other sleepwear because of the presence of air on both sides of the fabric which fuels the flames.
- o Some fibres ignite more easily and once ignited will continue to burn rapidly. These include cotton, linen, rayon, cellulose acetate, acrylics and blends of these fibres. In addition, light weight fabrics, loose open weave fabrics, and pile fabrics (such as flannelette) burn more quickly than heavier, tightly woven fabrics. Material such as nylon, polyester, mohacrylics and cordelan, on the other hand, are harder to ignite and tend to self-extinguish.

The regulatory proposal will effectively reduce the use of the more flammable fabrics which meet the current regulations in those styles of children's sleepwear which are involved in the most severe burn injuries.

It is generally accepted in CCAC and within the industry that the implications of the regulatory proposals are that:

- o Most commercially available flame retardant treatments will not be economic under the regulations.
- o The regulation will effectively eliminate the use of cotton, linen, rayon, cellulose acetate, acrylics and poly/cotton blends in robes, nightgowns, baby doll and tailored pajamas sizes 0-14X. (Similar regulations have been in place for some years in the United States, and have had these impacts. This had led most observers to expect the same effect in Canada.)



#### 1.4 REASON FOR THIS STUDY

This regulatory impact analysis was conducted for three main reasons:

- o To facilitate consideration of possible regulatory options by senior management and the Minister of Consumer and Corporate Affairs.
- o To further good management in the area of developing and implementing new regulations.
- o To address the critical social and economic issues raised by the regulatory proposal.

As a result of the depth and thoroughness of analysis sought by CCAC, this study meets the requirements for a Socio-Economic Impact Assessment (SEIA) and a Regulatory Impact Analysis. The Treasury Board SEIA guidelines were used in preparing this analysis.

## 2. APPROACH

### 2.1 USE OF COST-EFFECTIVENESS METHODOLOGY

The preferred approach to identifying the allocative effects of regulatory proposals is often benefit-cost analysis, although there are circumstances in which cost-effectiveness analysis is more appropriate. The issue of whether to use benefit-cost or cost-effectiveness methodologies was thoroughly explored during the design phase of this study.

It was decided that cost-effectiveness analysis be used in this study because the major objective of the regulation is to avert the loss of life and pain of suffering from burns attributable to children's sleepwear. While benefit-cost theorists have developed methodologies for attempting to put a monetary value on the loss of human life, these approaches are controversial. They are particularly questionable when used to assess the value of the life of a child, and to put a value on the extent of pain and suffering incurred not only by the child who receives significant burns, but also by the victim's family, and by Canadian society as a whole, as they contemplate such a tragedy. It was to avoid attempting to express these dimensions of the problem in monetary terms that the decision was made to use a cost-effectiveness approach.

The implication of the cost-effectiveness methodology for this study is that the regulatory proposal is considered in comparison to various alternative schemes of government regulation. The cost-effectiveness measures illustrate the extent to which each alternative achieves its objectives of reducing the incidence and severity of children's burns due to sleepwear ignition, compared to the social costs of achieving these objectives. This forms the basis for comparison amongst the regulatory proposal and the various options. It therefore provides information to assess whether the regulatory proposal appears to be effective in comparison to the practical alternatives.

### 2.2 APPROACH TO THE CONDUCT OF THE STUDY

Initial work on this study was conducted by the Bureau of Management Consulting who undertook the following tasks:

- o Held interviews with interested parties to more fully define relevant issues and data sources.
- o Identified possible alternatives to dealing with the risk.

- o Examined key health economics issues pertaining to regulatory options.

The second stage of the work was undertaken by Peat Marwick. The main tasks involved here included:

- o Review of existing literature related to sleepwear flammability.
- o Review of available Statistics Canada and other primary data.
- o Conduct of a series of in person and telephone interviews with sleepwear manufacturers, primary textile manufacturers, sleepwear importers, retailers and consumer associations.
- o Use of a survey technique known as Qualitative Controlled Feedback to assess the potential impacts of alternative regulations on the incidence and severity of children's sleepwear burns.
- o Analysis of data collected as described above, and preparation of a draft report.
- o Preparation of a final report.

The report by Peat Marwick is attached as an Annex.



### 3. FINDINGS

#### **3.1 ALTERNATIVES CONSIDERED**

In this study, a number of different regulatory alternatives were considered as alternative means of reducing the risk of sleepwear burns to children in Canada. During early stages of the work a wide variety of alternatives were defined, and the most plausible candidates were selected for further analysis. One of the options considered was an information campaign. Analysis indicated that while an information campaign would be a useful addition to a regulatory proposal, in itself an information campaign would not be viable in achieving a significant reduction in sleepwear related injuries and deaths. The regulatory options which passed the initial review and were analyzed in detail each required sleepwear garments to meet the same flammability standards, but differed along two basic dimensions. The two basic dimensions of the regulatory options were the range of styles to come under regulation, and the implementation date for new regulations. The different scope of style coverage options considered were as follows:

- o Coverage option 1: Covers nightgowns and robes sizes 0 to 14X.
- o Coverage option 2: Covers the above plus tailored and baby doll pajamas sizes 0 to 14X, except those for children sizes 0 to 7 kg.
- o Coverage option 3: Covers all children's sleepwear garments 0 to 14X, except those for children 0 to 7 kg.

The above style coverage options were considered in conjunction with the following implementation timing options:

- o Timing option 1: Implementation date March 1987.
- o Timing option 2: Implementation date September 1987.
- o Timing option 3: Implementation date March 1988.

An information campaign would accompany and support the introduction of new regulations to inform parents and children of sleepwear flammability hazards. The impact of allocating different levels of resources to an accompanying information campaign was also considered.

**3.2 ALLOCATIVE EFFECTS**

Under each style coverage option, the price of affected sleepwear garments would be expected to rise by 15%-20% in the short term, due largely to the use of substitute materials and shortages of low cost imports. In the longer run, prices may subsequently fall somewhat, although remaining higher in real terms than sleepwear prices today. The estimated social costs of the new regulation stem largely from the expected sleepwear price increases.

A summary of the expected social costs for selected garment coverage and timing options is presented in Exhibit 1. Long run social costs are a function of the range of garment styles covered by the regulations, and these costs would accrue primarily to consumers. Short run costs would accrue to industry under each option due to foregone profits and losses on inventories. These costs are a function of both the range of styles covered and the chosen implementation date. While long run costs are recurring annual costs, short run costs are of a lump sum nature.

**EXHIBIT 1**

**SOCIAL COSTS OF REGULATORY OPTIONS**  
(Based on 1984 Volumes and in 1984 Dollars)

Long Run Net Costs (annual)	Style Coverage		
	Option 1 (\$ millions)	Option 2 (\$ millions)	Option 3 (\$ millions)
High Estimate:	14	26	81
Base Case Estimate:	12	20	59
Low Estimate:	7	12	33
Short Run Costs (lump sum)	Coverage Option 1 Implemented in March 1987 (\$ millions)	Coverage Option 2 Implemented in Sept. 1987 (\$ millions)	Coverage Option 3 Implemented in March 1988 (\$ millions)
Foregone Profits and Losses to Industry	7	8	22

High and low estimates of long run social costs have been provided for each coverage option under different sets of assumptions.

Base case estimates of benefits and cost-impact ratios for each regulatory option are presented in Exhibit 2. The ratios combine the base case estimates of both social costs and benefits to allow a comparison of the cost performance of the regulatory options.

**EXHIBIT 2**  
**BASE CASE ESTIMATES OF BENEFITS AND**  
**COST PERFORMANCE OF REGULATORY OPTIONS\***  
**(For a typical year, 1984 \$)**

	Coverage Option 1 (\$ millions)	Coverage Option 2 (\$ millions)	Coverage Option 3 (\$ millions)
<b>NET COST</b> (annual)	12	20	59
<b>BURN IMPACTS</b> (annual)			
<b>Reduction in</b> <b>Fatalities</b>			
Number	1	2	2
Cost Ratio (\$mill/life)	12	10	29.5
<b>Reduction in Total</b> <b>Burn Incidence</b>			
Number	9	11	12
Cost Ratio (\$mill/burn)	1.3	1.8	4.9

\* combines base case estimates of benefits and social costs.

An information campaign will accompany the introduction of new regulations, to inform parents and children of sleepwear flammability hazards. This campaign should serve to educate parents and children to the danger of sleepwear flammability and how to react to sleepwear ignition. It is expected that this will encourage early adoption of less flammable sleepwear, and should aid in reducing sleepwear burn incidence and severity. However, it is uncertain how strong the impact of this campaign would be or what additional impacts could be expected from allocating greater resources to this. For this reason, the potential effects of the information campaign have been omitted from our estimation of burn impacts.

### 3.3 NON-ALLOCATIVE EFFECTS

In addition to increased costs, each regulatory alternative may have non-allocative effects. The anticipated non-allocative effects are summarized in Exhibit 3.

Generally, non-allocative effects are relatively minor under coverage options 1 or 2, but somewhat greater under the third option. In particular, it is expected that coverage option 1 or 2 might result in relatively small reductions in domestic output, and perhaps fewer than 75 and 40 lost jobs respectively. However, coverage option 3 may result in greater losses in output and as many as 430 lost jobs in total. Similarly, increased import penetration is relatively unlikely under coverage options 1 and 2, but is somewhat more likely under option 3. These effects would be primarily confined to the children's sleepwear and textile industries, and would be concentrated in the Montreal area.

The net impacts of each regulatory alternative on the market structure and competition in the children's sleepwear industry would be small. However, there might be some redistribution of incomes among firms in the children's sleepwear and clothing industries, with this effect again greatest under the third coverage option.

Macro-economic impacts and impacts on technology would be negligible under each regulatory alternative.

EXHIBIT 3

SUMMARY OF NON-ALLOCATIVE IMPACTS OF REGULATORY OPTIONS

	Under Coverage option 1 or option 2	Under Coverage option 3
Distribution of Income:	<ul style="list-style-type: none"><li>o Some minor redistribution among firms in sleepwear industry.</li></ul>	<ul style="list-style-type: none"><li>o Potential substantial redistribution to children's clothing manufacturers outside sleepwear industry.</li></ul>
Market Structure and Competition: (Sleepwear Industry)	<ul style="list-style-type: none"><li>o Slightly fewer firms producing affected garments. Major players not affected.</li><li>o Decreased short-term competition due to shortages of low cost imports.</li><li>o Slightly increased competition from U.S. sleepwear manufacturers.</li></ul>	<ul style="list-style-type: none"><li>o As for Option 1 and 2.</li><li>o Competition from foreign sources somewhat greater than under Options 1 or 2 but still reduced for short term.</li><li>o Slightly greater U.S. competition than for Options 1 and 2.</li></ul>
Technical Progress:	<ul style="list-style-type: none"><li>o Domestic firms will acquire ability to produce less flammable sleepwear - no other impacts.</li></ul>	<ul style="list-style-type: none"><li>o As for Options 1 and 2.</li></ul>
Output and Employment: (Sleepwear and fabric industry)	<ul style="list-style-type: none"><li>o Impacts confined to Montreal area.</li><li>o Less than 5% reduction in unit output of domestically produced sleepwear garments.</li><li>o Fewer than 80 jobs lost in sleepwear and fabric industries combined.</li></ul>	<ul style="list-style-type: none"><li>o As for Options 1 and 2.</li><li>o As much as 23% reduction in domestically produced sleepwear garments.</li><li>o As many as 430 jobs lost in sleepwear and fabric industries combined.</li></ul>
Impacts on Foreign Trade:	<ul style="list-style-type: none"><li>o Reduced low cost (Far East) imports for short-term.</li></ul>	<ul style="list-style-type: none"><li>o As for Options 1 and 2.</li></ul>

EXHIBIT 3

SUMMARY OF NON-ALLOCATIVE IMPACTS OF REGULATORY OPTIONS

	Under Coverage option 1 or option 2	Under Coverage option 3
	<ul style="list-style-type: none"><li>o Slightly increased level of imports from U.S.</li><li>o Potential for sleepwear exports to U.S.</li></ul>	<ul style="list-style-type: none"><li>o Slightly greater level of imports than under Options 1 or 2.</li><li>o As for Options 1 and 2.</li></ul>
Macro Economic Impacts:	Negligible.	Negligible.



4. FOLLOW-UP ACTION

The regulatory initiative for children's sleepwear that is being proposed, consists of performance requirements for children's robes, nightgowns, baby doll and tailored pyjamas, size 0-14x excluding garments for children weighing less than 7 kg. The implementation date is planned for September 30, 1987. This regulatory initiative represents option 2 of this study and corresponds to the recommendation of the Children's Sleepwear Advisory Committee established by the Minister in October 1985.

In order for the children's sleepwear regulatory proposal to receive approval, a number of steps must be followed to meet the requirements under the government's new Regulatory Process Action Plan.

A regulatory impact analysis statement (RIAS), a requirement under the new process has been prepared for submission to the Regulatory Affairs Secretariat for approval. This study constitutes the base analysis of the RIAS, assessing the impact of the children's sleepwear regulatory proposal. The Secretariat will forward the regulatory proposal to PCO (Justice) for approval. Consultation with affected parties will then take place through prepublication and publication of the RIAS and the proposal in the Canada Gazette as appropriate.

The study itself can be used to provide a common basis for discussion with interested parties. The underlying analysis is based on in-depth consultation with affected parties, and indeed the regulatory proposal itself was developed through formal consultation with the Children's Sleepwear Advisory Committee.

ANNEX 1

Children's Sleepwear Advisory Committee

**ANNEX 1**

**CHILDREN'S SLEEPWEAR ADVISORY COMMITTEE**

G.T. Holmes (Chairman - Non voting)  
ADGA Group

Dr. M. Day (Technical Advisor - Non voting)  
Division of Chemistry  
National Research Council

Dr. E. Nielsen (Secretary - Non voting)  
Product Safety Branch

**VOTING REPRESENTATIVES**

Mr. G. Vala-Webb  
Amalgamated Clothing and Textile Workers' Union

Ms. H. Morrison  
Canadian Council on Children and Youth

Mrs. S. Post  
Executive Director  
Canadian Institute of Child Health

Dr. Richard Stanwick  
Canadian Paediatric Society

Mr. J. Robertson  
Canadian Textile Institute

Mr. R.F. Mersereau  
Canadian Textile Importers' Association

Mr. H. Boshouwers  
Children's Apparel Manufacturer's Association

Mr. T. Cave  
Consumers' Association of Canada

Mrs. Trudy Wiltshire  
National Council of Women of Canada

Mr. M. Fruitman  
Retail Council of Canada

**NON VOTING REPRESENTATIVES**

Mr. W.B. Monk (CTI)  
DuPont Canada Inc.

Mrs. C. Shipley  
Canadian Institute of Child Health

Mr. J. Roskies (CTI)  
Huntex Ltd.

Dr. Robin Walker (CCCY)  
Moncton Hospital

Mr. A. Straw (CTI)  
Vice-President  
Leedye Textiles

Mr. J. Turcotte (CTI)  
Dominion Textile Inc.

Ms. M. Grégoire (CTI)  
Dominion Textiles Inc.

Mr. H. Whelan (CAMA)  
St. Lawrence Textiles

Ms. H. Vanderveerd (CAMA)  
St. Lawrence Textiles

Dr. R. Viau  
Product Safety Branch

Mr. H. Furman  
Retail Research Foundation of Canada

ANNEX 2

Report by Peat Marwick and Partners -- An  
Analysis of Impacts of Proposed Regulation  
of Children's Sleepwear, July 24 1986



Peat, Marwick and Partners  
Management Consultants  
P.O. Box 31  
Commerce Court Postal Station  
Toronto, Ontario M5L 1B2  
(416) 863-3500

July 24, 1986

Mr. Ken Tiedemann  
Senior Programmer Evaluation Manager  
Program Evaluation Division  
Consumer and Corporate Affairs  
Place du Portage, Tower 1  
50 Victoria Street  
Hull, Quebec

Dear Mr. Tiedemann:

**Analysis of Impacts of Proposed Regulation of  
Children's Sleepwear**

We are pleased to submit our final report on this study. An executive summary has been provided at the front of the report. The report is then structured in four sections:

- Background to the Proposed Regulation
- Allocative Effects
- Non-Allocative Effects
- Summary and Conclusions

A series of appendices, also included, provides much of the support for the analysis in the report.

We are very appreciative of the cooperation which we have received from the Program Evaluation Division as well as the other groups with whom we dealt in CCAC. This has been a very interesting study for us, and we thank you for the opportunity to have worked on it.

Yours very truly,

PEAT, MARWICK and PARTNERS

*Peat, Marwick & Partners*



**CCAC**  
**ANALYSIS OF IMPACTS OF**  
**PROPOSED REGULATION OF CHILDREN'S SLEEPWEAR**

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**CCAC**  
**ANALYSIS OF IMPACTS OF**  
**PROPOSED REGULATION OF CHILDREN'S SLEEPWEAR**

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E - Results of the QCF Survey	
F - Glossary	
G - Industry Interview Guides	
H - Summary Results of CCAC Consumer Research Study	

**EXECUTIVE SUMMARY**

**BACKGROUND AND METHODOLOGY**

It is estimated that about 40 children suffer burns each year due to the ignition of sleepwear garments. Of these children, perhaps three will die each year. In order to reduce this risk to children, the Product Safety Branch of Consumer and Corporate Affairs has proposed new regulations which would require children's sleepwear garments, size 0 to 14x, to pass a more stringent flammability test. The flammability test is similar to that used in the United States for children's sleepwear.

The new sleepwear flammability regulations were viewed as major new regulations, in that the impact on consumers and industry was potentially large and widespread. Treasury Board of Canada guidelines require that a Socio-Economic Impact Analysis (SEIA) be conducted with the introduction of any major new regulations. This study was performed according to SEIA guidelines to assess the potential impacts of the new regulations on consumers and industry, and to facilitate consideration of the regulatory options by senior management and the Minister.

Owing to difficulties with assigning values to disfigurement, suffering or death, cost-effectiveness was chosen as the methodology with which to assess the regulations under study. Long run costs and benefits have not been discounted as we have no rationale for forecasting any significant variance in costs or benefits. Discounting would scale the annual flows by the same factors for each option. For simplicity costs and benefits are discussed as annual flows "for a typical year in equilibrium", assuming these are the same for each year.

**ALTERNATIVES CONSIDERED**

In this study, a number of different regulatory alternatives or options were considered as alternative means of reducing the risk of sleepwear burns to children in Canada. The regulatory options which were considered each required sleepwear garments to meet the same flammability standards, but differed along two basic dimensions. The two basic dimensions of the regulatory options were the range of styles to come under regulation, and the implementation date for new regulations. The different scope of style coverage options considered were as follows:

- o Coverage option 1: Covers nightgowns and robes sizes 0 to 14x.
- o Coverage option 2: Covers the above plus tailored and baby doll pajamas sizes 0 to 14x, except those for children 0 to 7kg.

- o Coverage option 3: Covers all children's sleepwear garments sizes 0 to 14x except those for children 0 to 7kg.

The above style coverage options were considered in conjunction with the following implementation timing options:

- o Timing option 1: Implementation date March 1987.
- o Timing option 2: Implementation date September 1987.
- o Timing option 3: Implementation date March 1988.

An information campaign will accompany the introduction of new regulations to inform parents and children of sleepwear flammability hazards. The impact of allocating different levels of resources to an accompanying information campaign was also considered as a separate option.

**ALLOCATIVE EFFECTS**

Under each style coverage option, the price of affected sleepwear garments would be expected to rise in the short term, due largely to the use of substitute materials and shortages of low cost imports. In the longer run, prices may subsequently fall somewhat, although remaining higher in real terms than sleepwear prices today. The estimated social costs of the new regulation stem largely from the expected sleepwear price increases.

Social costs are of two kinds: long run annual costs and short run lump sum costs. Long run social costs are a function of the range of garment styles covered by the regulations, and these costs would accrue primarily to consumers. Short run costs would accrue to industry under each regulatory alternative due to foregone profits and losses on inventories. These costs are a function of both the range of styles covered and the chosen implementation date. While long run costs are recurring annual costs, short run costs are of a lump sum nature.

Using base case estimates, total long run social costs are estimated at \$12 million annually under coverage option 1, \$20 million annually under coverage option 2, and \$59 million annually under coverage option 3. Short run lump sum costs are estimated at \$7 million under timing option 1 (assuming coverage option 1), \$8 million under timing option 2 (assuming coverage option 2), and \$22 million under timing option 3 (assuming coverage option 3).

Each of the coverage options considered would be expected to achieve different total impacts on burn incidence and severity. Successive coverage options (including more garments under regulation) would be expected to have increasing impacts on the incidence and severity of sleepwear burns. It is estimated that coverage option 1 would eliminate 1 fatality per year versus a reduction of 2 fatalities per year for either coverage option 2 or 3. Comparing the reduction of total burn incidence among the options, coverage option 1 might eliminate 9 burns per year, coverage option 2 might result in 11 fewer burns per year, and coverage option 3

might result in 12 fewer burns per year. It should be noted that although expanding garment coverage reduces burn incidence through the ranges of options, the additional impact of successive options diminishes substantially.

Cost ratios were developed for each coverage option, which compare benefits in terms of annual reductions in burn incidence and severity, to annual social costs. Coverage option 1 would reduce fatalities at a cost of about \$12 million per fatality reduction. The equivalent per fatality reduction costs are \$10 million under option 2 and \$29.5 million under coverage option 3. Cost ratios for burn incidence reduction also increase under successive coverage options.

An information campaign will accompany the introduction of new regulations, to inform parents and children of sleepwear flammability hazards. This campaign should serve to educate parents and children to the danger of sleepwear flammability and how to react to sleepwear ignition. It is expected that this will encourage early adoption of less flammable sleepwear, and should aid in reducing sleepwear burn incidence and severity. However, it is uncertain how strong the impact of this campaign would be or what additional impacts could be expected from allocating greater resources to this.

#### NON-ALLOCATIVE EFFECTS

In addition to increased costs, each regulatory alternative has the potential to produce non-allocative effects.

Non-allocative effects are expected to be relatively minor under coverage options 1 or 2, but somewhat greater under the third option. In particular, it is expected that coverage option 1 or 2 might result in relatively small reductions in domestic output, and perhaps 80 lost jobs. However, coverage option 3 may result in greater losses in output and as many as 430 lost jobs in total. Similarly, increased import penetration is relatively unlikely under coverage options 1 and 2, but is somewhat more likely under option 3. These effects would be primarily confined to the children's sleepwear and textile industries, and would be concentrated in the Montreal area.

The net impacts of each regulatory alternative on the market structure and level of competition in the children's sleepwear industry would be small. However, there might be some redistribution of incomes among firms in the children's sleepwear and clothing industries, with this effect again greatest under the third option.

Macro-economic impacts and impacts on technology would be negligible under each regulatory alternative.

## I - BACKGROUND TO THE PROPOSED REGULATION

### THE MINISTER'S ANNOUNCEMENT

On October 23, 1985, the Minister of Consumer and Corporate Affairs Canada ("CCAC") announced that he was introducing more stringent flammability regulations under the Hazardous Products Act to cover children's nightgowns and robes. These revised regulations will apply to sizes up to 14X, and the announcement indicated that they would come into effect in March, 1987. The Minister also noted that his Department will be initiating a campaign to increase public awareness of the hazards associated with fire and children's sleepwear, and to advise parents, guardians, and children of what they can do to eliminate these burn accidents.

### DESCRIPTION OF THE REGULATORY PROPOSAL

The regulatory proposal consists of performance requirements for children's robes and nightgowns, sizes 0-14X. The detailed requirements are included in Appendix A, and have the following main features.

- o Every product treated with a flame retardant shall have a label which is permanently affixed to the product and which displays in a clear and legible manner precautionary care instructions. These include procedures for washing, bleaching, drying, ironing, and dry cleaning. They are intended to protect the product from agents or treatments which are known to cause deterioration of its flame resistance.
- o Every product, when prepared and tested as outlined in the detailed requirements, is restricted to maximum average and individual char lengths.
- o If products are treated with flame retardants, neither the flame retardant or any breakdown product shall cause dermal irritation or dermal sensitization. In addition, it shall not be genotoxic, chronically toxic, nor shall it cause benign or malignant tumors.

### Exclusions

Under the proposed regulations, polo pajamas, tailored pajamas, baby doll pajamas and sleepers would be exempt from these requirements and would continue to be subject to the current flammability regulations.



## THE PURPOSE OF THE REGULATORY PROPOSAL

The purpose of the regulatory proposal is to reduce the incidence and severity of children's sleepwear burns, and thus to reduce the number of deaths and serious injuries from this cause.

### Risk Addressed

Injuries resulting from burns of one kind or another are a major cause of death and serious injury of children in Canada. A number of these incidents, especially for children up to 9 years old, can be directly related to the flammability of their sleepwear.

The only comprehensive study in Canada, conducted by Dr. R. Stanwick of the University in Manitoba in 1982, indicates that 18 to 20 children under the age of 9 are severely burned each year due to the ignition of sleepwear, and that on average one or two of these burned children die each year. Dr. Stanwick's study was based only on burns treated in pediatric burn units and as such does not account for burns treated elsewhere. The results of this study can then be taken as a lower bound estimate. His estimate of the current total number of sleepwear-related burns for children is in the area of 40 annually (see Appendix E, Attachment 1). This is a judgemental estimate and is not the result of an empirical study. This estimate of 40 annual sleepwear burns to children is used as our base case for analysis. We have estimated the number of fatalities at 3 per year.

The principal causes of sleepwear ignition for these burned children include playing with matches or lighters, and being too close to fireplaces or stoves.

However, once sleepwear has ignited, the two factors which appear to have the major impact on the extent and severity of burn injuries suffered by these children are the style and fabric of the sleepwear. In particular:

- o Loose and flowing styles such as nightgowns and robes are usually implicated in the most severe injuries. Not only are they more likely to come into contact with an ignition source, but they burn faster than other sleepwear because of the presence of air on both sides of the fabric, thus fueling the flames.
- o Some fibres ignite easily, burn rapidly and are difficult to put out. These include cotton, linen, rayon, cellulose acetate, acrylics and blends of these fibres. In addition, light weight fabrics, loose open weave fabrics, and pile fabrics (such as flannelette) burn more quickly than heavier, tightly woven fabrics. Material such as nylon, polyester, modacrylics and cordelan, on the other hand, are hard to ignite and tend to self-extinguish.

The regulatory proposal will effectively reduce the use of the more flammable fabrics which meet the current regulations in those styles of children's sleepwear which appear to cause the greatest risk of severe burns once ignited.

#### The Likely Implications Of The Regulatory Proposal

It is generally accepted in CCAC and within the industry that the implications of the regulatory proposals are that:

- o Most commercially available flame retardant treatments will not be economic under the regulations.
- o The regulation will effectively eliminate the use of cotton, linen, rayon, cellulose acetate, acrylics and poly/cotton blends in robes and nightgowns, sizes 0-14X. (Similar regulations have been in place for some years in the United States, and have had these impacts. This has led most observers to expect the same effect in Canada.)

#### CONSULTATION

##### The Current Regulatory Regime

Following several years of discussions on regulatory action, on November 2, 1971, regulations were promulgated under the Hazardous Products Act setting flammability standards for children's sleepwear, sizes 0-6x. At the current time, therefore, the fabrics used to manufacture children's sleepwear in Canada are subject to more stringent regulation related to flammability than are fabrics in other clothing items. It is generally accepted that children's sleepwear products sold in Canada are in compliance with these regulations, but burn incidents continue to occur.

##### Key Elements of Consultation

Since the regulations were promulgated in 1971, there has been continued discussion of the children's sleepwear issue. The most important elements of the process of consultation leading up to the development of this regulatory proposal are as follows:

- o In the Spring of 1983, the Canadian Institute of Child Health (CICH) set up a Working Group to study, among other issues, sleepwear burn injuries to children. The Working Group included Canadian apparel manufacturers, Canadian textile manufacturers, fire authorities, the Canadian Paediatric Society, the Consumer Association of Canada, and the Product Safety Branch of CCAC. Based on the discussions of this working group, in July 1984, the CICH recommended more stringent flammability regulations for children's sleepwear than the current Canadian

regulations require. The intent would be that fabrics used in children's sleepwear, to size 14x, would not support combustion, and would tend to self extinguish if ignited.

- o In November 1984, a Steering Committee was established by CCAC to examine the technical and economic aspects of such a course of action. This Committee included representation from the above mentioned groups. In addition, separate Sub-committees were established to deal with the technical aspects of a proposed standard, and with the communication aspects. Both the Committee and Sub-committees held a number of meetings through 1985, which provided full opportunity for the exchange of the views of all interested groups.
- o Following the Minister's announcement, a Children's Sleepwear Committee was established by CCAC, with representatives of the various interested groups. This Committee met in early 1986, and developed an alternative regulatory proposal. This proposal is the basis of one of the alternatives to the regulations proposed by the Minister which are analyzed in this study.

#### THE REASON FOR THIS STUDY

This regulatory impact study was conducted for three main reasons:

- o To facilitate consideration of possible regulatory options by senior management and the Minister of Consumer and Corporate Affairs
- o To further good management in the area of developing and implementing new regulations
- o To address the critical social and economic issues raised by the regulatory proposal.

As a result of the depth and thoroughness of analysis sought by CCAC, this study meets the requirements for a Socio Economic Impact Assessment, (SEIA), and a Regulatory Impact Analysis. The Treasury Board SEIA guidelines were used in preparing this analysis.

#### APPROACH TO THE CONDUCT OF THE STUDY

Peat Marwick began work on this study following some preliminary work conducted on CCAC's behalf, by the Bureau of Management Consulting (BMC). Prior to Peat Marwick's involvement in the study, a decision was made to use the cost-effectiveness methodology. The cost-effectiveness

framework was used by Peat Marwick in this study, and preliminary research done by BMC was also incorporated.

The following are the broad steps which were undertaken by Peat Marwick in the course of this study:

- o A review of existing literature related to sleepwear flammability. (See Appendix B for a bibliography.)
- o A review of available Statistics Canada and other secondary data.
- o The conduct of a series of on-site and telephone interviews with sleepwear manufacturers, primary textile manufacturers, sleepwear importers and retailers. A list of those interviewed is included in Appendix B.
- o The use of a survey technique known as Qualitative Controlled Feedback to assess the impacts of the different regulations on children's sleepwear burns. (The results of the QCF survey are included as Appendix E.)
- o The analysis of data collected as described above, and preparation of a draft report for CCAC. This was subject to a review and discussion with members of CCAC.
- o The preparation of this final report.

## II - ALLOCATIVE EFFECTS

### OVERVIEW OF THIS SECTION

#### Definition of Allocative Effects

The allocative effects of the regulatory proposal are those which bear directly on the efficiency of resource allocation resulting from the regulatory proposal, i.e., the social costs and benefits of the proposal.

#### Structure Of The Chapter

In this chapter:

- o The choice of cost-effectiveness rather than benefit-cost methodology is outlined and explained.
- o The basic alternatives studied are outlined and defined.
- o The social costs associated with the regulatory proposal are identified and estimated.
- o The desired impacts or benefits of the regulatory proposal are identified and assessed.
- o Cost-effectiveness comparisons are presented.

The Treasury Board Administrative Policy Manual suggests that alternatives be discussed at the end of the section on allocative effects. For several reasons, however, it was judged appropriate to define the alternatives earlier in this chapter, and to carry forward the analytical results for a range of alternatives. The basic reasons for this include the following:

- o The choice of cost-effectiveness as a methodology (compared to the benefit-cost approach) puts a greater weight on the comparison of alternatives as the basic indicator of regulatory effectiveness.
- o The treatment of the implementation date, one variable around which alternatives are constructed, has to be dealt with carefully since the regulatory proposal has already been announced and a proposed implementation date selected.
- o Further consultation since the announcement of the regulatory proposal has led to the development of an alternative proposal by the Children's Sleepwear Committee, which is treated as an alternative in the analysis.

The outline of allocative effects in this section is based on more detailed material provided in three appendices to this report, which are:

- o An outline of the basic structure of the industry in Appendix C.
- o A relatively detailed delineation of the likely impacts of the various regulatory alternatives, in Appendix D.
- o The specific results of a methodology designed to yield estimates of the impacts of various regulatory options on the incidence and severity of burns, in Appendix E.

In order to conform with the suggested structure for SEIA documents in the Treasury Board guidelines this material has been provided in appendices. It is, however, central to the analyses which are provided in this chapter, and in Chapter III, which deals with non-allocative effects.

#### USE OF COST-EFFECTIVENESS METHODOLOGY

##### Benefit-Cost and Cost-Effectiveness

The preferred approach to identifying the allocative effects of regulatory proposals is benefit-cost analysis, although there are circumstances in which cost-effectiveness analysis must be used. Chapter 490, Appendix E of the Treasury Board Administrative Policy Manual spends some time discussing this issue.

"Benefit-cost analysis of a proposed government action is a systematic attempt to identify and measure in monetary terms all relevant social costs and benefits. It involves a comparison of these costs and benefits with those of possible technological and policy instrument alternatives for achieving the same objectives".

