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# HOUSE COMMITTEE REPORT

(7)

Date Referred: April 27, 1992

FURTHER REFERRALS:

Date of Committee Action: 5-5-92

The JUDICIARY Committee considered:

HB 356

HOUSE BILL NO. 356

FREON CONSTRUCTION STANDARDS

"An Act relating to construction involving freon systems; and providing for an effective date."

**RECOMMENDATIONS:**

be replaced with C.S. H.B. 356 (LFC)  the same title  
 a new title

have attached amendments(s)

do pass

do not pass

no recommendations

individual recommendations

additional referral to the \_\_\_\_\_ Committee

ADOPTS: \_\_\_\_\_ letter of Intent

ATTACHES NEW FISCAL NOTE(s): \_\_\_\_\_ (Dept)

APPROVES PREVIOUS: \_\_\_\_\_ (Dept/Date)

fiscal impact \_\_\_\_\_

fiscal note(s) Labor 4-27-92

zero fiscal note \_\_\_\_\_

zero fiscal note(s) \_\_\_\_\_

SIGNING DO PASS	DP	OTHER RECOMMENDATIONS	DNP	NR	AM
<u>David Wiley</u>	✓	<u>Serry Martin</u>			✓
<u>Kevin P. Parnell</u>	✓				
<u>Art Greenhoff</u>	✓				
<u>Tom Ellis</u>	✓				

David Wiley  
CHAIRMAN'S SIGNATURE

FISCAL NOTE

STATE OF ALASKA  
1992 LEGISLATIVE SESSION

Number 1  
BILL Bill Version: CSHB 356 (L&C)  
(H) Publish Date: 4-27-92

Revision Date: \_\_\_\_\_  
Title: " An Act relating to construction  
involving freon systems..."  
Sponsor: Representative Bruckman  
Requestor: House Labor & Commerce

Department Affected: Labor  
BRU: Labor Standards & Safety  
Component: Occupational Safety & Health  
COMPONENT SERIAL NO. 970

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98
PERSONAL SERVICES	8.6	32.1	32.1	32.1	32.1	32.1
TRAVEL	3.6	4.0	4.0	4.0	4.0	4.0
CONTRACTUAL	14.0	6.5	6.5	6.5	6.5	6.5
SUPPLIES	0.3	0.9	0.9	0.9	0.9	0.9
EQUIPMENT	1.3					
LAND&STRUCTURES						
GRANTS,CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	27.8	43.5	43.5	43.5	43.5	43.5

CAPITAL						
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REVENUE		45.5	45.5	45.5	45.5	45.5
FUND SOURCE:		PR #1005	PR #1005	PR #1005	PR #1005	PR #1005

FUNDING: (Thousands of Dollars)

GENERAL FUND	27.8					
FEDERAL FUNDS						
PROGRAM RECEIPTS		43.5	43.5	43.5	43.5	43.5
TOTAL	27.8	43.5	43.5	43.5	43.5	43.5

POSITIONS:

FULL-TIME						
PART-TIME	0.25	0.5	0.5	0.5	0.5	0.5
TEMPORARY						

Estimate of current year impact: None

ANALYSIS: (Attach a separate page if necessary)

See attached

Prepared by: Richard Arab, Deputy Director

Phone: 465-4855

Division: Labor Standards & Safety

Date: 4/14/92

Approved by Commissioner: C. W. Mahlen

Agency: Department of Labor

Date: 4/14/92

Distribution (by preparer): Legislative Finance, Legislative Sponsor, Requestor, OMB, & Impacted Agency(ies).

Fiscal Note Analysis for:  
"An Act relating to construction involving freon systems...."

This bill would place additional responsibilities on the Occupational Safety & Health (OSH) component of the Department of Labor. OSH would be required to develop a training and certification program for persons who construct, install, alter, maintain, or repair refrigerating systems. The department would contract with the University of Alaska's Mining and Petroleum Training Service to assist in developing the training program at a cost of \$10,000.

During the first year, this bill would require the addition of a part time Data Processing Clerk for six months (\$8,600). The Data Processing Clerk would provide needed clerical support during development of the program.

Additional travel funds would also be required. We estimate an existing Regulation Specialist would be required to make four trips around the state at a cost of \$900 per trip (\$3,600) to work with the University of Alaska's Training Service in development of the training program and to hold hearings regarding the program.

Additional contractual (\$4,000) and commodity (\$300) expenses would also be incurred for printing of training applications and certification forms, advertising, postage, phones, space rent, and other average per employee costs.

Equipment consisting of a desk and chair (\$1,300) would also be required and would be a one time cost.

In the second year existing staff would perform the certification inspections. This would entail costs for: inspector and supervisory time (\$15,000), travel (\$4,000), contractual (\$500), and supplies (\$300). The Data Processing Clerk will be required part time for twelve months to provide clerical support and perform the data entry involved with tracking the inspections and certifications.

Program receipts would be generated as a result of charging a fee for the training and certification, the department estimates that 650 certifications would be issued at a cost of \$70. This would fund the program from the second year on. During the first year development period of the program no certifications would be issued so that general funds are required.

An effective date of July 1, 1992 is assumed.

Position Title <b>Data Processing Clerk II</b>			No. of Positions <b>1</b>	Range/Step <b>9A</b>	Barg. Unit <b>GGU</b>
Time Status <b>Part Time</b>	Staff Months <b>3</b>		Location <b>Anchorage</b>		Election District <b>7</b>
Type of Expenditure			Amount		
1			2		3
Salary			<b>\$5,900</b>		
Benefits			<b>2,700</b>		
Premium Pay					
Other					
<b>Total Personal Services</b>					<b>\$8,600</b>
Travel					
Contractual					<b>2,000</b>
Commodities					<b>300</b>
Equipment					<b>1,300</b>
Other					
<b>Total Cost</b>					<b>\$12,200</b>
Funding Source for Total Cost					
Federal Receipts 1002					
G. F. Match 1003					
General Fund 1004					<b>12,200</b>
GF Program Receipts 1005					
Other					
Justification					
<p>This position will provide the data entry and clerical support for this program.</p> <p>Contractual costs include postage, phone, space rent, and other average per employee costs.</p> <p>Commodities cover normal office supplies for this position.</p> <p>Equipment is for a desk and chair and is a one time cost.</p>					

COMMITTEE COPY

CSHPB 356 (C) No. 1

**Request For  
New Position**

Agency Labor  
 BRU Labor Standards & Safety  
 Component Occupational Safety & Health

Page 3 of 3  
 Revised Date

**FY 92**

**FISCAL NOTE**

**STATE OF ALASKA**  
**1992 LEGISLATIVE SESSION**

**BILL NO :** CSHB 356 ( )

Revision Date: \_\_\_\_\_  
 Title: " An Act relating to construction  
Involving freon systems..."  
 Sponsor: Representative Bruckman  
 Requestor: House Labor & Commerce

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 BRU: Labor Standards & Safety  
 Component: \_\_\_\_\_  
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<b>CAPITAL</b>						
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<b>FUND SOURCE:</b>		PR #1005	PR #1005	PR #1005	PR #1005	PR #1005

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Estimate of current year impact: None

**ANALYSIS:** (Attach a separate page if necessary)

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General Fund 1004					<b>12,200</b>
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**Request For  
New Position**

Agency Labor  
 BRU Labor Standards & Safety  
 Component Occupational Safety & Health

Page 3 of 3  
 Revised Date

**FY 92**



REPRESENTATIVE BETTY BRUCKMAN

Sponsor Statement

HB 356

"An Act relating to refrigerating systems"

On May 20, 1991 a major Freon leak occurred in the Freon compressor room of the Dimond Ice Chalet in the Dimond Mall in Anchorage. Three employees, untrained in proper safety procedure, entered the room to try and shut off the leak. All three collapsed. One, William Temple, a likeable 24 year old engaged to be married, died.

The Ice Chalet had no formal or written safety program. William Temple died because his employers did not give him the safety information he needed to work with refrigerant gases. HB 356 ensures that another friendly, hardworking young Alaskan will not needlessly die. Safety training for all but the most qualified refrigeration workers will now be mandatory.

HB 356 will require workers who construct, alter, repair, or maintain refrigeration systems to attend a Department of Labor approved safety training program unless they have two years of recent experience as a journeyman in refrigeration or are a graduate of an accredited college or trade school in refrigeration. HB 356 ensures the safety of refrigeration workers; it does not seek to regulate the wider refrigeration industry. If another leak does occur, HB 356 makes sure workers will know how to protect themselves from death or injury.

