



Non-Passenger Screening at Montreal's Pierre Elliott Trudeau International Airport: Risk Analysis

By:

Domingo Amarillo-Brillantes, Member of the Policy Health and Safety Committee

Philippe Arnold, Labour Relations Advisor for STAS

Roxanne Lanctôt, Health and Safety Advisor for STAS

Roger Thauvette, Member of the local Health and Safety Committy

Audrey-Mélissa Therrien, Vice-President District 5, United Steelworkers

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1.0 Non-Passenger Screening (NPS) Position Risk Evaluation

Employees working at one of the eight Non-Passenger Screening (NPS) Positions at Montreal's Pierre Elliott Trudeau International Airport (YUL) are responsible for the screening of all employees and passengers entering the sterile zone through a number of key entry points. The potential risks have been divided into two groups: Risks Common to all NPS Positions and Risks Specific to Each NPS Position.

1.1 Risks Common to all NPS Positions

There are few tasks that are common to all the NPS positions. These include the Hand Held Metal Detector, the Manual Search of Persons, the Manual Search of Baggage, and the use of the EDT Machine. The potential risks that are common to all the NPS positions can be divided into two categories: Ergonomic Risks and Biological Risks.

Ergonomic Risks

1. When performing a manual search of persons, employees tend to bend over instead of crouching down to search the lower portion of the body.
2. Depending on the task being performed, the working surface (table or cart) is too low, leading to bad back posture and additional neck strain for tall employees. Tables are either twenty-six, twenty-eight or thirty-two inches (26", 28" or 32") high, while the NPS carts are all thirty-one inches (31") high.
3. Employees working the NPS positions are asked to remain standing for long periods of time (8 to 10 hours) on a hard surface (note: this does not apply to the NPS – Primary Position). This risk is amplified for employees working night shifts because the limited available personnel makes it difficult or even impossible to ensure relief for breaks. Moreover, when employees do not have chairs to rest on, they tend to find other objects on which to lean or sit, which can create a risk in and of itself.

Biological Risks

1. Working with the public, there is always a risk of contamination from insects, bacteria, and virus'. However, since employees are asked to wear Nitech or Nitrile gloves, the chain of transmission is ruptured.

1.2 Risks Specific to Each NPS Position

The eight NPS positions each have their particularities, which can present risks that are either isolated to one position or shared by a number of positions. The potential risks in this section have been divided into four main categories: Ergonomic Risks, Physical Risks, Risks Associated to the Work Environment, and Biological Risks.

1.2.1 NPS – Domestic

Physical Risks

1. Due to the Stack Effect, there is a constant draft flowing through this access point, the temperature of which varies with the season.
2. This access point has poor lighting, which forces employees to strain their eyes when screening baggage.
3. The layout of the working equipment makes for a confined working environment that limits employee mobility. This problem is frustrated by various companies that use the space for storage, thereby creating clutter in the access point.

1.2.2 NPS – Gate 51

Other than the general risks common to all NPS positions, Gate 51 NPS does not have only specific risks.

1.2.3 NPS – CTX

Ergonomic Risks

1. Due to the high number of persons passing through this access point and the limited space, employees must turn their heads to the sides on multiple occasions.

Physical Risks

1. There is a draft when near-by doors that lead outside are opened. The temperature of the draft varies according to the season.

Risks Associated to the Work Environment

1. The working space for this access point is very small and there is a high flow of people transiting through it, both of which decrease employee mobility. This problem is frustrated by the fact that the Airport Patrol personnel is also set up within the limited space. There is a door within the access point that is blocked by a cart.

1.2.4 NPS – Y38

Ergonomic Risks

1. Due to the high number of persons passing through this access point and the limited space, employees must turn their heads to the sides on multiple occasions.

Physical Risks:

1. This access point has poor lighting, which forces employees to strain their eyes when screening baggage.

Risks Associated to the Work Environment:

1. The working space for this access point is very small, limiting employee mobility.

1.2.5 NPS – SP1

Physical Risks

1. This access point has both poor air circulation and heavy machinery nearby, which as a results in a stuffy working environment.

Risks Associated to the Work Environment

1. There is an electric wire that sticks out because of the EDT Machine's.

1.2.6 NPS – Starbucks

Ergonomic Risks

1. Due to the high number of persons passing through this access point and the limited space, employees must turn their heads to the sides on multiple occasions.

Risks Associated to the Work Environment

1. The multiple doors in proximity to this access point create a draft and a fluctuation in temperature.
2. The nearby restaurants often give off odors – food and cleaning products.
3. This access point is poorly lit, forcing agents to strain their eyes when screening baggage.
4. This access point has limited space and is located in a junction with high personnel flow, thereby restricting employee mobility.
5. The automatic doors pose a risk to employees who work in this confined space.

1.2.7 NPS – Porte 79

Physical Risks

1. Depending on the season, the temperature gets cold when the garage doors are opened for deliveries.

Biological Risks

1. The proximity of the garbage leads to insects and vermin in the vicinity. It should be noted that the access point is not in direct contact with the garbage because of the doors.

Risks Associated to the Work Environment

1. The concrete floor in this access point is often dirty, which creates a risk of slipping and causes the anti-fatigue mats to slip out of place.

