

JOB SPECIFICATON

AND

SKILL TEST

JOB TITLE : **BOILER OPERATOR (ATTENDANT), L - 1**
SECTOR : **MECHANICAL ENGINEERING**
SUB-SECTOR : **THERMAL**

COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING

NATIONAL SKILL TESTING BOARD

MADHYAPUR THIMI -17, SANOTHIMI, BHAKTAPUR, NEPAL

2002 (2059)

The National Skill Standards and Test was Revised by

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Approved by the Tripartite National Skill Testing Board..

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Approved by the Tripartite National Skill Testing Board..

1995

JOB SPECIFICATION

1	JOB TITLE : Boiler Operator (Attendant) LEVEL : One (1)
2	JOB DESCRIPTION Boiler Operator, L - 1 shovels or feeds coal/husk into, or arranges fuel supply to the boiler. Checks boiler before operation. Checks and reports temperature and pressure gauge readings. Lubricates moving parts in the close supervision of the superiors. Checks and reports the supply of coal/husk/fuel. Prepares boiler for firing and running the boiler. Collects and carries away boiler ash as per instruction. Attends to the required function following boiler shut down.
3	LIST OF TASKS: <ol style="list-style-type: none">1. Cleaning of boiler and boiler room.2. Checking boiler before operation.3. Preparing boiler for firing and running.4. Attending to the required function following boiler shut down.
4	QUALIFYING NOTES (entry requirement etc.) Physical Requirement: Normal health, no special physical requirements demanded by this job. Educational requirement: Able to perform simple Arithmetic operations (addition, subtraction, multiplication and division.)

TASK SPECIFICATION

5	TASK NO: 1 Cleaning of boiler and boiler room	JOB TITTLE: Boiler Operator (Attendant), L - 1
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| 6 | TASK ELEMENTS: <ol style="list-style-type: none">1. Receives verbal/written instruction.2. Dons protective clothing.3. Checks for proper lighting and illumination.4. Checks for emergency exits and presence of unauthorized persons.5. Selects cleaning materials.6. Cleans boiler room.7. Cleans boiler exterior.8. Cleans circulating pumps.9. Cleans gauges and sight glass.10. Cleans fire chamber (if husk or coal fired).11. Cleans all other exposed components.12. Stores cleaning agents. |
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TASK SPECIFICATION

7 **TASK PERFORMANCE REQUIREMENTS**
Broom, Cloth (jute/cotton waste), Detergent powder, Brush, Basket, Flat file, Emery paper, Inspection lamp, Note book, Pencil, Boiler complete with feed water arrangement and other accessories, Fire extinguisher, Goggles, Industrial gloves.

- 8** **TASK PERFORMANCE STANDARDS**
- Appropriate safety clothing worn properly.
 - Fused bulbs replaced, if any. Flickering lights corrected. Bulbs or light domes cleaned. Light switches checked and reported, if found defective.
 - Walking passages in the boiler room cleared up of any obstruction and unauthorized persons removed, if any.
 - Appropriate cleaning materials or agent selected, i.e. broom, cloth or rag, cotton waste, detergent.
 - Floor cleaned, made non slippery, and entire room cleaned.
 - Boiler exterior cleaned without any scratch or damage to the surface.
 - Pumps and other accessories cleaned properly.
 - Gauges and Sight Glass cleaned and made clear for easy reading.
 - Ashes and un burnt fuel removed, and disposed off in identified location.
 - Cleaning accessories and unused detergent stored properly.

9	10	TASK TRAINING DATA			
TASK NO:	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY & HYGENE
1	1 2 3 4 5	<p>Knowledge of procedure for cleaning of lighting fixtures, tubes and bulbs.</p> <p>Knowledge of opening sequence of emergency exits.</p> <p>Knowledge of types and use of detergents.</p> <p>Knowledge of major components of pumps, gauges, sight glass, fire chamber, and other accessories as applicable</p> <p>Knowledge of importance of removal of fibrous materials striking to the surface as a result of improper cleaning operation.</p>			<p>Use and importance of proper protective clothing. Follows proper procedures.</p> <p>Hazards due to electric shock.</p> <p>Hazards due to oily surface.</p> <p>Hazards due to hot surface, hot gas/flue and hot water, Fire hazards due to oil spill and partial burnt solid fuel.</p>

