



CLASSIFICATION STANDARD

HEATING, POWER AND STATIONARY PLANT OPERATION

OPERATIONAL CATEGORY

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OPERATIONAL CATEGORY

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CLASSIFICATION STANDARD
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RECORD OF AMENDMENTS

Amendment No.	Date	Inserted by	Remarks
1	November 1968	TB	
2	October 1986	TB 803362	Replace all bench-mark position descriptions. Add a ninth level to the level structure. Convert all imperial measured to the metric system.

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In Ascending Order of Point Values

INTRODUCTION

The classification standard for the Heating, Power and Stationary Plant Operation Group is a point-rating plan consisting of an introduction, definition of the Operational Category and the occupational group, rating scales and bench-mark position descriptions.

Point rating is an analytical, quantitative method of determining the relative values of jobs. Point-rating plans define characteristics or factors common to the jobs being evaluated, define degrees of each factor and allocate point values to each degree. The total value determined for each job is the sum of the point values assigned by the raters.

All methods of job evaluation require the exercise of judgment and the orderly collection and analysis of information in order that consistent judgments can be made. The point-rating method facilitates rational discussion and resolution of differences in determining the relative values of jobs.

Factors

The combined factors may not describe all aspects of jobs. They deal only with those characteristics that can be defined and distinguished and that are useful in determining the relative worth of jobs. Five factors are used in this plan.

Factor Weighting and Point Distribution

The weighting of each factor reflects its relative importance. Similarly, points are distributed to the factors or elements in an arithmetic progression.

Rating Scales

In the rating plan the following factors, factor weights and point values are used.

Factors	Factor Weights	POINT VALUES	
		Minimum	Maximum
1) Skill and Knowledge	37.5	70	375
2) Operational Responsibility	35.0	70	350
3) Working Conditions			
a) Environment	6.0	12	60
b) Hazards	4.0	8	40
4) Physical Effort	5.0	10	50
5) Supervision	12.5	5	125

Bench-mark Positions

Bench-mark position descriptions are used to exemplify degrees of factors. Each description consists of a brief summary, a list of the principal duties with the percentage of time devoted to each, and specifications describing the degree of each factor to which the position is rated. The bench-mark positions have been evaluated and the degree and point values assigned for each factor are shown in the specifications. These descriptions are an integral part of the point-rating plan and are used to ensure consistency in applying the rating scales.

Use of the Standard

There are six steps in the application of this classification standard.

1. The position description is studied to ensure understanding of the position as a whole. The relation of the position being rated to positions above and below it in the organization is also studied.
2. Allocation of the position to the category and the group is confirmed by reference to the definitions and the descriptions of inclusions and exclusions.
3. Tentative degrees of each factor in the position being rated are determined by comparison with degree definitions in the rating scales.. Uniform application of degree definitions requires frequent reference to the description of factors and the notes to raters.
4. The description of the factor in each of the bench-mark positions exemplifying the degree tentatively established is compared with the description of the factor in the position being rated. Comparisons are also made with descriptions of the factor in bench-mark positions for the degrees above and below the one tentatively established.
5. The point values for all factors are added to determine the tentative total point rating.
6. The position being rated is compared as a whole with positions to which similar total point values have been assigned, as a check on the validity of the total rating.

Determination of Levels

The ultimate objective of job evaluation is the determination of the relative values of jobs in each occupational group. Jobs that fall within a designated range of point values will be regarded as of equal difficulty and will be assigned to the same level.

LEVEL AND LEVEL BOUNDARIES

1	<270
2	271 - 356
3	357 - 442
4	443 - 528
5	529 - 614
6	615 - 700
7	701 - 786
8	787 - 872
9	873 AND OVER

CATEGORY DEFINITION

Occupational categories were repealed by the Public Service Reform Act (PSRA), effective April 1, 1993. Therefore, the occupational category definitions have been deleted from the classification standards.

GROUP DEFINITION

For occupational group allocation, it is recommended that you use [the Occupational Group Definition Maps](#), which provide the 1999 group definition and their corresponding inclusion and exclusion statements. The maps explicitly link the relevant parts of the overall 1999 occupational group definition to each classification standard.

SKILL AND KNOWLEDGE

This factor is used to measure the difficulty of the duties in terms of the nature of the work performed and the vocational preparation required.

Definitions

"Vocational preparation" refers to the training and experience required to understand underlying principles, to learn the techniques and practices, and to develop the ability to perform the duties of the position. It is normally acquired through one or more of the following ways: formal education or private study, in-plant training including organized classroom study, on-the-job training under a qualified worker, and working in related and progressively more responsible jobs.

"A service" or "a major service" is defined as one of the following as indicated in the table below.

"Services" or "major services" are defined as two or more of the following as indicated in the table below:

"Service"	"Major Service"
1) Heating - through low or high pressure hot water or steam boilers.	1) Heating - through high pressure hot water or steam boilers with a combined capacity exceeding 20,000 kilowatts.
2) Cooling - by central plant or individual refrigeration or air conditioning units.	2) Cooling - by central plant or individual units with a combined capacity exceeding 10,000 kilowatts.
3) Electric power - continuous or stand-by generation.	3) Electric Power - continuous generation with a capacity exceeding 1,250 kilowatts.
4) Water treatment.	4) Large water treatment plants, including pumping, storage, chlorination, and at least two of the following processes: presetting, flocculation, softening, recarbonation, filtration, odor and taste removal and aeration.
5) Sewage treatment.	5) Large sewage treatment plants capable of reducing biological oxygen demand by more than 60 percent.
6) Dry docking.	6) Dry docking for large ocean going vessels.
7) Pumping and storing of fuel.	7) Pumping and storing of fuel in a depot with a capacity exceeding 5,000,000 litres.
8) Steam or high temperature water and condensate return systems.	8) Extensive steam or high temperature water and condensate return systems.

Notes to Raters

The degrees of Vocational Preparation element that are assigned to the bench-mark positions have been established by the comparative rank of key positions in the occupational group. The degree tentatively selected in rating a position is to be confirmed by direct comparison of the position being rated with the duties and specifications of the bench-mark positions. In selecting a tentative rating for a position under this element the following characteristics are to be considered

- 1) the number of different subject areas that have to be studied and learnt in order to operate and maintain the plant and equipment and provide the service
e.g. heating, refrigeration, machine shop and welding, internal combustion engines, electrical generation, water treatment, etc.

in combination with

- 2) the type and amount of experience necessary to gain sufficient familiarity with the plant and equipment so that the operational and maintenance duties can be performed according to the required regulations and procedures.

ENERGY CONVERSION FACTORS

1. Heating
Boilers, steam
 High temperature, hot water
 Low temperature, hot water
 Heat pumps

1 HP = 9.8095 KW
2. Cooling
Refrigeration compressors and chillers

1 ton = 3.5169 KW
3. Other Equipment
Small self contained air conditioning and
refrigeration units, pumps, fans, motors,
etc.

1 HP = 0.746 KW

RATING SCALE - SKILL AND KNOWLEDGE

NATURE OF WORK, AND DEGREE

DEGREE OF
VOCATIONAL
PREPARATION

Tends, starts and stops stationary plant equipment, makes coarse mechanical adjustments and performs simple maintenance tasks such as lubricating, painting and cleaning.

Operates and maintains stationary plant equipment, makes fine mechanical adjustments and performs maintenance tasks such as repairing and overhauling equipment or replacing parts.

Controls the operation of a stationary plant providing a service, including repairs, overhauls and installation of equipment.
or
Controls the activities of a shift on a rotational basis.

Controls the operation and maintenance of a stationary plant providing a number of services
or
a single major service.

Controls the operation and maintenance of a large plant providing several major services.

A B C D E

1	70	95	120		
2	96	121	146	171	
3	122	147	172	196	
4	148	173	197	221	
5	174	198	222	247	272
6		223	248	273	298
7		249	274	299	324
8		275	300	325	350
9			326	351	375

OPERATIONAL RESPONSIBILITY

This factor is used to measure the difficulty of the work in terms of the scope that exists for initiation and judgment and the impact of the duties on the service provided.

Definition

"Scope for initiative and judgment" refers to the freedom to act within the framework of instructions, regulations and established procedures; the availability of direction or supervision; and the degree of authority delegated by superiors.

"Impact of activities" refers to the effect of the activities on plant operations and the services provided.

Notes to Raters

The four degrees of the Impact of Activities element are illustrated by the bench-mark position descriptions. In selecting a tentative rating for a position under this element the following characteristics of the work are to be considered.

1. The number and variety of operations performed and services provided.
2. The nature of the plant and the distribution systems.
3. The extent to which the position implies accountability for plant operations, cost control, energy conservation, safety, etc. This is usually related to the organization in which the position is located and the responsibilities of other positions in the organization.
4. The effect on organizations and people for whom the services are provided.
5. The consequences of an error in judgment.

Anyone of these characteristics is only an indication of the impact of activities, and the whole context within which the work is performed is to be considered. The degree of the element tentatively selected for a position is to be confirmed by direct comparison of the position with the duties and specifications of the bench-mark positions.

The Operational Responsibility rating tentatively selected is to be confirmed by comparing the position with the descriptions of the duties and specifications of the bench-mark positions.

RATING SCALE - OPERATIONAL RESPONSIBILITY

Scope for Initiative and Judgment, and Degree

Degree of Impact of Activities	Methods and procedures are prescribed in detail or are standardized. There is little scope for initiative and judgment.	Methods and procedures are normally well defined. There is some scope for initiative and judgment in interpreting instructions and regulations to meet operational and user requirements.	A moderate degree of initiative and judgment is required in interpreting instructions and regulations, in planning and directing operations, and in planning and scheduling major repair and overhaul programs so as not to disrupt the services provided.	A high degree of initiative and judgment is required in interpreting instructions and regulations, in devising modifications and changes in plant operating methods and procedures, and in evaluating and making recommendations on proposals to change operating methods and procedures affecting plants operated by the department.
	A	B	C	D
1	70	116	162	208
2	117	163	209	255
3	164	210	256	302
4	211	257	303	350

WORKING CONDITIONS

This factor is used to measure the disagreeable conditions of the work as indicated by the environment in which the duties are performed and the exposure to hazards.

Definitions

"Environment" refers to the disagreeable conditions under which the duties are performed, such as

- exposure to dust and dirt, obnoxious odors and extremes of noise, vibration, heat and cold,
- the required wearing of cumbersome protective clothing or equipment.

"Hazards" refers to requirements associated with the duties that can result in injury and disability, although usual safety measures have been taken.

Notes to Raters

In rating positions under the Environment element only those conditions that make the work disagreeable and that are of value in assessing relative differences between jobs in the group are to be considered. In using this element raters are to consider the severity and frequency of the exposure.

In rating positions under the Hazards element only the hazards that are probable are to be considered, and not those that are remotely possible. In using this element raters are to consider the frequency of, and the need for, the exposure.

RATING SCALE – ENVIRONMENT

ENVIRONMENT AND DEGREE		POINTS
Occasional exposure to a few disagreeable conditions.	1	12
Frequent exposure to one disagreeable condition, or Occasional exposure to either several disagreeable conditions, or to one very disagreeable condition.	2	28
Frequent exposure to several disagreeable conditions or to one very disagreeable condition.	3	44
Constant exposure to several very disagreeable working conditions.	4	60

RATING SCALE - HAZARDS

Frequency of Unavoidable Exposure to Hazards, and Degree	Probable Severity of Injury, and Degree		
	A	B	C
	Minor injuries such as cuts, bruises, abrasions, scalds, burns or strains.	"Lost-time" injuries such as serious burns, eye injuries or loss of finger.	Incapacitating injuries such as those resulting in serious permanent impairment.
	8	18	28
Occasional 1			
	20	30	40
Frequent 2			

PHYSICAL EFFORT

This factor is used to measure the demands of the work in terms of the physical effort required to perform the duties.

Notes to Raters

In rating positions under the Physical Effort factor raters are to consider the fatigue caused by the kind, frequency, intensity and duration of muscular exertion, the work positions, and the weight of tools and materials handled.

The degree of the Physical Effort factor tentatively selected is to be confirmed by direct comparison of the position being rated with the duties and specifications of the bench-mark positions.

RATING SCALE - PHYSICAL EFFORT

PHYSICAL EFFORT AND DEGREE		POINTS
Work requires intermittent standing, walking, or handling of light-weight objects. Occasionally requires greater physical effort for short periods.	1	10
Work requires frequent or continual standing or walking, where only limited periods of relief are possible, or continual handling of light-weight objects. Occasionally requires greater physical effort for short periods.	2	23
Work requires frequent climbing, working from ladders or scaffolds, handling of medium weight objects, or working in an awkward position. Occasionally requires greater physical effort for short periods.	3	36
Work requires frequent handling of heavy weight objects. Occasionally requires great physical effort while working in awkward positions.	4	50

SUPERVISION

This factor is used to measure the continuing responsibility that the incumbent of the position assumes for the work of other employees in terms of the nature of the supervisory responsibility and the number of employees supervised.

Definitions

"Nature of supervisory responsibility" refers to the extent to which supervisory positions have such responsibilities as controlling the quality and quantity of work, assigning work, allocating staff, appraising employee performance, training and disciplining staff, and making recommendations on the number of positions needed to perform the work.

"Number of employees supervised" refers to the total number of employees for whom the incumbent of the position exercises supervisory control directly or through subordinate supervisors.

Notes to Raters

In all positions there is some requirement for showing others how to perform tasks or duties; therefore, no position will be assigned less than 5 points (A1).

Occasional supervision, such as that performed during absences of the supervisor on annual or sick leave, is not to be rated.

For the purpose of this standard the number of employees supervised includes the total of the following:

1. The number of employees for whom the incumbent of the position has continuous responsibility.
2. The number of person-years of work performed by casual, part-time and seasonal employees who are supervised by the incumbent of the position.

In rating positions all the characteristics outlined for each degree of the Nature of Supervisory Responsibility element must be considered. Generally speaking, the criterion for the assignment of a position to a degree is that it must include most of the characteristics of the degree to which it is assigned.

