METHOD STATEMENT FOR FETTELING WORK

A

Job Description: **Fettling Work- Job Work**	
Area/ Location: Plant: LPDC- Fettling area	
Aux Permit Type:	NA

B

Major hazards associated with the job: 1. Electric Shock 2. Fire and Explosion 3. Slip, Trip and Fall hazard 4. Fall from height (if height work is carried out) 5. Falling Object.	6. Burn injury during Hot work 7. Eye and Cut injury During cutting work 8. Dust Fumes inhalation during drilling work.. 9. eye irritation. 10. Human Injury 11. Any Other.
What Worst can Happen? 1. Fatality or permanent disability due to Electric Shock, Amputation etc.	

C

PPE's Required for Jobs: Safety Shoes, Safety glasses, Hand Gloves , Ear Plug etc.
Resources /Tools Required for the Job: Hand Tools, Chisel, and Hammer etc.

D

Activities Sequence: (What, Who & How?)

S. No	Activity	Who Will do	Risk involved	Risk Mitigation / Control Measure
	FETTLING OPERATION			
1	Collect the castings after heat treatment by trolley	Operator	Sprain due to manual pushing/pulling of the trolley Falling of material at working level on the level	Safe Material handling, dedicated trolley, trained person etc.
2	Fixing the casting inside the bench vice	Operator	STF. Material Hazards, material fall down, foot	Material handling training, OJT, etc.

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			injury, Body injury etc. Sharp edges that may be contact with skin	
3	Removal of the un wanted material with the help of file and chisel	Area Owner	Slip Trip Fall etc. Deafness, Mental stress, eye injury, Body injury	Adherence of required PPE – Hand gloves, Ear plug, goggle etc. Trained person, Closed supervision etc.
4	After completion of filing Keep the casting in the designated bin.	Approved Contractor	Trip hazard due to improper handling Equipment's and machines. Body injury, Material hazards	Ensure the PPE adherence, closed supervision, proper stacking etc.
5	Collect the chips	Trained and experienced persons from contractor	Burr may contact with skin, Hand Injury.	Ensure that all work must be done by train person. Ensure the PPE adherence
6	Disposal of chips	Contract Employees	Burr may contact with skin. Hand Injury	Ensure that all work must be done by train person. Ensure the PPE adherence
	MELTING OPERATION			
	Receiving of ingots and rej from stores	Trained and experienced persons from contractor	Sprain due to manual handling of the trolley.	Ensure that all work must be done by train person.
	Charging into the melting furnace.	Trained and experienced persons from contractor	Sprain due to manual handling of the trolley.	Ensure the PPE adherence
	Melting operation	Trained and experienced persons from contractor	Smoke that may inhale Fire &explosion High noise	Ensure that all work must be done by train person.
	Temperature measurement	Trained and experienced persons from contractor	Exposure to heat radiation Exposure to electrical energy Manual handling of the burner Hot laddle may contact with skin	Ensure the PPE adherence
	Tapping of the liquid metal	Trained and experienced persons from contractor	Exposure to heat radiation Exposure to heat radiation Fall of molten metal	Ensure that all work must be done by train person.
	Degassing	Trained and experienced persons from contractor	Fall of cylinder Explosion of the cylinder Fall of dross on body	Ensure the PPE adherence

	Density checking machine(Vaccum tester)	Trained and experienced persons from contractor	Exposure to electrical energy Manual handling of the lid Fall of molten metal	Ensure that all work must be done by train person.
	Degassing rotor changing	Trained and experienced persons from contractor	Exposure to hot environment Manual handling of the damaged rotor(Hot rotor)	Ensure the PPE adherence
	Lining of the melting furnace	Trained and experienced persons from contractor	1)Fall of bricks on working level	Ensure that all work must be done by train person.
	Storage of consumables(fluxes)	Trained and experienced persons from contractor	Fall of consumables Residue may contact with skin	Ensure the PPE adherence
	Disposal .	Trained and experienced persons from contractor	Residue may ingest through mouth	Ensure that all work must be done by train person.
	Power hack saw operation	Trained and experienced persons from contractor	Sharp edges may contact with skin	Ensure the PPE adherence
	Dross Reclamination	Trained and experienced persons from contractor	Falling of dross Exposure to heat radiation	Ensure that all work must be done by train person.

E

Special Instructions/Note:

1. Follow all the work instructions strictly as per ETL Policy.
2. No Tobacco, Gutkha, allowed in premises
3. Follow HSE Golden Rule and ECOC policy.
4. Close Supervision while performing the work.