HB 356 protects more than refrigeration workers: it also safeguards the general public. During the Dimond Mall incident several people swimming in a nearby health club were rescued from the bottom of the pool after inhaling Freon that had accumulated on the surface of the water. A day care center for children was also nearby. Two firefighters who attempted to resuscitate Mr. Temple later received hospital treatment for the effects of Freon inhalation. If refrigeration workers understand proper safety procedure, refrigerant leaks such as the one at Dimond Mall will be less likely to spread to areas where the general public is harmed.

HB 356 will not add hardship to an already overburdened state budget. The Department of Labor will be required to establish program fees that meet the cost of safety training. Program fees will be limited to a reasonable amount. An efficient and cost effective safety training program will therefore be necessary. This provision is in line with the current state budget crisis; the Department will be required to operate efficiently and those who use the service will help defray its cost.

HB 356 will save Alaskan lives. Not only will refrigeration workers be protected from death or injury by deadly refrigerant gases, the safety of the general public will also be enhanced. Reflecting declining state revenues, HB 356 also mandates an efficient and cost effective training program. If HB 356 had been passed a year ago, William Temple would be alive today.

## Answers to questions about HB 356:

**1. Why do we need this bill?** On May 20, 1991 William Temple died in the Freon compressor room of the Dimond Ice Chalet in the Dimond Mall. After Mr. Temple's death many facts came to light. The Ice Chalet had no formal or written safety program. Safety meetings had been held for only three months before the accident. Mr. Temple attended two of them. Mr. Temple worked on the company's Freon system and had requested maintenance manuals to learn more about the system. No other training on the freon system is known to have been provided to Mr. Temple by his employer. William Temple died because his employers did not give him the safety information he needed to work with refrigerant gases. HB 356 seeks to prevent another such death.

**2. What kind of refrigeration systems will be included in the domain of HB 356?** Factory assembled systems (home refrigerators, coolers, etc.) will be exempted. Other refrigeration systems that fall within the ratio guidelines specified by the American Society of Heating, Refrigerating and Air-Conditioning Engineers of refrigerant to room space will be included in the jurisdiction of HB 356. This excludes systems in spaces such that if a leak did occur the refrigerant would be harmlessly dispersed over a very large area.

**3. What kind of training will be required under HB 356?** Safety training. The intent of HB 356 is to save refrigeration system workers from death due to ignorance of proper safety procedures. HB 356 does not seek to train workers on all aspects of refrigeration system installation, retrofitting, repair or maintenance. Rather, if a leak does occur, HB 356 will ensure that workers know what to do to protect themselves from death or health damage. HB 356 mandates only safety training, it will not affect any other aspect of refrigeration work.

**4. What are the current training requirements for those who work with refrigerating systems?** Only those who do work within the scope of the mechanical administrators license are required to have training. Installation, alteration, or retrofitting of refrigeration equipment must be supervised by a mechanical administrator. Those who actually do the installation, alteration, or retrofitting however, are not currently required to attend safety training. Particularly vulnerable to death and health damage are those repair and maintenance workers unaware of proper safety procedures, who are now legally allowed to work without

supervision or knowledge of the danger of suffocation and other effects from a refrigerant leak.

**5. Who is exempted from the training requirement?** People with two years of recent refrigeration experience at a journey level and anyone who has attended an accredited college or trade school in refrigeration.

**6. Will a person be required to prove their refrigeration experience and education?** Yes, the bill only states that the Department must require proof. The proof currently required for the Mechanical Administrator's license in Refrigeration is probably similar to the standard that will be used.

The current proof required for the Mechanical Administrator's License in Refrigeration (12 AAC 39) includes the following: 1) a completed application, on a form provided by the department, that identifies the license category for which the applicant is applying; 2) the fees required by the department by regulation; 3) official transcripts from any regionally accredited college, university, or trade school attended by the applicant and sent directly to the department by that college, university, or trade school; 4) a complete resume detailing the applicant's experience and education in the license category for which the applicant is applying; and 5) a notarized certificate, in support of the applicant's experience and qualifications for licensure as a mechanical administrator, from each of three persons who are employed in the mechanical industry in any state, who have direct personal knowledge of the applicant's work and qualifications, and who submit the certificate directly to the department.

**7. What is "journey level" refrigeration work?** Work under supervision of a mechanical administrator, Refrigeration Category, installing, altering, or retrofitting refrigeration equipment and systems including the installation of domestic water piping from an existing valved connection to the system, tower and condensing water piping, and chilled water piping, limited to the refrigerant cycle, controls and related appurtenances. Also, work supervised by a mechanical administrator installing, altering, retrofitting all pneumatic or electric controls and control wiring of 48 volts or less necessary for the operation of refrigeration systems. (12 AAC 39.270)

**8. Is requiring program receipts to reflect the cost of the program a realistic requirement?**

The State budget is overburdened. There are too many calls on state revenue and many programs are run without regard to state budget

realities. Requiring program receipts to reflect program costs is not just a good idea - in these times of fiscal hardship it is a necessary one.

Two examples of programs that already do this are: the Electrical Examiners and Mechanical Administrators programs. Both have program receipts which in fiscal years 1991 and 1992 exceeded costs. The total yearly expenditure for the Electrical Examiners Program in FY 91 was \$59,237. The average yearly program receipts for FY 91 and FY 92 were \$84,270. The total yearly expenditure for the Mechanical Administrators Program in FY 91 was \$62,941. The average yearly program receipts for FY 91 and FY 92 were \$97,165. Thus, in both cases program receipts met and in fact exceeded program costs.

In these times of fiscal hardship it is essential that those who will benefit from the new training program contribute, through program receipts, toward defraying its costs. Such "user fees" are an example of the responsible state spending our declining revenues require.

**9. What kind of chemicals fall in the category of refrigerants?** Substances used to produce refrigeration by their expansion or vaporization. These can include refrigerants such as Trichlorofluoromethane, Dichlorodifluoromethane, Chlorotrifluoromethane, Bromotrifluoromethane, Tetrafluoromethane, Dichlorofluoromethane, Methylene chloride, Trichlorotrifluoroethane, Dichlorotetrafluoroethane, Chloropentaluoroethane, Octafluorocyclobutane, Dichlorodifluoromethane, Chlorodifluoromethane, Carbon Dioxide and Ammonia.

**10. Are there any other training programs for hazardous substances?** Yes. There are two successful hazardous substance programs currently being run by the State of Alaska: the asbestos program and the hazardous paint program.

**11. What are the penalties for violating the standards set out in HB 356?** An individual, company, contractor or subcontractor who knowingly violates HB 356 even after an initial notice of violation has been given, will be guilty of a Class A misdemeanor. This entails: a \$5,000 maximum fine for an individual, a \$200,000 maximum fine for an organization (company for example), or if the violation results in a death, a maximum fine of \$500,000 for an organization. An individual can be sentenced to a maximum of one year in jail for a Class A misdemeanor.

Since violations of standards set out in HB 356 can put those performing the work as well as the general public in danger of injury or death, these penalties are appropriate.

**12. Who is culpable for violations of standards set out in HB 356?** An owner or contractor (this includes a corporation or business, not just a human individual) who knowingly allows his or her employees to perform refrigeration work without a certificate and an owner or contractor who performs refrigeration work him or herself, without a certificate.

HB 356 ensures that employers will require all refrigeration workers to have certification. If an employer knows that he or she will be held accountable for refrigeration work performed without a certificate, he or she will be likely to require all employees to have one. This puts responsibility for worker safety where it belongs: with the owner or contractor. The Dimond Mall incident is an example of what can happen if employers take no responsibility for their employees' safety.

# STATE OF ALASKA

## THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

FINANCE DIVISION  
P.O. BOX WF  
JUNEAU, ALASKA 99811  
PHONE: (907) 465-3795

### MEMORANDUM

DATE: March 6, 1992

TO: Representative Betty Bruckman

FROM: David Tonkovich, Revenue Analyst <sup>DT</sup>  
Legislative Finance Division

SUBJ: Revenues and Costs of Regulated Professions

Heather Hulseman of your staff asked me to provide you with information on revenues and costs associated with three regulated professions: Electrical Examiners, Mechanical Administrators and individuals working with asbestos and hazardous paint. Two of these professions (Electrical and Mechanical) are regulated by the Division of Occupational Licensing in the Department of Commerce and Economic Development. Asbestos and hazardous paint workers are regulated by the Department of Labor.

The attached spreadsheet gives revenues and costs for the Electrical Examiners and Mechanical Administrators. The revenue figure is an average of two years to account for the fact that these professions are on a two year cycle to renew licenses. This typically results in a high revenue year followed by a low revenue year. Costs are provided to us by the Division of Occupational Licensing. Neither revenues nor costs are audited by Legislative Finance Division.

