Module 6.1.1
GUIDELINES

HEALTH AND SAFETY ACTION PLAN FOR REPAIR AND CONSTRUCTION PROJECTS AT THE JOHN H. CHAPMAN SPACE CENTRE

1. Background

The Security and Facilities Division (SFD) is the organization mandated by the Canadian Space Agency to plan and implement renovation, construction, maintenance and repair work at the John H. Chapman Space Centre. The SFD must plan its activities on the basis of having to complete several hundred projects per year in an environment that is safe and healthy for the construction workers, its employees and the public.

2. Scope

The guidelines of the Health and Safety Action Plan apply to everyone responsible for planning and implementing construction, maintenance and repair projects in the SFD.

3. References

Laws and regulations

- *Canada Labour Code, Part II*
    - *Canadian Occupational Health and Safety Regulations, Part XII*
    - *Marine Occupational Safety and Health Regulations, Part X*

Publications by the Treasury Board

- Personal Protective Equipment and Clothing Directive
- The Effects of Extreme Cold

4. Procedure

Every construction, repair and maintenance project implemented by the SFD at the John H. Chapman Space Centre must include a preliminary assessment at the planning stage to evaluate the risk level.

The risk level is assessed without regard to the protective measures normally applied when implementing a similar project. Subsequently, the risk level is assessed by answering a set of questions aimed at determining the probability of an accident occurring and the consequences on the health of the workers and the public, and damage to the facilities if such an accident were to occur.

A risk rating of acceptable, tolerable or unacceptable is assigned to the project based on the answers obtained.

Projects deemed acceptable can go ahead without having to file an abridged action plan form. For tolerable and unacceptable projects, an abridged action plan form must be filled out, detailing the general and specific measures. Based on the preventative measures recommended in the abridged form, the project's risk level is changed to acceptable or tolerable. The project can then proceed after signature by the contractor assigned to the work attesting that he has read the risk assessment and agrees to implement the health and safety action plan for the project. These projects must be systematically approved by the Canadian Space Agency's Occupational Health and Safety.

Projects still deemed unacceptable after the proposed preventive measures must be abandoned. In all circumstances, the project risk level assessment grid and, where applicable, the action plans must be approved by the Senior Officer, Facilities Management.

5. Roles and responsibilities

As stated in the implementation process for fixed assets projects, any project conducted by the SFD must be supervised by a project manager. This person is an SFD employee assigned to manage the project planning and implementation and assume responsibility for quality and budget control. The project manager must conduct the preliminary project risk assessment by filling out the questionnaire and using the grid.

The project manager is also responsible for drafting the general and specific action plans (using templates), filling out the contractor's commitment form and having it signed by the contractor and the Senior Officer, Facilities Management.

As applicable, the project manager must submit the file for approval to the Canadian Space Agency's OHS Officer. If required, he/she must provide any additional information required for analysis of the file.

The technical officer must send copies of approved documents to the various parties and archive the documents so that they are easy to retrieve for future consultation.