TASK PERFORMANCE TEST (SKILL ASSESSMENT)

	TASK PERFORMANCE TEST (SKILL ASSESSMENT)		
11	TASK TITLE : Cleaning of boiler and boiler room TASK NO : 1 (One)	LOCATION OF TEST : CANDIDATE'S NAME : EVALUATORS NAMES:	
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE? 1. Wear appropriate safety clothing properly. 2. a. Clean domes, bulb and lights. b. Replace fused bulbs, if found. c. Check and report any flickering tube light and defective light switches. 3. Clear up walking passages in the boiler room and removed un- authorized persons, if any. 4. Select appropriate cleaning materials and agents. 5. Clean floor and room. 6. Clean boiler exterior without any scratch or damage to the surface. 7. Clean pumps and other accessories properly. 8. Clean gauges and sight glass. 9. Remove Ash and un burnt fuel, and dispose off in identified location. 10. Store cleaning accessories and unused detergent properly.		

TASK SPECIFICATION

5	TASK NO: 2 Checking boiler before operation	JOBTITLE: Boiler Operator (Attendant), L - 1
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| 6 | TASK ELEMENTS: <ul style="list-style-type: none">2.1 Receives instructions.2.2 Dons protective clothing.2.3 Checks and corrects the followings:<ul style="list-style-type: none">a. Position of the valves.b. Water level in the gauge glass.c. The fuel level (if oil fired) in fuel oil service tank.d. Water level in soft water tank.e. Gauges and indicators.f. Stock of husk or coal (if applicable).g. Tightness (manholes, hand/head holes, front door, smoke box door, flanges and joints).h. Leakage if any.i. Cracks and breakage.j. Electrical supply.k. Proper ventilation.l. Proper lubrication.2.4 Preheats the oil in service tank, if necessary.2.5 Collects log-sheet and places in proper location. |
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TASK SPECIFICATION

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TASK PERFORMANCE REQUIREMENTS

Standard and special wrenches, Electrical line tester, Hammer, Open ended and ring wrenches, Screwdriver (Flat and Phillips), Pliers, Fuel (Husk, coal, wood, furnace oil, Light Diesel Oil, Kerosene, High Speed Diesel as applicable), Log Sheet, Pen, Goggles, Gloves. Lubricating Oil, Grease.

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TASK PERFORMANCE STANDARDS

Appropriate safety clothing worn properly.
following performed:

- Position of the valves checked visually or by turning hand wheels and corrected accordingly .
- Water level gauge checked and corrected accordingly.
- Fuel level checked as per level gauge or dipstick, and corrected accordingly.
- Water level in soft water tank checked as per level gauge or by dipstick, and corrected accordingly.
- Gauge indicator's reading checked and reported for any abnormality.
- Stock of husk or coal checked, and reported accordingly.
- Manholes, hand/ head holes, front door, smoke box door, flanges and joints checked, and corrected accordingly.
- Leakages checked visually, and corrected accordingly.
- Cracks and breakages checked visually, and corrected accordingly.
- Line Voltage, and 3 phase supply checked by the meter provided.
- The exhaust fan switched on, and reported accordingly.
- Components lubricated as per instruction.

Oil in service tank preheated as per instruction.

Log- sheet collected and placed in specified location.

9	10	TASK TRAINING DATA			
TASK NO:	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY & HYGENE
2	2	<p>3.a Knowledge of types and identification of valves, valve position, and opening/closing methods of the valves.</p> <p>b Knowledge of upper and lower limits of water level in gauge glass.</p> <p>c Knowledge of upper and lower limits of fuel level in gauge glass/dipstick.</p> <p>d Knowledge of upper and lower limit of water level in soft water tank.</p> <p>e Knowledge of normal operating readings of gauges and indicators.</p> <p>f Knowledge of tentative amount of fuel as required for boiler operation for a shift of 8 hours.</p> <p>g Knowledge of identification and tightness of the covers of manhole, hand/head holes, front door, smoke box, flanges and joints.</p> <p>h Knowledge of probable location of leakages and identification of real leakages.</p> <p>i Knowledge of use and selector switches of the panel board voltmeter.</p> <p>j Knowledge of identification of the lubricating points..</p> <p>k Knowledge of selection of appropriate lubricants</p>			<p>Use and importance of proper protective clothing. Safety requirements in the handling different types of boiler fuels.</p> <p>Hazards due to electric shock. Perform first aid and report.</p>