The rating scale shows the point values assigned to four degrees of the Nature of Supervisory Responsibility element. These degrees, which are designated only as A, B, C and D on the scale, are defined in the following table:

Nature of Supervisory
Responsibility, and Degree

Occasionally shows other employees how to perform tasks or duties. A

Assumes limited supervisory responsibility such as assigning work and checking work for accuracy. B

Instructs employees in work methods and procedures, ensures that work is done in accordance with established standards; advises and guides on work problems; reports on employee performance and punctuality; reports to superior on cases requiring disciplinary action. C

Gives advice and guidance to subordinate supervisors; establishes standards of quality and quantity of work; establishes priorities and work schedules; makes allocations of staff to ensure their effective utilization and development; formally appraises general performance of subordinates and discusses appraisals with them; interviews employees who present problems of discipline; formally recommends disciplinary action; formally recommends changes in number of positions. D

RATING SCALE - SUPERVISION

NUMBER OF EMPLOYEES SUPERVISED, AND DEGREE		DEGREE OF NATURE OF SUPERVISORY RESPONSIBILITY			
		A	B	C	D
ANY NUMBER OF EMPLOYEES	1.	5			
1 - 6	2.		15	30	50
7 - 15	3.		25	50	75
16 - 25	4.		40	75	100
26 AND OVER	5.		55	100	125

BENCH-MARK POSITIONS

NO.	BENCH-MARK TITLE	S & K	O R	W. C. E	H	P E	SUP	TOTAL PTS	LEVEL	PAGE NO.
16	PLANT SUPERINTENDENT, CLIFF STREET	E9 375	D4	350	1 12	AI	8 1 10 D5 125	880	9	16.1
15	CHIEF, STATIONARY ENGINEER, DORVAL	E8 350	D4	350	1 12	AI	8 1 10 D4 100	830	8	15.1
14	CHIEF, OPERATING ENGINEER, CFB PETAWAWA	E7 324	D3	302	1 12	AI	8 1 10 D4 100	765	7	14.1
13	CHIEF, STATIONARY ENGINEER, GREENWOOD	D6 273	C3	256	1 12	AI	8 1 10 D4 100	659	6	13.1
12	SHIFT SUPERVISOR, CLIFF STREET	C6 248	B3	210	2 28	A2	20 2 23 C2 30	559	5	12.1
11	CHIEF ENGINEER, N. F. R. C.	D4 221	C2	209	2 28	A2	20 2 23 C2 30	531	5	11.1
10	SHIFT SUPERVISOR, BOOTH STREET	C4 197	B3	210	2 28	A2	20 2 23 C2 30	508	4	10.1
9	SHIFT ENGINEER	C4 197	B3	210	2 28	A2	20 2 23 C2 30	508	4	9.1
8	SHIFT OPERATOR	B4 173	B2	163	2 28	A2	20 2 23 AI 5	412	3	8.1
7	ASSISTANT SHIFT ENGINEER	B3 147	B2	163	2 28	A2	20 2 23 AI 5	386	3	7.1
6	SHIFT OPERATOR S. C. F.	B3 147	B2	163	2 28	A2	20 2 23 AI 5	386	3	6.1
5	ASSISTANT ENGINEER	B2 121	B2	163	2 28	A2	20 2 23 AI 5	360	3	5.1
4	SHIFT OPERATOR, SEWAGE TREATMENT PLANT	B2 121	B1	116	4 60	B2	30 2 23 AI 5	355	2	4.1
3	ASSISTANT OPERATOR, BAIT DEPOT	B2 121	B1	116	3 44	A2	20 2 23 B2 15	339	2	3.1
2	ASSISTANT SHIFT ENGINEER	B2 121	B1	116	2 28	A2	20 2 23 AI 5	313	2	2.1
1	BOILER ROOM HELPER	AI 70	AI	70	3 44	A2	20 4 50 AI 5	259	1	1.1

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 1

Level: 1

Descriptive Title: Boiler-Room Helper
 Low Pressure Steam Plant

Point Rating: 259

Summary

Reporting to the Shift Operating Engineer, stokes and tends five low pressure steam boilers, on a rotating shift schedule, in five separate heating plants to provide heat and domestic hot water to a group of buildings at Canadian Forces Base Esquimalt, British Columbia; assists the operating engineer and trades personnel perform overhauls and major repairs; and performs related duties.

Duties

% of Time

Stokes and tends five low pressure steam boilers (4 coal fired and 1 oil fired) aggregating 2,450 kilowatts, in five separate locations to maintain combustion efficiency and prescribed boiler temperatures and pressures, by:

80

- periodically inspecting the various plants, on foot;
- starting and stopping the automatic oil fired boiler;
- loading coal bunkers and hoppers and controlling the feeding rate of the semi automatic coal stoker;
- regulating the flow of air through the fire beds;
- shaking down grates, breaking clinkers, removing fly ash from fire sides and cleaning fire tubes;
- opening and closing valves in steam and feed water lines and starting and stopping feed water pumps to maintain boiler levels when automatic controls fail;

Assists the Operating Engineer and trades personnel perform overhauls and major repairs, by:

10

- entering laid-up boilers and reporting on the visible condition of the boiler interiors;
- removing scale and corrosion from watersides with pressure hoses, scrapers and cleaning compounds;
- replacing burnt or broken grates and brickwork.

Performs related duties such as "blowing down" boilers and gauge glasses; cleaning and lubricating equipment; changing water gauge glasses; "righting" boiler tubes; sweeping, cleaning and painting boiler rooms and equipment; checking for fire hazards and reporting defects to operating engineer for remedial action.

10

Specifications

Degree/
Points

Skill and Knowledge

The work requires the skill and knowledge to read simple gauges and scales, open and close valves and switches, start and stop feed water pumps, clean and lubricate equipment and manipulate simple hand tools such as soot blowers, hoses, clinker hooks, shovels,

AI / 70

scrapers, brooms and mops. The work also requires familiarity with the operation of semi-automatic stoker and oil-fired boiler controls. This skill and knowledge is usually acquired through several months experience within the plants, including on-the-job training.

Operational Responsibility

The work requires the stoking and tending of low pressure steam boilers in accordance with established methods and procedures. The activities affect the combustion efficiency of five low pressure boilers. Supervision is provided by an operating engineer and the overhaul and repair tasks performed are closely supervised. Failure to follow procedures regarding the control of fire beds or flow of oil during a shift could result in burnt equipment and wasted fuel.

AI / 70

Working Conditions

Environment - The work requires frequent exposure to heat, dust, and combustion gases when stoking and tending boilers, and occasional exposure to hot, cramped and dirty spaces when working in laid-up boiler fire boxes. Some of the duties require the use of goggles, face masks and protective clothing.

3 / 44

Hazards - There is frequent exposure to injuries such as minor burns, scalds and abrasions when replacing grates and brickwork, cleaning fire tubes and performing other boiler tending duties. There is occasional exposure to back strain and eye injury when shoveling coal, removing ash or shaking down clinker.

A2 / 20

Physical Effort

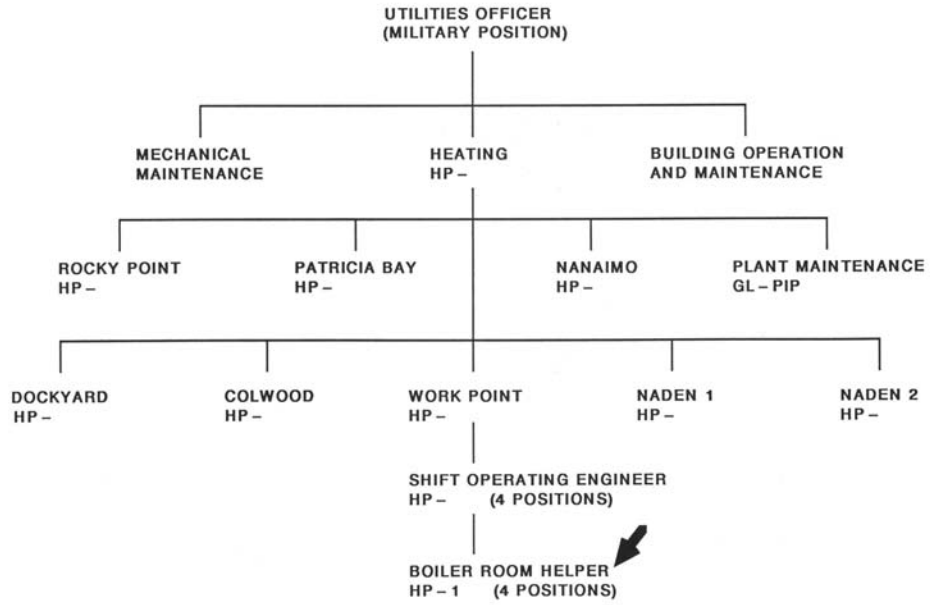
The work requires shoveling coal by hand from a coal-bin into a wheelbarrow and into a hopper or firebox, removing fly ash from clean-out doors by shovel and wheelbarrow, and sweeping and cleaning the boiler rooms. There is an occasional requirement to manipulate hoses and scrapers and to replace heavy cast iron grates in laid-up boiler fire boxes.

4 / 50

Supervision

Supervision of other employees is not required, but it may be necessary to show others how to perform tasks.

AI / 5



CANADIAN FORCES BASE
ESQUIMALT

DEPARTMENT OF NATIONAL
DEFENCE

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 2

Level: 2

Descriptive Title: Assistant Shift Engineer,
Base Heating Plants

Point Rating: 313

Summary

Reporting to the Shift Engineer, Base Heating Plants, assists in the operation and maintenance of a number of oil fired high and low pressure steam boilers, on a rotating shift schedule, to provide heat, steam and hot water for National Defense buildings at Canadian Forces Base, Moncton, New Brunswick, including the Moncton Militia Garrison and Detachments; and performs other duties.

Duties

% of Time

Assists in the operation of three oil fired high pressure steam boilers, aggregating 5,890 kilowatts, and periodically checks the operation of 12 low pressure heating units aggregating 8,150 kilowatts on a scheduled basis, by:

65

- starting and stopping electrically driven feed water and fuel pumps;
- collecting water samples from boilers and condensate return systems;
- conducting standardized tests on water samples to determine the quantity of chemicals required to maintain water suitability;
- adding chemicals as indicated by test results and periodically "blowing down" boiler to change water;
- checking and recording fuel, light oil and propane gas supplies.

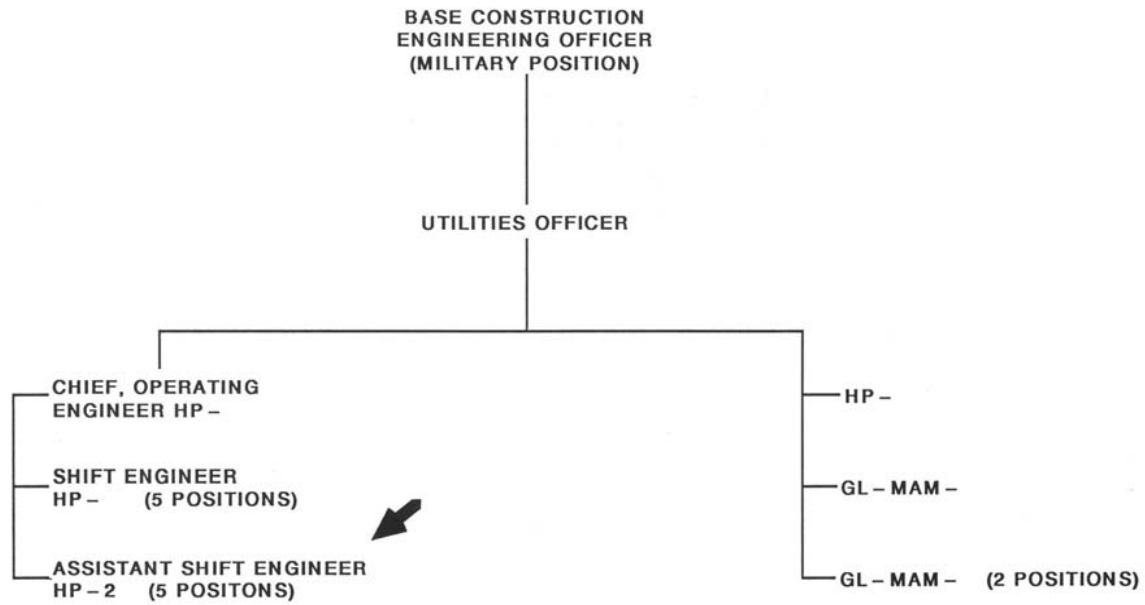
Assists the Shift Engineer to carry out maintenance and minor repair tasks to main plant equipment, by:

20

- cleaning, adjusting, regulating and replacing burner and nozzle tips;
- lubricating all moving parts;
- inspecting the firesides, watersides and accessory equipment of laid-up boilers and replacing boiler controls and mechanisms;
- checking boiler manhole and handhold plates, tubes, stay-bolts and surfaces for corrosion, scale, leaks and other faults and reporting findings to the Shift Engineer;
- removing and replacing boiler covers, overhauling equipment and removing or replacing damaged parts using a variety of hand and power tools;
- cleaning and tidying the boiler rooms and equipment.

Performs related duties such as analyzing flue gas, calculating furnace and boiler efficiency, operating the plant under the direction of the Chief Engineer during the absence of the Shift Engineer, ensuring access to boiler plants, investigating trouble calls from locations outside the plant and driving a motor vehicle from site to site during inspection tours.

<u>Specifications</u>	<u>Degree/ Points</u>
<u>Skill and Knowledge</u> The work requires the skill and knowledge to operate and maintain, under supervision, oil fired steam boilers and ancillary equipment; to use a variety of hand, power and machine tools and measuring instruments; to start and stop pumps; to carry out standardized feed water chemical tests; and maintain a shift log. The work requires a knowledge of operational and running maintenance procedures covering high and low pressure boiler pumps and closely related ancillary equipment. This skill and knowledge is normally acquired by the formal study of operational and maintenance procedures, by the study of arithmetic, basic physics and chemistry and by experience operating high and low pressure steam plants, under the direction of a shift engineer, according to the required regulations and established procedures.	B2 / 121
<u>Operational Responsibility</u> The work requires operating, maintenance and repair tasks; maintaining a shift log; interpreting feed water test results; starting and stopping pumps and electric motors according to established procedures and methods. There is a requirement to investigate trouble calls from locations outside the plant and to identify malfunctions and potential hazards in the handling and storage of fuels and feed water chemicals. Reports on equipment or operational problems are made to the Shift Engineer. The activities affect the service life of high and low pressure boilers and failure to follow established procedures could result in the waste of fuel, or interruption of the heating service to a building or section of the base due to the failure of a boiler or a piece of equipment.	B1 / 116
<u>Working Conditions</u> Environment - The work requires occasional exposure to dirt, dust, heat and fumes and the use of goggles, face masks and protective clothing when inspecting firesides, checking for corrosion, scale and leaks and when adding chemicals to boiler water. Hazards - There is frequent exposure to injuries such as minor burns, scalds, burns and abrasions when maintaining, repairing and overhauling plant and equipment.	2 / 28 A2 / 20
<u>Physical Effort</u> The work requires continual standing and walking during inspection tours and there is an occasional requirement to lift medium weight tools and equipment when overhauling the plant or when shoveling snow from heating plant doors during inspection tours.	2 / 23
<u>Supervision</u> Supervision of other employees is not required, but it may be necessary to show others how to perform tasks.	A1 / 5



CANADIAN FORCES BASE
MONCTON

DEPARTMENT OF NATIONAL
DEFENCE

3.1
BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 3

Level: 2

Descriptive Title: Assistant Operator,
Bait Depot

Point Rating: 339

Summary

Reporting to the Bait Depot Operator, operates and maintains, on a rotating shift schedule, a refrigeration plant to quick freeze fish bait at Long Harbor, Newfoundland. Supervises, during the fishing season, a crew of laborers engaged in unloading, freezing, storing and shipping fish bait; buys and sells fish bait; and performs related duties.

Duties

% of Time

Operates an 18,200 kilogram capacity quick freeze and cold storage facility, with high pressure ammonia and freon units aggregating 160 kilowatts, and a private water supply, by:

40

- interpreting operational methods and procedures and devising and proposing modification to suit the facility or to improve efficiency;
- observing gauges and instruments and rating readings in a log book;
- starting, stopping and regulating motors and other equipment to maintain temperatures at the required levels.

Carries out preventive maintenance and repair duties, by:

30

- inspecting electric motors, evaporators, condensers, expansion coils, gas receivers and other components of the refrigeration units, testing for leakages and noting unusual noises or vibrations;
- investigating and diagnosing equipment failures and dismantling, repairing or replacing the failed components;
- reconditioning pumps and compressors and repairing or replacing associated piping, valves and plumbing fixtures;
- cleaning and painting buildings and wharf structures;
- assigning work priorities to all maintenance and repair tasks.

Supervises, during the fishing season, up to 12 casual laborers (2 person-years) engaged in unloading, freezing, storing and shipping fish bait during a shift, by assigning tasks, reporting hours worked and performance, and calculating pay deductions and gratuities.