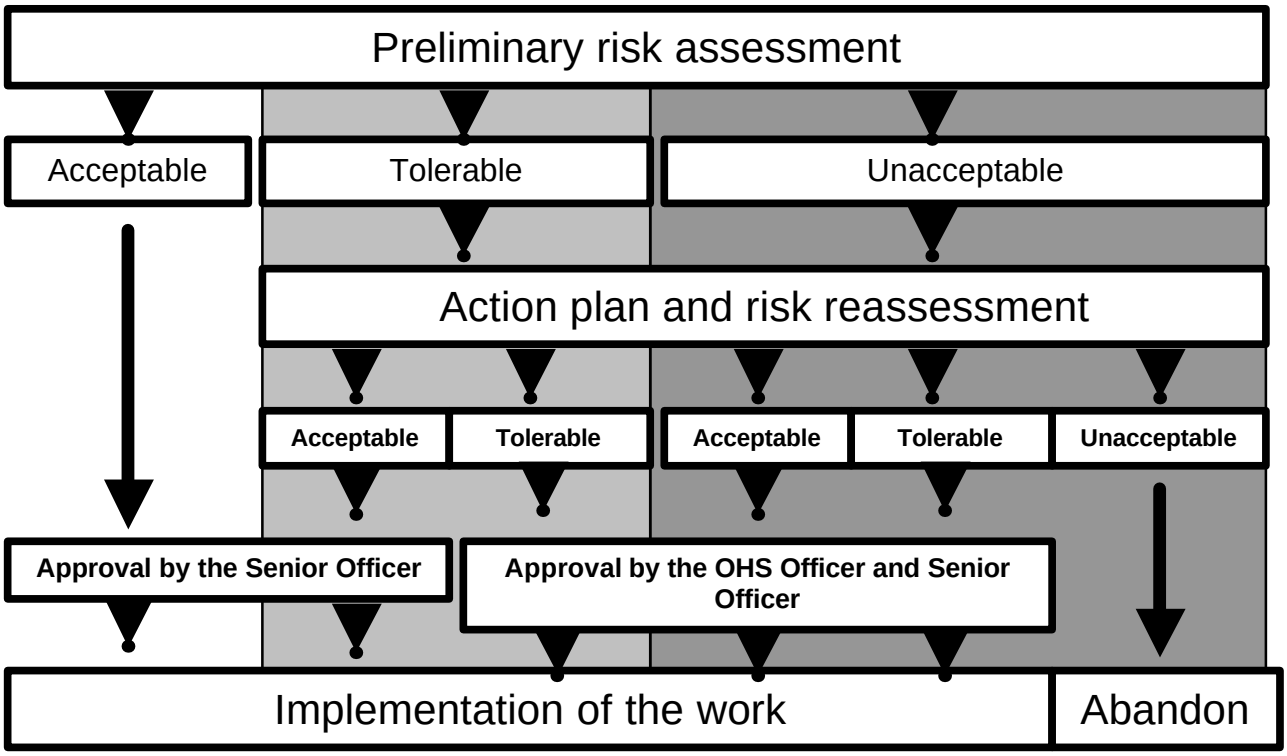

Diagram of the health and safety action plan

6. Steps in drafting the action plan

6.1. Preliminary risk assessment

The preliminary risk assessment is done by using the risk management grid (Module 6.1.2). The project manager must fill out the questions aimed at assessing the likelihood of the risks occurring and the degree of severity of the consequences should an accident occur.

The questions aiming to assess the likelihood are divided into three categories:

Risk of an accident stemming from human intervention;

Risk related to operations;

Risk related to the work environment.

6.1.1. Risk of an accident stemming from human intervention

It is important to assess the impact of workers' activities on the likelihood of an accident occurring. Factors to consider include physical and mental effort, required skills and the possibilities of workers being exposed to various emissions.

6.1.1.1. Physical effort

Sustained physical effort is conducive to an accident occurring. Moving loads and handling heavy tools that require pulling and pushing are factors to consider. The duration of strenuous work, and the sequential and repetitive nature of the effort also has an effect on the risk of an accident occurring.

Normal physical effort

Normal effort is work that requires continuous physical effort that does not require the movement of heavy loads. In fact, it is the effort a worker normally makes in doing his work. Accordingly, for a plumber, moving and lifting pipes and handling heavy tools is considered normal effort.

Demanding physical effort

Demanding effort is work that requires sustained effort and the movement of heavy loads. Although making this level of effort may not be unusual for a worker, it is not normally made in doing his work. Accordingly, for a plumber, moving a piece of equipment weighing over 70 kg or using bulky tools is considered demanding effort.

Strenuous physical effort

Strenuous effort is work that requires the movement of excessive loads or significant effort over a long period. The movement of successive loads weighing over 70 kg, or the handling of loads using a lever, or the handling of tools that requires consecutive pushing and pulling over a long period is considered strenuous effort.

6.1.1.2. Mental effort

The concentration required to do work as well as the level of attention have an impact on the risk level. The numerous elements to be considered, the duration of the work shift and the stress generated by the number of decisions to be made are also factors to consider.

Normal mental effort

Normal effort is work whose conceptual components are preset and familiar to workers. A worker implementing a detailed plan, following precise instructions or doing work typical of his trade fall under this category. Accordingly, an electrician installing electrical cables and connectors shown on a drawing or plan is doing work that requires normal effort.

Sustained mental effort

Sustained effort is work whose conceptual components are uncertain and require a certain level of on-site initiative, adaptation and creation. A worker working from a simple sketch in an unfamiliar environment falls under this category. Accordingly, an electrician installing electrical equipment that is not frequently installed, and who must consult the manufacturer's instructions or constantly refer to the installation diagram is doing work that requires diligent effort.