"When it is not possible to measure the benefits of some proposed government actions in monetary terms, cost-effectiveness analysis can be useful in exploring a range of technological and policy instrument alternatives in terms of the costs of achieving a specific non-monetary objective".

The Treasury Board discussion goes on to note that there are significant theoretical advantages to using benefit-cost methodologies, because they provide information which can lead to efficient resource allocation for all government intervention in the economy. Cost-effectiveness analysis, on the other hand, can only ensure efficiency in obtaining a given reduction in a particular external effect. In other words, it does not in itself provide the information to determine whether the regulatory proposal is worthwhile, compared to other projects in other fields of policy which might be undertaken. As the Treasury Board guidelines say, the advantage of the cost-effectiveness methodology lies mainly in allowing comparisons of the relative success (in terms of total cost) of different



ways of achieving a physical objective when benefits are difficult to measure in monetary terms. In addition, cost-effectiveness analysis can provide means of comparing the relative cost of achieving different levels of a physical objective, in a situation in which benefits are difficult to measure in monetary terms.

In this context, the issue of whether to use benefit-cost or cost-effectiveness methodologies was thoroughly explored during the design phase of this study. A decision to use a cost-effectiveness methodology, rather than a benefit-cost approach, was reviewed at a meeting of the Advisory Committee during late November, 1985.

#### **Why Cost-Effectiveness Analysis is Being Used**

Cost-effectiveness analysis is used in this study because the major objective of the regulation is to avert the loss of life and pain of suffering from burns attributable to children's sleepwear. While benefit-cost theorists have developed some methodologies for attempting to put a monetary value on the loss of human life, these approaches are not completely accepted. They are particularly questionable when used to assess the value of the life of a child, and to put a value on the extent of pain and suffering incurred not only by the child who receives significant burns, but also by the victim's family, and by Canadian society as a whole, as they contemplate such a tragedy. It was to avoid attempting to express these dimensions of the problem in monetary terms that the decision was made to use a cost-effectiveness approach.

The implication of the cost-effectiveness methodology for this study is that the regulatory proposal is considered in comparison to various alternative schemes of government regulation. The cost-effectiveness measures illustrate the extent to which each alternative achieves its objectives of reducing the incidence and severity of children's burns due to sleepwear ignition, compared to the social costs of achieving these objectives. This forms the basis for some comparison amongst the regulatory proposal and the various options. It therefore provides information to assess whether the regulatory proposal appears to be effective in comparison to the practical alternatives.

#### **THE TREATMENT OF TIME**

In considering allocative effects, there are both short term (transitional) and long term (equilibrium) dimensions. As will be discussed below, we do not anticipate major transitional effects, although different implementation dates may have some differential impacts. The primary impacts are thus long term.

For a number of reasons, it is not necessary to use discounting or net present valuing in developing the cost-effectiveness estimates. In particular:

- o The regulatory proposal is unlikely to generate any significant "capital costs".
- o It will essentially generate an annual stream of benefits (reduced incidence or severity of burns), and costs (administrative costs, reductions in consumer surplus and health care costs). In the long term these annual flows will be relatively constant on a year by year basis.
- o Benefits are not being valued financially, and it is difficult to interpret a discounted annual stream of reduced incidence and/or the severity of burns.

Discounting is necessary where there is significant variability in the pattern of costs and/or impacts. Discounting in these instances permits comparisons to be made. In this study, we have no strong rationale for projecting any significant variance in costs or impacts, except for some "lump sum" short term costs. Our best assumption for illustrative calculations is that the cost flows are uniform through time. Discounting would scale the annual flows by the same factor for each option. Arguably this would have no effect on the relative rankings of the regulatory options. As a result we have presented the costs and benefits as an annual flow for "a typical year in equilibrium", assuming these are the same for each year.

The short term impacts are of a "lump sum" nature, and are discussed separately as adjustment costs to industry and to the government.

#### THE ALTERNATIVES

The Treasury Board guidelines recognize the importance of considering all possible alternatives to the proposed regulations under study. In principle, one should consider all the possible technological and policy-instrument alternatives for achieving the same objectives. Obviously, the rationale for considering alternatives to the regulatory proposal is to ensure that the proposal is, in fact, relatively efficient from an allocative point of view and therefore appears to be a superior approach to meeting policy objectives, compared to the available options.

The rationale for considering alternatives in cost-effectiveness analysis is particularly strong. Cost-effectiveness analysis, as compared to benefit-cost analysis, does not provide any measure of the net social benefit of proceeding with the regulatory proposal. It only provides a measure of the social cost required to achieve a certain level of satisfaction of objectives. This information is really only meaningful when it can be compared to the social costs of achieving the same or different levels of the policy objectives, through various alternatives to the regulatory proposal.

In the case of children's sleepwear regulation, there is potentially a wide range of regulatory alternatives. The most relevant dimensions are the following:

- o The scope of garment coverage, i.e., what range of styles of children's sleepwear will be included in the more stringent regulation.
- o The timing of implementation, i.e., how long will manufacturers and retailers have to plan for the change-over to the more stringent regulations.
- o Communications support, i.e., what would be the effect of allocating more resources to communications support.

These dimensions are each dealt with in turn below.

#### Scope Of Garment Coverage

Discussions within CCAC have led to the definition of four basic cases which should be explored with respect to the scope of garment coverage. These are outlined below:

- o The status quo, i.e., the regulations which are currently in place, governing the flammability testing and requirements of children's sleepwear, sizes 0-6X.
- o Option 1: The regulations outlined in the Minister's announcement of October 23, effectively applying U.S. flammability standards and effectively eliminating the use of cotton, linen, rayon, cellulose acetate, acrylics, and poly/cotton blends, in robes and nightgowns sizes 0-14X. (Polo pajamas, tailored pajamas, baby doll pajamas and sleepers would be exempt from these regulations and would continue to be subject to the current flammability regulations.)
- o Option 2: The consensus reached by the Children's Sleepwear Committee. This option would extend U.S. flammability standards to baby doll and tailored pajamas, in addition to nightgowns and robes, sizes 0 to 14X (but excluding garments for children weighing less than 7 kg.). This would effectively eliminate the use of the fabrics noted in Option 1 for this broader range of sleepwear products. (Polo pajamas and sleepers would still be exempt.)
- o Option 3: All children's sleepwear sizes 0 to 14X (but excluding garments for children weighing less than 7 kg.) would conform to the U.S. flammability standard, effectively eliminating the use of the same fabrics as in Option 1 for all children's sleepwear garments without exception.

### Timing Of Implementation

Appendix C outlines the lags which are inherent in the flow of materials and the ordering decisions which represent normal practice in the industry. These lags may make the impacts of regulatory proposals sensitive to the actual timing of implementation, at least in the short run. In the study, we consider three options for the implementation date of regulations. These are:

- o March, 1987
- o September, 1987
- o March, 1988.

It is generally agreed that implementation dates will be specified in terms of implementation at the retail level. There has been some discussion of the possibility of implementation at the production level. However, this was not viewed to be sufficiently likely to warrant adding an extra dimension of complexity to the analysis.

### Dealing With the Time of Announcement

Short-run impacts may depend on the length of the gap between the timing of the announcement of the proposed regulation, and the proposed implementation date at the time of the announcement, i.e., how much time is available for adjustment. The timing of announcement and implementation dates in relation to established selling seasons is also important in determining impacts. In recognition of this, we have structured the various alternatives around the same announcement date. Each of the alternatives studied was assumed to have the same announcement date as the proposed regulatory option, i.e., announced by the Minister in October, 1985. This approach is necessary to achieve comparability among options. It is also intended to meet the spirit of the SEIA approach, even though the study work was undertaken following the Minister's announcement.

Therefore, for example:

- o The proposed regulation, for purposes of the study, is defined as a Ministerial announcement in October 1985 with scope of government coverage Option 1, to be implemented in March 1987.
- o An alternative case studied is a Ministerial announcement in October 1985 with scope of garment coverage Option 2, to be implemented in September 1987.

Most of the industry interviews for this study took place in January and February 1986. At that time, virtually all industry participants were aware of the Minister's announcement and had already made changes in their plans and operations to adjust to it. In discussing with them, for example, Option 2 with an implementation date of September 1987, their

immediate reaction was to consider the implications of a Ministerial announcement in, say, March, 1986, of this regulatory option, after they had already been planning for six months to meet the requirements of the Minister's actual announcement of October 1985.

It was therefore difficult to structure the data gathering around the somewhat hypothetical framework used in this study, i.e., assuming that each alternative to the proposed regulation was, in fact, announced in October 1985. However, for analytical purposes and presentation of results, we have attempted to maintain this framework.

#### **Communications Support**

The regulatory proposal includes provision for communications support, which would be focused on the period immediately around the implementation date for the new regulations. We have also considered the implications of providing additional levels of communications support.

#### **HOW THE OPTIONS ARE DEALT WITH**

In addition to the base case (status quo), the options outlined above define 18 separate cases (three style ranges x three timing options x two levels of communications support). We have not carried 18 separate options through data collection, analysis, and presentation of results. Instead, a simpler framework, outlined below, has been used for each of these steps.

#### **Data Collection**

Data collection has centred on interviews with various members of the industry. In these interviews, we have used the following framework:

- o The interviews have focused on the three options related to scope of garment coverage. In particular, we have asked the interviewees to consider the proposed regulation (Option 1) in comparison to the status quo. We have then asked them to consider the impact of Option 2 and Option 3 in the light of the basic framework they have developed with respect to Option 1.
- o We have then asked for views on the implications of alternative implementation dates in general, and have asked for any specific differences in the impact of implementation dates across the various scope of garment options.
- o Similarly, we have explored the impact of increased expenditure on the information campaign, and asked whether there are any differences across Options 1 to 3.

### Analysis

A similar approach has been followed in our analysis. We have essentially considered each of the three dimensions used to construct alternatives independently. We have assumed that the results along these dimensions can be combined either additively or multiplicatively, except in cases where we can specifically identify that this approach is not appropriate. In these cases, we have considered more complex interactions.

### Presentation

A similar format is considered with respect to presentation of results. Rather than providing all results in 18 separate calls, we provide them along each of the three relevant dimensions. We identify any areas where simple additive or multiplicative combinations of the dimensions are inappropriate.

### COSTS

The basic categories of cost are:

- o Administrative Costs: These are costs borne essentially by government to administer the regulation. Estimates of these costs have been obtained from CCAC.
- o Costs Borne by Consumers: A major element of cost is the additional resources required for manufacturers and retailers to comply with the changed regulations. We incorporate these costs in the overall change in consumer surplus, rather than as a resource cost per se. The results are unaffected by this decision.
- o Changes in Producer Surplus: We do not anticipate any significant changes in producer surplus, of the sort which are associated with rents or an upwardly sloping supply curve. However, the topic is discussed below.
- o Adjustment Costs: These costs are lump sum costs incurred by industry in the form of lost sales, slack capacity and possibly inventory write-offs. Such costs would only be incurred in the short run, over a period of two or three seasons.
- o Health Care Costs. Changes in health care costs associated with changes in the incidence and severity of burns would be defined as "benefits" in a benefit-cost framework. They can either be incorporated as an element of the desired impact of the regulatory proposal, or be brought to the cost side of the equation by changing sign, and netted out in deriving cost-effectiveness measures.

**EXHIBIT II-1**

**ADMINISTRATIVE AND INFORMATION CAMPAIGN COSTS**  
**(constant 1986 dollars)**

<b>Year</b>	<b>Total</b>	<b>Administration</b>	<b>Information Campaign</b>
<b>1</b>	<b>\$280,800</b>	<b>37,800</b>	<b>243,000</b>
<b>2</b>	<b>67,800</b>	<b>37,800</b>	<b>30,000</b>
<b>3</b>	<b>48,900</b>	<b>18,900</b>	<b>30,000</b>
<b>4</b>	<b>33,780</b>	<b>3,780</b>	<b>30,000</b>
<b>5 &amp; beyond</b>	<b>33,000</b>	<b>3,000</b>	<b>30,000</b>

**SOURCE: Consumer and Corporate Affairs**

We have taken the latter approach by netting cost savings from total gross costs.

Each element of cost is dealt with below.

#### Costs of Program Administration

The implementation of new sleepwear flammability regulations would result in costs for administration and monitoring. Monitoring would consist chiefly of Product Safety Branch inspectors' visiting sleepwear retailers and examining goods on the shelf. Samples would be bought of any goods suspected of not meeting the new flammability regulations. These samples would then be tested in laboratories to determine whether they comply with flammability regulations or not.

Typically, monitoring and administration costs are greatest in the first year or two after the implementation of new regulations. Costs usually drop off considerably by the third and subsequent years as most manufacturers are then in compliance with the new regulations.

Exhibit II-1, opposite, presents CCAC estimates of the total direct and indirect costs associated with program administration. It should be noted that these estimates are based on the assumption that "treated" flame retardant fabrics are not used in children's sleepwear, as testing costs for these fabrics are somewhat higher than for polyester and other synthetics.

In addition, a budget of \$243,000 has been allocated to the information campaign in year one of implementation of the new regulations. Although it is uncertain what amounts will be allocated in subsequent years, it is assumed that "maintenance level" amounts of \$30,000 will be spent for reprinting and distributing materials after year one. These amounts are also shown in Exhibit II-1.

#### Consumer Losses

The discussion of consumer losses due to the regulatory proposal takes place within the context of Exhibit II-2, overleaf. Exhibit II-2 illustrates two ways in which consumers can be made worse off by the regulatory proposal:

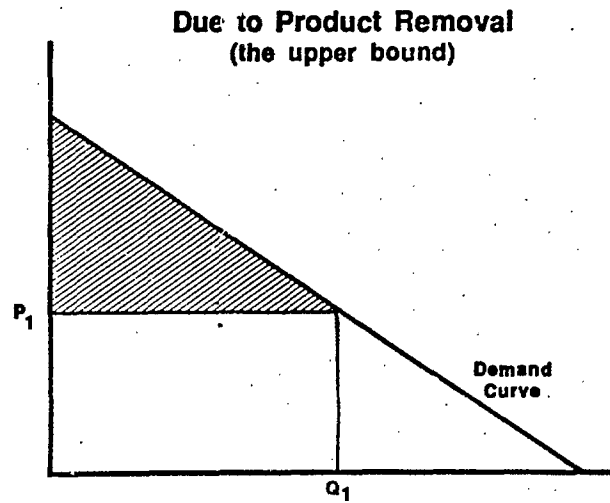
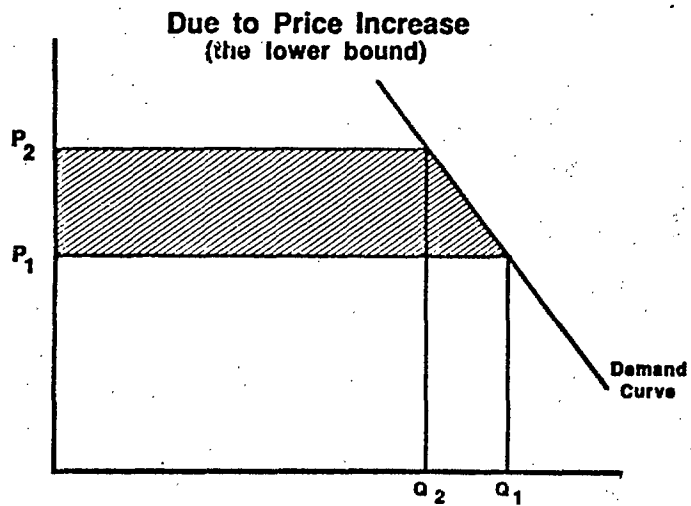
- o Firstly, substitutes for cotton sleepwear may be more expensive, so that the consumer loses surplus<sup>1</sup> due to the need to pay a higher price for effectively equivalent sleepwear. These include the resource costs associated with more expensive materials, as well as the consumer

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1. Consumer Surplus defined in glossary in Appendix F.



EXHIBIT II-2  
CONSUMER SURPLUS LOSS



 Consumer Surplus Loss

surplus loss due to reductions in volumes purchased at the higher price.

- o In addition, cotton sleepwear may be significantly preferred to polyester or nylon sleepwear, at similar prices. At the extreme, the consumer loses significant additional consumer surplus by losing access to garments for which he feels there are no close substitutes. This is equivalent to product removal.

The "price increase" and "product removal" scenarios depicted in Exhibit II-2 represent lower and upper bounds to the actual losses in consumer surplus. In the middle range, the loss to the consumer may be closer to a change in product quality<sup>2</sup> than to "product removal". The "true loss" depends to a considerable extent on the availability of close substitutes for the products which are eliminated. Obviously, the greater the range of children's sleepwear which is effectively eliminated by the regulatory proposal, the less likely it is that close substitutes can be found for the eliminated material.

#### Approach To Dealing With Consumer Surplus Costs

Our review of the literature on how to deal with this situation methodologically has not yielded a definitive approach. We have designed a methodology which we believe is appropriate, but which has not been found in other studies. The approach is described in greater detail in Appendix D, and is summarized below.

The loss to the consumer in bearing the costs of the standard is a loss in utility<sup>3</sup>, which can be treated as a consumer surplus loss. Consumer surplus loss calculations are used to estimate the utility losses which result from both increases in price and fabric changes in affected sleepwear styles. Higher prices and unavailability of desired fabrics combine to reduce the total utility attainable by consumers for a particular expenditure on sleepwear. The conventional consumer surplus approach is adequate for capturing the effects of a price increase, and can with some

2 "Quality" is intended to mean the perceived advantages of cotton, for which consumers prefer cotton to polyester (e.g., texture, breathability). The use of this term does not mean to say that there are not other dimensions where polyester is superior to cotton (e.g., durability).

3 Utility is used in the economist's sense of the word to mean the level of satisfaction or happiness attained from consuming some good. Utility in this case does not mean durability or have any other common usage meaning.

**EXHIBIT II-3**

**BASE CASE ESTIMATES OF  
CONSUMER SURPLUS AND VOLUME LOSSES  
(For a Typical Year Based on  
1984 Volumes and in 1984 dollars)**

	<u>Sleepwear Sales</u>		<u>Market Segment Elasticity</u>	<u>Unit Volume Loss (%)</u>	<u>Consumer Surplus Loss (\$ million)</u>
	<u>Units (000's)</u>	<u>Value (\$000's)</u>			
<b>Garments Covered</b>					
<u>Option 1</u>					
Gowns	2,810	25,000			
Robes	912	18,000			
<b>Total Option 1</b>	<b>3,722</b>	<b>43,000</b>	<b>1.5</b>	<b>70</b>	<b>12.8</b>
<u>Option 2</u>					
Garments covered by Option 1	3,722	43,000			
plus:					
Tailored Pajamas	1,778	17,000			
Baby Doll Pajamas	93	1,000			
<b>Total Option 2</b>	<b>5,593</b>	<b>61,000</b>	<b>1.0</b>	<b>45</b>	<b>21.3</b>
<b>Incremental Loss     Option 2 vs. 1</b>					<b>8.5</b>
<u>Option 3</u>					
Garments covered by Option 2	5,593	61,000			
plus:					
Polo Pajamas	5,515	49,000			
Sleepers	6,081	39,000			
<b>Total Option 3</b>	<b>17,189</b>	<b>149,000</b>	<b>0.5</b>	<b>23</b>	<b>59.9</b>
<b>Incremental Loss     Option 3 vs. 2</b>					<b>38.6</b>

Source: Canadian Textile and Clothing Board statistics and PMP estimates based on industry research.

difficulty deal with the issue of product removal. It is however difficult to integrate this approach with the assessment of losses which stem from a change in product quality.

Nonetheless, it is clear that the utility loss to consumers may be approximated by a surplus loss which lies between the price increase and the product removal cases depicted in Exhibit II-2. We have dealt with the issue by estimating an equivalent price increase to model the effects of decreased fabric quality. This equivalent price increase has been derived from estimates of segment volume shifts which might occur after the implementation of new regulations.

#### Estimates of Consumer Surplus Loss

We now provide illustrative calculations of the consumer surplus loss which might result from each style coverage option. The timing of implementation is not an issue in consumer surplus loss.

The following assumptions, discussed in Appendix D, were made in calculating consumer surplus losses.

1. The final price of less flammable sleepwear will be 20% greater than the price of cotton or poly/cotton sleepwear. In the long run imports of fabrics and garments will return to their status quo levels. Thus, there are no "additional" long run price increases because of displaced imports of fabrics or garments.
2. The quality decrease due to the substitution of polyester is equivalent to an additional price increase of about 25%. The effective net price increase for surplus loss calculations is then 45%.
3. Demand curves are linear.
4. Current prices, volumes and import levels for sleepwear garments are as indicated in Exhibit C-2.
5. As the range of styles covered increases under successive coverage options, a narrower range of non-affected sleepwear styles is left to substitute into. As a result, price elasticities can be expected to be lower for successive options. Elasticities are assumed to range from 1.5 and 0.5 for the various options.

Exhibit II-3, opposite, summarizes the consumer surplus losses which might result under each regulatory regime. As a result of decreasing elasticities, the consumer surplus loss for each style coverage option is not the sum of losses which would occur if subset ranges were covered separately. The loss per style covered becomes increasingly large as the total number of styles covered increases and elasticities decrease.

EXHIBIT II-4

SENSITIVITIES IN CONSUMER  
SURPLUS CALCULATIONS\*

(for a Typical Year Based on  
1984 Volumes and in 1984 dollars)

Parameter	Value	Coverage		Coverage		
		Option 1	Option 2	Option 2	Option 3	
		Surplus Loss (\$million)	Surplus Loss (\$million)	Incremental Loss 2 vs. 1 (\$million)	Surplus Loss (\$million)	Incremental Loss 3 vs. 2 (\$million)
Equivalent Price Increase (Fabric Quality)	35%	13.9	24.3	10.4	70.7	46.4
	5%	8.7	13.3	4.6	34.9	21.6
Price Elasticity** of Demand	3.0	6.3	8.9	2.6	21.1	12.2
	0.2	18.5	26.2	7.7	64.0	37.8
Price Premium (Polyester vs. other sleepwear)	40%	14.9	26.7	12.4	81.6	54.9
	0%	8.7	13.3	4.6	35.1	21.8
Total Sleepwear Sales (Retail)	\$300m	25.6	42.6	17.0	120.0	79.4
	\$75m	6.4	10.7	4.3	30.0	19.3
Base Case Estimates from Exhibit II-3		12.8	21.3	6.5	59.9	38.6

\* Results of altering key parameters one at a time, compared to values used in Exhibit II-3.

\*\* These elasticity values are "across the board" for each coverage option.

There is some diversity of opinion on whether there is any offset to the loss of consumer surplus when a substitute good is consumed in place of one whose price has increased. For example, under Option 1 unaffected sleepwear styles such as polo pajamas may be substituted for affected sleepwear garments. It would be argued by some that the increased consumption of polo pajamas represents an offset to consumer surplus losses. However, it is argued by Mishan (see bibliography) and others that consumer surplus losses should not be adjusted in this way. According to this second school of thought, consumer surplus loss calculations must consider only the demand curve for the affected good. In this analysis we have not made any adjustments (offsets) to consumer surplus losses for increased consumption of substitute goods.

#### Sensitivities in Consumer Surplus Calculations

The consumer surplus loss calculations are very sensitive to assumptions which have been made about:

- o the price premium of polyester over cotton sleepwear fabrics;
- o the equivalent price effect of polyester substitution;
- o the price elasticity of demand for affected sleepwear-style segments;
- o the total retail value of sleepwear sales in Canada.

All of the above issues are dealt with in greater detail in Appendix D. Exhibit II-4, opposite, presents a summary of the effects on consumer surplus of altering our key assumptions one at a time. It is clear from this exhibit that changes in key parameters within the indicated ranges can have large effects on consumer surplus calculations.

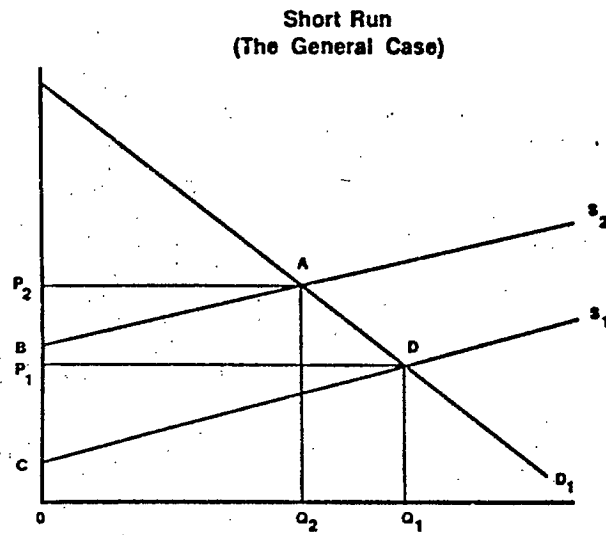
It should also be noted that there is currently a trend in the market towards polo pajamas in place of other styles. It is uncertain whether this is a long term trend or a transitory shift in tastes. To the extent that this is a long term trend, our base case estimates overstate longer run consumer surplus losses for Options 1 and 2.

#### Producer Losses

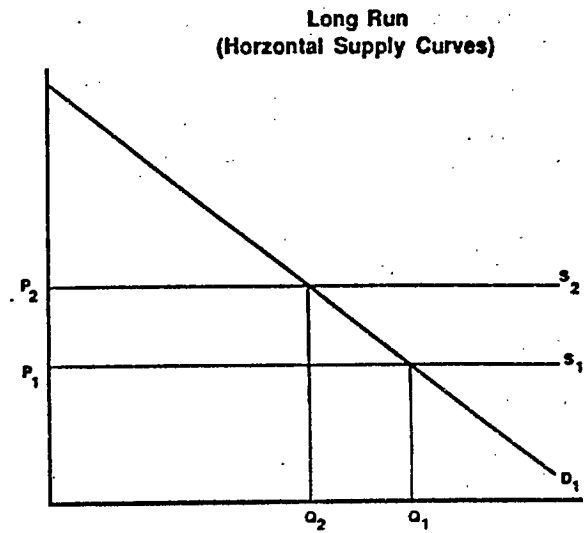
Producer surplus losses<sup>4</sup> due to an upward shift in the supply curve are illustrated in Exhibit II-5, overleaf, from the perspective of the short run and the long run.

4 Defined in glossary in Appendix F.

EXHIBIT II-5  
PRODUCER SURPLUS LOSS



Producer Surplus Loss =  $P_1 DC - P_2 AB$



Producer Surplus Loss = Nil

For our purposes, the thing which distinguishes the short and the long run is the slope of the supply curve. Our research suggests that in the long run, the supply curve is essentially horizontal, and it may well be horizontal even in the short run, i.e., producers will supply a range of volumes at the same price level. If the supply curve were upward sloping, an upward shift of the supply curve would result in price increases which are less than cost increases. This, in turn, would result in producer surplus losses.

However, upward sloping supply curves occur only where marginal costs increase with volume. It is believed that marginal costs in the sleepwear industry are constant and supply curves are relatively flat. As is discussed in Appendix C, the bulk of costs of a finished garment are variable, and the use of polyester fabrics should not incur any significant capital costs. The only significant cost increases will be the result of fabric cost increases and these will be constant on a unit basis. Thus producer surplus losses due to shifts of the sloping supply curve will be minimal. In addition, we believe no significant "economic rents" are earned in the sleepwear industry and there will be no surplus losses due to reduced rents. However, short term profit losses will accrue to manufacturers in the form of lump sum adjustment costs.

#### Long Run Producer Surplus Losses

In the long run, producers will presumably adapt to the changes imposed by the legislation by re-allocating productive capacity and investment in the most profitable manner. Whereas, in the short run, the marginal cost of producing less flammable sleepwear may increase somewhat with volume in the long run, marginal costs are constant although higher than under the previous regulatory regime. This is depicted in Exhibit II-5.

Producer surplus loss is thus nil in the long run. Sleepwear manufacturers will again operate as profitably as before the regulation. In addition, no economic rents are foregone. The assumptions reflect the flexibility of production for sleepwear manufacturers. However, there is a resource cost to imposing more stringent sleepwear flammability standards, and this cost accrues entirely to the consumer in the long run. That is to say that increased costs of production are passed on by each element in the chain from manufacturers to consumers.

#### Short Run Industry Adjustment Costs

Short run marginal cost increases with volume may be the result of increased fabric imports from the U.S., or other short term production adjustments. However, it seems likely that the supply curve is relatively elastic even in the short term. Short term producer losses may arise from:



**EXHIBIT II-6**  
**SHORT RUN INDUSTRY ADJUSTMENT COSTS**  
 (Based on 1984 Volumes and in 1984 dollars)

Timing Option Implementation Date*	Retail Profit Loss** (\$ million)	Domestics Manufacturer Profit Loss** (\$ million)	Sleepwear*** Importer Loss (\$ millions)
<b>March 1987</b> (Gowns and Robes Covered)			
Loss in 1986 (Fall only)	1.7	0.3	
Loss in 1987 (Spring and Fall)	4.3	0.8	
Total Loss	6.0	1.1	0.3
<b>September 1987</b> (Gowns, Robes, Tailored and Baby Doll Covered)			
Loss in 1987 (Spring and Fall)	5.4	0.8	
Loss in 1988 (Spring only)	1.5	0.2	
Total Loss	6.9	1.0	0
<b>March 1988</b> (All sleepwear covered)			
Loss in 1987 (Fall only)	5.2	0.6	
Loss in 1988 (Spring and Fall)	14.9	1.8	
Total Loss	20.1	2.2	0

\* assumes announcement date is in October, 1985

\*\* due to lost sleepwear sales

\*\*\* due to losses on committed sleepwear and fabric orders which are  
 obsolete before intended season of sale

Source: PMP estimates based on Industry Research (see Appendix D)

- o fabric and finished goods inventory write-offs;
- o slackened sleepwear sales during the adjustment period;
- o slack capacity from discontinued sleepwear production.

The above effects are largely the result of the timing of the announcement and implementation dates for new regulations. A more complete discussion of the impact of timing is included in Appendix D.

All timing options provide a minimum of 18 months to implementation, and occur at about the beginning or end of selling seasons. Thus, no large avoidable costs are incurred as a result of timing. The only significant costs which are likely to be incurred are those due to conservative retail buying in the transitional period. These costs are in turn a function of whether a Spring or Fall implementation date is chosen. Given our assumptions about retail reactions, a Fall implementation date might result in somewhat smaller retail sales losses than a Spring implementation date for any range of garments covered.

The effects of regulation timing are essentially multiplicative for each range of covered garments in that the same percentage sales decreases for affected garments are expected for the same seasons. The results are not literally multiplicative in that robes are sold almost exclusively in the Fall and baby doll pajamas are sold only in the Spring. The Spring selling season also accounts for about one-third of annual retail sales of other garments while the Fall accounts for two-thirds.

Illustrative calculations of transitional losses due to reduced sleepwear sales for each timing option are presented in Exhibit II-6, opposite. One of the style coverage options is used in making each calculation. Appendix D provides the detailed assumptions used in making these calculations.

#### Relevance of the U.S. Experience

Sleepwear flammability regulations were first implemented in the United States in 1973. At this time sizes 0 to 6x in all sleepwear styles were required to meet new flammability standards. In 1975, the scope of the regulations was enlarged to also include sizes 7 to 14. These regulations were implemented at the manufacturer's level in each case. The U.S. standards initially allowed the use of flame retardent chemical treatments, but these treatments were later found to be hazardous. In 1978 the standards were changed to effectively eliminate the use of such flame retardent treatments.

From the above description it would seem that the U.S. standard is similar to the third garment coverage option under consideration in this analysis. However, the different means of implementation, and the initial mixed use of flame retardent and other fabrics, limit the value of this experience for projecting the short term response in Canada.

It is necessary to apply caution in using the U.S. experience to estimate the long run response in Canada because of the following reasons:

- o U.S. flammability legislations were implemented during a period of rapid inflation, and covered all children's sleepwear garments. As a result it is difficult to know what sleepwear prices would have existed if no regulations were implemented. This limits the usefulness of the U.S. experience for projecting an expected price premium for less flammable sleepwear.
- o There are no instances where only one segment of the sleepwear market experienced a sizable price increase. This limits the usefulness of the U.S. experience for understanding cross-price elasticities, or in other words, how volumes would shift between different segments of the market if one segment increased in price relative to others. Uneven price rises of the above sort would be expected under scope of coverage options 1 or 2.

Still the following observations can be made from available U.S. sleepwear data for the years 1970 to 1984:

#### Prices

- o Children's sleepwear prices rose in several sharp steps, relative to other apparel prices, between 1970 and 1984. These steps occurred in and around milestone years for the implementation of new sleepwear flammability regulations:

The total price increase (relative to apparel items) attributable to new flammability regulations in the U.S. may be as high as 40% for the years 1970 to 1979. This price premium appears to have persisted between 1979 and 1984. However, the difficulties with interpreting the U.S. data, pointed out at the beginning of this section, must be borne in mind.