TASK PERFORMANCE TEST (SKILL ASSESSMENT)

	TASK PERFORMANCE TEST (SKILL ASSESSMENT)		
11	TASK TITLE : Checking boiler before operation. TASK NO : 2 (Two)	LOCATION OF TEST : CANDIDATE'S NAME : EVALUATORS NAMES:	
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE? 2.1. Wear appropriate safety clothing properly. 2.2a. Check position of valves visually or by turning hand wheels, and corrected accordingly. b. Check water level gauge, and corrected. c. Check fuel level as per level gauge or dipstick. d. Check water level in soft water tank as per level gauge or by dipstick, and corrected. e. Check gauge indicator's reading, and reported for any abnormality. f. Check stock of husk or coal, and reported accordingly. g. Check manholes/head holes, front door, smoke box door, flanges and joints, and corrected. h. Check leakages visually, and corrected. i. Check cracks and breakages visually, and reported accordingly. j. Check line voltage, and three phase supply by the meter provided, and reported accordingly. k. Switch on the exhaust fan, and reported l. Lubricate components as per instruction. 2.3 Preheat oil in service tank as per instruction. 2.4 Collect and place log- sheet in specified location.		

TASK SPECIFICATION

5 **TASK NO: 3**
Preparing boiler for firing and running **JOBTITLE: Boiler Operator (Attendant), L - 1**

- 6** **TASK ELEMENTS:**
- 3.1 Receives instructions.
 - 3.2 Dons protective clothing.
 - 3.3 Performs the following functions as per instruction:-
 - A Switches on the main power supply.
 - B Prepares /places/Ignites the solid fuel, if applicable.
 - C Checks the flow of water and fuel.
 - D Checks the smoke exhaust, and adjusts the air flow.
 - E Checks the temperature, pressure, and level gauge readings.
 - F Blows down the boiler.
 - 3.4 Reports any visible abnormal condition or unusual sound to the senior operator.
 - 3.5 Fills up log sheet.
 - 3.6 Shuts down the boiler in case of emergency.
 - 3.7 Operates fire extinguisher and alarm signals in case of fire.

TASK SPECIFICATION

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TASK PERFORMANCE REQUIREMENTS

Log -sheet, Pen, Standard and Special Wrenches, Goggles, Gloves, Shovel and Spreader, Kerosene, Cotton waste, Lighter.

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TASK PERFORMANCE STANDARDS

- Appropriate safety clothing worn properly.
- Following function performed as per instruction :
 - a. Main power supply switched on safely.
 - b. Solid fuel prepared, replaced, and ignited, if applicable.
 - c. Flow of water and fuel supply checked properly.
 - d. Smoke exhaust checked, and air flow adjusted properly.
 - e. Temperature, pressure, and level gauge readings checked .
 - f. Blow down of the boiler executed.
- Any visible abnormal condition or unusual sound reported to the senior operator, if found.
- Log- sheet filled up properly.
- Boiler shut- downed, in case of emergency, in absence of senior operator.
- Fire extinguisher and alarm signals operated in case of fire.

9	10	TASK TRAINING DATA			
TASK NO:	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY & HYGENE
3	3.a. b. c. d. f. g. 6. 7.	Knowledge of operating sequence of different types of switches Knowledge of handling, preparation and initial ignition of solid fuel. Knowledge of inspection of flow indicator, if installed, and/or sensing of water /fuel flow. Knowledge of adjustment of air flow. Knowledge of normal operating readings of gauges and indicators. Knowledge of operation of blow down valve. Knowledge of shut down procedure/sequence of the boiler as applicable. Knowledge of operation of different type of fire extinguisher.			Use and importance of safety protective clothing . Hazards electric shock. Perform first aid and report. Hazards to the boiler encase of disruption of water/fuel flow. Hazards due to hot steam/hot water. Perform first aid and report to senior operator.