The attached figures for the asbestos and hazardous paint areas were provided by the Department of Labor, Occupational Safety and Health. They indicated that no fee is charged for asbestos workers although individuals must pay for training by private vendors.

COMPARISONS OF COST ALLOCATIONS FOR FY91				
TO RESTRICTED REVENUE AVERAGE (FY91 AND FY92)				
			<b>ELECTRICAL</b>	<b>MECHANICAL</b>
			<b>EXAMINERS</b>	<b>ADMINISTRATORS</b>
<b>REVENUES</b>			\$84,270	\$97,165
<b>PERSONAL SERVICES</b>			\$39,997	\$43,712
<b>TRAVEL</b>			\$3,832	\$5,565
<b>CONTRACTUAL</b>			\$13,209	\$11,731
<b>SUPPLIES</b>			\$1,441	\$1,196
<b>EQUIPMENT</b>			\$758	\$737
<b>TOTAL EXPENDITURES</b>			\$59,237	\$62,941
<b>REVENUES OF EXPEND</b>			\$25,033	\$34,224

# DIVISION OF LEGAL SERVICES

## LEGISLATIVE AFFAIRS AGENCY STATE OF ALASKA

(907) 465-3867 or 465-2450  
FAX (907) 465-2029  
Mail Stop 3101

240 Main Street, Suite 500  
Juneau, Alaska 99801-2101

### MEMORANDUM

April 30, 1992

**SUBJECT:** Sectional summary of draft CSHB 356 (L&C)

**TO:** Representative Betty Bruckman  
Attn: Heather

**FROM:** Theresa L. Bannister  
Legislative Counsel

You have requested a sectional summary of the above described bill.

As a preliminary matter, note that a sectional summary of a bill should not be considered an authoritative interpretation of the bill and the bill itself is the best statement of its contents.

Section 1 establishes a new article in the safety chapter. Establishes certain requirements regarding the construction, installation, alteration, maintenance, and repair of refrigerating systems.

Sec. 18.60.860 directs the Department of Labor ("department") to establish safety standards for the construction, installation, alteration, maintenance, and repair of refrigerating systems in buildings.

Sec. 18.60.863 makes the department responsible for administering the standards. Authorizes the department to make inspections. Requires the department to maintain a record of its inspections.

Sec. 18.60.865 authorizes the department to enforce compliance with the standards. Directs the department to notify certain persons when there is a violation of the standards. Indicates what the notice of the violation must contain.

Sec. 18.60.870(a) obliges the owner of a refrigerating system to require that the individual performing refrigeration work on the system show the owner a copy of the individual's refrigeration work certificate.

Representative Betty Bruckman

April 30, 1992

Page 2

Sec. 18.60.870(b) requires an individual who owns a refrigerating system to have a refrigeration work certificate before personally performing refrigeration work on the system.

Sec. 18.60.873 directs the department to issue a two-year refrigeration work certificate to applicants who satisfy certain requirements. Establishes the requirements for renewing the certificate.

Sec. 18.60.875 directs the department to establish guidelines for training programs on how to safely work on refrigerating systems. Directs the department to approve those programs that comply with the guidelines.

Sec. 18.60.877 directs that the fees charged under the new article be established by regulation and reflect the costs of implementing the article.

Sec. 18.60.880 establishes criminal penalties for certain violations of the new article, including violations of the refrigerating system standards.

Sec. 18.60.883 excludes certain self-contained refrigerating systems from the coverage of the new article.

Sec. 18.60.885 authorizes the department to adopt regulations to implement the new article.

Sec. 18.60.890 defines certain terms for the new article.

Section 2 directs the department to adopt the initial refrigerating system safety standards on or before January 1, 1993.

Section 3 states that the standards provisions of the bill and certain general provisions apply to maintenance refrigeration work that occurs on or after January 1, 1993 and to other refrigeration work that begins on or after January 1, 1993.

Section 4 states that the standards provisions of the new article and certain general provisions take effect immediately.

Section 5 states that the certification, training, and fees provisions of the new article take effect January 1, 1993.

If I may be of further assistance, please advise.

TLB:pl  
92-316.plm

**BILL NO:** House Bill No. 356

**DATE:** April 1, 1992

**TITLE:** "An Act relating to construction involving freon systems;..."

**CONTACT:** Arbe Williams  
465-2700

House Bill No. 356 would require the Department of Labor to adopt regulations establishing standards for construction of freon systems in buildings. The bill would allow a municipality the option to develop standards that are as effective as state standards and to provide for enforcement within the jurisdiction of the municipality.

House Bill No. 356 would also require the department to inspect the installation, removal and alteration or replacement of freon systems. A person who fails to correct a violation identified by the department may be charged with a class A misdemeanor.

There are 11 ice skating rinks in Alaska that have large capacity freon refrigerating systems. There are also numerous small capacity freon systems used by such establishments such as grocery stores and other food and beverage wholesalers and retailers.

The Department's Occupational Safety and Health program places a priority on the inspection of high hazard industries. A special emphasis has been placed on the inspection of ice skating rinks in Alaska. Consequently, it is not anticipated that regulating small capacity freon systems would affect the operation of the Department's Occupational Safety and Health Section.

APPROVED:



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C. W. Mahlen, Commissioner  
Department of Labor

**POSITION PAPER/Department of Labor**

## INSPECTION FINDINGS OF ICE SKATING RINKS

### Sullivan Arena managed by Ogden Facility Management:

Findings: The freon system did not have an emergency remote switch located outside of the room and there was no ventilation switch located outside of the compressor room. In addition to these mechanical deficiencies, the employer did not have a hazard communication program, did not have a lock out/ tag out program, nor an accident prevention program.

### Ben Bock Ice Arena managed by Ogden Facility Management:

Findings: The freon system lacked tight fitting seals on the door leading in and out of the compressor room. In addition to this mechanical deficiency, the employer did not have a hazard communication program, did not have a lock out/ tag out program, nor an accident prevention program.

### Fire Lake Recreation Center:

Findings: The freon system lacked tight fitting seals on the door leading in and out of the compressor room and did not have a metal name plate identifying the emergency shut off valve. In addition to these mechanical deficiencies, the employer did not have a written hazard communication program and there were also open containers of hazardous chemicals in the work site.

### University of Alaska - Anchorage:

Findings: The freon system lacked tight fitting seals on the door leading into the compressor room.

### Matanuska-Susitna Ice Arena managed by Mat-Su Borough:

Findings: The freon system lacked tight fitting seals on the door leading in and out of the compressor room and lacked a fresh air intake fan. In addition to these mechanical deficiencies, the employer did not have a hazard communication program.

### Soldotna Sports Arena managed by Ogden Facility Management:

Findings: The freon system lacked tight fitting seals on the door leading in and out of the compressor room. In addition to this mechanical deficiency, the employer did not have an adequate hazard communication program.

Dempsey Anderson Ice Arena managed by Ogden Facility Management:

Findings: The compressor room doors of the freon system opened inward instead of outward and there was no metal sign to identify the emergency cut off switch.

Big Dipper Ice Arena managed by the North Star Borough:

Findings: The emergency ventilation switch was located inside the freon compressor room rather than being on the outside as required by the industry standard. The doors to the compressor room opened inward instead of opening outward and the doors were lacking tight fitting seals.

Carlson Acting Center managed by Ogden Facility Management:

Findings: The freon system lacked tight fitting seals on the door leading in and out of the compressor room.

Pattv Center Ice Rink managed by the University of Alaska, Fairbanks:

Findings: The doors to the compressor room opened inward instead of opening outward and there were no tight fitting seals on the doors. Also the compressor room did not have an exhaust system nor emergency shut down switches, and the alarm system was located inside rather than outside the compressor room.

# MEMORANDUM

# STATE OF ALASKA DEPARTMENT OF LABOR Administrative Services Division

TO: Karen Rehfeld  
Fiscal Analyst  
Legislative Finance Division

DATE: March 2, 1992

FILE: DTOV0227.LEG

PHONE: 465-2720

FROM: David Teal, Director

SUBJECT: Hazardous Painting  
Certification Program

You requested information concerning the status of the hazardous painting certification program which is operated by our Occupational Safety & Health Component (OSH). I have gathered statistics regarding the program's performance in FY 92 as well as budgeted information for FY 93.