Vigilant mental effort

Lastly, vigilant effort is work that has no preset conceptual components, thus obliging the worker to adapt and create

on-site in a situation where his decisions can have an impact on the safety of workers and the public, or on the durability of the facilities. Accordingly, an electrician working in an unfamiliar environment with rough drawings or sketches, or installing a new type of equipment is doing work that requires vigilant effort.

6.1.1.3. Required skills

The level of skill required to perform a task has an impact on the likelihood of an accident occurring. Factors to be considered include the general nature of an activity, its compatibility with the worker's level of professional training, and the degree of handling required.

Skills of the trade

Skills of the trade are those required to perform activities related to the worker's trade or profession. Accordingly, a painter painting a wall with standard paint is doing work that requires skills of the trade.

Specialized skills

Specialized skills are those required to perform specific or specialized work. A painter applying a two-part coating that requires careful mixing and ventilation precautions in the work area is doing work that requires specialized skills.

Expert skills

Expert skills are those required to perform highly technical tasks of a very specific nature that must be done by a person who has the necessary qualifications, permits and experience to do such work. A painter applying a fire-retardant coating to a steel beam located in a room above delicate equipment is doing work that requires expert skills.

6.1.1.4. Exposure to emissions

The level of exposure to emissions of all types has an impact on the after–effects that a worker could suffer after the work is done.

Acceptable exposure

Acceptable exposure occurs during activities that do not produce emissions or which produce emissions that are below acceptable levels.

Moderate exposure

Moderate exposure is occasional and low in intensity. This exposure can cause discomfort, but would not affect the workers' quality of life.

Intense exposure

Intense exposure is exposure that is likely to cause lesions or injuries, and affect the workers' health.

6.1.2. Risks related to operations

6.1.2.1. Project

The organization's experience in managing a similar project has an impact on the likelihood of an accident occurring.

Familiar projects

Proven projects that are frequently carried out by the organization are deemed to be familiar. The project implementation conditions, work environment and work sequence are familiar and well known to the project manager, Agency employees and workers. Annual cleaning of the boilers, installation of an electrical socket and tree pruning are projects familiar to the SFD.

Infrequent projects

Infrequent projects are those that the organization carries out on an occasional basis at spaced-out intervals. The project implementation conditions, work environment and work sequence are not well known to the project manager, Agency employees and workers. Replacing the lining of a boiler, installing a reversing switch on the electrical network or cutting down a tree are projects carried out infrequently by the SFD.

New and complex projects

New and complex projects are those that the organization is doing for the first time. The project implementation conditions, work environment and work sequence are new to the organization and not known to the project manager, Agency employees and workers. Replacing a boiler, installing high-technology electrical equipment for a specific program or renovating a support wall are new and complex projects.

6.1.2.2. Methods

The method required to carry out work has an impact on the likelihood of an accident occurring.

Proven mastery

The project is deemed to use a proven methodology when it consists in doing tasks or activities that are recognized and proven within the limits of the workers' skills. Making electrical connections for an electrician, using a circular saw for a carpenter, or handling a paint can for a painter are activities considered as proven with respect to the skills normally held by these workers.

Relative mastery

Relative mastery concerns projects requiring a specific methodology within the limits of the skills of specialized workers. Making connections to a 600-V UPS, installing formwork for a concrete slab located several metres above the ground or applying two-part coatings require a higher

degree of expertise, experience and knowledge. The workers who perform these tasks must be specialists in their respective fields. Despite the workers' skills and specialization, performing these tasks involves a higher risk level than proven mastery tasks.

Unproven mastery

Unproven mastery concerns projects that require a rare or specialized methodology, generally mastered by professionals with specific expertise. Making modifications to an electrical substation, doing subcontract work or handling volatile or toxic products require a specific level of specialization. Doing these types of activities always carries a risk, even for specialized and experienced workers.

6.1.2.3. Hazardous materials

Handling hazardous materials has an impact on the likelihood of an accident occurring.

Absence of hazardous materials

Work not requiring the use of hazardous substances or materials that can affect people's health and comfort does not comprise a risk in this regard.

Minimum

Handling small quantities of hazardous materials with a low toxicity index comprises a minimum risk.

Abundant

Handling large quantities of a hazardous product, or handling products with a high toxicity index, even in small quantities, increases the likelihood of an accident.

6.1.2.4. Machinery and tools

The type of machinery used can have an impact on the likelihood of an accident occurring.

Light - workshop

Light equipment generally used by a worker in his trade represents a minimum risk. An electrical circular saw for a carpenter, a chainsaw for a tree pruner or a blowtorch connected to a gas tank for a plumber are equipment normally used by these workers and comprise a minimum risk.

