The following Fatality Report contains information about the circumstances surrounding an occupational related fatality. Please note that this is an unofficial copy of the Coroner's findings. It is provided for information purposes only as an overview of the recommendations issuing from Coroner's Inquest and should not be represented as an official document.

Record Number: 2628

CIS Descriptors: SPORTS FACILITIES WORK ON ICE
INFORMATION OF PERSONNEL
DESIGN OF EQUIPMENT
HOT-WATER HEATING SYSTEMS

FATALITY REPORT

REPORT CHARACTERISTICS:

DONOR: Office of the Chief Coroner
JURISDICTION: Ontario
REPORT TITLE: Verdict of the Coroner's Jury
INDIVIDUAL PRESIDING: Dr. William A. Buckton, Coroner
PLACE OF INQUIRY: London
DATE OF INQUIRY : 1996-09-23

INFORMATION ABOUT DECEASED:

NAME: Timothy James Hickman
OCCUPATION: Ice surface operator
INDUSTRIAL SECTOR: Municipal industry

ACCIDENT INFORMATION:

DATE OF ACCIDENT : 1996-03-23
PLACE OF ACCIDENT: Silverwoods Arena, City of London
BRIEF CAUSE OF DEATH: (ARDS) Adult respiratory distress syndrome
BRIEF MANNER OF DEATH: Accidental ACCIDENT DESCRIPTION:
On Saturday morning, March 23, 1996, Timothy Hickman, an employee with the City of London, re-surfaced the ice at Silverwoods Arena with an Ice Resurfacer. He then drove the machine outside to empty the snow. Although there were no eye witnesses to the subsequent accident, it was believed the following sequence of events transpired:

Upon returning the ice re-surfacer to the storage room, he proceeded to refill the wash water tank. This was filled with hot water supplied from twin natural gas water heaters. The heaters were mounted 20 inches off the floor. Mr. Hickman then left the area, presumably to work on a malfunctioning scoreboard clock. By the time he returned a few minutes later, the hot water was overflowing on to the adjacent gasoline tank. This caused a pressure build-up in the gas tank and gasoline vapour could be heard escaping from around the cap. At this point, after turning of the water, he released the pressure by removing the gas cap. An explosion then occurred when the gasoline vapour, being heavier than air, settled on the floor and ignited, probably from the pilot lights of the gas water heaters. The time of the explosion was approximately 1130 hrs.

The explosion blew the "roll-up" door, leading from the storage room to the ice surface area, off its track. Hickman, with his clothing afire, ran from the area, making his way on to the ice surface. The fire was extinguished by individuals in the area. Two nurses attended Hickman until the ambulance arrived. He was then transported to Victoria Hospital-South St. Campus. On April 2, 1996 at 2230 Hrs., Timothy Hickman died as a result of internal injuries due to the burns he suffered.
RECOMMENDATIONS ISSUING FROM INQUIRY:
Arena:

1. The appropriate ministry shall order that arenas must not have water heaters or other significant sources of ignition in the same room as an ice resurfacer.
2. The appropriate governing body shall better define a "repair garage" and a "storage garage," or find a more comprehensive definition for "arena facilities".
3. The design of all arenas shall be reviewed to ensure the safety of both employees and the public.
4. Municipalities shall design and implement a facility orientation tour for all user groups especially those involving minors.
5. The appropriate ministry shall require the installation of well marked gates and exit signs clearly indicating all available exits from both the ice surface and the building providing for their free and clear access in all arenas.
6. The appropriate ministry shall require that all buildings with access to or used by the public have adequate emergency first aid kits and appropriate emergency devices available to all staff at all times.

The Resurfacing Machines:

7. The federal and/or provincial government shall appoint the appropriate ministry to require that the ice resurfacer manufacturer issue an IMMEDIATE bulletin to all owners and dealers (world-wide) of their gas powered ice resurfacing machines. This bulletin shall set out the circumstances of this accident and the recommended modifications to these ice resurfacers.
8. The federal and/or provincial government shall set mandatory safety standards for the certification of design and manufacture of all ice resurfacers.
9. The operator's manual for ice resurfacing machines shall contain appropriate safety precautions, procedures and environmental conditions for the use and storage of ice resurfacers.
10. All other ice resurfacer manufacturing companies shall be advised of all of the circumstances of this accident and the recommendations of the coroner's jury.
11. Modifications to existing equipment pertaining to safety, handling and operation be reviewed by employee user groups and corrective action shall be taken.