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Hazard Identification, Risk Assessment And Risk Control Register (HIRA)

tivity	Sub-Activities	E	R / NR	Hazard	Risk	Legal	Probability	Consequence	Resultant	Risk level	Sig. Hira No.	Priority No.	Objective No.	Additional Controls						
														Operational Control						
														E	S	EC	W	P	OCP No	MP No
ng of nd rej wes	Requisition given to stores		R																	
	Transfer the ingots bundle and rejection by forklift to melting		R	Site transport	1	Incident		2	2	4	M									
			R	Fall of material on the level	2	Incident		2	2	4	M									
			NR	Wetting of material due to rain	3	Incident		2	2	4	M									
g into the furnace	Cut the ingots strip		R	Strip may contact with skin	4	Cut Injury		2	2	4	M									
	Lift the ingots with hands(manual lifting) and throw it into the furnace.		R	Manual lifting of Al ingots	5	Sprain		2	2	4	M									
			R	Fall of ingot/rej casting from height	6	Foot Injury		2	2	4	M									
	Lift the ingots with hands(manual lifting) and put it in trolley		R	Manual lifting of Al ingots	7	Sprain		2	1	2	L									
			R	Fall of material on the level	8	Foot Injury		2	1	2	L									
operation	Put oily cotton inside the furnace		NR	Oily cotton may contact with skin	9	Skin irritation		2	1	2	M									
			NR	Smoke that may inhale	10	Respiratory inhalation		2	1	2	M									
	Keep the fire		NR	Fire &explosion	11	Incident		2	2	4	M									
			NR	High noise	12	Partial deafness		2	2	4	M									
	Starting of the Melting furnace blower ,Furnace oil pump and burner&Exhaust blower and Scrubber pump		R	Exposure to electrical energy	13	Electric shock		2	2	4	M									
	Adjustment the flame.		R	Fall of person on the level	14	Body injury		2	2	4	M									
	Melt the charge.		R	Exposure to heat radiation	15	Skin irritation/ Dehydration		2	2	4	M									
	Wrapling the charge with scrapper		R	Exposure to heat radiation	16	Skin irritation/ Dehydration		2	2	4	M									
			R	Molten metal may contact with skin	17	Burn		2	2	4	M									
	Take the molten metal sample into the sampling cup with spoon.		R	Fall of molten metal	18	Burn		2	1	2	L									
			R	Exposure to heat radiation	19	Skin irritation		2	1	2	L									
	Quench the solidified sample in water		R	Hot sample may contact with skin	20	Burn		2	1	2	L									
analysis	Collect the Argon cylinder from stores.		R	Fall of cylider	21	Injury		2	2	4	M									
	Store the cylinder in site.		R	Fall of cylider	22	Injury		2	1	2	L									
	Scratch surface of the sample on table belt grinder		R	Slipping of the tool	23	Cut injury		2	1	2	L									
			R	Chips may contact with eye	24	Eye injury		2	2	4	M									
			R	Slipping of the Job	25	Incident		2	1	2	L									
	Analyse the sample		R							0										
	Print the report		R							0										
ature sment	Measure the temperature with thermocouple.		R	Exposure to heat radiation	26	Skin irritation		2	1	2	L									
	Switch off the blower and burner		R	Exposure to electrical energy	27	Electric shock		2	1	2	L									
ing of the	A)Connect the preheating burner to the supply(LPG and air)		NR	Manual handling of the burner	28	Incident		2	2	4	M									
	Keep the laddle in right position		NR	Hot laddle may contact with skin	29	Burn		2	2	4	M									
	Put the burner above the laddle(Preheating stand)		NR	Manual handling of the burner	30	Incident		2	1	2	L									

