

**LABOUR CANADA POLICY
ON INDOOR AIR QUALITY**

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Labour Canada is responsible for administering the Canada Labour Code. Part II of the Code deals with the protection of the safety and health of workers under federal jurisdiction. Air quality is only addressed indirectly in the regulations pursuant to the Code. Guidelines based on ASHRAE Standard 61-1989 have been written to assist Labour Canada's inspectors in dealing with complaints related to indoor air quality. In this paper, the guidelines are briefly discussed. A summary of relevant legislation from provincial and territorial jurisdictions is included. Finally, some statistics on indoor air quality complaints received by Labour Canada in the past five years are presented.

INTRODUCTION

In Canada, the responsibility to regulate and administer occupational safety and health legislation is shared between the ten provinces, the two territories and the federal government. The federal jurisdiction is limited to international and interprovincial undertakings, and some other activities. Examples of workplaces under federal jurisdiction are the railways, interprovincial highway transport companies, telephone companies, radio and television stations, banks, airlines, grain elevators, most Crown corporations, and the federal public service. About 10 percent of the Canadian workforce is subject to federal occupational safety and health legislation, the remaining 90 percent being covered by provincial or territorial laws.

FEDERAL LEGISLATION

The federal instrument for regulating occupational safety and health is Part II of the Canada Labour Code. The Code is administered by Labour Canada, which has the responsibility to develop, promote and enforce occupational safety and health requirements. Various standards are prescribed throughout the regulations issued pursuant to the Code. These include standards for noise, illumination, electrical safety, etc. While the Code does not specifically refer to indoor air quality, it does empower the Minister of Labour to prescribe standards for ventilation, temperature and humidity. However, at the present time none of the regulations directly specify such standards. There are two regulations which deal indirectly with indoor air quality. These are the Hazardous Substances Regulations, and the Building Safety Regulations. For a variety of reasons, these are not altogether suitable for dealing with indoor air quality complaints.

COMPLIANCE POLICY

Labour Canada's policy is to encourage workplace internal responsibility, and voluntary compliance with the law. The primary means to this end are the mandatory joint safety and health committees (or worker representatives). The safety and health committee (or representative) has the power to "receive, consider and expeditiously dispose of complaints relating to the safety and health of the employees represented by the committee". If a problem remains unresolved, an employee may choose to bring the matter to the attention of Labour Canada.

Upon receiving a complaint, a Safety Officer proceeds to the workplace and investigates the matter. If the Officer finds an infraction of the Code or the Regulations, under normal circumstances he/she seeks an assurance of voluntary compliance from the employer. If a situation of danger exists (as defined in the Code), the Officer issues a direction. In the case of indoor air quality complaints, because the regulations address this issue only indirectly, not many directions have been issued. Needless to say, it would be different if some specific contaminant (such as pathogenic bacteria for example) is detected in the workplace which could be causally related to the complaints. In that event, the Officer has the option of utilizing the Code in order to obtain corrective action. In an effort to assist the Officer in investigating indoor air quality complaints, a guide has been written which outlines the protocol for such investigations.

LABOUR CANADA'S GUIDE

The investigative procedure is divided into five steps:

- gather information about the complaints and the building;
- conduct a walk-through survey to inspect the workplace and the ventilation system;
- if necessary, monitor for specific contaminants;
- provide recommendations or receive assurance of voluntary compliance from the employer on specific violations; and
- follow-up.

The first step is to gather information about both the complaints and the building. It is important to know what type of problems are being experienced by the workers, when these problems are occurring, how many workers are affected, where they are located, when the problems first started, etc. A questionnaire has been developed to help identify some of these points.

The building itself should be characterized: when was it built, what was its original purpose, was the original design (particularly the layout) significantly modified, what type of heating and ventilating system does it have, is there a regularly scheduled maintenance program, etc. In order to facilitate the gathering of this information, a building information check list has been prepared for use by the Officer.

The second step is to conduct a walk-through survey. Simple instruments are available to the Officer to check temperature, relative humidity, and concentration of gases such as carbon monoxide, carbon dioxide, etc. The Officer is expected to check air diffusers, return air openings, humidification systems, etc.

Because the reference to ASHRAE Standard 61-1981, Ventilation for Acceptable Indoor Air Quality, in the Building Safety Regulations is quite indirect, it is not recommended that it be used for purposes of resolving indoor air quality complaints. The revised standard, 61-1989, bearing the same title, forms the basis of the Officer's recommendations. The guide recommends that the concentration of carbon dioxide should not be in excess of about 1000 ppm. This can be achieved with a ventilation rate of about 7.5 litres per sec (or 15 cfm) per person in a typical office environment.