Worksite

Infrequently used worksite cutting equipment comprises a probable risk. The use of a concrete saw, a wood chipper, a cutting torch or an excavator for civil engineering works comprises an average risk.

Heavy - worksite

The use of heavy equipment comprises a probable risk. Equipment used to read electrical current on high-voltage circuits, presses or heavy lifting equipment comprise a high risk.

6.1.2.5. Prior incidents

Accidents that have occurred during the implementation of similar projects is an indicator to consider. The number of accidents indicates the risk level to consider. Even the seriousness of the consequences of accidents indicates the level of vigilance required to implement a project.

6.1.3. Risks related to the work environment

6.1.3.1. Worksite

Factors that could have an impact on the likelihood of an accident occurring include the site where the work is done, access to the site, ventilation, and height above ground level.

Minimal risk

Work done on an easy-access, ventilated site at ground level represents a minimal risk. Outdoor work done at ground level, indoor renovation work in office spaces or work in a well-lit, ventilated technical room fall under this risk group.

Probable risk

Work done on a site with restricted access that is poorly ventilated or located several metres above ground level represents a probable risk. Work requiring the use of scaffolding that is at least 4 m high or work done in a cramped, but not enclosed space fall under this risk group.

Highly probable risk

Sites with restricted access, that are unventilated or which require the use of scaffolding or a lifting device at least 4 m high represent a highly probable risk.

6.1.3.2. Neighbouring areas

The degree to which a construction site is insulated from its neighbours has an impact on the public's exposure level, therefore on the likelihood of an accident occurring. Insulated sites, separated from the public by a solid partition represent a minimal risk. Poorly insulated sites, separated from the public by permeable partitions or barriers represent a probable risk. Sites not insulated from the public expose employees and visitors to a highly probable risk.

6.1.3.3. Debris, falls and splinters

The amount of debris and the radius of its effect have an impact on the likelihood of an accident occurring. Construction work done at ground level or in an insulated area that produce little debris represents a minimal risk. Construction work done above ground level or in a poorly insulated area, producing debris at an intermittent rate with a radius of several metres represents a probable risk. Lastly, construction work done at heights or in a non-insulated area, producing debris at a constant rate with a radius of several metres represents a highly probable risk.

6.1.4. Consequences of an accident on workers (human)

The severity of workers' injuries has an impact on the seriousness of the consequences of an accident. Activities that can cause mild, fleeting injuries represent a low level of severity. Activities that can cause serious or persistent injuries represent a moderate level of severity. Activities that can cause permanent disability or loss of life represent a high level of severity.

6.1.5. Consequences of an accident on operations

The consequences of an accident on operations and the functioning of a building have an impact on the quality of life of the occupants and their ability to do their work. Activities that can cause accidents having negligible consequences on the facilities, equipment operations, occupants' quality of life or the Space Agency's operations represent a low level of severity. Activities that can cause accidents having tangible consequences on the facilities, that disrupt equipment operations for a moderate period, affect occupants' comfort and disrupt or halt the Space Agency's operations represent an average level of severity. Activities that can cause accidents having significant consequences on the facilities, that disrupt equipment operations for an extended period, affect occupants' comfort and halt the Space Agency's operations represent a high level of severity. In general, an accident having tangible consequences will require short-term remedial work at a moderate cost. Accidents having significant consequences will require remedial work that may extend over a long period, and at a high cost.

6.1.6. Consequences of an accident on neighbours (environment)

For the purposes of this document, neighbours includes people beyond the construction site who could suffer from an accident resulting from activities done on the construction site. Activities that can momentarily affect the quality of the neighbouring work environment without, however, causing discomfort, irritation or poisoning are considered to be of low consequence. Activities that can disturb the quality of the neighbouring work environment, cause temporary discomfort, irritation or poisoning are considered to be of average consequence. Activities that can deteriorate the quality of the work environment, cause significant discomfort, irritation or poisoning sufficient to jeopardize the neighbours' life or health are considered to be of high consequence.

6.2. Developing the action plan

For projects with an initial tolerable or unacceptable assessment, a health and safety action plan is mandatory. The action plan has two parts—the general action plan and the specific action plans. The general action plan is mandatory, whereas the specific action plans are required only for projects involving certain types of work.