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	Put the fire manually		NR	Fire &explosion	31	Incident		2	2	4	M												
	Open the LPG Cylider and Air valve		NR	Fire &explosion	32	Incident		2	2	4	M												
	Regulate the LPG and Air flow		NR	Fire &explosion	33	Incident		2	2	4	H												
	After completion of pre heating close the valves of LPG and air supply.		NR	Fire &explosion	34	Incident		2	2	4	M												
	Remove the burner and keep in their respective place.		NR	Burner may contact with skin	35	Burn		2	1	2	L												
	Cover the laddle with Ceramic blanket		NR	Blanket may contact with skin	36	Skin irritation		2	1	2	L												
	BiPlug in Electrical Preheated Laddle& Switch on		R	Exposure to electrical energy	37	Electric shock		2	2	4	M												
Tapping of the liquid metal	Bring the pre heated laddle nearer to the pouring spout with crane		R	Exposure to heat radiation	38	Skin irritation		2	1	2	L												
	Keep the laddle in right position		R	Exposure to heat radiation	39	Skin irritation		2	1	2	L												
	Tapping of the liquid metal into the laddle from the furnace		R	Fall of molten metal	40	Burn		2	2	4	M												
			R	Manual handling of the furnace	41	Sprain		2	2	4	M												
			R	Fire	42	Incident		2	2	4	H												
Cleaning of the melting Furnace	Put coveral-5 over the melting furnace walls.		R	Fumes may inahale	43	Respiratory inhalation		2	2	4	M												
	Scrap the walls with the help of scrapper.		R	Preheated scrapper may contact with skin	44	Burn		2	2	4	M												
	Remove the dross with the help of skimmer in designated bin.		R	Fall of dross	45	Burn		2	2	4	M												
			R	Manual handling of the dross	46	Sprain		2	2	4	M												
			R	Fumes may inahale	47	Respiratory inhalation		2	2	4	M												
Degassing	Collect the Nitrogen cylinder from stores.		R	Fall of cylinder	48	Foot Injury		2	1	2	L					✓							
	Store the cylinder in site.		R	Fall of cylinder	49	Foot Injury		2	2	4	M												
			R	Explosion of the cylinder	50	Incident		2	2	4	M												
	Transfer the laddle to degassing station with crane or Forklift.		R	Exposure to heat radiation	51	Skin irritation		2	1	2	L												
	Put the laddle in designated place for degassing.		R	Exposure to heat radiation	52	Skin irritation		2	1	2	L												
	Put Coveral flux to the melt		R	9)Fumes may inhale	53	Respiratory inhalation		2	1	2	L												
	Mix thoroughly with skimmer and remove the dross into the dross bin		R	11)Fall of dross on body	54	Burn		2	2	4	M												
			R	14)Manual handling of the dross	55	Sprain		3	1	3	M												
			R	9)Fumes may inhale	56	Respiratory inhalation		2	2	4	M												
			R	13)Exposure to heat radiation	57	Skin irritation		2	1	2	L												
			R	11)Splashing of the molten metal may contact with skin	58	Burn		2	1	2	L												
	Bring the degassing machine arm of the degassing machine to working position.		R	Manual handling of the machine	59	Sprain		2	1	2	M												
	Open the nitrogen cylinder with key.		R	Gas may inhale	60	Respiratory inhalation		2	1	2	M												
	Adjust the cylinder pressure ,working pressure and nitrogen flow.		R	Explosion of the cylinder	61	Incident		2	2	4	M												
	(a)Keep the machine in auto mode.		R	Exposure to electrical energy	62	Electric shock		2	1	2	L												
	Start the machine.		R	Fall of molten metal due to stirring action	63	Burn		2	1	2	M												
	Add GR 510,GR 2815 and Mod alloy to the melt.		R	Exposure to heat radiation	64	Skin irritation		3	1	3	M												
	After completion of the degassing clean the degassing rotor		R	Exposure to heat radiation	65	Skin irritation		3	1	3	M												
	Close the nitrogen cylinder valve with key.		R	Gas may inhale	66	Respiratory inhalation		3	1	3	M												