10

Performs related duties such as buying and selling fish bait according to established price scales, lifting, carrying and stacking boxes of fish bait, recording purchases and sales, accounting for money dispersed and received, arranging for bait shipments to other depots, reporting on the disposal of spoiled bait.

20

Heating, Power and Stationary

Plant Operation

B. M. P. D. No. 3

3.2

Degree/
Points

Specifications

Skill and Knowledge

The work requires skill and knowledge, to operate and maintain, under supervision, a refrigeration plant and related equipment; to read vacuum gauges and thermometers; to start and stop electric motors; to perform straightforward clerical and bookkeeping duties. The work requires a knowledge of procedures governing the operation and maintenance of a quick-freeze refrigeration plant; of arithmetic, basic physics and bookkeeping; of basic plumbing, carpentry, welding, brazing and soldering techniques. The work requires the use of various hand and power tools. This skill and knowledge is normally acquired by formal or private study, on-the-job training and experience in operating a refrigeration and storage plant according to the required regulations and procedures.

B2 / 121

Operational Responsibility

The work requires operating, maintaining and repairing refrigeration plant equipment in accordance with instructions and established methods and procedures and the buying and selling of fish bait according to established price scales. The work requires supervising casual laborers during the fishing season. The activities affect the storage and availability of fish bait used by local commercial fishermen, the service life of the refrigeration plant and equipment and the consumption of fuel. Reports on plant condition, malfunctions and casual workers are made to the Bait Depot Operator. Failure to detect malfunctions or to follow established procedures could result in bait spoilage or shortages and damage to equipment.

B1 / 116

Working Conditions

Environment - The work requires exposure to ammonia fumes and freon gas, noise, dampness, unpleasant odors and inclement weather. Extreme temperature changes are experienced when entering and leaving the freezer and cold storage areas.

3 / 44

Hazards - There is frequent exposure to injuries such as minor bruises, burns, abrasions and strains when maintaining or repairing equipment or lifting and carrying boxes of fish bait. Some duties require the wearing of goggles and protective clothing.

A2 / 20

Physical Effort

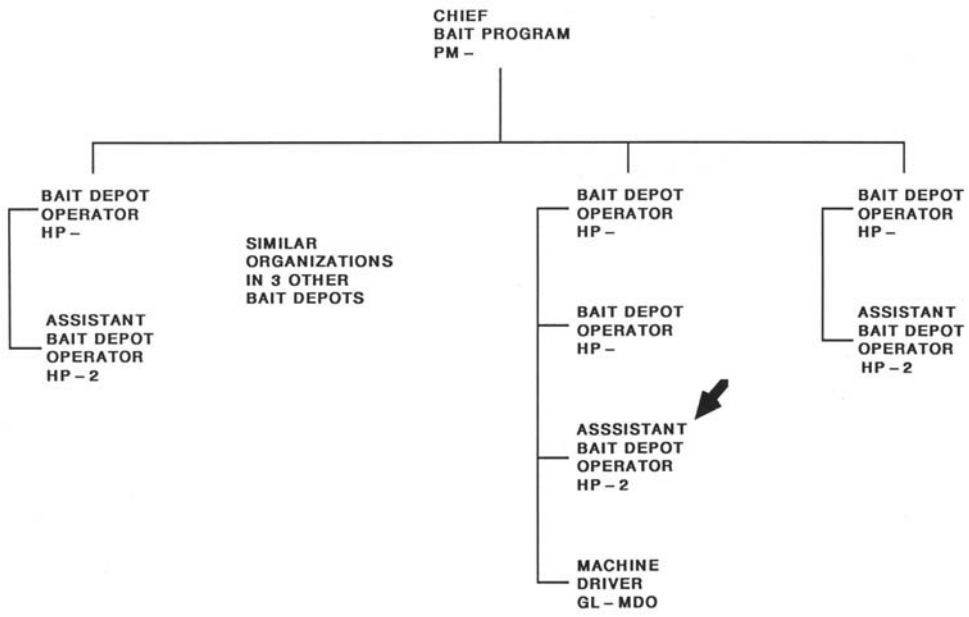
The work requires continual standing and walking, the lifting and carrying of medium weight boxes of fish, the intermittent painting of wharves structures and buildings and the climbing of ladders.

2 / 23

Supervision

The work requires assigning tasks and reporting on the work performance and hours worked of up to 12 casual employees (2 person-years).

B2 / 15



ATLANTIC FISHERIES SERVICE

FISHERIES AND OCEANS CANADA

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 4

Level: 2

Descriptive Title: Shift Operator,
Sewage Treatment Plant

Point Rating: 355

Summary

Reporting to the Shift Supervisor operates and maintains, on a rotational shift schedule, a sewage treatment plant, including 2 septic tanks, for the Canadian Forces Base, Cornwallis, Nova Scotia. Also operates 3 indoor swimming pools, the fuel storage and dispersing facility and performs related duties.

Duties

% of Time

Operates and maintains a 3,879,000 liters per day activated tertiary sludge treatment plant with sewage pumps aggregating 300 kilowatts, diffused aeration, phosphate removal, gas chlorination, aerobic digestion and third stage filtration to ensure that the sewage treatment and discharged effluent meets prescribed standards, by:

- controlling and regulating lift stations, sewage pumps, a comminutor, compressors and various pneumatic valves and control systems;
- controlling and servicing the diffused aeration system, the sludge and grease collection system, the alum feed system, the chlorination system, the gravity fed filters, the waste treatment lagoon and septic tanks to ensure their correct functioning;
- maintaining the correct oxygen to food ratio and adjusting supplies as tests and experience indicate;
- inspecting and maintaining the aeration, sludge and chlorine tanks, the secondary clarifier, the sewage collection system and various pumps and compressors;
- conducting tests to determine chlorine and P.H. residuals, dissolved oxygen levels, settle back and suspended solids;
- recording test results and calculating sludge volumes;
- compiling and recording all flow data, loading and wasting rates and chemical usage;
- collecting and shipping sewage samples for federal laboratory analysis.

75

Operates three swimming pool filtration systems having a combined capacity of 2,860,200 litres with gas chlorination, vacuum filtration, chemical feeder, sump and recirculating pumps aggregating 127 kilowatts, by:

- inspecting and regulating the recirculation system, the water supply from the pools and the overflow system;
- inspecting, regenerating and recharging the filtration system and chemical feed systems including three separate chlorinators and dry feeders;
- adding bulk chemicals to dry feeders;
- regulating and maintaining heat exchangers;
- providing pool water samples for bacteriological analysis, conducting tests and recording test results and gauge and meter readings.

20

Inspects and services all gasoline and diesel fuel oil storage and dispensing equipment, conducts weekly inspections and safety checks and carries out minor repairs on pumps, hose, valves, etc. Also maintains the sewage systems for the Boat Shed and Granville Range and performs other related duties.

5

Specifications

Skill and Knowledge

The work requires skill and knowledge to operate and maintain, under supervision, sewage and water treatment plants and equipment; to start and stop pumps; to carry out standardized chemical tests and to collect and ship samples. The work requires the use of a variety of hand and power tools and measuring instruments. The work requires knowledge of the procedures governing the operation and running maintenance of sewage and swimming pool facilities, of arithmetic and of basic chemistry. This skill and knowledge is normally acquired by formal or private study, in-plant training and experience in operating sewage treatment and filtration systems.

B2 / 121

Operational Responsibility

The work requires operating and maintaining sewage treatment and water filtration systems according to established procedures or under the instruction of the supervisor. This includes the conducting of standardized chemical tests, the collection and compilation of recorded data pertaining to sewage treatment and water filtration; the adjusting of the processes to ensure the plant operates efficiently and the effluent is discharged within prescribed limits. The activities affect the service life of the treatment tanks, filtration systems and pumps and the fuel storage and dispensing equipment. Malfunctions and equipment problems are reported to the shift supervisor. Failure to follow established procedures could result in the interruption of service, damaged equipment, and through the failure to respond to test results or observable conditions, the eventual pollution of a shellfish area.

B1 / 116

Working Conditions

Environment - the work requires exposure to obnoxious odors when repairing sludge pumps and cleaning screens, weirs and launders and to noxious fumes and dust when charging chemical feeders. Some tasks require working in awkward and confined spaces and the wearing of respirators, goggles, hard hats, safety boots and life belts. Outside equipment and plant has to be operated and maintained in all weather conditions.

4 / 60

Hazards - there is frequent exposure to injuries such as burns to skin and eyes from contact with caustic chemicals. There is also frequent exposure to toxic and pathogenic substances when carrying out maintenance tasks in the sewage facility.

B2 / 30

Physical Effort

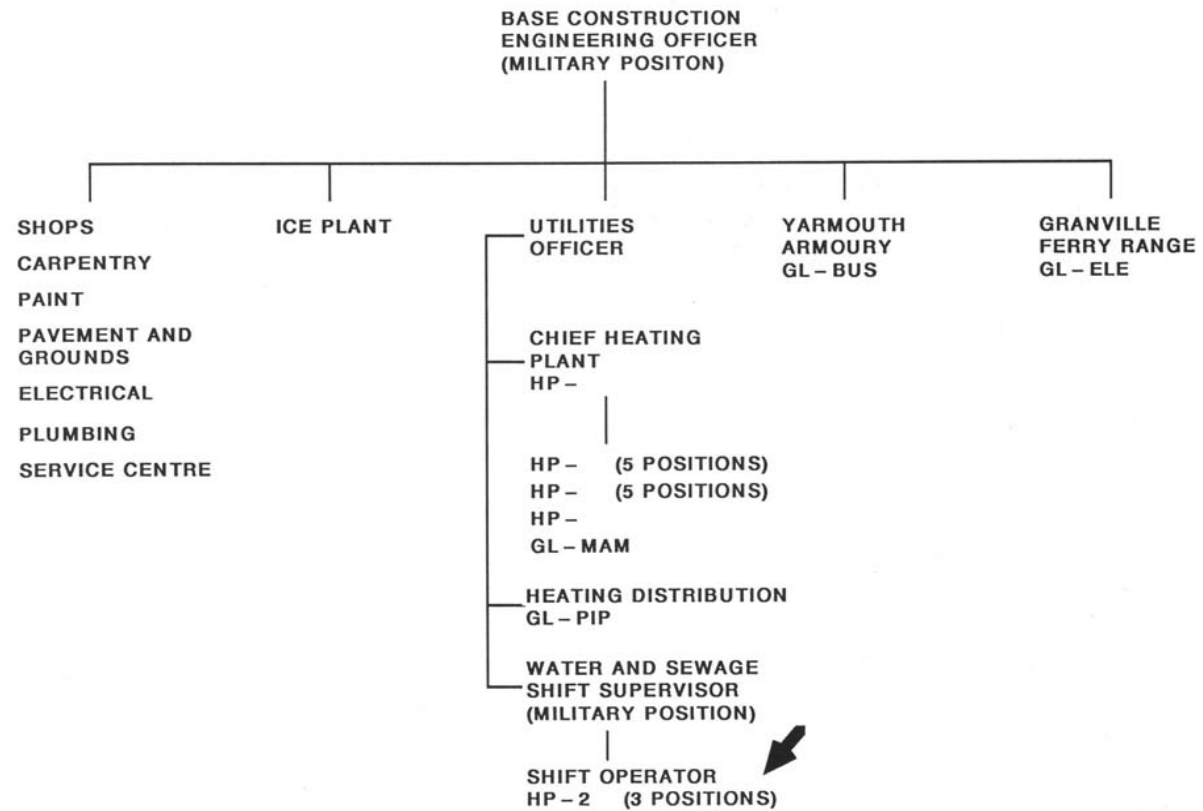
The work requires continual standing and walking frequent climbing, the intermittent operation of valves, and the lifting of medium weight parts and bags of chemicals when handling equipment and charging chemical feeders.

2 / 23

Supervision

Supervision of other employees is not required, but it may be necessary to show others how to perform tasks.

A1 / 5



CANADIAN FORCES BASE
CORNWALLIS

DEPARTMENT OF NATIONAL
DEFENCE

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 5

Level: 3

Descriptive Title: Assistant Engineer

Point Rating: 360

Summary

Reporting to the Chief Engineer, assists in the operation and maintenance of gas and oil fired, high pressure boilers, an electric generating plant and auxiliary equipment, on a rotating shift schedule, to provide heat, hot water and electric power to the Saskatchewan Penitentiary. Also carries out preventive maintenance and repair tasks throughout the institutions and performs related duties.

Duties

% of Time

Assists in the operation, maintenance and repair of three dual fuel, high pressure, steam boilers aggregating 19,615 kilowatts, an electric generating plant, high and low pressure steam lines and emergency light and power equipment, by:

45

- starting and stopping gas or oil fired boilers;
- observing instruments and gauges and regulating boiler feed water, and condensate pumps and deaerators to meet demand loads;
- regulating low and high pressure reducing valves;
- carrying out preventive maintenance and repair tasks, using special test equipment and tools to check equipment;
- starting, running and testing the standby diesel-electric generators, the switchboard and synchronization panel;
- inspecting ducts for leaks and needed repairs.

Carries out preventive maintenance and/or repairs in all buildings and equipment throughout the institutions, by:

35

- conducting daily inspections of buildings, mechanical systems, the water reservoirs and pumps and performing minor repairs to ensure equipment is operational and reliable;
- maintaining equipment, changing belts, filters, etc. and adjusting air controls and pumps according to manuals using special test apparatus and tools;
- reporting problems and deficiencies to appropriate personnel;
- instructing inmates on correct maintenance and repair methods.

Conducts fire prevention service checks and maintains fire fighting equipment, by:

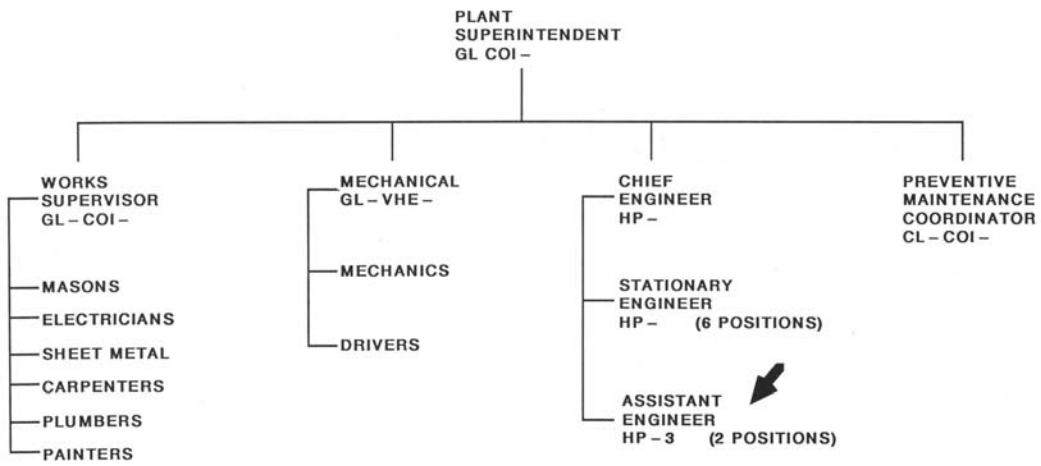
10

- regularly checking and testing fire extinguishers and signing for their serviceability;
- regularly testing fire hoses and hydrants;
- recommending the acquisition of new or different equipment.

Performs related maintenance and repair tasks as required, assists in the annual inspection of boilers, ensures that operations and inspection duties comply with Occupational Health and Safety Regulations and that safety and good housekeeping rules are understood and enforced.