Fire Department:

12. All City fire rescue vehicles shall be equipped with two full body water-gel burn suits.
13. The City Fire Department, the Fire Marshall and the Ministry of Labour shall review and re-affirm their relationship and commit to ensure the security and preservation of fire scenes.

Training:

14. Formal, mandatory safety and W.H.M.I.S. training shall be developed and delivered to employees. This training shall be reinforced through regular mandatory safety meetings with an appointed, certified safety officer attending such meetings and available to do regular safety inspections.
15. All employees shall receive regular, mandatory training with regular updates by certified trainers with respect to their job functions.
16. The City shall publish, as soon as possible, the comprehensive Arena Operations Manual and relevant material shall be given to each employee upon hire. The manual shall be reviewed and updated on a regular basis.
17. The City shall establish a formal certification process for all equipment operations.

Communication:

18. Nationwide municipalities, in conjunction with organizations such as O.R.F.A., shall regularly share information on health and safety issues.

19. The City shall increase the frequency of on-site scheduled supervisory visits and shall improve communications with all arena employees.
20. All employees of all arenas shall regularly be evaluated and reviewed to ensure proper procedures and practices are followed. A training profile document and job description shall be updated and maintained.
21. Guidelines or procedures shall be established to ensure the reporting of "near misses" followed by corrective action.
22. A portable two-way radio system to be made available to operation staff shall include a man down function. Any employee working alone shall maintain hourly contact with central dispatch.
23. There shall be a clear, documented understanding of a chain of responsibility for each arena employee in the absence of the immediate supervisor.

Public Information:

24. Cost-free counselling, such as L.E.A.C., shall be made available to all individuals affected by critical incidents.
25. A public service announcement shall be made to clearly inform the general public that 911 is a free service to callers from pay phones.

COMMENTS ON RECOMMENDATIONS BY CORONER:

A. Arena

1. The Fire Marshall stated that this explosion would not have occurred if the hot water heaters were in another room. 2. Evidence revealed that if this was deemed to be a repair garage rather than a storage garage, then the building code would have specified that the water heaters be 54 in. off the floor rather than 20 in. Since gas vapour is heavier than air, and settles to the lowest level, then ignition would have been less likely.
3. Self-explanatory.
4. Self-explanatory.
5. At Silverwoods arena not all gates from the ice surface were marked as such, and during the ensuing explosion and fire everyone on the ice attempted to get off through one gate.
6. The first aid kit was locked in the arena office and the snack bar attendant, the only other arena employee, did not have key access.

The Resurfacing Machines:

7. Evidence revealed that the water tank and gas tanks were only ¼ in. apart and it was the hot water overflowing on to the gas tank that caused the gas vapour to expand. Modifications included moving the tanks further apart and separating them by a heat shield.
8. Currently there are no licensing standards for the manufacturing or design of ice resurfacers.
9. The existing manual had some ambiguities, such as the water temperature to be used in the wash water tank. Arena employees in London have now been instructed to use cold water.
10. Self explanatory. 11. Self explanatory.

Fire Department:

12. A fireman gave evidence that these water-gel suits retard the burn damage to the body, but the fire trucks do not have them due to funding cutbacks.
13. The Fire Marshall arrived at the scene to find it unsecured and various parts of the scene had actually been removed. This naturally made his investigation into the cause of the fire more difficult.

Training:

14. There was evidence presented that showed training largely consisted of one employee showing a new employee how to operate the ice resurfacer with little formal or classroom training. Little emphasis was placed on W.H.M.I.S.(Workplace Hazardous Materials Information System). The inquest revealed the importance of safe fuel handling for ice resurfacer operators.
15. Self-explanatory.

16. This arena manual has been under development since February/96 and although almost complete, has not been distributed yet. 17. Self explanatory.

Communication:

18. ORFA (Ontario Recreational Facilities Association) holds an annual classroom course in Guelph and could be an ideal forum for sharing such information.
19. Self explanatory.
20. Self explanatory.
21. This would alert other employees of potential dangers in the workplace.
22. After midnight there is only one arena employee on duty.
23. Self explanatory.

Public Information:

24. L.E.A C.(London Employee Association Consortium) was made available to City of London employees for debriefing but it was not clear if the public using the arena could use this service. Some of the coaches and young hockey players who witnessed this tragedy were also emotionally traumatized.
25. The snack bar attendant at the arena felt she couldn't phone 911 because she didn't have a quarter for the pay phone and the office was locked. The 911 call was placed by someone in the arena using their cellular phone.