FRASER SURREY DOCKS

Pacific Rim Stevedoring

# Coal Transfer Facility

## Fire Safety Plan

## September 2012 Version


Created by

RKMS GROUP

7234 Ladner Trunk Road, Delta BC. V4K 3N3

robert@rkmsenterprises.ca

www.rkmsgroup.ca

Office: 604 940 4155 Mobile: 604 908 1812

Gerardo Noriega, CRSP – Robert Sands, Principal – Jason Kirby, Senior Project Manager

# Statement of Principles and Practices

FRASER SURREY DOCKS

OH&S

September 2012

*The fundamental objective of FRASER SURREY DOCKS Safety Program is to eliminate or minimize accidents and injuries which result in suffering and hardship to employees.*

*In order to achieve optimal safety performance, all employees must fulfill their individual responsibility to work safely for their families, their fellow workers and themselves.*

*Management of FRASER SURREY DOCKS is committed to providing a safe, productive work environment for all employees. Management is also dedicated to promoting Off-the-Job safety to assist in a safe work environment.*

*It is the responsibility of Superintendents and Foremen to ensure that their employees are trained in and follow proper work procedures, in order to obtain optimal output without accidents or industrial disease. Superintendents are also accountable for ensuring that employees are aware of and follow policies and regulations.*

*It is the responsibility of every employee to follow safe work procedures and to become familiar with and observe safety regulations in order to prevent accidents to themselves and their fellow employees and loss of equipment and property.*

***Jurgen Franke***

***Director, Engineering and Maintenance***

***Jeff Scott***

***President and CEO***

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Health and Safety Policy

- **All employees are entitled to a safe and healthy workplace.**
- **Workplace injuries, incidents and occupational disease are unacceptable and preventable.**
- **It's everyone's responsibility to come to work fit for duty and to work safely.**

## Our Responsibilities

Health and Safety is paramount at Fraser Surrey Docks. Everyone, regardless of position or seniority, has a role in creating and maintaining an injury free workplace. Our decisions and actions can affect our own personal safety and the safety of others regardless of where we work in the company.

Management has prime responsibility for managing and providing resources for health and safety. Supervisors are responsible for ensuring a healthy and safe work environment for employees under their direction. Employees are responsible for working safely and in compliance with applicable regulations and all Fraser Surrey Docks policies and procedures. Everyone has the right to refuse unsafe work.

## Our Commitment

- We will be in compliance with all applicable Health and Safety legislation and regulations including: Canada Labour Code, Canadian Occupational Health and Safety Regulations, Maritime Occupational Health and Safety Regulations, Canada Shipping Act & the Canadian Tackle and Fumigation Regulations

- We will identify, assess and control foreseeable hazards to protect employees, contractors, visitors and physical assets from harm.

- We will report health and safety incidents, including near misses, and initiate preventive and corrective actions to avoid future incidents.

- We will establish and uphold proper safety standards for the maintenance of our facility and equipment to keep employees safe while on the job.

- We will implement work practices, procedures and training that will prevent injuries, occupational disease and reduce risk.

- We will work with and support our Health & Safety Committee to create a culture of awareness and understanding while obtaining input on issues impacting the health and safety of employees.

- We will strive for continual improvement of our health and safety management system and performance by setting goals and targets, monitoring performance and celebrating our success.

November 22, 2011
Date

Jeff Scott
President and CEO

FRASER SURREY DOCKS LP 11060 ELEVATOR ROAD, SURREY, BC, V3V 2R7
Phone: 604-581-2233 Fax: 604-588-4811 E-mail: interact@fsd.bc.ca Website: www.fsd.bc.ca

## INTRODUCTION

This Fire Prevention Plan was written as an addition to Fraser Surrey Dock's Health, Safety and Environment program for the Temporary Coal Barge Loading Facility. Therefore, as a fundamental requirement, all employees, contractors, and visitors to FSD's Facilities must know and abide by them. This plan is not an operating or a maintenance manual; however, it should form the underlying foundation for all procedures.

The objective of this plan is:

A. Ensure employee safety
B. Comply with existing laws, regulations and codes
C. Protect FSD's property

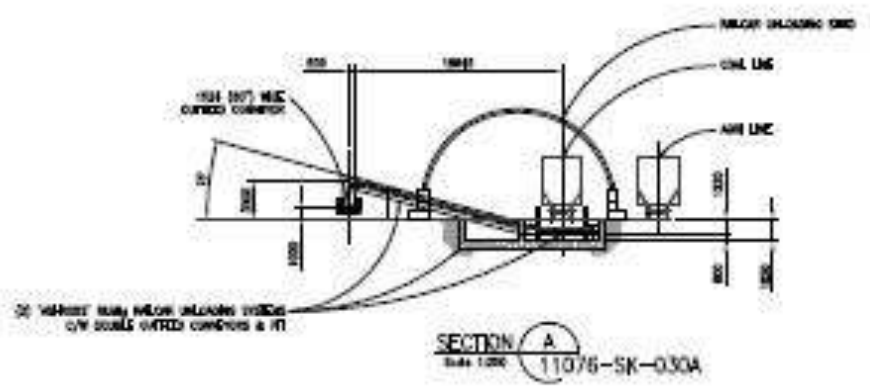
In order to achieve the latter, participation and collective efforts of all parties is required and expected.

## TEMPORARY COAL BARGE LOADING FACILITY

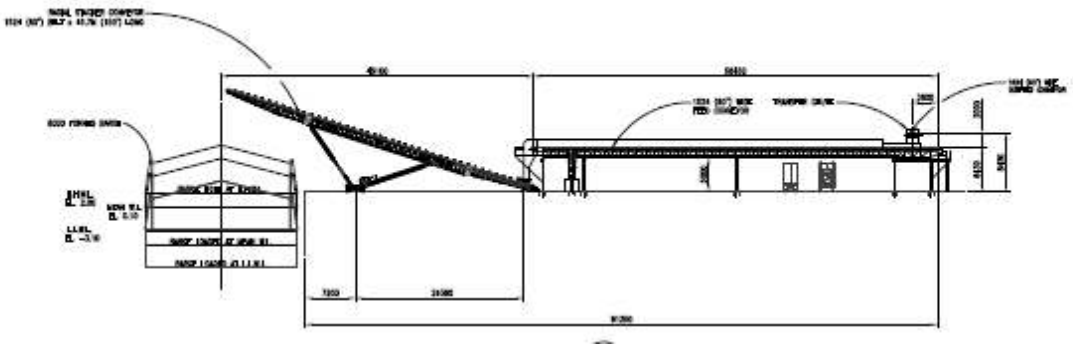
This coal handling facility occupies five acres within the existing FSD's property and it is located along berths 2 and 3. This facility has been designed to make the process of loading barges with coal more cost effective, fast and efficient.

Coal will arrive by train and it will be taken to the coal line's railcar unloading shed where it will be unloaded by means of a double out feed conveyor. Coal will then be fed to a main 60" wide conveyor system to be finally fed into a radial stacker conveyor which will be putting the coal onto 8000 tonne barges stationed at the dock.

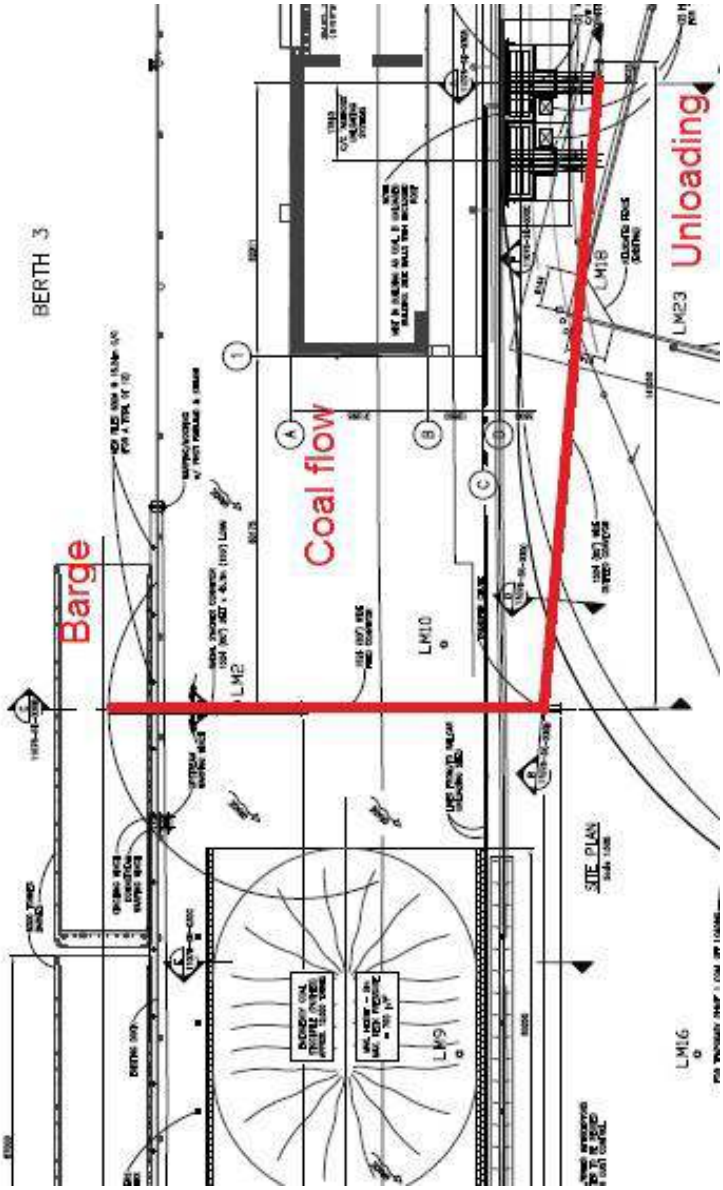
This radial conveyor will also pivot to dump coal onto an emergency coal yard where coal will be re-directed to, by means of the radial stacker conveyor, in case of emergency.




**Unloading Shack (side view)**



**Last section of conveyor and barge 1**




**Coal path from unloading area to barge**

**GENERAL DUTIES**

In compliance with Federal and Provincial Regulations, as well as FRASER SURREY DOCKS' OH&S Program, and the Workers Compensation Act.

**FRASER SURREY DOCKS WILL:**

- Adhere to Work Safe BC's O.H. & S. Regulation as well as any local Government health and safety regulations.

- Provide the safest possible conditions for employees, sub-contractors and visitors.

- Ensure that workers, sub-contractors and visitors, are made aware of all known or reasonably foreseeable health or safety hazards to which they are likely to be exposed by their work before they engage in any task

- Ensure all employees are properly trained in regards to this Temporary Coal Barge Loading Facility's Fire Safety Plan requirements and related equipment and procedures.

- Ensure all employees abide by this Temporary Coal Barge Loading Facility's Fire Safety Plan and related equipment and procedures.

- Monitor the effectiveness of this Temporary Coal Barge Loading Facility's Fire Safety Plan and related equipment and procedures.

- Update and revise this Temporary Coal Barge Loading Facility's Fire Safety Plan and related equipment and procedures once a year (quarterly recommended) or as deficiencies become apparent.

- Understand that safety is everyone's responsibility, and a team effort must be made to keep safe work site conditions.

- Perform a fire and evacuation drill at least once a year.

- Provide specialized personal protective equipment to personnel.

**FSD's SUPERVISORS WILL**

- Ensure the health and safety of all workers under their direct supervision.

- Ensure that workers, sub-contractors and visitors, are made aware of all known or reasonably foreseeable health or safety hazards to which they are likely to be exposed by their work before they engage in any task

- Ensure all employees are properly trained in regards to this Temporary Coal Barge Loading Facility's Fire Safety Plan requirements and related equipment and procedures.

- Ensure all employees abide by this Temporary Coal Barge Loading Facility's Fire Safety Plan and related equipment and procedures.

- Monitor the effectiveness of this Temporary Coal Barge Loading Facility's Fire Safety Plan and related equipment and procedures.

**FSD's WORKERS WILL**

- Take reasonable care to protect their health and safety as well as the health and safety of other co-workers who may be affected by the worker's acts or omissions at work.

- Abide by this Temporary Coal Barge Loading Facility's Fire Safety Plan and related equipment and procedures.

- Ensure they are properly trained in regards to this Temporary Coal Barge Loading Facility's Fire Safety Plan requirements and related equipment and procedures.