10

<u>Specifications</u>	<u>Degree/ Points</u>
<u>Skill and Knowledge</u> The work requires skill and knowledge to operate, maintain and repair high pressure boilers, fans, pumps and controls and diesel electric standby power plants, switchboards and a synchronization indicator panel; to use a variety of hand and power tools and measuring instruments; to carry out standardized tests of boiler and "make-up" water; to read blueprints and record operational data. The work requires a knowledge of the procedures governing the operation and maintenance of high pressure boilers, electric generators, switchboards and other related equipment and of building maintenance practices. This skill and knowledge is normally acquired by the formal study of operational and maintenance procedures, by the study of arithmetic, basic physics and chemistry and by experience operating boilers, generators and related equipment, and maintaining buildings in accordance with the required regulations and procedures.	B2 / 121
<u>Operational Responsibility</u> The work requires adjusting plant controls in response to varying load demands or emergency conditions according to established procedures or regulations; carrying out plant maintenance and repair tasks according to instruction or as scheduled; carrying out general building maintenance duties and instructing inmates on correct maintenance methods. The activities affect the supply of heat, hot water, electric power and refrigeration service to maximum and minimum security institutions housing approximately 50 inmates and the service life of plant and equipment. Reports on malfunctions or unusual operating situations are made to the shift engineer. Failure to follow established procedures or instructions could result in interruption of service, discomfort of inmates and increased operating costs.	B2 / 163
<u>Working Conditions</u> Environment - The work requires occasional exposure to dirt, dust, heat and noise and the use of goggles, and protective clothing when operating, maintaining and repairing plant, equipment and buildings. Hazards - there is frequent exposure to injuries such as minor bruises, burns and abrasions when operating and repairing plant and equipment and when performing general building maintenance tasks.	2 / 28 A2 / 20
<u>Physical Effort</u> The work requires continual standing and walking when inspecting the plant and performing maintenance duties. Working on high equipment occasionally requires the climbing of ladders or scaffolds and the installing of heavy equipment occasionally requires the use of levers, jacks, rollers, dollies and trucks. Also required to work in such awkward and confining spaces as pressure tanks, boilers and ducts.	2 / 23
<u>Supervision</u> Supervision of other employees is not required, but it may be necessary to show other employees or inmates how to perform tasks and the correct maintenance methods.	A1 / 5



SASKATCHEWAN PENITENTIARY

CORRECTIONAL SERVICE CANADA

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 6

Level: 3

Descriptive Title: Shift Operator
South Central Facility

Point Rating: 386

Summary

Reporting to a Shift Supervisor, assists in the operation and inspection of a central heating and cooling plant, on a rotational shift schedule to provide heating, cooling, ventilation and emergency electric power to the South Central Toronto Postal facility. Also assists in the maintenance and repair of plant and equipment and the fire protection system. Performs other related duties.

Duties

% of Time

Assists in the operation and inspection of a central heating and cooling plant with three low pressure steam boilers aggregating 5,880 kilowatts, two centrifugal chillers aggregating 7,700 kilowatts, computerized Johnson control systems, natural gas furnaces aggregating 1,200 kilowatts, air conditioning and cooling units aggregating 850 kilowatts, electrical power systems with a combined consumption of 86,000 kilowatts, a 300 kilowatt standby generator, a vacuum pump system and various pumps and compressors by:

85

- monitoring the control console and computer, interpreting the data provided and taking action to correct deficiencies,
- making regular inspection tours to complement the console or computer output and to make adjustments and operational corrections,
- starting and stopping boilers and chillers to provide efficient and economical operation,
- starting, stopping and conducting running tests of the standby diesel generating unit,
- conducting water treatment tests and adding the chemicals as required to meet operating standards,
- controlling the operation of the air handling and associated equipment,
- reviewing and preparing operation logs and charts and referring problems that cannot be corrected to the shift supervisor.

Assists in the maintenance, repair and periodic overhaul of plant and equipment by:

15

- inspecting and monitoring equipment and controls, correcting observed or recorded problems and performing minor repairs or replacements,
- overseeing the work of maintenance personnel assigned to assist in overhauls and repairs,
- responding to emergency calls and taking corrective or remedial action as directed by the shift supervisor,
- performs preventive maintenance and carries out minor repairs to the fire protection systems.

Specifications

Skill and Knowledge

The work requires skill and knowledge to operate, inspect and maintain low pressure steam boilers, cooling systems, a standby diesel electric generator and various pumps, compressors and fans; to monitor computerized control systems and interpret their output; to use various measuring instruments and hand and power tools; and to read engineering drawings and record operational data. The work requires an understanding of operating and maintenance procedures and a knowledge of the basic principles of heating, air-conditioning, ventilation and distribution systems. This skill and knowledge is normally acquired by the formal study of basic principles, by the study of arithmetic, basic physics and chemistry and by experience in operating heating, cooling and ventilation systems.

B3 / 147

Operational Responsibility

The work requires operating and inspecting heating and cooling plant and systems, interpreting computerized control data, correcting malfunctions and equipment deficiencies, making manual adjustments, recording operational data and carrying out maintenance, repair and overhaul duties. All duties are carried out according to established methods or procedures or under the instruction of the supervisor. The activities affect the supply of heating, cooling, ventilating and fire protection services to a large postal facility and the service life of the plant and equipment. Failure to follow established methods or instructions could result in the disruption of service, increased operating costs or equipment breakdown.

B2 / 163

Working Conditions

Environment - The work requires occasional exposure to dirt, dust, heat and fumes and the use of goggles, face masks and protective clothing when repairing or replacing equipment and adding chemicals to boiler water.

2 / 28

Hazards - there is frequent exposure to minor injuries such as cuts, bruises, burns and strains when working around hot equipment, performing maintenance tasks and lifting replacement parts.

A2 / 20

Physical Effort

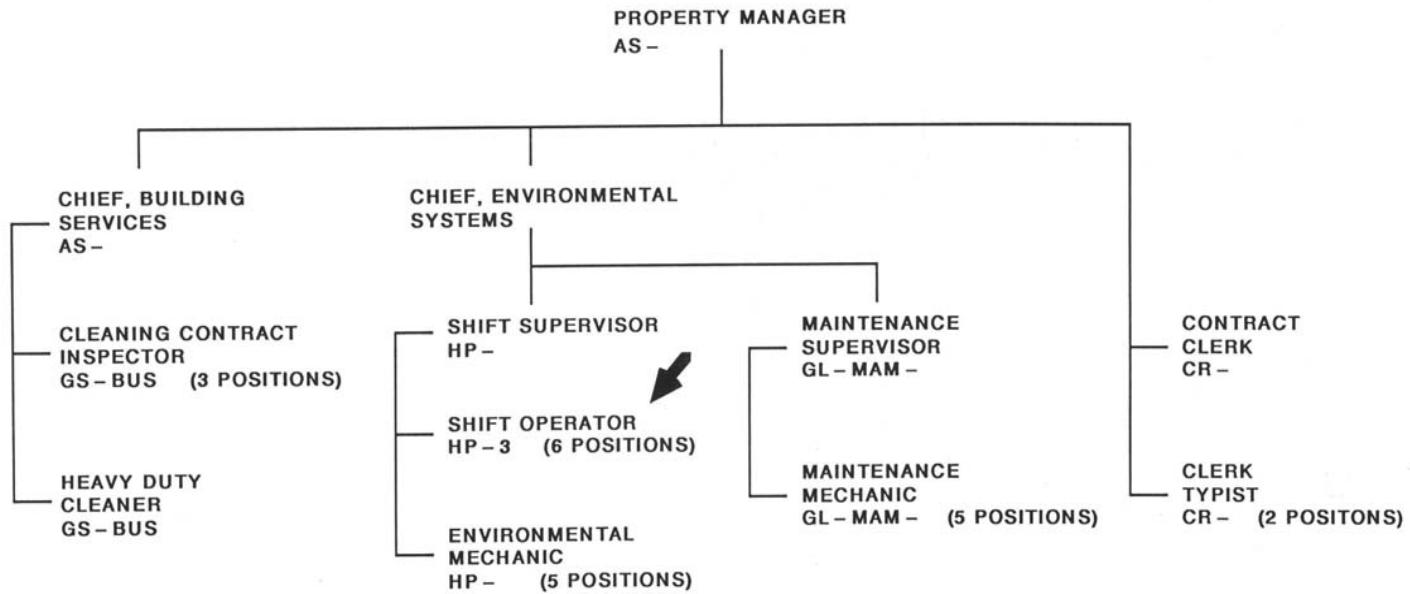
The work requires standing, walking and climbing stairs when inspecting and maintaining equipment. The replacement of some parts requires the use of lifting devices and medium weight tools, and there is an occasional requirement to work in confined spaces when replacing grates and firebrick.

2 / 23

Supervision

Supervision of other employees is not required, but it may be necessary to show others how to perform tasks.

A1 / 5



SOUTH CENTRAL FACILITY

PUBLIC WORKS CANADA

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 7

Level: 3

Descriptive Title: Assistant Shift Engineer
Central Heating Plant

Point Rating: 386

Summary

Reporting to the Shift Engineer, assists in the operation, maintenance and repair of a large, high pressure central heating plant, on a rotational shift schedule, to provide heat, hot water, and recreational ice to Canadian Forces Base Petawawa; maintains and repairs associated equipment; and performs related duties.

Duties

% of Time

Assists in the operation of a dual fuel gas fired, high pressure, central heating plant with four boilers aggregating 52,500 kilowatts, a 34-kilometer underground steam and condensate return system, a 75-kilowatt ammonia refrigeration plant, and 26 remote low pressure steam and hot water boilers aggregating 560 kilowatts, to provide heat, hot water, and recreational ice to CFB Petawawa, by:

60

- determining the operational status of the plant and "blowing down" operating boilers to verify boiler drum water levels in the presence of the previous shift engineer;
- checking plant operating equipment, oil levels in sight glasses, bearing temperatures, chemical tank levels and standby fuel levels and temperatures;
- checking all recording instrument charts and transcribing chart data to operating logs and ensuring proper operation of recording instruments;
- testing feed water, adding chemicals to feed water according to test results and "blowing down" to change boiler feed water;
- testing the diesel air compressor;
- carrying out emergency procedures to restore heating services in the event of power failures or interruptions to the supply of gas.

Assists in maintaining and repairing the main heating plant equipment, the ammonia refrigeration system and the remote low pressure boilers, by:

30

- cleaning, adjusting and replacing burner nozzle tips;
- inspecting the firesides, watersides and ancillary equipment of laid up boilers, repairing boiler controls and mechanisms and replacing burnt metal and firebrick;
- checking boiler manholes, handhold plates, tubes, stay bolts and surfaces for corrosion, scale, leaks, warping and other faults and reporting findings to the shift engineer;
- disassembling and overhauling boilers and hoisting and positioning equipment using various hand and power tools;
- performing boiler start-up duties and running tests following annual overhauls;
- checking the ammonia refrigeration system, inspecting the brine pumps, cleaning and replacing condenser tubes, lubricating bearings, checking the control valves and adding ammonia or refrigerant oil.

	<u>% of Time</u>
Responding to heating system trouble calls as directed by the Shift Engineer, by:	5
- conducting on-site evaluation of problems, manually adjusting pressure reducing valves and manually operating valves to bypass faulty equipment;	
- reporting to the shift engineer for further action if the fault cannot be remedied.	
Performs related duties such as operating the plant under the supervision of the Chief Engineer in the absence of a Shift Engineer, servicing, cleaning and storing tools used on the shift; filling instrument ink reservoirs and adjusting and cleaning pens; cleaning and tidying boiler rooms and equipment; attending safety meetings and driving a departmental vehicle during inspection tours.	5

<u>Specifications</u>	<u>Degree/</u>
	<u>Points</u>

Skill and Knowledge

The work requires skill and knowledge to operate, maintain and repair high pressure boilers, pumps, turbines, compressors and ancillary equipment; to use a variety of hand, power and machine tools and measuring instruments; to start, stop and make running adjustments to a variety of stationary plant equipment; and to carry out standardized feed water chemical tests. The work requires a knowledge of heating and refrigeration plant operations, of preventive maintenance and safety procedures, and of water treatment methods. This skill and knowledge is normally acquired by formal study of regulations, codes and procedures, by the study of arithmetic, basic physics and chemistry and by experience in operating a high pressure steam plant according to the required regulations and procedures.	B2 / 147
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Operational Responsibility

The work requires operating, maintenance and repair tasks, maintaining a shift log, interpreting feed water test results, starting and stopping pumps, compressors, diesel engines and electric pumps according to established methods and procedures. There is a requirement to identify malfunctions and potential hazards in the operation of the equipment and in the handling and storing of fuels and chemicals. The activities affect the service life of high pressure steam boilers, the low pressure boilers in various base locations, the ammonia refrigeration plant and ancillary plant equipment. Reports on equipment malfunction and unusual operating situations are made to the Shift Engineer or supervisor. Failure to follow established methods and procedures could result in equipment failure, waste of fuel or interruption of service.	B2 / 163
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Working Conditions

Environment - The work requires occasional exposure to dirt, dust, heat and fumes and the use of goggles, face masks and protective clothing when inspecting firesides, replacing burnt metal and firebrick and checking the refrigeration system.	2 / 28
Hazards - There is frequent exposure to injuries such as minor bruises, abrasions and burns when operating equipment or valves or when cleaning heating equipment.	A2 / 20

7.3

Physical Effort

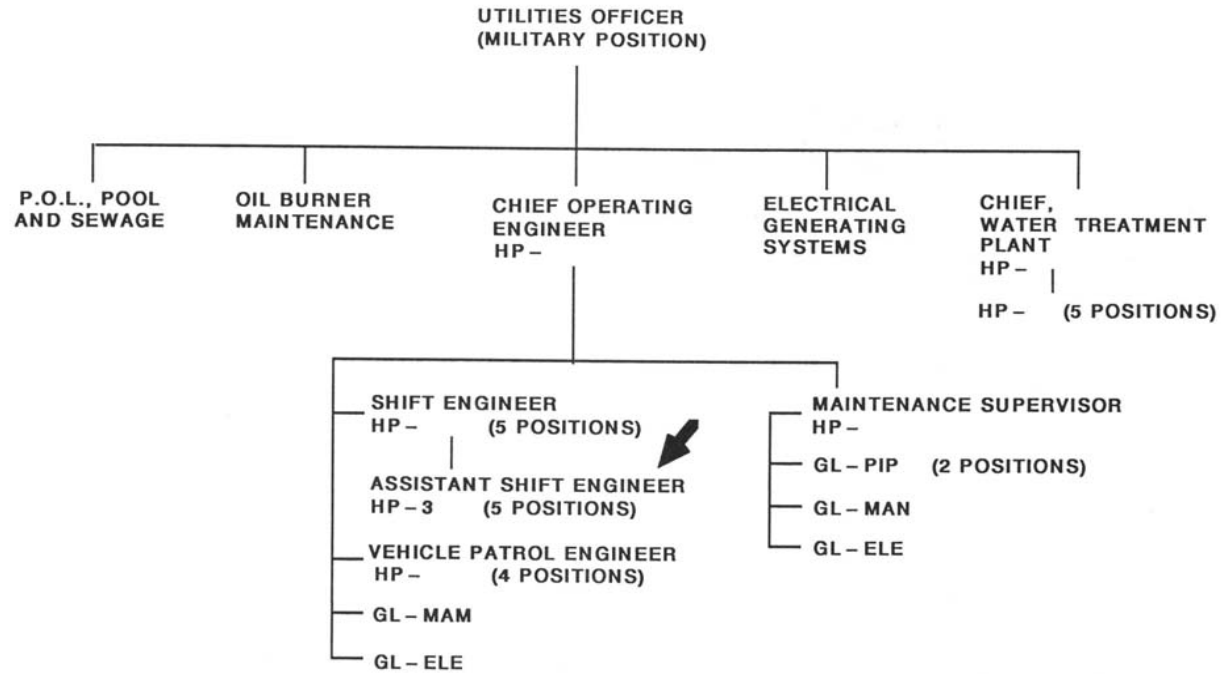
The work requires continual standing and walking and the handling of medium weight, tools, spare parts and equipment and a significant amount of lifting and carrying of medium weight objects. There is also a requirement to occasionally climb ladders and scaffolds and to work in confined distribution manholes.