AS 08.63.010-100, which became law in 1988, requires professional painters performing hazardous painting to obtain certificates from the Department of Labor (DOL). In order to obtain the certificate, a painter must complete hazardous painting courses which are approved by DOL. DOL also audits the training plans and evaluates requests for renewal of training plans. Inspections are conducted on job sites to assure persons performing hazardous painting are certified and performing the work safely.

During FY 92 we have one full time Industrial Hygienist assigned to the above duties. Some clerical support is also provided by OSH staff. Since July 1, 1991, 211 painters have received certificates generating revenue of \$21,100 (certificates cost \$100 each). We estimate total revenue generated by this program for the fiscal year will be between \$35,000 and \$45,000. 21 training classes have been conducted at approved training facilities. 16 inspections of job sites have occurred resulting in 13 enforcement actions.

For FY 93 we are anticipating no changes to this program. One full time Industrial Hygienist will continue to be assigned to the program. The salary and benefits for this person is budgeted at \$77,000. A small amount of non-personal services is also included. In our budget documents we estimated revenue of \$40,000 which would be generated from issuing 400 certificates for this program.

Please let me know if you need additional information.

cc: Sharon McCauley, OMB  
Arbe Williams, DOL  
✓Richard Arab, DOL

RECEIVED  
MAR 3 1992  
IND. DIV.

M21-2.1: 1705 persons certified as hazardous painters  
2359 asbestos

### ASBESTOS ABATEMENT WORKER CERTIFICATION PROGRAM

The following is an estimate of the time and monies that Department of Labor spends on Asbestos Abatement Worker Certification.

This program takes approximately 50 percent of an industrial hygienist time and 50 percent of a data entry clerk time.

The cost of the program therefore is estimated as follows:

#### Personal Services:

Industrial Hygienist (Range 20B) (0.5)	\$ 33,200
Data Processing Clerk (0.5)	18,200
Non-Personal Services	21,000
Total Cost	\$ 72,400

The Department does not charge a fee for asbestos worker certification.

The Department approves and evaluates asbestos certificate training programs; issues certificates to trainees; and approves asbestos contractors plans for employing only certificate workers at asbestos abatement worksites. Enforcement of the certification requirement is performed by other enforcement field staff as part of their regular occupational safety and health inspection of work places.

# MEMORANDUM

**STATE OF ALASKA**  
Department of Environmental Conservation  
Division of Environmental Quality - Air Quality

TO: Ann Hayes  
Legislative Assistant  
Representative Bruckman's Office

DATE: December 5, 1991

FILE NO: F20C

THRU: Len Verrelli, Chief

TELEPHONE NO: 465-5128

FROM: John M. Stone *JMS*  
Project Manager

SUBJECT: House Bill No. 356

At your request, I have attempted to detail how regulation of ozone-depleting substances under Title VI of the Clean Air Act Amendments of 1990 may interact with the provisions of House Bill No. 356. I have also commented upon the efficacy of Title VI as it relates to HB No. 356.

As you know, Congress instructed the U.S. Environmental Protection Agency to regulate substances which are believed to be responsible for the depletion of ozone in the earth's stratosphere. These substances include most of the common refrigerants. The U.S. EPA is in the process of rulemaking to implement the provisions of Title VI.

Review of HB No. 356 indicates the bulk of overlap with the provisions of Title VI will occur with regulations developed pursuant to Section 608, the National Recycling and Emission Reduction Program. Under this program, the U.S. EPA must develop and implement regulations regarding the use and disposal of listed substances during the service, disposal, and repair of appliances and industrial process refrigeration. HB No. 356 appears to cover the use of similar refrigerants in similar equipment and facilities.

The implementation dates specified in Title VI vary according to the class of substance. For Class I substances, which include the chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform, the standards and requirements must be effective not later than July 1, 1992. Standards and requirements for the Class II substances, which include the hydrochlorofluorocarbons, must become effective not later than November 15, 1995. Also, Section 308(c)(1) prohibits the release of a Class I or Class II substance into the environment beginning on July 1, 1992. Of course, this provision would not apply to accidental releases.

I must caution you that actions specified in the Clean Air Act are not always achieved in a timely fashion by the U.S. EPA. According to information published in the Federal Register, the expected promulgation date of regulations concerning the Class I substances is approximately six months behind schedule. One may safely assume

that delays of six months to one year could occur in the implementation dates of regulations concerning the National Recycling and Emission Reduction Program.

If we assume that the requirements of HB No. 356 become effective on January 1, 1993, then the Department of Labor would initiate regulation of the Class I substances at about the same time as the U.S. EPA and the Class II substances about three years before the U.S. EPA. One would need to know the number of facilities using Class I and II refrigerants in the State of Alaska to determine how EPA-affected facilities would differ from the Department of Labor-affected facilities.

Without draft regulations, I am not able to comment on how EPA's standards and requirements would differ from the Department of Labor's standards and requirements. I would recommend that Department of Labor staff incorporate, where possible, the U.S. EPA rulemaking provisions to promote consistency and to reduce confusion among the regulated community.

HB No. 356 **does differ** from the National Recycling and Emissions Reduction Program in training requirements. Congress did not direct the U.S. EPA to establish a training and operator certification program, as you have specified in HB No. 356. The U.S. EPA may choose to create a program, but at this time we have no reason to presume such a program will be created.

The U.S. EPA is responsible for the implementation and enforcement of the National Recycling Program and Emissions Reduction Program. The U.S. EPA has not asked the State of Alaska to adopt and implement the program, nor do we expect to assume control of the program for some time. With the magnitude of other requirements of the Clean Air Act Amendments of 1990 and the U.S. EPA's limited resources within this state, you should expect the initial implementation of this program to be scant and non-uniform.

In conclusion, Title VI is not intended to address direct health and safety concerns and the prevention of accidental releases as does HB No. 356. Therefore, you should not expect Title VI to substitute for regulation intended to protect workers and the public from direct exposure to refrigerants. Since both programs will result in the common effect of preventing the release of refrigerants to the environment, we should expect some regulatory overlap. The Departments of Labor, Environmental Conservation, and the U.S. EPA should coordinate so that confusion upon the regulated community from this overlap will be reduced. We conclude that the provisions of HB No. 356 will provide better control in the protection of workers than will the provisions of Title VI, especially in the prevention of accidental releases.

JMS/jp

ALASKA STATE LEGISLATURE  
HOUSE OF REPRESENTATIVES

3111 C STREET  
ANCHORAGE, ALASKA 99503  
(907) 561-2034

LABOR & COMMERCE

WHILE IN SESSION  
STATE CAPITOL  
JUNEAU, ALASKA 99801-1182  
(907) 465-4843



STATE AFFAIRS

REPRESENTATIVE BETTY BRUCKMAN

May 5, 1992

Representative Dave Donley  
Chair, House Judiciary Committee  
State Capitol  
Juneau, Alaska 99801-1182

Dear Representative Donley,

I would like to respond to the concerns brought up by Mr. Brian Sweiven in his May 1 letter to you. I regret that I am only today in receipt of a copy of Mr. Sweiven's letter, I would like to have been able to respond to his concerns earlier.

In his first paragraph Mr. Sweiven refers to Refrigerating System Safety Standards: "If a system is not properly installed, it will not work."

This section pertains to safety features of refrigeration construction. For example: vapor detectors, properly placed vents and tightly fitted doors. Both the Dimond Mall and Wasilla Carrs freon leaks occurred from systems that "worked" for years, but which did not have such safety features. A refrigeration system can refrigerate properly without a vapor detector or vent, but is much more likely to kill a worker without these features.

Paragraph two: "How will the department carry out the inspection process? Who will pay for an inspection?"

This information is detailed in the position paper from the Department of Labor included in your packet.

Paragraph three: "Does this section mean that every time a person works on any refrigeration system they must get a certificate? How would emergencies be handled, must the repair person wait for a certificate to perform emergency repairs?"

A certificate is required for those who are not exempted by

experience or education (the vast majority of refrigeration workers will be exempted) every two years. Certificates are not required on a job by job basis. Rather, to work for a company, contractor, or to be self employed in the refrigeration industry a worker must have a certificate.

Paragraph four: "Where would a repair person receive the required training? Who would pay for it? How does a repair person get two years experience unless he works for a company who has a training program? To my knowledge there is no accredited college or trade school in refrigeration in the state of Alaska."

The proposed training program is detailed in a handout included in your packet entitled, "Outline of Video Training." The training would be paid for by program participants. There are at least two accredited refrigeration programs in the State. The University of Alaska Anchorage has already indicated an interest in bidding for the safety training contract.

I hope the above has adequately answered any questions you had after reading Mr. Sweiven's letter. I will be happy to provide you with additional information.

