Case No.: 2009-02

Redacted Decision No.: OHSTC-09-036

CANADA LABOUR CODE

PART II

OCCUPATIONAL HEALTH AND SAFETY

Public Health Agency of Canada

Appellant

and

Rino De Rosa

Respondent

November 30, 2009

This case was decided by Appeals Officer Richard Lafrance.

For the appellant

Mr. Richard Fader, Counsel, Treasury Board Legal Services

For the respondent

Ms. Mary Mackinnon, Counsel, Raven, Cameron, Ballantyne &Yazbeck LLP/ s.r.l.

This decision has been redacted to respect the order given, on May 19, 2009 by the Tribunal, that the hearing be held *in camera* and that any evidence adduced *in camera* and any written submissions were expressly prohibited from disclosure by anyone participating and assisting to these procedures. This included evidence in support of Health and Safety Officer McKeigan's testimony. The original decision is to remain sealed in accordance with the government archiving policies.

[1] This is an appeal lodged by the Public Health Agency of Canada pursuant to paragraph 146(1) of the *Canada Labour Code* (the Code) Part II against a direction issued on December 17, 2008 by health and safety officer (HSO) Bruce McKeigan.

Background

[2] This case stem from an investigation, conducted by HSO McKeigan, of health and safety complaints made by R. De Rosa employed as a plumber by Public Works and Government Services Canada (PWGSC). Almost a year before, R. De Rosa had complained to the Labour Program about health and safety issues related to the plumbing at a government complex in Ottawa. For various reasons these complaints were not investigated by a health and safety officer. However, in July of 2008, HSO McKeigan was assigned to investigate the matter. Redacted

[3] HSO McKeigan testified at the hearing and submitted his report. I retain the following from his testimony and report.

[4] Even though R. De Rosa did not work anymore at the said complex, he nonetheless maintained his complaints and requested that they be investigated by HSO McKeigan.

[5] On November 20, 2008, HSO McKeigan conducted an inspection of two buildings in the complex. He was assisted by HSO Béland and accompanied by Mr. De Rosa and Mr. Bédard who is an employee representative on the local health and safety committee. As well Mr. G. Smith, O&M supervisor for PWGSC agreed to accompany them on the inspection. Redacted

[6] One of the items that R. De Rosa wanted to cover during the inspection was "backflow preventers" (BFP): a device that prevents backflow[1]. He stated that according to the Plumbing Code and the CSA Standards; BFPs could not be installed in a contaminated area.

[7] The inspection led them to a building where the Hazard Prevention Brach (HPB) is located. This building contains laboratories under the control of the Public Health Agency Canada (PHAC). Mr. De Rosa informed HSO McKeigan that this was where there was a BFP in a contaminated room.

[1] Definitions: CSA Standard B64.10.07

[8] The room in question is a containment laboratory and could not be accessed as it was marked on the door “WARNING DO NOT ENTER – BIOHAZARD - Authorised Personnel Only”. Mr. Smith informed the HSO that they could not enter as the room was presently “hot”, that the HSO understood to mean “contaminated”. Redacted

[9] Following his inspection of the building, HSO McKeigan reviewed the following legislation. Redacted

***Canada Labour Code,* Part II**

125. (1) Without restricting the generality of section 124, every employer shall, in respect of every work place controlled by the employer and, in respect of every work activity carried out by an employee in a work place that is not controlled by the employer, to the extent that the employer controls the activity,

(a) ensure that all permanent and temporary buildings and structures meet the prescribed standards;

Canada Occupational Health and Safety Regulations

2.2 (1) The design and construction of every building, the construction of which begins on or after the day of the coming into force of this subsection, shall meet the requirements of the National Building Code.

(2) Every building, the construction of which begins before the day of the coming into force of this subsection, shall, to the extent reasonably practicable, meet the requirements of the National Building Code.

(3) The renovation of any building or part of a building shall, to the extent reasonably practicable, meet the requirements of the National Building Code.

(4) When it is not reasonably practicable for an employer to comply with the requirements of subsection (3), the employer shall, before the proposed renovations start, notify the work place committee or the health and safety representative.

***National Building Code* (2005)**

7.1.2.1 Conformance with the Regulations or National Plumbing Code

1) Every plumbing system shall be designed and installed in conformance with the appropriate provincial or territorial regulations or municipal bylaws, in the absence of such regulations or bylaws, in conformance with the *National Building Code* of Canada 2005.

***National Plumbing Code of Canada* (2005)**

2.6.2.1 Connection of systems

2) Backflow preventers shall be selected and installed in conformance with CAN/CSA-B64.10, Manual for the selection and Installation of Backflow prevention Devices.

The plumbing Code also states:

"Backflow" means a flowing back or reversal of the normal direction of the flow.

"Backflow preventers" mean a device or a method that prevents backflow.

CSA standard: CSA B.64.10-07/B64.10.1-07 Selection and Installation of backflow preventers/Maintenance and field testing of backflow preventers.