Following the investigation, if the Officer has found some inadequacies relative to the Regulations, he/she may receive an assurance of voluntary compliance from the employer on specific violations. Refusal to work cases would be evaluated on a case by case basis, taking into account the medical histories of the complainants. Where the Officer is unable to resolve the matter, and feels that additional detailed measurements are needed, he/she has the option of calling upon the services of the Technical Services Division of Labour Canada. Industrial hygiene engineers from that Division carry out detailed measurements using long term sampling techniques, and field deployable analytical instruments.

COMPARISON WITH OTHER JURISDICTIONS

The approach taken to deal with indoor air quality varies with the jurisdiction. Most provincial regulations focus on the problem of exposure to chemical agents in the workplace by specifying some form of maximum exposure limits, generally the ACGIH TLVs. Some jurisdictions go a little further by prescribing minimum ventilation requirements which apply to all types of workplaces. Three provinces have taken that route. New Brunswick and Prince Edward Island require a minimum of 7.5 litres of outside air per second per person. For offices, Quebec prescribes a minimum of 2.4 litres per sec per person of outside air for an occupancy density of one person per square metre. In addition, there is a requirement for total air movement of 45 litres per sec per person. Table 1 gives a summary of the requirements noted above, as well as those of the rest of the provinces and territories.

TABLE 1

SUMMARY OF CANADIAN LEGISLATION RELATED TO IAQ

Jurisdiction	Ventilation		Temperature (°C)	Relative Humidity (%)
	Natural (% floor area)	Mechanical (l/sec/person)		
Prince Edward Island	≥ 5	7.5	≥ 20	≥ 30
New Brunswick	≥ 5	7.5	≥ 20	-
Newfoundland	-	not specific	-	-
Nova Scotia	-	not specific	-	-
Quebec	≥ 5	2.4 (fresh) 45 (total)	≥ 20	≥ 20
Ontario	not specific	not specific	≥ 18	-
Manitoba	-	not specific	-	-
Saskatchewan	-	not specific	not specific	not specific
Alberta	-	for contaminants	-	-
British Columbia	-	not specific	≥ 21	-
Yukon	-	for contaminants	not specific	not specific
Northwest Territories	-	for contaminants	-	-
Federal	-	2.5 (indirectly)	-	-

STATISTICS

An attempt has been made to compile some statistics of the complaints received by Labour Canada regarding indoor air quality. A questionnaire was designed and sent to the six regional offices of Labour Canada¹. The questionnaires were filled out at the district office level (each region has from two to five district offices). Completed summary forms were received from all 23 district offices.

From April 1985 to November 1989, a total of 2155 complaints related to safety and health were received under Part II of the Canada Labour Code. Of these, 417 (19%) were attributed to indoor air quality. The number of indoor air quality complaints has doubled from the period 1985-86 to 1987-88. However, air quality complaints as a percentage of all complaints has slightly decreased from the first year of the survey to stabilize itself at about 17%. Table 2 lists this data. It should be noted that the number of complaints is not a good barometer of the magnitude of the problem. While some complaints may have involved just a few individuals in a small office, others have involved hundreds of workers in large office complexes. Unfortunately, we do not have a very precise way of quantifying this information.

TABLE 2

OCCUPATIONAL SAFETY AND HEALTH COMPLAINTS RECEIVED BY LABOUR CANADA

Fiscal Year	Part II Complaints	IAQ Complaints		No. Refusals to Work over IAQ
		Number	Percentage	
1985-86	187	53	28.3	1
1986-87	303	73	24.1	4
1987-88	634	112	17.7	5
1988-89	657	112	17.0	5
1989-90 *	374	67	17.9	5

* First 7 months only

The regional distribution of complaints is shown in Table 3. In Atlantic Region, out of a total of 380 complaints received in the period 1985-86 to 1989-90, 33% were related to indoor air quality. This Region reported the highest percentage of complaints attributed to indoor air quality. The lowest, 4%, was reported by St. Lawrence Region.

Most indoor air quality complaints originated from banks and from the public service: together they total 66%. The others were from air transport, Crown corporations, broadcasting, railways, telecommunications, road transport, stevedoring and grain elevators. This data is summarized in Table 4.