2 / 23

Supervision

Supervision of other employees is not required, but it may be necessary to show others how to perform tasks.

AI /5



CANADIAN FORCES BASE
PETAWAWA

DEPARTMENT OF NATIONAL
DEFENCE

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 8

Level: 3

Descriptive Title: Shift Operator
Central Heating and Cooling Plant

Point Rating: 412

Summary

Reporting to a Shift Supervisor, assists in the operation, maintenance, repair and overhaul, on a rotational shift schedule, of a large central heating and cooling plant providing heating and cooling services to government and private sector buildings served by the Cliff Street Plant, Ottawa.

Duties

% of Time

Assists in the operation of a large central heating and cooling plant with six boilers aggregating 171,200 kilowatts, four steam turbine-driven refrigeration compressors totaling 102,000 kilowatts, auxiliary diesel-electric generators, a water treatment plant and auxiliary equipment to provide heating and chilling services to some 34 government and private sector building complexes in Central Ottawa, by

- starting and stopping equipment to meet load requirements;
- making inspection tours to observe operating conditions, and reporting equipment malfunctions to the Shift Supervisor;
- testing water samples, and adding chemicals as required, to maintain chemical concentrations at prescribed levels;
- reading instruments, meters and gauges and recording pertinent data on log sheets.

50

Carries out preventive maintenance, overhaul and repair tasks to ensure equipment reliability and client service, by:

- checking, adjusting and maintaining boilers, water chillers, compressors, pumps, motors, emergency power and other auxiliary equipment according to a scheduled preventive maintenance program;
- dismantling and assembling equipment and plant when replacing or repairing worn-out or defective items;
- assisting maintenance personnel in major repairs and overhauls and in the installation of equipment and systems.

40

Performs other duties such as cleaning and tidying equipment and plant areas, investigating and reporting matters affecting personnel safety or plant operations, and on occasion replacing more senior staff on an acting basis.

Specifications

Degree/
Points

Skill and Knowledge

The work requires the skill and knowledge to operate, maintain and repair large high pressure boilers, large water chillers, compressors, emergency diesel-electric power generators and other auxiliary equipment; to start, stop and make running adjustments to plant and equipment; to carry-out standardized tests of heating and cooling water; and to use a variety of hand and power tools and measuring instruments. The work requires a

B4 / 173

knowledge of the procedures and methods prescribed for the operation and control of high pressure boilers and chillers, refrigeration units, water treatment equipment and emergency power generators. This skill and knowledge is normally acquired by the formal study of regulations, codes and procedures, by the study of arithmetic, basic physics and chemistry and by experience in operating high pressure boilers and chillers according to the required regulations and procedures.

Operational Responsibility

The work requires operating, starting and stopping equipment, carrying-out preventive maintenance and repair tasks in accordance with prescribed procedures and instructions and assisting trades personnel with major repairs and overhauls. There is a requirement to identify equipment malfunctions and safety hazards during inspection tours and to report such conditions to the shift supervisor. The activities affect the service life of plant and equipment and the heating and cooling services to a number of government and commercial building complexes in central Ottawa. Failure to follow instructions or established procedures could result in equipment failure and damage, increased operating costs and the interruption of service.

B2 / 163

Working Conditions

Environment - The work requires exposure to dirt, dust, heat and fumes and the use of goggles, face masks and protective clothing when dismantling, repairing and assembling equipment and assisting in major repairs and overhauls. There is occasional exposure to high noise levels requiring the use of protective hearing devices when working near to high speed chiller turbines.

2 / 28

Hazards - There is frequent exposure to injuries such as minor cuts, bruises, burns and scalds when servicing equipment and carrying out maintenance and repair work.

A2 / 20

Physical Effort

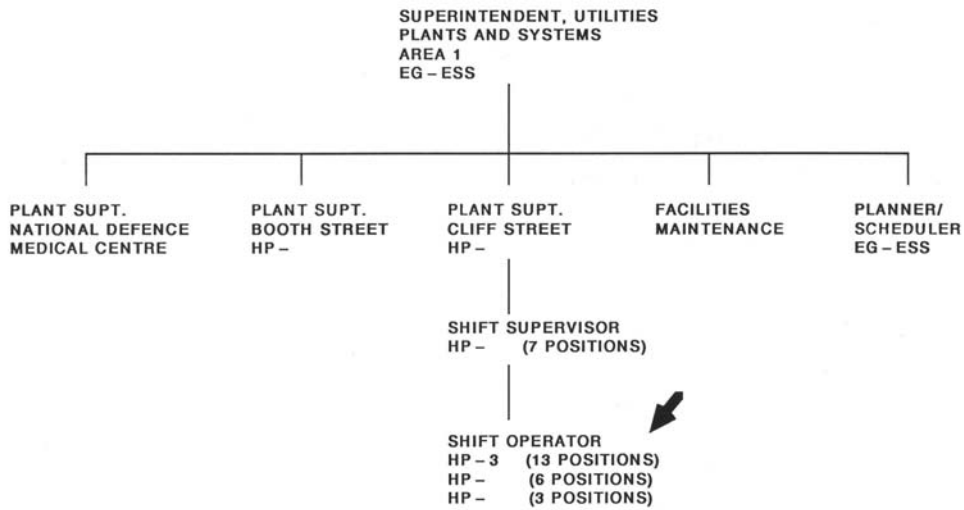
The work requires continual standing and walking, the handling of medium weight objects and working in awkward and confined spaces when maintaining or repairing equipment.

2 / 23

Supervision

Supervision of other employees is not required, but it may be necessary to show others how to perform tasks.

A1 / 5



CLIFF STREET CENTRAL HEATING
AND COOLING PLANT

PUBLIC WORKS CANADA

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 9

Level: 4

Descriptive Title: Shift Engineer

Point Rating: 508

Summary

Reporting to the Heating Plant Supervisor, controls the operation, maintenance and repair of a high pressure central heating and cooling plant, seven low pressure steam boilers, seven air conditioning units and related equipment providing heating, cooling and other services to the terminal buildings, and other supporting buildings at the Vancouver International Airport. Supervises an assistant Shift Operator, oversees the activities of contracted trades personnel and performs other related duties.

Duties

% of Time

On a rotating shift schedule, controls the operation of four natural gas and oil fired, high temperature, hot water boilers aggregating 14,500 kilowatts, four synchronized absorber-type refrigeration units aggregating 5,000 kilowatts, a number of lower pressure steam heating boilers and air conditioning units aggregating 2,500 kilowatts and various fans, pumps and compressors, by:

55

- testing and checking controls as prescribed by regulations to maintain high and low pressure boilers at acceptable efficiency and safety levels;
- "blowing down" boilers and chemically treating boiler water to maintain prescribed levels of chemical concentration;
- operating an electronic data control computerized system regulating and monitoring the operation of the terminals' air conditioning systems;
- starting and stopping systems, when required, to heat and/or air condition the main terminal building;
- compiling data for hot water, domestic water, electrical and fuel consumption for airport tenants;
- answering enquiries and complaints from other agencies, airport tenants and the public.

Maintains and overhauls plant and equipment providing services to the terminals and supporting buildings, by:

20

- carrying out scheduled preventive maintenance duties and reporting potential scheduling or equipment problems to the Plant Supervisor;
- repairing and overhauling plant and equipment as directed by the Plant Supervisor;
- completing shift logs and recording maintenance and operational activity data;
- overseeing the activities of trades personnel contracted to carry out repair and overhaul work.

Maintains sewage disposal and drainage pumping systems, by:

10

- inspecting the systems and testing and checking controls and alarms at regular intervals;
- starting and stopping pumps to verify their reliability and effectiveness;
- performing scheduled maintenance tasks and reporting potential problems to the Plant Supervisor.

% of Time

Supervises the activities of an Assistant Shift Operator, by: 10

- assigning work and providing instruction on procedures, methods and safety requirements;
- checking work performed to ensure conformity to prescribed standards;
- recommending promotional or disciplinary actions.

Assists the Plant Supervisor in the external and internal inspection of plant and equipment, in the monitoring and administration of safety, firefighting and emergency procedures and performs other related duties. 5

Specifications

Degree/
Points

Skill and Knowledge

The work requires knowledge of operational, maintenance and safety regulations, codes and procedures to control the activities of a shift in a plant providing heating, cooling, sewage and drainage services to the Vancouver International Airport. The work requires the knowledge of computerized control procedures, plant efficiency calculation techniques, an understanding of information and data contained in mechanical and electrical schematic drawings, and skill in the use of a variety of hand and power tools and measuring instruments. This skill and knowledge is normally acquired by the formal study of regulations, codes and procedures, by the study of mathematics, physics and chemistry and by experience in operating, maintaining and repairing high and low pressure boilers, cooling systems and sewage disposal and pumping facilities according to the required regulations and procedures. C4 / 197

Operational Responsibility

The work requires operating, starting and stopping equipment, carrying out preventive maintenance and repair tasks in accordance with established procedures and instructions, directing the activities of an assistant shift operator and overseeing contracted trades personnel. There is a requirement to identify potential equipment, scheduling and safety problems during inspection tours and report such conditions to the Plant Supervisor. These activities affect the service life of equipment and the supply of heating, cooling, hot water, sewage and other services to the terminal buildings and other supporting airport buildings. Failure to follow established operating and maintenance procedures to provide adequate guidance or check the work of an assistant engineer could result in damage to plant and equipment, interruption of service, increased operating costs and endanger life and property. B3 / 210

Working Conditions

Environment - The work requires occasional exposure to dirt, dust, heat and fumes and the use of goggles, face masks and protective clothing when repairing and overhauling plant and equipment and adding chemicals to boiler water. 2 / 28

Hazards - There is frequent exposure to injuries such as minor cuts, bruises, burns and scalds when operating and maintaining equipment and handling components of high or low temperature systems. A2 / 20

Physical Effort

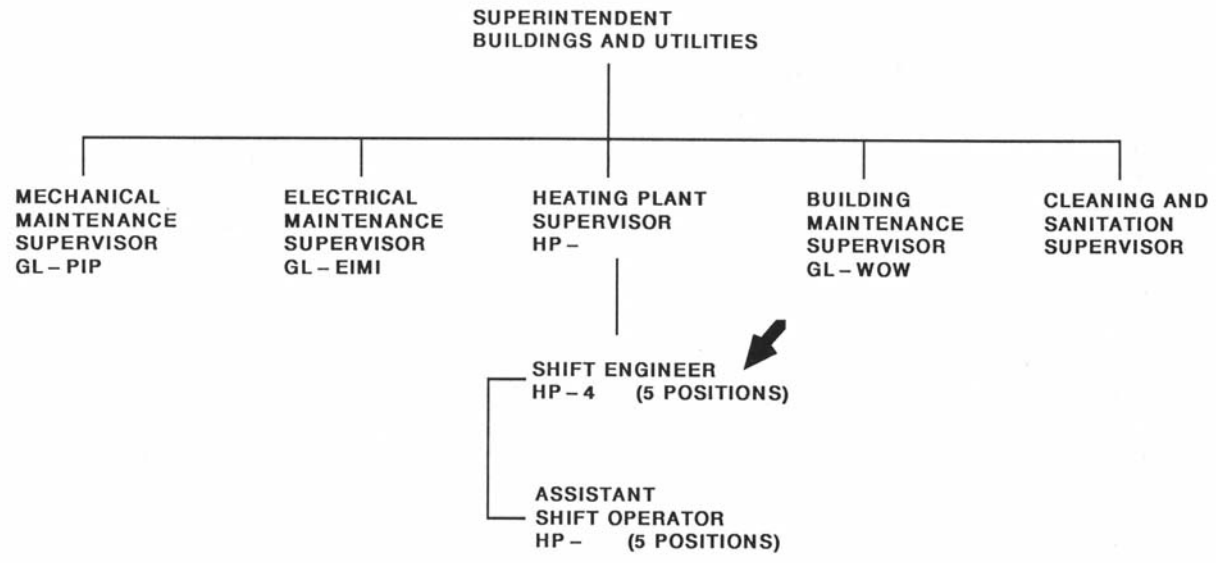
The work requires continual standing and walking, and the handling of tools and medium weight objects. There is also an occasional requirement to climb ladders when opening, closing or adjusting valves and control devices.

2 / 23

Supervision

The work requires assigning work, providing instructions on procedures and methods and checking the work performed by an assistant shift operator. Also the recommending of promotional or disciplinary actions to the Plant Supervisor.

C2 / 30



PACIFIC REGION - AIRPORTS

TRANSPORT CANADA

BENCH-MARK POSITION DESCRIPTION

Bench-mark Position Number: 10

Level: 4

Descriptive Title: Shift Supervisor, Booth Street

Point Rating: 508

Summary

Reporting to the Plant Superintendent, controls the operation, maintenance and repair of a high pressure central heating plant, an extensive distribution system, a diesel electric generator and related equipment providing heating to several large office buildings, research laboratories and computer facilities. Supervises the activities of a shift operator and performs other related duties.

Duties

% of Time

On a rotational shift basis, controls the operation of four high pressure steam boilers aggregating 41,000 kilowatts, a 250-kilowatt generator and various pumps, fans and compressors, by:

- inspecting the operation and determining the condition of equipment and systems;
- starting and shutting down boilers to meet load requirements and adjusting controls and equipment to ensure safe and efficient plant operation;
- testing boiler water, make-up water and condensate, determining the chemical concentrations and adjusting feed rates to meet prescribed levels;
- maintaining operating logs and compiling data on plant operations, production and labor, fuel and material costs;
- accepting fuel deliveries and verifying the quantities received.

65

Maintains plant and equipment, by:

- reporting the condition of plant and equipment and recommending repair and overhaul requirements to the Plant Superintendent;
- carrying out repairs and overseeing the activities of maintenance personnel as directed by the Plant Superintendent;
- maintaining records of repair and overhaul activities.

20

Supervises the activities of a Shift Operator, by:

- assigning work and providing instruction on operating and maintenance procedures, methods and safety requirements;
- checking work performed to ensure compliance with prescribed standards and safety codes;
- investigating and reporting on accidents and providing recommendations to prevent accidents;
- resolving staff problems and recommending promotional or disciplinary actions.

15

Specifications

Degree/

Points

Skill and Knowledge

The work requires the knowledge of operational, maintenance and safety regulations, codes and procedures to control the activities of a shift in a plant providing two major heating and distribution services and an emergency electrical services to the Booth Street

C4 / 197

complex. The work requires the understanding of engineering and operational information and data contained on drawings and in manuals and skill in the use of a variety of hand and power tools and measuring instruments. This skill and knowledge is normally acquired by the formal study of regulations, codes and procedures, by the study of mathematics, physics and chemistry and by experience in operating, maintaining and repairing high pressure steam boilers, distribution systems and electrical generators according to the required regulations and procedures.