6.6 - Location

6.6.1 Air gaps, backflow preventers, or vacuum breakers with vents to the atmosphere shall not be installed in a corrosive or polluted atmosphere, because the contaminated air can enter the piping system through the air gap or open vent or cause the backflow preventer or vacuum breaker to malfunction.

[10] HSO McKeigan also reviewed literature provided by Mr. De Rosa. The stated purpose of the literature was to provide an understanding of how far reaching and critical backflow contamination problems were and to urge the development of the highest backflow prevention programs possible.

[11] A copy of those documents was attached to the HSO's report. These documents consisted on a collection of articles referencing incidents caused by cross connections of potable water supply to various sources, tanks of pollutants, chemicals etc. where back flow occurred for various reasons because there was no back flow prevention systems or air gaps in place or where the system was bypassed by a cross connection, therefore eliminating the protection provided by a BFP and/or air gap.

[12] In addition HSO McKeigan considered the opinion of Mr. C. Brown; owner of WALMAR Mechanical Sales, who, at some point in time had been a BFP tester. Mr. Brown's opinion with regard to this particular situation was that BFPs should not be situated inside a contaminated area because airborne contaminants could be sucked into the fresh water supply. He further indicated that there may still be problems with a BFP outside a contaminated area, but there was less risk.

[13] HSO McKeigan also took into consideration information from the website of the Ontario Backflow Prevention Association Inc. a non-profit organisation comprised of professionals dedicated to protecting Ontario's drinking water quality.

[14] This website informed him about Cross Connection Control. It was stated that a "cross connection" in a plumbing system is defined as "any actual or potential connection between a potable water system and any source of pollution or contamination. It said as well that this was a dynamic problem because piping systems were continually being installed, altered or extended.

[15] HSO McKeigan informed Mr. Smith that he may have no choice but to issue a direction because the legislation pointed to the requirements that backflow preventers shall not be installed in a contaminated room. So far he had not been presented with information, documentation or exclusion indicating that it was acceptable to have this equipment located in a containment laboratory inside a "dirty" (contaminated room). Redacted

[16] HSO McKeigan was later told by D. Laframboise who is the Head of Emergency Response, Office of Laboratory Security that the reason the change room is called a "dirty" or contaminated room is because that room is located in a containment laboratory and may hold bacterial agents. It is treated as "dirty" as a precaution. Redacted

[17] He was further informed that the laboratory was designed to be under negative air pressure to prevent contaminated air from escaping when a door was opened. Lastly, he was informed that it took nine days to complete a decontamination of those rooms.

[18] Based on these findings, HSO McKeigan decided that there was a "danger" situation in the said laboratory and on December 17, 2008 issued the following direction to the employer, Public Health Agency of Canada:

> The said health and safety officer considers that a condition in the workplace constitutes a danger to an employee while at work:
>
> **The backflow preventer equipment in room 2407a is located in a contaminated area.**
>
> Therefore, you are Hereby Directed, pursuant to subsection 145(2)(*a*) of the *Canada Labour Code,* Part II, to take proper measures to correct the situation that constitutes a danger.

[19] The employer through its representative Dr. J. Lynch appealed the decision and requested a stay of the direction until the issue could be heard and decided by an Appeals Officer.

[20] A hearing on the stay of the direction was held on March 26, 2009. A stay of the direction was granted[2] on March 27, 2009.

[21] The appellant requested as well that the hearing be held *in camera*. The respondent did not object to the appellant's request. After careful consideration of the appellant's submission, an order[3] was issued for the hearing to be held *in camera*, also expressly prohibiting the disclosure of any evidence adduced and submissions made at the hearing. This included any evidence derived from HSO McKeigan's testimony. Redacted

Issue

[22] The issue to be decided is whether health and safety officer McKeigan erred in issuing a direction under subsection 145(2)(a) of the Code.

Appellant's evidence

[23] The appellant submitted nine documents in evidence and called five witnesses.

Witnesses

- Mr. M. Birks: principal owner of The Birks Company who represents manufacturers of products sold in the plumbing and water works market. He is the current chair of the CSA B64 committee responsible for standards related to BFPs. He is also a member of the CSA steering committee for plumbing products and the current chair of the AWWA[4] as well a member of the OWWA[5].
- Dr. J. Lynch: Director General, Public Health Agency, Infectious Disease and Emergency Preparedness Branch. Diplomat, American College of veterinary Microbiologists. Specialist, Veterinary Microbiology, Canadian Medical Association.
- Ms. V. Bergeron: Head Biocontainment & Certification Program, Canadian Food Inspection Agency, Office of Biohazard Containment and Safety.
- Mr. D. Laframboise: Head Emergency Response, Office of Laboratory Security, Public Health Agency Canada.
- Mr. K. Ugwu, P. Eng.: Manager, Biocontainment Engineer, Public Health Agency Canada. Expert Knowledge of Biosafety and Biocontainment engineering.