This bill is the result of months of input from national and local industry representatives. Every section of this legislation reflects their ideas and suggestions.

Sincerely,

Representative Betty Bruckman

A handwritten signature in cursive script, appearing to read "Betty", is written below the typed name.

cc: Judiciary Committee

May 1, 1992

Representative Dave Donley  
Chair, House Judiciary Committee  
State Capitol  
Juneau, AK 99801-1182

Dear Rep. Donley:

I understand that House Bill 356 is to be up in Judiciary Committee on Monday, May 4th at 1:30. I would like to express my strong objections to this bill:

Page 1, line 5: Sec. 18.60.860 pertaining to safety standards, construction and installation, -- If a system is not properly installed, it will not work.

Page 2, line 1: Sec. 18.60.865 on ENFORCEMENT OF COMPLIANCE -- How will the department carry out the inspection process? Who will pay for an inspection?

Page 2, line 10: Sec. 18.60.870 on CERTIFICATE REQUIRED -- Does this section mean that every time a person works on any refrigeration system they must get a certificate? How would emergencies be handled, must the repair person wait for a certificate to perform emergency repairs?

Page 2, line 21: Sec. 18.60.873 on REFRIGERATION WORK CERTIFICATES -- Where would a repair person receive the required training? Who would pay for it? How does a repair person get two years experience unless he works for a company who has a training program? To my knowledge there is no accredited college or trade school in refrigeration in the state of Alaska.

I would appreciate your consideration of this bill in light of my comments.

Sincerely,

*Brian R. Sweiven*

Brian R. Sweiven  
BRIAN'S APPLIANCE AND  
REFRIGERATION REPAIR  
3675 Main Street  
Homer, AK 99603  
Phone: 235-6754

CC: All Judiciary Committee Members

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FROM

PAGE 1 OF 1

DATE 4-17-92

Bobby Gordon

TO

Representative Betty Bruckman

465-2299

SUBJECT

Here is another freon leak at a supermarket. I think supermarkets need to be added into your bill as well.

### Freon leak in Wasilla injures 6, closes mall

A Freon leak in a Wasilla supermarket sent six people to the hospital Thursday and closed the Carrs mall for most of the afternoon. No one was seriously injured, and the store reopened about 4 p.m., said Mat-Su Fire Chief Jack Krill.

About 12:30 p.m., workers found the store's refrigeration compressor room filled with Freon 502 gas. Investigators found that a cooling fan had shut down, allowing the refrigeration system to overheat. When pressure built up, a release valve vented and Freon escaped, according to Krill.

Occupational Safety and Health Administration investigators determined that less than 150 pounds was released, he said.

Six people were treated at Valley Hospital in Palmer, complaining of symptoms ranging from hyperventilation to nausea. Twelve people were checked out or treated at the scene by paramedics, Krill said.

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...ital.  
...ords to  
...ver it," he  
...ll ask me  
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...ounger people  
...grades."  
The eighth-grader is a seven-year veteran of spelling bees, and must retire from competition this year. He declined to share his training secrets, other than the importance of knowing how a word is pronounced.  
"I'm probably going to start giving out hints after this is over," he said. "I don't want to divulge anything now, because I don't want anyone to suddenly do real great and beat me."

...lation is pro-

— Howard Bess  
Coalition for Choice

...tivate."  
...sburg, chairwoman of  
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...ue," Branson said.  
...is that the Supreme  
...e 9th Circuit Court  
...his decision on are  
...It's either there or it

# Quayle

Continued from page B1

those costs."  
Brady said he believes Quayle will depart Alaska for a trip to the Far East but will not be accompanied by his wife Marilyn.  
It will mark Quayle's fifth Alaska visit — and third refueling stop — since he was elected vice president in 1988.  
He came to Alaska in May 1989 to check on the progress of cleanup efforts after the Exxon Valdez oil spill.  
Quayle stopped briefly at Elmendorf twice in September 1989 and at Eielson Air Force Base near Fairbanks in May 1991 while en route to trade and diplomatic talks in the Far East.

...try trade group has joined the  
...lobbying campaign to open the  
...coastal plain of the Arctic National  
...Wildlife Refuge to oil explo-  
...ration, but the state is pushing  
...ahead with its advertising cam-  
...paign.  
"We see this as a long-term ef-  
...fort," said John Katz, director of  
...Gov. Walter J. Hickel's Washing-  
...ton office.

"The process of grass-roots ad-  
...vocacy takes time," Katz said  
...Thursday. "It is not done a week  
...before the next vote."

But no vote is planned in this  
...legislative session and the Ameri-  
...can Petroleum Institute is not  
...spending more money to prepare  
...for one if and when it finally  
...comes.

The oil industry group budget-  
...ed \$6.5 million last year to pro-  
...mote ANWR exploration, largely  
...by paying travel costs to the  
...North Slope for members of state  
...legislatures, congressional com-  
...mittee staff, business people and  
...others who could influence public  
...and government opinion.

About \$3 million was already  
...spent, including some funds for  
...area advertising, when API Presi-

The Senate, unable to over-  
...come stiff opposition by conserva-  
...tionists, last November refused to  
...consider a comprehensive energy  
...bill because it called for oil and  
...gas leasing on the 1.5 million acre  
...coastal plain.

Environmentalists said the  
...plain is the ecological jewel of the  
...arctic and that should be spared  
...from development, despite its  
...possible 9 billion barrels of oil.

The House was not expected to  
...act on an ANWR provision unless  
...it first passed the Senate. An en-  
...ergy bill working its way through  
...House committees does not in-  
...clude ANWR exploration.

"We don't see it happening  
...this political year," API  
...spokesman Joe Lastelic said  
...Thursday. "The Hill is not mov-  
...ing any ANWR legislation. There  
...is no realistic expectation there  
...will be an ANWR amendment.  
...We have to look at what we face  
...on the Hill."

Lastelic said the remaining  
...money will be returned to those  
...companies in the 250 member or-  
...ganization that contributed to the  
...special fund.

## Freon leak forces evacuation of Wasilla Carrs

TIMES STAFF

Two hundred customers were  
...evacuated from a Carrs Quality  
...Center in Wasilla Thursday after-  
...noon after freon leaked from an  
...upstairs compressor room, said  
...the Central Mat-Su Fire Depart-  
...ment.

Fire Chief Jack Krill said six  
...people were treated and released  
...from Valley Hospital in Palmer

for nausea, and 12 people were  
...treated at the scene.

The store reopened at 4 p.m.  
...after the building was inspected  
...by officials with the state Depart-  
...ment of Environmental Conserva-  
...tion and the federal Occupa-  
...tional Safety and Health Admin-  
...istration.

Carrs officials said no mer-  
...chandise was damaged.

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**TURINSKY**  
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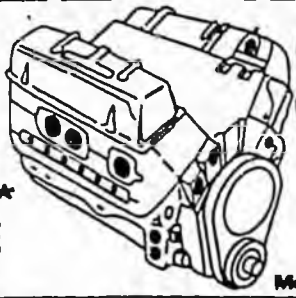
**3-2960**

Insurance Co., Bloomington, IL

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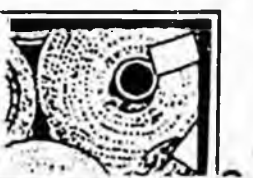
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- Gasket
- Intake Gasket



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Anchorage, Alaska 99524

March 31, 1992

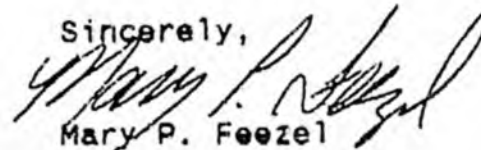
The Honorable David Finkelstein  
P.O. Box V  
Juneau, Alaska 99811

Dear Representative Finkelstein:

I am writing regarding HB356, which I understand you are chairman of the committee. I have had a chance to look over a draft of this Bill and agree that mandatory training for persons working with a hazardous material is necessary. The proper training and the enforcement of regulations concerning Freon, hopefully will prevent accidents such as the Dimond Center incident from happening again.

I would appreciate your support in passing this legislation.

Sincerely,



Mary P. Feezel

**NIOSH**  
**ALERT**  
**ALERT**  
**ALERT**  
**ALERT**  
**ALERT**  
**ALERT**



*Request for Assistance in*

**Preventing Death from Excessive  
Exposure to Chlorofluorocarbon 113  
(CFC - 113)**

*May 1989*

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Centers for Disease Control  
National Institute for Occupational Safety and Health

## **DISCLAIMER**

Mention of the name of any company or product does not constitute endorsement by the National Institute for Occupational Safety and Health.