#### Volumes

- o Per capita\* sleepwear volumes appear to have changed little between 1970 and 1984, except for two brief upsurges in volume. These surges actually occurred when sleepwear regulations were first introduced in the 1973 to 1975 period, and in 1978/79 when the use of TRIS

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\* Per capita means per child in the 0 to 14 size range.

was eliminated. During both of these periods, the new less flammable sleepwear was at a price premium compared to the current sleepwear which was being replaced. Thus, it may be that consumers were hoarding current (cheaper) sleepwear before it became unavailable. It may also have been that publicity encouraged some consumers to purchase the "next generation" of sleepwear, and dispose of old sleepwear in each case.

#### Imports

- o When new flammability regulations for children's sleepwear were introduced in the 1973 to 1975 period, imports to the U.S. were effectively blocked. Imports of children's sleepwear have only begun to return to the U.S. within the last two or three years.
- o This low level of import competition may account for at least some of the apparent price premium which has persisted over the years since new flammability regulations were implemented.

#### BENEFITS

##### Status Quo Burn Distribution

There is no definitive empirical data on the current number of sleepwear burns which occur in Canada annually. Previous studies by Dr. Stanwick can only be taken as lower bound estimates for the years in which they were conducted. As more definitive data are not available, we use Dr. Stanwick's judgemental estimate of 40 sleepwear burns per year as our base case for analysis. His estimate of the distribution of these burns with respect to severity categories is presented in Exhibit II-7, overleaf, as the status quo case.

##### Impacts On Burn Severity And Incidence

The basic design impacts of the various regulatory alternatives are changes in the incidence and particularly the severity of children's burns due to children's sleepwear. These impacts were estimated using an iterative survey technique known as Qualitative Controlled Feedback (QCF), with a panel of textile, medical and other professionals. The panel members collectively have considerable expertise in the areas of textile flammability, and burn treatment. A list of the panel members and their credentials is provided in Attachment 2 to Appendix E. However, it should be stressed that the results of the QCF are only the collective informed opinions of our panel members. There is no definitive clinical or experimental data with which to assess the impact of the regulatory proposals on the incidence and severity of children's sleepwear burns.

**EXHIBIT II-7**

**BASE CASE ESTIMATES OF  
IMPACTS OF REGULATORY OPTIONS ON BURNS\*  
(For a Typical Year Based On Current Estimates of Burn Incidence)**

Burn Severity	Extent of Burn (% of Body Area)			Total
	<15%	15% - 60%	>60%	
	#	#	#	#
<b>3rd Degree**</b>				
Status Quo	4	12	5	21
Under Option 1	7	6	2	15
Under Option 2	8	4	1	13
Under Option 3	8	4	1	13
<b>2nd Degree**</b>				
Status Quo	8	8	0	16
Under Option 1	9	5	0	14
Under Option 2	10	5	0	15
Under Option 3	10	4	0	14
<b>Non-Incident</b>				
Status Quo	NA***	NA	NA	0
Under Option 1	NA	NA	NA	9
Under Option 2	NA	NA	NA	11
Under Option 3	NA	NA	NA	12
<b>Fatal</b>				
Status Quo	NA	NA	NA	3
Under Option 1	NA	NA	NA	2
Under Option 2	NA	NA	NA	1
Under Option 3	NA	NA	NA	1

\* The numbers are arithmetic mean estimates of burns per year in each category. Results total 40 under each option.

\*\* 3rd degree and 2nd degree correspond to the accepted medical interpretation of these burn severity categories.

\*\*\* NA means not applicable.

Source: Results of QCF Survey (see Appendix E)

Appendix E presents a detailed discussion of the results of the QCF survey which was conducted, and presents a list of the panel members and their credentials. These results are summarized in Exhibit II-7. It is apparent that all style coverage options serve to reduce burn fatalities and burn severity. All options have the same directional impacts on each category of burns. Most notably, the following impacts occur under each coverage option:

- o Fatalities decrease significantly under each of the three options.
- o 3rd degree burns covering greater than 15% of the body are expected to significantly decrease under each option, but 3rd degree burns covering a small body portion increase.
- o A major reduction occurs for 2nd degree burns covering 15% to 60% of the body, but 2nd degree burns covering a small part of the body increase slightly under each of the options.

Although each option has the same directional impact on burns, Options 2 and 3 diminish in their incremental impacts. In fact, the inclusion of polo pajamas and sleepers in Option 3 seems to increase the impacts by very little over Option 2.

#### Impacts on Health Care Costs

Changes in the incidence and severity of children's burns can be expected to lead to impacts on health care costs. Within the cost-effectiveness framework, there is some discretion as to whether health care costs should be treated separately or should be incorporated within the achievement of the physical objective, i.e., reductions in incidence and severity of burns. In this analysis, the reduction in health care costs has been dealt with as a reduction in social costs.

We have had some difficulty developing reasonable estimates of the impact of the regulatory options on health care costs. The difficulty is in knowing the actual health care costs currently incurred in treating burns of varying severity. Still, estimates of the health care costs for burns in each category were developed using available data and expert opinions. These estimates are provided in Appendix D.

Using Dr. Stanwick's estimate of the current number and distribution of burns, total costs for the treatment of children's sleepwear burns currently may total \$2 million annually.

Exhibit II-7 provides average burn incidence figures estimated from the QCF survey for each category of burns under each regulatory option. Applying these weights to costs per burn for each burn category, we have

EXHIBIT II-8

BASE CASE ESTIMATES OF  
NET COSTS OF REGULATIONS  
(1984 \$)

	Coverage Option 1 (\$ million)	Coverage Option 2 (\$ million)	Coverage Option 3 (\$ million)
<u>Long Run Costs (annual)</u> (For a Typical Year)			
Consumer Surplus Loss	12.8	21.3	59.9
Administrative Costs	<u>.05</u>	<u>.05</u>	<u>.05</u>
	12.85	21.35	59.95
Less:			
Health Care Cost Savings	<u>0.9</u>	<u>1.1</u>	<u>1.2</u>
Net Cost	11.95	20.25	58.75
	Coverage Option 1 Implemented in March 1987 (\$ millions)	Coverage Option 2 Implemented in Sept. 1987 (\$ millions)	Coverage Option 3 Implemented in March 1988 (\$ millions)
<u>Short Run Costs (lump sum)</u> (Over 3 Selling Seasons)			
Foregone Profits and Losses to Industry	7.4	7.9	22.3

Source: Information drawn from Exhibits II-1, II-3, II-6, and II-7

estimated the annual reduction in health care costs associated with each regulatory option. As a sensitivity analysis, we have also calculated health care cost savings using upper and lower 95% confidence intervals for mean burn impacts. Estimated health care cost savings under each regulatory option are summarized below:

Style Coverage	Using Upper 95% Confidence Limits (\$ million)	Using Mean Estimates (\$ million)	Using Lower 95% Confidence Limits (\$ million)
Option 1	0.6	0.9	1.3
Option 2	0.9	1.1	1.6
Option 3	0.9	1.2	1.7

As there was a considerable range of opinion on burn impacts, this range and 95% confidence intervals for mean estimates are presented in Appendix E.

#### Overall Net Costs

Net costs for each regulatory option have been calculated for both the long run and the short run. In calculating long-run net costs for each option, health care cost savings have been netted from administrative costs and consumer surplus losses. Short-run adjustment costs have been calculated using combinations of selected garment coverage and timing options. The results of these calculations are presented in Exhibit II-8, opposite. As was discussed, short-run costs are of a lump-sum nature while long-run costs are a future stream of annual costs.

With reference to Exhibit II-8, it is apparent that long-run net costs far outweigh short-run costs in that they are larger in the span of one year alone, and recur annually. It should also be noted that administrative costs are insignificant in comparison to health care cost savings or consumer surplus losses.

In comparing the net long-run cost of each option, it can be seen that Option 2 would cost almost twice as much as Option 1. However, Option 3 would cost more than three times as much as Option 2. Stated another way, it would cost almost as much to increase coverage to include tailored and baby doll pajamas, as it would to first cover gowns and robes alone under new regulations. It would then cost three times as much to also include polo pajamas and sleepers under the new regulations. Thus, it is clear that incremental costs of implementing Options 1 and 2 are about the same, but the incremental cost of implementing Option 3 is considerably higher.



EXHIBIT II-9

BASE CASE ESTIMATES OF  
COST PERFORMANCE OF REGULATORY OPTIONS  
(For A Typical Year, in 1984 \$)

	Coverage Option 1 (\$ millions)	Coverage Option 2 (\$ millions)	Coverage Option 3 (\$ million)
<b>NET COST</b> (annual)	12	20	59
<b>BURN IMPACTS</b> (annual)			
<b>Reduction in Fatalities</b>			
Number	1	2	2
Cost Ratio (\$mill/life)	12	10	29.5
<b>Reduction in Total Burn Incidence</b>			
Number	9	11	12
Cost Ratio (\$mill/burn)	1.3	1.8	4.9

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Source: Combines the results of Exhibit II-7 and Exhibit II-8

### Distribution and Measurement of Costs and Benefits

The benefits of the new regulations are reductions in the severity and incidence of burns to children from sleepwear. Benefits accrue directly to children through reducing painful, disfiguring and sometimes fatal burns, and indirectly to parents through avoidance of emotional upset and work absenteeism, and to government in avoiding some burn treatment costs.

The long term costs of the regulations accrue directly to children because of fabric changes and assumed quality changes, and indirectly if parents switch to cheaper, but less preferred styles. Long term costs accrue directly to parents in the form of increased sleepwear prices. Indirectly parents also bear the "quality" cost of fabric changes due to concern about their children's comfort and well being.

The major element of cost (consumer surplus loss) has been calculated from our understanding of the purchase behaviour and preferences of parents. However, it is assumed that for the most part parents reflect the desires and preferences of children in their purchase patterns and thus all consumer losses have been captured by considering parental preferences.

### COST-EFFECTIVENESS MEASURES

#### Impacts Versus Costs

Exhibit II-9, opposite, presents cost-impact ratios for each regulatory option. Presented in this manner, the options can be compared on an average cost-per-impact basis. It should be noted that while each successive coverage option improves impacts on burns, there are diminishing returns to the inclusion of more garments under the regulation.

As an example of the above, under coverage option 1, each single annual reduction in burn incidence would "cost"<sup>5</sup> an average of about \$1.3 million. This compares with an average cost of about \$1.8 million under option 2 and about \$4.9 million under option 3. However, option 1 achieves a total reduction of 9 burns per year versus reductions of 11 and 12 burns for options 2 and 3, respectively.

When analyzed on an incremental basis, the diminishing effects of each option become more clear. Option 2 eliminates 1 more fatal and 1 more non-fatal burn than option 1, at an incremental cost of \$8 million. Option 3 fails to improve the impact on fatalities achieved by option 2, but does eliminate 1 more non-fatal burn per year than option 2. However, this occurs at an incremental cost of \$39 million.

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5. Cost is defined as opportunity cost and does not mean money outlay (see Appendix F).

With respect to the effects of committing more resources to the information campaign to accompany new regulations, it was concluded (in Appendix D) that the campaign would have its greatest impacts in the introductory period. The allocation of additional resources to the information campaign beyond the introductory period would have an uncertain effect on long run impacts on burns. At any rate, compared to consumer surplus losses, the effect on long run net cost of doubling or even tripling the campaign budget would be almost insignificant. For these reasons, we have not incorporated the impacts of additional campaign spending into our cost-impact ratios.

#### Comparing the Regulatory Options

The physical objectives of each option are different, as more garments are covered by successive options with the objective of further reducing both incidence and severity. Care must thus be taken when comparing options strictly on the basis of average cost per prevented burn. Considering the incremental costs of achieving added impacts provides a clear insight into the cost-effectiveness of the regulatory options.

Though small in comparison to long-run consumer surplus costs, short-run costs and temporary disruptions to the sleepwear industry and retailers must be considered as well.

#### Sensitivities in Overall Measures

The overall results are sensitive to assumptions which have been made and the range of opinion regarding burn impacts. Under more negative assumptions each regulatory option becomes less cost-effective, but the order of magnitude results are still about the same. That is to say that the options still fall into the same rank order of cost-per-achieved impact, and are still about the same relative "distance" apart on these measures. The incremental cost-impact performance of Option 3 is still considerably less than the incremental performance of either Option 1 or 2.

### III - NON-ALLOCATIVE EFFECTS

The allocative effects of the regulatory proposals have been discussed in Chapter II. This chapter addresses the potential non-allocative effects. This discussion takes place in the context of background information provided in Appendix C (Industry Structure) and Appendix D (Impacts). While we are quite confident of our understanding of qualitative or directional impacts, in some cases we are less certain about the size of these impacts. In particular, the magnitude and duration of impacts on foreign trade have been difficult to assess. Likewise, impacts on output and employment have been assessed in the form of illustrative calculations based on particular assumptions. All such assumptions have been detailed in the appropriate sections of Appendix D.

Non-allocative effects are discussed in turn below, under the following topics:

- o Distribution of Income.
- o Market Structure and Competition.
- o Technological Progress.
- o Output and Employment.
- o Impacts on Foreign Trade.
- o Macro Economic Impacts.

#### DISTRIBUTION OF INCOME

As a result of consumer substitution, some manufacturers who produce affected garment styles may lose business to manufacturers whose strengths are in non-affected styles. However, the major participants are likely to be relatively unaffected. In addition, there should be no significant change in the regional distribution of economic activity related to the children's sleepwear industry. Impacts will be concentrated in the Montreal area where the bulk of manufacturers and their domestic suppliers are concentrated.

#### MARKET STRUCTURE AND COMPETITION

In the long run, the regulatory changes may reduce the number of domestic manufacturers, as a number of the manufacturers for whom children's sleepwear is not particularly important may decide to exit from this business. However, the major participants are likely to be relatively unaffected, and the effective concentration of the industry will not be much different.

The number of fabric manufacturers supplying the sleepwear industry will probably not be affected by new flammability regulations.

EXHIBIT III-1

IMPACTS ON DOMESTIC OUTPUT AND EMPLOYMENT

<u>Garments Covered</u>	<u>% of Unit Volume Lost</u>	<u>Substitute Spending</u>	<u>Net Change In Domestic Sleepwear Unit Volume (million)</u>	<u>% of Domestic Sleepwear Output</u>	<u>Jobs Lost In Sleepwear &amp; Fabric Industries</u>
<u>Option 1</u>					
Nightgowns Robes					
Total Option 1	70%	Pajamas	0.5	-4%	75
<u>Option 2</u>					
Garments covered by Option 1 plus: Tailored Pajamas Baby Dollar					
Total Option 2	45%	Polo Pajamas	0.2	-2%	40
<u>Option 3</u>					
Garments covered by Option 2 plus: Polo Pajamas Sleepers					
Total Option 3	23%	Active wear, underwear	- 3.0	-23%	430

SOURCE: PMP estimates based on Industry research (see Appendix D).

Imports of both fabric and sleepwear garments from the developing countries may be lower for the medium term. There may be attendant reductions in competitive pressure for domestic manufacturers in this time period. Appendix D provides greater detail on the potential effects of the proposed regulations on imports.

#### TECHNOLOGICAL PROGRESS

The implementation of new flammability standards will not impact technological progress to any degree. Domestic fabric manufacturers will acquire the capability to produce a 100% polyester sleepwear fabric, but this will probably not have any spin-off benefits outside the children's sleepwear industry. As no changes will be made in the sleepwear manufacturing process, no technological impacts will be felt here.

#### OUTPUT AND EMPLOYMENT

The implementation of sleepwear flammability regulations can be expected to have impacts on output and employment at all levels in the chain of production. The impacts of the new regulations will be primarily confined to the Montreal area where most sleepwear manufacturers and their suppliers are located. The greatest impacts will occur in the sleepwear industry, as this is the most labour-intensive sector in the chain of production, and is also the most directly affected. Sleepwear as an end use represents an increasingly smaller portion of sales for fabric and yarn manufacturers respectively. The output and potential employment impacts of each scope of coverage option on the fabric and sleepwear sectors is discussed in turn below. The impacts on the yarn industry are thought to be negligible and are not discussed further.

Exhibit III-1, opposite, summarizes the potential output and employment impacts under each regulatory option. The assumptions used in making these illustrative calculations are detailed in Appendix D.

#### Impacts of Option 1

The implementation of Option 1 may displace 70% of gown and robe unit sales due to the less appealing quality of substitute fabrics and retail price increases. Assuming that the spending displaced from the robe and gown segments would be diverted to other children's sleepwear purchases, the net effects on domestic unit production and employment would be small.

#### Impacts of Option 2

The implementation of Option 2 may displace 45% of sales of affected garments (gowns, robes, tailored and baby doll pajamas) due to the less appealing quality of substitute fabrics and retail price increases. Again, substitution of non-affected garments might result in minor effects on domestic unit output and employment.

### Impacts of Option 3

Option 3 would cover all sleepwear garments. Within any price range, percentage price increases would be about the same across all sleepwear styles. Thus, we might not expect to see any large shifts among style segments of the market. All sleepwear sales might be in the same proportions as before the legislation, but unit volumes would be reduced in response to higher prices.

Given the combined effects of increased prices and decreased fabric quality, domestic volumes could drop by as much as 23%. Thus, total employment in the sleepwear industry could also decline by 23%, in proportion to the decrease in domestic unit volume. This could mean a loss of 370 jobs in the sleepwear industry. The ripple effect on employment for supplying fabric mills might be about 60 lost jobs. This potential impact on output and employment exceeds the apparent U.S. experience when new flammability standards were introduced there. However, a lower elasticity value was used for sensitivity analysis and impacts on output calculated in this way come closer to the apparent U.S. experience.

To the extent that displaced spending is used to purchase other children's clothing at similar prices and with import content similar to sleepwear, output and employment impacts on the children's clothing and fabric industries will be reduced. However, offsetting gains in other children's clothing items would not accrue to sleepwear manufacturers in many instances.

### Sensitivities in Employment Impacts

As is discussed in greater detail in Appendix D, changes in the assumptions used to calculate volume and substitution effects can produce considerably different employment impacts. In particular, output and employment impacts are sensitive to assumptions about:

- o the nature of "substitute spending"\* (dollar-per-dollar, or unit-per-unit) and the substitute spending items (sleepwear, other clothing, or other items);
- o the price elasticity of demand for sleepwear;
- o the effective increase in the price of affected sleepwear;
- o the relative prices and import content of substitute garments.

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\* This corresponds to an equivalent cross-price elasticity of demand for substitute items. However, industry people speak more in terms of percentage shifts in spending from one segment to another segment, rather than in terms of the cross-price elasticity. For clarity and consistency with what was learned from industry interviews, we have used this approach to modelling product shifts in our analysis.

As an illustration of these sensitivities, in Exhibit III-2, overleaf, we have summarized the employment and output impacts under different sets of assumptions. As can be seen from Exhibit II-2, impacts on output and employment are very sensitive to the assumptions used to calculate volume and substitution effects. The impacts are perhaps most sensitive to assumptions which have been made about the nature of substitute spending.

As an example, suppose 50% of spending displaced from the purchase of gowns and robes were used to purchase non-clothing gifts or other clothing items not produced by sleepwear manufacturers. This scenario corresponds to the "50% of substitute spending outside sleepwear industry" case in Exhibit II-2. Under Option 1, this scenario could result in 190 lost jobs in the sleepwear industry and supplying fabric mills. This result is very different from the potential loss of 75 jobs under the assumption that all substitute spending is for goods produced within the sleepwear industry.

#### Short Run Employment Effects

In the short run, there may be some additional net volume decreases. These would persist for one or two seasons at most and would be unlikely to have any significant employment effects. Transitional impacts on volumes are discussed in greater detail in Appendix D.

#### IMPACTS ON FOREIGN TRADE

Assuming there is a domestic source of polyester in the long run, it seems likely that the domestic share of sleepwear production would return to its status quo level. In the long run developing country imports might return to near current trend levels, and imports of sleepwear from the U.S. might be left somewhat higher. It also seems likely that in the short term there will be some above trend imports of affected sleepwear styles and sleepwear fabrics. Most of this may be sourced in the United States, as short term sources can be readily found there. Appendix D provides a more detailed discussion of potential import effects.

#### MACRO ECONOMIC IMPACTS

Macro economic impacts are likely to be relatively insignificant. There will be an impact on measured inflation, since it appears that polyester-based products will be higher in price with no increase in perceived value to the consumer. However, this will not be discernable at aggregate levels.



**EXHIBIT III-2**  
**SENSITIVITIES IN OUTPUT AND**  
**EMPLOYMENT IMPACT CALCULATIONS**  
(For a Typical Year Based on 1984 Volumes)

Parameter	Value	Coverage Option 1		Coverage Option 2		Coverage Option 3	
		% Change in Domestic Unit Output	Job* Losses	% Change in Domestic Output	Job* Losses	% Change in Domestic Output	Job* Losses
<b>Substitute Spending</b>							
Outside Sleepwear Industry	100% 50% 0%	-18% -10% -4%	-340 -190 -75	-17% -9% -2%	-320 -170 -40	-23% -13% -4%	-430 -250 -75
Price Elasticity of Demand	2.0	-4%	-75	-4%	-75	-90%	-1,700
	0.2	-0.4%	-5	-0.4%	-5	-9%	-170
Effective Price Increase (nominal plus fabric quality effect)	65%	-4%	-75	-3%	-55	-33%	-620
	10%	0.6%	-10	-0.4%	-5	-5%	-95
Domestic Content of Substitute Garments (within sleepwear industry)	100%	+4%	+75	+4%	+75	-23%	-430
	0%	-18%	-340	-17%	-320	-23%	-430
Base Case Estimates from Exhibit III-1		-4%	-75	-2%	-40	23%	-430

Note: Base Case Assumptions (as noted in Appendix D)

- Option 1: Substitute price \$10, import content 30%, substitute spending 100% within sleepwear industry, elasticity = 1.5
- Option 2: As above except elasticity = 1.0.
- Option 3: As above except elasticity = 0.5., and substitute spending is all outside sleepwear industry.

\* Job losses in sleepwear industry and fabric mills.

## IV - SUMMARY AND CONCLUSIONS

## BACKGROUND AND METHODOLOGY

It is estimated that about 40 children suffer burns each year due to the ignition of sleepwear garments. Of these children, perhaps three will die each year. In order to reduce this risk to children, the Product Safety Branch of Consumer and Corporate Affairs has proposed new regulations which would require children's sleepwear garments, size 0 to 14x, to pass a more stringent flammability test. The flammability test is similar to that used in the United States for children's sleepwear.

This study was conducted to assess the potential impacts on consumers and industry of various regulatory options, and to facilitate consideration of the options by senior management and the Minister.

Owing to difficulties with assigning values to disfigurement, suffering or death, cost-effectiveness was chosen as the methodology with which to assess the regulations under study. Long run costs and benefits have not been discounted as we have no rationale for forecasting any significant variance in costs or benefits. Discounting would scale the annual flows by the same factors for each option. For simplicity costs and benefits are discussed as annual flows "for a typical year in equilibrium", assuming these are the same for each year.

## ALTERNATIVES CONSIDERED

In this study, a number of different regulatory alternatives were considered as alternative means of reducing the risk of sleepwear burns to children in Canada. The regulatory options which were considered each required sleepwear garments to meet the same flammability standards, but differed along two basic dimensions. The two basic dimensions of the regulatory options were the range of styles to come under regulation, and the implementation date for new regulations. The different scope of style coverage options considered were as follows:

- o Coverage option 1: Covers nightgowns and robes sizes 0 to 14x.
- o Coverage option 2: Covers the above plus tailored and baby doll pajamas sizes 0 to 14x, except those for children sizes 0 to 7kg.
- o Coverage option 3: Covers all children's sleepwear garments 0 to 14x except those for children 0 to 7kg.

The above style coverage options were considered in conjunction with the following implementation timing options:

EXHIBIT IV-1

SOCIAL COSTS OF REGULATORY OPTIONS  
(Based on 1984 Volumes and in 1984 Dollars)

Long Run Net Costs (annual)	Style Coverage		
	Option 1 (\$ millions)	Option 2 (\$ millions)	Option 3 (\$ millions)
High Estimate:	14	26	81
Base Case Estimate:	12	20	59
Low Estimate:	7	12	33

Short Run Costs (lump sum)	Coverage Option 1 Implemented in March 1987 (\$ millions)	Coverage Option 2 Implemented in Sept. 1987 (\$ millions)	Coverage Option 3 Implemented in March 1988 (\$ millions)
	Foregone Profits and Losses to Industry	7	8

- o Timing option 1: Implementation date March 1987.
- o Timing option 2: Implementation date September 1987.
- o Timing option 3: Implementation date March 1988.

An information campaign will accompany the introduction of new regulations to inform parents and children of sleepwear flammability hazards. The impact of allocating different levels of resources to an accompanying information campaign was also considered as a separate option.

#### ALLOCATIVE EFFECTS

Under each style coverage option, the price of affected sleepwear garments would be expected to rise in the short term, due largely to the use of substitute materials and shortages of low cost imports. In the longer run, prices may subsequently fall somewhat, although remaining higher in real terms than sleepwear prices today. The estimated social costs of the new regulation stem largely from the expected sleepwear price increases.

A summary of the expected social costs for selected garment coverage and timing options is presented in Exhibit IV-1, opposite. Long run social costs are a function of the range of garment styles covered by the regulations, and these costs would accrue primarily to consumers. Short run costs would accrue to industry under each option due to foregone profits and losses on inventories. These costs are a function of both the range of styles covered and the chosen implementation date. While long run costs are recurring annual costs, short run costs are of a lump sum nature.

High and low estimates of long run social costs have been provided for each coverage option under different sets of assumptions. These high and low estimates are drawn from analysis in Chapter II of this report. The relative costs of the style coverage options are about the same under different assumptions.

Base case estimates of benefits and cost-impact ratios for each regulatory option are presented in Exhibit IV-2, overleaf. The ratios combine the base case estimates of both social costs and benefits to allow a comparison of the cost performance of the regulatory options.

An information campaign will accompany the introduction of new regulations, to inform parents and children of sleepwear flammability hazards. This campaign should serve to educate parents and children to the danger of sleepwear flammability and how to react to sleepwear ignition. It is expected that this will encourage early adoption of less flammable sleepwear, and should aid in reducing sleepwear burn incidence and severity. However, it is uncertain how strong the impact of this campaign would be or what additional impacts could be expected from allocating greater resources to this. For this reason, the potential effects of the information campaign have been omitted from our estimation of burn impacts.

EXHIBIT IV-2

BASE CASE ESTIMATES OF BENEFITS AND  
 COST PERFORMANCE OF REGULATORY OPTIONS\*  
 (for a typical year, 1984 \$)

	Coverage Option 1 (\$ millions)	Coverage Option 2 (\$ millions)	Coverage Option 3 (\$ millions)
<b>NET COST</b> (annual)	12	20	59
<b>BURN IMPACTS</b> (annual)			
<b>Reduction in Fatalities</b>			
Number	1	2	2
Cost Ratio (\$mill/life)	12	10	29.5
<b>Reduction in Total Burn Incidence</b>			
Number	9	11	12
Cost Ratio (\$mill/burn)	1.3	1.8	4.9

\* combines base case estimates of benefits and social costs.

**NON-ALLOCATIVE EFFECTS**

In addition to increased costs, each regulatory alternative has the potential to produce non-allocative effects. These are summarized in Exhibit IV-3, overleaf.

Generally, non-allocative effects are relatively minor under coverage options 1 or 2, but somewhat greater under the third option. In particular, it is expected that coverage option 1 or 2 might result in relatively small reductions in domestic output, and perhaps fewer than 80 lost jobs. However, coverage option 3 may result in greater losses in output and as many as 430 lost jobs in total. Similarly, increased import penetration is relatively unlikely under coverage options 1 and 2, but is somewhat more likely under Option 3. These effects would be primarily confined to the children's sleepwear and textile industries, and would be concentrated in the Montreal area.

The net impacts of each regulatory alternative on the market structure and competition in the children's sleepwear industry would be small. However, there might be some redistribution of incomes among firms in the children's sleepwear and clothing industries, with this effect again greatest under the third coverage option.

Macro-economic impacts and impacts on technology would be negligible under each regulatory alternative.

EXHIBIT IV-3

SUMMARY OF  
NON-ALLOCATIVE IMPACTS  
OF REGULATORY OPTIONS

	Under Coverage option 1 or option 2	Under Coverage option 3
Distribution of Income:	<ul style="list-style-type: none"><li>o Some minor redistri- bution among firms in sleepwear industry</li></ul>	<ul style="list-style-type: none"><li>o Potential for substantial redis- tribution to children's clothing manufacturers outside sleepwear industry</li></ul>
Market Structure and Competition: (Sleepwear Industry)	<ul style="list-style-type: none"><li>o slightly fewer firms producing affected gar- ments. Major players not affected</li><li>o Decreased short- term competition due to shortages of low cost imports</li><li>o Slightly increased competition from U.S. sleepwear manufacturers</li></ul>	<ul style="list-style-type: none"><li>o As for Option 1 and 2</li><li>o Competition from foreign sources somewhat greater than under Options 1 or 2 but still reduced for short term.</li><li>o Slightly greater U.S. competition than for Options 1 and 2</li></ul>
Technological Progress:	<ul style="list-style-type: none"><li>o Domestic firms will acquire ability to produce less flammable sleepwear - no other impacts</li></ul>	<ul style="list-style-type: none"><li>o As for Options 1 and 2</li></ul>

EXHIBIT IV-3 (Cont'd)

	Under Coverage option 1 or option 2	Under Coverage option 3
Output and Employment: (Sleepwear and fabric industry)	<ul style="list-style-type: none"> <li>o Impacts confined to Montreal area</li> <li>o Less than 5% reduction in unit output of domestically produced sleepwear garments</li> <li>o Fewer than 80 jobs lost in sleepwear and fabric industries combined</li> </ul>	<ul style="list-style-type: none"> <li>o As for Options 1 and 2</li> <li>o As much as 23% reduction in domestically produced sleepwear garments</li> <li>o As many as 430 jobs lost in sleepwear and fabric industries combined</li> </ul>
Impacts on Foreign Trade:	<ul style="list-style-type: none"> <li>o Reduced low cost (Far East) imports for short-term</li> <li>o Slightly increased level of imports from U.S.</li> <li>o Potential for sleepwear exports to U.S.</li> </ul>	<ul style="list-style-type: none"> <li>o As for Options 1 and 2</li> <li>o Slightly greater level of imports than under Options 1 or 2</li> <li>o As for Options 1 and 2</li> </ul>
Macro Economic Impacts:	Negligible	Negligible



**APPENDIX A**

**THE PROPOSED REGULATIONS**

D R A F TWORKING DOCUMENT ONLY  
PRODUCT SAFETY BRANCHScheduleDOCUMENT DE TRAVAIL SEULEMENT  
SECURITE DES PRODUITS

1. Part II of the schedule to the Hazardous Products Act is amended by adding thereto, immediately after item \_\_\_ thereof, the following item:

\_\_\_ . Children's nightgowns, nightshirts, dressing gowns, bathrobes, housecoats, robes, pyjamas and baby-doll pyjamas other than:

- a) those designed for hospital use,
- b) those designed for infants up to 7 kg,
- c) polo pyjamas and
- d) sleepers,

in sizes up to and including 14X.

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REGULATIONS RESPECTING THE ADVERTISING,  
 SALE AND IMPORTATION OF CHILDREN'S NIGHTGOWNS,  
 NIGHTSHIRTS, DRESSING GOWNS, BATHROBES, HOUSECOATS AND ROBES,  
 PYJAMAS, TAILORED AND BABY-DOLL PYJAMAS

WORKING DOCUMENT ONLY  
 PRODUCT SAFETY BRANCH

Short Title

DOCUMENT DE TRAVAIL SEULEMENT  
 SECURITE DES PRODUITS

1. These Regulations may be cited as the Hazardous Products (Children's Sleepwear) Regulations.

Interpretation

2. In these Regulations,

"Product" means a product set out in Item \_\_\_ of Part II of the schedule to the Hazardous Products Act. (produit)

"2-GP-115M" means the Standard for Detergent, Laundry, Powder, Built published by the Canadian General Standards Board, January 1979.

"Can2-4.2-M77 Method 58, December 1984" means the National Standard of Canada, Colour Fastness and Dimensional Change in Domestic Laundering of Textiles published by the Canadian General Standards Board.

"Can2-4.2-M77 Method 30.3, May 1980", means the National Standard of Canada, Procedure for the Removal of Flame-Retardant Treatments from Textile Products published by the Canadian General Standards Board.

"FF5-74" means the United States Flammable Fabrics Act Regulations entitled Standard for the Flammability of Children's Sleepwear: Sizes 7 through 14, FF 5-74 established by the Consumer Product Safety Commission. (FF 5-74)

"Flame Resistance" means the property of a material whereby flaming combustion is slowed, terminated or prevented. (résistance à la flamme)

"Flame Retardant" means a substance used to impart flame resistance to a material. (ignifugeant)

"Char Length" means the maximum extent of the damaged length of a specimen under the test conditions specified in these regulations. (longueur carbonisée)

"OECD" means the Organization for Economic Cooperation and Development.