2. The working space is limited when there is delivery of merchandise.
3. The nearby garbage bins produce unpleasant odors inside the access point.

1.2.8 NPS – Primary

Physical Risks

1. There are electrical wires close to the X-Ray machine, which create a risk of tripping.
2. The screen on the X-Ray machine is not adjustable.

1.3 Recap of Main Risks

The major risks that are either common to all the NPS positions or specific to a few can be summarized as follows:

1. The working surfaces used by employees are not at the appropriate height for all the tasks performed by the screening officers.
2. Employees are asked to remain standing for long periods of time on a hard surface.
3. A number of the NPS positions experience cold drafts created by the Stack Effect.
4. A number of the NPS positions are situated in confined areas and laid out in a way that further restricts employee mobility.

2.0 Review of Applicable Publications

When reviewing the available articles published on the subject of prolonged standing in the work place, we immediately notice a clear consensus: There are undeniable negative effects associated with working on your feet. These negative effects start on the physical level but tend to expand into the mental and corporate realm.

Let us begin by exploring the harmful effects on the physical. There are a few main factors worth noting that can accentuate the potential risks. Evidently, the length of time one is asked to stand has a direct impact. The thresholds will of course vary on the situation – risks for a pregnant woman, for example, can start after only three hours¹ – but most studies are based on situations where employees are asked to stand for a prolonged period of time, such as a complete work shift. Another set of factors that influence the potential impact on the physical are the factors specific to the work being performed while standing. For instance, if employees are able to move around or if they are relatively immobile, confined to a restricted area. Finally, the work environment itself will influence the potentials risks. This includes factors such as the hardness of the floor or the ergonomics of the equipment used.

¹ Le Réseau canadien pour la santé des femmes, *Prévenir les blessures professionnelles : Les blessures associées au travail en position debout.*

In less serious cases, employees who are asked to remain standing for long periods of time experience generalized muscle fatigue and discomfort². Beyond general fatigue, working standing up increases your risk of experiencing pain, especially in the feet, in the legs, and in the lower back³. While mobility helps stimulate blood circulation, a work environment that fosters a relatively fixed position will increase the risk of health complications related to circulation⁴. In the long term, standing for prolonged periods will increase the number of occupational injuries⁵.

As previously mentioned, the harmful effects go beyond the physical, as is often the case, and affect the mental well-being of employees. Studies have shown that the physical fatigue and discomfort associated with standing for prolonged periods of time is linked to psychological fatigue and a decline in alertness, mental concentration, and motivation⁶. It is therefore not surprising that standing jobs have also been linked to a decrease in performance and productivity⁷.

Luckily, there are some easy ways to counter these harmful effects. The most common solution is to allow employees to alternate between a standing and a sitting position. This has been shown to be an ideal way to minimize muscle fatigue and discomfort⁸, giving your body alternating rests⁹. The movement associated with alternating positions not only improves circulation but it has also been found to provide nutrients to intervertebral discs and increase productivity and employee well-being¹⁰.

Paying attention to other aspects of the work environment can also help counter some harmful effects on the health of employees. The posture adopted by employees to perform their work, influenced by the height of the working bench, will have a considerable impact. The ideal heights have been established for physically demanding work (65cm to 95cm) and light, clerical work (85cm to 110cm)¹¹.

Article 122.2 of the *Canadian Labour Code* stipulates that the employer must strive to eliminate the risks to the health and the safety of employees at the source. When considering the use of anti-fatigue mats, it is important to be aware of the specific needs of the work environment¹². Although anti-fatigue mats are often used to reduce the discomfort and fatigue associated to standing, this alleviation does not fix the problem at the source.

Once the potential risks associated to a particular work environment have been identified, it is important to explore a variety of solutions that not only alleviate the discomforts that are experienced by employees but that also cut right to the root cause and work to counter the harmful potential.

² Centre canadien d'hygiène et de sécurité au travail, *Troubles musculo-squelettiques liés a travail – Facteurs de risque*.

³ Messing, K et al. (2004), *La souffrance inutile : la posture debout statique dans les emplois de service*.

⁴ Messing, K et al. (2004), *La souffrance inutile : la posture debout statique dans les emplois de service*.

⁵ Halim, I. et al., (2012), *Assessment of muscle fatigue associated with prolonged standing in the workplace*.

⁶ Halim, I. et al., (2012), *Assessment of muscle fatigue associated with prolonged standing in the workplace*.

⁷ Halim, I. & Omar A. R. (2012), *Development of prolonged standing strain index to quantify risk levels of standing jobs*.

⁸ Halim, I. et al., (2012), *Assessment of muscle fatigue associated with prolonged standing in the workplace*.

⁹ Commission Universitaire de Sécurité et Santé au Travail Romande (2005), *Ergonomie : Aménagement des postes de travail*.

¹⁰ Commission Universitaire de Sécurité et Santé au Travail Romande (2005), *Ergonomie : Aménagement des postes de travail*.

¹¹ Centre canadien d'hygiène et de sécurité au travail, *Travail en position assise : Information de base*.