**DHHS (NIOSH) Publication No. 89-109**

Copies of this and other NIOSH documents are available from

— Publications Dissemination, DSDTT  
National Institute for Occupational Safety and Health  
4676 Columbia Parkway  
Cincinnati, Ohio 45226  
(513) 533-8287

For further information on other occupational safety and health problems, call  
1-800-35-NIOSH

**REQUEST FOR ASSISTANCE IN PREVENTING DEATH FROM EXCESSIVE  
EXPOSURE TO CHLOROFLUOROCARBON 113 (CFC-113)**

**WARNING!**

**Working with chlorofluorocarbon 113 (CFC-113) or other chlorofluorocarbons in confined spaces may cause death by cardiac arrhythmia or asphyxiation.**

**SUMMARY**

The National Institute for Occupational Safety and Health (NIOSH) requests assistance in reducing the risk of death from cardiac arrhythmia and asphyxiation in workers exposed to 1,1,2-trichloro-1,2,2-trifluoroethane (more commonly known as CFC-113 or by a trade name such as Freon 113<sup>®</sup>, Genetron 113<sup>®</sup>, Halocarbon 113<sup>®</sup>, or Refrigerant 113<sup>®</sup>) or to other chlorofluorocarbons (CFCs). A number of workers have died recently as a result of exposure to CFC-113 in confined spaces or in areas with insufficient ventilation. These workers were apparently unaware that CFC-113 might generate vapor concentrations sufficient to cause death by cardiac arrhythmia or asphyxiation. NIOSH requests that these recommendations be brought to the attention of workers, supervisors, managers, and owners by the editors of appropriate trade journals, by the members of health and safety organizations, and by all those responsible for the safety and health of workers who use CFC-113 or other CFCs.

**MAY 1989**

## BACKGROUND

Fluorocarbons are halogenated hydrocarbons; fluorocarbons that contain chlorine are called chlorofluorocarbons (CFCs). These colorless, noncombustible liquids are used as refrigerants, propellants, degreasers, fire extinguishants, deicers, and agents for cleaning electronic equipment and preparing frozen tissues for histopathology.

Of the more than 36 commercially available fluorocarbons, approximately 12 are produced and used in significant quantities. One of these, 1,1,2-trichloro-1,2,2-trifluoroethane,\* is more commonly known as CFC-113 or by such trade names as Freon 113<sup>®</sup>, Genetron 113<sup>®</sup>, Halocarbon 113<sup>®</sup>, or Refrigerant 113<sup>®</sup>. The National Occupational Hazard Survey (NOHS) estimates that 300,000 workers are potentially exposed to CFC-113 [NIOSH 1977].

Because of its high vapor pressure (285 millimeters of mercury) at room temperature, CFC-113 can produce high ambient concentrations of vapor during normal use of the liquid. Uncontrolled use therefore poses a significant hazard and can result in lethal workplace concentrations, particularly in confined spaces.†

This hazard is clearly demonstrated by the reports of worker deaths presented in this *Alert*. All of the deaths resulted from exposures to CFC-113 and subsequent cardiac arrhythmia or asphyxiation. The hazard is especially significant because of the extensive use of CFC-113 for degreasing, cleaning, drying, and refrigeration.

## TOXIC EFFECTS

For more than a decade, published reports have indicated that fluorocarbons can induce respiratory depression, bronchoconstriction, and death in exposed workers and individuals who use them for psychophysiological effects [Bass 1970; Reinhardt et al. 1971; Garriott and Petty 1980; EPA 1983; May and Blotzer 1984].

A study with human volunteers who inhaled CFC-113 for 1.25 to 2.75 hours (hr) indicated that 2,500 parts of CFC-113 per million parts of air (2,500 ppm) may be the threshold for impairment of psychomotor functions such as manual dexterity, vigilance, and ability to concentrate; such impairment disappeared within 15 minutes (min) after exposure ceased [Stopps and McLaughlin 1967].

The lethal airborne concentration of CFC-113 for humans may be similar to that for animals. The mean lethal concentration (LC<sub>50</sub>) is the concentration at which 50% of inhalation-exposed animals die during a specific time period. In rats, the 4-hr LC<sub>50</sub> for CFC-113 ranges from 52,000 to 68,000 ppm [ACGIH 1986].

\*Chemical Abstract Service (CAS) Number 76-13-1 and National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS) Accession Number KJ4000000 [NIOSH 1987c].

†NIOSH has previously defined a confined space as having the following characteristics: (1) limited openings for entry and exit, (2) unfavorable natural ventilation, and (3) continuous worker occupancy [NIOSH 1979, 1987a].

### Page 3 - Request for Assistance In Preventing Death From Excessive Exposure to Chlorofluorocarbon 113 (CFC- 113)

Chemically induced cardiac (ventricular) arrhythmia, fibrillation, and death have been confirmed in experimental monkeys, dogs, and mice exposed by inhalation to CFC-113 and a number of other CFCs. These responses were ascribed to epinephrine hypersensitivity [Clark and Tinston 1973; Aviado 1975; Reinhardt et al. 1973]. Reinhardt et al. [1973] demonstrated that conscious dogs do not exhibit cardiac arrhythmias when exposed to CFC-113 alone or to epinephrine administered alone intravenously (IV). However, when a 5-min CFC-113 exposure at 10,000 ppm was followed by an IV injection of epinephrine, cardiotoxicity resulted in three of four treated dogs. Two dogs developed severe arrhythmias, and the third experienced fibrillation and cardiac arrest. These effects were not induced by the same IV dose of epinephrine following CFC-113 exposures below 5,000 ppm.

#### REGULATORY STATUS

Both the Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) [29 CFR\* 1910.1000 (1988)] and the American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV<sup>®</sup>) [ACGIH 1988] for CFC-113 are 1,000 ppm as a time-weighted average (TWA) over an 8-hr workshift with a 15-min short-term exposure limit (STEL) of 1,250 ppm. The TLV is based on "providing a margin of safety for systemic effects and an adequate margin against cardiac sensitization" [ACGIH 1986]. Although NIOSH has no recommended exposure limit (REL) for CFC-113, the Institute has determined that 4,500 ppm is immediately dangerous to life and health (IDLH) [NIOSH 1985]. Furthermore, NIOSH considers this substance to have poor warning properties because it is nearly odorless and its irritant effects are only slight and transient at concentrations near the PEL [NIOSH/OSHA 1981].

#### FOUR CASE REPORTS OF FATAL INCIDENTS

The following four reports describe 12 fatalities resulting from occupational exposure to CFC-113 in confined spaces; they are typical of situations in which CFC-113 can cause death. All of the deaths described here were attributed to cardiac arrhythmia or asphyxiation or both.

##### Case No. 1 (one death from cardiac arrhythmia)

The Michigan Department of Public Health [1983] reported that on November 14, 1983, a military tank was brought to a maintenance shop for repairs. Before repairing it, workers cleaned the tank's interior by flushing with 15 gallons (gal) of CFC-113. The tank was then parked outside on an inclined ramp for draining of the CFC-113. Because mechanical ventilation was not used to speed the vaporization process, some CFC-113 remained in the tank. This method was commonly used to clean the interior of these military vehicles.

On the evening of the flushing operation, a worker drove the tank back into the repair shop. The driver later indicated that he was seriously affected (details not reported) by the CFC-113 vapor in the tank, but he made no formal complaint of the incident.

\*Code of Federal Regulations. See CFR in references.

**Page 4 - Request for Assistance In Preventing Death From Excessive Exposure to Chlorofluorocarbon 113 (CFC -113)**

The next day, another worker climbed into the tank and started the engine. He did not assess the air quality and was not wearing a respirator or protective clothing. Starting the engine also activated an interior ventilation system that moved residual CFC-113 vapor into the driver's breathing zone. Shortly thereafter, he was seriously affected by the vapor. He alerted his coworkers and then lost consciousness. Workers who attempted to revive him and remove him from the vehicle reported that they almost passed out from the CFC-113-contaminated air. The worker never regained consciousness and was pronounced dead after being taken to a hospital. Upon autopsy, the medical examiner identified the cause of death as cardiac arrhythmia resulting from inhalation of CFC-113 vapor.

Although the victim's exposure time was brief (approximately 1 min), the exposure concentration was estimated to be very high. This estimate was substantiated 24 hr after exposure, when the Michigan Department of Public Health measured airborne CFC-113 concentrations inside the vehicle. They were as high as 7,600 ppm well above the NIOSH IDLH concentration of 4,500 ppm for CFC-113 [NIOSH 1985].