- Use or wear protective equipment, devices and clothing as required by the regulations, and FRASER SURREY DOCKS' OH&S

- Report the absence of or defect in any protective equipment, device or clothing, or the existence of any other hazard, that the worker considers is likely to endanger the worker or any other person.

## HAZARD IDENTIFICATION

## COAL PROPERTIES AND HAZARDS

Coal is a brown to black combustible material made from decayed plant matter that has been compressed by rock formations over a long period of time. It is found throughout the world and is the most abundant of the fossil fuels. Coal is classified by its type, grade and rank. The type of coal depends on the plant materials the coal is made from, grade is the purity of the coal and rank relates to the geological age of the coal. The major types of coals, in order of lowest to highest rank, are:

***Lignite*** This coal is brown to black in colour and contains the most moisture. While it has low heat value, there are vast deposits of it throughout the world.

***Sub-Bituminous*** This coal is black and contains about 15 to 30% moisture. It ignites less easily than lignite coal, but burns cleaner. It is used extensively for heating and electricity generation.

***Bituminous coal*****, black coal or western coal,** is a relatively soft coal containing a tarlike substance called bitumen. It is of higher quality than lignite coal but of poorer quality than anthracite. It was usually formed as a result of high pressure on lignite. This kind of coal is usually black, sometimes dark brown, often with well-defined bands of bright and dull material. This is also the type of coal that will be handled at the Fraser Surrey Docks' Temporary Coal Loading Facility.

***Anthracite****.* This type of black coal is usually found deeper than bituminous coal. Only a small amount of the world supply of coal is anthracite. It has a very high carbon concentration and a high heat value. It is hard to ignite. But once burning, it does so with little smoke. It is used mainly as a domestic fuel.

## EXPOSURE TO COAL DUST

Dust generated by coal will pose a hazard to the health and safety of workers exposed to it.
WORKSAFE BC has assigned the respirable fraction of coal dust containing less than 5 percent crystalline silica a threshold limit value (TLV) of 0.9 mg/m$^3$ as a TWA for a normal 8-hour workday and a 40-hour workweek.
This limit is based on the risk of pneumoconiosis.

### Routes of Exposure

Exposure to coal dust can occur through inhalation, ingestion, and eye contact.

### Toxicology

Coal dust causes pneumoconiosis, bronchitis and emphysema in exposed workers. Coal dust causes coal workers' pneumoconiosis (CWP or black lung decease) , which is characterized by lesions consisting of a mass of rubbery well defined black tissue that is often adherent to the chest wall. This is associated with decrements in ventilatory capacity, low diffusing capacity, abnormalities of gas exchange, low arterial oxygen tension, pulmonary hypertension, and premature death. The disease may progress after the cessation of exposure.

Coal dust is also recognized as a cause of chronic bronchitis. Exposure to coal dust is associated with an increased risk of focal emphysema, which is usually associated with the presence of pneumoconiosis and centrilobular emphysema, which can occur in the absence of pneumoconiosis. Workers with rheumatoid arthritis and the simple coal workers' pneumoconiosis may also have Caplan's Syndrome which

involves rapidly developing lung damage. ACGIH considers the toxicity of coal dust with greater than 5 percent silica to be similar to quartz.

**Signs And Symptoms Of Exposure**

- Acute exposure: Symptoms of inhalation of excessive amounts of coal dust include coughing, wheezing, and shortness of breath.

- Chronic exposure: Chronic exposure to coal dust may result in symptoms of bronchitis and emphysema.

**Exposure Control**

Methods that are effective in controlling worker exposures to coal dust, depending on the feasibility of implementation, and area of the facilities are as follows:

- Process enclosure

- Local exhaust ventilation

- General dilution ventilation

- Personal protective equipment

**Workplace monitoring**

Where a worker is or may be exposed to a hazardous substance, an assessment of the potential for harmful exposure and monitoring, or sampling, of exposure levels to airborne contaminants. The program required has 3 major elements:

- A walk-through survey

- Air sampling to assess the potential for overexposure, and
- Workplace monitoring to reliably characterize worker exposure, where workers may be exposed to an air contaminant at levels greater than 50% of the exposure limit. Exposure monitoring and assessment must be conducted using occupational hygiene methods acceptable to the board.

The joint committee should be involved in workplace monitoring, where feasible.

**Monitoring worker exposure**

FRASER SURREY DOCKS will conduct air sampling when the walk-through survey reveals that workers may be at risk of overexposure. Normally, FRASER SURREY DOCKS would select one or more workers for sampling, which should be those workers who are likely to be the most heavily exposed on a given day (worst case conditions). Sampling results are then compared with exposure limits in Table of Exposure Limits for Chemical and Biological Substances

If the assessment conducted reveals that a worker may be exposed to an air contaminant in excess of 50% of its exposure limit, -or measurement is not possible at 50% of the applicable exposure limit, additional workplace monitoring to reliably determine worker exposure is required

**Acceptable occupational hygiene methods**

All elements of an assessment or monitoring program (e.g. hazardous materials survey, air sampling and bulk sampling) will be conducted using occupational hygiene methods acceptable to WorkSafeBC.

**Exposure Control Plan**

According to Worksafe BC, an exposure control plan must be implemented when

- exposure monitoring indicates that a worker is or may be exposed to an air contaminant in excess of 50% of its exposure limit

- measurement is not possible at 50% of the applicable exposure limit, or

- otherwise required by Worksafe BC's Regulation.

An exposure control plan is required when any of the following conditions are present:

- The results of exposure monitoring indicate that a worker is or may be exposed to an air contaminant at levels greater than 50% of its exposure limit.
- Measurement is not possible at 50% of the applicable exposure limit.

The levels of most common substances can be measured at the exposure limit. Even though exposure cannot be precisely measured or determined at 50% of the exposure limit, there may still be sufficient evidence for a knowledgeable person to reasonably conclude that there is no probability of exposure to levels greater than 50% of the exposure limit. In such cases no exposure control plan is required.

| | | |
|---|---|---|
| **5.57** | Controlling Exposure | Where it is not practicable to replace a material referred to in section 5.57(1) (designated substances) with a material that reduces the risk |

**Risk identification, assessment and control**

The exposure control plan must incorporate risk identification, assessment and control. When identifying and assessing risk, the requirements for a walk-through survey and exposure monitoring apply. Continuous monitoring of the work area may also be required, when necessary, to ensure the continuing safety of workers.

To evaluate compliance with risk identification, assessment and control:

- determine whether the hazards have been correctly identified
- establish whether the risk assessment is acceptable
- assess the practicability of any proposed control measures, and
- evaluate whether those measures provide an acceptable level of protection to workers.

The degree of risk will depend on the probability, the extent, and the possible consequences of exposure (an injury or disease). Some of the factors that FRASER SURREY DOCKS should consider when performing a risk assessment are outlined in the table below.

**Factors to be considered when performing a risk assessment**

| General | Specific |
|---|---|
| What is the nature of the hazard? | • what are the body systems involved ?<br>A. Lungs<br>• what are the possible effects of exposure ?<br>A. pneumoconiosis (long term effects) and when combusting, poisonous effects from gases |
| What is the nature of the exposure? | • what are the specific substances to which workers may be exposed?<br>A. Bituminous Coal / Burning coal<br>• what are the way(s) in which workers may be exposed (e.g. spills, during routine tasks or preventative maintenance)? |

| | |
|---|---|
| | A. Doing regular work around coal, inspections, maintenance, operating machinery, etc / evacuation |
| **General** | **Specific** |
| What is the nature of the exposure? (Continued) | • what are the specific work methods or procedures which may result in exposure?<br>A. Doing regular work around coal, inspections, maintenance, operating machinery, etc<br>• who are the workers at risk for exposure ?<br>process workers, maintenance workers |
| Are there control measures in place to reduce the risk of exposure? | • are there any engineering controls? (e.g. is the process enclosed or isolated?)<br>A. Constant dowsing the coal with sprinklers<br>• are there administrative controls (e.g. is work scheduled to minimize time spent in the hazardous area)?<br>A. Only authorized trained personnel allowed. Any device that can produce a flame is forbidden in the facilities<br>• is personal protective equipment available? (i.e. what type is available and how is it used?)<br>A. Yes, half face piece respirators, and escape scbas |

**Health Monitoring**

The exposure control plan will incorporate "health monitoring, when required." Health monitoring may be required explicitly, or as an element of an exposure control plan.

The purpose of health monitoring is to protect workers from developing occupational disease by detecting biological indicators or adverse health effects at an early stage. Action can then be taken to prevent, reverse, reduce the severity, or arrest the progression of the adverse health effect or disease.

Health monitoring should be considered when

- there is reasonable likelihood of a workplace exposure,
- the exposure can potentially cause an occupational disease or adverse health effect, or
- there is a means of detecting or measuring the disease, adverse health effect or its precursor or biological indicator.

The results of health monitoring are also useful in evaluating the effectiveness of the exposure control plan, particularly when it cannot be evaluated by exposure monitoring alone. This occurs when

- the skin or the gut are significant routes of absorption,
- the skin itself may be affected by contact exposure, or
- exposure control is dependent on the use of personal protective equipment.

The skin and gut could be significant routes of exposure if the skin is in direct contact with a contaminant or if the contaminant is ingested and absorbed into the gut.

Records concerning health, biological and biological effect monitoring should be kept and maintained in a form, which is easily linked to job and exposure records, while still observing the rules of confidentiality.

Health monitoring programs will be reviewed and re-evaluated on a regular basis, and when

- there is a change in work processes or substance usage,
- there is a significant change in the results of air monitoring, where a significant change may indicate either that the exposure limit is being exceeded or that control measures are keeping exposure levels below 50% of the exposure limit,
- signs or symptoms of occupational ill health are reported and investigated, or
- results of biological or biological effect monitoring exceed recommended limits.

**Annual Review**

FRASER SURREY DOCKS will undertake, on an annual basis, the following:

- Evaluation of the control options and work procedures used
- Evaluation of any new technologies and methods that have come onto the market
- Review of first aid reports and any reported health-related symptoms
- Review of documentation for training and education
- Review of the respirator program

The annual review will be done in consultation with the joint health and safety committee, and/or worker health and safety representative, if applicable.

**Type Of Controls**

If there is a risk to a worker from exposure to a hazardous substance by any route of exposure, FRASER SURREY DOCKS will eliminate the exposure, or otherwise control

it below harmful levels and below the applicable exposure limit established under section 5.48 by

- Substitution
- engineering control
- administrative control
- personal protective equipment

When selecting a suitable substitute, FRASER SURREY DOCKS will ensure that the hazards of the substitute are known, and that the risk to workers is reduced by its use. The use of personal protective equipment as the primary means to control exposure is permitted only when

- substitution, or engineering or administrative controls are not practicable
- additional protection is required because engineering or administrative controls are insufficient to reduce exposure below the applicable exposure limits
- the exposure results from temporary or emergency conditions only

It is required that, when selecting a substitute, FRASER SURREY DOCKS will ensure that the hazards of a substitute are known and that the risk to workers is reduced by its use. Factors that should be considered in selecting a suitable substitute include:

- The exposure limit
- Route(s) of exposure
- Acute and chronic effects
- Warning properties
- Flammability or other hazards
- Work procedures
- Training and supervision required

**Personal Hygiene Procedures**

If coal dust contacts the skin, workers should wash the affected areas with soap and water.

Clothing contaminated with coal dust should be removed immediately, and provisions should be made for the safe removal of the chemical from the clothing. Persons laundering the clothes should be informed of the hazardous properties of coal dust.

A worker who handles coal dust should thoroughly wash hands, forearms, and face with soap and water before eating, using tobacco products, using toilet facilities, applying cosmetics, or taking medication.

Workers should not eat, drink, use tobacco products, apply cosmetics, or take medication in areas where coal dust handled, processed, or stored.

***Personal Protective Equipment***

All personnel in the facility must wear the following Personal Protective Equipment during regular operations.

- CSA Approved Hardhat
- CSA Approved Glasses with side shields
- CSA Approved steel toed boots
- Work gloves
- Hi Visibility Flame Resistant (FR) level 3 clothing as a minimum.
- Air purifying particle filtering respirator (p100 filters) (According to 8.32 from WorksafeBC's OH&S Regulation)

***Emergency Escape Respirator***

In the unlikely event of a fire, SCBAs or escape SCBA will be worn by personnel during evacuation (WorksafeBC's 8.36). It is recommended to have sufficient SCBA's located throughout the facility to be available for all workers in the unlikely event of a fire.