[2] OHSTC 09-012(s), Public Health Agency of Canada and R. De Rosa (April 8, 2009)
[3] OHSTC 09-018(I), Public Health Agency of Canada and R. De Rosa(May 19, 2009)
[4] AWWA: American Water Works Association
[5] OWWA: Ontario Water Works Association

[24] As the laboratory was closed for a yearly inspection and maintenance and that it had been decontaminated of any potential contaminants, a visit of the laboratory was arranged so that both parties and the Tribunal could view the inside of the laboratory and BFPs discussed in these proceedings.

[25] M. Birks testified as the Current chair of the CSA B64[6] committee regarding subsection 6.6.1 of the said standard. The standard states:

> 6.6 Location
>
> 6.6.1 Air gaps, backflow preventers, or vacuum breakers with vents to the atmosphere shall not be installed in a corrosive or polluted atmosphere, because the contaminated air can enter the piping system through the air gap or open vent or cause the backflow preventer or vacuum breaker to malfunction.

[26] M. Birks stated that in his opinion the intent of the wording of subsection 6.6.1 is to prevent the device of being placed in a corrosive or polluted atmosphere. He further stated that this is meant to be the normal operating atmosphere surrounding the BFP during the normal operating time of the device.

[27] M. Birks confirmed that the BFP illustrated in the Watts manufacture's document is the type installed in the laboratory in question and that it is the normal type of BFPs installed in laboratories.

[28] He further explained about air-gaps as they are both referenced in the Watts documents and the CSA Standard.

[29] M. Birks indicated as well that the industry keeps informed of whatever problems may arise with such components and that to his knowledge he has never heard of such type BFPs failing to operate and allow liquids to flow back into the potable water feed system.

[30] Dr. Lynch testified about the physical location and physical aspect of the laboratory. He commented on the fact that the air in the laboratory is under negative pressure. That is, the air pressure in the laboratory is less than in the rest of the building. This is done to make sure that nothing in the air of the laboratory escapes to the building but rather goes through the HEPA[7] filter of the ventilation system. The HEPA filters are inspected annually.

[31] He went on to explain that samples were very small, around 5 ml. or smaller, as the bulk of the samples were kept by the clients. All

[6] CSA Standard, B64.10-07/B64.10.1-07: Selection and Installation of backflow preventers/Maintenance and field testing of backflow preventers.
[7] HEPA: high efficiency particulate air filter

samples are packaged in double sealed approved containers and opened only when they were placed inside the Biological safety cabinets. Redacted

[32] He explained how the tests were conducted, in a first step to kill any potential agent in the sample. Killing the potential agent means that it is safe to be handled, however this leaves the DNA[8] intact, and this is what is required to identify the potential agents in the sample. The laboratory only identifies the type of bacterial agents.

[33] He further commented on the fact that the samples that may contain bacterial agents are so miniscule that, in his opinion they would not meet the threshold of being called pollutants. He further indicated that as a precaution chlorinated water is added to all drains to kill any pathogen agents that may be present in drained liquid. Normal procedure however is that no samples or potential agents are to be emptied in drains, they are to be autoclaved or returned to the clients.

[34] Dr. Lynch testified as to the kind of bacteria or agents they try to identify. He also discussed the virulence, life time, and what can destroy those bacteria. Redacted

[35] V. Bergeron testified about the "Containment Standards for Veterinary Facilities", which outlines the minimum design, physical and operational requirements for Canadian laboratories and animal facilities that import and work with animal or zoonotic pathogens (including most pathogens of food borne diseases).

[36] She confirmed that the laboratory of concern in this case was recertified in August of 2008 as having met all the requirements of the Containment Standard. This recertification is done on an annual basis.

[37] D. Laframboise testified the air in the laboratory is cleaner than the air anywhere else in the building or outside of the building. He indicated that he did air surveys in the past and that the bacteria count in the laboratory was 0 to 1. The air in the rest of the building was 100 counts for bacteria.

[38] In case of a heating, ventilation, and air conditioning (HVAC) system failure, he confirmed that there was an audible and visual alarm to alert the staff in the laboratory to stop all work, seal materials in Biosafety containers and evacuate the laboratory.

[39] He indicated that the only corrosive material in the laboratory would be the 10% chlorine solution that is used to wipe down the Biosafety cabinets and equipment as well as to decontaminate any spills that may occur. This solution would not affect, in his opinion, the BFPs.

[8] (DNA) Deoxyribonucleic acid

[40] D. Laframboise explained the procedure to bring in samples from the outside in double sealed containers. These containers are approved by Transport Canada for the transportation of Hazardous Materials.

[41] He explained the procedure and precautions to enter, work and exit the laboratory, as these are outlined in the Standard Operating procedures. He further explained that no agents could enter the air of the laboratory as all agents are handled in the Biosafety cabinets and if any agent was released it would be sucked up the ventilation system of the cabinet through the HEPA filters.

[42] D. Laframboise commented that no agent could be spilled outside the Biosafety cabinets as they are sealed in containers before being moved out of the cabinet. Nonetheless, in the off chance that such a spill may occur, the procedure exists to clean the spill with the chlorinated solution, take air and swab samples and cultivated as required. If needed, the laboratory is decontaminated using the normal decontamination procedure with vaporized hydrogen peroxide.