**Case No. 2 (two incidents, two deaths from cardiac arrhythmia)**

May and Blotzer [1984] reported two separate incidents of deaths resulting from cardiac arrhythmia after workers were exposed to CFC-113 vapor in confined spaces. In one case, a worker who was not wearing a respirator or protective clothing was exposed to CFC-113 while cleaning the inside of a small degreasing tank. The worker was found collapsed in the tank and was taken to a local hospital where he was pronounced dead as a result of cardiac arrhythmia.

In the second case, a worker who was also not wearing protective equipment was exposed while using CFC-113 to test for leaks in compressed air lines in a small room aboard a marine vessel. He was overcome and later died from cardiac arrhythmia. Two other workers were also overcome while trying to rescue him; both recovered.

**Case No. 3 (six incidents, eight deaths)**

The U.S. Navy [1985] reported six incidents involving eight deaths from inhalation of CFC-113. All of these deaths involved exposure to the vapor in either a confined space such as a storage tank or in a small room such as an engine compartment or air conditioning facility. Of the eight deaths, seven were due to asphyxiation and one to cardiac arrhythmia. One additional death was reported from an unknown cause, but it was probably related to CFC-113 exposure. The ages of the victims ranged from 19 to 26 years.

**Case No. 4 (one death from asphyxiation)**

This case was investigated by staff from the NIOSH Division of Safety Research [NIOSH 1986]. Four men at a chemical plant were assigned to clean a vapor/ultrasonic degreasing tank where metal parts were cleaned with CFC-113. The tank (6 feet [ft] 4 inches [in.] high, 8 ft long, and 4 ft wide) was located in a small building used exclusively for cleaning metal parts.

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Without entering the tank, three workers, who were unfamiliar with the company's written instructions for cleaning the tank, drained all but approximately 1 gal of the CFC-113 from the degreaser and then went to lunch. When they returned, a fourth worker, who was familiar with the cleaning process, joined the other three. He and one of the three workers donned half-mask respirators with organic vapor cartridges and paint-spray prefilters, climbed into the tank, and began cleaning the bottom. Soon after entering, both workers had breathing problems and climbed out of the tank. The worker who was familiar with the cleaning process then collapsed and was transported to a local hospital, where he was pronounced dead as a result of asphyxiation and pulmonary edema. The other worker did not experience any long-term ill effects. Although air was not monitored, estimates of CFC-113 concentrations were as high as 300,000 ppm, which greatly exceeds the NIOSH IDLH of 4,500 ppm.

### CONCLUSIONS

Few data exist to describe the effects of CFC-113 or other CFCs on humans. However, data from animal studies generally demonstrate that CFC-113 concentrations of approximately 50,000 ppm are lethal to rats [ACGIH 1986]. Death from cardiotoxicity was observed among dogs exposed at 10,000 ppm CFC-113 and then injected IV with epinephrine [Reinhardt et al. 1973]. These data and the deaths of the workers described in this report demonstrate that exposure to CFC-113 is hazardous and can cause death by cardiac arrhythmia and asphyxiation. The human health effects of CFC-113 are summarized in Table 1.

Table 1. -Human health effects related to various concentrations of CFC-113

Concentration (ppm)	Health effect
1,000	No adverse health effects (OSHA PEL)
2,500	Impairs ability to perform simple tasks; induces mild lethargy and loss of ability to concentrate
4,500*	Considered IDLH
7,600 (measured 24 hr after exposure)	Death from cardiac arrhythmia (Case No.1)
300,000 (estimated)	Death from asphyxiation and pulmonary edema (Case No. 2)

\*The IDLH concentration can be reached in a confined, unventilated space by evaporating as little as 21 ounces (about 1.5 pints) of CFC-113 in an enclosed, 1,000-cubic-ft area (10 by 10 by 10 ft) [AIHA 1982].

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Several factors that contribute to the hazards of exposure to CFC-113 and that are applicable to other CFCs are as follows:

- Use in confined spaces
- High vapor pressure, which results in hazardous vapor concentrations, particularly in confined spaces
- Poor odor warning properties and absence of irritation
- Relatively low toxicity up to approximately 2,500 ppm, which leads workers to believe that the chemical is inherently safe

These factors may work together to create situations in which workers may be exposed to CFC-113 or other CFCs at concentrations sufficient to cause death by cardiac arrhythmia or asphyxiation.

## **RECOMMENDATIONS**

NIOSH recommends the following measures for controlling exposures to CFC-113 and other CFCs:

### **1. Hazard Awareness**

Workers should be warned about the hazards of exposure to CFC-113--particularly that exposure can cause death by cardiac arrhythmia or asphyxiation. Furthermore, workers should be warned that CFC-113 is especially hazardous when used in confined spaces or in poorly ventilated areas.

### **2. Training**

Training should include information about

- the hazards of using CFC-113, especially in confined spaces,
- the use of appropriate protective gear, including respiratory protection, and
- all other aspects of working safely with CFC-113.

### **3. Engineering Controls**

Consider substitution of a less toxic chemical than CFC-113 for operations conducted in confined spaces or for any situation where there is potential for exposure at concentrations above the OSHA PEL of 1,000 ppm. If substitution is not possible, use other forms of engineering controls such as ventilation or isolation to reduce exposure to CFC-113.

### **4. Hazards in Confined Spaces**

Because the hazards associated with CFC-113 increase dramatically when it is used in confined spaces, workers should follow all recommendations identified in the NIOSH documents entitled *Criteria for a Recommended Standard...Working in Confined Spaces* [NIOSH 1979] and *A Guide to Safety in Confined Spaces* [NIOSH 1987a].

## 5. Medical Considerations

All persons with significant exposure to CFC-113 should be examined by a physician to identify medical conditions that might increase the risk associated with this exposure (e.g., cardiovascular disease) [NIOSH/OSHA 1981]. Workers taking medications containing catecholamines should also be advised by the examining physician that they may be at increased risk and should avoid excessive exposure to CFC-113. Medications that may be of concern include epinephrine, norepinephrine, and dopamine, as well as isoproterenol and other sympathomimetic agents commonly used by asthmatics [Reinhardt et al. 1973; Balazs et al. 1986]. Emergency medical service (EMS) personnel should also be aware of the potential problems with using these medications in patients after excessive exposure to CFC-113 or other CFCs.

## 6. Personal Protective Equipment

### a. Respiratory Protection

The following recommendations for respiratory protection should be implemented for all exposures to CFC-113, particularly those that occur in confined spaces or in areas with insufficient ventilation.

Although engineering controls and work practices should be used to minimize exposure to CFC-113, certain situations may require the use of respirators--for example, some confined-space operations, emergencies, and some setting-up or repair operations. As demonstrated in Case No. 2, the use of air-purifying, half-mask respirators was not sufficient to protect against high concentrations of CFC-113. NIOSH recommends that supplied-air respirators (SARs) or self-contained breathing apparatus (SCBAs) be used for CFC-113 because of its poor warning properties [NIOSH/OSHA 1981]. Table 2 lists the types of respiratory protection recommended for CFC-113 under various conditions. For additional information on the selection and use of respirators, refer to the *NIOSH Respirator Decision Logic* [NIOSH 1987d] and the *NIOSH Guide to Industrial Respiratory Protection* [NIOSH 1987c]. Respirators should be approved by NIOSH and the Mine Safety and Health Administration (MSHA) [NIOSH 1987b].

### b. Chemical Protective Clothing

Although skin absorption of CFC-113 is not a recognized route of exposure contributing to systemic toxicity or cardiovascular effects, repeated contact with the chemical can produce irritation and drying of the skin and irritation and tearing of the eye. In addition, contact of skin or eye tissues with liquid CFC-113 may result in chilling or freezing from rapid evaporation of the liquid.

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To minimize skin contact and absorption, workers using CFC-113 should wear appropriate chemical protective clothing (CPC) such as gloves and aprons. CPC made from neoprene and nitrile rubber should provide adequate protection for at least 1 hr [Schwope et al. 1985]. Note, however, that the quality of gloves may vary significantly among glove producers [Mickelsen and Hall 1987]. Product-specific chemical permeation data should therefore be obtained from the glove manufacturer. If CFC-113 gets on the skin, promptly wash the contaminated area with soap or a mild detergent and water. Splash-proof safety goggles should be worn if there is any possibility that liquid CFC-113 will contact the eyes. If contact does occur, wash eyes immediately with large amounts of water, lifting the lower and upper lids occasionally; get medical attention as soon as possible.