6.2.1. General action plan

Preparing a general action plan is mandatory for all projects initially assessed as tolerable or unacceptable. The project manager must use the template provided (Module 6.1.3). The general action plan covers the following aspects:

1. First aid
2. Personal protective equipment
3. Fire prevention
4. Site maintenance
5. Access and signage
6. The worksite and the public

7. Training and information

8. Skills

The general action plan must be drafted in compliance with the following guidelines:

6.2.1.1. First aid

The first heading in the general action plan describes the procedures for workers to follow in case of injury.

In an accident, the speed in providing first aid often affects the ability to minimize the consequences of the victim's injuries. The location of the infirmary, first aid kits and telephones, and the availability of radios are key factors in any strategy designed to minimize the consequences of an accident. In this section, it is important that the project manager define the means of communication available to workers.

6.2.1.2. Personal protective equipment (PPE)

PPE is a key component in any strategy designed to minimize the consequences of an accident. Based on the guidelines, the project manager must stipulate the minimum PPE that workers must wear on the construction site. The list of PPE is not exhaustive, and contractors and workers are encouraged to wear additional PPE if they believe it is in their interest to do so.

6.2.1.2.1. Protective headwear

Workers who are exposed to falling objects must wear a safety helmet. If they risk coming into contact with electrical cables, they must wear a helmet made from a rigid dielectric.

CSA standard Z94.1 defines three main classes of safety helmet:

1. Class G: **General helmet.** The safety helmets in this class protect the head against mechanical shock and penetration. They are non-conductive and must meet the dielectric rigidity requirements for this type of helmet. These helmets also provide some protection against electric shock caused by the wearer's accidental contact with a live electrical device.
2. Class E: **Electrical helmet.** Electrical helmets protect the head against mechanical shock and penetration. They are made of superior-quality non-conductive materials and provide increased protection against electric shocks caused by the wearer's accidental contact with a live electrical device.
3. Class C: **Conductive helmet.** These safety helmets are not made of non-conductive material and are used only to protect the wearer against mechanical shock and penetration.

Safety helmets

Workers who risk a head injury from falling or flying objects, or from an electric shock must wear a safety helmet.

The helmets used for protection against falling or flying objects must comply with CSA standard Z94.1.

The helmets used for protection against electric shock and burns caused by high voltage must comply with CSA standard Z94.1.

6.2.1.2.2. Eye protection

Workers who risk an injury from flying objects, splashes, hazardous liquids or radiation must protect their eyes and face.

Workers must protect their eyes if there is a risk of injury or illness caused by airborne dust, fibres, various fumes and

aerosols, or if their work requires them to be in contact with hazardous radiation or blinding electric arcs.

If exposure to the sun cannot be avoided, workers must wear appropriate protective glasses.

Glasses

Safety glasses provide protection against objects and dust that can get into the eyes from the front of the face. Glasses with side shields provide increased protection against objects that can get into the eyes from the side of the face.

Safety goggles

Safety goggles protect the eyes against hazardous chemicals and against even more hazardous projections likely to get into the eyes from the front or side of the face.

Goggles equipped with a hooded or indirect breathing device provide additional protection against chemical splashes and fumes.

Workers in contact with molten metal or ovens or who do crushing work must wear safety goggles.

6.2.1.2.3. Face protection

A welder's mask protects the eyes and the face, as well as the top and sides of the head. It protects the wearer against the risks of welding work (sparks, harmful radiation, projections, splashes and heat).

NOTE: Workers who are exposed to chemical fumes, splashes, intense heat, molten metal and dust may not wear contact lenses.

6.2.1.2.4. Hearing protection

Workers who are exposed for eight hours to an MPT of 85 decibels (dB) or higher must wear hearing protection. For reference, here are several examples of acoustic intensity levels:

normal conversation	= 60 dB
woodwork	= 100 dB
pneumatic drill	= 100 dB
gunshot	= 120 dB

Earplugs

There are three main types of earplugs:

1. Soft earplugs, made of foam or fibre which adapt to most ears. They may be disposable (i.e. designed for a single use) or semi-disposable (designed to be used for one week). These earplugs have the advantage of being comfortable, adjustable, hygienic and inexpensive.

2. Pre-molded earplugs are made of soft plastic, rubber or silicone. The standard earplugs adapt to most ear canals, but they may be ordered in other formats, if the standard earplugs are unsuitable.

3. Customized molded earplugs are perfectly adjusted to the shape of the wearer's ear and provide increased comfort for people who are unable to adjust to other earplugs. If properly cared for, these earplugs can last from three to five years.