**Workers wearing escape SCBA**

Note: It is recommended that compressed air that is used to supply supplied air respirators meet the breathing air purity requirements of CSA Standard Z180. 1-00. When an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor/alarm should be provided

***Fit Tests***

WorkSafeBC's OH&S Regulation 8.40 specifies that a respirator which requires an effective seal with the face for proper functioning must not be issued to a worker unless a fit test demonstrates that the face piece forms an effective seal with the wearer's face. Fit tests must be performed in accordance with procedures in *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

Fit tests must be done

- before initial use of a respirator,
- at least once a year,
- whenever there is a change in respirator facepiece, including the brand, model, and size, and
- whenever changes to the user's physical condition could affect the respirator fit.
- Other personal protective equipment that is to be worn at the same time as a respirator and which could interfere with the respirator fit must be worn during a fit test.

Refer to FRASER SURREY DOCK'S OH&S Respiratory Program for more information.

## EDUCATION AND TRAINING

In compliance with the provide to the employer's workers the information, instruction, training and supervision necessary to ensure the health and safety of those workers in carrying out their work and to ensure the health and safety of other workers at the workplace

Workers and supervisors involved in the facility's operations will be educated and instructed in the health hazards associated with coal and coal dust, and will be trained in the control measures, including the safe use, limitations and maintenance of the respiratory protection used.

## COAL DUST AT THE FACILITIES

Coal will generally be transported in loose lumps of varying sizes. Sometimes, this will include dust but at other times, the coal is pre-screened to a certain size. The volumes of material being handled when offloading will range between hundreds and thousands of tonnes per hour. Every time a transfer occurs, there will be a potential to break the lumps and dust may be produced at this point if not properly mitigated.

Once the coal is stockpiled at the barge or emergency stockpile, it may still be a problem. Even if it arrives wet, movement of wind across the stockpile can evaporate the moisture and dust may be lifted. Any vehicles or heavy machinery driving over crushed coal will also raise dust. All of these sources of dust require special consideration and different solutions are required.

## Dust Sources

When handling coal, there are a number of sources of dust, and all need to be addressed to arrive at an environmentally sensitive and professional operation. For an unloading operation these sources are:

1. Transfer from train to onward transport (conveyor)
2. Conveying transfer points
3. Open belt conveying at height
4. Drop from conveyor to stockpile (on barge or emergency)
5. Time spent as a stockpile
6. Vehicle / heavy machinery movements around stockpile

## Methods Of Dust Control

Clearly, there is not going to be one 'silver bullet' that is going to solve all of these problems. There are, however, different techniques available that, when combined, form a powerful armoury for eliminating the problems.

### *Fogging*

Use: reception hoppers; conveyor transfer points, stockpile building (emergency and barge), wagon unloading.

An effective technique to control dust is to use a fogging system to remove dust from the air.
Fogging works by releasing very small droplets of water into the air. Airborne dust particles adhere to the water droplet and agglomerate. Once several have agglomerated together they become heavy enough to fall out of the air.

The water droplet size is very important. If the droplet is too large, about 50 microns plus, the dust particle will bounce off the water droplet surface tension and remain airborne. To achieve a useful dust suppression effect, the droplets need to have a mean diameter in the region of **10 to 15 microns**, which is a similar size and mass to the respirable dust particles.

If the fog is generated in the right way, by using pressurised water, the energy required can be very low – between 2 to 3kW for a system requiring hundreds of nozzles, e.g. a large stockpile radial conveyor – giving considerable operating cost savings when compared to other techniques.

Typical Fogging Nozzle

Catch Basins will be attached to the conveyor and areas near the stockpile to receive residual liquids that drip from the coal after being doused.
Refer to the Fraser Surrey Docks Environmental Policy to learn how these fluids will be treated before they are released to the drainage system.

***Stockpile design***

If a stockpile is to remain in position for some time, it is important to pay attention to the shape of the pile. Some shapes, whilst being easier to build, leave an edge that can be dried quickly by the wind. This edge then allows the wind to lift dust and all of the benefits arising from the other techniques used are instantly lost.

***Conveyor covers***

Use: transfer conveyors

When material is being conveyed from one point to another, cross-winds over the conveyor can cause dust to be lifted. This is especially dangerous for vehicles passing underneath the conveyors. It is therefore essential to ensure that most part of the conveyors are covered or guarded. This can be done simply with covers fitted over the conveyor belt.

For the radial conveyor, as the belt is lifted at the moving discharge point, the top of the conveyor cannot be covered as easily, so wind boards/fencing should be fitted to keep wind off the belt, or maintain the coal dust inside.

***Telescopic chute***

Use: Dumping end of radial conveyor

Ensures that material particles are kept in mass flow form and at low velocity throughout the extended length of the chute. This minimizes the liberation of dust particles and greatly reduces the generation of fugitive dust.


Telescopic chute being used on a barge

***Sprinklers***

Use: emergency stockpile

Once stockpiled, water can be sprayed on the stockpiles to keep them damped down. Sprinklers should be used with caution, however, as the volume of water required can be significant, causing drainage and run-off treatment problems. Irrigation systems can be used to control dust on outdoor stockpiles, but when the stockpiles are excavated, dust will arise as the drier material in the pile is exposed and moved around. The sprinkler droplet sizes are often in excess of 100 microns, which is too large to suppress

airborne dust, and it is quite common to observe dust rising from the ground where the sprinkler water lands, thus exacerbating the problem. An irrigation system uses a lot more water than a fogging system – typically 10 times the amount – and is much less effective when materials are being moved around. Sprinklers should be used as a last line of defence and with considerable planning and forethought.

***Portable Self Contained Dust Suppression System***

Use: Coal Barges

Can be positioned in proximity to a coal barge to dowse the stockpiles as coal is being dumped. Will provide enough coverage to control the dust on all of the barge's surface (approx. 27,000 sq ft). A more practical approach to having to custom build a custom sprinkler system that can be deployed every time a barge is loaded, and retrieved, once the operation is completed and the barge is ready to leave the dock.

***Environmentally Safe Surfactant Agents***

Use: stockpiles
To reduce the amount of water used with sprinklers, it is possible to add chemicals that improve the penetration and wetting effect of the water.
The proper use and application of surfactants can halve the number of times that a surface has to be treated. There are a number of ways they can be applied:

1. As an additive to a sprinkler system

2. Application from a pumped hose and mobile bowser

3. Sprinkling as dry granules.

The third option uses granules that are hygroscopic. These draw in moisture from the air to create the damping effect and can eliminate the need for a network of sprinklers. The agents used in the facility must be bio-degradable and do not contaminate soils, streams, vegetation etc.

**Wind Fencing**

Use of wind fencing to protect adjoining properties. A **windbreak** slows the wind in one place by deflecting it to another. The best windbreaks produce a zone behind the windbreak which will have wind of about a quarter of the speed.
Well-designed windbreaks typically reduce fugitive dust to less than one eighth of the unprotected situation.

Wind fencing will be used where there is a potential for fugitive coal dust to be blown over to adjoining properties.

***Personnel and Vehicle Protection From Falling Debris***

Guards / Mesh will be installed in the higher areas of the conveyor belt where there is a potential for coal dust and fragments to fall onto personnel, vehicles or machinery.

Use of Wind Fence

## COAL FIRE HAZARD

The risk from fire exists anywhere significant amounts of coal are in transportation or storage. Coal in any form, is a combustible material, making it susceptible to a variety of ignition scenarios, and it should be treated with care. Bituminous Coal ignition temperature is 454 degrees Celsius.

Coal handling facilities typically suffer from fire risks due to two sources of ignition that need to be considered. The first is coal itself (self-ignition); the second is the conveyor belt used in the transport of coal (hot burning coal, over-heating due to damaged bearings, roller, belt slip etc.).

### Environmental Impact Of Coal

There are environmental issues caused by both, coal falling into natural water streams and burning coal. The trace elements contained in coal (and others formed during combustion) are a large group of diverse pollutants and can potentially cause a number of health and environmental effects.
Refer to the Environmental Plan to learn more about these issues and how to control them.

### General Fire Prevention Policy

#### *Open Flame Policy*

Personnel in the facility will not:

- Light or build a fire in the facilities, or

- Weld, cut by the use of heat or flame, or use a blowtorch in the facilities without the written permission of the facilities Superintendent.

- Permission will be given in the form of a hot work permit, provided that a safe work procedure has been submitted, and all fire hazards have been controlled.

***Prohibited Articles***

When in the facilities, all personnel are forbidden to have in their possession:

- A match or any other apparatus of any kind for creating an open flame or spark except as it exists in a flame safety lamp, or

- Cigarettes, cigars, or smoking materials in any form.

***Fire Hazard Areas Identification***

All Fire hazard areas will be identified by warning signs, and personnel will not smoke, use open flame lamps, matches, or other means of producing heat or fire in designated fire hazard areas.

As soon as a fire is detected, the situation will be immediately addressed as per FSD's Emergency Response Plan.

**Self Ignition**

One of the most frequent and serious causes of coal fires is spontaneous combustion, which has been responsible for a number of incidents in the past. Spontaneous combustion fires usually begin as "hot spots" deep within the reserve of coal. The hot

spots appear when coal absorbs oxygen from the air. Heat generated by the oxidation then initiated the fire.

Such fires can be very stubborn to extinguish because of the amount of coal involved (often hundreds of tons) and the difficulty of getting to the seat of the problem. Moreover, coal in either the smoldering of
flaming stage may produce copious amounts of methane and carbon monoxide gases. In addition to their toxicity, these gases are highly explosive in certain concentrations, and can further complicate efforts to fight this type of coal fire.

Areas in which a self ignited fire could start are the train coal wagons, unloading shed, emergency pile stock yard and the receiving barge.

**Spontaneous Combustion Prevention**

Housekeeping and dust control is also essential to prevent coal fires. Floating dust either in the air or settled on beams, pipes, etc , provides fuel for ignition.
A wet dust suppression will be dozing the coal by means of sprinklers at the coal unloading shed, along the conveyor system, at the emergency coal stockpile, and the barge. Sprinklers location, distribution and height, will be such that it will allow for 100% coverage.

**Spontaneous Combustion Detection**

***Carbon Monoxide Detection***

A proactive approach to fire prevention focuses not so much on detecting smoke, which indicates fire, but rather on monitoring CO and upward trends, which indicates the *potential* for fire. Thus, an integrated CO monitoring system can warn of a potential fire

up to two days before a flame is present. The Industry has deemed the most efficient way to find out whether there is a fire in the making.

CO detectors may as required be installed in the cart unloading shed, conveyor system and stockpile yard, and the location and distribution will be such that will allow for 100% coverage.

***Infrared (IR) scanning***

This can be effective in detecting hot spots. Periodic monitoring of a pile using an IR thermographic camera to scan the inside or outside such enclosures is a common practice. Such a scan can pinpoint hot spots precisely. This can be helpful, but should not preclude CO monitoring.

***Manual Scanning***

A competent worker may as required be designated to inspect for hot spots idling railcars with an IR sensor as they wait to be unloaded

**<u>Conveyor Fires</u>**

Coal handling facilities, regularly report fires on their conveyor systems. Investigations have proven that in the majority of events, the cause of the fire was NOT from already ignited material being loaded onto and transported by the conveyor (as many may have originally believed) but due to friction between belt support roller bearings and material

that had spilled from the conveyor belt , like an undetected overheat condition which was allowed to progress to a combustion stage.

Fire represents one of the most severe hazards in coal handling facilities. The heat and combustion products liberated are away from the fire, eventually contaminating areas of a facility far removed from the fire. The ventilation airflow produced as coal is transported by the conveyor, serves to dilute the combustion products, thus lowering their concentration. The higher the airflow, the greater the dilution. Combustion products also spread more rapidly at higher air velocities than at lower air velocities. These effects are somewhat obvious. The effects that the airflow has on the growth and burning characteristics of the fire are not so obvious. For many fires that develop within conveyor belt entries, it is found that coal heats to the point of flaming because of frictional overheating in the belt drive area or near idlers along the belt structure. When the conveyor belt is stopped, the coal fire then spreads to the conveyor belting, and if the conveyor belt has poor flame-resistant properties, the flame will begin to propagate along the exposed surfaces of the conveyor belt. As the surface area of the burning conveyor belt increases, so does the total fire intensity, along with increases in the levels of smoke and CO that are produced. Typical fires in belt entries develop in three distinct stages:

1. Early smoldering stages of coal heated, due to overheated equipment or friction, to the point of flaming;

2. Early flaming stages of a small coal fire, which ignites a stationary conveyor belt;

3. Combined coal and conveyor belt fire, which increases in intensity to the point of sustained belt flame spread.

The time it takes for the fire to develop through these various stages depends upon many factors.
The duration of the smoldering stage depends upon the temperatures of the overheated equipment, the quantity of coal involved, and the proximity of the source of heating to the exposed surfaces of the coal pile.
The size of the coal (dust or lumps, or a mixture of the two) also has an effect. This stage of development may take minutes or hours before the coal begins to flame.
During this stage, CO and smoke are produced, with the quantities produced depending upon the size of the coal, the mass of the coal, the temperature of the coal mass involved, and other factors.
Once ignited, the coal fire intensity begins to increase. The rate of increase depends upon the air velocity and the surface area of coal available for burning.
Subsequent ignition of the conveyor belt depends upon the proximity of the belt to the coal fire, the thermal characteristics of the belt material, and the air velocity.
Once the belt ignites, usually near the lateral edges of the belt, the flame will begin to spread over the surface of the belt in the vicinity of the source coal fire. The rate of spread, locally, depends upon the air velocity and the flame-spread characteristics of the belt material.