**Table 2. -Respiratory protection recommended for CFC-113**

Condition	Minimum respiratory protection
Concentration less than 4,500 ppm	Any SAR,* or  Any SCBA†
Concentration greater than 4,500 ppm, or planned or emergency entry into unknown concentrations	Any SAR equipped with a full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in a pressure-demand or other positive-pressure mode, or  Any SCBA equipped with a full facepiece and operated in a pressure-demand or other positive-pressure mode
Firefighting	Any SCBA equipped with a full facepiece and operated in a pressure-demand or other positive-pressure mode
Escape only‡	Any air-purifying, full-facepiece canister respirator providing protection against CFC-113 and equipped with an end-of service-life indicator (ESLI), or  Any SCBA equipped with a full facepiece and operated in a pressure-demand or other positive-pressure mode

\*Supplied-air respirator.

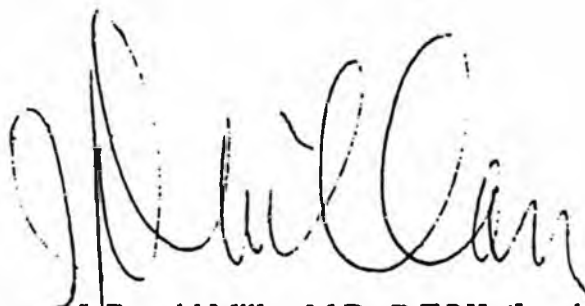
†Self-contained breathing apparatus.

‡If the atmosphere is oxygen-deficient (less than 19.5% oxygen), use SCBA option only.

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NIOSH requests that these recommendations be brought to the attention of workers, supervisors, managers, and owners by the editors of appropriate trade journals, by the members of health and safety organizations, and by all those responsible for the safety and health of workers who use CFC-113 or other CFCs. Requests for additional information or questions related to this announcement should be directed to Dr. Richard Niemeier, Acting Director, Division of Standards Development and Technology Transfer, NIOSH, 4676 Columbia Parkway, Cincinnati, Ohio 45226-1998; telephone (513) 533-8302.

We greatly appreciate your assistance.

A handwritten signature in cursive script, appearing to read "J. Donald Millar".

J. Donald Millar, M.D., D.T.P.H. (Lond.)  
Assistant Surgeon General  
Director, National Institute for  
Occupational Safety and Health  
Centers for Disease Control

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## Outline of Video Training:

Safety training video is cost-effective and efficient. Eliminates cost difference between urban and rural. Training could be done continuously.

- **Video could be mailed out** to a proctor in rural areas or shown on rural television networks. In urban areas (79%) it could be shown to large groups.

- **A safety booklet** would accompany the video. The first page would have important numbers such as poison control and OSHA and an "800" number to call with questions after the video. The worker could keep the booklet afterwards for safety reference.

- The last page of the booklet would be a tear out test. The applicant would take the test open book and then the video and completed test would be sent back to the proctor.

- **The video and training program could be contracted out.** Applicants would pay a minimal certification fee and then, if required to go to training, would pay the training company another fee.

- **Training could be done continuously.** If only one person in a rural area were certified and that person left the area, a replacement worker could quickly complete the certification requirements.

- **There would be no hardship for rural areas.** Their only extra cost would be postal expenses. Since training could be done continuously, if only one person in a rural area were certified and that person left the area, a replacement worker could quickly get a certificate.

# State-wide safety training for refrigeration workers:

The Department of Labor identified the following S.I.C. codes of businesses that would be affected by the requirements of H.B. 356: S.I.C. 7623, Refrigeration and Air Conditioning Service and Repair; S.I.C. 2097, Manufactured Ice; S.I.C. 1711, Plumbing and Heating; S.I.C. 2091, Canned and Cured Seafoods; S.I.C. 2092, Fresh or Frozen Seafoods; and S.I.C. 7999, Ice Rinks.

More than 90% of the locations listed under these S.I.C. codes would be within 2 hours travel time of the proposed training locations.

**NOTE:** All businesses would not necessarily have employees that would be required to attend safety training. The majority of refrigeration workers would qualify by experience or education for a training exemption. In a given year many training locations might not be needed.

## Suggested Training Locations:

Barrow  
Prudhoe Bay  
Nome  
Fairbanks  
Bethel  
Anchorage\*  
Kenai/ Soldotna/ Homer  
Valdez/Cordova  
Kodiak  
Juneau / South East  
Dillingham  
King Salmon  
Alakanuk  
Bristol Bay

*79% of all businesses affected by HB 356 are in urban areas.*

*37% of all urban businesses affected by HB 356 are located in Anchorage.*

\* For many businesses it will be much easier to fly to Anchorage than to attend training at a geographically closer location. For example: Unalaska, Adak, Port Moller, and Unimak Island usually fly through Anchorage to reach another location in the area. Anchorage would also be a more convenient training location for the Niamna Lake region than King Salmon or Dillingham.

SIC codes affected by House Bill 356 by area:

Plumbing and Heating:

3 Barrow  
1 Meade River  
2 Prudhoe Bay  
1 Nome City  
1 Golovin  
1 St. Lawrence Island  
1 Eielson Air Force Base  
27 Fairbanks City  
4 Richardson Highway (Fairbanks/ North Star Borough)  
2 Bethel City  
1 Unalaska  
1 Adak  
3 Palmer  
9 Wasilla  
10 Eagle River  
66 Anchorage  
1 Girdwood  
9 Kenai City  
4 Soldotna  
3 Homer City  
1 Seward City  
4 Kodiak City  
1 Shearwater Bay (Kodiak)  
1 Valdez City  
3 Cordova City  
1 Copper Center  
1 Haines  
7 Juneau  
5 Sitka  
1 Wrangell City  
1 Thorne Bay (Prince of Wales Island)  
8 Ketchikan City  
2 Unclassified: Out of State usually with reps in AK

172 urban 13 non-urban

2 Unclassified

93% urban

Total: 156, (120 actually operating, 2-3 people per business )  
2. (according to chuck (ain))

Canned and Cured Seafoods:

1 Prudhoe Bay  
1 Galena or nearby (checked with Lincoln's office)  
4 Dillingham or nearby (checked with Jacko's office)  
1 Alakanuk or nearby (checking with Foster's office)  
8 Bristol Bay  
1 Port Moller (Aleutians East)  
1 Unimak Island (Aleutians East)  
4 Unalaska  
2 Lake and Peninsula Borough (mostly Jacko's all nearby and accessible to King Salmon, Dillingham, or in the case of the Iliamna Lake area Anchorage.)  
3 Anchorage

60% urban

40 urban

27 rural

5 unclass.

- 2 Kenai City
- 2 Soldotna
- 1 Homer City
- 4 Kodiak City
- 1 Afognak (Kodiak Island)
- 2 Shearwater Bay (Kodiak Island)
- 1 Valdez City
- 5 Cordova City
- 1 Yakutat (could go to training in Juneau)
- 1 Gustavus (could go to training in Juneau)
- 2 Hoonah (could go to training in Juneau)
- 1 Hawk Inlet (could go to training in Juneau)
- 2 Haines
- 2 Juneau
- 2 Sitka
- 1 Petersburg
- 3 Wrangell
- 1 Metlakatla
- 1 Thorne Bay (Prince of Wales Island)
- 1 Hollis (Prince of Wales Island)
- 4 Ketchikan City
- 5 Unclassified - probably out of state with reps in AK

Fresh and Frozen Seafoods:

- 1 Richardson Highway (Fairbanks Area)
- 5 Dillingham and nearby (checked with Jacko's office)
- 3 Alakanuk and nearby (checking with Foster's office)
- 1 St. Matthew Island (Lower Kuskokwim)
- 1 Kalskag (near Aniak/ Bethel)
- 2 Bristol Bay
- 2 Port Moller (Aleutians East)
- 2 Unimak Island (Aleutians East)
- 7 Unalaska
- 2 Pribilof Islands
- 6 Lake and Peninsula District (mostly Jacko's all nearby and accessible to King Salmon, Dillingham, or in the case of the Iliamna Lake area Anchorage.)
- 9 Anchorage
- 5 Kenai City
- 6 Soldotna
- 4 Homer City
- 4 Seward
- 13 Kodiak City
- 1 Afognak (on Kodiak Island)
- 5 Knight Island Passage (Prince William Sound)
- 2 Valdez City
- 2 Cordova City
- 2 Gustavus (can go to Juneau for training)
- 1 Hoonah (can go to Juneau for training)
- 1 Juneau
- 4 Sitka
- 6 Petersburg

68 urban 8 unclass.  
 37 rural  
 65% urban