Headband with earplugs

Headband with earplugs are earplugs joined together by a flexible metal or plastic headband. Workers who have difficulty wearing earplugs may opt for these devices. To ensure effective protection, the headband with earplugs must completely block the ear canal. They are useful for workers who frequently move through areas where there is considerable noise, and can be placed around the neck

when not in use. Headbands with earplugs are generally light and can be more comfortable in certain work conditions.

Ear muffs

Ear muffs provide protection against loud or high-frequency noise. They must be properly adjusted. However, they do not provide adequate protection against noise levels above 105 dB. In areas where the noise level exceeds 105 dB, workers must use earplugs in addition to ear muffs.

6.2.1.2.5. Protection for the:

a) Hands

Workers must protect their hands against risk of injury or illness that could be caused by a variety of factors: Welding, cutting or brazing, electricity, corrosive substances, toxic solvents, infectious or contaminated materials, radiation, heat, cold, sharp edges, etc.

There is a whole variety of protective gloves available. Here are several examples of gloves to be worn, depending on the type of work to be done:

Electrical risks:	Insulated protective gloves (with sleeves, as necessary) suitable for voltage
Handling batteries:	Acid-resistant gloves
Open-air tanks:	Waterproof gloves long enough (with sleeves) to protect the clothing and skin
Shotblasting with compressed air:	Leather or heavy canvas gloves

Workers must wear gloves when their hands are likely to be in contact with blood or other potentially infectious materials, or when handling or touching contaminated surfaces or items.

Disposable gloves must be replaced once contaminated, if they are torn or perforated, or when they no longer provide adequate protection. Disposable gloves may not be washed or decontaminated for reuse.

Gloves can be decontaminated for reuse if their ability to provide adequate protection is not compromised. Damaged gloves or gloves providing inadequate protection must be replaced.

b) skin

On a worksite, where there is a hazard of skin injury or disease, the employer must provide every person granted access to the worksite with one of the following items:

A protective shield or screen, skin protection cream or protective clothing.

6.2.1.2.6. Foot protection

Workers who risk an injury from falling or rolling objects, or having their feet punctured must wear safety shoes. They must also wear such shoes if they risk suffering electric shocks or are likely to slip.

Safety shoes with a protective toecap must comply with CSA standard Z195-M1984 with respect to shock and compression resistance. In the standard, safety shoes are grouped into three categories, depending on the scale of shock the shoes must resist.

Workers may only wear class 1 safety shoes (CSA standard), identified by a green triangle (clearly marked on the side of the boot). Workers who operate equipment (those working in storerooms, boiler rooms, power stations, etc.) may wear class 2 shoes, identified by a yellow triangle (clearly marked on the side of the boot).

Here are several examples of worksites, trades or activities for which it is mandatory to wear safety shoes:

- Construction sites
- Renovation sites
- Electricians and worksite foremen
- Work on electrical equipment and circuits
- Excavation, trench digging and shoring up work
- Use of chainsaws
- Use of hazardous liquids or materials
- Work in enclosed spaces or supervising such spaces
- Heating facilities and power stations

6.2.1.2.7. Fall-arresting systems and safety harnesses

Fall–arrest systems

The components of fall-arresting systems must comply with the following standards:

1. CSA Z259.1-1976, Fall-arresting Safety Belts and Lanyards for the Construction and Mining Industries
2. CSA Z259.2-M1979, Fall-arresting Devices, Personal Lowering Devices, and Life Lines
3. CSA Z259.3-1978, Lineman's Body Belt and Lineman's Safety Strap

Fall-arresting systems are necessary when a worker is required to work:

1. On an unguarded structure that is situated more than 2.4 m above the permanent surface;
2. Above a machine in operation (with moving parts) or any other surface or item that could injure the employee if touched;
3. On a scaffolding or structure that is situated more than 6 m above a safe permanent surface;

4. On a scaffolding or structure that is situated more than 3 m from a safe, permanent surface, if the work is done above water;

5. On a ladder at a height of more than 2.4 m above the closest permanent, safe surface if, because of the type of work, the employee is unable to use at least one hand to hold onto the ladder.

The anchoring devices for any fall-arresting system must be capable of withstanding a force of 17.8 kN.

The fall-arresting system must be able to stop:

a. A fall with a force of at least 8 kN;

b. A free fall of more than 1.2 m.