Operational Responsibility

The work requires operating, starting and stopping plant and equipment, carrying out inspections and maintenance and repair work in accordance with established procedures or as directed by the Plant Superintendent. The work requires coordinating the activities of a Shift Operator and overseeing the work of maintenance personnel. There is a requirement to report the condition of the plant and equipment and to recommend repair and overhaul requirements to the Plant Superintendent. These activities affect the service life of equipment and the supply of heating to office buildings, laboratories and computer facilities. Failure to follow established operating, maintenance or safety procedures, to provide adequate instruction or to check the work of staff could result in damage to plant or equipment, interruption of service, increased operating costs and endanger the safety of staff or clients.

B3 / 210

Working Conditions

Environment - The work requires frequent exposure to high noise levels and occasional exposure to heat, fumes, dust and combustion gases when inspecting plant, adjusting firing equipment and controls and the use of goggles and protective clothing when maintaining or repairing equipment, mixing chemicals and testing boiler water.

2 / 28

Hazards - There is frequent exposure to minor injuries such as cuts, bruises, burns and scalds when adjusting plant equipment and performing maintenance tasks.

A2 / 20

Physical Effort

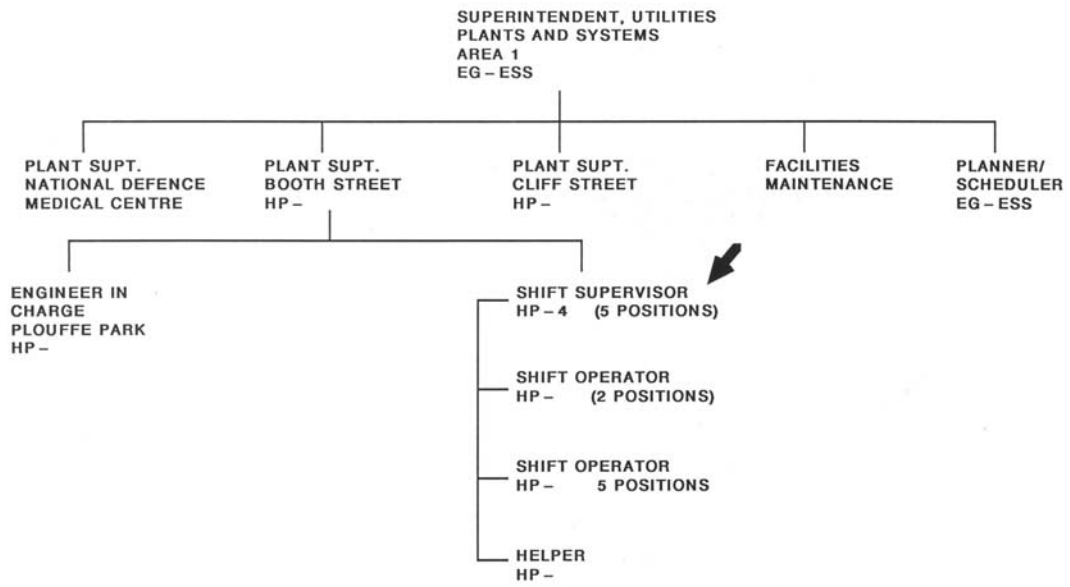
The work requires continual standing and walking when making inspections and the lifting of tools and medium weight objects when adjusting and maintaining equipment. There is an occasional requirement to climb and work from scaffolds and in confined or awkward spaces when maintaining equipment.

2 / 23

Supervision

The work requires assigning work, providing instruction to operating and maintenance personnel (1.6 person-years) on operating and safety procedures and checking to ensure the work performed complies with codes and standards. There is a requirement to recommend promotional or disciplinary actions to the Plant Superintendent.

C2 / 30



BOOTH STREET
CENTRAL HEATING PLANT

PUBLIC WORKS CANADA

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 11

Level: 5

Descriptive Title: Chief Engineer, Northern
Forest Research Centre

Point Rating: 531

Summary

Reporting to the Head, Physical Facilities, directs and controls the operation and maintenance of energy generating and consuming apparatus and equipment and the distribution and service systems of the Northern Forest Research Centre, Edmonton, Alberta. Carries out general maintenance of buildings, coordinates the Centre's Fire Prevention program and performs related duties.

Duties

% of Time

- Directs and controls the operation and maintenance of two low pressure steam boilers aggregating 7,350 kilowatts; two refrigeration absorption chillers aggregating 1,760 kilowatts; a 400-kilowatt natural gas electrical generator; air handling, compressing and pumping units; a vacuum system, a demineralizer and a water still to provide heating, chilling and operational and emergency services to the research centre, by:
- interpreting and carrying out procedures and regulations;
 - interpreting log sheet data, mechanical drawings and blueprints and reading service manuals;
 - inspecting and overhauling boilers, chillers and other plant equipment, fabricating replacement parts and aligning bearings, shafts, pulleys etc.;
 - adjusting and repairing exhaust fans and cleaning sanitary sewers;
 - testing, adjusting, calibrating and repairing control equipment;
 - adjusting dampers and balancing valves in ventilation and radiation systems;
 - evaluating recorded data, instrument readings and equipment performance to determine faulty equipment or unsatisfactory conditions and preparing condition reports;
 - assisting in the preparation of plans and specifications for work to be carried out under contract and monitoring and inspecting work carried out by contractors.
- Coordinates the Centre's fire prevention programs, by:
- arranging educational programs, attending courses in fire fighting and preparing material for fire prevention campaigns;
 - writing and amending procedures and orders covering emergency actions and developing and maintaining fire prevention programs;
 - fighting fires and investigating and reporting incidents and fire hazards;
 - checking sprinkler systems, fire hoses and extinguishers and supervising the flushing of sprinkler systems;
 - attending Safety Committee meetings and communicating with Federal or Provincial Fire Marshals and Municipal Fire Department officials.
- Carries out general maintenance and repair tasks needed for buildings upkeep, by:
- repairing and adjusting all types of doors, windows, locks, door closers and latches;
 - reglazing windows and greenhouse panes and painting and varnishing walls, doors, panels, etc.;
 - fabricating and installing shelves, blackboards, bulletin boards, etc.;

Heating, Power and Stationary

Plant Operation

B. M. P. D. No. 11

11.2

% of Time

- repairing and/or installing floors and interior and exterior sheathing;
- monitoring buildings environmental systems by taking air flow, velometer, etc. readings and adjusting air conditioning, humidity and other environmental controls.

Supervises the work of two stationary engineers, by:

10

- checking work for adherence to standards;
- recommending training requirements and disciplinary actions;
- planning and controlling the preventive maintenance and lubrication programs.

Performs related duties such as reviewing work orders, preparing estimates of cost and material and providing advice concerning layouts, sizing and pipeline and duct calculations.

5

Degree/
Points

Specifications

Skill and Knowledge

The work requires knowledge of the operational, maintenance, repair and safety regulations, codes and procedures to control the operation of plant and equipment providing heating, cooling, electrical generation and other services to the Research Centre. A knowledge of specification preparation and an understanding of the information and data contained in drawings and manuals is required. The work requires a knowledge of building maintenance and fire protection procedures and skill in the use of a variety of hand and power tools and measuring instruments. This skill and knowledge is normally acquired by the formal study of regulations, codes and procedures, the study of mathematics, physics and chemistry and by experience in operating heating, cooling and other plant and equipment according to the required regulations and procedures.

D4 / 221

Operational Responsibility

The work requires interpreting regulations, procedures and practices; planning and directing operational, maintenance and repair duties; interpreting operational data; supervising stationary engineers. The activities affect the cost and continuity of heating, cooling, ventilating and other services to the Centre. The activities also affect the service life of plant and equipment and the fire fighting capability of the Centre. Reports are made to a trades supervisor. Errors in judgement could result in discomfort and inconvenience to the centre's staff, interruption of services, waste of energy and damage to plant and equipment.

C2 / 209

Working Conditions

Environment - The work requires occasional exposure to dirt, heat, noise, fumes and extremes of temperature and the use of goggles, face masks and protective clothing when inspecting and overhauling boilers, working in the laboratory areas, cleaning sewers and maintaining roof exhaust fans.

2 / 28

Hazards - There is frequent exposure to injuries such as minor bruises, burns and abrasions when operating and maintaining plant and equipment.

A2 / 20

11.3

Physical Effort

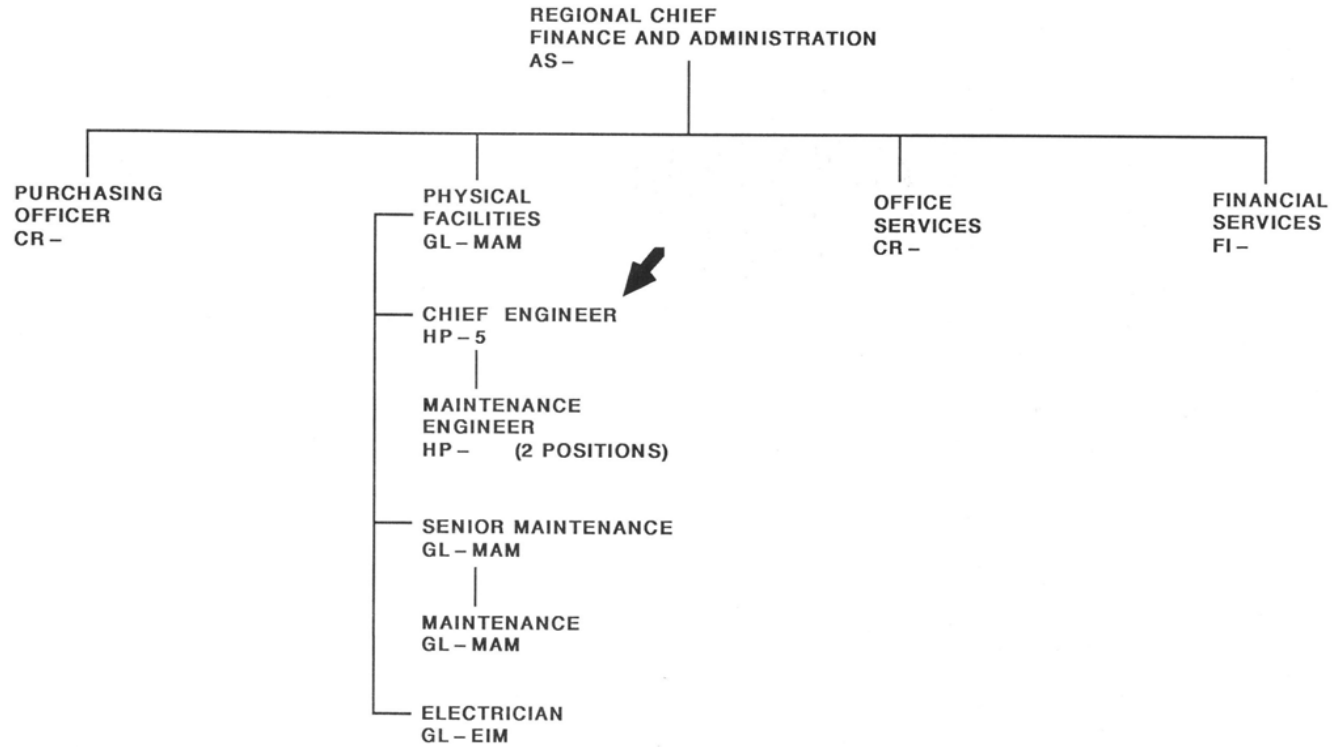
The work requires continual standing or walking when inspecting plant, repairing equipment and maintaining buildings. There is an occasional requirement to lift medium weight parts during repairs and overhauls.

2 / 23

Supervision

The work requires providing advice and guidance to staff (2 person-years), implementing operational and maintenance programs, checking the work of subordinates and contract personnel for adherence to technical and safety standards and recommending training and disciplinary actions.

C2 / 30



NORTHERN FOREST RESEARCH CENTRE

ENVIRONMENT CANADA

BENCH-MARK POSITION DESCRIPTION

Bench-mark Position Number: 12

Level: 5

Descriptive Title: Shift Supervisor, Cliff Street

Point Rating: 559

Summary

Reporting to the Plant Superintendent, controls the operation and maintenance of a large central heating and cooling plant providing heating and cooling services to government and private sector clients in central Ottawa.

Duties

% of Time

On a rotational shift basis, controls the operation of six high pressure oil and gas fire steam boilers aggregating 171,000 kilowatts, four steam turbine driven refrigeration compressors totaling 102,000 kilowatts, a water pumping and treatment plant, auxiliary diesel-electric generators with a combined capacity of 1,400 kilowatts and related equipment to provide heating and cooling to some 34 building complexes, by:

55

- carrying out inspection tours to ensure the safe and efficient operation of the plant and to provide dependable service to clients;
- analyzing heating and cooling requirements and starting and stopping boilers on water chillers to meet requirements and to maximize efficiency and the conservation of energy and water;
- testing boiler water-, make-up water and condensate, determining the chemical concentrations and adjusting feed rates within the recommended limits;
- maintaining data logs of plant operation, calculating boiler and plant efficiencies and compiling information relating to the operation of the plant and the costs of labor, fuel and material;
- accepting fuel deliveries and verifying the quantities received.

Maintains plant and equipment, by:

15

- inspecting and reporting the condition of all equipment and systems in the plant and recommending repairs and overhaul requirements to the Plant Superintendent;
- carrying out repairs and overseeing the activities of maintenance personnel as directed by the Plant Superintendent;
- carrying out periodic running tests on the diesel electric emergency power units and performing recommended maintenance tasks;
- maintaining records of repair and overhaul activities.

Supervises the activities of two shift operators and maintenance personnel, by:

30

- assigning work and providing guidance and instruction on operating and maintenance procedures, methods and safety requirements;
- checking work performed to ensure compliance with prescribed standards and safety codes;
- investigating and reporting on accidents and providing recommendations to prevent accidents;
- evaluating staff performance, resolving problems and recommending promotional or disciplinary actions.