General

3. For the purposes of subsection 3(2) of the Hazardous Products Act a product may be advertised, sold or imported into Canada if it meets the requirements of these Regulations.

Labelling Requirements

DOCUMENT DE TRAVAIL DEULEMENT  
SECURITE DES PRODUITS

4. Every product treated with a flame retardant shall have a label which is permanently affixed to the product and which displays in a clear and legible manner the words "Flame Retardant" and precautionary instructions, including procedures for cleaning to protect the product from agents or treatments which are known to cause deterioration of its flame resistance.

Performance Requirements

5. Every product, when prepared in accordance with the procedures set out in Section 1 and 2 of the Schedule and tested using the apparatus and procedures described in subsections 1616.5 (a) and (b), and 1616.5 (c) (1) - (3) of FF 5-74 shall not have
  - a) an average char length of five specimens exceeding 178 mm; and
  - b) more than one individual specimen with a char length equal to full specimen length (254 mm).
6. Every product, treated with a flame retardant, shall be such that the flame retardant (or any breakdown or extracted product) shall not cause dermal irritation or dermal sensitization or shall not be genotoxic, chronically toxic, or shall not cause benign or malignant tumours when tested in accordance with Section 3 of the schedule.

Schedule

Laundering and Cleaning Procedures

1. (1) Products not treated with flame retardants.
  - (a) Products shall be subjected to one washing cycle using the washing procedure described in subsection (3) (a) with the exception that the requirements for wash water hardness and bleaching shall be omitted followed by one drying cycle in accordance with the drying procedure in subsection (3) (b).
  - (b) Products which are labelled "dry-clean only" shall be dry cleaned once in accordance with the procedure in subsection (3) (c).
- (2) Products treated with flame retardants
  - (a) Products, except those exempted by subsections (2) (b) and (2) (c) of the schedule shall be subjected to twenty successive washing cycles in accordance with subsection (3) (a) followed by one drying cycle using the procedure in subsection (3) (b).
  - (b) Products which are labelled with instructions "do not bleach" shall be subjected to twenty successive washing cycles in accordance with the procedure in subsection (3) (a) except that bleaching will be omitted followed by one drying cycle according to the procedure in subsection (3) (b).

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ELEMENT

DOCUMENT DE TRAVAIL SEULEMENT  
SECURITE DES PRODUITS

(c) Products which are labelled "dry clean only" shall be dry cleaned five times in accordance with the procedure in subsection (3) (c).

(3) (a) Washing procedure

The apparatus and procedure described in sections 4.1 and 6 of CAN2-4.2-M77 Method 58 December 1984, shall be used with the following modifications:

- Wash water temperature: 60°C
- Wash water hardness : less than 50 ppm calcium carbonate
- Agitation : moderate ("Normal" setting on automatic washing machine)
- Synthetic detergent : any detergent complying with 2-GP-115M
- Bleaching : commercial sodium hypochlorite which produces 0.015% available chlorine in the wash liquor

(b) Drying procedure

The apparatus and procedures described in Sections 4.2 and 7.5 (procedure E. Tumble Dry) in CAN2-4.2-M77 Method 58 December 1984 shall be used.

(c) Dry cleaning procedure

The dry cleaning procedure specified in CAN2-4.2-M77 Method 30.3 May 1980 shall be used with the exception of subsections 3.2 and 5.5 to 5.7.

Specimen Preparation and Testing

2. (1) Prepare the sample in accordance with the appropriate procedures in Section 1.
- (2) Cut four specimens, 89 mm x 254 mm from the sample such that two specimens are cut in the lengthwise direction and two are cut in the crosswise direction of the product. Specimens from products made from multilayer fabrics shall include all layers of the fabrics held in the relative position they occupy. Ensure that specimen directions are properly identified on the specimens.
- (3) Test the four specimens in accordance with the procedure specified in Item 5 of these regulations.
- (4) Determine the average char lengths for the two specimens in the lengthwise direction and for the two specimens in the crosswise direction.
- (5) Cut a 5th specimen such that its long direction is in the direction of the longest char length as determined in subsection 2 (4). Test the specimen in accordance with the procedure specified in Item 5.

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- (6) Report the char length and the direction of test for each of the five specimens as well as the average char length for the five specimens tested.

Toxicological Hazards

3. (1) To assess dermal irritation the flame retardant will be tested according to OECD Test Guideline No. 404 "Acute Dermal Irritation/Corrosion".
- (2) To assess dermal sensitization the flame retardant will be tested according to OECD Test Guideline No. 406 "Skin Sensitization".
- (3) To assess genotoxicity the flame retardant will be tested by a battery of short term mutagenicity tests with end-points equivalent to OECD Test Guidelines No. 471-478.
- (4) To assess chronic toxicity and tumorigenicity the flame retardant will be tested by the dermal route in an animal assay according to OECD Test Guideline No. 453, "Combined Chronic Toxicity/Carcinogenicity Studies".

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**APPENDIX B**

**LIST OF THOSE INTERVIEWED  
AND  
BIBLIOGRAPHY**

**APPENDIX B**  
**LIST OF THOSE INTERVIEWED**

**Sleepwear Manufacturers**

**Quebec**

Barbret Apparel, Montreal  
Beco Industries, Montreal  
Beauty Industries, Hamilton  
Bright Sleepwear Inc., Montreal  
Coccinelle, St. Antoine de Tilly  
Dormelle Lingerie Ltd., Montreal  
Hallmark Knits, Montreal  
Harley Inc., Montreal  
Heitner, Montreal  
Hi-Lyn Inc., Montreal  
Lutfy Ltd., Montreal  
Miller, Jack Inc., Montreal  
Michel Exclusif Ltee., Montreal  
Milton Selections, Montreal  
Philip La Cie Ltd., Montreal  
Pretty Baby, Montreal  
St. Lawrence Textiles Ltd., St. Jerome  
Sleepyhead Sleepwear Inc., Montreal

**Ontario**

Beauty Industries, Hamilton  
Davis, L. Textiles, Toronto  
Tiny Tots Knitting Mills, Inc., Brampton

**Western Canada**

I.D. Fashions Limited, Winnipeg  
Terry No-Fold Products Ltd., Edmonton  
Jen and Jon Fashions, Winnipeg

**Sleepwear Importers**

Monark Export/Import Ltd., Montreal  
Transcontinental Sales, Montreal  
A. Ostroff Inc., Montreal



**Retailers**

Sears, Toronto  
Eatons, Toronto  
The Bay, Toronto  
Woolco, Montreal  
Woolworths, Toronto  
Woodwards, Vancouver  
Bi-way, Toronto  
K-Mart, Brampton  
Kid's Port, Toronto  
Young Canada, Toronto

**Primary Textile Mills**

Agmont Inc., Montreal  
Dominion Textiles, Montreal  
Huntingdon Mills, Huntingdon, Quebec  
Leedye Textiles, Lachine, Quebec  
Manoir Knitting, Montreal  
Tricots Canada/U.S., St. Hyacinthe, Quebec  
Dionne Spinning, Montreal  
Consoltex, Montreal  
Celanese, Montreal  
Dupont, Kingston  
Guilford Mills, U.S.  
Burlington Mills, N.Y.

**Plastic Surgeons and Medical Professionals**

Dr. Richard Stanwick, Canadian Paediatric Society  
Dr. Ron Zuker, Toronto Hospital for Sick Children, Toronto  
Dr. Charles Snelling, Vancouver General Hospital, Vancouver  
Dr. Andrew Robertson, Health Sciences Centre, Winnipeg  
Dr. Robin Walker, The Moncton Hospital, Moncton  
Dr. Wilson, Isaak Walter Killam Hospital, Moncton  
Dr. John D. Crawford, Shriners Burn Institute, Boston  
Cheryl Leeder, Victoria Hospital, London, Ontario  
Sara Bolieu, Shriners Burn Institute, Galveston  
Robert Innes, Alberta Children's Hospital, Edmonton  
Maura Beam, Dr. Charles A. Janeway Child Health Centre, St. John's

**Industry and Other Experts**

Margorie Wall, University of Guelph  
Dr. Anne Wilcox, University of Guelph  
Rachel Dardis, University of Maryland  
Fred Shippee, AAMA, Arlington  
Jim Charman CPSC, Washington  
Mike Day, NRC, Ottawa  
Louis Bates, Bates Sleepwear U.S.

**Industry and Other Experts (Continued)**

Cotton Council International, Memphis  
Pran Manga, University of Ottawa  
Jim Robertson, Canadian Textiles Institute,  
Henk Boushwers, Children's Apparel Manufacturers Association  
R. F. Mersereau, Canadian Importers Association  
Mel Fruitman, Retailers Council of Canada  
Mr. Campbell, Ontario Research Foundation

**Government Agencies**

Ontario Ministry of Health  
Hospital Medical Records Institute  
Department of External Affairs Canada  
Revenue Canada (Tariffs and Customs)  
U.S. Department of Commerce  
Statistics Canada  
Department of Regional and Industrial Expansion  
Consumer and Corporate Affairs Canada

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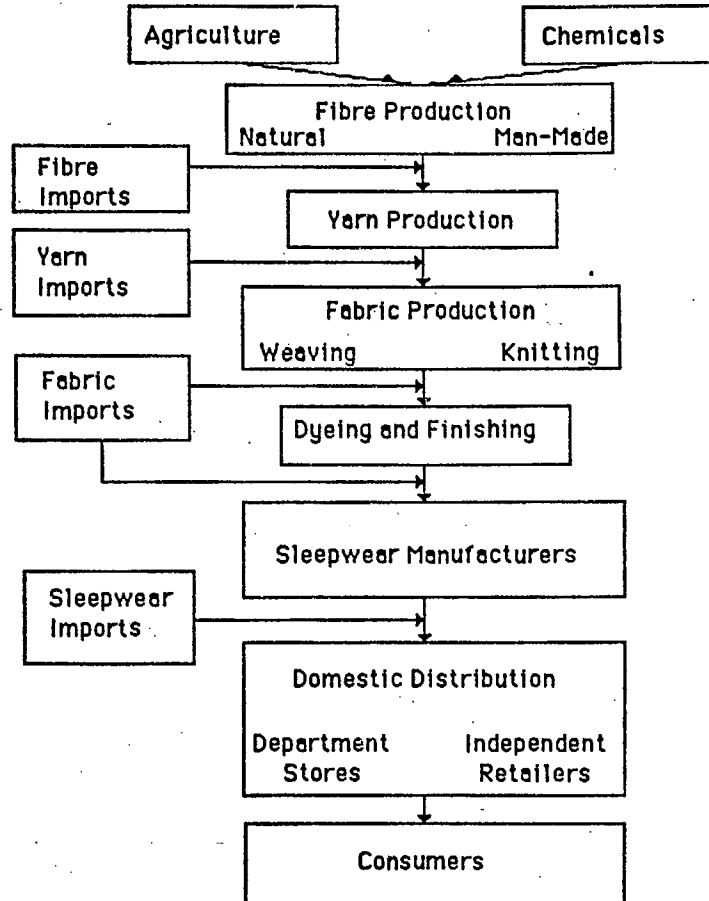
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**APPENDIX C**

**INDUSTRY STRUCTURE**

Exhibit C-1  
Flow of Production in the Children's  
Sleepwear Industry



## APPENDIX C INDUSTRY STRUCTURE

### OVERVIEW

The following description of industry structure is a synthesis of what was learned from interviews and available sources of secondary data.

The chain of production and distribution in the children's sleepwear industry can be broken into three main components:

- o Primary textile manufacturers who produce yarn and fabric.
- o Children's sleepwear/clothing manufacturers who manufacture finished garments.
- o Retailers who sell sleepwear to the consumers.

In addition to these three main groups, there are several large importer/wholesalers who import fabric and finished garments. Exhibit C-1, opposite, is an illustration of the flow of production and distribution in the children's sleepwear industry. Industry structures, profit margins and planning cycles differ for each industry group. Each group is discussed in turn along these dimensions below.

### RETAILERS AND CURRENT SLEEPWEAR DEMAND PATTERNS

#### Mix of Retail Channels

Children's sleepwear in Canada is sold to the consumer through a mix of large department stores, mass merchandisers, and independent retailers and small chains. Retailers within each group tend to specialize in price points for the sleepwear garments they sell. With a few exceptions, the large department stores, such as Sears and the Bay, specialize in mid-to low-priced sleepwear apparel, while mass merchandizers such as Bi-way stores, tend to carry more low priced merchandise.

The price points of merchandise carried by the various independents are somewhat higher than for mass merchandisers and department stores. These operations include boutique retailers whose merchandise is more upscale, and mid-market stores whose prices are in between those of boutiques and department stores.

On a unit basis, perhaps 70% of children's sleepwear is sold through department stores and mass merchandisers, and the remaining 30% is sold through independents. Correspondingly, the bulk of the children's sleepwear business is concentrated in low- to mid-priced garments.

EXHIBIT C-2

THE CANADIAN MARKET FOR CHILDREN'S SLEEPWEAR (1984)  
(Sizes 0 to 14X)

	Style Proportion	1984 000's garments Domestic	1984 000's garments Imported	Avg. Price per garment Domestic	Avg. Price per garment Imported	Unit Import Content	Total \$ Retail Value of Domestic Prod. \$000's	Total \$ Retail Value of Imported Prod. \$000's	Total \$ Retail Value of Cdn. Market \$000's
Girl's Sleepwear 2-6X		2,277	253	\$ 9	\$ 7	0.10	\$ 20,495	\$ 1,771	\$ 22,266
• Nightgowns	0.95								21,153
• Sleepers	0.05								1,113
Girl's Pajamas 2-6X		1,301	558	\$10	\$ 8	0.30	\$ 13,014	\$ 4,462	\$ 17,476
• Polo Pjs	0.48								8,388
• Tailored Pjs	0.48								8,388
• Baby Doll Pjs	0.04								699
Girl's Nightgowns 7-14X		387	20	\$10	\$ 8	0.05	\$ 3,870	\$ 163	\$ 4,033
Girl's Pajamas 7-14X		348	116	\$12	\$10	0.25	\$ 4,173	\$ 1,158	\$ 5,232
• Polo Pjs	0.48								2,560
• Tailored Pjs	0.48								2,560
• Baby Doll Pjs	0.04								213
Boys Pajamas 2-6X		3,067	1,315	\$ 9	\$ 7	0.30	\$ 27,607	\$ 9,202	\$ 36,809
• Polo Pjs	0.85								31,288
• Tailored Pjs	0.10								3,681
• Sleepers	0.05								1,840
Boys Pajamas 7-14X		630	270	\$11	\$ 9	0.30	\$ 6,928	\$ 2,429	\$ 9,357
• Polo Pajamas	0.75								7,018
• Tailored	0.25								2,339
Girls and Boys Robes 2-14X		867	45	\$20	\$16	0.05	\$ 17,430	\$ 720	\$ 18,150
Boys and Girls Sleepwear 0-1		4,015	1,721	\$ 7	\$ 5	0.30	\$ 28,105	\$ 8,604	\$ 36,709
• Sleepers	0.95								34,873
• Newborn gowns	0.05								1,835
<b>TOTAL GARMENTS</b>		<b>12,892</b>	<b>4,298</b>				<b>\$121,622</b>	<b>\$28,510</b>	<b>\$150,132</b>

SOURCE: Estimated from Textile and Clothing Board Statistics and expert opinion.



### Prices, Volumes and Size Ranges

At retail prices, the entire Canadian market for children's sleepwear may be worth \$150 million annually. The domestic portion of retail sales may total close to \$120 million, and imports account for the remaining \$30 million. Exhibit C-2, opposite, provides an estimated breakdown of domestic and import sales in 1984 by size and style of sleepwear. It should be noted that CAMA\* submitted a brief to CCAC which estimated retail sales to be considerably higher. This brief is included in the bibliography.

The bulge in the mid- to low-priced segment of the children's sleepwear market is consistent with the general price sensitivity of all children's apparel. Consumers are reluctant to spend heavily on clothing which will soon have to be replaced as a child outgrows it. Children's sleepwear is particularly price sensitive, as it is seen as a relatively utilitarian item. Children in the 0 to 1 and 2 to 6X size ranges correspond to infants and toddlers respectively. The rapid growth of children in these size and age ranges, coupled with the need for frequent changes of sleepwear, result in a very high volume of sales in this end of the sleepwear market. Sleepwear in the 0 to 1 size range is predominantly composed of sleepers, and these are generally seen as commodity items. Price sensitivity is perhaps greatest in this size range. Price pressure, along with smaller unit material requirements, result in unit prices in sizes 0 to 6X, which are below those for garments in the 7 to 14 size range. Retail margins for department stores are perhaps 30% to 35% for infant sleepers\*\* and increase with size to as much as 40% or 50% for size 6X garments.

As children age and grow into the 7 to 14 size range, fewer sleepwear changes are needed. Children in this age range also become more likely to wear underwear or other sleepwear substitutes to bed. As children provide more input into the buying decision, styling becomes more important. Increased styling and larger sizes naturally have attendant effects on costs and retail prices. All these factors combine to result in lower volumes, greater fashion content and higher price points in sleepwear garments sized 7 to 14. Retail margins in the 7 to 14 size range vary from 40% to 50% for department stores.

### Styles and Fabrics

Clearly, the strongest fabric preference among consumers today is for cotton and cotton blends. Consequently, the bulk of children's sleepwear today is made from cotton and polyester/cotton blends. Acrylic blends are

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\* Children's Apparel Manufacturers Association

\*\* i.e., the retailers' cost of the sleepwear items is 65%-70% of their selling prices.

EXHIBIT C-3

GARMENT WORN MOST OFTEN TO BED  
(among all children)

Size Range	M A L E			F E M A L E		
	0 to 1 (includes 0-7 kg.)	2 to 6X	7 to 14X	0 to 1 (includes 0-7 kg.)	2 to 6X	7 to 14X
Approximate Age Range	Less than 2 years	1 year to 8 years	5 years to 16 years	Less than 2 years	1 year to 8 years	5 years to 16 years
Sleepers	85%	0%	0%	90%	0%	0%
Blanket Sleepers	0%	5%	0%	0%	5%	0%
Polo Pajamas	10%	80%	60%	0%	19%	14%
Tailored Pajamas	0%	10%	20%	0%	19%	14%
Baby Doll Pajamas	N/A	N/A	N/A	0%	2%	2%
Nightgowns	N/A	N/A	N/A	0%	50%	40%
Newborn gowns	5%	N/A	N/A	10%	N/A	N/A
Non-sleepwear Garments (underwear, etc.)	0%	5%	20%	0%	5%	30%
Robes (worn in addition)	0%	10%	20%	0%	10%	30%

Source: Expert Opinion

also commonly used in children's sleepwear. There are currently few 100% polyester or nylon fabrics used in children's sleepwear. The experience of several retailers who have imported 100% polyester sleepwear from the United States is that it sells very poorly in Canada.

Styling in children's sleepwear tends to be largely a function of size and age. Exhibit C-3, opposite, provides an approximate breakdown of the styles of garment primarily worn by children of each sex and within each size range. It can be seen that sleepers constitute the vast majority of garments worn by infants, and that polo pajamas, in particular, grow in popularity as children grow into the larger size ranges.

The fashion component of children's sleepwear is very important in sizes 7 to 14 and, as a rule, garment variety and fashion content increase with size and age. Retail buyers seek from season to season to find new and unique designs and are reluctant to buy the same thing as last year, other than in infant sizes. The demand for new design and prints is generally met by the sleepwear manufacturers. A variety of fabric finishes, such as velour or terry cloth, constructions (knit or woven), and prints are used to provide considerable variety in the appearance and feel of finished sleepwear garments.

#### Seasonality

In addition to age, season is a large determinant of styling and fabric choice in sleepwear garments. There are two selling seasons for children's sleepwear: Fall/Winter and Spring/Summer. In general, heavier fabrics such as flannelettes are used more often in the Fall and lighter fabrics tend to be used in the Spring. Robes sell primarily in the pre-Christmas period as gift items and baby doll pajamas appear only in the Spring.

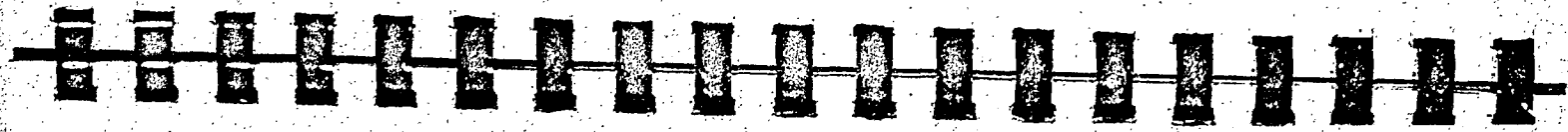
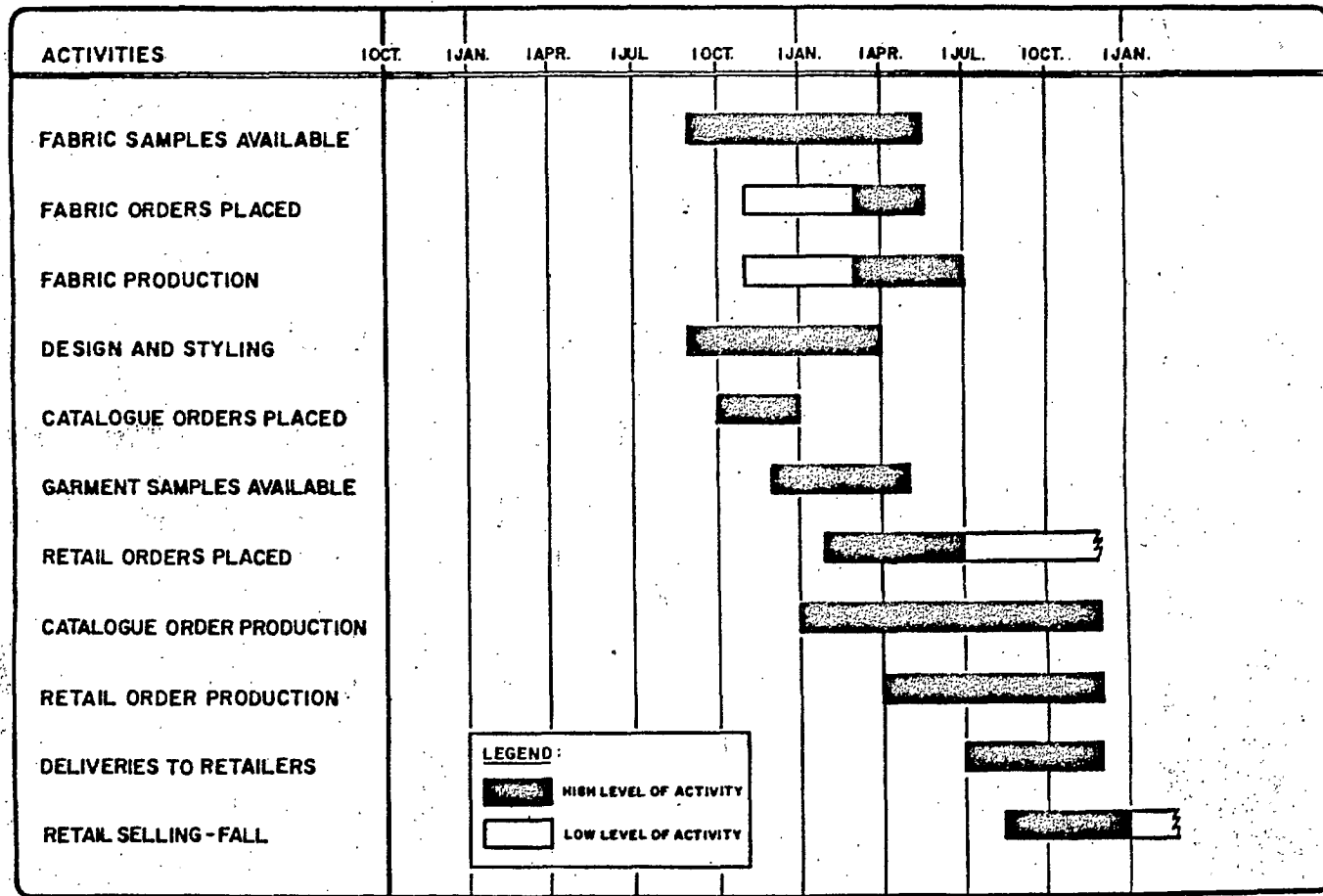
The Fall selling season combined with Christmas accounts for roughly two thirds of the retail volume of children's sleepwear. The Fall selling season generally begins in August with the traditional back-to-school sale. This sale is used largely to clear carry-over merchandise from the previous Fall. New Fall merchandise begins selling in earnest from September through December. Spring sales historically are less important and account for the other one-third of annual sales. Spring selling generally runs from April to the end of May.

#### OPERATING CHARACTERISTICS OF RETAILERS

##### Planning and Ordering

There are two selling seasons for children's sleepwear in Canada and two retail buying seasons which correspond to these: Fall/Winter and Spring/Summer. Planning and sourcing of garments for retail stores occurs one season (6 months) ahead for garments sourced domestically and about 12 months ahead for garments which are purchased overseas. The purchasing cycle for the Fall season begins in mid-February, when retailers look

EXHIBIT C-4  
**CHILDREN'S SLEEPWEAR  
 FALL / WINTER TIMETABLE**



at the sample garments prepared by domestic manufacturers. Retail orders are placed soon afterwards, and most orders have been placed with domestic manufacturers by the end of April. Some re-ordering may occur when shortages are anticipated. Exhibit C-4, opposite, shows retail order lead times and selling seasons in relation to the lead times of manufacturers.

In the case of imported garments, sourcing occurs 12 months ahead of the season of sale. In many cases, orders will be placed in the Fall only, but for both Spring and Fall merchandise. As sleepwear imports tend to be basic items, the danger of fashion obsolescence is not great.

The Sears catalogue operation, which accounts for a substantial proportion of children's sleepwear sales, must also source its domestic purchases one year ahead of time owing to the logistics of this sort of operation.

#### **Selling and Inventory Policies**

Orders are generally made to cover the basic demand of an entire season, and anticipated shortages are reacted to by re-ordering from domestic manufacturers on a rolling basis. As so much of the buying power in the children's sleepwear market is controlled by relatively few buyers, there is some skew in the balance of power towards large retailers. This has the effect that orders may come relatively late, and that unsold inventories at season's end may occasionally be forced back on manufacturers. Extra inventories of sleepwear are, however, generally carried over into the following year, and sold in clearance sales such as the traditional "back-to-school" sales. Inventory carryovers of large retailers are typically no larger than 10% for each season. Carryovers among smaller retailers may be somewhat larger on a percentage basis, and this group may be more inclined to return merchandise to manufacturers.

#### **Retail Margins**

Retailers in Canada operate on approximately a 50% margin for children's sleepwear items. That is to say that their wholesale prices are doubled before sale to the consumer. These margins are reduced during clearance sales. Margins are somewhat lower for department stores and mass merchandisers than for independents and chains. Margins of 40% to 50% may be more common for department stores while margins of 50% or more may be representative for the independents. As has been discussed, margins are also lower in the infant size ranges as these garments are less style-intensive and almost commodity items.

#### **SLEEPWEAR MANUFACTURERS**

##### **Domestic Manufacturers**

There are perhaps 40 or 50 children's sleepwear manufacturers in Canada, and these are heavily concentrated in the Montreal area. These manufac-

turers vary widely in the absolute volume of sleepwear produced, in the relative importance of sleepwear to the entire business, and in the type and size ranges of garment produced. There are perhaps three manufacturers of sleepwear in Canada who together account for 40% of all domestically produced sleepwear in sizes 0 to 14X. Of these firms, one specializes in children's sleepwear garments, one produces sleepwear for women and children, and one produces a full line of children's clothing. Within the balance of the industry, perhaps three others produce only children's sleepwear, while another five produce only sleepwear but for both children and women. The remaining domestic manufacturers produce other children's apparel as well as sleepwear, and in many cases, sleepwear is a relatively small part of the overall business.

#### **Planning and the Production Process**

Exhibit C-4 illustrates manufacturing planning and lead times vis-a-vis retailer milestones for a typical Fall selling season.

Typically, in the sleepwear business, samples of Fall merchandise must be available to show buyers from mid-February through March. As a result, sample fabric procurement and design must begin in late Fall of the previous year. Thus, in order to meet deadlines, sample fabric from domestic suppliers must be available 12 months prior to the season in which the finished garment will be sold. Production orders for this fabric are placed at the end of the retail buying period (March) and generally take six to eight weeks for delivery from domestic mills. These order lead times are longer by a period of about six months for fabric which is sourced overseas.

Production lead times vary somewhat among firms in the sleepwear business. Larger firms who deal heavily with the large department stores typically have shorter lead times to production than smaller manufacturers. These firms must begin production and have inventories in advance of receiving firm orders from the larger retailers in order to meet demand when orders are placed. Smaller firms typically round out the line of sleepwear offered by a major retailer and these firms tend to produce only after firm orders have been taken.

After orders have been taken, the actual process of production proceeds relatively quickly. Assuming fabric is available and there are no other production bottlenecks, large department store orders can be turned out in several weeks, and smaller orders can be turned out in a week or less. As mentioned, the larger manufacturers produce earlier as production bottlenecks may be more likely for them.

#### **Fixed Costs and Flexibility of Production**

There are few factors of production in children's sleepwear manufacture which are dedicated to the production of sleepwear, or any particular type of sleepwear. Equipment and labour can quickly be turned to the produc-

tion of any of a number of garments. Only fabrics are limited in some degree in their range of end uses. The major determining steps in changing production are fabric sourcing and design which have their associated lead times. However, there are marketing variables, such as relationships with departmental buyers at department stores and sleepwear branding, which cannot as readily be transferred to the marketing of non-sleepwear garments. These can be viewed as partially fixed and ongoing costs.

#### Labour

Labour in the garment industry is generally employed and paid on a piece-work basis. While it is to the advantage of manufacturers to maintain and keep a fixed workforce busy, risk is reduced in that layoffs are possible without severance costs. Though quality may not be as high as if in-house production were used, the problems of an idle, or expanding and contracting workforce are reduced when contractors are used.

#### Fabric Ordering and Inventories

Fabrics for sleepwear manufacture are available from foreign and domestic sources. Lead times to delivery for fabric orders from domestic manufacturers are from six to eight weeks. Production ordering usually occurs during and just after the retail buying periods. However, sample fabrics must be available to manufacturers six months ahead of each retail buying period, for design work. This, in effect, means that sample fabrics must be available to manufacturers 12 months ahead of the season of sale of finished garments.

Inventories are generally kept low in sleepwear manufacture to minimize carrying costs. Inventories are kept particularly low in printed fabrics, as retailers demand different designs from season to season. Basic cloths, or gray goods, may be kept in somewhat larger amounts as these are subject to less fashion obsolescence. Generally, however, orders will be placed for the anticipated demand of only one season. Slow inventory turnovers and carryovers may occur because of:

- o minimum fabric order sizes, which can be large relative to fabric use, particularly for smaller manufacturer.
- o errors in estimating seasonal requirements.

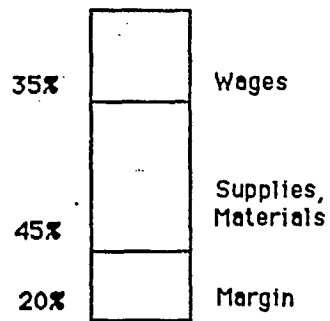
Clearly, manufacturers have little control over either of these sources of inventory carryover.

#### Industry Costs and Profit Margins

The cost structure within the sleepwear manufacturing business is relatively uniform across firms of all sizes. Exhibit C-5, overleaf, provides a typical breakdown of the costs of a finished sleepwear garment. Most manufacturers work on a cost-plus basis in arriving at their selling prices, and

Exhibit C-5

Manufacturers' Selling Price  
Breakdown for Children's  
Sleepwear





the bulk of costs in the manufacturers' price of a garment are variable. The wages component and the supplies and materials component are direct garment costs. Wages account for approximately 45% of direct garment costs, fabric costs account for 50% to 60%, and trim accounts for about 5%. As indicated, gross margins of approximately 20% are used to cover overheads and contribute to profit.

There are few significant economies of scale to be achieved in sleepwear production, but some differential advantages arise from the following:

- o Minimum order sizes of fabric mean firms with larger sleepwear sales can achieve higher inventory turnover, and reduce carrying costs on a unit basis.
- o Firms producing women's sleepwear garments using the same fabrics can also achieve higher inventory turnover by serving women's and children's garment production from the same inventory.
- o Higher volume producers can spread the fixed costs of selling over a larger unit base, and can achieve some labour efficiency advantages with longer production runs.
- o Larger firms are more likely to gain access to limited fabric supplies than smaller firms.
- o Larger firms may be seen by retailers as being more reliable in their delivery of finished garments.
- o Branding may establish consumer preferences and result in higher volumes, but is not likely to allow premium pricing.
- o Limited automation is possible with automatic marking and grading equipment. This equipment automatically produces cutting patterns to speed this process and to allow optimal use of fabric bolts.