When a worker has to install or remove a fall-arresting system, the contractor must:

a. Give the worker instructions on how to safely install or remove such a system;

b. Keep such instructions updated and ensure they are readily available to the worker.

Safety harnesses

The trims, fasteners and accessories used with a safety harness must comply with CSA standard Z91-M1980, Safety Code for Window Cleaning Operations, or a standard approved by regional safety and health managers or the Manager, Environment, Safety and Health.

Safety harnesses are required when the worker must work:

1. On a structure that is not surrounded by or fitted with a safety harness, and which is situated more than 2.4 m above the closest permanent, safe surface, above a machine in operation, or a device, framework or obstacle that could injure the employee if touched, or above any open tank, ditch or reservoir;

2. On scaffolding or a raised structure of the same type at more than 6 m above a permanent, safe surface;

3. On a ladder at a height of more than 2.4 m directly above the closest permanent, safe surface if, because of the type of work, the employee is unable to use at least one hand to hold onto the ladder.

6.2.1.2.8. Working outside

The circumstances related to the tasks of a worker required to work outside in conditions of extreme cold will determine the type of PPE to be used or worn. For more information on protection against the harmful effects of extreme cold, see the Treasury Board of Canada Secretariat Advisory Notice 6-3 on The Effects of Extreme Cold.

If it is impossible to avoid exposure to the sun, the employees must be provided with the following appropriate protection:

1. Reduce direct exposure to the sun, and especially avoid it in the middle of the day between 10 a.m. and 3 p.m., when the sun's rays are strongest. However, should this be impossible, the contractor must:

   Provide shaded areas in the form of tents or umbrellas;

   or

   Provide clothing that gives good coverage, specifically a wide-brimmed hat, gloves, long-sleeved shirt, long pants or skirt in order to reduce exposure to the harmful effects of the sun. The fabric must be:

   - Sufficiently tightly woven to block the sun's rays;
   - A poor insulator;
   - Light in texture;
   - Permeable to sweating;

2. Provide sun blocks with an SPF (sun protection factor) of 15, and which meet Health Canada requirements;

3. Provide sunglasses in cases where light reflected off sand, water, snow, ice and cement can damage the eyes. Sunglasses must meet ANSI standard Z80.3 to protect

employees' sight against the harmful effects of the sun's ultraviolet rays; and

4. Provide drinking water to prevent dehydration and heat-related problems, as described in the Treasury Board's Sanitation Directive (Chapter 2-18).

6.2.1.3. Fire

The possibility of a fire breaking out is a constant risk in a building such as the Space Centre. When doing construction or repair work, this risk increases, since fires are often caused by the workers' own activities.

The health and safety general action plan developed as part of the construction work gives workers instructions on what to do in case of a fire. It is important that the project manager indicate any additional protective measures included as part of the work.

6.2.1.4. Site maintenance

In addition to lessening the possibility of tripping over objects, construction site maintenance has an impact on the ability of workers and building occupants to quickly leave the building in case of an emergency.

The health and safety general action plan developed as part of the construction work gives the contractor and the workers instructions about bringing materials onto the site and the methods and frequency for removing waste.

6.2.1.5. Access and signage

Access to a construction and repair site is an important factor in the health and safety prevention strategy. The measures taken are designed to enable workers to perform their tasks without compromising the health or safety of Agency employees and visitors.

The health and safety general action plan developed as part of the construction work gives the contractor and the workers instructions on the status and method of access to the worksite. It describes the precautions for disrupting

neighborhood activities as little as possible and for protecting the public.

Signage on the construction and repair site is another important factor in the access strategy. It is used to inform workers and the public of the rules of coexistence and to remind site workers and visitors of the minimum personal protective equipment to be worn.

The health and safety general action plan developed as part of the construction work gives the contractor and the workers information on the signage measures in place or those that must be set up to ensure adequate signage.

6.2.1.6. The worksite and the public

Before starting work, it is important to indicate to the contractor and the workers the rules of coexistence. These rules are even more important when the work is done in an open-access area, or in a closed-access area that is close to the public.

6.2.1.7. Training and information

The method used for providing information on work progress and the health and safety instructions to be respected is crucial to the protection of workers and the public.

The health and safety general action plan developed as part of the construction work stipulates the methods for informing workers and if necessary, the public, of the issues and the preventive measures to be respected.

6.2.1.8. Skills

It is the responsibility of everyone, including the workers, to ensure that the people working on the construction site have the necessary skills for doing the tasks assigned to them. Often, the project manager does not have complete information on the level of skill required to perform tasks, nor sufficient information on the workers to assess whether their skill levels are adequate for the tasks assigned to them.