If the belt material has poor flame-resistant properties (it propagates flame easily), the combined local coal and belt fire will attain sufficient intensity so that the flame begins to spread away from the original ignition area along the exposed surfaces of the belt and in the direction of the airflow. If the belt has good flame-resistant properties (it is difficult to propagate flame), local burning will occur only in the vicinity of the coal fire, with no propagation of the flame along the belt surfaces.

For a conveyor belt with poor flame-resistant properties, the time it takes for the fire to begin to propagate downstream, away from the ignition area, depends upon the air velocity and the flame-spread characteristics of the belt material. In general, if the fire

reaches a size sufficient to begin flame spread down the belt, the effectiveness of control and extinguishment procedures diminishes rapidly. In addition, the levels of smoke and CO produced begin to approach dangerous levels, and lethal levels may subsequently result during the propagation stage.

***Conveyor Belt Safety***

The conveyor used at the facilities will be in compliance with WorksafeBC's OH&S Regulation, Parts 12.22, 12.23 and 12.25. It will also the requirements of *ANSI Standard ANSI/ASME B20.1-1993, Safety Standards for Conveyors and Related Equipment*.
Also, according to BC's Mines Act Section 4.4.16 Personnel shall not ride on a conveyor belt or cross a conveyor belt except at an established foot bridge not less than 500 mm in width equipped with guardrails.
And every conveyor way will be provided with a walkway or other acceptable access for maintenance and inspection purposes.

***Notification System***

A notification system based on strobe lights, alarms and radio communication will be established in the facility.
Strobe lights and alarms will be located at strategic areas of the facility will let personnel know a fire emergency is taking place.
Also refer to FSD's Emergency Response Program


**Prevention of Conveyor Fires**

For fires in belt entries, all evacuation and control procedures must be carried out prior to the onset of belt flame spread. Also, measures will be taken to reduce or eliminate the possibility of the occurrence of belt fires.

1. Diligent housekeeping procedures to eliminate coal spillage in a belt drive-belt take-up area will reduce the potential for the source coal fire to develop. This will involve the installation of mist nozzles along the conveyor and hoppers. Also, Routine clean-up activity will form part of the facilities operating procedures, in addition to the maintenance program.

   Dust and spillage built up around rollers and bearings will be removed to prevent ignition from stalled hot rollers (see next point).

2. Maintaining slippage switches to reduce the occurrence of frictional heating also reduces the potential for development of the fire. Several conveyor belt fires have been caused by belt slippage. To prevent conveyor belt fires, a belt slippage detection system should be provided to stop the conveyor drive automatically

when belt slippage occurs.

Most conveyor slip switches are designed to operate on one of three principles; magnetism, centrifugal force, or photo-electricity. Today, a common choice for underground use is a system utilizing a slip switch proximity sensor. These units work by detecting interruptions of a magnetic field by targets installed on a rotating shaft or roller. Slippage is detected by a change in the speed of rotation of the shaft or roller. In addition, a new technology that uses a computer generated signal to monitor motor current and voltage to detect a slow down in the belt is available.

Regardless of the type of detection system used, the systems will be checked at least once per shift.

3. Along the belt entry, continuous vigilance for overheated rollers, which can serve as the initiator for the fire, is beneficial. A daily inspection program will be put in place to ensure that all parts of the conveyor are in good condition, and to keep the support roller bearings lubricated. Temperature of each section will be taken using a laser thermometer and recorded for record keeping and trends.

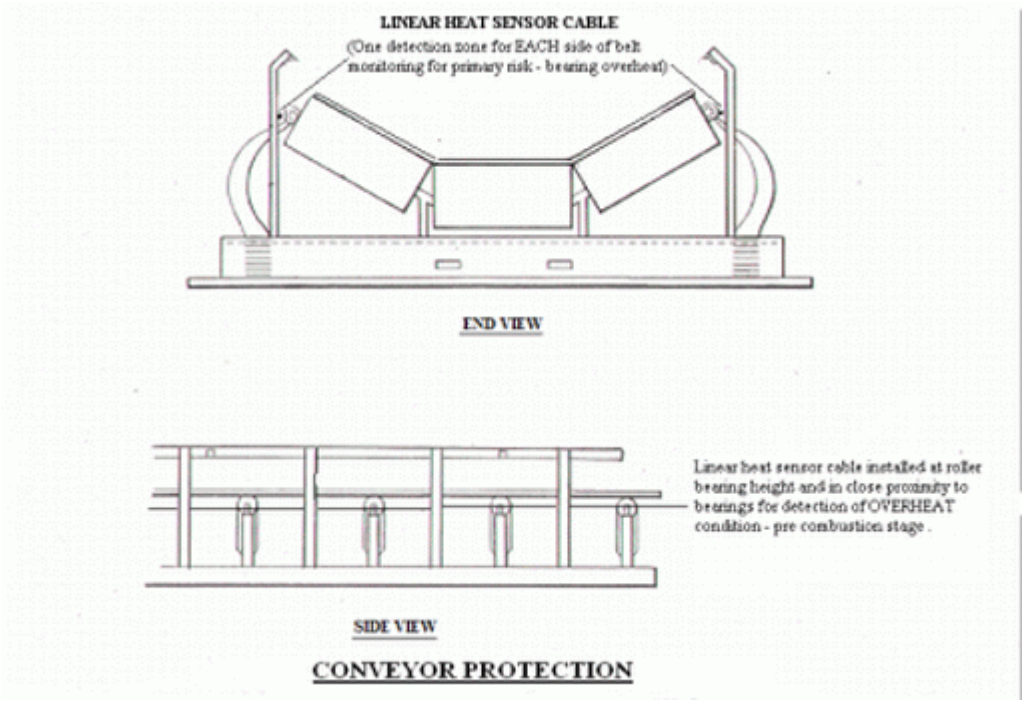
4. Use of belt materials that have superior fire-resistance characteristics will reduce the possibility of belt flame spread.

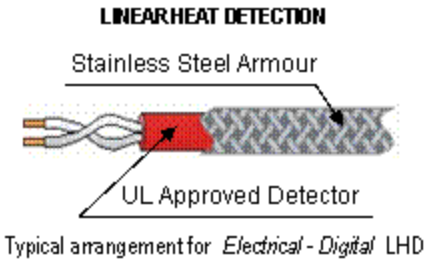
5. Use of a Fire Detection system that is flexible, durable and serviceable while providing fast response and remaining stable in the harsh ambient conditions. The occurrence of any fire at any stage of development represents a potential hazard to all facilities' personnel.
   If, and when, a fire develops, the detection of that fire at the earliest possible moment is paramount to secure the safety of employees and to extinguish the fire.

   Detection of any developing fire prior to open flaming is the objective. If the duration of this stage of development is long (several minutes to an hour, or longer) and a sufficient mass of coal (or other combustible) is involved, the probability of detecting the fire during this stage will be high. However, a small flaming coal fire may result from an intense smoldering stage that may last only a few minutes and may initially involve a small mass of coal. For this situation, the probability of detecting the fire in its smoldering stage is reduced. In general, a flaming coal fire follows the smoldering stage of development, During this flaming stage, the fire may grow in intensity until, eventually, the conveyor belting is ignited. The probability of detecting a fire in this stage of development depends upon how fast the fire grows and at what fire size belt ignition is achieved. The slower the growth rate of the flaming coal fire, the higher the probability that it can be detected prior to belt ignition. It is imperative that the relative times for transition of the fire from one stage to the next, along with the levels of CO and smoke produced during each stage, be quantified as accurately as possible.

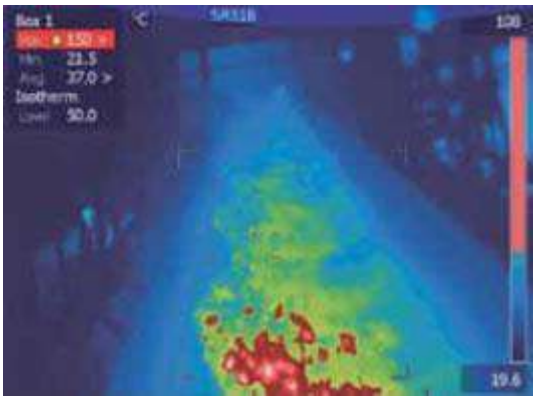
   **Linear heat detection (Thermal Detection)** that is not fixed temperature - but can average heat build-up and is temperature adjustable is best suited for conveyor applications. The ability to average temperatures provides good performance for moving fires and detection of large open

areas. Adjustable capabilities are needed to optimize the sensing temperature given the varying conditions of each specific hazard and seasonal climatic changes.




**Infrared Detection** will be used to enhance detection in unloading area, transfer areas stockpiles, and conveyor.




Infrared detector showing conveyor fire detection

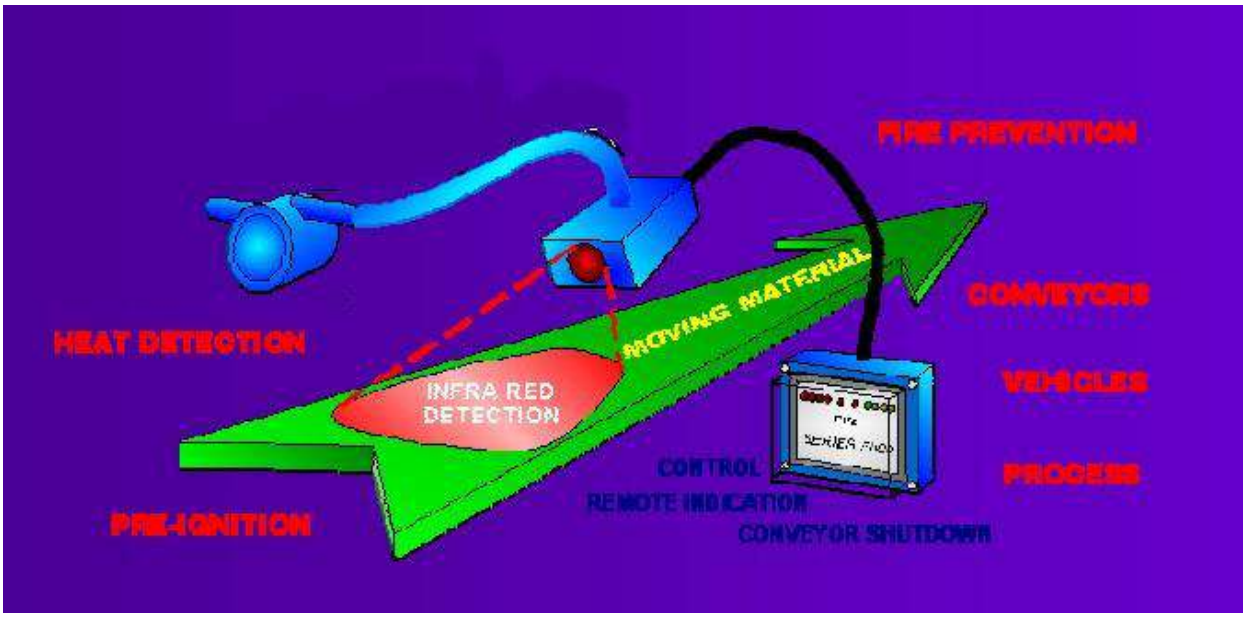
Sprinklers activated after

***IR Detector Location***

The infrared detector should be mounted at the loading end of each conveyor such that when detecting a fire the belt will be stopped before the conveyor can discharge the fire onto another belt or stockpile.