It should be noted that most of the above advantages accrue to the large sleepwear manufacturers. Nonetheless, there are few economies of scale in the industry, and the cost structures of most manufacturers appear to be relatively similar.

#### **Sleepwear Importer/Wholesalers**

There are perhaps three importers/wholesalers who account for most imports of children's sleepwear garments. Sleepwear importers work on lead times of from 12 to 18 months, often ordering for two seasons in advance. Typically, cash commitments are made soon after orders are placed and thus financial risk is inherent in the import business.

EXHIBIT C-6

1984 IMPORTS OF SLEEPWEAR, BATHROBES, DRESSING GOWNS  
(all sizes)

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	1984 Imports (000's of garments)	Restraint Level*
<b>Main Exporting Countries:</b>		
<b>Developing Countries:</b>		
Peoples Republic of China	2,472	2,370
Taiwan	2,289	2,340
Hong Kong	274	299
Korea (south)	95	227
<b>Developed Countries:</b>		
United States	220	N/A
Italy	78	N/A
Total Imports (all sources)	7,664	N/A
Net Domestic Shipments	29,924	N/A

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\* Tariffs of 22% to 25% of value also apply to all sleepwear imports regardless of source country.

Source: Textile and Clothing Board Statistics

Importer/wholesalers deal with both large and small retailers. However, large department stores may have their own offshore sources of sleepwear and may import finished goods directly. Some sleepwear manufacturers are also involved in some limited importing of finished garments which are not competitive with their own. The import share of the children's sleepwear business may be in the order of 25% to 30% on a unit basis for pajamas, less for other garments. Most import goods are basic, low cost items and are sourced in developing countries such as China and Korea.

A regime of quantitative constraints currently sets limits on the number of garments which may enter Canada from most developing countries. The quota arrangements have provisions for annual growth and flexibility (swing, carry-over, carry-forward) which allow fluctuation around a base figure. In recent years, imports have grown at the rate of 3% to 5% annually. Exhibit C-6, opposite, provides a breakdown of the main import countries, their 1984 imports and restraint levels. It appears that most of the developing countries were at their quota limits in 1984 and this situation is not thought to be materially different for 1985. Thus any short term increase in the demand for imported sleepwear garments is likely to be met by the U.S., rather than the developing countries. However, the current bi-lateral agreements governing textiles expire in 1986, and it remains to be seen what the next generation of such agreements will bring.

In addition to quantitative restraints, a system of tariffs is also in place which applies surcharges of about 22% to 26% on fabric and sleepwear imports. This and the current strength of the U.S. dollar act as the main impediments to imports from the U.S.

#### PRIMARY TEXTILE INDUSTRY

##### Mix of Primary Textile Operations Serving Sleepwear Industry

The primary textile industry serves the needs of the sleepwear industry in producing yarns and finished fabrics. There are essentially two processes by which fabrics are produced for the apparel industries: knitting and weaving. Both knitting and weaving operations use yarns as input and produce fabrics, but the former use knitting machines and the latter use looms. The different production processes result in cloths which are noticeably different in construction, and which are often used more in some garment styles more than others. For instance, polo pajamas are generally made from knit fabrics, while tailored pajamas are made from woven fabrics.

While there are many primary textile plants in operation, there are only a few operations which provide the bulk of domestic knit and woven fabric to sleepwear manufacturers. There are more knit than woven fabric producers serving the sleepwear industry, but these "knitters" are also served by the few large yarn mills. Thus, there is a high concentration of primary textile producers supplying the sleepwear industry, particularly

**EXHIBIT C-7**

**1984 IMPORTS OF COTTON AND POLYESTER FABRICS**

	Cotton Fabrics		Polyester Fabrics	
	1984 Imports (000's of kilograms)	Share of Imports	1984 Imports (000's of kilograms)	Share of Imports
<b>Main Exporting Countries:</b>				
<b>Developing Countries:</b>				
Peoples Republic of China	7,570		-	
Hong Kong	5,732		141	
Korea (South)	1,871		550	
Taiwan	1,746		54	
All developing countries	25,893	65%	1,025	14%
<b>Developed Countries:</b>				
United States	10,294		3,362	
Japan	1,250		1,881	
All developed countries	13,117	33%	6,162	85%
Total Imports (all sources)	39,644		7,226	
Net Domestic Shipments	131,472		unknown*	

\* not released for reasons of confidentiality

Source: Textile and Clothing Board Statistics

in yarns and woven fabrics. This can restrict the variety of fabrics produced and affect the service that small sleepwear manufacturers receive.

#### Yarn and Fabric Production

There are definite economies of scale in weaving; in general, weaving operations require long production runs. There is perhaps one large weaving operation in Canada which serves the sleepwear industry (Dominion Textile). Knitting operations involve a smaller setup per production run and thus there are fewer economies of scale in this kind of operation. As a result, there are more "knitters" serving the sleepwear industry than "weavers".

The distinction between sleepwear manufacturers and the primary textile industry blurs as some sleepwear manufacturers are vertically integrated. The integrated operations are knit apparel producers, who produce their own fabric from yarn, and then produce finished sleepwear garments. However, this type of operation is the exception rather than the rule in the sleepwear industry.

Beyond the knitting or weaving stage, fabrics must also be finished and dyed. Dying and finishing may be done in-house by the fabric producer or by one of the finishing and dyeing houses which serves the textile industry. Finishing is the process by which the fabrics are textured and given other qualities such as wrinkle resistance, while dyeing is the process of colouring or printing a design on the cloth. It seems that much dyeing equipment today is geared to printing cotton or poly/cotton fabrics, and that the capacity for printing on 100% polyesters is more limited and expensive.

#### Imports of Fabric

Imports of cotton and poly/cotton fabric account for about 65% of the market for these fabrics in Canada. Within the children's sleepwear industry in particular, imports may command an even higher share as quality is less a concern for children's sleepwear than for adult clothing and other end uses. Imports of fabrics or "piece goods" used by the sleepwear industry are perhaps largest for flannel (cotton), and China in particular produces much of the flannel imported by the sleepwear industry. Flannel is used extensively in tailored pajamas and nightgowns in the fall season.

Fabric imports from developing countries are subject to quantitative restraints, and tariffs of from 22% to 25% apply to all imports regardless of the country of source. Exhibit C-7, opposite, provides a breakdown of the main exporting countries of various fabrics and their 1984 import levels.

The developing countries (China, Hong Kong, Korea and Taiwan) export large amounts of cotton and poly/cotton fabric, but the U.S. is orders of magnitude stronger in exports of synthetic (polyester and nylon) fabrics

to Canada. It appears that until recent years polyester production capacity had been limited in the developing countries. As new polyester plants have come "on-line" in the Far East, polyester imports have begun to rise rapidly. Despite these recent trends, any appreciable short term increase in the demand for imported polyester fabric would probably be met by the U.S. rather than the developing countries. Domestic manufacturers can "tag" onto the fabric production runs of U.S. sleepwear manufacturers. Relatively small orders and short lead times can be accommodated in this manner, but domestic manufacturers run the risk of delays or not being able to find desired prints. Thus, "tagging" on U.S. production runs can only be used as a short term means of sourcing fabric.

#### **Imports of Yarn and Fibre**

Inputs to the production of cloth are yarns, which are generally produced by a small number of large domestic producers and foreign sources. Yarns are, in turn, made from either synthetic or natural fibres. In the case of cotton, which is heavily used in children's sleepwear, about 60% of yarn is imported while the remaining 40% is produced domestically. The fibre inputs to domestic yarn production are, however, necessarily imported from the U.S. and other countries where cotton is grown.

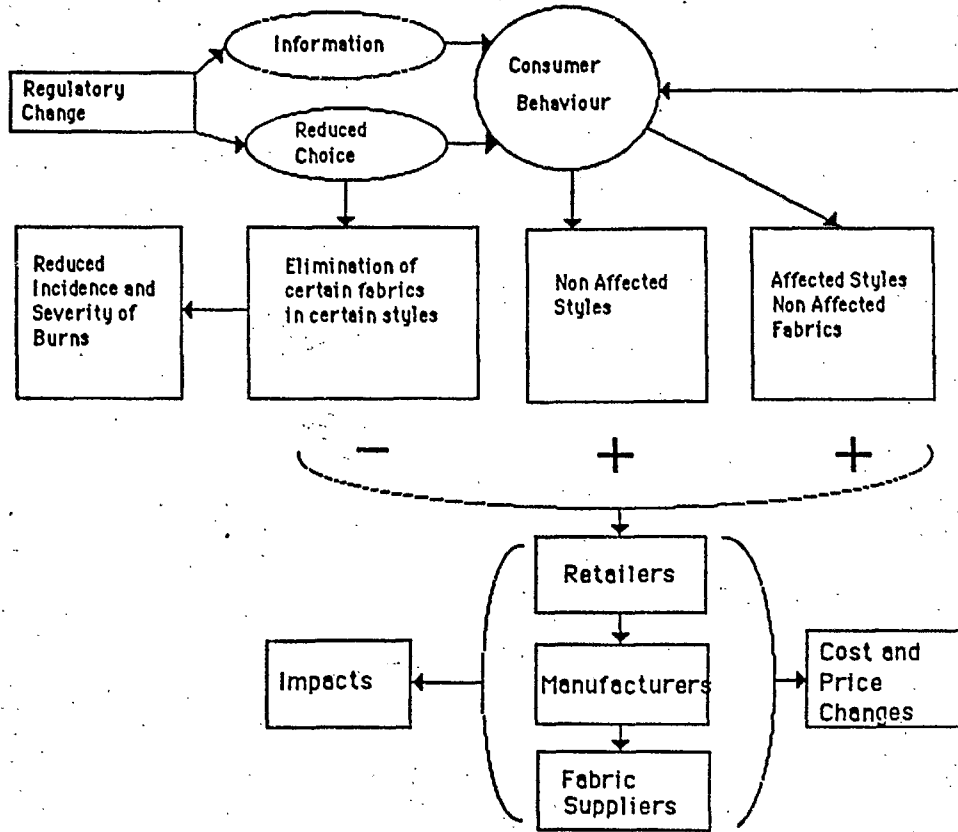
In the case of nylon and polyester yarns, the situation is reversed as perhaps 40% of yarns are imported while 60% of these yarns are domestically produced. Also, the domestic fibre producers use domestically produced raw materials (petro-chemicals). Polyester fibre is produced in large amounts for various uses, primarily by Celanese in Canada. Dupont is the largest domestic producer of nylon.

While cotton and polyester/cotton yarns are imported primarily from the developing countries, 100% nylon and polyester yarn imports are far more likely to come from the United States and other developed countries. Synthetic yarn production is a process in which the developing countries have no significant resource or labour cost advantages.

**APPENDIX D**

**IMPACTS OF THE REGULATIONS**

Exhibit D - 1  
Overview of Impact Process





**APPENDIX D****IMPACTS****OVERVIEW**

As a backdrop to the estimation of the allocative and non-allocative effects of the regulatory proposals, in this appendix we develop a model of the likely impacts of the regulatory options, in terms of:

- o key linkages between sectors;
- o expected direction of impacts;
- o quantitative results.

This appendix draws heavily on information contained in Appendix C and on further information from interviews and secondary data sources. In addition to interviews and secondary sources of information, we have made some assumptions regarding price elasticities, the shape of demand curves, and possible substitution effects. While we believe our qualitative model of impacts to be a fairly reliable description of likely responses to new legislation, our quantitative estimates are based largely on assumptions concerning key parameters. As a result, our quantitative results are really only illustrative calculations. These are meant to show order of magnitude differences between the impacts of the regulations under study. These impact estimates should not be taken as reliable forecasts, but used only for comparative purposes.

The model in Exhibit D-1, opposite, summarizes the nature of the impacts to be expected from the whole range of regulatory proposals under study. In other words, the different regulatory options under study may have different quantitative impacts, but the general structure and nature of the impacts are all likely to be as outlined in Exhibit D-1.

**OVERVIEW OF THE IMPACT PROCESS**

Exhibit D-1 graphically illustrates the following channels by which the impacts are generated:

- o The proposed regulatory changes, by restricting choice, lead to the elimination of certain fabrics in certain styles of children's sleepwear.
- o In addition, the regulatory proposal leads to increased information and presumably awareness by consumers with respect to aspects of sleepwear flammability, which influence consumer behaviour directly.
- o Consumers substitute for the eliminated fabric/style combinations, by either purchasing non-affected styles, or by

shifting to affected styles using non-affected fabrics. It is generally accepted in the industry that substitutions toward non-affected styles will be primarily in order to retain those fabrics eliminated in the affected styles. There may not be complete substitution in quantity and/or value terms, so that the shift in consumer behaviour may have quantity impacts on children's sleepwear purchases as a whole.

- o The result of the change in children's sleepwear purchases will be reduced incidence and severity of burns. It is generally accepted in the industry that there will be some avoidance of the intent of the regulation, by substituting similar but non-sleepwear products which closely parallel the affected styles and are manufactured with the affected fabrics. We have not attempted to illustrate this phenomenon in Exhibit D-1, but it will presumably reduce the effectiveness of the regulatory proposal.
- o The reduced incidence and severity of sleepwear burns will reduce associated burn treatment costs.
- o The change in purchasing behaviour of consumers will have an impact on retailers in terms of the mix and volume of products which they sell.
- o This mix and volume impact will be quickly passed back to manufacturers of children's sleepwear. Canadian manufacturers will need to shift production, and there may be some change in the mix of imported versus domestic sourcing.
- o A similar process will take place at the level of fabric suppliers, so that domestic fabric suppliers will be affected both by any change in the domestic/import manufacturing mix, and also by revised sourcing by domestic manufacturers of their fabric requirements.
- o The shifts outlined in the above three steps will create other impacts, such as employment effects.
- o The adjustments made by retailers, manufacturers, and fabric suppliers will result in cost and therefore price changes which will flow back to influence consumer behaviour.

The potential impacts on imports and sleepwear prices are discussed in more detail below.

### POTENTIAL IMPORT SUBSTITUTION

When flame retardency regulations were first introduced in the United States in 1973 to 1975, imports of sleepwear were effectively blocked to a large extent. At the time, the developing countries were unable to produce a suitable less flammable substitute fabric. Today the necessary technology is well known, even in the developing countries, and imports of polyester sleepwear for children are on the rise in the United States. Although imports have not regained the level of penetration they had prior to the introduction of regulations, there appear to be no technical or capacity constraints to prevent this. As technology and production capacity in the developing countries are no longer the impediments they were, imports of polyester sleepwear could enter Canada to the limit of quantitative restraints.

Quantitative restraints are currently in place for imports of sleepwear from most of the major exporting developing countries. However, import restraints can in effect be transcended through transshipment or direct investment in unrestrained countries. Of course, this situation is faced by sleepwear manufacturers regardless of whether cotton or polyester is used in sleepwear manufacture.

Therefore, the issue for the purposes of this study is whether exporting countries have any sustainable advantages in producing polyester fabric or sleepwear which they do not already have in cotton fabric or sleepwear production. In other words, will new regulations result in more than the trend level of sleepwear or fabric imports that currently exists?

The substitution of polyester for cotton in children's sleepwear may result in a greater than trend penetration of imported polyester sleepwear and fabrics in the near term. However, this would be due to a shortage of domestically produced polyester, rather than greater cost advantages of imported polyester garments or fabrics. Therefore, labour cost advantages in the production of finished sleepwear garments would continue to provide the differential cost advantage for imports over domestically produced sleepwear. These labour cost advantages would not be any greater for polyester garments than for cotton garments.

#### Imports from U.S.

Imports of sleepwear from the U.S. could increase somewhat since flame retardent sleepwear is already produced there. Longer production runs provide some cost advantages in the U.S. However, tariffs of 22% to 25% and the recent strength of the U.S. dollar tend to weaken these advantages. The likelihood of U.S. imports is also reduced to the extent that a less than total garment coverage is implemented. If Canadian regulations govern only certain styles of sleepwear (Option 1 or 2), some substitution to cotton sleepwear garments in non-affected styles will occur. This would further limit the potential for U.S. sleepwear imports. Thus, increased

imports of fabric and sleepwear are likely to be greatest in the short term, if domestic industry cannot or will not produce to meet demand.

#### **Imports From Developing Countries**

In light of the limited import penetration currently seen in the U.S., it is possible that the Canadian sleepwear industry may experience a period of fewer sleepwear and fabric imports from developing countries. This may occur until low cost manufacturers of polyester fabric and sleepwear can be found in the developing countries. There may also be some reluctance to import from the developing countries because of product liability concerns.

#### **Overall Impact**

Sleepwear and fabric imports may rise above trend for the first season or two after the implementation of new regulations, but imports in this period may come mainly from the United States. The level of imports may then fall off considerably as domestic sleepwear manufacturers begin production of polyester sleepwear using domestically produced fabric. A below trend level of imports may continue for several seasons until new sources of polyester fabrics and garments are found in the developing countries. These imports may then begin to displace domestic production and shipments from the U.S.

#### **FABRIC SUBSTITUTION AND SLEEPWEAR PRICE INCREASES**

Each proposed option would require that a range of sleepwear garments 0 to 14X (exempting 0 to 7 kg. in Options 2 and 3) meet new flammability standards. Sleepwear and fabric manufacturers have indicated that this will effectively mean that cotton, cotton blends and acrylics will no longer be used in the sleepwear garments affected. Chemical treatment of fabrics has been ruled out (by both sleepwear manufacturers and primary textile mills) due to technical problems which became apparent when sleepwear flammability legislations were introduced in the United States. Virtually all sleepwear garments covered by the legislation will be made from 100% polyester, or 100% nylon. It appears from early indications in this country and from the experience of the U.S. that the fabric of choice will be 100% polyester rather than nylon in most cases.

#### **Fabric Cost Increases**

When sleepwear flammability regulations were first introduced in the United States, retail sleepwear prices rose by up to 40% over a period of several years. These price increases were due largely to startup costs associated with developing the new fabrics and garments. Since this time, there is some evidence to suggest that the real cost of less flammable fabrics has fallen in the U.S. However, the price premium for less flammable sleepwear appears to have persisted despite decreases in fabric costs.

The effort in developing the new fabric consists mainly of trying various combinations of methods for dyeing, finishing and constructing the fabrics. The U.S. experience in developing flame retardent polyester should obviate much of this research for Canadian manufacturers, as the technology is now well known and readily transferrable.

Early indications from Canadian textile mills and sleepwear manufacturers are that substitute fabrics would cost from 25% to 50% over existing sleepwear fabrics. The greatest percentage cost increases would be for low cost fabrics such as acetate/nylon which are used in some low cost sleepwear items. Exhibit D-2, overleaf, provides a list of commonly used sleepwear fabrics, their potential less flammable substitutes and ranges of percentage cost increases associated with the use of substitutes.

In particular, a 100% brushed nylon which might replace the acetate/nylon currently in use in some robes and gowns, would cost in the neighbourhood of 40% more. Cost increases of 25% are anticipated for a 100% polyester which would replace cotton flannellettes and cotton blend woven fabrics. These types of fabrics are used heavily in tailored pajamas, gowns and robes. Similar cost increases would be expected for circular knit fabrics which are used in polo pajamas. An overall weighted price increase of 35% is assumed in our analysis for the fabrics which will replace current sleepwear fabrics.

It should be noted that these estimates of cost increases are the opinions of industry people. There is a fair degree of uncertainty in these estimates for the following reasons:

- o These estimates reflect implicit assumptions about which particular fabric will replace which in sleepwear garments.
- o Many of the particular constructions of replacement fabrics are new to the sleepwear market and fabric manufacturers are uncertain what final production costs will be or how the fabrics will be priced. This pricing uncertainty is largely tied to uncertainty about how great the final demand for these fabrics will be.
- o It is not known to what extent imports will fill the demand for the new fabrics.

Competitive pressures may reduce domestic fabric costs in the long run to the extent that:

- o imports of polyester yarn and/or fabric increase;
- o more domestic firms produce polyester fabrics and yarns.

The above two occurrences and their attendant effects on reducing the price of polyester may be enhanced in the long term if the range of garments to be covered by any legislation is extended. The greater the

EXHIBIT D-2

FABRICS COMMONLY USED IN CHILDREN'S  
SLEEPWEAR AND POTENTIAL  
REPLACEMENT FABRICS

Sleepwear Garment	Current Fabrics Commonly Used In Sleepwear Garment	Potential Replacement Fabric	Potential % Price Increase in Fabric Component of Sleepwear Cost
Nightgowns	<ul style="list-style-type: none"> <li>. acetate/nylon knit</li> <li>. brushed nylon knit</li> <li>. circular knit poly/cotton</li> <li>. woven 100% cotton flannellette</li> <li>. acetate knit</li> <li>. poly/cotton fleece</li> </ul>	<ul style="list-style-type: none"> <li>. 100% polyester knits and wovens</li> </ul>	25% to 50%
Robes	<ul style="list-style-type: none"> <li>. poly/cotton terry blanket</li> <li>. acetate/nylon</li> <li>. acrylic blanket</li> <li>. quilted acetates</li> <li>. quilted cotton</li> <li>. cotton flannellette</li> </ul>	<ul style="list-style-type: none"> <li>. 100% polyester jersey knits</li> <li>. 100% brushed nylon knits</li> </ul>	25% to 50%
Tailored Pajamas	<ul style="list-style-type: none"> <li>. woven 100% cotton</li> <li>. flannellette</li> <li>. woven poly/cotton</li> </ul>	<ul style="list-style-type: none"> <li>. 100% polyester wovens</li> </ul>	25%
Polo Pajamas	<ul style="list-style-type: none"> <li>. circular knit 100% cotton</li> <li>. circular knit poly/cotton</li> </ul>	<ul style="list-style-type: none"> <li>. 100% polyester circular knits</li> </ul>	30%
Sleepers	<ul style="list-style-type: none"> <li>. acrylic blanket</li> <li>. cotton terry knit</li> <li>. poly/cotton jersey knit</li> </ul>	<ul style="list-style-type: none"> <li>. 100% polyester knits</li> </ul>	50%

range of garments covered by the legislation, the greater will be the demand for a polyester fabric suitable for sleepwear. Increased demand for polyester should encourage increased competition among domestic firms and increased imports. However, these possibilities are limited by:

- o the existence of very concentrated domestic industries in polyester fibre and yarn production;
- o the likelihood that sleepwear polyester demand would be limited, this limiting the firms who could profitably serve the demand to one or two (if any);
- o the possibility of reduced imports of low priced sleepwear fabrics and garments from developing countries.

#### Potential Import Effects on Price

Imports of polyester fabric from the developing countries are currently not very significant. However, there seem to be no capacity or technical constraints in the developing countries which would prevent them from exporting polyester sleepwear fabrics. In fact, imports of polyester fabric and garments from such sources as China and Korea have risen rapidly in recent years.

Recent trends notwithstanding, in Canada the developing countries are still thought of as producers of cotton goods. In addition, retailers may be somewhat reluctant to import less flammable fabrics or sleepwear from the developing countries due to product liability concerns. Thus, it may be some time before imports of polyester reach the same levels as cotton sleepwear and fabric imports from the developing countries.

Though imports of sleepwear garments and fabrics from the developing countries may drop below current levels for the medium term, it is assumed that in the long run, these imports will return to their status quo levels. As a result, we assume that in the long run no "extra" price increases or consumer surplus losses will arise from the displacement of low priced imported fabrics or sleepwear garments. By this, we mean that imports from the developing countries will be available in amounts equivalent to current levels, and that these imported goods would increase in price by the same percentage as domestic goods.

#### Process Cost Increases

There may be some small learning curve inefficiencies when sleepwear manufacturers first begin to use polyester fabrics in sleepwear production. Depending on how reduced unit volumes distribute among manufacturers after the introduction of new regulations, it is also possible that shorter production runs will result in some productivity losses. However, it is unlikely that the use of polyester fabrics will seriously affect labour productivity in the sleepwear industry in the long run.

The use of polyester fabrics should not require any major new investments in cutting or sewing equipment. With the exception of perhaps some sewing needles and other minor attachments, current equipment will continue to be used for the production of polyester sleepwear. Likewise, fabric production equipment would require no major retooling, although production runs may be shorter and some bottlenecks in dyeing may occur.

#### Inventory Cost Increases

Manufacturers inventory costs may rise somewhat with the use of polyester fabrics. Increased inventory costs may increase because of:

- o higher unit cost of fabric for any given volume of production;
- o slower turnover of inventory if fabric is restricted to use in a narrow range of garments.

If total industry inventories (of fabrics and finished goods) have an average value of \$8 million\* in any year, increased carrying costs might total \$250,000 (at same rates of use) per year if all garments are covered by the new regulations. This would amount to less than a 1% increase in manufacturers' total costs per garment. If inventory turnover rates were also to decrease by 2%, this would have the effect of increasing manufacturers' costs by about 1.5% per garment. Thus, the impact of increased carrying costs under any of the garment coverage options is expected to be no more than a 1%-2% increase in the final retail price of sleepwear.

#### Net Price Increase

The price of fabric in a finished sleepwear garment represents from 50% to 60% of the manufacturer's cost. Therefore, with a weighted average fabric cost increase of 35%, net of all the above effects, long run price increases of 15% to 20% might be expected for sleepwear garments affected by flammability regulations. This transfer of costs to the consumer is what we expect given the mark-up approach to costing used by sleepwear manufacturers, importers and retailers.

It should be noted that in the case of regulatory Option 2, covering tailored pajamas, manufacturers may react by making styling changes such that tailored pajamas are "closed off" at the legs and sleeves. For the purpose of the regulation these would in effect become polo pajamas, and the fabrics used in these pajamas would presumably remain the same. To the extent

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\* Using an inventory/sales ratio of 14%, which is typical for the clothing industry.



that this would occur under Option 2, the 15% to 20% estimate overstates the potential price increase which might result from restyling.

## IMPACTS ON THE INDUSTRY

### Long Run Impacts

In the long run, manufacturers presumably will adapt to the changes imposed by the legislator by re-allocating productive capacity and investment in the most profitable manner. Thus, producer surplus losses are nil in the long run as manufacturers are again operating as profitably as before the legislation. In the short term, however, there may be additional impacts which accrue to industry.

### Short Term Impacts

There are avoidable short term costs which are a function of the timing of the regulation implementation, and some unavoidable adjustment costs. These short term effects are discussed in turn below.

### Impact of Regulation Timing

Short term adjustment impacts will be largely the result of the timing of new flammability regulations: both announcement date and implementation date. However, it is not just the absolute number of months between announcement and implementation dates which determines adjustment costs. The timing of the announcement in relation to selling seasons is also important in determining the effect of timing. Adjustment costs will be greater to the extent that implementation dates occur:

- in the middle of a selling season
- before goods currently in the manufacturing pipeline can be cleared
- before domestic textile mills can produce a less flammable substitute for current sleepwear fabrics.

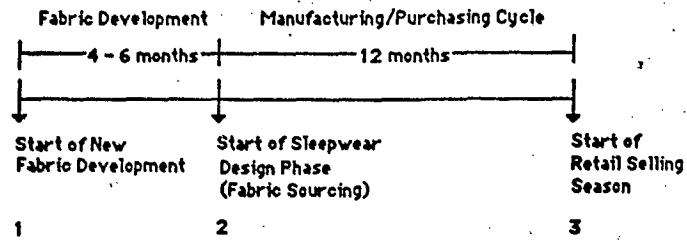
A regulation implemented in the middle of a selling season would disrupt normal consumer purchase patterns, and might result in some otherwise avoidable inventory losses at the retail level, or very conservative buying for the season of implementation.

As sleepwear manufacturers work on a one year lead time to selling seasons, a regulation implemented less than one year in advance of the beginning of a selling season could result in disruptions in the normal manufacturing cycle. A one year lead would allow ample time for garments which are at the beginning of the design phase at the time of announcement, to be redesigned using less flammable fabrics. If garment design and production are already in process for the selling season one year downstream, an

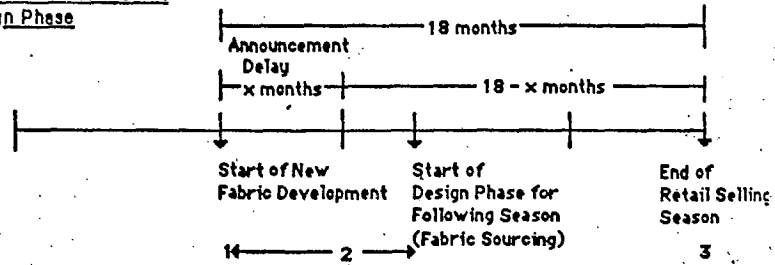
EXHIBIT D-3

Time Requirements for  
Smooth Implementation  
of New Regulations

Announcement at Start  
of Design Phase



Announcement after Start  
of Design Phase



- 1- Announcement date to minimize disruption of domestic fabric sourcing and manufacturing/purchasing
- 2- Announcement date to minimize disruption of domestic manufacturing/purchasing
- 3- Implementation dates to minimize disruption

implementation date at the end of that selling season would be needed to minimize disruption. This would allow all goods in process and fabric inventories to clear. Thus the timing of the announcement with respect to established selling seasons and manufacturing milestones is also critical in determining adjustment costs to manufacturers. Depending on announcement timing, a total lead time of 12 to 18 months may be required to minimize disruption to sleepwear manufacturers and retailers. This discussion is clarified with reference to Exhibit D-3, opposite.

To the extent that an announcement is made as the production cycle for the season of implementation nears its end, or to the extent that the implementation date cuts the selling season short, the following impacts seem likely:

- o Sleepwear manufacturers will take losses on goods in process, and raw and finished goods inventories which will not be completely sold. Depending on how far into the cycle the announcement is made, manufacturers may not be able to produce less flammable garments for the season of implementation.
- o If manufacturers cannot produce less flammable sleepwear for the season of implementation, there will be some sleepwear imports from the U.S. in the short term.
- o Retailers will take losses on unsold inventory which is obsolete before the end of the season, or will order very conservatively for the season of implementation. In the latter event, losses will accrue to retailers and manufacturers in the foregone sales and profits.
- o If the implementation date cuts the selling season short and retailers react by buying very conservatively for the season of implementation, there will be shortages of affected sleepwear styles in cotton. Likewise, there will be shortages of affected styles in less flammable fabrics if manufacturers do not have time to produce these for the season of implementation.

In order to minimize disruption of normal fabric sourcing from domestic suppliers, an additional four to six months prior to the start of sleepwear production is needed to allow the development of less flammable fabrics by domestic mills. Thus, a total of 16 to 18 months lead time may be required to minimize adjustment costs to the sleepwear industry, retailers and domestic fabric suppliers. This is depicted in Exhibit D-3.

A total lead time of 18 months would also allow importers who work on lead times of 12 to 18 months to clear most, but not all, inventories and committed orders of sleepwear. Another 6 months would be needed to insure that importers could clear all sleepwear garments and most fabrics. This would

bring the total lead time to two years, or one year in advance of when domestic sleepwear manufacturers would begin production with less flammable fabrics. If this one year lead time to production were cut to less than 12 months but more than 6 months, the following impacts seem likely:

- o Some importer/wholesalers would take losses on up to one season's worth of sleepwear garments (garments ordered 18 months prior to season of implementation and intended for sale in the season of implementation).
- o Some importer/wholesalers would take losses on up to one or two seasons' worth of sleepwear fabrics (fabrics ordered 12 to 18 months prior to when sleepwear manufacturers would need less flammable fabrics).

If the lead time to production were less than 6 months, the following impacts might occur:

- o Some domestic textile mills might not be able to produce a less flammable fabric in time for the production of garments for the season of implementation. As a result, there might be some short term imports of sleepwear fabrics from the U.S. to bridge shortages.
- o Some sleepwear manufacturers might be unable to find domestic or imported sources of fabric. As a result, shortages of sleepwear in affected styles might result for the season of implementation. This may also encourage retailers to import finished sleepwear garments directly from the U.S.
- o Sleepwear importers would take some losses on sleepwear garment orders which would be obsolete before they reached retail shelves.
- o Importers of sleepwear fabrics would take losses on fabric orders not scheduled for delivery until after manufacturers begin production with flame retardent fabrics.

#### Unavoidable Short Term Impacts

Some one-time adjustment costs are probably unavoidable whenever the regulations are introduced. Slackened industry sales would occur for one or two seasons prior to and after the implementation date as retailers buy more conservatively. This lighter buying by retailers would occur to avoid:

- o Losses on carry-over merchandise which does not meet new flammability regulations, and is obsolete after the implementation date.

- o Slow turnover of less flammable garments which may sell slowly for the first season or two after the implementation date.