The general action plan informs the contractor and the workers that they may do only the tasks for which they have the skills, according to recognized procedures, methods and standards.

6.2.2. Specific action plan

A specific action plan is not always necessary. These action plans are designed to cover specific phases or techniques not covered by the general action plan.

Some specific action plans already exist and must be attached to the general action plan (Module 6.1.4), when applicable. Where necessary, the project manager can draft specific action plans for phases for which there are no preset plans.

The currently available action plans concern the following points:

- ❑ Civil Engineering Work (Module 6.1.4.1)
- ❑ Protection against Falls (Module 6.1.4.2)
- ❑ Plumbing Work (Module 6.1.4.3)
- ❑ Hand Tools (Module 6.1.4.4)
- ❑ Electrical Work (Module 6.1.4.5)
- ❑ Building Mechanical Work (to come)
- ❑ Interior Finishing Work (to come)
- ❑ Use of Bucket Trucks and Lifts (to come)

6.3. Reassessing the project risk level after drafting an action plan

On completion of drafting the health and safety action plan, the project manager must reassess the project risks, taking into account the impact of the action plan on the risk level.

6.4. Approvals

The action plan for a project initially assessed “judgmental boundary” and which becomes “acceptable” after the action plan must be approved by the Senior Officer, Facilities Management before work can start. If this project remains “judgmental boundary”, it must be approved by the OHS Officer, and then by the Senior Officer, Facilities Management before work can start.

The action plan for a project initially assessed “unacceptable” and which becomes “acceptable” or “judgmental boundary” after the action plan must be approved by the OHS Officer, and then by the Senior Officer, Facilities Management before work can start.

The action plan for a project initially assessed “unacceptable” and which remains “unacceptable” will not go ahead. The scope of work for this type of project must be changed so as to make it acceptable.

Except for the projects which remain “unacceptable”, all action plans must be sent to the contractor for approval and signature, before being approved by the Senior Officer, Facilities Management. The form “Commitment of the Contractor and/or Subcontractors” attached to the general action plan template (Module 6.1.3) must be used for this purpose.

Communication management process

Risk code	Risk reduced to	Written approval by the OHS Officer	Commitment by the contractor/subcontractor	Signatures required on sheet 7.2
Acceptable	—	—	—	• Project manager • Senior Officer, FM Proceed with the work
Tolerable	**Yes**	—	**Yes**	• Project manager • Contractor • Senior Officer, FM Proceed with the work
	Not reducible	**Yes**	**Yes**	• Project manager • Contractor • **OHS Officer** • Senior Officer, FM Proceed with the work
Unacceptable	**Yes**	**Yes**	**Yes**	• Project manager • Contractor • **OHS Officer** • Senior Officer, FM Proceed with the work
	Not reducible	**Yes**	**Yes**	• Project manager • Contractor • **OHS Officer** • Senior Officer, FM Proceed with the work
	Not reducible	**Do not proceed with the work**		• Project manager • **OHS Officer**

Risk code

It is mandatory that this risk be changed to a lower level

Risk for which the activity requires written approval

Risk for which the activity is permitted

6.5. Implementation

The health and safety action plan must be distributed before the start of work. A copy is sent by the Technical Assistant in the Security section of the SFD before the start of work. The document must tell the security guards which personal protective equipment they must wear and inform them that they must ensure that workers accessing the site wear the personal protective equipment stipulated in the action plan.

The project manager must ensure that the instructions in the health and safety action plan are respected. However, this supervision in no way releases the contractor, its subcontractors and its employees from their responsibility to implement and respect the instructions stipulated in the action plan and approved by all parties.

The Technical Assistant must place a copy of the risk assessment grid and action plan in the project file and in the annual Health and Safety file.

6.6. Ongoing improvement of the process

The health and safety prevention process implemented by the SFD is a dynamic, ongoing process. The action plan must evolve based on changing needs and experience acquired.

When using action plan templates, project managers will encounter situations where they will be required to draft new sections to meet health and safety needs. The project managers must share these new sections with their colleagues, and thereby add to the bank of sections in the action plan templates. This improvement process will be promoted through periodic meetings among project managers.

The project manager can ask his colleagues to study projects deemed unacceptable even after drafting an action plan, or projects including specific challenges. This study can be done during the periodic meetings or at a special meeting called by the project manager.