[43] He further commented the laboratory is closed once a year for maintenance and recertification purposes. At that time, the laboratory is decontaminated as a precautionary measure. The laboratory may also be decontaminated as required in case of a spill. He noted however that no spill had ever occurred in the laboratory.

[44] D. Laframboise noted that in order to have air from the laboratory to be sucked in the potable water system, four failures would need to occur simultaneously: a feed water pressure failure, a check valve failure in the BFP device, a HVAC failure and a spill in the laboratory containing an agent.

[45] He confirmed that some control agents were stored in the laboratory. However, these were stored in the freezer at minus 80 degrees; the freezer doors are always locked and alarmed to prevent any unauthorized access.

[46] K. Ugwu testified that the laboratory HVAC system was designed to have ten air changes per hour, that is, the air in the laboratory is changed 10 times every hour, no recirculation, 100% in and 100% out. Consequently, the possibility of having a polluted or corrosive atmosphere is next to impossible.

[47] K. Ugwu further commented on the operation of BFP. He explained that these units were sealed with no contact with the surrounding atmosphere.

Respondent's evidence

[48] The respondent submitted three documents and called one witness, Mr. R. De Rosa.

Witness

[49] R. De Rosa has been an employee of Public Works and Government Services Canada (PWGSC) as a Plumbing and Heating Specialist for more than 20 years.

[50] He testified that he believed there were a number of violations in the laboratory regarding the CSA Standard B64 as well as with the Plumbing Code.

[51] He confirmed that he accompanied HSO McKeigan during his investigation and provided as well a number of documents to explain the nature of the problem that he believed existed inside the laboratory. However, he also explained that he never worked in the laboratory of concern in this case as it was being built at the time the worked in that complex. Redacted

[52] He stated that according to the Plumbing Code and the CSA Standard a BFP should not be installed in a noxious environment and that in his opinion the BFPs/air gaps should have been installed outside the laboratory.

[53] R. De Rosa contended that he believed that it was a noxious and contaminated environment because he heard that the laboratory was handling noxious matters. Redacted

[54] He recalled a few incidents from the past were he was involved in having to change BFP after being told that they where defective.

[55] Regarding the failure of a Watts BFP, he explained that he is not qualified to test or repair BFPs; he only changes the unit when he is told to do so by the experts who test the units. He stated that he does not know what is wrong with the unit when asked to change them; he can only rely on what the technicians tell him.

[56] Regarding the Watts cross connection information handbook[9], he explained that this is something that the expert, the technicians who test and service BFPs, are trained on and must apply. He avowed that regarding the specifics of training he can only speculate at what the training is or what it says, because he never took that training.

[57] He further commented that in his opinion as a plumber, any mechanical devices, such as the BFPs has a limited life, and that one day or another it will malfunction and as a consequence, the unit will then allow polluted air in the system. R. De Rosa testified a length about the potential for a BFP to malfunction and related incident about cross connection which can cause contamination of water sources.

[9] (Evidence E-23) Watts Regulators: Cross Connection Information Handbook

Submissions

Appellants' submissions

[58] R. Fader, counsel for the employer, held that this case deals with the location of BFPs, a plumbing device that stops the backflow of water. He added that the need for a BFP in the laboratory is unavoidable because in a containment laboratory, water is required for safety reasons such as emergency shower or eye wash. Redacted

[59] R. Fader submits that the answer to the question, as to whether the BFPs are place in wrong location, lies with the interpretation of article 6.6.1 of the CSA Standard B64.

- "Air gaps, back flow preventers, or vacuum breakers with vents to the atmosphere shall not be installed in ***a corrosive or polluted atmosphere***", because the contaminated air can enter the piping system through the air gap open or open vent or cause the BFP or vacuum breaker to malfunction. [emphasis added]

[60] R. Fader maintains that the air in the laboratory is not polluted. He argued that the evidence establishes that because of the precautions in place, there is no chance of any agent ever coming into contact with the BFPs. He relies on the following evidence:

- Samples are sealed in a polypropylene sealed tube inserted in a double sealed evidence bag, which is contained in a sealed container that has been seen to survive airplane crashes. These containers are only opened once in the biological safety cabinets. Redacted
- The samples are at most 10 millilitres in size.
- The laboratory operates in a sealed environment under negative pressure. The incoming air into the laboratory is 100% fresh from the outside and is changed at least 10 times per hour. The incoming and outgoing air is filtered through HEPA filters.

[61] R. Fader submitted as well that,

- As noted by D. Laframboise any spill outside the biological safety cabinet, or any agent dissipating in the air would be exhausted out of the laboratory through the HEPA filters.
- As well, as indicated in a note from the Mechanical Technologist, because of the negative air pressure in the laboratory, any aerosol formed from spillage of toxins would immediately be "swept" to the room's exhaust system.
- The entry and exit protocol is such that it eliminates the possibility that any agents be brought in or out of the laboratory by accident.
- All the work is done within a biological safety cabinet. This device is specially designed to prevent any of the agents leaving the cabinet and entering the laboratory.