There may also be a reluctance on the part of domestic sleepwear manufacturers to produce sleepwear for the first season or two after implementation, as many will adopt a "wait-and-see-what-happens" strategy. Once consumer acceptance has been determined, and preferences established, the domestic manufacturers will enter or exit from the manufacture of affected garments to match supply with demand. Retailer buying patterns will also adjust to new demand conditions after this time.

#### IMPACTS OF TIMING OPTIONS

Under all proposed timing options, the announcement date occurs at roughly the beginning of a manufacturing cycle, and a minimum of 18 months is provided prior to implementation. Thus, most avoidable costs would probably not be incurred. There still may be transitional costs due to conservative retail buying and restrained production for one or two seasons prior to and after the implementation date. For the March 1987 option, some importer/wholesalers might also take losses on one Spring season's worth of garments.

In this section, we discuss the qualitative effects of each option and then provide illustrative calculations of the short run costs which might result under each. It should be emphasized again that for the purposes of analyses, we have taken the perspective that all new regulations would be announced in October of 1985. This is in light of the fact that the minister's announcement regarding garment coverage Option 1, was made at this time. For comparability of the effects of each timing option, it is necessary to assume this announcement date for all of them.

#### Option 1 - Qualitative Effects

Under this option, the announcement of new regulations would be made in October 1985, and the implementation date would be March, 1987. For the purposes of discussion and illustrative calculations, it is assumed that gowns and robes would be covered by the new regulations.

The following reactions seem likely:

- o Domestic textile mills which react immediately after the announcement will be able to supply 100% polyester fabric for use in Spring 1987 sleepwear. However, all domestic mills may not produce sleepwear fabric for this season, and there may be some limited fabric imports from the U.S. to bridge shortages.
- o Many domestic sleepwear manufacturers, with a small interest in robes and gowns, will drop production of these

items until it is clear how the consumer will react, or until domestic mills can produce an acceptable 100% polyester.

- o Retailers may buy affected sleepwear styles somewhat lightly for the 1986 Fall selling season (prior to implementation) to avoid losses on obsolete inventory.
- o Retail buyers will buy affected sleepwear styles conservatively for the Spring of 1987 (the season of implementation).
- o Purchases for the Fall of 1987 (the season after implementation) will also be conservative as retailers wait to see what consumer reactions will be.
- o Some domestic sleepwear manufacturers will produce lightly for Spring and Fall of 1987 as they wait to see what consumer reactions will be to the less flammable sleepwear garments.
- o Losses to domestic manufacturers from slackened sales of affected styles will be offset somewhat by greatly reduced imports of these styles from the Far East.
- o It is assumed that the announcement date in October occurs before most importers make their 1985 orders in the Far East. This ensures that importers will not order goods which will become obsolete before their intended season of sale (Mar. 87 and beyond). However, importers will take losses on some orders (from the Far East) of fabric for affected styles in the season of implementation. These orders will have been placed before the announcement date for new regulations.
- o Some retailers will import some limited amounts of finished garments from the U.S. to bridge shortages of production from domestic sleepwear manufacturers.
- o Most inventories of fabrics not meeting new flammability standards would be fully consumed given this timing, and thus large inventory losses due to obsolescence would probably not occur.
- o Retailers will order more pajamas than in previous years in anticipation of substitution from robes and gowns.
- o Shortages of affected styles (gowns and robes) for retail sale will be likely for the near term.

### Option 2 - Qualitative Effects

Under this option, the announcement of new regulations would be made in October 1985, and the implementation date would be September, 1987. The two year lead time would ensure that importers' orders of affected styles would have time to clear the pipeline. This timing option's impacts would differ from Option 1 impacts in that the period of reduced sales would be centered on a Fall season rather than a Spring season and importers would not bear losses due to obsolete inventories. Again, shortages of all covered sleepwear styles would likely occur in the near term. Gowns, robes, tailored and baby doll pajamas (sizes 0 to 14X) are assumed to be covered by the new regulations for illustrative calculations.

For any given range of garments, short term losses might be less for a Fall implementation date than for a Spring implementation date. This is due to the fact that Fall selling seasons are considerably more important to domestic manufacturers than Spring seasons, and because a Spring implementation date might result in reduced sales for two Fall seasons, rather than one.

### Option 3 - Qualitative Effects

Under this option, the announcement of new regulations would be made in October 1985, and the implementation date would be March 1988. The impacts of this timing option would not differ from those of Option 2, except that the transitional period of reduced sales would be centered on a Spring selling season. As for timing Options 1 and 2, shortages of the covered styles would result in the near term. All sleepwear styles (sizes 0 to 14X) are assumed to be covered by the new regulations for illustrative calculations.

For any garment coverage range, the impacts of timing Option 2 and Option 3 are about the same. Thus, delays in implementing the new regulations beyond September 1987 would probably not reduce adjustment costs further. This again assumes that new regulations are announced in October 1985 in each case.

### ILLUSTRATIVE CALCULATIONS

Illustrative calculations of industry losses associated with each timing option are provided in Exhibit D-4, overleaf. The following assumptions were used in making these calculations:

#### For March 1987 date:

- o Gowns and robes sizes 0 to 14X are covered by the new regulations.
- o Volume and import content for each segment of the sleepwear market is as shown in Exhibit C-2.

**EXHIBIT D-4**  
**SHORT RUN INDUSTRY ADJUSTMENT COSTS**

Timing Option Implementation Date*	Retail Profit** Loss (\$ million)	Domestics Manufacturer Profit Loss** (\$ million)	Sleepwear*** Importer Loss (\$ millions)
<b>March 1987</b> (Gowns and Robes Covered)			
Loss in 1986 (Fall only)	1.7	0.3	
Loss in 1987 (Spring and Fall)	4.3	0.8	
Total Loss	6.0	1.1	0.3
<b>September 1987</b> (Gowns, Robes, Tailored and Baby Doll Covered)			
Loss in 1987 (Spring and Fall)	5.4	0.8	
Loss in 1988 (Spring only)	1.5	0.2	
Total Loss	6.9	1.0	0
<b>March 1988</b> (All sleepwear covered)			
Loss in 1987 (Fall only)	5.2	0.6	
Loss in 1988 (Spring and Fall)	14.9	1.6	
Total Loss	20.1	2.2	0

\* assumes announcement date is October, 1985

\*\* due to lost sleepwear sales

\*\*\* due to losses on inventories or committed orders of sleepwear and fabric which are obsolete before intended season of sale

Source: PMP estimates based on Industry Research



- o Retailers buy 10% fewer affected garments for the season prior to implementation (Fall 1986) to avoid carry over inventory losses.
- o Retailers and domestic manufacturers jointly reduce the availability (and sales) of affected garments by 20% for the season of implementation (Spring 1987).
- o Retailers and domestic manufacturers jointly reduce the availability (and sales) of affected garments by 20% in the first season after implementation (Fall 1987).
- o Imports of affected sleepwear are effectively blocked for the three selling seasons discussed above and domestic manufacturers pick up the import share of sales.
- o Importers committed (before the announcement date) to fabric orders for use in Spring, 1987 garments will take losses on these orders. Importers take distress prices of 50% of their cost. It is assumed that 30% of the fabrics used in affected garments are imported.
- o All merchandise bought by retailers sells in the seasons for which it is purchased with normal carryovers (except Fall 1986 for which there is no carry over).
- o Increased sales of unaffected sleepwear styles do not appreciably offset lost sales of affected styles.

For September 1987 date:

- o As for March 1987 except:
  - gowns, robes, baby doll and tailored pajamas 0 to 14X would be covered by new regulations
  - transitional period of reduced sales of affected garments is centered on September 1987
  - sleepwear importers take no losses on obsolete orders of sleepwear or fabric, as time has been allowed for all import orders made before the announcement date to clear the pipeline.

For March 1988 date:

- o As for March 1987 except:
  - all sleepwear styles sizes 0 to 14X would be covered by new regulations

- transitional period of reduced sales of affected garments is centered on March 1988
- sleepwear importers take no losses on obsolete orders of sleepwear or fabric, as time has been allowed for all import orders made before the announcement date to clear the pipeline.

### **IMPACT OF INFORMATION CAMPAIGN**

#### **Market Research**

Awareness studies conducted by Consumer and Corporate Affairs in March 1988 and by Wall in 1983, indicate that there is limited consumer awareness of the potential flammability hazards of children's sleepwear. The results of CCAC's (1986) study indicate that about half of all children's sleepwear consumers think it is essential that public information campaigns be used to warn people about flammability in children's sleepwear. A summary of the results of this study are presented in Appendix H.

From the results of her study, Wall states that "much work is needed to supply consumers with information so that they may become aware, understand the situation, and form attitudes toward the issue based on adequate knowledge". Wall goes on to recommend that "educational and information programs should be undertaken regardless of any other action by government. Consumers are sadly lacking in awareness that textiles, particularly in children's sleepwear, can pose a serious fire hazard".

From the above discussion, it seems that some form of public awareness program should accompany the implementation of new flammability regulations for children's sleepwear. This is the view which has been taken by CCAC and such a campaign is certain to coincide with the introduction of the new regulations. This section attempts to assess the impacts that such a campaign might have in addition to the impacts of the actual regulations.

#### **Impact Variables**

It is very difficult to anticipate the impacts of varying levels of expenditures on public awareness. The amount of expenditure on public awareness bears on impacts indirectly through the following variables:

- frequency and reach
- execution
- media used.

Increased public awareness expenditure can increase frequency and reach through the use of more expensive mass media or more media spots. Greater expenditure can also result in advertising executions of higher quality or greater creativity. Thus, the dollar amount of advertising generally determines the magnitude of the impact of any campaign.

Other variables which impinge on the effectiveness of any advertising campaign include:

- target audience
- message.

The choice of target audience and message are essentially strategic choices which are relatively costless, but these provide the direction for advertising impacts. The appropriate choices for these variables are obviously important and perhaps most critical in determining the success of a public awareness campaign.

#### **Impacts of Increased Expenditure**

While it is acknowledged that increased expenditure on public awareness will always increase desired impact, it is also acknowledged that there is a point at which this expenditure rapidly "tails off" in its incremental effectiveness. Predicting advertising response functions is something the academic and advertising communities have had little success with thus far. Due to the difficulty of such prediction, we have not attempted to forecast quantitative impacts on reduced burn severity and incidence for various levels of spending. Instead, we focus on the qualitative impacts the information campaign might have.

#### **Target Audience and Message**

For the sleepwear flammability campaign, CCAC's communications department states that both children and parents will be targetted. The message will alert parents and children to the potential danger of igniting children's sleepwear garments. The message will also promote the "stop, drop and roll" technique developed by Canadian Fire Services. A combination of media including radio, television, videos and literature, will be used. It is assumed that these media will be used in the best mix to reach the target audiences, for any level of expenditure.

#### **Qualitative Impacts**

Given a level of expenditure on this campaign, we might expect the following benefits to some degree:

- o Increased consumer adoption of less flammable sleepwear in affected styles.
- o Increased consumer purchase of less flammable sleepwear styles.
- o Increased parental supervision of children wearing sleepwear.

- o Increased awareness among children of sleepwear fire hazards and how to react to garment ignition.
- o Reduced burn severity and incidence as a result of all of the above.

These impacts would be qualitatively the same given the message which will be used by CCAC and would vary in degree with the amount spent on the information campaign.

The experience of past government information campaigns is that these have their greatest impacts in the initial stages of implementation. According to CCAC, this is largely because expenditures on awareness programs diminish after the first year or two of implementation. Decisions on budget allocations within CCAC are made on from year to year, but it is likely that in future years, resources will be drawn from the sleepwear information campaign to other uses. In addition to spending cuts, the stock of literature, videos and other aids will wear out or become obsolete, and more current issues will begin to occupy greater "top of mind" awareness among parents and children.

The greatest benefit of the information campaign may be in increasing early adoption of less flammable (polyester) sleepwear by consumers. This will improve the sales of sleepwear manufacturers in the near term, as well as enhance the near term impacts on burn severity and incidence. It may be that subsequent generations of parents, faced only with less flammable sleepwear, will buy such sleepwear readily, compared to today's parents who must make a transition.

#### **IMPACTS OF GARMENT COVERAGE OPTIONS**

We now discuss the expected impacts of the proposed garment coverage options in turn below. This discussion is largely qualitative, but is augmented by illustrative calculations in the section on "Output and Employment Impacts".

##### **Long Run Response to the Minister's Announcement (Option 1)**

This regulatory option announced in October 1985 would be implemented in March 1987 at the retail level. Nightgowns and robes would be covered by the new regulations. A base level of communications support would accompany the introduction of new regulations.

It is believed that this option would displace large percentages of the robe and gown segments due to:

- o price increases with the use of polyester;
- o the perceived poorer feel and breathability of polyester.

Decreased consumer demand could also be compounded by decreased styling and variety in robes and gowns. Decreased variety and styling in gowns may occur due to:

- o efforts of retailers and manufacturers to maintain price points, thus squeezing the labour component of cost;
- o potential styling limitations imposed by problems in finishing and texturing polyester.

Decreased variety and styling would likely affect the gift occasion segment of gown and robe sales most greatly. The gift occasion segment of robe sales may account for 80% of all robe sales and 30% of gown sales.

Decreased variety would also result in much less scope for differentiation among manufacturers, and the remaining gown and robe volumes would probably accrue to a much smaller number of manufacturers, those with slight cost or marketing advantages. These tend to be the large manufacturers in the sleepwear industry.

Manufacturers would incur increased carrying costs, as separate inventories of polyester would now have to be carried for gowns and robes. Depending on how volumes distribute themselves among manufacturers, minimum order sizes which are large relative to gown sales, could result in very low inventory turnovers.

Displaced demand for gowns and robes would likely result in:

- o increased demand for pajamas and other unaffected sleepwear garments;
- o increased home sewing of gowns;
- o increased purchase of larger sized (greater than children's 14 and small adult) gowns and robes for larger children;
- o increased use of non-sleepwear garments as substitutes.

#### Impacts of Option 2

This regulatory option would cover tailored and baby doll pajamas (except for children under 7 kg.) in addition to robes and gowns. It is believed that the effects of this option would be similar to the effects of Option 1 described above. The percentage of sales displaced from affected garments (gowns, robes, tailored and baby doll pajamas) would be moderated as the only unaffected substitute garments would be sleepers and polo pajamas. The main differential impacts of Option 2 versus Option 1 might be:

- o decreased unit sales of tailored and baby doll pajamas in addition to robes and gowns;
- o greater demand for polo pajamas and some increased demand for large sized blanket sleepers;
- o greater use of non-sleepwear garments as sleepwear substitutes.

Manufacturers would still have to carry separate inventories of children's sleepwear fabric. However, to the extent that the same fabrics are used in making tailored pajamas and other affected sleepwear garments, inventory turnovers would be greater and thus carrying costs would be somewhat less.

#### Impacts of Option 3

Option 3 would cover all children's sleepwear garments except those for children 7kg. or less. The longer term impacts of this option might differ from those of Options 1 or 2 in the following ways:

- o Consumer demand for all sleepwear would decline in response to higher prices across the board.
- o Substitution out of children's sleepwear and into daywear and home sewn garments would be greater than for Options 1 or 2. Those consumers with a strong preference for cotton in children's sleepwear would be most inclined to substitute cotton daywear for sleepwear.
- o Percentage price increases would be about the same for garments in each price range. Thus, there might be very little substitution between styles of sleepwear, but the overall market may shift in the direction of "down scale" garments to compensate for price increases.
- o The decreased variety resulting from such a downscale shift and inherent styling limitations, would decrease the number of sleepwear manufacturers somewhat. This effect would be greater for Option 3 than Options 1 or 2. Some of the volume lost by small producers would probably accrue to the larger sleepwear producers.
- o As the demand for polyester sleepwear fabrics would be greatest under this regulatory regime, there is a higher likelihood that domestic textile mills would supply the demand for these fabrics.
- o The greater fabric and garment demand might also encourage import competition.

- o Inventory turnovers would be higher to the extent that all sleepwear garments use the same polyester fabrics. Thus, carrying costs to manufacturers would be lower than under Options 1 or 2.

#### OUTPUT AND EMPLOYMENT IMPACTS

Under the assumption that labour content (man-hours) per sleepwear garment is unaffected by fabric (and style), employment in the sleepwear industry is affected primarily by the change in domestic unit volumes. Thus all regulatory options have potential employment effects in that:

- o Price increases in some segments of the sleepwear market will result from increased fabric costs. This will result in some substitution between segments (styles) of sleepwear and will have volume effects.
- o The import share of affected sleepwear garments, or fabrics may shift off trend. This will affect domestic volumes directly.

Given that employment in the sleepwear industry is tied to domestic output, job losses in the sleepwear industry will be reduced to the extent that:

- o Consumers spend dollars displaced from affected sleepwear styles on other sleepwear items.
- o Imports of finished sleepwear garments are reduced and consumers buy more units of domestically produced sleepwear.
- o Consumers substitute spending on more labour-intensive sleepwear garments (e.g., pajamas versus robes). In general, these are cheaper sleepwear garments where the fabric component of cost is somewhat less and the labour component is somewhat greater on a percentage basis.

However, job losses in the sleepwear industry will be greater to the extent that:

- o Imports of inexpensive fabric are reduced, further increasing domestic sleepwear prices, and further decreasing domestic unit volumes.
- o Consumers continue to buy affected sleepwear styles at increased prices, but in correspondingly smaller unit amounts.

Illustrative calculations of volume and substitution effects for each garment coverage option follow below. Assumptions used in making these calculations are discussed later in this Appendix.

### Option 1

Garments Affected	% of Unit Volume Lost (joint effect of price and fabric changes)	Change In Total Retail Sales (\$ millions)	Change In Domestic Retail Sales (\$ millions)	Change In Domestic Unit Volume (millions)
Nightgowns	70%	-16.0	-15.5	-1.87
Robes	70%	-11.5	-11.2	-.74
TOTAL		-27.5	-26.7	-2.61
<u>Substitute Item</u>				
Pajamas*		+30.1	+22.6	+2.11
Net Change (all sleepwear)		+2.6	-4.1	-.5
				-4% of domestic output

\* average price (imports and domestic) of \$10, and 30% unit import content.

### Changes in Output

Although pajamas are more import-intensive than robes and gowns, they are also cheaper on a unit basis; this results in largely offsetting effects on domestic sleepwear unit volumes. Thus, under the assumption that spending displaced from gowns and robes is spent on pajamas, domestic unit production might decrease by only 4%. In addition, at equilibrium, domestic sales may be about \$4 million less (\$116 million) and sales of imports may be \$7 million higher (\$37 million). Thus, on net, total retail sleepwear sales may be about \$3 million higher.

The results are highly sensitive to the assumptions which have been made about:

- o the nature of substitute spending;
- o the relative import content and prices of substitute garments;
- o the price elasticity of demand;
- o the "effective" increase in the price of affected sleepwear.



To the extent that import content or prices for the substitute garments are higher, reductions in domestic unit output will be more likely. To the extent that demand is more inelastic or the effective price increase is less, reductions in domestic unit output will be smaller. These sensitivities are discussed in greater detail later in this Appendix.

#### Changes in Employment

Based on an estimated average annual wage of \$15,000 per year for production workers, and sales estimates presented in Table C-2, the sleepwear industry may employ about 1,600 people directly. The sleepwear industry may be responsible for another 265 jobs in supplying fabric mills (using DRIE labour/output ratio of 11 jobs/\$ million fabric sales\*).

As domestic unit output would decrease by, at most, 4% under our assumptions, employment in the sleepwear industry might also change by this amount. At most, perhaps 75 jobs would be lost in the sleepwear and fabric industries combined.

While no significant net employment impacts are expected, limited demand for the new sleepwear and fabrics may reduce the number of firms producing robes and gowns. Such rationalization might result in layoffs at some plants and offsetting new hires at others, such that the net effect on employment would be minor.

#### Option 2

Garments Affected	% of Unit Volume Lost (joint effect) of price and fabric changes)	Change In Total Retail Sales (\$ millions)	Change In Domestic Retail Sales (\$ millions)	Change In Domestic Unit Volume (millions)
Nightgowns and Robes	45%	-15.0	-14.6	-1.59
Tailored Pjs	45%	-6.0	-4.5	-.57
Baby Doll	45%	-.4	-.3	-.03
<b>TOTAL</b>		<b>-21.4</b>	<b>-19.4</b>	<b>-2.19</b>

\* From discussions with DRIE.

## Option 2 (Cont.)

Garments Affected	% of Unit Volume Lost (joint effect) of price and fabric changes)	Change In Total Retail Sales (\$ millions)	Change In Domestic Retail Sales (\$ millions)	Change In Domestic Unit Volume (millions)
<u>Substitute Item</u>				
Polo Pajamas*		+28.4	+21.3	+1.99
Net Change (all sleepwear)		+7.0	+1.9	-2
				- 2% of domestic output

\* average price (imports and domestic) of \$10, and 30% unit import content.

**Changes in Output**

Given our assumption that spending displaced from affected sleepwear garments is now spent on polo pajamas, the incremental effect of Option 2 with respect to Option 1 is almost nil. This is due to the fact that spending on polo pajamas is substituted for spending on tailored and baby doll pajamas. These garments are all similarly priced and have similar import content. In fact, as we expect percentage volume losses (for affected styles) to be smaller under Option 2, impacts on unit volumes might be less than under Option 1. In addition, total dollar volumes might increase by about \$7 million. About \$2 million might accrue to domestic manufacturers and \$5 million might accrue to imports. The increase in domestic sales over Option 1 would be due to the fact that fewer consumers would switch from affected garments to cheaper substitutes.

**Changes in Employment**

As was the case for Option 1, there may be some layoffs with offsetting new hires in the sleepwear and fabric industries. Net of these effects perhaps 40 jobs might be lost in the sleepwear and fabric industries. Thus, given our assumptions, the incremental impact of Option 2 on employment is small and may even be slightly positive.

## Option 3

Garments Affected	% of Unit Volume Lost (joint effect) of price and fabric changes)	Change In Total Retail Sales (\$ millions)	Change In Domestic Retail Sales (\$ millions)	Change In Domestic Unit Volume (millions)
All Children's Sleepwear	23%	-11.4	-9.2	-3.0
Net Change (Sleepwear Industry)		-11.4	-9.2	-3.0
				-23% of domestic output
<u>Substitute Item</u>				
Active wear*, home Sewn garments		+34.5	+25.9	+2.4
Net Change (Children's Clothing Industry)		+23.1	+16.7	-6

\* average price (imported and domestic) of \$10, and 30% unit import content

**Changes in Output**

As Option 3 covers all styles of children's sleepwear with the effective exception of newborn gowns, all garments may rise by 20% in retail price. This across-the-board price increase, might result in very little substitution between styles. A unit volume decrease of 23% might result under Option 3 given these assumptions.

**Changes in Employment**

A 23% decrease in output could translate into 370 lost jobs in the domestic sleepwear industry. The ripple effect of this might be 60 lost jobs in supplying fabric mills.

To the extent that displaced spending is used to purchase similarly priced active wear with similar import content to sleepwear, the impact on the entire children's clothing industry will again be negligible. As an example, sleepwear manufacturers who produce jogging suits as well as

polo pajamas might pick up offsetting volume. Thus the main effect of Option 3 might be to re-distribute employment and income to other children's clothing manufacturers outside of the sleepwear industry. Under Option 3, further adjustment costs might accrue in the form of:

- o unemployment insurance payments by government;
- o start-up costs to sleepwear manufacturers not currently manufacturing active wear.

It should be noted that a brief submitted to CCAC by CAMA, puts current sales and employment levels at about double those we have used. These estimates, together with CAMA's higher estimates of likely retail price increases, would result in estimates of lost jobs far in excess of those we have calculated.

#### ASSUMPTIONS MADE IN CALCULATING QUANTITATIVE IMPACTS

A number of assumptions have been used in estimating the impacts on output and employment. These same assumptions are used to calculate consumer surplus losses and are thus critical in determining the overall impact of each regulatory option. For this reason, we present our assumptions one by one and discuss the sensitivity of our results to changes in the major assumptions. The following assumptions have been made in calculating impacts on output and employment and consumer surplus losses:

- o Current prices, volumes and import levels are as in Exhibit C-2.
- o The retail price of all affected sleepwear garments (including imports) increases by 20% as a result of substituting 100% polyester for current fabrics. The fabrics and prices of non-affected garments remain constant.
- o There is a strong preference for current sleepwear fabrics versus polyester and other substitute sleepwear fabrics. This compounds the effects of price increases from the use of polyester by inducing greater switching to cotton garments. An equivalent price increase of 25% is used to model the effects of fabric substitution on quality. This approach is explained in detail below.
- o Demand curves are linear.
- o Demand for affected sleepwear garments becomes increasingly price/fabric inelastic as the range of covered garments is extended, and the range of non-affected substitutes is effectively narrowed. Elasticities of 1.5, 1.0 and .5 are used to calculate volume and surplus losses for Options 1, 2 and 3, respectively.

- o All spending displaced from affected garments due to price and fabric quality effects accrues to other sleepwear garments in the case of Options 1 and 2, and to other children's clothing in the case of Option 3.
- o In the long run, import and domestic sleepwear shares remain at status quo levels for each garment style. Increases or decreases in style volumes accrue to imports and domestic production in proportion to status quo shares.

These assumptions and the sensitivity of impacts to changes in these are discussed in greater detail below. We first discuss at some length the methodology used to calculate the effects of fabric changes on consumer surplus and sleepwear volumes. For the purposes of discussion, we will refer to perceived changes in breathability and texture (associated with polyester) as reductions in fabric quality.

#### DEALING WITH THE EFFECTS OF FABRIC QUALITY

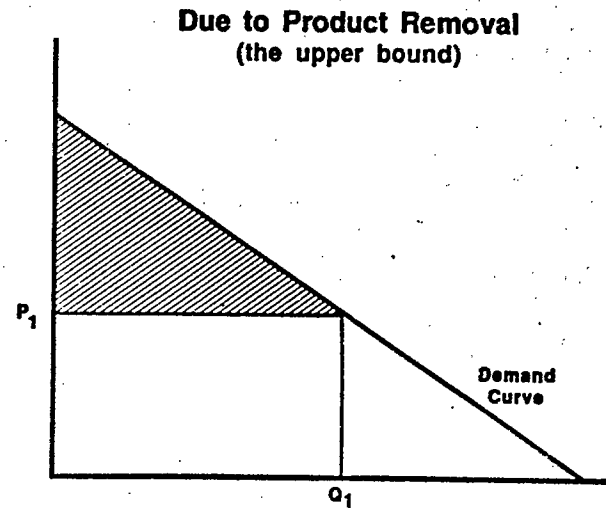
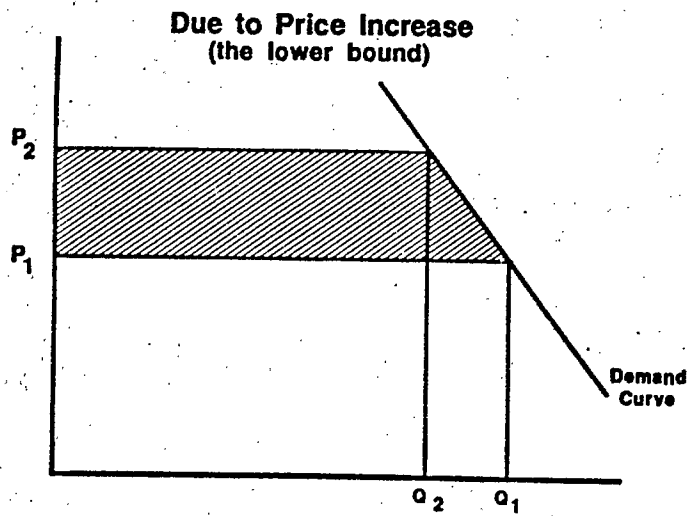
Consumer surplus loss calculations are used to try to gauge utility losses which result from increases in price and fabric changes in affected sleepwear styles. Higher prices and poorer fabric quality combine to reduce the total utility attainable by consumers of sleepwear for a particular expenditure. While the consumer surplus approach is adequate for capturing the effects of product removal or a price increase, it is not directly applicable to the task of assessing losses which stem from a change in product quality. Likewise, conventional supply and demand analysis cannot forecast the effect on volume of decreased quality.

It can be said that the utility loss to consumers may be gauged by a surplus loss which lies between the pure price effect and the product removal effect. These cases are depicted graphically in Exhibit D-5, overleaf. Some consumers will place very high value on having cotton sleepwear in the particular style covered by regulations. In this extreme case, the substitution of polyester for cotton can be modelled by the product removal case, although for a reduced base of consumers. At the other extreme, some consumers will be almost indifferent to style or fabric changes but will still be subject to increased price. To the extent that other sleepwear garments are close substitutes and are similarly priced, this second group of consumers will substitute these garments and not be much worse off.

Thus, volume losses are bounded at one end by the entire segment volume, and at the other by what could be expected if only a price increase were to occur.

As the consumer surplus model is only capable of dealing with the cases of product removal and price increases directly, we have devised a method of translating the joint effects of increased price and decreased quality into an equivalent effect which is intermediate to the product removal and price

EXHIBIT D5  
CONSUMER SURPLUS LOSS



 Consumer Surplus Loss

increase cases. We also use this method to forecast volume decreases which stem from decreased fabric quality and price increase.

#### Assumptions

An assessment of the order of magnitude differences in consumer utility losses under each option is necessary to determine the relative severity or "badness" of these. In order to use consumer surplus to estimate these order of magnitude differences, it is necessary to assume constant marginal utility from the consumption of sleepwear (at least within budgeted expenditure ranges). The constant marginal utility assumption may be fair, at least within normal budgeted purchase ranges. Given this assumption, we can place consumer surplus losses under each option on a ratio scale to determine how severe these options are relative to one another.

#### The Purchase Decision

The consumer makes his decision on what to buy on the basis of units per dollar.  $U_1/P_1$  is the utility/price (u/p) ratio for garment one and  $U_2/P_2$  is the utility/price ratio for garment two. As a result of the constant utility assumption consumers will only buy one type/style of sleepwear; that with the greatest u/p ratio.

#### Price Effects

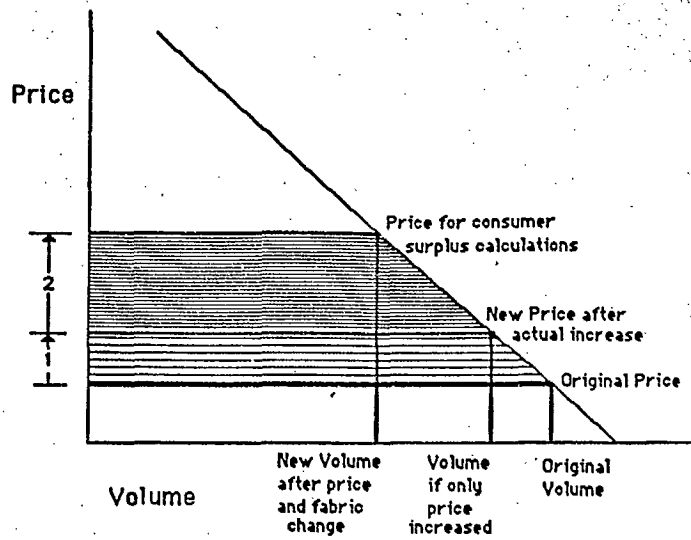
Now, price clearly enters the decision on what to buy through the denominators of the u/p ratios. As the price of garment 1 increases, its u/p ratio decreases and garment 2 becomes increasingly attractive until the threshold point where all spending is then on garment 2. Price alters these ratios uniformly for all consumers regardless of the numerator values. The loss in total utility from a price increase is a result of an income effect and the fact that resources are drawn from more sleepwear consumption or other consumption. Thus, price increases limit the total utility attainable, through decreasing the number of units of sleepwear or other substitute goods which can be bought.

#### Price Elasticity Interpreted

In the consumer surplus model, utility losses are gauged as consumer surplus losses depicted by the cross hatched areas in Exhibit D-5. To the extent that, the demand curve is flat and is price elastic, total utility and consumer surplus losses are less in either the price increase or product removal case. The relative price elasticity of demand implies that there are ready substitutes for the particular garment (i.e., garments with similar u/p ratios). Thus, the effect of a price increase in one garment is minimal if there are many other "good buys" to be had in sleepwear. These other sleepwear garments may be substituted without losing much in the way of total utility. On the other hand, if the consumer sees unaffected sleepwear garments as poor substitutes for regulated garments

Exhibit D - 6

Equivalent Price Increase  
of Fabric Substitution



- 1 Upward shift of supply curve in response to increased costs
- 2 Virtual upward shift of supply curve - equivalent to decreased fabric quality



Consumer Surplus Loss due to actual price increase



Consumer Surplus Loss due to decreased fabric quality



(and these are the only substitutes) then the demand curve of regulated garments is relatively price inelastic. In this case, the imposition of new flammability standards subjects the consumer (by forcing him to buy one of the poor substitutes) to a considerable loss in total utility which is gauged by a large surplus loss.