TASK PERFORMANCE TEST (SKILL ASSESSMENT)

	TASK PERFORMANCE TEST (SKILL ASSESSMENT)		
11	TASK TITLE : Preparing boiler for firing and running.. TASK NO : 3 (Three)	LOCATION OF TEST : CANDIDATE'S NAME : EVALUATORS NAMES:	
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE? 1. Wear appropriate safety clothing properly. 2. Perform the following function as per instruction:- a) Switch on the main power supply. b) Prepare, replace, and ignite solid fuel, if applicable. c) Check flow of water and fuel supply properly. d) Check exhaust smoke, and adjust air flow. e) Check temperature, pressure, and level gauge reading. f) Blow down of the boiler executed. 3. Report any visible abnormal condition or unusual sound to the senior operator, if found. 4. Fill up the log- sheet properly. 5. Shut- down the boiler in case of emergency, in absence of senior operator. 6. Operate fire extinguisher and alarm signals encase of fire.		

TASK SPECIFICATION

5	TASK NO: 4 Attending to the required function following boiler shut down.	JOB TITTLE: Boiler Operator (Attendant), L - 1
6	TASK ELEMENTS: 4.1 Receives instructions. 4.2 Dons protective clothing. 4.3 Selects specified tools, if necessary required for shut down. 4.4 Performs following functions as per instruction:- a. Shuts off the supply of fuel, and follows the post fuel cut off procedures. b. Retards, and extinguishes the solid fuel fire, if applicable. c. Closes the outlet valves (steam or hot oil) in the proper sequence. d. Operates the blow down valve, where applicable. 4.5 Opens the vent valve where applicable, and fills of the boiler with feed water for next operation. 4.6 Cleans the boiler, and its surroundings of any dripped off water. 4.7 Fills up the log -sheet.	

	TASK SPECIFICATION
7	TASK PERFORMANCE REQUIREMENTS Standard Wrenches, Special Tools, Cloth/Cotton waste, Goggles, Gloves, Shovel and spreader, Fire extinguisher.
8	TASK PERFORMANCE STANDARDS <ul style="list-style-type: none">- Specified tools selected for shut -down, if necessary.- Following functions performed as per instructions:<ol style="list-style-type: none">a. Supply of fuel shut-off, and post fuel cut off procedure followed.b. Solid fuel fire retarded and extinguished, if applicable.c. Outlet valves (steam or hot oil) closed in the proper sequence.d. Blow down valve operated, where applicable.- Vent valve opened, where applicable and boiler filled up with feed water for next operation.- Boiler and its surrounding cleaned of any dripped oil/water.- Log sheet filled up properly.

9	10	TASK TRAINING DATA			
TASK NO:	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY & HYGENE
4	3. 4. a. b. 5. 6.	Knowledge of identification of shut down tools, if applicable. Knowledge of procedure for shut off and/ procedure for post fuel cut off operation. Knowledge of identification, opening, and closing of outlet valves. Knowledge of operation of blows down valve. Knowledge of operation of vent valve and filling up of the boiler with feed water. Knowledge of type and use of detergent.			Hazards due to hot steam/water . Perform first aid and or report to senior operator.

TASK PERFORMANCE TEST (SKILL ASSESSMENT)

	TASK PERFORMANCE TEST (SKILL ASSESSMENT)		
11	TASK TITLE : Attending to the required function following boiler shut down. TASK NO : 4 (Four)	LOCATION OF TEST : CANDIDATE'S NAME : EVALUATORS NAMES:	
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (Comments)
	DID THE CANDIDATE? 4.1. Wear appropriate safety clothing properly. 4.2. Select tools as specified for shot down, if necessary. 4.3. Perform the following functions as per instructions: a) Shut-off supply of fuel, and follow cut off procedure of the post fuel properly. b) Retard and extinguish solid fuel fire, if applicable. c) Close out-let valves (steam or hot oil) in the proper sequence. d) Operate blow-down valve, where applicable. 4.4. Open vent valve, where applicable, and fill the boiler with feed water for next operation. 4.5. Clean boiler, and its surrounding of any dripped oil/water. 4.6. Fill up the log-sheet properly.		