- All of the employees working in the laboratory have academic training in microbiology and have specialized training and have annual refresher training in the operation of the laboratory.
- The Standard Operating Procedures covers explicitly *Spill of infectious Materials.* It is clear that any spill would be quickly contained, and dealt with. Given the negative air pressure and the availability of the *Vaporized Hydrogen Peroxide* decontamination; there is no possibility of the BFP being exposed to any harmful agent. Redacted
- The Standard Operating Procedures also include *Emergency Procedures* and *Operation Procedures for the Autoclave.*

[62] Furthermore, R. Fader argued that the wording of the CSA Standard B64 is aimed at constant exposure and not to a situation where (in an exceptional situation) there is a brief amount of exposure.

[63] To that effect R. Fader argued that M. Birks, as chair of the CSA Standard opined that article 6.6.1 of the Standard is aimed at situations where the BFPs would be "constantly exposed" to the "noxious environment" like in fume cabinets where the exposure would be 99% of the time. He believes the aim was at the "normal operating environment of the device". He further believes that given the operational reality that exists in the said laboratory there was "no reason not to install it [the BFP] in this location."

[64] R. Fader maintains that the provision of the Standard does not say "could be exposed to"; it focuses on the actual atmosphere, or the normal operating environment of the BFP. The choice in the term "in a corrosive or polluted atmosphere" is clearly not aimed at potential exposure but routine or ordinary exposure.

[65] He further maintained that the uncontested evidence from D. Laframboise is that the air inside of the laboratory is the cleanest in the building and could not be considered corrosive or polluted.

[66] On the question of danger, R. Fader argued that the test for danger had been articulated by the Federal Court in the decision *Canada Post Corporation v. Pollard*[10]*:* R. Fader submitted that the facts must establish the following:

- the existing or potential hazard or condition, or the current or future activity in question will likely present itself;
- an employee will be exposed to the hazard, condition, or activity when it present itself;
- exposure to the hazard, condition, or activity is capable of causing injury or illness to the employee at any time, but not necessarily every time; and

[10] *Canada Post Corporation v. Pollard* 2007 FC 1362; affirmed 2008 FCA 305.

- the injury or illness will likely occur before the hazard or condition can be corrected or the activity altered.

[67] To this effect R. Fader submitted that the testimony of D. Laframboise established that in order to have contamination of the water source:

- all of the standard operating procedures would have to fail, and despite the negative air flow, some particles would have to come in contact with the BFP.
- The check valve inside of the BFP would have to fail.
- There would have to be a significant downstream loss of water pressure sufficient to produce a suction on the line attached to the backflow prevention device: and
- the release valve on the BFP would have to fail.

[68] In addition to these critical failures, R. Fader pointed out that as noted by D. Laframboise, all of these would have to happen at the same time. This in D. Laframboise's opinion is "not possible".

[69] R. Fader further argued that even then, based on the evidence given by Dr. Lynch, this would not pose a health concern as the amounts analysed in the laboratory are not sufficient to cause infection in the water supply as they would be diluted.

[70] In addition, R. Fader submitted that D. Laframboise indicated in his testimony that:

- the BFPs in the laboratory are top of the line.
- These units have reduced pressure zones and have no ports to the atmosphere.
- They have test ports that are sealed and the relief valve only opens to the atmosphere when discharging water.
- If there is a problem with either check valve the unit will leak water from the relief valve.
- Given yearly recertification and design of the units, there is no possibility of water re-entering the potable water supply.

[71] R. Fader pointed out as well, the following in his arguments:

- Neither K. Ugwu nor M. Birks ever heard of a situation where this type of BFPs has failed resulting in the water contamination of the potable water supply.
- K. Ugwu testified that the reduce pressure zone in the BFP is the ultimate protection, if there is a problem with either check valve the unit will discharge the water through the relief valve well before there is any backflow of water into the potable water supply.

- K. Ugwu and M. Birks both stated that the relief port (“air break”) is not an air gap as the term used in the CSA standard. The only air gaps are from the taps or shower head.
- K. Ugwu also affirmed that to get air or water through this air gap and back into the potable water supply would be to pump air or water into it (even this assumes that the BFP is not working).

[72] Further on R. Fader noted the following:

- The backflow are serviced annually by a certified master plumber.
- The testimony of M. Birks, establishes that there are no air gaps in the *Reduced Pressure Zone* BFPs as the units are closed to the atmosphere.
- The laboratory itself is recertified annually by an independent agency.
- Dr. Lynch also testified that there were no requirements for special drainage as the laboratory only deals with indigenous agents that are normal to the Canadian environment.

[73] As a result R. Fader submitted that there is no “danger” as defined in the Code. Simply put: the facts do not engage any of the four factors identified by the Federal Court for a finding of “danger”.

[74] R. Fader argued that since the BFPs are not installed in a corrosive or polluted atmosphere, then there can be no danger with regard to this issue. Consequently, the employer requests that the direction issued by HSO McKeigan be rescinded in its entirety.