#### Quality Effects

Quality enters the purchase decision through the numerator of the u/p ratio. The substitution of polyester for cotton in garment 1 reduces the utility which can be had from each unit of that garment, but the marginal effect that polyester substitution has on utility will vary among consumers. For each consumer there is a corresponding price change which would offset the marginal effect of polyester substitution on the overall u/p ratio. Clearly, this number is not known for every consumer, but if it can be approximated for the average consumer, we can translate average quality effects on total utility (from sleepwear consumption) into an average equivalent price increase.

#### Equivalent Price Effect of Decreased Quality

If the average consumer could be compensated for the substitution of polyester for cotton by a price decrease of 20%, we can easily calculate the equivalent price increase of this substitution. Assuming a 20% decrease is correct, the substitution of polyester for cotton in sleepwear garments is equivalent to 25% price increase (1/.8). If we then add to this an actual price increase of 20% we have reduced total utility attainable, by an amount equivalent to a total price increase of about 45% (of the original price). With this transformation of quality effects into price effects, we can then calculate the consumer surplus loss from joint price/quality effects in our conventional framework. Again, to the extent that the price elasticity of demand for a garment is elastic (i.e., there are close substitutes with similar u/p ratios), the total utility and surplus losses incurred will be less.

The effect of decreased garment quality can be modelled through an upward "virtual shift" of the supply curve. This is depicted in Exhibit D-6, opposite. Using this approach, we can forecast the volume effects and surplus losses from a joint change in price and quality. This can be achieved through standard means using price elasticities. In Exhibit D-6, the effective consumer surplus loss is the sum of the loss due to the actual price increase, and due to the equivalent price increase of decreased fabric quality. The volume loss of affected sleepwear is compounded by the fabric effect and is thus greater than the volume loss from a price increase alone. The new volume can be read off Exhibit D-6, where the projection of "virtual price" intersects the volume axis.

The key to all calculations is the price equivalent effect of the substitution of polyester for cotton. In other words, how big would the virtual shift of

the supply curve be. This could be measured empirically using conjoint analysis\*, but project deadlines have not permitted this approach.

Instead, we have taken estimates of price elasticity, the nominal price increase and forecasts (from interviews) of sleepwear volumes after the implementation of new regulations to imply equivalent price effects for

fabric quality. In this way, we estimate the equivalent price effect of decreased fabric quality to be an added 25% increase in price.

We now discuss the other key assumptions which have been used, and the sensitivity of calculations of consumer surplus and volume losses to changes in these.

#### LINEARITY OF DEMAND CURVE

It is unlikely that the demand curve for sleepwear is linear. In fact, theory would predict that a concave curve would be more representative of the demand for most goods. However, it is convenient to assume linear demand curves to capture order of magnitude effects when there is not empirical evidence of the shape of the demand curve.

#### Consumer Surplus Loss Calculation

Assuming the demand curve is linear, the loss to the consumer is then given by:

$$\text{C.S. LOSS} = t * V_1 * (1 - (n * t)/2)$$

where  $t = ((P_1 - P_2)/P_1) + F$  the "effective" change in retail price (nominal plus fabric quality component)

$F =$  the equivalent price increase due to decreased fabric quality

$V_1 = P_1 * Q_1$  the initial dollar volume of sales

$n =$  price elasticity of demand for sleepwear styles affected by flammability regulations

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\* Conjoint analysis is a multivariate statistical technique for estimating the utility function associated with the consumption of a particular good. The technique "fits" a utility function to empirically collected preference rankings of pre-defined goods with fixed levels of attributes. In effect, conjoint analysis transforms rank order preference data into a cardinal utility function for the good under study. The marginal utilities of the considered product attributes (including price) can be estimated and compared using this method.

$P_1, Q_1 =$  the initial price and quantity respectively before the imposition of the flammability standard

$P_2 =$  the price of affected styles after the imposition of flammability standard, i.e., made of polyester

If a concave demand curve was used to estimate volume and consumer surplus effects, this curve would necessarily be tangent to our linear curve at the current equilibrium price and volume point. From this point, the concave curve would rise above the equivalent linear curve. The use of a concave demand curve would then increase our estimates of consumer surplus loss, and decrease our estimate of volume losses and substitution. The functional form of the demand curve is then important in calculating impacts on output and employment and consumer surplus.

#### COST OF POLYESTER VS. COTTON FABRIC

In the United States, some cotton flannellettes now cost about the same as some polyester fabrics which were developed to replace them in children's sleepwear. This may reflect supply and demand conditions more than the relative cost of production. However, it is uncertain whether polyester fabrics used to replace current sleepwear fabrics will be at a cost premium over these in future years.

In light of the above discussion, the actual premium over cotton which consumers would have to pay could fluctuate from year to year. As a result, consumer surplus losses would also vary from year to year in response to changes in relative fabric prices. The issue really though, is whether recent trends, on which estimates of the price premium are based, are "normal" over the long run. The consumer surplus calculations are therefore very sensitive to the actual price premium which consumers will have to pay in the long run. To the extent which current premiums for polyester are "super normal" the long run consumer surplus loss has been overstated. Likewise, impacts on domestic output and employment have been overstated.

#### EQUIVALENT PRICE EFFECT OF FABRIC QUALITY

Similarly, the current preference for cotton over polyester may be more or less extreme than we have assumed. Over or under estimation of the equivalent price effect of polyester substitution could have a large effect on calculations of consumer surplus and volume losses. Again, the issue really is whether recent trends in "taste" are "normal" over the long run or not. If, for instance, polyester became fashionable once again, as it was in the 1970's, the price equivalent effect of polyester substitution might well be negative. That is to say that consumers would pay a premium to have polyester rather than cotton sleepwear.

The above discussion is concerned with whether current fabric tastes have been measured correctly (as the price equivalent effect of quality), and whether current tastes are "normal" over the long run. In addition to these issues, it is possible that the introduction of new regulations will change tastes in the direction of preferring substitute fabrics. The increased availability of sleepwear made from polyester may serve to educate parents about this fabric and ultimately polyester sleepwear may prove to be quite acceptable vis-a-vis cotton. Again, this would reduce the price equivalent effect of fabric quality and consumer surplus losses accordingly.

## PRICE ELASTICITIES

### Sleepwear Segment Elasticities

Estimation of segment price elasticities from secondary sources (Statistics Canada and U.S. Department of Commerce) was considered inappropriate due to a number of data limitations. The main limitation of available data was the fact that historic price changes have tended to be across-the-board for all style segments of children's sleepwear (i.e., no large real price increases for certain segments). Under Options 1 or 2, only certain segments of the market would change in price, and thus estimates derived from available data might fail to capture likely substitution effects (cross-price elasticities) and would not properly reflect consumer surplus or volume losses. In short, elasticity estimates derived from available data might be biased downwards.

Elasticities of 1.5 and 1.0 were used to estimate consumer surplus and volume losses for garment coverage Options 1 and 2, respectively. These elasticity estimates were roughly consistent (given linear demand curves and "effective" price increases) with estimates of product shifts taken from industry interviews. Using decreasing elasticities for successive garment coverage options (1 through 3) is also consistent with the decreasing number of unaffected substitute styles which would be available under each option. Arguably, consumers would become increasingly resistant to style switching under successive options as there would be fewer unaffected substitutes available.

### Elasticity of Demand for Children's Sleepwear in Aggregate

Problems with levels of aggregation, classification systems, and other issues limited the suitability of available secondary data for estimating the price elasticity of the entire category of children's sleepwear. However, an analysis of available U.S. and Canadian data suggests that historic price elasticities are roughly in the 0.2 to 0.5 range for children's sleepwear aggregate. An elasticity of 0.5 was chosen as our base case estimate of elasticity for the entire children's sleepwear market and 0.2 was used as the lower value in our sensitivity analysis.

To the extent that we have incorrectly estimated price elasticities under the various options, our estimates of consumer surplus and volume losses are correspondingly incorrect. However, it is believed that the upper and lower values used for sensitivity analysis adequately bracket the actual range of elasticities which would result under each garment coverage option.

A second caveat stems from the fact that elasticities may change with time as taste shifts occur. To the extent that current tastes (and elasticities) are not "normal" over the long run, we have mis-estimated long run consumer surplus losses.

#### SUBSTITUTION EFFECTS

For the purposes of this analysis, we have discussed "substitution effects" rather than "cross-price elasticities" for substitute goods. That is to say that we have considered how much spending would be displaced from affected sleepwear garments due to increased prices and fabric changes, and then assessed where displaced dollars would be spent. This differs from the formal approach of using cross-price elasticities for substitute goods. Still, each substitution scenario corresponds to an implied cross-price elasticity for the substitute good. For clarity of presentation and consistency with interview data, the "substitution effects" approach was chosen as the means by which to model style segment shifts in volume.

We have assumed for the purposes of calculations, that all spending displaced from garments affected by each option would be spent on sleepwear or other children's clothing items. In the case of Option 1, it is assumed that tailored and polo pajamas would be substituted, and in the case of Option 2, only polo pajamas would be substituted. We have assumed a price of \$10 and a unit import content of 30% for substitute garments. For Option 3, it was assumed that other children's clothing items, also priced at \$10 per garment, and with a 30% unit import content, would be purchased instead. The actual substitution which might result under each option may well be different from what has been assumed for illustrative calculations.

Substitution may, in fact, occur on a unit-per-unit basis rather than a dollar-for-dollar basis, as was assumed. In this case impacts on domestic volume would be more severe. It is also conceivable that cheaper imports could pick up more than proportional amounts of displaced spending, and this could have further adverse effects on domestic output. There are, in fact, a large number of substitution scenarios which are conceivable. The import substitution scenario has no bearing on calculations of consumer surplus losses, but is perhaps the most critical assumption in calculating impacts on domestic output and employment.

#### HEALTH CARE COSTS

In order to assess the impacts of the regulatory options on health care costs, it was necessary to develop estimates of the costs of treatment for

**EXHIBIT D-7**

**STATUS QUO ANNUAL BURN TREATMENT COSTS  
(1985 \$)**

Burn Severity	Extent of Burn (% of Body Area)		
	<15%	15% - 60%	>60%
<b>3rd Degree</b>			
# burns status quo	4	12	5
# days in hospital	42	120	180
# of physician visits	23	23	23
Total cost/burn	\$ 27,712	\$ 78,537	\$ 117,633
Total status quo cost	\$ 110,849	\$ 942,444	\$ 588,165
<b>2nd Degree</b>			
# burns status quo	8	8	0
# days in hospital	21	60	60
# of physician visits	12	12	12
Total cost/burn	\$ 13,864	\$ 39,276	\$ 39,276
Total status quo cost	\$ 110,912	\$ 314,208	\$
<b>Fatal</b>			
# burns status quo	3		
# days in hospital	30		
# of physician visits	30	N/A	N/A
Total cost/burn	\$ 19,998		
Total status quo cost	\$ 59,994		

**All Burns**

**Total Status Quo Cost \$2,126,572**

**Total Number of Hospital Days 3,246**

Based on: Per diem cost of hospital  
burn treatment: \$652/day

Cost of follow-up physician visit: \$15/visit

SOURCE: Expert Opinion

burns of varying severity. Definitive data on length of hospital stay or costs associated with the treatment of burns from children's sleepwear are not readily available.

The Hospital Medical Records Institute has a data base which could provide a breakdown of length of hospital stay by burn severity, for children treated for clothing burns in Canada. However, this would have required added time for special computer runs, and was infeasible within project deadlines and resource availability. Instead we spoke with paediatric plastic surgeons who deal with clothing burns and had them estimate the length of hospital stay and number of physician visits for each burn category. These estimates multiplied by the daily cost of treating a burn in each severity category would yield total costs per burn. However, the use of global budgeting in provincial health care systems precludes an analysis of hospitalization costs by diagnosis.

To estimate daily costs of burn treatment, we took an average per diem rate across all diagnoses (provided by the Hospital for Sick Children in Toronto) and increased this by 20%, as an approximation of actual costs. On this basis, the average costs incurred as a result of a sleepwear burn in each category would be as shown in Exhibit D-7, opposite. Using Dr. Stanwick's estimate of the current number and distribution of burns, total status quo costs for the treatment of children's sleepwear burns would total about \$2 million annually.

The health care costs which would be incurred under each regulatory regime can be calculated by multiplying QCF estimates for each burn category by the corresponding cost estimate in Exhibit D-7. The sum of these costs subtracted from the status quo total costs, yields the estimated cost savings from reduced burn incidence and severity for each option.

**APPENDIX E**

**RESULTS OF THE QCF SURVEY**



## APPENDIX E

ESTIMATES OF BURN SEVERITY AND INCIDENCE -  
QUALITATIVE CONTROLLED FEEDBACK RESULTS

## INTRODUCTION

The best data which exists on the current incidence and severity of sleepwear burns to children, comes from a 1982 study by Dr. Richard Stanwick. The 1982 study indicated that a total of 21 burns due to sleepwear may occur in any one year, and that 1 or 2 of these burns may result in death. However, this study only covered tertiary burn treatment units, and as a result, these estimates do not cover all children's sleepwear-related burns which occur. Dr. Stanwick's judgemental estimate of the number of sleepwear burns occurring in any one year is 40 to 50 burns with 2 to 4 of these resulting in death (see Attachment 1 to this Appendix).

There is no definitive experimental data with which to estimate the impact of the regulatory options on the current incidence and severity of children's sleepwear burns. As an approach to estimating impacts on sleepwear burns, a survey technique known as Qualitative Controlled Feedback (QCF) was used.

QCF is an iterative survey technique which uses a panel of experts to estimate quantitative data in an area of interest. The process is iterative in that there are two or more rounds to complete. In the first round, the panel is asked to complete a questionnaire giving reasons for answers. These reasons are compiled on a "composite reason list" and this is sent out with the subsequent round questionnaires. QCF differs from the related Delphi technique in that summary statistical measures of the earlier round results are not provided. This is to avoid biasing responses towards the mean which has been noted in the use of the Delphi technique. The reasons of other group members provide the only stimulus to change responses from earlier iterations. As the anonymity of panel members is preserved, status hierarchy effects on judgements are avoided as well.

## THE SURVEY PROCESS

Respondents for the QCF were assembled using a snowball technique; i.e., that certain well-known experts were approached to take part in the survey. These experts were then asked to provide names of others with backgrounds suitable to the task of assessing the impacts of new regulations. As a result of this process, our assembled panel consisted of 16 medical and textile professionals. Collectively, panel members had experience in the U.K., Canada and the United States in the area of sleepwear flammability and burn treatment. A list of the QCF panel respondents and their credentials is included as Attachment 2 to this Appendix.

A written questionnaire was sent to the designated panel of experts. This questionnaire is provided as Attachment 3 to this appendix. As part of the instructions to the questionnaire, each of the three regulatory options was described in detail. Respondents were also given an approximate annual breakdown of yearly sleepwear burns, classified by extent of burn (<15%, 15%-60%, and >60% of body), and burn severity (major/3rd degree and minor/2nd degree), as well as the number of fatalities (exclusive of the extent of burn severity categories). This breakdown was based on a hypothetical total of 100 burns (rather than 40) to ensure that shifts between categories of burn severity and burn extent would be captured. The distribution of burns within this hypothetical 100 is meant to be representative of the actual distribution of the estimated total number of burns (40). However, it must be stressed that the figure of 100 was chosen for analytical convenience. For the purposes of analysing actual expected impacts, the estimated 40 status-quo burns were scaled by the results of the QCF. This is to say that the results of the QCF survey for each regulatory option were translated into equivalent impacts on a status quo total of 40 annual sleepwear burns.

Respondents were asked to assess what relative changes would occur in each of the 7 questionnaire calls (3 extent of burn categories times 2 degree categories plus one fatality category) for each regulatory option. They were also asked to indicate the relative number of burns which would not occur under each of the regulatory options but which do occur in the status-quo case. This category was inserted to ensure the new totals added to 100.

In order to meet the project deadlines, responses were collected by telephone. A composite reason list\* was compiled, and sent back to each of the first-round respondents. They were then asked if, based on these reasons, they would change their first-round responses. Only one individual changed his response, and the modification was minor. In the discussion of results in the following section, we incorporate the second-round estimates of that one individual into the first-round responses of each of the other experts. A total of 16 individuals responded to the questionnaires.

## RESULTS

### Third Degree Burns

Exhibit E-1, overleaf, shows the average response for each of the questions, with the range in parenthesis. As seen in this Exhibit, the number of third degree burns covering less than 15% of the body is estimated, as an average, to increase by 70% under option 1, i.e., to go from 10 to 17. However, it should be noted that there is a wide diversity of views on this

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\* This composite reason list is Attachment 4 to this Appendix.

**EXHIBIT E-1**  
**IMPACTS OF REGULATORY OPTIONS**  
**ON BURN SEVERITY AND INCIDENCE**

(actual range of estimates)

Burn Severity	Extent of Burn (% of Body Area)			Total
	<15%	15% - 60%	>60%	
<b>3rd Degree**</b>	<b>#****</b>	<b>#</b>	<b>#</b>	<b>#</b>
Status Quo	10	30	15	55
Under Option 1	17 (2-45)*	16 (0-40)	5 (0-10)	39 (11-70)
Under Option 2	19 (1-49)	11 (0-23)	3 (0-10)	32 (5-75)
Under Option 3	20 (0-50)	10 (0-25)	2 (0-5)	32 (0-80)
<b>2nd Degree**</b>				
Status Quo	20	20	0	40
Under Option 1	23 (5-45)	12 (4-25)	0 (0-0)	35 (20-57)
Under Option 2	26 (7-58)	11 (2-30)	0 (0-5)	37 (12-78)
Under Option 3	26 (5-60)	10 (0-28)	0 (0-5)	36 (8-76)
<b>Non-Incident</b>				
Status Quo	N/A****	N/A	N/A	0 N/A
Under Option 1	N/A	N/A	N/A	23 (0-66)
Under Option 2	N/A	N/A	N/A	29 (0-83)
Under Option 3	N/A	N/A	N/A	30 (0-88)
<b>Fatal</b>				
Status Quo	N/A	N/A	N/A	5 N/A
Under Option 1	N/A	N/A	N/A	2 (0-5)
Under Option 2	N/A	N/A	N/A	1 (0-1)
Under Option 3	N/A	N/A	N/A	1 (0-3)

\* The number outside the parentheses is the arithmetic mean. The numbers inside the parentheses represent the actual range of values. Numbers add up to 100 under each option.

\*\* 3rd degree and 2nd degree corresponds to the accepted medical interpretation of these burn severity categories.

\*\*\* A hypothetical 100 burns was used as the base case for responding to the QCF. Numbers should be interpreted as the percentage of all sleepwear burns which actually occur annually.

\*\*\*\* N/A means not applicable.

change. Two experts forecast an increase to 45 (a 350% increase in incidence of these burns), while one forecast 2 and another 5. Physicians tended to respond higher in this category, indicating that extensive burns (over 60% of the body) would tend to be decreased, but small third degree burns, later requiring grafting, would increase. An overall decrease in extensive burns is noted in Exhibit E-1 as well. Burns covering over 60% of the body range from 15 in the Base Case, to 5, 3 and 2 for Options 1, 2 and 3, respectively.

Several experts responded to the third degree burn category in unusual ways. One respondent saw major differences in the Options, with third degree burns covering small areas going from 10 to 20 to 35 for options 1, 2, and 3, and burns covering 15-60% of the body moving from 40 to 20 to 18 for the three options. The reason given was that Option 1 exempted the most popular types of sleepwear. Several individuals who cited British experience indicated particularly significant decreases in third degree burns. One of these suggested a drop in small (less than 15%) third degree burns of 50%, and of large third degree burns of 67%, in Option 2. A second expert indicated that British and U.S. experience indicated a complete elimination of large third degree burns under Option 1, and a reduction of the 15-60% category from 30 to 5 under Option 1.

In general, there are not sizeable differences among the three options for major burns. Experts who rated low on one option tended to follow suit on other options, and vice versa. This is corroborated by examination of the correlation coefficients for the various major burn categories. These are as follows:

Correlation Between	Extent of Burns		
	<15%	15%-60%	>60%
Option 1, Option 2	.890	.805	.432
Option 1, Option 3	.831	.720	.617
Option 2, Option 3	.973	.974	.741

#### Second Degree Burns

On average, the experts saw a small increase in second degree burns covering under 15% of the body, increasing from the current 20 to 23 under Option 1 and 26 under Options 2 and 3. However, there was quite a diversity in opinions on these estimates. For example, the forecast under Option 2 ranges from 7 to 58. As one would expect, those forecasting a large increase in third degree burns covering under 15% of the body also estimated a similar decrease in second degree burns covering under 15% of the body (and vice versa). Thus the correlation coefficients between these two estimates are -.685, -.595, and -.541 for Options 1, 2 and 3 respectively. For example, the expert who forecast a reduction in second degree burns under 15% of the body to 5 under Option 1 and 7 under Options 2 and 3 also estimated third degree burns under 15% of the body to increase to 45 under Option 1 and 47 under Options 2 and 3. This pattern of an increase in small third degree burns and decrease in small second

EXHIBIT B-2

IMPACTS OF REGULATORY OPTIONS  
ON BURN INCIDENCE AND SEVERITY

(95% confidence intervals)

Burn Severity	Extent of Burn (% of Body Area)			Total
	<15%	15% - 60%	>60%	
<b>3rd Degree**</b>	####	#	#	#
Status Quo	10	30	15	55
Under Option 1	17 (11-24)*	16 (11-22)	5 (3-7)	39 (28-50)
Under Option 2	19 (10-28)	11 (6-15)	3 (1-4)	32 (20-45)
Under Option 3	20 (11-29)	10 (6-14)	2 (1-3)	32 (19-45)
<b>2nd Degree**</b>				
Status Quo	20	22	0	40
Under Option 1	23 (17-30)	12 (9-15)	0 (0-0)	35 (29-42)
Under Option 2	26 (17-35)	11 (6-15)	0 (0-1)	37 (27-48)
Under Option 3	26 (17-35)	10 (5-14)	0 (0-1)	36 (24-49)
<b>Non-Incident</b>				
Status Quo	N/A****	N/A	N/A	N/A
Under Option 1	N/A	N/A	N/A	23 (13-34)
Under Option 2	N/A	N/A	N/A	29 (15-42)
Under Option 3	N/A	N/A	N/A	30 (15-45)
<b>Fatal</b>				
Status Quo	N/A	N/A	N/A	5 N/A
Under Option 1	N/A	N/A	N/A	2 (1-3)
Under Option 2	N/A	N/A	N/A	1 (1-2)
Under Option 3	N/A	N/A	N/A	1 (1-2)

\* The number outside the parentheses is the arithmetic mean. The 95% confidence interval is shown in parentheses. Numbers add up to 100 under each option.

\*\* 3rd degree and 2nd degree correspond to the accepted medical interpretation of these burn severity categories.

\*\*\* A hypothetical 100 burns was used as the base case for responding to the QCF. Numbers should be interpreted as the percentage of all sleepwear burns which actually occur annually.

\*\*\*\* N/A means not applicable.

degree burns was mostly seen in the medical experts, whereas the reverse pattern was more evident in the scientific/technical experts.

For medium size (15-60% of body) burns, there was an average estimated decrease of from 10 to 12 under the three options (from a status quo number of 20). Again there was a fairly wide diversity of opinion, e.g., estimates under Option 3 range from 0 to 28. British experience was cited for the reasons given in the case of an increase to 28, whereas U.S. experience was cited in the instance of a 0 forecast.

Most experts predicted no second degree burns covering over 60% of the body. It appears that the expert predicting 5 such injuries in Options 1 and 2 likely misread the option. The reason cited was that tailored pajamas leads to increased risk for boys and girls. This indicates that this one individual probably mistook inclusion for exemption with regard to regulation of tailored pajamas.

#### Non-Incidence

There is tremendous variation in the prediction of non-incidents ranging from a prediction that there will be no non-incidence (i.e., every burn which resulted in injury previously would still occur under each of the regulatory options) to a prediction of 88 (88% of previous incidents would be eliminated under Option 3). British experience was cited for a prediction of no increase in non-incidence, whereas British and U.S. experience was also cited in support of an increase to 76 for Option 3. The 88 was forecast by an American expert, as was a fairly high 48 for the other American respondents.

#### Fatalities

Fatalities are estimated to reduce significantly under the three options (from a status quo figure of 5 to 2 under Option 1 to 1 under Options 2 and 3). One expert, who predicted only a drop-off to 4 in Option 1, felt the most popular styles were not being regulated (he predicted a decrease to 1 in Options 2 and 3). As with other categories, U.S. experience seemed correlated with fatality estimates; those experts residing in the U.S. or citing U.S. experience predicted no fatalities.

#### SUMMARY

Although there is a wide diversity of opinion on the effects of the three options, a major influence on the numbers is exerted by several people holding fairly extreme views. Perhaps a somewhat better view of general opinion can be seen in Exhibit E-2, opposite, where 95% confidence intervals, rather than ranges, are given. Examining Exhibit E-2, we see more clearly the following summary results:

- all third degree burns are expected to significantly decrease, except those covering a small body portion which will increase under each option
- a major reduction will occur for second degree burns covering 15-80% of the body, although second degree burns covering a small part of the body will show a small increase in each of the options
- fatalities will decrease significantly in each of the 3 options.

**ATTACHMENT 1**

**DR. STANWICK'S ESTIMATE OF TOTAL ANNUAL  
NUMBER OF SLEEPWEAR BURNS**





THE UNIVERSITY OF MANITOBA

FACULTY OF MEDICINE  
Department of Social and Preventive Medicine

750 Bannatyne Avenue  
Winnipeg, Manitoba  
Canada R3E 0W3

May 22, 1986

Mr. John Cripps  
Feat, Marwick and Partners  
P.O. Box 31  
Commerce Court Postal Station  
Toronto, Ontario  
MSL 1B2

Dear Mr. Cripps:

RE: BURN FREQUENCY ESTIMATES

The numbers suggested are based upon the study I performed in 1981 coupled with what is known about morbidity and mortality reporting.

At one extreme, one could claim that the retrospective study I conducted identified all clothing related burns in Canada. Therefore, the number of such events would number 21, with one to two fatalities per year.

The scenario described above, is not in keeping with known trends in morbidity and mortality. Not all clothing burns would be seen in the tertiary care centers. A number of children would die prior to arriving at the tertiary care centers, either in their homes or at community hospitals. As well, a number of community hospitals are capable of providing care for children who are not too badly burned. Consequently, a more realistic estimate would be 40-50 sleepwear related burns in Canada every year. Both ends of the spectrum would require expansion of the initial estimate (a few more fatalities and expansion in the mild and moderate severity categories).

Thus, in generating estimates, one can be reasonably sure that the trends in clothing burns will resemble those of other forms of trauma. However, the only sure way to ascertain the true frequency would be to perform a prospective study sampling from both tertiary and community hospitals, as well as working with the provincial coroners.

Please contact me if you have any questions or comments on the information I have relayed to you.

Sincerely yours,

Richard S. Stanwick, M.D., M.Sc., F.R.C.P.,(C), F.A.A.P.  
Assistant Professor of Pediatrics and  
Social and Preventive Medicine

ATTACHMENT 2

QCF PANEL RESPONDENTS

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ATTACHMENT 2  
QCF PANEL RESPONDENTS

Respondent	Current Position and Credentials
Dr. Richard Stanwick	- Chairman, Accident Prevention Committee, Canadian Paediatric Society  - M.D.
Dr. C.R. Walker	- Director of Perinatal Pediatrics, The Moncton Hospital, Moncton, New Brunswick  - M.B., Ch.B. (United Kingdom) FRPC (Canada)
W.B. Monk	- Technical Service Specialist, Dupont Canada Inc., Kingston, Ontario  - B.A.Sc., P.Eng.
Cheryl Jane Leeder	- Head Nurse, Burns and Plastic Surgery, Victoria Hospital Corporation, London, Ontario
Dr. Charles Snelling	- Director, Vancouver General Hospital Burn Unit, Vancouver, British Columbia  - M.D., F.R.C.S.
Dr. Mike Day	- Senior Research Officer, National Research Council, Division of Chemistry, Ottawa  - Ph.D.
Micheline Gragoire	- Specification Co-ordinator, Dominion Textile Inc., Montreal, Quebec  - Textile Technologist Diploma.
Helena Vanderveerd	- Quality Control Manager, St. Lawrence Textiles Inc., St. Jerome, Quebec  - B.S.C. Textiles
Fred Shippee	- Director of Technical Services, American Apparel Manufacturers Association, Arlington, Virginia  - M.S. (Chemistry)

<b>Respondent</b>	<b>Current Position and Credentials</b>
Robert Innes	- Executive Director, Alberta Children's Hospital, Calgary, Alberta - Hospital Administration Diploma
Dr. Ron Zuker	- Staff Surgeon, Director of Burn Unit, Toronto Sick Children's Hospital, Toronto - M.D., F.O.S. (C)
Dr. G.A. Robertson	- Director, Burn Unit (Adult & Paediatric), Health Sciences Centre, Winnipeg, Manitoba - M.Phil, F.R.C.S. (Eng.) & (C)
Dr. John D. Crawford	- Chief of Pediatrics, Shriners Burn Institute Boston Unit, Boston, Massachusetts - M.D.
Dr. K.L. Wilson	- Plastic Surgeon, Isaak Walton Killam Hospital, Moncton, New Brunswick - M.D.
Sara Boileu	- Director of Burn Prevention/Public Relations, Shriners Burn Institute, Galveston Unit, Galveston, Texas
Maura Beam	- Head of Child Safety Centre, Dr. Charles A. Janeway Child Health Centre, St. John's, Newfoundland

**ATTACHMENT 3**

**QCF FIRST ITERATION QUESTIONNAIRE**

ASSESSING THE IMPACT OF  
CHILDREN'S SLEEPWEAR FLAMMABILITY REGULATIONS

Peat, Marwick and Partners has been contracted by Consumer and Corporate Affairs Canada to analyze the potential impacts of different regulatory regimes for flammability in children's sleepwear. One component of this study is estimating the incidence, severity and extent of burns under the different sets of regulations. In order to develop these estimates, Peat Marwick is undertaking a specialized expert panel methodology, known as Qualitative Controlled Feedback (QCF). We ask your cooperation in this procedure as one of the identified experts.

Qualitative Controlled Feedback is an iterative survey procedure. An initial survey is carried out; certain information from this survey is compiled and fed back in a second iteration. Unlike its counterpart, the Delphi procedure, QCF feeds back no numerical information, but only reasons for responses. Thus, if individuals change their first questionnaire responses, it should be solely due to the weight of the reasons given by the other participants.

We would like you to complete this short questionnaire and send it to us by mail as soon as possible. However, we also ask you to make a copy of your responses available to your secretary who, on your behalf, can read them over the telephone to us. We will call you for your responses on or about March 7, 1986. We will analyze all responses, and send the second iteration to you by March 11, 1986. We again ask you to make a copy of your 2nd set of responses to leave with your secretary. We will be calling no later than March 20, 1986 for the results of the 2nd iteration. We apologize for the short notice, but our final analysis must be completed by March 28.

All responses will be kept strictly confidential. At the completion of the study, we will send you a summary of results, i.e., aggregate estimates of impacts and a composite of reasons.

I thank you for your cooperation in this important project. If you have any questions or concerns please call John Cripps (a consultant in our Toronto office) at 416-863-3610, or me at 613-237-6402.

Yours very truly,

PEAT MARWICK and PARTNERS  
Dr. David Zalinger  
Managing Partner

A - PARTICIPANT INFORMATION

In this section, we would like some information about you. All information will be kept confidential. We will use this information for analytic purposes only, in particular to see if there are any relationships between an individual's characteristics and their impact assessments. Any reported data will ensure that the identity of the participant cannot be determined from the data.

1. Name: \_\_\_\_\_

2. Sex: \_\_\_\_\_

3. Organization: \_\_\_\_\_

4. Current Position: \_\_\_\_\_

5. Highest Degree Obtained: \_\_\_\_\_

6. Experience in the Area of Sleepwear Flammability: \_\_\_\_\_

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## B-REGULATORY REGIMES

Below are given short descriptions of the current regulatory regime, and three optional regulatory regimes. These should be referred to when filling out the information in Section C. Please note that for each option, the flammability test standard used is the same. The 3 options differ only in the range of sleepwear styles that the new flammability standard would be applied to.

### Status Quo

The status quo regulation in Canada governs children's sleepwear sizes 0 to 6x. These garments are tested in accordance with ASTM method D1230-61, with the requirement that flame spread times must be greater than 7 seconds. Under the status quo regime, Consumer and Corporate Affairs of Canada reports a compliance rate of virtually 100%. Currently most cottons, poly/cottons and acrylics meet the status quo flammability test requirements. Only some light weight cottons, rayons and other cellulosic fabrics will not pass the status quo test.