<u>Specifications</u>	<u>Degree/ Points</u>
<p><u>Skill and Knowledge</u></p> <p>The work requires the knowledge of operational, maintenance and safety regulations, codes and procedures to control the activities of a shift in a plant providing four major heating, cooling, distribution, water treatment services and an emergency electrical service to a large number of government and commercial buildings. The work requires the understanding of engineering and operational information and data contained on drawings and in manuals and skill in the use of a variety of hand and power tools and measuring instruments. This skill and knowledge is normally acquired by the formal study of regulations, codes and procedures, by the study of mathematics, physics and chemistry and by experience in supervising the operation of high pressure steam boilers and refrigeration plants, distribution systems and electrical generators according to the required regulations and procedures.</p>	<p>C6 / 248</p>
<p><u>Operational Responsibility</u></p> <p>The work requires the operating, adjusting, starting and stopping heating and cooling plants and electrical generating units and the carrying out of inspections and maintenance work in accordance with established procedures or as directed by the Plant Superintendent. The work requires coordinating the activities of shift personnel and overseeing the work of maintenance and tradespersons. There is a requirement to report any unsafe conditions to the Plant Superintendent, to ensure the safety of operational personnel and to recommend repair and overhaul requirements. The activities affect the supply of essential services (such as emergency electric power to the House of Commons) to many prestige buildings in central Ottawa, the efficiency of the plants and the service life of the equipment. Failure to follow established operating maintenance and safety procedures, to provide adequate guidance and instruction or to check the work of the staff could result in damage to equipment or private property, interruption of service, inconvenience to the clients or general public, increased operating costs and endanger the safety of staff.</p>	<p>B3 / 210</p>
<p><u>Working Conditions</u></p> <p>Environment - The work requires exposure to high noise levels and the use of ear protecting devices when working near the steam turbines. There is occasional exposure to heat, combustion gases and dust when inspecting the plant and adjusting the firing equipment and controls. The use of goggles and protective clothing is required when repairing equipment, mixing chemicals and testing boiler and chiller water.</p> <p>Hazards - There is frequent exposure to minor injuries such cuts, bruises and scalds when adjusting plant equipment and performing maintenance tasks.</p>	<p>2 / 28</p> <p>A2 / 20</p>
<p><u>Physical Effort</u></p> <p>The work requires continual standing and walking when inspecting the plants and the lifting of tools and medium weight objects when adjusting and repairing equipment. There is also a requirement to work in awkward or confined spaces when inspecting the distribution systems.</p>	<p>2 / 23</p>

12.3

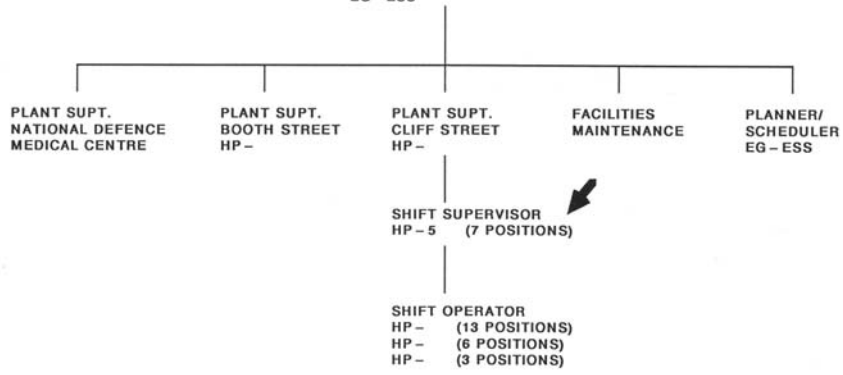
Degree/
Points

Supervision

The work requires assigning work, providing instruction and guidance to operating and maintenance personnel (3.1 person-years) on operating and safety procedures and checking the work performed for compliance with codes and standards. There is a requirement to appraise performance and recommend promotional or disciplinary actions to the Plant Superintendent.

C2 / 30

SUPERINTENDENT, UTILITIES
PLANTS AND SYSTEMS
AREA 1
EG - ESS



BENCH-MARK POSITION DESCRIPTION

Bench-mark Position Number: 13

Level: 6

Descriptive Title: Chief Stationary Engineer
Canadian Forces Base Greenwood, Nova Scotia

Point Rating: 659

Summary

Reporting to the Utilities Officer, directs the operation and maintenance of two high pressure steam heating plants, several outlying heating plants, oil storage facilities and other associated ancillary plant and equipment providing heating, hot water, emergency electric power and air conditioning support to buildings in and adjacent to the CFB, Greenwood, Nova Scotia. Also directs preventive maintenance and safety programs, provides technical advice to the Utilities Officer and the Base Construction Engineering Officer and prepares and evaluates reports regarding plant efficiency, fuel costs, repairs, overhauls and construction.

Duties

% of Time

Directs the operation and maintenance of seven oil or natural gas fired boilers aggregating 47,000 kilowatts located in two central heating plants, two diesel generators and other auxiliary equipment such as fans, turbines, motors, air compressors and pumps to provide heat, hot water and emergency electric power, by:

65

- interpreting and implementing regulations, procedures and practices;
- planning and coordinating the operational, maintenance and safety programs and establishing repair and overhaul schedules and priorities;
- interpreting and ensuring the maintenance of operating and maintenance standards and practices;
- ensuring records, reports and daily operating data are prepared as prescribed by regulations, codes, manuals and related publications;
- evaluating operational data, fuel costs and repair and overhaul schedules and estimating and requisitioning fuels, chemicals, spare parts, housekeeping materials and safety equipment;
- evaluating reports regarding major repairs, overhauls and construction.

Supervises a staff of 24 operating engineers and trades personnel, through subordinate shift supervisors, by:

35

- providing direction, technical advice and guidance concerning the operation and maintenance of the plants;
- providing training to staff on safety and safety measures and ensuring the safety regulations are understood and maintained;
- establishing work schedules and allocating staff to maintain 24-hour operations;
- assessing and reporting on staff performance and recommending appropriate training, promotional or disciplinary actions;
- investigating and reporting breaches of discipline and resolving or reporting on minor grievances;
- participating on selection boards and position classification reviews to select new staff and update and evaluate position descriptions.

Specifications

Skill and Knowledge

The work requires a knowledge of operational, maintenance, repair, overhaul and safety regulations, codes and procedures to control the operation of a number of high and low pressure heating plants and other equipment providing a major heating service and emergency electric generating and air conditioning services to the CFB Greenwood. A knowledge of cost estimating techniques and an understanding of information and data contained in drawings, manuals and specifications is required. This skill and knowledge is normally acquired by the formal study of regulations, codes and procedures, the study of mathematics, physics and chemistry and by experience in supervising the operation of high and low pressure boilers and other equipment according to the required regulations and procedures.

D6 / 273

Operational Responsibility

The work requires the interpretation and implementation of regulations, procedures and practices relating to the operation of heating plants and oil storage facilities. It also requires the planning scheduling and implementation of maintenance, overhaul and repair programs; the establishing of repair and overhaul schedules and priorities; the review and interpretation of operating data and the supervising of operating and maintenance personnel. The activities affect the continuity and costs of servicing a medium sized military base, the operation of the plants and equipment and the effective deployment of staff. Reports and recommendations are made to the Utilities Officer. Errors in judgment could result in the interruption of service, damage to plant and equipment and additional operating costs.

C3 / 256

Working Conditions

Environment - the work is relatively free of disagreeable working conditions.

1 / 12

Hazards - there is occasional exposure to minor injuries such as bruises, abrasions and burns when inspecting plant and equipment.

A1 / 8

Physical Effort

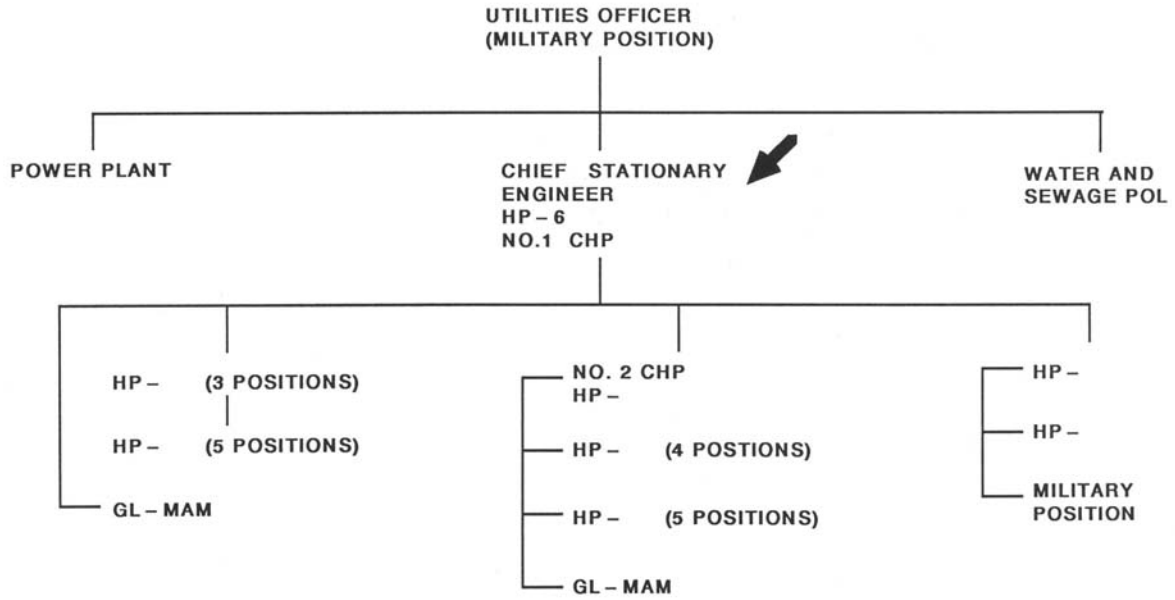
The work requires standing and walking during inspection tours.

1 / 10

Supervision

The work requires the provision of advice and guidance to operating engineers and trades personnel and to contractors carrying out repairs and overhauls. There is a requirement to allocate work, to ensure compliance to prescribed operating and safety standards, to plan and implement training programs, to appraise and report on staff performance, recommend promotions or disciplinary actions and resolve or report on personnel problems.

D4 / 100



CANADIAN FORCES BASE
GREENWOOD

DEPARTMENT OF NATIONAL
DEFENCE

BENCH-MARK POSITION DESCRIPTION

Bench-mark Position Number: 14

Level: 7

Descriptive Title: Chief Operating Engineer
Canadian Forces Base, Petawawa

Point Rating: 765

Summary

Reporting to the Utilities Officer, directs and controls the operation and maintenance of a large high pressure central heating plant, an extensive steam distribution system, several remote heating plants, an artificial ice plant and ancillary support equipment to provide heating, steam and recreational ice to the C. F. B. Petawawa.

Duties

% of Time

Directs the operation and maintenance of a central heating plant with four dual fuel high pressure steam boilers aggregating 52,500 kilowatts, a 34-kilometer underground steam and condensate return system, a 75-kilowatt ammonia refrigeration plant and 26 remote low pressure steam and hot water boilers aggregating 560 kilowatts to provide heat, hot water and recreational ice to C. F. B. Petawawa, by:

70

- interpreting and implementing regulations, procedures and practices;
- coordinating and implementing operational procedures and preventive maintenance programs for plant and equipment;
- consulting with engineering and inspection staff regarding plant operation and modifying methods, procedures and equipment to maximize efficiency and reduce costs;
- analyzing and interpreting operational data to control plant efficiency;
- checking automatic combustion control equipment and the treating and testing of feed water;
- consulting with shift supervisors and reviewing log sheets to identify and resolve unusual operating conditions and plant problems;
- planning and coordinating construction, maintenance and installation projects and the major overhaul or repair of plant and equipment;
- reviewing preliminary designs and quotes from suppliers, estimating material and labor costs and submitting drawings and forms to the Utility Officer for approval;
- calculating boiler efficiencies, production, labor and material costs and assessing developing trends;
- reviewing historical records of equipment, assessing replacement needs and the relative merits of equipment and determining repair and overhaul schedules;
- ensuring the operating, safety and fire regulations are understood and enforced.

Supervises a staff of 24 operating and maintenance personnel through Subordinate Shift Engineers, by:

20

- reviewing, approving and implementing shift schedules, approving labor vouchers and time sheets and recommending the authorization of overtime;
- allocating staff to projects and coordinating a general training program;
- appraising the performance of subordinate supervisors and reviewing the appraisals of operating and maintenance staff;
- investigating breaches of discipline and resolving or reporting on minor grievances.

% of Time

Performs related duties such as preparing and submitting fuel statistics and stock checks, reviewing accident reports, drafting technical reports, letters and memoranda and preparing written and oral examinations for prospective employees.

10

Degree/
Points

Specifications

Skill and Knowledge

The work requires knowledge of operational, maintenance, repair, overhaul and safety regulations, codes and procedures to control the operation of a large central heating plant, a number of low pressure boilers and a refrigeration plant providing two major heating and distribution services and a cooling service to the CFB Petawawa. A knowledge of cost estimating and plant efficiency calculation techniques and understanding of the information and data contained in design proposals, drawings, manuals and technical reports is required. This skill and knowledge is normally acquired by the formal study of regulations, codes and procedures, by the study of mathematics, physics and chemistry and by experience in supervising the operation of high and low pressure boilers, extensive distribution systems and refrigeration plants according to the required regulations.

E7 / 324

Operational Responsibility

The work requires the interpretation and application of regulations and procedures relating to the operation and maintenance of heating plants, the distribution system and the refrigeration plant. It also requires the planning and scheduling of construction, maintenance, overhaul, installation and safety programs and projects appropriate for a central heating plant and several remote steam and hot water boilers; the planning of major overhauls with the minimum of service interruption; the reviewing of preliminary design information and quotes and the writing of technical reports and memoranda; the supervising of subordinates. The activities affect the continuity, efficiency and cost of providing service to the base, the service life of the plants and equipment and the deployment of staff. Reports and recommendations affecting operating and maintenance methods and procedures or the selection or improvement of equipment are made to the Utilities Officer and Engineering staff. Errors in judgment could result in the interruption of service, damage to plant and equipment, increased operating costs and injury or discomfort to Base personnel.

D3 / 302

Working Conditions

Environment - the work is relatively free of disagreeable conditions. There is some exposure to noise, dirt, dust and heat when performing inspection tours of plant and buildings.

1 / 12

Hazards - there is occasional exposure to minor injuries such as bruises, abrasions and burns when inspecting plant and equipment.

A1 /8

Degree/
Points

Physical Effort

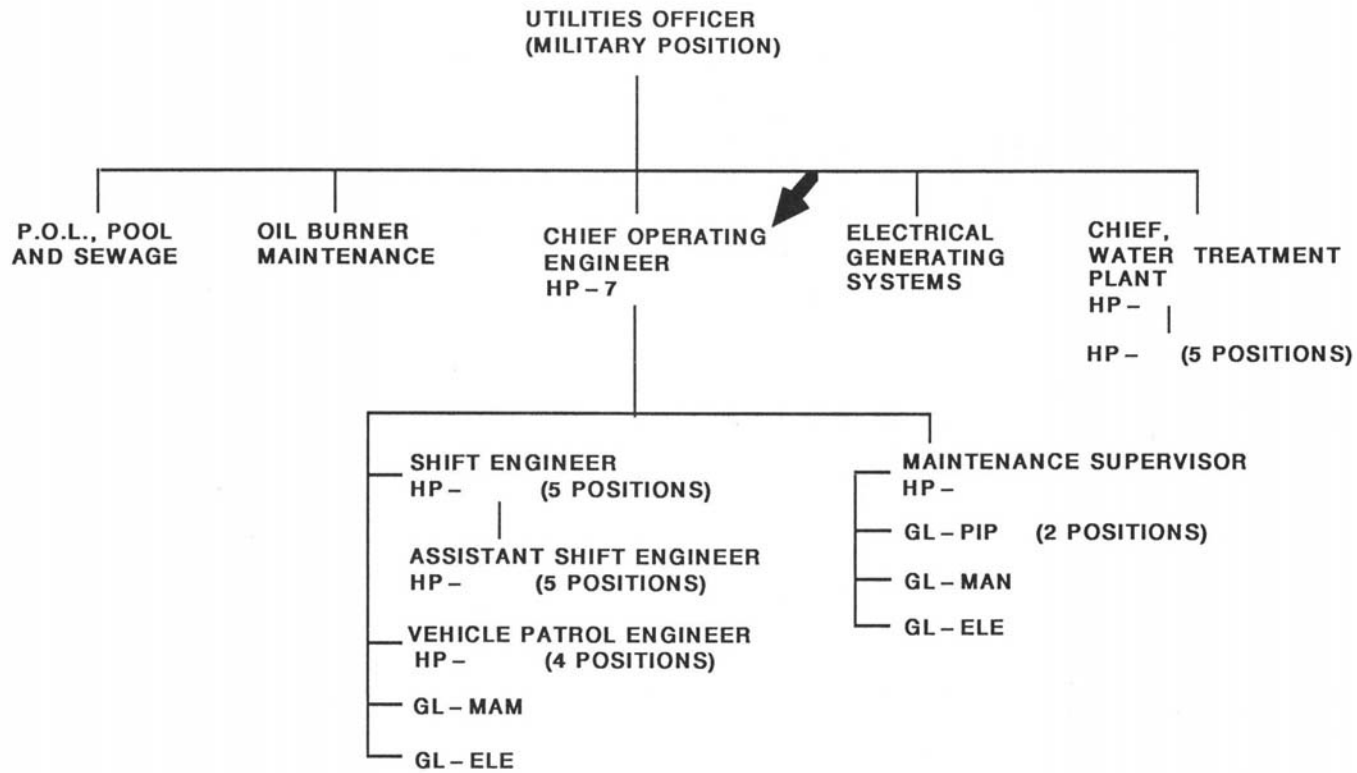
The work requires standing and walking during inspection tours and the occasional climbing of ladders and descending into confined spaces when inspecting the distribution system.