The Infra-red Detector will be configured to automatically stop the conveyor and raise an alarm.
At this stage the water spray shall be initiated

- Automatically by the IR Detector.
- Manually, after an operator has observed the belt.
- Automatically after a time delay, if not overridden by the operator
- Automatically by LHD detection.




**Location of Sensor**

## FIRE SUPRESSION

Automated extinguishment systems that are activated in the early stages of fire development can reduce the potential for flame spread. For optimum results these piped installations will be combined with the dust control misting/sprinkler systems (hybrid system). These systems will shift from dust control / house keeping mode to a fire suppression mode automatically or manually when activated by workers and thus activated to deliver an extinguishing agent in the event of fire.

The distribution of the sprinklers and the distance between them will be such that full and efficient coverage will be obtained.

Switches for manual operation of the fire suppression system will be strategically distributed at the plant, and they will be conspicuous.

### Fire Extinguishing Agents

Water alone is not recommended to supress a coal fire because the surface tension of water does not allow it to penetrate deep below the coal's surface and reach the fire unless large quantities are injected.
The following table shows a typical fire extinguishing agents that are available.

#### *Wetting Agents*

Wetting agents allow water to penetrate Class A material by reducing the surface tension of the water. They extinguish by cooling. (Used for dust control)

***Foams***

Foams contain a wetting agent that acts as the carrier of the foam. The primary function of foams is to blanket the fuel's surface, thereby reducing the oxygen supply.

Foams are not very effective on coal fires due to the length of time it takes to smother a coal fire and the need to keep the foam blanket in place.

Mechanical foams also tend to break down and dissipate before the fire is completely out.

Class A fires cannot be effectively extinguished with foams. Foams that pass UL Fire Performance Criteria are Class B.

Foams that do not pass the test are classified as Class A and do not meet any usage criteria other than the manufacturer's own recommendations.

***Micelle-Encapsulating Agents***

These agents, when used with water, are the preferred extinguishing media for coal fires and for flammable liquids fires (Class A and B fires).

These agents have the following three suppression mechanics:

- Micelle formation. On Class B fires, the agents encapsulate both the liquid and vapor phase molecules of the fuel and immediately render them non-flammable.

- Surface tension reduction. The agents reduce the surface tension of water by 58% providing up to a 1,000% increase in the wetted area, compared with using water alone.

- Free radical interruption. The agents interrupt the free radical chain reaction of the fire tetrahedron.

***Other Agents***

Gases such as $CO_2$ and Nitrogen have been tried as fire-suppression agents but have not proven effective. Reasons include their poor cooling capacity and their general inability to maintain proper concentration levels in bunkers and silos.

These agents require extended use for hours or even days, depending on the quantity of the coal burning and the complexity of the fire.

**Fire Department**

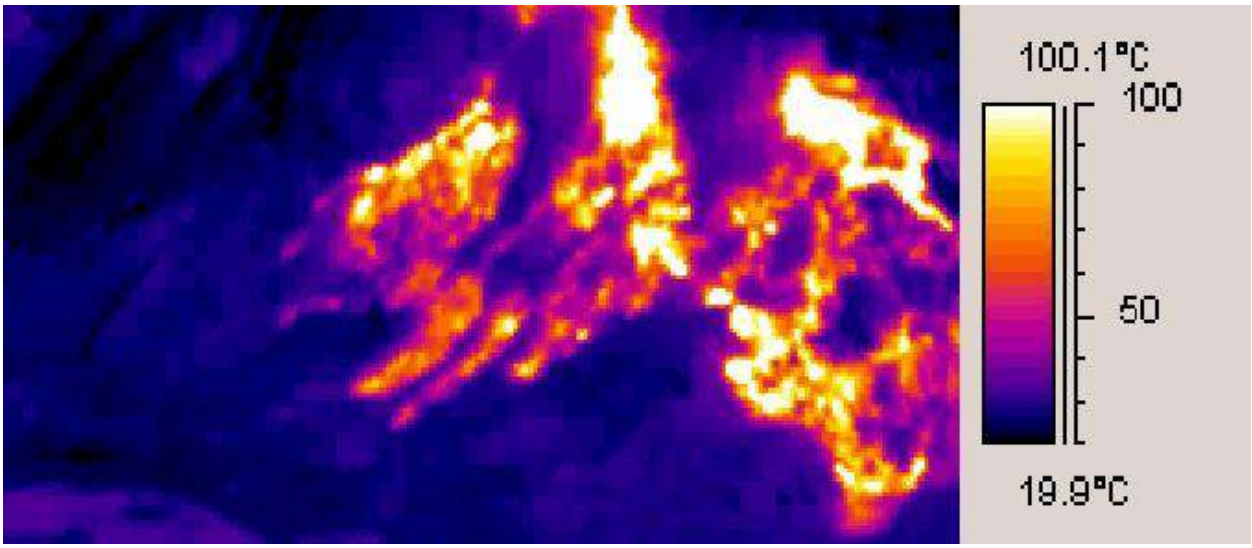
The use of a hybrid sprinkler system might not be enough to completely supress the fire According to FSD's Emergency Response Plan, the Surrey Fire Department will be summoned to assist in supressing the fire.

When members of SFD arrive on site, all personnel must have evacuated to a mustering area, except for designated workers which will be waiting for the Fire Department at a safe access point and will assist them with knowledge of the facilities.

**IMPORTANT: Workers from FSD will NOT engage in firefighting activities, or other tasks they have not been trained for.**

A three-step approach to supress coal fires is recommended

1. Development of an action plan. This step entails initial investigation of the suspected fire, performance of a thermographic survey, mapping the fire within the bunker or silo, and suspending coal-feeding operations to the affected area.




**A typical thermal image of a coal fire**

2. Preparation of the area. After the action plan has been developed, the next step is to prepare the area for firefighting operations by neutralizing dusting in the immediate area, ventilating the area, and staging equipment and personnel to prepare to attack the fire.

3. Extinguish the fire. After all preparations have been made, firefighting can begin. Monitoring the fire at this stage is key to the effort's success.

***Recommended Methods for Extinguishing Coal Fires***

Using a fire hose to stream water through the top of a bunker or silo is not recommended. Nor is using a stream to “drill” into the coal in an attempt to reach the fire.
This technique most likely will stir up the coal and dust and result in a flash explosion. A secondary explosion can also occur as the heat ignites float dust in the air.
An industry accepted, and most preferred method of extinguishing a fire is to get the agent directly to the origin of the fire. To do this, the location of the fire within the pile must be known (a thermal image will make this spot easier to find).

The main tool used to deliver an agent directly to a hot spot is a piercing rod. These are designed to pierce the surface of the coal and be manually maneuvered to the hot spot. The benefit of piercing rods is that they can be used to render inert the inside of the stockpile atmosphere by spraying the sides and surface of the coal with agent prior to storing it.

It must be considered that the longer the rod, the harder it is to maneuver it inside the enclosure. Rods are generally made of stainless steel and come in several diameters (0.75 inches, 1.25 inches, and 1.5 inches). The tip of the rod is perforated and cone-shaped, which allows it to be easily inserted deep into the coal and used at any angle. The rod can be inserted through the top or the sides of the enclosure if access ports have been preinstalled.

Trained workers using a piercing rod in a stockpile's hot spot

**Detail of the tip of a piercing rod**

***Fire Hydrants***

FRASER SURREY DOCKS will ensure that enough fire hydrants be located in proximity to the intake side of conveyor loading and
transfer points, main junctions, and electrical substations.

**CONVEYOR SYSTEM CHECKLIST**

Conveyors are useful for moving things around the workplace. However, moving machinery can cause serious injuries. This Conveyor System Safety Checklist provides a minimum checklist for ensuring safe conveyor belt operation. If any of the checklist boxes are marked with a NO, the employer must correct the deficiency immediately.

| CHECKLIST COMPLETION DATE | NEXT SCHEDULED REVIEW DATE |
|---|---|
| YYYY / MMM / DD | YYYY / MMM / DD |

| COMPANY INFORMATION | | | |
|---|---|---|---|
| **Name** | | **Branch or Location** | |
| **Address** | | **Identification Number** | |
| **PERSONNEL INFORMATION** ***(PERSON COMPLETING CHECKLIST)*** | | | |
| **Name** | | **Position** | **Contact Number** |

| CONVEYOR SYSTEM SAFETY CHECKLIST | | |
|---|---|---|
| **TRAINING**<br>**Have operators received training, supervision and information about:** | | |
| • the correct method of starting and stopping the conveyor system? | Yes | No |
| • the hazards of the conveyor system in its normal operations? | Yes | No |
| • the hazards of being inattentive or not following safe work procedures? | Yes | No |
| • the purpose of guards? | Yes | No |
| **STARTING THE CONVEYOR**<br>**Before the conveyor system is started up, do you inspect to ensure that:** | | |
| • nobody is working on the conveyor system? | Yes | No |
| • access platforms are clear? | Yes | No |
| • guards are fitted? | Yes | No |
| • emergency stop switches are working and clearly marked? | Yes | No |
| • lanyards are fitted and working? | Yes | No |
| • lights are working and clean? | Yes | No |
| • start-up warning lights and signs are clearly visible? | Yes | No |

| CONVEYOR SYSTEM SAFETY CHECKLIST (CONTINUED) | | |
|---|---|---|
| **STARTING THE CONVEYOR (CONTINUED)**<br>**Before the conveyor system is started up, do you inspect to ensure that:** | | |
| • start-up warning horns, bells or claxons are clearly audible? | Yes | No |
| • the area around the conveyor is clean? | Yes | No |
| **SAFE OPERATING PROCEDURES** | | |
| Are all stop/start controls and emergency stop switches clearly marked? | Yes | No |
| Are workers aware of the locations of these controls and switches? | Yes | No |
| Are these controls within easy reach for workers? | Yes | No |
| Is the conveyor locked out or isolated before maintenance or clearing out are started? | Yes | No |
| Do operators wear appropriate, close-fitting clothing at all times? | Yes | No |
| Do operators keep hair controlled under caps at all times? | Yes | No |
| **GUARDS** | | |
| Are guards in place to prevent access to all dangerous areas while the conveyor system is in operation? | Yes | No |
| Are guards either permanently or securely fixed to ensure they cannot be altered or detached without the aid of a tool or key? | Yes | No |
| If a fixed barrier is not practicable, and access to dangerous areas is required during operation, is an interlocked physical barrier | Yes | No |
| Are nip points guarded? | Yes | No |
| Are emergency stop devices in working condition? | Yes | No |
| Are emergency stop devices checked on a regular basis? | Yes | No |
| **THE MOVING CONVEYOR SYSTEM Do workers know:** | | |
| • they must not walk under the moving conveyor system, unless it is guarded, to prevent spillage and/or entrapment by moving parts? | Yes | No |
| • they must not clean belts, pulleys, drums or troughs while the conveyor system is moving? | Yes | No |
| • they must not ride on or cross over the conveyor system? | Yes | No |
| • they must not carry out repairs or maintenance on the conveyor system while it is moving? | Yes | No |

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Clean Agent Systems

### Semi-Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Agent quantity and pressure of refillable containers shall be checked. | Inspect | NFPA 2001 | - | 7.1.3 |
| Factory charged, non-refillable containers shall have the agent quantity checked. | Inspect | NFPA 2001 | - | 7.1.5 |

### Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| System shall be thoroughly Inspected. | Inspect | NFPA 2001 | - | 7.1.1 |
| . Examine system hoses for damage. | Inspect | NFPA 2001 | - | 7.3 |
| Hazard enclosure inspection unless a documented administrative control program exists that addresses | Inspect | NFPA 2001 | - | 7.4, 7.5.3 |
| System alarm, detection and release controls | Test | NFPA 72 | - | Table 14.4.5 |

### Five Years:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| System hoses | Test | NFPA 2001 | - | 7.3.2.1, 7.3.2.2 |
| Cylinders in Continuous Operation Without Discharging the last test and inspection. | Inspect | NFPA 2001 | - | 7.2.2 |
| Cylinders shall not be recharged without retesting if more than 5 years have elapsed since the date of | Test | NFPA 2001 | - | 7.2.1 |