Respondent’s submissions

[75] M. Mackinnon upheld that the issue to be determined is that the plumbing array and specifically the location of the BFP in the Public Health Agency laboratory constitute a danger as prescribed by the Code. Redacted

[76] M. Mackinnon affirmed that the employer downplayed the risk, based on built-in redundancies (check valves, relief valves, reverse air flow in laboratory, precautionary measures taken handling agents).

[77] She avowed as well that that they do not dispute the fact that a number of things have to go wrong simultaneously in order to produce the dangerous effect. However, she stated that they might disagree with the likelihood of those systems failing.

[78] On this she submitted that Mr. De Rosa provided testimony that he had seen back siphonage with the Watts BFPs, the very type of fitting used in the laboratory. She argued that this was not a question as to whether the unit could go wrong, he had seen those units go wrong in the past.

[79] Referring to the Correctional Services Decision[11] which makes reference to the federal court decisions in paragraph 51 of *Juan Verville*[12], she argued that the probability of injury can be determined from opinions of ordinary experienced persons, Consequently, M. Mackinnon submitted that it was possible to conclude, from the testimony of R. De Rosa that at some point in time, both check valve and the relief valve of the BFP will fail.

[80] She further argued that as R. De Rosa believed the reverse air flow in the laboratory would be insufficient to counter affect the back siphonage caused by a water pressure failure if a water main went out.

[81] M. Mackinnon noted the following in her arguments:

- Agents are stored onsite and would be present in the atmosphere, or could be onsite during a 7-day incubation period and testing.
- As testified by D. Laframboise, it is possible that some people could drop samples in moving samples between the biological safety cabinet and the autoclave, incubator or refrigerator.
- The fact that there had been no plumbing failure at the laboratory maybe because it is relatively new and that they have not started to appear yet.
- It was recommended by a Watts representative[13], that the BFPs be located outside of the laboratory.

[82] Based on the above, M. Mackinnon, argued that it was not a mere speculative risk, but a very real potential threat to the health and safety of the employees at that location, that potable water could be affected by dangerous bacterial agents. Redacted

[83] In final M. Mackinnon maintained that while the CFIA and the PHAC laboratory system experts (and guideline referenced) indicate that for their purposes, the BFPs only needed to be near the perimeter of the laboratory, she submitted that there is clear direction from the CSA that the fittings should not be located in the contaminated laboratory.

[84] On the question of danger M. Mackinnon citing the Elnicki decision[14] contends that the issue of danger has to be evaluated based on the context of the industry standard. To this effect she further argued that the high potential for danger is recognised by the employer in its laboratory guidelines and the significant precautions which it takes in dealing with these factors. Redacted

[11] Correctional Services Canada Edmonton Institution, v. Confédération des Syndicats Nationaux OHST 2005-37, 2005
[12] Juan Verville and Correctional Service Canada, Kent Institution, 2004 FC 767, May 26, 2004..
[13] Evidence: E-24
[14] Stephen Elnicki and Loomis Armored Car Service Ltd. CLRB decision 1105, January 31, 1995.

[85] On this she stated that simply put: these agents are very hazardous materials for the health of employees and for the health of the general population. She further stated that given these health risk, it is not surprising that the PHAC takes significant precautions in handling these agents. Redacted

[86] M. Mackinnon noted that :

- the employer acknowledged that the reason for taking such serious precautions was that the agents could present a significant health risk, if a susceptible individual was exposed to them; Redacted
- the risk assessment and level accorded to laboratories depends on the types of pathogens and on the type of work that the laboratory is doing; and that Redacted
- CFIA requires that PHAC take extra precaution in containment laboratories because no pathogen should be released in the water supply. Redacted

[87] In addition, as an example of the potential danger present in the laboratory she noted the significant precautions that the PHAC takes in utilizing these laboratory facilities, such as:

- Double layers of PPE[15] (two layers of latex gloves);
- Full hazmat suits;
- Breathing apparatus;
- Autoclaving of all disposable materials;
- A nine day decontamination by vaporized hydrogen peroxide;
- Seven day incubation of biological indicators to ensure that the decontamination was successful.
- As well there are signs on the entry door stating: “Warning - do not enter BIOHAZARD - authorised personnel only”.

[88] Consequently, M. Mackinnon requested on behalf of the respondent that the BFPs be removed from the location that PHAC identifies as “dirty” laboratories, change rooms, rooms that may become so polluted that they require nine days to decontaminate.

Appellant’s rebuttal

[89] R. Fader maintained that the testimony of Dr. Lynch was clear about the potential of contaminating the city water. The samples received in the laboratories and the quantities required to do the analysis are simply too small to have any effect to city water even if there was a spill. In addition he recalled that the measures in place are more than sufficient to contain any potential contamination of the city water.

[15] PPE: personal protective equipment

[90] Regarding the term “dirty room” R. Fader maintained as well that this was an industry term to signify that a place “may” be contaminated and needed to be treated as such as a precaution.

[91] On the testimony of R. De Rosa that he had seen BFPs fail, he noted that most of what was presented was anecdotal in nature from second and third hand information and that the Tribunal should review in detail this testimony.