¹² Occupational Health Clinics for Ontario Workers Inc., *Working on your feet*.

3.0 Conclusion and Recommendations

Just as with the potential risks, we have divided our conclusions and recommendation into two groups: those that are applicable to all NPS positions and those that are specific to a limited number of NPS positions.

3.1 Common Recommendations and Conclusions

Three different risks were identified as being common to all NPS positions, the first of which is a result of improper technique applied when using the Handheld Metal Detector. Instead of crouching down to search the lower part of the body, employees tend to bend at the hip. For this risk, a campaign to raise awareness regarding the proper applicable technique is likely to show the best results. There are no modifications to the work environment or working equipment that could avoid this risk.

The second risk is associated to the ergonomics of the NPS positions. One such concern involves the height the tables used by employees through the course of their work day. Both the tables and the work carts fit within the norms that were identified earlier (section 2.0) for physically demanding work but they are too low for light clerical work. In other words, when employees are asked to complete reports, the low table will force them to bend over and adopt a poor posture. The simple solution to this problem is to provide employees working at these positions with some clip-boards on which they can complete their reports. Another ergonomic concern for NPS position relates to the restricted space within which employees must work. This problematic can be improve by increasing employee awareness with regards to the position of the non-passenger during the screening process. If they are placed with arms stretched out parallel to the access point, the flow of the other persons through the access point is not blocked by the search, thus freeing up the access point.

The third and most serious risk common to all NPS position (with the exception of the NPS – Primary Position) is caused by prolonged standing. The articles published on the subject are clear, there are undeniable risks associated to working on your feet, which vary from general fatigue and discomfort to circulation problems and an increase in occupation injuries. Looking beyond the health of the employees, we have also seen that working on your feet is linked to a drop in productivity and performance, as a result of decreased motivation, alertness, and mental concentration. Since we are dealing here with airline security, this last point is especially important. It is undeniably essential that employee maintain an adequate level of alertness and mental concentration.

The reintroduction of chairs to the NPS positions will resolve this potential risk at the source, as is obliged by the *Canadian Labour Code* Employees working at the NPS positions often work in restricted spaces that limit their mobility. Providing chairs and allowing them to alternate between the standing and sitting position will not only alleviate fatigue, discomfort and pain but it will also help circulation and counter the decrease in motivation, alertness and concentration that lead to a drop in productivity.

3.2 Specific Recommendations and Conclusion

1.2.1 NPS – Domestic

In addition to the general conclusions and recommendations mentioned in the previous section, there are a few recommendations that could be made for this NPS position. First, employees would be supplied with either a light sweater or wind breaker (appropriate apparel) because of the draft that exists in this access point. Second, the layout of the access point could be rearranged, moving the table below one of the lights to improve employee visibility, important for the search of baggage. Finally, if this space would stop being used as a type of “storage space” by other companies, it would open up the working environment for employees, allowing for greater mobility.

1.2.2 NPS – Gate 51

Other than the general conclusions and recommendations common to all NPS positions, Gate 51 NPS does not have any that are specific to this position.

1.2.3 NPS – CTX

There are two main concerns for this NPS position. The draft, which can be resolved with appropriate apparel, and the layout of the access point. The limited space within which employees are asked to work restricts employee mobility. The problem is made evident by the cart blocking a door. It is further exasperated by the fact that the limited area is shared with employees of the Airport Patrol. If the employees of the Airport Patrol could be moved back to their original position, it would go a long way to freeing up some space within this access point.

1.2.4 NPS – Y38

The main problem with this NPS position is the layout of the access point. As it is now, the layout leads to low lighting and an inappropriate distance between the cart used for searching baggage and the area designated for the metal detection. Different layouts could be considered to improve the lighting and create a more fluid screening point.

1.2.5 NPS – SP1

The poor air circulation and hot temperature of this access point could be improved by installing a fan. As for the exposed wire, it can be covered by simply moving the EDT Machine so that it is positioned over the wire.

1.2.6 NPS – Starbucks

The automatic doors have been identified as potential risk for employees working in this access point. By working area for employees with markings on the floor, this risk is immediately diminished. As with other NPS position subject to draft, appropriate apparel would counter this issue. Finally, the layout of the access point could be rearranged to improve lighting for the employees searching baggage.

1.2.7 NPS – Porte 79

This NPS position is the one that is the most subject to variations in temperature. When the doors open for delivery, the access point can get quite cold. Employees working this position could benefit from lockers, allowing them to keep a coat for these occasions. Another risk that was identified is related to the anti-fatigue mats. When the floor is dirty, the mats slip and become a hazard in and of themselves. Because of the proximity of the checkpoint to an access door outside, the floors will often be dirty, making the anti-fatigue mats slip, which renders them inappropriate for this access point.

1.2.8 NPS – Primary

The Primary NPS is considered by employees as the favorite NPS position. The presence of chairs allows employees to alternate between the sitting and standing position, which counters discomfort and the decrease in moral and alertness. The risks identified in the position were the wires along the ground, which should be tied up and kept out of the zone with personnel travail to avoid the possibility of tripping. Finally, adjustable screens on the X-Ray machines would help posture for the employees who vary greatly in height.

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