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Any time:

| | | | | |
|---|---|---|---|---|
| Halocarbon Clean Agent Cylinders that show more than 5% net loss in agent weight or loss in pressure (adjusted for temperature) of more than 10% shall be refilled or replaced. | Inspect | NFPA 2001 | - | 7.1.3.1 |
| Inert gas clean agent cylinders containing agent under pressure (not liquefied) showing a loss in pressure (adjusted for temperature) of more than 5% shall be refilled or replaced. | Inspect | NFPA 2001 | - | 7.1.3.2 |
| Any penetrations made in the enclosure protected by a clean agent system shall be sealed immediately. | Inspect | NFPA 2001 | - | 7.5.3 |

Based on NFPA 2001, 2012 Edition

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Fire Alarm

### Daily:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Power Supply – public emergency alarm reporting systems-wired system-voltage test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 7d |

### Weekly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Equipment: fire alarm systems unmonitored for alarm, supervisory and trouble signals (fuses, interfaced equipment, lamps and LEDs and Primary (main) power supply) | Inspect | NFPA 72 | 14.3.1 | |
| Fire Alarm Control Unit trouble signals | Inspect | NFPA 72 | 14.3.1 | |
| Engine-driven generator – public emergency alarm reporting systems | Test | NFPA 72 | 14.4.5 | |

### Monthly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Lead Acid Batteries | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 No. 5 |
| Primary (dry cell) Batteries | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 No. 5 |
| Engine Driven Generator-Central Station Facilities and Fire Alarm Systems | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 |
| Batteries-Central Station Facilities-Lead Acid type-30 Minute Discharge Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5 |
| Batteries-Central Station Facilities-Lead Acid type-Load Voltage Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Batteries-Central Station Facilities-Sealed Lead Acid type- Charger Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6d |
| Batteries-Central Station Facilities-Sealed Lead Acid type- 30 Minute Discharge Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 5 |
| Batteries-Central Station Facilities-Sealed Lead Acid type- Load Voltage Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6d |
| Batteries-Fire Alarm Systems-Primary (dry cell) type- Age Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6a |
| Supervising Station Fire Alarm Systems-Receivers (DACR, DARR, McCulloh, Two-way RF multiplex, RASSR, RARSR, Private Microwave) | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 19 |
| Single- and Multiple-station smoke alarms | Inspect/Test | NFPA 72 | 14.4.5 | 14.4.6 |

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Inspection, Test & Maintenance Requirements

### Quarterly

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Batteries-Central Station Facilities-Sealed Lead Acid type- Charger Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6d |
| Power Supply-Public Fire Alarm Reporting Systems-Lead Acid type batteries-2 Hour Discharge Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5 |
| Power Supply-Public Fire Alarm Reporting Systems-Lead Acid type batteries-Load Voltage Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Power Supply-Public Fire Alarm Reporting Systems-Nickel Cadmium type batteries-Load Voltage Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6c |
| Power Supply-Public Fire Alarm Reporting Systems-Sealed Lead Acid type batteries-Load Voltage Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Supervisory Signal Devices (Pressure Supervisory; Water level; Water temperature, Room temperature indicating devices and Other suppression system supervisory initiating devices.) | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 14 |

### Semi-Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Batteries-Nickel Cadmium | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 No. 5 |
| Batteries-Sealed Lead Acid | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 No. 5 |
| Transient Suppressors | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Fire Alarm Control Unit Trouble Signals | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| In-building Emergency Voice/Alarm Communications Equipment | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Remote Annunciators | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Air Sampling Detectors | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Duct Smoke Detectors | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Electromechanical Releasing Devices | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Fire Extinguishing Systems(s) or Suppression System(s) Switches | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Manual Fire Alarm Boxes | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Heat Detectors | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Smoke Detectors (excludes 1 & 2 family dwellings) | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Guard Tour Equipment | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Fire Extinguisher Monitoring Device/Systems | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Carbon Monoxide Monitoring Device/Systems | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Interface Equipment | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Alarm Notification Appliances-Supervised | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Exit Marking Audible Notification Appliances | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Supervising Station Fire Alarm Systems-Transmitters (DACT, DART, McCulloh, RAT) | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Special Procedures | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

| | | | | |
|---|---|---|---|---|
| Supervising Station Fire Alarm Systems-Receivers | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Public Fire Alarm Reporting System Transmission | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 No. 8a |
| Public Fire Alarm Reporting System Transmission Equipment-Master Box Manual operation | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Mass Notification system, non-supervised systems installed prior to adoption of NFPA 72 2010 Edition (Control Equipment Fuses, Interfaces, Lamps/LEDs, Primary (main) power supply, Secondary power batteries (Lead Acid, Nickel-Cadmium, Primary (dry cell), Sealed Lead Acid), Initiating Devices, Notification Appliances | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Batteries-Central Station Facilities-Lead Acid type-Specific Gravity | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Batteries-Fire Alarm Systems-Lead Acid type-30 Minute Discharge test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Batteries-Fire Alarm Systems-Lead Acid type-Load Voltage Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Batteries-Fire Alarm Systems-Lead Acid type-Specific Gravity | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Batteries-Fire Alarm Systems-Nickel Cadmium type-Load Voltage Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6c |
| Batteries-Fire Alarm Systems-Sealed Lead Acid type-Load Voltage Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6d |
| Power Supplies-Public Fire Alarm Reporting Systems-Lead acid type batteries specific gravity | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Radiant Energy Fire Detectors | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 14 |
| Valve Supervisory Switches | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 14 |
| Waterflow Devices | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 14 |
| Public Emergency Alarm Reporting System Transmission Equipment-publicly accessible fire alarm box | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 |
| Public Emergency Alarm Reporting System Transmission Equipment –Master Box Manual operation | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 |
| Mass notification system – protected premise, non-supervised systems installed prior to adoption of this code (Control unit functions and no diagnostic failures are indicated, Audible/visible functional test, secondary power, Verify content of prerecorded messages, verify activation of correct prerecorded message based on a selected event, verify activation of correct prerecorded message based on a targeted area, verify control unit security mechanism is functional.) | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 27 |

## Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Equipment – Fuses, Interfaced Equipment, Lamps and LEDs, Primary (main) power supply | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 No. 1, 7, 18, 19 |
| Fiber Optic Cable Connections | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Public Fire Alarm Reporting System Transmission Equipment – Auxiliary Box | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Public Fire Alarm Reporting System Transmission Equipment – Master Box Auxiliary operation | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Annual (cont.):

| | | | | |
|---|---|---|---|---|
| Mass Notification system, supervised systems Control Equipment Fuses, Interfaces, Lamps/LEDs, Primary (main) power supply, Secondary power batteries (Lead Acid, Nickel-Cadmium, Primary (dry cell), Sealed Lead Acid), Initiating Devices, Notification Appliances | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Mass notification system Antenna | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Mass notification system Transceivers | Inspect | NFPA 72 | 14.3.1 | Table 14.4.2.2 |
| Control Equipment – Bldg systems connected to a Supervising Station- Functions, Fuses, Interfaced Equipment, Lamps and LEDs, Primary (main) power supply and Transponders | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 |
| Batteries-Central Station Facilities-Lead Acid type Charger test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Batteries-Central Station Facilities-Nickel Cadmium type 30 minute Discharge test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5 |
| Batteries-Central Station Facilities-Nickel Cadmium type Load Voltage test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6c |
| Batteries-Fire Alarm Systems-Lead Acid type Charger test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Batteries-Fire Alarm Systems-Nickel Cadmium type Charger test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6c |
| Batteries-Fire Alarm Systems-Nickel Cadmium type 30 minute Discharge test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5 |
| Batteries-Fire Alarm Systems-Sealed lead acid type Charger test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6d |
| Batteries-Fire Alarm Systems-Sealed lead acid type 30 minute Discharge test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5 |
| Power Supply-Public Emergency Alarm Reporting Systems-Lead Acid type batteries Charger test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6b |
| Power Supply-Public Emergency Alarm Reporting Systems-Nickel Cadmium type batteries Charger test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6c |
| Power Supply-Public Emergency Alarm Reporting Systems-Nickel Cadmium type batteries 2 hour Discharge test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5 |
| Power Supply-Public Emergency Alarm Reporting Systems-Sealed Lead Acid type batteries Charger test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5, 6d |
| Power Supply-Public Emergency Alarm Reporting Systems-Sealed Lead Acid type batteries 2 hour Discharge test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 5 |
| Fiber Optic Cable Power | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 13b |
| Control Unit Trouble Signals | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 10 |
| In-building Fire Emergency Voice/Alarm Communications Equipment | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 20 |
| Remote Annunciators | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 11 |
| Fire-gas and other detectors | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 14 |
| Electromechanical Releasing Device | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 14 |
| Fire Extinguishing system(s) or suppression system(s) switches | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 No. 14 |

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Annual (cont.):

| | | | | |
|---|---|---|---|---|
| Heat Detectors | Test | NFPA 72 | 14.4.5 | 14.4.5.5<br>Table 14.4.2.2<br>No. 14 |
| Manual Fire Alarm Boxes | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 14 |
| System Smoke Detectors Functional Test | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 14 |
| Single & Multiple-station smoke alarms | Test | NFPA 72 | 14.4.5 | 14.4.4.6<br>Table 14.4.2.2<br>No. 14 |
| Single & Multiple-station heat alarms | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 14 |
| Other supervisory initiating devices (not included during quarterly or semi-annual testing) | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 14 |
| Guard Tour Equipment | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 24 |
| Fire Extinguisher Monitoring Device/Systems | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 21a |
| Carbon Monoxide Monitoring Detector/Systems | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 |
| Interface equipment and Fire Safety Functions | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 22, 23 |
| Special Hazard Equipment | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 17 |
| Audible Devices, Audible Textual notification appliances, Visible Devices | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 15 |
| Audible Devices, Audible Textual notification appliances, Visible Devices | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 15 |
| Exit Marking Notification Appliances | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 16 |
| Supervising Station Fire Alarm Systems-Transmitters | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 18 |
| Special Procedures | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 25 |
| Public Emergency Alarm Reporting Transmission Equipment Auxiliary Box | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 8b |
| Public Emergency Alarm Reporting Transmission Equipment Master Box Auxiliary Operation Mass | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2 |
| notification system – protected premise, supervised (Control unit functions and no diagnostic failures are indicated, Audible/visible functional test, secondary power, Verify content of prerecorded messages, verify activation of correct prerecorded message based on a selected event, verify activation of correct prerecorded message based on a targeted area, verify control unit security mechanism is functional.) | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 27 |
| Mass notification system-wide area (Control unit functions and no diagnostic failures are indicated, Control unit reset, Control unit security, Audible/visible functional test, Software backup, Secondary power test, Antenna, Transceivers, Verify content of prerecorded messages, Verify activation of correct prerecorded message based on a selected event, Verify activation of correct prerecorded message based on a targeted area, | Test | NFPA 72 | 14.4.5 | Table 14.4.2.2<br>No. 27 |

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Fire Monitor

### Semi-Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Monitor Nozzles | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.6 |

### Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Monitor Nozzles - (range and operation) | Test | NFPA 25 | 7.1.1.2 | 7.3.3 |
| Monitor Nozzles | Maintenance | NFPA 25 | 7.1.1.2 | 7.4.3 |

Based on NFPA 25, 2011 Edition

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule
## Fire Pump

### Weekly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Casing Relief Valves | Inspect | NFPA 25 | 13.1.1.2 | 13.5.7.1, 13.5.7.1.1 |
| Control Valve - (Sealed) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1 |
| Diesel Fire Pump Operation - no flow condition | Test | NFPA 25 | 8.1.1.2 | 8.3.1 |
| Fire Pump System | Inspect | NFPA 25 | 8.1.1.2 | 8.2.2 |
| Pressure Relief Valves | Inspect | NFPA 25 | 13.1.1.2 | 13.5.7.2, 13.5.7.2.1 |

### Monthly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (Locked) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Control Valve - (Tamper Switches) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Electric Fire Pump Operation - no flow condition | Test | NFPA 25 | 13.1.1.2 | 8.3.1 |

### Quarterly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Pressure Reducing Valves | Inspect | NFPA 25 | 13.1.1.2 | 13.5.1.1 |

### Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Circulation Relief | Test | NFPA 25 | 13.1.1.2 | 13.5.7.1.2 |
| Control Valves – Position & Operation | Test | NFPA 25 | 13.1.1.2 | 13.3.3.1 |
| Fire Pump alarm signals | Test | NFPA 25 | 8.1.1.2 | 8.3.3.5 |
| Fire Pump Operation - flow test | Test | NFPA 25 | 8.1.1.2 | 8.3.3 |
| Hydraulic | Maintenance | NFPA 25 | 8.1.1.2 | 8.5 |
| Mechanical Transmission | Maintenance | NFPA 25 | 8.1.1.2 | 8.5 |
| Motor | Maintenance | NFPA 25 | 8.1.1.2 | 8.5 |
| Pressure Relief Valves | Test | NFPA 25 | 13.1.1.2 | 13.5.7.2.2 |

### 5 year:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Check Valves - interior | Inspect | NFPA 25 | 13.1.1.2 | 13.4.2.1 |

## Summary of NFPA
## Inspection, Test & Maintenance Requirements / Schedule

**Varies:**

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Electrical System | Maintenance | NFPA 25 | 8.1.1.2 | 8.5 |
| Controller, Various Components | Maintenance | NFPA 25 | 8.1.1.2 | 8.5 |
| Diesel Engine System, Various Components | Maintenance | NFPA 25 | 8.1.1.2 | 8.5 |

Based on NFPA 25, 2011 Edition

Note 1: The Inspection, Test and Maintenance requirements of fire pump systems can vary by type and manufacturer. The manufacturer's recommended maintenance should be utilized to develop the maintenance program for fire pump systems. If the manufacturer's maintenance information is not available, an alternative maintenance program can be established. Alternative maintenance requirements can be found in NFPA 25, Table 8.1.2.