1 / 10

Supervision

The work requires supervising a staff of 24 through subordinate engineers, establishing and maintaining shift schedules, allocating work and appraising staff performance. There is a requirement to investigate breaches of discipline, to review accident reports and resolve and report on personnel problems and recommend promotion or disciplinary actions.

D4 / 100



CANADIAN FORCES BASE
PETAWAWA

DEPARTMENT OF NATIONAL
DEFENCE

15.1

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 15

Level: 8

Descriptive Title: Chief Stationary Engineer-,
Dorval International Airport

Point Rating: 830

Summary

Reporting to the Superintendent Maintenance and Mechanical Services, directs and controls the operation and maintenance of a central heating and cooling plant and several satellite steam generators providing heating and cooling to various buildings at Dorval International Airport, Quebec. Also directs a preventive maintenance program, provides technical advice and prepares reports and correspondence related to the above duties.

Duties

% of Time

Directs the operation and maintenance of a central heating and cooling plant with four oil and gas fired high pressure boilers aggregating 72,600 kilowatts, a Delta 2000 automatic Control Centre, five satellite steam generators aggregating 9,100 kilowatts, a number of refrigeration compressors totaling 11,200 kilowatts, an extensive underground and tunnel distribution system, and auxiliary diesel-electrical generators aggregating 540 kilowatts, by:

70

- interpreting and implementing regulations, directives and procedures;
- planning and directing operational, emergency, safety and pollution control programs;
- planning and coordinating the preventive maintenance program for the central heating and cooling plant and all satellite and auxiliary equipment;
- maintaining and reviewing operational log sheets and records and computing operational cost boiler efficiency and the quantity of heat produced and sold;
- directing the chemical treating and testing of boiler water;
- directing the treating of fuel oils and the maintenance of reserve fuel oil tanks;
- drafting repair- and overhaul specifications for work to be performed by own staff or outside contractors;
- planning and coordinating the activities of contractors carrying out major repairs and overhauls to ensure adherence to specifications;
- preparing an operational budget for senior management approval and a monthly expenditure report.

Supervises a staff of 25 operating and trades personnel through subordinate shift supervisors by:

25

- establishing and maintaining the work standards and practices to be followed in the operation of the plant and equipment;
- developing shift schedules and deploying staff to meet operational requirements;
- appraising the performance of subordinate supervisors, reviewing the appraisals of operating and trades personnel and recommending promotions or disciplinary actions;
- conducting an informal training program and recommending courses and staff training requirements.

Performs related duties such as providing technical and service advice to clients, contractors and other technical staff, preparing correspondence and performing other administrative duties as required.

5

Specifications

Skill and Knowledge

The work requires knowledge of operational, maintenance, repair, overhaul, pollution control and safety regulations, codes and procedures to control the operation of a large central heating and cooling plant with an extensive distribution system and satellite steam generators providing three major services and an emergency electrical generating service to the Dorval International Airport complex. A knowledge of cost estimating, plant efficiency calculation, production quantification and budgeting techniques and an understanding of information contained in contract specifications, drawings, manuals and technical reports are required. This skill and knowledge is normally acquired by the formal study of regulations, codes and procedures, by the study of thermodynamics, mathematics, physics and chemistry and by experience in supervising the operation of high pressure heating and cooling plants, extensive distribution systems and electric generating plants according to the required regulations and procedures.

E8 / 350

Operational Responsibility

The work requires the interpretation and implementation of regulations and procedures relating to the operation and maintenance of heating, cooling, electric generating and water treatment plants and equipment. It also requires the planning and scheduling of operational, emergency, maintenance and safety programs appropriate for a central heating and cooling plant and several satellite steam generators; the planning and coordinating of major repairs and plant overhauls with minimal client inconvenience; the writing of technical reports and the drafting of repair and overhaul specifications; the supervising of subordinates. The activities affect the continuity and cost of heating, cooling and emergency electric power supplied to the Main Terminal Building, the Control Tower, hangers and various other buildings at the Dorval International Airport; the service life of the boilers, chillers, diesel-electric generators and the underground distribution system; the effective deployment of staff. Reports and recommendations affecting plant operation or the acquisition of new equipment are made to the Superintendent, Maintenance and Mechanical Services. Errors in judgment could result in interruption of service to clients, inconvenience to travelers, damage to plant and equipment and increased operating costs.

D4 / 350

Working Conditions

Environment - the work is relatively free of disagreeable conditions. There is occasional exposure to noise, heat, dust and fumes when inspecting the plant and the work being performed.

1 / 12

Hazards - there is occasional exposure to minor injuries such as cuts, burns or bruises when touring the installation.

A1 / 8

Physical Effort

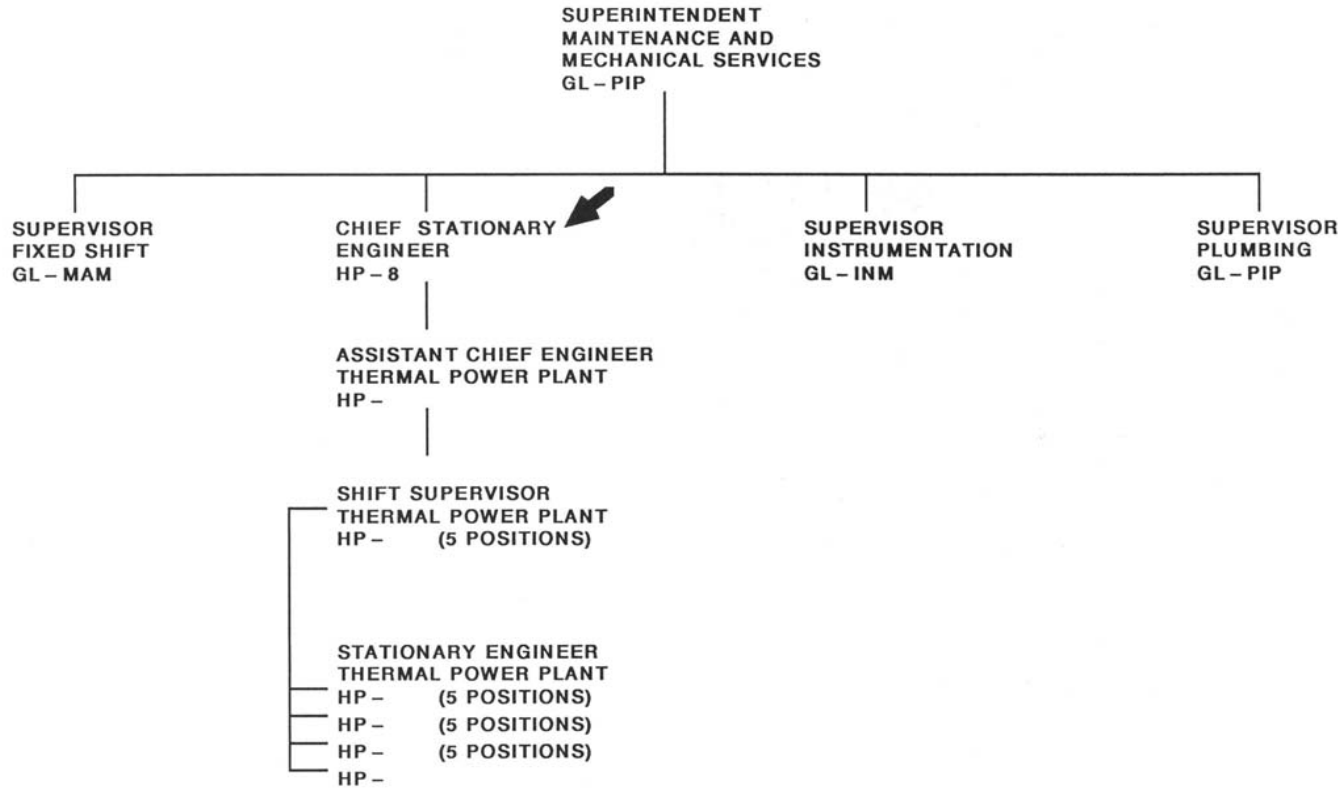
The work requires standing, walking and climbing stairs during inspection tours.

1 / 10

Supervision

The work requires supervising a staff of 25 including subordinate Shift Supervisors, establishing shift schedules, allocating work and appraising staff performance. There is a requirement to investigate breaches of discipline, resolve and report on personnel or operational problems and recommend promotions or disciplinary actions.

D4 / 100



THERMAL POWER PLANT MONTREAL
INTERNATIONAL AIRPORT

TRANSPORT CANADA

BENCH-MARK POSITION DESCRIPTION

Bench-Mark Position Number: 16

Level: 9

Descriptive Title: Plant Superintendent
Cliff Street Plant, Ottawa

Point Rating: 880

Summary

Reporting to the Superintendent, Utilities, Plants and Systems, directs and controls the operation and maintenance of a very large heating and cooling plant and the energy distribution systems providing heating, cooling and primary and auxiliary electrical power to some 34 large government and private sector buildings in the centre of Ottawa, including the Houses of Parliament, National Defence Headquarters, the Chateau Laurier Hotel. Also develops, implements and controls safety and security programs and performs other related operational and administrative duties.

Duties

% of Time

Directs the operation and maintenance of a large energy producing plant comprising six oil and gas fired, high pressure boilers aggregating 171,200 kilowatts, four steam turbine driven refrigeration compressors totaling 102,000 kilowatts, primary electric power distribution system, auxiliary diesel-electric generators aggregating 1,350 kilowatts, other equipment totaling 4,400 kilowatts and an extensive water treatment plant with a capacity of 1,634,000 liters per day, by:

70

- interpreting and implementing regulations, directives and procedures;
- developing and proposing the adoption of emergency, operational and safety programs and implementing the approved programs;
- planning, developing and implementing, on a continual basis, the overall preventive maintenance program appropriate for the plant's equipment and operation;
- ensuring the upkeep of operational, maintenance and repair records;
- reviewing heating, cooling and primary electrical distribution load requirements, based upon running data, and implementing start-up and shut-down procedures to maximize economy of operation;
- regulating the operation of the plants and modifying operational methods to maximize efficiency and optimize safe working conditions;
- developing and implementing test and maintenance schedules for boiler, make-up, condensate, chilled and condenser water at acceptable chemical levels;
- calculating boiler and chiller efficiency, energy costs and consumption, material and repair costs and contract and labor costs;
- monitoring the effect of fluctuating energy demands upon plant operation and controlling the plants to ensure optimal synchronization, balance and energy economy;
- planning, scheduling and implementing major shut-downs, overhauls and the installation of new equipment to minimize the interruption of service to key installations;
- discussing problems with client building personnel and determining solutions to correct the situations;
- ensuring safety procedures and security measures are understood and enforced in all plant locations, tunnels and manholes;
- carrying out many of the above tasks when directing the operation of a smaller plant supplying services to a single building.

% of Time

Supervises a staff of 29 operating engineers and trades personnel through 7 subordinate supervisors, by:

- establishing and enforcing the work standards and practices to be followed in operating and maintaining the plants;
- developing shift schedules and deploying staff to meet operational requirements;
- appraising the performance of subordinate supervisors, reviewing appraisals of operating engineers made by the supervisors and recommending promotion or disciplinary actions.

Performs related duties such as compiling data on plant operations, production, fuel and material costs for use in monthly reports and annual estimates and drafts engineering drawings and specifications. Also writes correspondence to, and meets with, suppliers and clients and performs other administrative tasks as required.

Degree/
Points

Specifications

Skill and Knowledge

The work requires knowledge of operational, maintenance, repair and safety regulations, codes and procedures to control the operation of a large central heating and cooling plant with extensive distribution systems and water treatment capability providing four major services and an emergency electrical generating service to a large number of commercial and government buildings in the centre of Ottawa. A knowledge of energy consumption and costing, plant optimization and efficiency calculation, repair and labor costing and contract analysis and an understanding of information contained in contract specifications, drawings, manuals and technical reports is required. This skill and knowledge is normally acquired by the formal study of regulations, codes and procedures, by the study of thermodynamics, mathematics, physics and chemistry and by experience supervising the operation of high pressure heating and cooling plants, large water treatment plants, extensive distribution systems and electric generating plants according to the required regulations and procedures.

Operational Responsibility

The work requires the interpretation and implementation of regulations and procedures relating to the operation, maintenance and repair of heating, cooling, electrical generating and water treatment plant and equipment. It also requires the planning, scheduling and implementing of operational, emergency, maintenance and safety programs; the planning, scheduling and implementing of major shut-downs and overhauls and the installation of new equipment with minimal client inconvenience; the writing of technical reports and equipment specifications; and the supervising of subordinates. The activities affect the continuity and cost of servicing 34 large private sector and government buildings in the centre of Ottawa, the operation and service life of high pressure steam boilers, steam turbine driven refrigeration compressors, diesel-electric generators, an extensive and complex system of underground service tunnels, and the effective deployment of staff. Reports and recommendations on plant operation or new equipment are made to the Superintendent, Utilities, Plants and Systems. Errors in judgment could result in interruption of service to both commercial and government clients, damage to plant and equipment, loss of confidence in utility services and increased operating costs.

Degree/
Points

Working Conditions

Environment - Occasional exposure to noise, heat, dirt or fumes when inspecting plant and work being performed.

1 / 12

Hazards - Occasional exposure to injuries such as minor bruises, burns and abrasions when touring work sites.

AI /8

Physical Effort

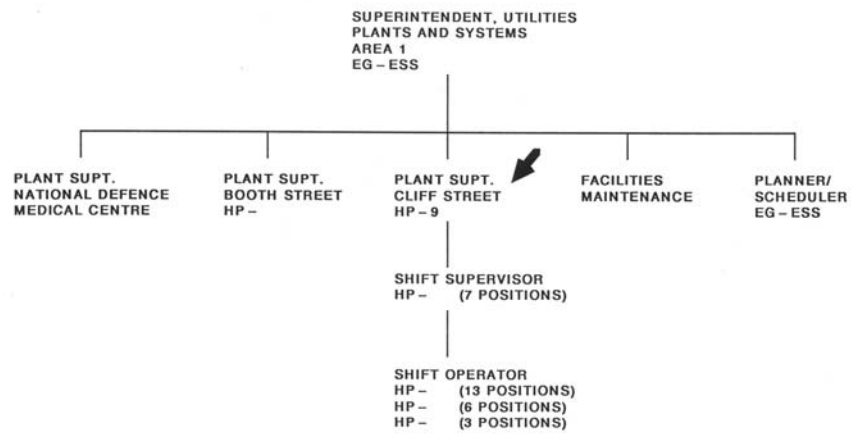
The work requires standing, walking and climbing stairs during inspection tours.

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Supervision

The work requires supervising a staff of 29, including subordinate supervisors, establishing shift schedules, planning operating, maintenance and safety programs, allocating work and appraising staff performance. There is a requirement to resolve and report on personnel and operational problems, investigate and report breaches of discipline and recommend promotions or disciplinary actions.

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CLIFF STREET CENTRAL HEATING
AND COOLING PLANT

PUBLIC WORKS CANADA