### Option 1

The regulations outlined in the Minister's announcement of October 23, 1985, applying U.S. flammability standards for children's sleepwear, to robes and nightgowns sizes 0 to 14x, effectively banning cotton, linen, rayon, cellulose acetate, acrylics and poly/cotton blends from these garments. Polo pajamas, tailored pajamas, baby doll pajamas and sleepers would be exempt from these requirements and would continue to be subject to the current flammability regulations. These regulations would also exclude sleepwear for infants less than 7 kg.

### Option 2

The consensus reached by the Children's Sleepwear Committee. This option would extend U.S. flammability standards to include baby doll and tailored pajamas in addition to nightgowns and robes sizes 0 to 14x (polo pajamas and sleepers would still be exempt). This would effectively ban the fabrics noted in Option 1 for this broader range of sleepwear products. Sleepwear for infants less than 7 kg. would still be exempt.



Option 3

All children's sleepwear 0 to 14x would conform to the flammability standard in the U.S., effectively banning the same fabrics as in Option 1 for all children's sleepwear garment styles (including polo pajamas and sleepers). Only sleepwear for infants less than 7 kg, would be excluded from this regulation.

C - BACKGROUND INFORMATION

Below is a table which illustrates how burns from sleepwear are currently thought to be distributed with respect to severity and extent. Although no definitive data on the current actual number of sleepwear burns is available, we would like you to assume that 100 burns occur. Because we are principally interested in relative changes from the status quo, you should not concern yourself with the accuracy of the base figures. Rather they should be used to scale your estimates for the different regulatory regimes.

Status Quo 1985

	<u>Extent of Burn (% of body surface)</u>			Total
	< 15%	15% - 60%	> 60%	
<u>Burn Severity</u>				
Major/3rd Degree	10	30	15	55
Minor/2nd Degree	20	20	0	40
-----				
Fatal	x	x	x	5
-----				
				100

We are interested in, the severity, extent and incidence of burns which might be expected under each regulatory regime, relative to the status quo case. As indicated in the table above, major burns correspond to third degree burns and minor burns to second degree burns. Examples of burn extent, in terms of the percentage of the body burned, are provided below. The actual body parts which are burned for any given burn extent, may vary from these examples:

15% of Body Surface: A burn of 15% or less might cover an entire back or chest but not the arms, legs, or head.

15% to 60% Body Surface: A burn of 15% to 60% might cover the chest and back but not the arms, legs or head.

60% or more of Body Surface: A burn of 60% or more might cover both arms, chest, back and head, or more.

### Styles of Sleepwear Worn

As further background, Exhibit A, attached, provides an estimated breakdown of styles of sleepwear garments primarily worn by Canadian children in each size range. This information may be of use in assessing how each regulatory regime will affect sleepwear burns.

### Age Ranges

While garment size does not directly imply age, it may be said that in most cases a child's age will be within one or two years of the garment size. As an example, a child wearing a size 8 garment will be from 6 to 10 years old in most cases. Approximate age ranges are given for each size range in Exhibit A.

### Effect of Style on Flammability

There is no conclusive empirical data relating garment style to burn severity or extent. However, loose and flowing sleepwear garments such as nightgowns and robes, have been involved in more sleepwear burn incidents than close fitting garments such as polo pajamas. It is generally accepted that loose, flowing garments burn more readily as air enters these garments more easily. In addition, loose, flowing garments are more likely to accidentally come in contact with ignition sources.

### Potential Garment Substitution

It is acknowledged that as children age they tend increasingly not to wear conventional sleepwear. This is depicted in Exhibit A, attached. It is possible that price increases in the cost of conventional sleepwear, after the introduction of new legislation, will result in some substitution of types/styles of garments worn to bed by children. Please do not concern yourself with substitution effects. Assume that garments which may be substituted for sleepwear, are no more hazardous than the conventional sleepwear which will be available after the new legislation. This seems likely to be the case, as underwear (which is tight fitting) is very often substituted for conventional sleepwear. If you disagree with this assumption you may say so on the questionnaire.

D - ASSESSING IMPACTS

There are 3 different tables corresponding to the 3 regulatory regimes, which we would like you to complete. As was mentioned, we are interested in the severity, extent and incidence of sleepwear burns under each regime. Consider the following example below:

Example

	<u>Extent of Burn (% of body surface)</u>			Total
	< 15%	15% - 60%	> 60%	
<u>Burn Severity</u>				
Major/3rd Degree	40	10	0	50
Minor/2nd Degree	36	10	0	46
Non-incident	x	x	x	2
-----				
Fatal	x	x	x	2
-----				
				100

In this case, the respondent has indicated that if this regime were in place:

-- of the current 100 burns, 50 would have been major, 36 would have been minor, there would have been 2 fatal burns, and 2 burns would not have occurred at all. Of the 50 Major burns which would occur, 40 would cover less than 15% of the body, and 10 would be cover between 15% and 60%. Of the 46 minor burns which would occur 36 would cover less than 15% of the body and 10 would cover between 15% and 60%. The respondent has also indicated that none of the burns would cover more than 60% of the body

The x's in the table represent values which are not of interest for the purposes of this study or are not applicable. These spaces in the tables should be left blank. Please also note that the sum of all boxes in the total column must always be 100.

Finally, for each option we would like you to indicate your reasons (and assumptions) for these changes. Similarly if there are no changes, we would like you to explain why you think this would be the case.

Option 1

The regulations outlined in the Minister's announcement of October 23, 1985, applying U.S. flammability standards for children's sleepwear, to robes and nightgowns sizes 0 to 14x, effectively banning cotton, linen, rayon, cellulose acetate, acrylics and poly/cotton blends from these garments. Polo pajamas, tailored pajamas, baby doll pajamas and sleepers would be exempt from these requirements and would continue to be subject to the current flammability regulations. These regulations would also exclude sleepwear for infants less than 7 kg.

Please note: The figures in parentheses are the status quo estimates. These are only provided for you to use as reference figures, and are not intended to constrain your response in any way. Please just ensure that the sum of all boxes in the total column is 100.

Extent of Burn (% of body surface)  
< 15%    15% - 60%    > 60%    Total

Burn Severity

	(10)	(30)	(15)	(55)
Major/3rd Degree <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	(20)	(20)	( 0)	(40)
Minor/2nd Degree <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	( x)	( x)	( x)	( x)
Non-incident <input type="checkbox"/>	x	x	x	<input type="checkbox"/>
	( x)	( x)	( x)	( 5)
Fatal <input type="checkbox"/>	x	x	x	<input type="checkbox"/>
				100

Reasons: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Option 2

The consensus reached by the Children's Sleepwear Committee. This option would extend U.S. flammability standards to include baby doll and tailored pajamas in addition to nightgowns and robes sizes 0 to 14x (polo pajamas and sleepers would still be exempt). This would effectively ban the fabrics noted in Option 1 for this broader range of sleepwear products. Sleepwear for infants less than 7 kg. would still be exempt.

Please note: The figures in parentheses are the status quo estimates. These are only provided for you to use as reference figures, and are not intended to constrain your response in any way. Please just ensure that the sum of all boxes in the total column is 100.

	<u>Extent of Burn (% of body surface)</u>			Total
	< 15%	15% - 60%	> 60%	
<u>Burn Severity</u>				
	(10)	(30)	(15)	(55)
Major/3rd Degree <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	(20)	(20)	( 0)	(40)
Minor/2nd Degree <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	( x)	( x)	( x)	( x)
Non-incident	x	x	x	<input type="checkbox"/>
	( x)	( x)	( x)	( 5)
Fatal	x	x	x	<input type="checkbox"/>
				100

Reasons: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Option 3

All children's sleepwear 0 to 14x would conform to the flammability standard in the U.S., effectively banning the same fabrics as in Option 1 for all children's sleepwear garment styles (including polo pajamas and sleepers). Only sleepwear for infants less than 7 kg, would be excluded from this regulation.

Please note: The figures in parentheses are the status quo estimates. These are only provided for you to use as reference figures, and are not intended to constrain your response in any way. Please just ensure that the sum of all boxes in the total column is 100.

Extent of Burn (% of body surface)  
< 15%    15% - 60%    > 60%    Total

Burn Severity

	(10)	(30)	(15)	(55)
Major/3rd Degree <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Minor/2nd Degree <input type="checkbox"/>	(20)	(20)	(0)	(40)
Non-incident <input type="checkbox"/>	(x)	(x)	(x)	(x)
Fatal <input type="checkbox"/>	x	x	x	(5)
				100

Reasons:

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**ATTACHMENT 4**

**COMPOSITE REASON LIST SENT TO QCF RESPONDENTS  
ON THE SECOND ROUND**



## ATTACHMENT 4

COMPOSITE REASONS FROM FIRST ITERATION  
OF QCF ON SLEEPWEAR FLAMMABILITY  
(as sent to QCF respondents)

## OPTION 1

- Increased temperature of burns with nylon.
- Gowns and robes have been most hazardous.
- Regulations are to make garments flame-resistant, not fire-proof.
- Less severity with non-flowing styles.
- Nylon very hard to ignite.
- Extent of burns influenced by self-extinguishing fabrics.
- Cotton nightgowns, whose regulation has been important in the U.S., will have small impact in Canada where they are less common (wool favoured in lower temperatures).
- The exempted styles are the most popular styles.
- This regulation affects serious burns from robes and loose nightgowns, but has no effect on close-fitting garments.

## OPTION 2

- "Melt-drip" of thermoplastic fabrics results in third-degree burns.
- This regulation will cover over 90% of garments of concern.

- Regulating tailored pajamas impacts the incidence of less severe burns.
- Burn severity is increased with polyester ignition.
- Tailored pajamas are very rare.
- All garments causing fatalities are regulated by this option.

OPTION 3

- There will be poor consumer acceptance of this, given cotton preference in polo pajamas and sleepers.
- The extra garments regulated affect less than 5% of the population.
- U.S. experience indicates large effect on major burns.
- Polo pajamas are very rare and effect only minor third-degree burns.
- Polo pajamas and sleepers are not involved in burns, so this option is equivalent to Option 2.

NOTE: This is a composite of reasons taken from the responses received from the QCF panel respondents. This panel consists primarily of medical and textile professionals.

**APPENDIX F**

**GLOSSARY**

**APPENDIX F  
GLOSSARY**

**Benefit:** Anything of value gained as a result of some action. A benefit can be monetary as in the case of a cost saving, or non-monetary as in the case of a saved life. Project evaluation methodologies generally compare benefits with costs (see below) to determine which projects are most attractive.

**Cost:** In economics, it is considered appropriate to define cost in terms of the value of the alternatives or other opportunities which have to be foregone in order to achieve a particular thing. As a result, the term "opportunity cost" is often used in place of cost by economists. Since opportunity cost is concerned with the real sacrifice involved in achieving something, costs are often measured as the amount of resources (of some kind) used, rather than as money outlays. Broadly, cost is the measure of what has to be given up in order to achieve something.

**Cost-benefit analysis:** A technique which attempts to set out and evaluate the social costs and social benefits of investment projects, to help to decide whether or not the projects should be undertaken. The essential difference between cost-benefit analysis and ordinary investment appraisal methods used by firms is the stress on the social costs and benefits. The aim is to identify and measure the losses and gains in economic welfare which are incurred by society as a whole if the particular project in question is undertaken. Cost-benefit analysis involves:

- o a careful itemization of all relevant classes of costs and benefits;
- o quantification of what can reasonably be quantified;
- o a full specification of the complete set of alternatives to the project under consideration.

Cost-benefit analysis provides a much sounder basis for an eventual decision and also permits an estimate to be made of the implicit money values that must be attached to particular non-monetary benefits and costs in order to justify a particular project. Thus, cost-benefit analysis should be viewed as a means of making the best possible information available to governmental decision-takers, rather than as a mechanical means of making decisions.

**Cost-Effectiveness Analysis:** While the costs of a social regulation can often be estimated with some accuracy in monetary terms, benefits often prove difficult to measure in a satisfactory manner. Cost-effectiveness analysis is an evaluation methodology which seeks to measure costs and benefits in dollar terms, but only for those items which can be feasibly measured this way. Other indices are used to measure benefits or costs which are not measurable in dollar terms. Cost-effectiveness analysis

often involves comparing ratios of non-dollar benefits to dollar costs (e.g., lives saved per million dollars cost). This allows projects to be compared on the basis of performance per dollar, without having to value all benefits in dollars.

**Consumer surplus:** The differences between the total amount of money an individual would be prepared to pay for some quantity of a good, and the amount he actually has to pay. If we were to ask an individual consumer to tell us the maximum amount he would be prepared to pay rather than go without some quantity of a particular good, we should generally find that this exceeds the amount of money he actually does pay, i.e., price per unit of the good multiplied by the quantity. This is because there is a "surplus" of satisfaction or utility from the consumption of the good which is not completely swallowed up by the total expenditure on the good. The money value of this "surplus" satisfaction is the consumer surplus.

**Demand Curve:** A mathematical function which relates the total quantity (number of units) of a good which would be bought in the market for various unit prices. If certain conditions are met or adjusted for, a demand curve for a product can be constructed from observations of various combinations of a price and quantity which have occurred for a good in the past.

Demand curves can display various degrees of "price elasticity" (see below). If the demand curve for a good is highly elastic, small percentage price increases result in large percentage decreases in quantities purchased. From this, we can infer that many consumers feel that they are almost as well off by spending money on substitute items. For products with inelastic demand curves, large percentage price increases result in small percentage changes in quantities purchased. From this, we can infer that many consumers place high value on the good in question and are relatively unwilling to consume less of it. If the price of an inelastic good rises, consumers will often pay the added cost sooner than forgo consumption of the good.

**Elasticity:** Defined in general terms, as a measure of degree of responsiveness of one variable to changes in another. Thus, the price elasticity of demand is the degree of responsiveness of the quantity demanded of a good to changes in its price; price elasticity of supply is the responsiveness of the quantity of a good supplied to change in its price.

Numerically, elasticity is given by the proportionate change in the dependent variable (e.g., quantity demanded, quantity supplied) divided by the proportionate change in the independent variable (e.g., price) which brought it about. The resulting elasticity measure is thus a pure number, independent of units, and so it can be readily compared for things measured in different units. For example, the price elasticity of demand for cornflakes will be greater than that for Rolls-Royce motor-cars, if the

elasticity measure for the former is 2, i.e., a 10 percent fall in price increases demand for cornflakes by 20 percent, and that for the latter is 1, i.e., a 10 percent fall in price causes an increase of 10 percent in quantity. Since elasticity is a measure of responsiveness of one variable to changes in another, it is implicit in the shape of the demand curves, supply curves and cost curves used by the economist.

**Marginal utility:** The increase in total utility (see below) of consumption of a good which results from increasing the quantity of the good consumed by one unit. Generally, marginal utilities are expected to decline as more of the good in question is consumed, and the consumer becomes saturated.

**Utility:** Utility is the total amount of satisfaction or happiness which is derived from consuming a particular good. This word used as an economic term should not be confused with the various common usage meanings of the word.

**Producer surplus:** The excess of total receipts by firms supplying some good, over the total cost incurred by them in supplying it. In common parlance, producer's surplus can be thought of as profits above and beyond the total costs of production and a fair return on investment. Essentially, producer's surplus arises where some firms have production cost efficiencies not had by other firms. As such cost advantages are not thought to exist in the sleepwear industry to any great extent, producer's surplus in the industry is also thought to be nil.

**Welfare economics:** A branch of economics concerned primarily with analyzing the conditions under which economic policies may be said to have improved social welfare.

**APPENDIX G**

**INDUSTRY INTERVIEW GUIDES**

**APPENDIX G****INTERVIEW PLAN  
(as set out at the beginning of the Study)****RANGE OF INTERVIEWS**

In assessing the effects of the various regulatory options under consideration, we will be interviewing representatives from the range of sectors which stand to be affected. This will include interviews with retailers, sleepwear manufacturers and fabric manufacturers. Yarn manufacturers will not be systematically interviewed in this process, although one or two may be contacted.

We intend to interview most major department store retailers as these are crucial players in determining the effects any regulation will have. We will also interview a sample of independent and chain retailers who carry children's sleepwear, but without selling geographic representatives across the country. Likewise, we will interview most major fabric manufacturers who stand to be affected by the regulations, as their actions are also key in determining how others react. Several importer/wholesalers covering the range of styles, sizes, and exporting countries, will also be interviewed to understand possible effects on them.

Our largest number of interviews will be with children's sleepwear manufacturers, as there are many of these. There is also a considerable variation among these firms in size and in the relative importance to their overall business. A cross section will be chosen according to size and sleepwear importance, such that we have good coverage of the range of these firms.

In addition to interviews with domestic manufacturers and retailers, we will also conduct several interviews with members of the U.S. Consumer Product Safety Commission, the American Textile Manufacturers Institute, and perhaps several U.S. manufacturers. The general effects of flammability standards in the U.S. may indicate the possible effects of similar standards to be implemented in Canada.

**OVERVIEW OF INTERVIEW PROCESS**

Interviewers will introduce themselves, outline the nature of the study, explain Peat Marwick's role in the SEIA, and then proceed with a relatively open-ended line of questioning. The goal of interviewing at this stage will primarily be to achieve a qualitative and directional understanding of industry linkages (e.g., between retailers, sleepwear manufacturers and fabric manufacturers), and to understand what kinds of responses might occur in the various sectors. We also wish to determine how members of each sector anticipate that their suppliers and customers will react and how this will impinge on their own reactions. The topics in the Interview



Checklists will be used to guide the interview, and quantitative estimates will be sought where possible. However, the emphasis will be on achieving a qualitative understanding of the questions outlined in the Interview Guide. Quantitative estimates will primarily be developed later, from further interviewing and from what we have inferred from qualitative interviews. Where the effects of the proposed regulation are concerned, we will address long term (equilibrium) and short term (transitory) effects.

The effects of implementation date and the range of garments covered by the legislation will be discussed separately at first. We will seek to understand what kinds of effects these factors could have on industry, and some idea of the magnitude of the costs implied by different timing and garment ranges. We will then consider the specific timing and garment ranges within each option, and attempt to understand the differential effects of these. Each regulatory option will be discussed separately and assuming the "base level" information campaign. The effects of an enhanced information campaign will be discussed separately.

Interviews will follow a format similar to that outlined below in the Interview Guide. This is meant to provide an example of the format of the interview. Interviewers will not use this interview guide verbatim.

#### INTERVIEW GUIDE

(i.e., the general sequence of comments and questions to be used)

##### Overview

Our purpose in doing this study is to try to assess the likely effects of each option being considered, on industry and consumers. With respect to industry, we are interested in the likely effects on the long and short term profitability of the industry, the potential effects on industry structure, and on possible employment effects. The consumer response is also important to understanding the potential effects on industry.

For the purpose of this study, we are considering three possible regulatory options governing children's sleepwear sizes 0 to 14X. These hypothetical are being considered in relation to the status quo regulation governing children's sleepwear. These three options differ in the range of styles that would be affected, but the flammability tests applied would essentially be the same. In addition, we are considering the impact of alternative implementation dates for these regulatory options.

Each of the three options involves flammability testing similar to that which has been implemented in the United States for children's sleepwear sizes 0 to 14X. In the United States, these standards had the effect that cotton, acrylics, acetates and poly/cotton blends were effectively eliminated from all sleepwear garments covered by the more stringent legislation. Synthetic substitutes such as 100% polyester and nylon have been used in their

place. It is expected that the Canadian regulations would have a similar impact on fabric selection.

I would like to discuss with you the impact of these possible regulatory options, and the alternative implementation dates.

#### **Effects of Implementation Timing**

In general, how would you be affected by date of implementation of a flammability regulation? Is this true of all firms in your industry? What would the likely effects of implementation date be on your customers and suppliers? Who would be affected most by different implementation dates and why? What is an optimal implementation date for you and why? When discussing the impact of implementation dates, I would like you to comment on any actions you have taken and impacts which have already occurred as a result of anticipated regulatory changes following the Minister's announcement of last October.

#### **March /87 Implementation Date**

What would be the specific effects on your company, your customers and suppliers if new flammability legislation became effective at the retail level in March of /87. Do the effects differ depending on what garments are covered by the legislation? Would these effects differ among firms? How would your company and others in your industry react? How would your suppliers and customers react?

#### **September /87 Implementation Date**

How would the affects you have described for a March implementation date, differ if the regulations came into effect in September of /87 instead? Would your firm react any differently to this implementation date? Would other firms or segments to the trade react or be affected differently?

#### **March /88 Implementation Date**

(As with September /87.)

#### **Garment Coverage in General**

Now I would like you to consider how varying the range of styles covered by these flammability regulations might effect your business. I would also like you to consider the likely effects on your customers, and on your suppliers. In general, what would be the effects of different garment coverages in a regulation? Would these effects be the same for others in your industry? How would these effects differ among firms?

#### **Option 1: Covering Nightgowns and Robes**

What would the specific effects be if these enhanced flammability regulations covered only nightgowns and robes?

What kind of effects might this have on your company and how do you think you would respond given such a regulation? Would other firms in your industry react differently? Who would be affected most least? Why?

How do you think your customers would react, and how would this affect your own decisions? How would this change your dealings with your customers? What would you have to do to meet their needs under these new conditions? To what extent do you think you would be able to meet your customers' needs?

How do you think your suppliers would react, and how would this effect your decisions? How would this change your dealings with your suppliers, and what would they have to do to meet your needs under these new conditions? To what extent do you think your suppliers would be able to meet your needs?

#### **Option 2: Including Baby Doll and Tailored Pajamas**

Now, what if baby doll and tailored pajamas were added to the garments covered by the regulations? Only polo pajamas and sleepers would still be exempt. How would this effect you (your industry), your suppliers or your customers? Is this situation much different from the previous case? How is it most different and for whom?

#### **Option 3: Including All Sleepwear Garments**

What if the regulation were to include all children's sleepwear garments? How would this effect you (your industry), your suppliers or your customers? Is this situation much different from the previous case? How is it most different and for whom?

#### **Effects of an Information Campaign**

It is likely that any changes to regulations regarding the flammability of children's sleepwear would be accompanied by an information campaign undertaken by the government. Another factor I would like you to consider is the impact of different levels of resources which the government would devote to this campaign. Such a campaign might make use of short public service announcements on TV and radio, combined with short videos to be shown at schools and a range of other print material. Do you think that the level of resources devoted to such an information campaign would have any significant impacts on consumer or retailer behaviour as it relates to children's sleepwear? What would be the nature of any reactions or impacts? Would these be significant in size?

#### **INTERVIEW CHECKLISTS**

The following areas of interest will not be directly and systematically asked about, but will be used to guide interviews with manufacturers and retailers. These guides represent "wish lists", and we do not expect to obtain all of the identified items from each interview. The following

question areas will concern both the individual firm and the larger industry where applicable. Quantitative estimates will be sought where possible.

#### RETAILERS

Current Conditions	Anticipated Effects Under Proposed Regulation (including reactions which may have already occurred)
- type of retailer, kind/size of business (up-market/midmarket/basic), position in industry	- anticipated overall reaction of firm, change in position
- industry structure, number of retailers, specialization, concentration/size	- anticipated reaction of others in industry - which firms threatened most, stand to lose most/least, difference in reaction
- characteristics of consumer demand, consumer preferences, segments, volumes, price elasticities, branding	- anticipated reactions of consumers - changes in preferences, substitutions, changes in volume sold, brand resilience to volume loss
- types/volume of sleepwear carried; importance of types to sales	- retail substitution, changes in volume carried, types dropped, impact on profitability of types - actions necessary to meet new demands of consumers, ability to meet demands
- sources of supply - domestic/imported	- anticipated reaction of suppliers - changes in domestic sources, or import mix - what will suppliers have to do to keep business, and perceived ability to do it
- costs of sleepwear carried	- % increase/decrease
- pricing, inventory policies	- effects on pricing, profitability, clearance sale losses

Current Conditions	Anticipated Effects Under Proposed Regulation (including reactions which may have already occurred)
--------------------	--

**RETAILERS (cont'd)**

- |                                    |  |
|------------------------------------|--|
| - timing/planning cycle for orders | - effects of implementation date on own business, suppliers, consumers |
| - employment                       | - potential employment effect.   |

**CHILDREN'S SLEEPWEAR MANUFACTURERS**

- |  |  |
|--|--|
| - kind/size of business, other characteristics, position in industry   | - anticipated overall reaction of firm, change in position   |
| - industry structure, number of manufacturers, specialization, concentration/size profitability determinants   | - anticipated reaction of others in industry<br>- which firms stand to gain/lose most, difference in reactions of other firms  |
| - relationship with retailers/distributors, retail order lead times, relative importance of different retailers, number of retailers served, kinds of retailers served | - anticipated reactions of retailers   |
| - garments produced, relative importance of these, who sold to   | - changes in volumes, types of garments demanded by retailers, substitutions by retailers, fabrics/styles effectively eliminated<br>- actions necessary to meet new demands of retailers/consumers |
| - production techniques/fabrics/costs  | - changes in production process, fabrics, fixed and variable cost changes  |
| - sources of fabric supply - domestic/import   | - anticipated reaction of fabric suppliers<br>- changes in domestic sources, import mix<br>- what suppliers will have to do to meet new demands, ability to do it                                  |

---

**Current Conditions**
**Anticipated Effects Under  
Proposed Regulation  
(including reactions which may have  
already occurred)**


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**CHILDREN'S SLEEPWEAR MANUFACTURERS (cont'd)**

- |  |   |
|--|---|
| - amount of direct garment import/resale | - % increase/decrease   |
| - pricing/production runs/inventories    | - effects on pricing, profitability, inventories, product disposal costs                            |
| - timing/planning order cycles           | - effects of implementation date on own business, suppliers, retailers. Optimal implementation date |
| - employment                             | - possible layoffs or hiring  |
| - financing structure                    | - capital spending requirements/working capital changes/lender reactions                            |

**FABRIC MANUFACTURERS**

- |   |   |
|---|---|
| - kind/size of business, other characteristics, position in industry  | - anticipated overall reaction of firm, change in position  |
| - industry structure, number of manufacturers, specialization, concentration/size profitability determinants                                  | - anticipated reaction of others in industry<br>- which firms stand to gain/lose most, difference in reactions of other firms   |
| - relationship with sleepwear manufacturers, order lead times, relative importance of different manufacturers, number of manufacturers served | - anticipated reactions of sleepwear manufacturers  |
| - fabrics produced, relative importance of these, for use in which garments   | - changes in volumes, types of fabric demanded by manufacturers, substitutions by manufacturers, fabrics effectively eliminated |

Current Conditions	Anticipated Effects Under Proposed Regulation (including reactions which may have already occurred)
--------------------	--

#### FABRIC MANUFACTURERS (cont'd)

- production techniques/ yarns/costs	- actions required to meet new demands of manufacturers/consumers, ability to do it (time)
- sources of yarn supply - domestic/imported	- changes in production process, yarns, fixed and variable cost changes  - anticipated reaction of yarn suppliers - changes in domestic sources, import mix - what suppliers will have to do to meet new demands, ability to do it
- pricing/production runs/ inventories	- effects on pricing, profitability, inven- tories, product disposal costs, effici- ency of operation
- timing/planning order cycles	- effects of implementation date on own business, suppliers, manufacturers. Order, development lead times. Optimal implementation date
- employment	- possible layoffs or hiring
- financing structure	- capital expenditures/working capital requirements/lender reactions.

#### ADDENDUM: THE REGULATORY OPTIONS

##### Status Quo

The status quo, that is, the regulations which are currently in place, governing the flammability testing and requirements of children's sleepwear size 0 to 6X.

##### Option 1

The regulations outlined in the Minister's announcement of October 5, applying U.S. flammability standards and effectively banning cotton, linen, rayon, cellulose acetate, acrylics, and poly/cotton blends, in robes

and nightgowns sizes 0 to 14X. (Polo pajamas, tailored pajamas, baby doll pajamas and sleepers would be exempt from these requirements and would continue to be subject to the current flammability regulations.)

**Option 2**

The consensus reached by the children's sleepwear committee. This option would extend U.S. flammability standards to baby doll and tailored pajamas, in addition to nightgowns and robes sizes 0 to 14X (polo pajamas and sleepers would still be exempt). This would effectively ban the fabrics noted in Option 1 for this broader range of sleepwear products.

**Option 3**

All children's sleepwear 0 to 14X would conform to the flammability standard in the U.S., effectively banning the same fabrics as in Option 1 for all children's sleepwear garments (including polo pajamas and sleepers) without exception.



**APPENDIX H**

**SUMMARY RESULTS OF CCAC CONSUMER RESEARCH STUDY.**

CONSUMER PRODUCTS CONSUMER SURVEY

PERCEIVED NEED FOR INFORMATION ON FLAMMABILITY  
IN CERTAIN PRODUCT AREAS

1. CHILDREN'S SLEEPWEAR
2. TENTS AND TENT TRAILERS

MARCH 1986

CANADA MARKET RESEARCH

CMR#2373

1. FLAMMABILITY OF CHILDREN'S SLEEPWEAR

Major Conclusion

Irrespective of how buyers feel about current manufacturer safety standards on flammability of children's sleepwear, the majority believe that the industry should provide more information in this area. This view is held by three in every four buyers and represents around a third of all consumers in general. Buyers are evenly divided about whether warning labels would be adequate or whether there is a need for Government to step in and ban certain fabrics. Only around half of buyers feel public information programs are essential. Overall, the view is that consumers would prefer to see action taken against the manufacturer to reduce the problem rather than making people more aware of current risks.

Detailed Findings

1.1 Incidence of Buyers

A total of 39% of consumers claim to have bought an item of children's sleepwear during the last 3 years. The age profile of this group shows that over half of all buyers are 25-44, most likely buying for children in their own households; and around one quarter are 45-64, most likely buying occasionally either for their own children or possibly as gifts for children in relative's families.

Among the different types of items bought, pyjamas accounts for over one third of buyers; sleepers accounts for roughly one in four; nightgowns account for roughly one in ten.

1.2 Consumer Consideration Given to Flammability

Over one third of all buyers claim to have considered flammability of the item at the time of buying. This figure represents 14% of all consumers in general. Whether buyers consider flammability tends to be irrespective of the level of consumer education, the age of the child for whom the item is bought, or the type of sleepwear item purchased. The most significant factor is age of consumer. The following shows the number of buyers in each age group who claim they consider flammability and highlights the increasing concern as age of consumer increases.

<u>Buyers of Children's Sleepwear</u>	<u>Considered Flammability</u>
18 - 24 years.....	14%
25 - 44 years.....	34%
45 - 64 years.....	42%
65 years plus.....	46%

1.3 Perceived Need For Information on Flammability

A total of 57% of buyers feel it is essential manufacturers provide information on flammability of children's sleepwear. A further 21% feel the information is essential, despite the fact they feel manufacturers already work to strict safety standards.

In total, over three in every four buyers believe the information is essential to consumers when buying children's sleepwear. This figure represents almost one third of all consumers in Canada. The following summarizes the key survey evidence.

Perceived Need For Information on Flammability

	<u>Among Buyers</u> %	<u>As Percentage of All Consumers</u> %
Consumers who believe:		
- it is essential manufacturers provide information on flammability.....	57	22
- manufacturers already work to strict safety standards.....	11	4
- both.....	21	9
- neither.....	<u>11</u>	<u>4</u>
NET TOTAL	100	39

These views are consistent across different consumers. This includes the fact that both younger and older consumers are equally agreed on the need for this information.

1.4 Provision of Warning Label From Manufacturer

Buyers of children's sleepwear are evenly divided about whether the provision of warning labels by the manufacturer would be sufficient, or whether there is a need to go further and ban the sale of fabrics which, despite meeting safety standards, can catch fire and burn relatively easily.

Although there is a slight tendency for better educated buyers to think warning labels would be adequate, on balance consumer opinion is largely irrespective of demographic differences. The evidence is highlighted below.

Perceived Need For Action on Flammability of Children's Sleepwear

	<u>Among Buyers</u> %	<u>As Percentage of All Consumers</u> %
Consumer Views on Possible Action:		
- think manufacturer warning labels would be adequate.....	41	16
- think certain fabrics should be banned..	43	17
- not sure.....	<u>16</u>	<u>6</u>
NET TOTAL	100	39

1.5 Perceived Need For Public Information Programs

On balance, buyers feel it is essential, rather than important but not essential, that Government provide public information programs warning people about flammability of children's sleepwear. Results are as follows.

Perceived Need For Public Information Programs

Consumers who think information is:	Among Buyers %	As Percentage of All Consumers %
- essential.....	48	20
- not essential but important.....	37	15
- not that important.....	15	4
NET TOTAL	100	39

Buyers who feel public information is essential tend to be consumers with younger children, and consumers with only a secondary level of education.

The fact that buyers divide equally between those who feel public information programs are essential and those who do not, tends to suggest that while consumers think there is a need to address the issue of flammability, the majority feel the problem lies with the manufacturer. Opinion may be divided on how this can best be achieved but it seems that consumers are saying that any action by Government should be aimed at getting manufacturers to do something to help the situation rather than educating consumers that a risk of flammability exists.