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Fire Service Mains

### After Use:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Mainline Strainers | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.3 |

### Daily:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Valve Enclosure (During Cold Weather, w/o alarms) | Inspect | NFPA 25 | 13.1.1.2 | 13.4.3.1, 13.4.4.1.1 |

### Weekly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (Sealed) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1 |
| Valve Enclosure(During Cold Weather, w/ alarms) | Inspect | NFPA 25 | 13.1.1.2 | 13.4.4.1.1.1 |

### Monthly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (Locked) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Control Valve - (Tamper Switches) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |

### Quarterly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Hose Houses | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.7 |

### Semi-Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve – Supervisory | Test | NFPA 25 | 13.1.1.2 | 13.3.3.5 |

### Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valves | Maintenance | NFPA 25 | 13.1.1.2 | 13.3.4 |
| Control Valves – Position and Operation | Test | NFPA 25 | 13.1.1.2 | 13.3.3.1 |
| Hose Houses | Maintenance | NFPA 25 | 7.1.1.2 | 7.2.2.7 |
| Mainline Strainers | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.3 |
| Mainline Strainers | Maintenance | NFPA 25 | 7.1.1.2 | 7.2.2.3 |

### 5 Year:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Piping (Exposed & Underground) (Flow Test) | Test | NFPA 25 | 7.1.1.2 | 7.3.1 |

### Other:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Piping (underground) | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.2 |

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Low Expansion
## Foam Systems

### Weekly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (Sealed) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1 |

### Monthly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (Locked) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Control Valve - (Tamper Switches) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Discharge Device (Spray Nozzle) Location & Position | Inspect | NFPA 25 | 11.1.1.2 | 11.2.5 |

### Quarterly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Foam Concentrate Strainer(s) | Inspect | NFPA 25 | 11.1.1.2 | 11.2.7.2 |
| Foam Concentrate Strainer(s) | Maintenance | NFPA 25 | 11.1.1.2 | Section 11.4 |
| Waterflow Devices | Inspect | NFPA 25 | 11.1.1.2 | 11.2.1 |
| Waterflow Devices (Water Motor Gongs, etc.) | Test | NFPA 25 | 11.1.1.2 | 11.3.1.3 |

### Semi-Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (Tamper Switches) | Test | NFPA 25 | 13.1.1.2 | 13.3.3.5 |

### Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Above Ground piping | Inspect | NFPA 11 | - | 11.2.3, 11.2.4 |
| Complete foam-water system | Test | NFPA 11 | - | 11.3.3 |
| Control Valve - Position and Operation | Test | NFPA 25 | 13.1.1.2 | 13.3.3.1 |
| Foam Concentrate | Test | NFPA 11 | - | 11.2.10 |
| Foam Water Solution | Test | NFPA 11 | 11.1.1.2 | 11.3.5 |
| Discharge Device Location & Position (Sprinklers) | Inspect | NFPA 11 | 11.1.1.2 | 11.2.5 |
| Proportioning Systems - All | Test | NFPA 11 | 11.1.1.2 | 11.2.9 |

### 5 Year:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Underground piping | Inspect | NFPA 11 | - | 11.3.3 |

Based on NFPA 11, 2005 and NFPA 25, 2011 Editions

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Foam Sprinkler

### Weekly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (Sealed) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1 |

### Monthly:

| | | | | |
|---|---|---|---|---|
| Control Valve - (Locked) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Control Valve - (Tamper Switches) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Discharge Device Location (Spray nozzle) | Inspect | NFPA 25 | 11.1.1.2 | 11.2.5 |
| Discharge Device Position (Spray nozzle) | Inspect | NFPA 25 | 11.1.1.2 | 11.2.5 |
| Foam Concentrate Pump Operation | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.6.1, 11.4.7.1 |
| Proportioning Systems (all) | Inspect | NFPA 25 | 11.1.1.2 | 11.2.9 |

### Quarterly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Drainage in System Area | Inspect | NFPA 25 | 11.1.1.2 | 11.2.8 |
| Foam Concentrate Strainer(s) | Inspect | NFPA 25 | 11.1.1.2 | 11.2.7.2 |
| Foam Concentrate Strainer(s) | Maintenance | NFPA 25 | 11.1.1.2 | Section 11.4 |
| Waterflow Devices | Inspect | NFPA 25 | 11.1.1.2 | 11.2.1 |

### Semi-Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (Tamper Switches) | Test | NFPA 25 | 13.1.1.2 | 13.3.3.5 |

### Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Backflow Preventers | Test | NFPA 25 | 11.1.1.2 | Chapter 13 |
| Complete Foam-Water System | Test | NFPA 25 | 11.1.1.2 | 11.3.3 |
| Control Valve - Position and Operation | Test | NFPA 25 | 13.1.1.2 | 13.3.3.1 |
| Control Valves | Maintenance | NFPA 25 | 13.1.1.2 | 13.3.4 |
| Discharge Device Location | Test | NFPA 25 | 11.1.1.2 | 11.3.2.6 |
| Discharge Device Location (Sprinkler) | Inspect | NFPA 25 | 11.1.1.2 | 11.2.5 |
| Discharge Device Obstruction | Test | NFPA 25 | 11.1.1.2 | 11.3.2.6 |
| Discharge Device Position | Test | NFPA 25 | 11.1.1.2 | 11.3.2.6 |
| Discharge Device Position (Sprinkler) | Inspect | NFPA 25 | 11.1.1.2 | 11.2.5 |

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Annual (Cont.)

| | | | | |
|---|---|---|---|---|
| Hangers/Supports | Inspect | NFPA 25 | 11.1.1.2 | 11.2.4 |
| Manual Actuation Device(s) | Test | NFPA 25 | 11.1.1.2 | 11.3.4 |
| Pipe Corrosion | Inspect | NFPA 25 | 11.1.1.2 | 11.2.3 |
| Pipe Damage | Inspect | NFPA 25 | 11.1.1.2 | 11.2.3 |
| Proportioning Systems - (all) | Test | NFPA 25 | 11.1.1.2 | 11.2.9 |
| Strainers | Maintenance | NFPA 25 | 10.1.1.2 | 10.2.7, 10.2.1.4, 10.2.1.6 |
| Valve Enclosure Low Temp Alarms | Inspect | NFPA 25 | - | 13.4.3.1.2 |
| Water Supply | Maintenance | NFPA 25 | 11.1.1.2 | 11.2.6.1 |
| Water Supply Piping | Test | NFPA 25 | 11.1.1.2 | Chapter 10 |

## 5 Year:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Check Valves | Inspect | NFPA 25 | 13.1.1.2 | 13.4.2.1 |
| In-Line Balanced Pressure Type Proportioning Systems - Balancing Valve Diaphragm | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.7.3 |
| In-Line Balanced Pressure Type Proportioning Systems - Foam Concentrate Pumps | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.7.2 |
| Pressure Vacuum Vents | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.8 |
| Standard Balanced Pressure Type Proportioning Systems - Balancing Valve Diaphragm | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.6.3 |
| Standard Balanced Pressure Type Proportioning Systems - Foam Concentrate Pump | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.6.2 |
| Standard Pressure Type Proportioning Systems - Ball Drip (Automatic Type) Drain Valves | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.3.1 |
| Strainers - Baskets & Screen | Maintenance | NFPA 25 | 10.1.1.2 | 10.2.1.4, 10.2.1.7, |

## 10 Year:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Bladder Type Proportioning Systems - Sight Glass | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.4.1 |
| Bladder Type Proportioning Systems - Hydrostatic Test | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.4.2 |
| In-Line Balanced Pressure Type Proportioning Systems - Foam Concentrate Tank | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.7.4 |
| Line Type Proportioning Systems - Foam Concentrate tank - corrosion and pickup tubes | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.5.1 |
| Line Type Proportioning Systems - Foam Concentrate tank - Drain and Flush | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.5.2 |
| Standard Balanced Pressure Type Proportioning Systems - Foam Concentrate Tank | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.6.4 |
| Standard Pressure Type Proportioning Systems - Foam Concentrate Tank Drain & Flush | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.3.2 |
| Standard Pressure Type Proportioning Systems - Tank Corrosion and Hydrostatic Test | Maintenance | NFPA 25 | 11.1.1.2 | 11.4.3.3 |

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

Based on NFPA 25, 2011 Edition

Refer to NFPA 25 Chapter 9 for Water Storage Tank & Fire Pump Inspection, Testing and Maintenance Requirements.

Refer to NFPA 25 Chapter 10 for Mainline Strainers Inspection, Testing and Maintenance Requirements.

Refer to NFPA 25 Chapter 13 for Valves, Valve Components & Trim Inspection, Testing and Maintenance Requirements. See FEMPSD "Summary of NFPA Inspection, Test & Maintenance Requirements for Sprinkler Systems."

Refer to NFPA 72 Chapter 10 for Fire Alarm Systems Inspection, Testing and Maintenance Requirements.

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Hydrant

### After Use:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Hydrant - (Dry Barrel and Wall) | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.4 |
| Hydrant - (Wet Barrel) | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.5 |
| Mainline Strainers | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.3 |

### Quarterly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Hose Houses | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.7 |

### Semi-Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Monitor Nozzles | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.6 |

### Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Hose Houses | Maintenance | NFPA 25 | 7.1.1.2 | 7.2.2.7 |
| Hydrant - (Dry Barrel and Wall) | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.4 |
| Hydrant - (Wet Barrel) | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.5 |
| Hydrant - (Flow Test) | Test | NFPA 25 | 7.1.1.2 | 7.3.2 |
| Monitor Nozzles – (Range & Operation) | Test | NFPA 25 | 7.1.1.2 | 7.3.3 |
| Hydrant | Maintenance Maintenance | NFPA 25 | 7.1.1.2 | 7.4.2 |
| Mainline Strainers | Inspect/ | NFPA 25 | 7.1.1.2 | 7.2.2.3 |
| Monitor Nozzles | Maintenance | NFPA 25 | 7.1.1.2 | 7.4.3 |

### Other:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Piping (underground) | Inspect | NFPA 25 | 7.1.1.2 | 7.2.2.2 |

Based on NFPA 25, 2011 Edition

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Each Shift:

| | | | | |
|---|---|---|---|---|
| UHSWSS – Controllers | Inspect | NFPA 25 | 10.1.1.2 | 10.4.3 |

**Each Shift (cont.):**

| | | | | |
|---|---|---|---|---|
| UHSWSS – Valves | Inspect | NFPA 25 | 10.1.1.2 | 10.4.4 |

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule
## Sprinkler

### Daily:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Valve Enclosure (during cold weather, w/o alarms) | Inspect | NFPA 25 | 13.1.1.2 | 13.4.3.1, 13.4.4.1.1 |

### Weekly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (sealed) | Inspect | NFPA 25 | 5.1.1.2 | 13.3.2.1 |
| Gauges – Dry, Pre-action & Deluge Systems | Inspect | NFPA 25 | 13.1.1.2 | 5.2.4.2, 5.2.4.3, 5.2.4.4 |
| Valve Enclosure(during cold weather, w/ alarms) | Inspect | NFPA 25 | 13.1.1.2 | 13.4.4.1.1.1 |