We also attempted to find out how many investigations were conducted where no measurements were taken, where minor measurements were taken, or a major survey was conducted. A major survey would involve several days of measurements, compared to a day or less for a minor survey. In 37% of the investigations, no measurements were taken; minor measurements were taken in 49% of the investigations; and 14% of the cases required a major

¹ The six regions of Labour Canada are Mountain, Central, Great Lakes, Capital, St. Lawrence, and Atlantic. The regional offices are located in Vancouver, Winnipeg, Toronto, Ottawa, Montreal, and Moncton, respectively.

survey. In 64% of the cases, specific problems were identified, and in 23% of the cases, no specific problems were identified. In 13% of the cases, it was not clear to the investigating officer whether the problems identified were necessarily the causes of the complaints.

TABLE 3

REGIONAL DISTRIBUTION OF COMPLAINTS

Fiscal Year	Region					
	Atlantic	St. Lawrence	Great Lakes	Capital	Central	Mountain
	(No. of IAQ Complaints / Total no. of Complaints)					
1985-86	19/62	10/50	8/18	12/24	10/24	4/65
1986-87	24/59	3/95	6/25	17/27	13/37	10/58
1987-88	39/106	6/130	16/159	9/34	21/60	21/136
1988-89	29/98	7/156	30/131	12/77	17/62	17/131
1989-90	14/55	6/101	17/66	7/38	11/40	12/72
Total	125/380	22/532	77/399	57/200	72/223	64/462
Percentage	32.9	4.1	19.3	28.5	32.3	13.9

TABLE 4

DISTRIBUTION OF IAQ COMPLAINTS BY TYPE OF WORKPLACE

Type of workplace	Fiscal Year					Total	Percent
	1985-86	1986-87	1987-88	1988-89	1989-90		
Banks	20	23	34	39	28	144	34.5
Public Service	16	26	40	29	19	130	31.2
Air Transport	3	6	11	12	8	40	9.6
Crown Corporations	5	7	5	6	5	28	6.7
Broadcasting	5	3	7	9	0	24	5.8
Railways	1	2	5	8	2	18	4.3
Telecommunications	1	4	4	5	1	15	3.6
Road Transport	2	1	5	3	2	13	3.1
Stevedoring	0	1	1	1	0	3	0.7
Grain Elevators	0	0	0	0	2	2	0.5
Total	53	73	112	112	67	417	100.0

Another way of looking at this data is that, where no measurements were taken, 70% of the time, specific problems were identified, and presumably, complaints were successfully resolved. One could consider this as a sort of a success rate. Similarly, where minor surveys were carried out, the success rate was 60%. Finally, for the cases where a major survey was undertaken, the success rate was 59%. This data is summarized in Table 5.

The ventilation system was checked in 225 cases. Problems were found in 58% of the installations (130 cases). The two main deficiencies were lack of fresh air and poor maintenance. Closed fresh air intakes, ventilation system turned off, or inadequate supply of outdoor air were found in 50 locations (38%). Broken or missing parts and controls, dirty filters, ducts and humidifiers were found at 36 locations (28%). System balancing was needed

in 21 cases. At nine sites, the location of the fresh air intake was such that, either the exhaust air was re-entering the building through the "fresh air" intake (short circuiting), or contaminants from outside (such as exhaust from motor vehicles) was likely to be captured by the fresh air intake. Miscellaneous contamination such as dead birds, or spilled chemicals were found in the ventilation ducts of 14 systems.

TABLE 5
EFFECTIVENESS OF TYPE OF INVESTIGATION

Type of Investigation	Problems Identified	No. of Complaints	Percent of Total	Success Rate for Type of Investigation
Without Any Measurements	yes	81	26.1	70%
	no	15	4.9	
	not sure	19	6.1	
	Total	115	37.1	
With Only Minor Measurements	yes	91	29.4	60%
	no	41	13.2	
	not sure	19	6.1	
	Total	151	48.7	
Major Survey	yes	26	8.4	59%
	no	15	4.8	
	not sure	3	1.0	
	Total	44	14.2	
		Grand Total	310*	100.0

* Data unavailable for remaining 107 cases.

Following these investigations, Labour Canada's officials received 53 assurances of voluntary compliance, issued 7 directions and made recommendations in 171 cases.

CONCLUSIONS

Just as in many other jurisdictions across Canada, as well as internationally, Labour Canada has had to deal with a significant number of complaints about the quality of air in non-industrial work environments. The instruments traditionally used to deal with occupational health concerns in industrial workplaces appear to be inadequate in addressing these complaints. Occupational safety and health legislation drafted in the sixties and seventies may need to be revised, to take into account the increasing body of evidence that exposure to low levels of a variety of contaminants over prolonged periods of time could affect human health. The challenge to regulators is to draft laws that will take into account the very real concerns of workers in non-industrial workplaces, but at the same time not create a double standard for industrial workers.