Analysis

[92] The issue to be decided is whether HSO McKeigan erred in issuing a direction under subsection 145(2)(*a*) of the Code.

[93] Subsection 145(2)(*a*) reads as follow:

> 145(2)(*a*) If a health and safety officer considers that the use or operation of a machine or thing, a condition in a place or the performance of an activity constitutes a danger to an employee while at work,
>
> (*a*) the officer shall notify the employer of the danger and issue directions in writing to the employer directing the employer, immediately or within the period that the officer specifies, to take measures to
>
> (i) correct the hazard or condition or alter he activity that constitutes the danger, or
>
> (ii) protect any person from the danger;
>
> (my emphasis)

[94] Danger is defined in the Code as follow:

> “danger” means any existing or potential hazard or condition or any current or future activity that could reasonably be expected to cause injury or illness to a person exposed to it before the hazard or condition can be corrected, or the activity altered, whether or not the injury or illness occurs immediately after the exposure to the hazard, condition or activity, and includes any exposure to a hazardous substance that is likely to result in a chronic illness, in disease or in damage to the reproductive system;

[95] The Courts have provided some guidelines in the interpretation of the concept of danger. The Honourable Justice Gauthier, in the Verville[16] decision, established that to determine that a “danger” exists:

1. There has to be a condition or activity that can be reasonably be expected to cause an injury or illness to an employee, which may not happen immediately upon exposure, but needs to happen before the condition or activity is altered and;

[16] *Verville v. Canada (Correctional Services)*, [2004] F.C. 767

2. The definition does not require that the “danger” causes an injury every time the condition or activity occurs. The French version, “susceptible de causer” indicates that it must be capable of causing injury at any time but not necessarily every time.
3. As well, it is not necessary to establish precisely the time when the hazard, condition or activity will occur, but only to ascertain in what circumstances it could be expected to cause injury and establish that such circumstances will occur in the future, not as a mere possibility, but as a reasonable one.
4. Reasonable expectation of injury cannot be based on hypothesis or conjecture, but if a hazard or condition is capable of coming into being or action, then it should be covered by the definition.

[96] Therefore, I have to decide whether health and safety officer McKeigan erred in deciding that the location of the BFP was in a contaminated (corrosive or polluted) atmosphere and thus created a condition that constituted a danger that could not immediately be corrected altered or protected.

[97] I agree with counsel for the employer position that the solution of this issue lies in the interpretation of Article 6.6.1 of the CSA Standard B64 which states:

- “Air gaps, back flow preventers, or vacuum breakers with vents to the atmosphere shall not be installed in ***a corrosive or polluted atmosphere***”, because the contaminated air can enter the piping system through the air gap open or open vent or cause the BFP or vacuum breaker to malfunction. [emphasis added]

[98] In this case, I find that the terminology used by the parties to describe the condition was not consistent: the terms contaminated, polluted and corrosive atmosphere and even noxious, were used indiscriminately.

[99] Contaminate(d) as noted by HSO McKeigan is defined in the dictionary[17] as:

> “*to make impure by contact or mixture, pollute”* 2) *“infect*.”3) *“Introduce radioactivity into a substance where it is harmful or undesirable.”*

[100] From HSO McKeigan’s testimony and from the general context of his investigation I infer that HSO McKeigan meant to replace both terms used in the standard with one that was more generic; consequently, I believe what he meant was that the BFP was located in a “corrosive or polluted” atmosphere.

[17] Canadian Oxford Dictionary, Second Edition 2004

[101] Atmosphere is defined in the same dictionary as: 1b) "*the air in any particular place"* Accordingly this would be the air in the laboratory.

[102] Corrosive is defined in the same dictionary as: 1) "*tending to corrode or consume".* As well I found that to corrode is defined as: 1) *wear away, esp. by chemical action.* Regarding the BFP in this case, I take this to mean that there has to be something in the atmosphere of the laboratory that will basically wear out the unit by way of a chemical reaction.

[103] I retain that Mr. Birks testified that he believed that what is meant in the CSA Standard by "atmosphere" is the normal operating atmosphere surrounding the BFP during the normal operating time of the device. Furthermore, R. Fader argued that the wording of the CSA Standard B64 is aimed at constant exposure and not to a situation where (in an exceptional situation) there is a brief amount of exposure to a pollutant or corrosive agent.

[104] As testified by D. Laframboise, the only corrosive matter in the laboratory is the 10% bleach solution that is used as a disinfectant to wipe down equipment, mostly in the Biosafety cabinet. This solution is not applied directly to the BFP but to the equipment and surfaces inside the Biosafety cabinets in cases on spills or eventually outside the cabinet. In addition, I find that as the evidence indicates, the laboratory operates under negative atmospheric pressure and the air in the laboratory is changed at least 10 times an hour. Finally, the evidence indicates that there has never been a spill outside the Biosafety cabinets.