### Monthly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Alarm Valve - Exterior | Inspect | NFPA 25 | 13.1.1.2 | 13.4.1.1 |
| Control Valve - (locked) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Control Valve - (tamper switches) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Dry-Pipe - Exterior | Inspect | NFPA 25 | 13.1.1.2 | 13.4.4.1.4 |
| Gauges - Wet Pipe Systems | Inspect | NFPA 25 | 5.1.1.2 | 5.2.4.1 |

### Quarterly:

| | | | | |
|---|---|---|---|---|
| Waterflow Alarm Devices - Mechanical | Test | NFPA 25 | 5.1.1.2 | 5.3.3.1 |
| Dry Pipe Valve Quick-Opening Device | Test | NFPA 25 | 13.1.1.2 | 13.4.4.2.4 |
| Dry Pipe Valve - Priming Water | Test | NFPA 25 | 13.1.1.2 | 13.4.4.2.1 |
| Dry Pipe Valve - Low Air Press. Alarms | Test | NFPA 25 | 13.1.1.2 | 13.4.4.2.6 |
| Fire Department Connection | Inspect | NFPA 25 | 13.1.1.2 | 13.7.1 |
| Hose Valves | Inspect | NFPA 25 | - | 13.5.6.1.1 |
| Hydraulic Nameplate | Inspect | NFPA 25 | 5.1.1.2 | 5.2.6 |
| Main Drain (when sole source of water is through a Backflow Preventer and/or Pressure Reducing Valves) | Test | NFPA 25 | 13.1.1.2 | 13.2.5, 13.2.5.1, 13.3.3.4 |
| Pre-action Valve - Priming Water | Test | NFPA 25 | 13.1.1.2 | 13.4.3.2.1 |
| Pre-action Valve - Low Air Pressure Alarms | Test | NFPA 25 | 13.1.1.2 | 13.4.3.2.13 |
| Pressure Reducing & Relief Valves | Inspect | NFPA 25 | 13.1.1.2 | 13.5.1.1 |
| Supervisory Signal Devices (except Valve Supervisory Switches) | Inspect | NFPA 25 | 5.1.1.2 | 5.2.5 |

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Semi-Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (tamper switches) | Test | NFPA 25 | 13.1.1.2 | 13.3.3.5 |

Semi-Annual (cont.):

| | | | | |
|---|---|---|---|---|
| Supervisory Signal Devices (except Valve Supervisory Switches) | Test | NFPA 25 | 13.1.1.2 | 13.3.3.5 |
| Waterflow Devices (vane & pressure switch) | Test | NFPA 25 | 5.1.1.2 | 5.3.3.2, 13.2.6 |

## Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Antifreeze Solution | Test | NFPA 25 | 5.1.1.2 | 5.3.4 |
| Backflow Prevention Assemblies | Test | NFPA 25 | 13.1.1.2 | 13.6.2 |
| Building (prior to freezing weather) | Inspect | NFPA 25 | 5.1.1.2 | 4.1.1.1 |
| Control Valves | Maintenance | NFPA 25 | 13.1.1.2 | 13.3.4 |
| Control Valves – Position & Operation | Test | NFPA 25 | 13.1.1.2 | 13.3.3.1 |
| Dry Pipe Valves & Quick Opening Devices | Maintenance | NFPA 25 | 13.1.1.2 | 13.4.4.3 |
| Dry Pipe Valve - Interior | Inspect | NFPA 25 | 13.1.1.2 | 13.4.4.1.5 |
| Dry Pipe Valve - Trip Test | Test | NFPA 25 | 13.1.1.2 | 13.4.4.2.2 |
| Hangers/Seismic Bracing | Inspect | NFPA 25 | 5.1.1.2 | 5.2.3 |
| Hose | Inspect | NFPA 1962 | - | Ch. 4 & 7 |
| Hose Assembly/Rack Pressure Reducing Valve | Inspect | NFPA 25 | 13.1.1.2 | 13.5.3.1 |
| Hose Connection Pressure Reducing Valve | Inspect | NFPA 25 | 13.1.1.2 | 13.5.2.1 |
| Hose Valves (Class I & III) | Test | NFPA 25 | - | 13.5.6.2 |
| Low Point Drains – Prior to Freezing (dry pipe sys) | Maintenance | NFPA 25 | 5.1.1.2 | 13.4.4.3.2 |
| Main Drain | Test | NFPA 25 | 13.1.1.2 | 13.2.5, 13.2.5.1, 13.3.3.4 |
| Pipe and Fittings | Inspect | NFPA 25 | 5.1.1.2 | 5.2.2 |
| Pre-Action Valve - (internal reset type) Interior | Inspect | NFPA 25 | 13.1.1.2 | 13.4.3.1.7 |
| Pre-Action Valve - Full Flow Trip Test | Test | NFPA 25 | 13.1.1.2 | 13.4.3.2.2 |
| Pre-action/Deluge Valves | Maintenance | NFPA 25 | 13.1.1.2 | 13.4.3.3.2 |
| Press. Reducing & Relief Valves Circulation Relief | Test | NFPA 25 | 13.1.1.2 | 13.5.7.1.2 |
| Pressure Relief Valves | Test | NFPA 25 | 13.1.1.2 | 13.5.7.2.2 |
| Spare Sprinklers | Inspect | NFPA 25 | 5.1.1.2 | 5.2.1.4 |
| Sprinklers | Inspect | NFPA 25 | 5.1.1.2 | 5.2.1 |
| Strainers | Maintenance | NFPA 25 | 10.1.1.2 | 10.2.7, 10.2.1.4, 10.2.1.6 |
| Valve Enclosure Alarms (at beginning of heating season) | Inspect | NFPA 25 | - | 13.4.3.2.14 |

## 3 Year:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Dry Pipe Valve - Full Flow Trip Test | Test | NFPA 25 | 13.1.1.2 | 13.4.4.2.2.2 |

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## 5 Year:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Alarm Valve - Interior | Inspect | NFPA 25 | 13.1.1.2 | 13.4.1.2 |
| Alarm Valve - Strainers, Filters & Orifices | Inspect | NFPA 25 | 13.1.1.2 | 13.4.1.2 |

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

**5 Year (cont.):**

| | | | | |
|---|---|---|---|---|
| Check Valve - Interior | Inspect | NFPA 25 | 13.1.1.2 | 13.4.2.1 |
| Dry Pipe Valve - Strainers, Filters & Orifices | Inspect | NFPA 25 | 13.1.1.2 | 13.4.4.1.6 |
| Gauges | Test | NFPA 25 | 5.1.1.2 | 5.3.2 |
| Hose Connections Pressure Reducing Valves | Test | NFPA 25 | 13.1.1.2 | 13.5.2.2 |
| Hose Racks Pressure Reducing & Relief Valves | Test | NFPA 25 | 13.1.1.2 | 13.5.3.2 |
| Hoses | Test | NFPA 1962 | - | |
| Obstruction Investigation | Inspect | NFPA 25 | 5.1.1.2 | 14.2 |
| Pre-Action Valve - (external reset type) Interior | Inspect | NFPA 25 | 13.1.1.2 | 13.4.3.1.7 |
| Pre-Action Valve - Strainers, Filters & Orifices | Inspect | NFPA 25 | 13.1.1.2 | 13.4.3.1.8 |
| Sprinkler - Extra High Temp. | Test | NFPA 25 | 5.1.1.2 | 5.3.1.1.1.4 |
| Sprinkler – Harsh Environment | Test | NFPA 25 | - | 5.3.1.1.2 |
| Sprinkler System Pressure Reducing & Relief Valves | Test | NFPA 25 | 13.1.1.2 | 13.5.1.2 |
| Strainers - Baskets & Screen | Maintenance | NFPA 25 | 10.1.1.2 | 10.2.1.4, 10.2.1.7, A.10.2.7 |

## 10 Year & every 10 Years thereafter:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|

## 20 Year & every 10 Years thereafter:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Sprinklers - Fast Response | Replace/Test | NFPA 25 | 5.1.1.2 | 5.3.1.1.1.3 |

Based on NFPA 25, 2011 and 1962, 2008 Editions

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Standpipe and Hose Systems

### Weekly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (sealed) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1 |
| Gauges | Inspect | NFPA 25 | 6.1.1.2 | 6.2.2 |

### Monthly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve - (locked) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |
| Control Valve - (tamper switches) | Inspect | NFPA 25 | 13.1.1.2 | 13.3.2.1.1 |

### Quarterly:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Fire Department Connection | Inspect | NFPA 25 | 13.1.1.2 | 13.7.1 |
| Fire Department Connection | Maintenance | NFPA 25 | - | 13.7.2, 13.7.3 |
| Hose Valves | Inspect | NFPA 25 | 13.1.1.2 | 13.5.6.1 |
| Low Air Pressure Alarms | Test | NFPA 25 | 13.1.1.2 | 13.4.4.2.6 |
| Main Drain (when sole source of water is through a Backflow Preventer and/or Pressure Reducing Valves) | Test | NFPA 25 | 13.1.1.2 | 13.2.5, 13.2.5.1, 13.3.3.4 |
| Pressure Regulating Devices and Connections | Inspect | NFPA 25 | 13.1.1.2 | 13.5.1.1 |
| Waterflow Alarms | Test | NFPA 25 | 13.1.1.2 | 13.2.6 |

### Semi-Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Control Valve – (tamper switches) | Test | NFPA 25 | 13.1.1.2 | 13.3.3.5 |

### Annual:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Cabinet | Inspect | NFPA 25 | 6.1.1.2 | NFPA 1962 |
| Fire Hose | Inspect | NFPA 25 | 6.1.1.2 | NFPA 1962 |
| Fire Hose - Other Than Occupant Hose (service test) | Test | NFPA 1962 | - | 4.1.2 |
| Hose Connections | Maintenance | NFPA 25 | 6.1.1.2 | Table 6.1.2 |
| Hose Connection/Pressure Regulating Devices | Inspect | NFPA 25 | 13.1.1.2 | 13.5.2.1 |
| Hose Nozzles | Inspect | NFPA 25 | 6.1.1.2 | NFPA 1962 |
| Hose Racks | Inspect | NFPA 25 | 13.1.1.2 | 13.5.3.1 |
| Hose Storage Device | Inspect | NFPA 25 | 6.1.1.2 | NFPA 1962 |
| Hose Storage Device | Test | NFPA 25 | 6.1.1.2 | NFPA 1962 |
| Hydraulic Placard | Inspect | NFPA 25 | 6.1.1.2 | 6.2.3 |
| Main Drain | Test | NFPA 25 | 13.1.1.2 | 13.2.5, 13.2.5.1, 13.3.3.4 |
| Occupant Fire Hose & Nozzles | Inspect | NFPA 1962 | - | 4.3 |
| Piping | Inspect | NFPA 25 | 6.1.1.2 | 6.2.1 |

FRASER SURREY DOCKS
Pacific Rim Stevedoring

# Summary of NFPA
# Inspection, Test & Maintenance Requirements / Schedule

## Annual (cont.):

| | | | | |
|---|---|---|---|---|
| Pressure Reducing Valves | Inspect | NFPA 25 | 13.1.1.2 | 13.5.2.1, 13.5.3.1 |
| Valves (all types) | Maintenance | NFPA 25 | 13.1.1.2 | 13.3.4 |

## 5 year:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Fire Hose (service test) and Every 3 Yrs. Thereafter | Test | NFPA 25 | 6.1.1.2 | NFPA 1962 |
| Flow Test Most Remote Hose Connection | Test | NFPA 25 | 6.1.1.2 | 6.3.1 |
| Hydrostatic Test (dry systems or pipe) | Test | NFPA 25 | 6.1.1.2 | 6.3.2 |
| Pressure Control Valve | Test | NFPA 25 | 13.1.1.2 | 13.5.3.2 |
| Pressure Reducing Valve | Test | NFPA 25 | 13.1.1.2 | 13.5.2.2, 13.5.3.2 |

## Prior to going in service:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Fire Hose (service test) - Within Prior 90 Days | Inspect | NFPA 1962 | - | 4.1.1, 4.3.1 |

## After each use:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Fire Hose (service test) | Inspect/Test | NFPA 1962 | - | 4.3.7 |
| Fire Hose (service test) | Maintenance | NFPA 25 | 6.1.1.2 | 6.4 |
| Hose Nozzle | Inspect | NFPA 25 | 6.1.1.2 | NFPA 1962 |

## After Freezing:

| Item | Activity | Standard | Table | Paragraph |
|---|---|---|---|---|
| Fire Hose (service test) | Test | NFPA 1962 | - | 4.1.12 |

Based on NFPA 25, 2011 and 1962, 2008 Editions