[105] Consequently, I have serious doubts that the vapours the bleach solution used in the Biosafety cabinets or on top of the counters could reach and affect the metal of the backflow preventers. Therefore, I am of the opinion that the atmosphere in the laboratory is not corrosive.

[106] Polluted is defined in the same dictionary as above as: "*made unclean; contaminated"*. Accordingly I take this to mean that there has to be something in the atmosphere of the laboratory that makes the air unclean, that would be harmful and that is certainly not desirable. I understand that matters such as the pathogens, described by R. De Rosa, would certainly fall into this category. Redacted

[107] I retain from Dr. Lynch's testimony that he did not dispute the fact that they could potentially handle lethal pathogenic agents. He explained at length that for most of the pathogens that they try to identify in the samples, they require very small doses to be lethal. I appreciate as well the fact that Comparative marker samples are kept and handled in the laboratory.

[108] I retain from the various testimonies that:

- The laboratory is a certified Containment laboratory which meets the *Containment Standards for Veterinary Facilities* requirements for *in vitro* work with animal pathogens. Redacted
- In accordance with the above named standard the laboratory is under negative air pressure. The laboratory is equipped with biological safety cabinets. No air is recirculated; the air inside the laboratory is changed ten times every hour. All incoming and exhausted air in the laboratory and Biosafety cabinets is filtered through HEPA filters.
- Should the ventilation (HVAC) system malfunction, visible and audible alarms inform the employees, and all work is to stop, samples sealed and locked away and the laboratory is evacuated. In addition, the ventilation system has its own back up power in case of power failure.
- All authorised staff working in the laboratory is academically trained to work with pathogens. They are also trained and retrained every year on the handling procedures for pathogens.
- Samples brought in are small, in the 5 to 10 ml range. Redacted
- All samples are sealed in a tube, which is double sealed in an evidence bag. In addition, the evidence bag is sealed in a container approved for the transportation of dangerous goods.
- Samples are only opened in the biological safety cabinet.
- No one is to carry or move any of the live samples outside of the Biosafety cabinets, unless they are carried in a sealed container.
- There is a procedure in place in case of spills of samples inside the cabinet to contain and clean the spill immediately.
- There is a procedure as well in case of a spill outside the cabinet where all other personnel in the laboratory is informed, and evacuated from the laboratory. Further more this procedure dictates the protocol how to contain and clean the spill immediately.
- If a spill does occur outside of the Biosafety cabinets, once it has been cleaned, environmental monitoring of the laboratory including air and surface sampling is to be conducted to verify the efficacy of the cleanup. I note that evidence show that there has never been a spill outside of the Biosafety cabinets since the laboratory opened.
- Should any sampling indicated above reveal the presence of agents, a full decontamination of the laboratory is done utilizing Vaporized Hydrogen Peroxide.
- If any samples are kept at the laboratory, they are stored in a locked freezer at minus 80 degrees. Only authorised personnel have access to them.

- Comparative marker samples are also kept under the same condition.

[109] I retain as well that D. Laframboise also stated that he conducted air surveys in the past and that the bacteria count in the laboratory was 0 to 1, while the air in the rest of the building had 100 counts for bacteria.

[110] I carefully considered the lengthy testimony of R. De Rosa about what he had heard about the agents being analysed in the laboratory as well as the fact that not knowing exactly what they were doing inside this laboratory how, as he mentioned in his testimony, he speculated about what could be going on in the said laboratory. Redacted

[111] I understand the fears of R. De Rosa when people are handling such bacterial agents, however, R. De Rosa's knowledge and experience is that of an ordinary experienced plumber. His experience is not that of an expert or even basic knowledge of pathogenic agents. Therefore, although I considered R. De Rosa's testimony at length, while I respect his expertise on plumbing issues, I cannot give considerable weight to his opinion on the potential consequences of handling those bacterial agents. Redacted

[112] All things considered, the testimony of R. De Rosa was more to the effect that a backflow preventer could one day malfunction, (feed pressure drop, two check valves that leak, one relief valve that leaks,) and all this has to happen at the same time that there are some pathogens in the air. Based on the evidence, I find this to be at best, a mere possibility, not a reasonable one.

[113] I might add that I find very unfortunate that D. Laframboise or Dr. Lynch did not take the time to sit down with HSO McKeigan at the very beginning of this and explain themselves. Should this have occurred when HSO McKeigan tried to meet with them early on, I am convinced that the outcome would have been completely different.

Conclusion

[114] As a result, I find that because of the configuration of the laboratory, such as the ventilation system, HEPA filtration, Biosafety cabinets and all the precautionary measures taken to bring in, work with and dispose of the potentially contaminated samples, as well as clean up and decontamination procedures **the air in the laboratory is not polluted**.

[115] Consequently, as the backflow preventer is not located in a polluted atmosphere and therefore meets the intent of CSA Standard B64.10-07. I find there is no danger to warrant the issuance of a direction under subsection 145(2).

Decision

[116] For all the reasons stated above, I hereby rescind the direction issued by HSO McKeigan to Public Health Agency of Canada on December 17, 2008.

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Richard Lafrance

Appeals Officer