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	Keep the degassing machine arm in idle position.		R	Manual handling of the machine	67	Sprain		3	1	3	M											
	Transfer the molten metal to LPDC/GDC with fork lift or crane.		R	Exposure to heat radiation	68	Skin irritation		3	1	3	M											
			R	Fall of metal from height	69	Burn		2	2	4	M											
			R	Metal in contact with skin	70	Burn		2	2	4	M											
			R	Manual handling of the laddle	71	Sprain		2	2	4	M											
	(b)Keep the machine in manual mode.		NR	Exposure to electrical energy	72	Electric shock		2	1	2	M											
	Down the degassing rotor into the molten metal.		NR	Splashing of the molten metal that may contact with skin	73	Burn		2	2	4	M											
	Start on the rotation of the rotor.		NR	Spillage of the molten metal	74	Burn		2	2	4	M											
	Set the RPM of the rotor.		NR	Exposure to electrical energy	75	Electric shock		3	1	3	M											
	Add GR 510,GR 2815 and Mod alloy to the melt.		NR	Exposure to heat radiation	76	Skin irritation		3	1	3	M											
	After completion of the degassing stop the rotation of the rotor.		NR	Exposure to heat radiation	77	Skin irritation		3	1	3	M											
	Up the degassing rotor.		NR	Exposure to heat radiation	78	Skin irritation		3	1	3	M											
	Clean the degassing rotor		NR	Exposure to heat radiation	79	Skin irritation		3	1	3	M											
	Close the nitrogen cylinder valve with key.		NR	Gas may inhale	80	Respiratory inhalation		3	1	3	M											
	Keep the degassing machine arm in idle position.		NR	Manual handling of the machine	81	Sprain		3	1	3	M											
	Mix thoroughly with skimmer and remove the dross into the dross bin.		NR	Fall of dross	82	Burn		2	2	4	M											
			NR	Manual handling of the dross	83	Sprain		3	1	3	M											
			NR	Fumes may inhale	84	Respiratory inhalation	✓	3	1	3	M											
			NR	Exposure to heat radiation	85	Skin irritation		2	2	4	M											
			NR	11) Splashing of the molten metal may contact with skin	86	Burn		3	1	3	M											
	Transfer the molten metal to LPDC/GDC with fork lift or crane.		R	Exposure to heat radiation	87	Skin irritation		3	1	3	M											
			R	Fall of metal from height	88	Burn		2	2	4	M											
				Metal contact with skin	89	Burn		2	2	4	M											
			R	Manual handling of the laddle	90	Sprain		3	1	3	M											
checking	Switch on the density checking machine(.vaccum tester)		R	Exposure to electrical energy	91	Electric shock		2	1	2	L											
	Open the lid of the vaccum chamber.		R	Manual handling of the lid	92	Sprain		2	1	2	L											
	Take the molten metal with spoon and pour it in the sampling cup kept inside the chamber.		R	Fall of molten metal	93	Burn		2	1	2	L											
			R	Exposure to heat radiation	94	Skin irritation		2	1	2	L											
	Switch on the vaccum		R	Exposure to electrical energy	95	Electric shock		2	1	2	L											
	Close the lid of the vaccum chamber		R	Manual handling of the lid	96	Sprain		2	1	2	L											
	After completion of cycle time open the lid and remove the sample.		R	Manual handling of the lid	97	Sprain		2	1	2	L											
	Quech the sample and visually inspect the surface of the sample.		R	Hot sample may contact with skin	98	Burn		2	1	2	L											
ng rotor g	Removal of the damaged rotor in hot Condition with pipe wrench		R	Exposure to hot environment	99	Burn		2	1	2	L											
	keep the damaged rotor in dust bin.		R	Manual handling of the damaged rotor(Hot rotor)	100	Burn		3	1	3	M											
	Hold the rotor holder with hand .		R	Manual handling of the holder	101	Incident		3	1	3	M											
	Replacing of the rotor with preheated rotor		R	Manual handling of the preheated rotor	102	Burn		3	1	3	M											
	Check the threads of the rotor		R	may contact with skin	103	Cut injury		3	1	3	M											

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	Keep the rotor into the holder and threading up with hands.		R	Manual handling of the damaged rotor(Hot rotor)	104	Burn		3	1	3	M											
	Hold the degassing rotor with chain above the metal in H.T.		NR	Exposure to heat radiation	105	Skin irritation		3	1	3	M											
	Dip the preheated rotor into the metal		NR	Splashing of the molten metal may contact with skin	106	Burn		2	2	4	M											
	Keep the rotor in molten metal until the metal is removed or remove the degassing rotor from the molten metal and poking with the rod.		NR	Exposure to heat radiation	107	Skin irritation																
	After cleaning the rod clean the area and keep the rotor in designated place		NR	Manual handling of the cleaned rotor(Hot rotor)	108	Burn																
Lining of the melting furnace	Removal of the old lining		NR	1)Fall of bricks on working level	109	Cut injury		2	2	4	M											
	Lining with new material		NR	1)Fall of bricks on working level	110	Cut injury		2	2	4	M											
Storage of consumables(fluxes)	Receive the consumable items from stores		R	Fall of consumables	111	Incident		2	1	2	L											
Disposal	Collection of damaged stalks		R	Fall of stalk	112	Foot Injury		2	1	2	L											
	Collection of empty plastic bags		R	Residue may contact with skin	113	Skin irritation		2	1	2	L											
			R	Residue may ingest through mouth	114	Omitting		2	1	2	L											
	Collection of empty cylinders		R	Cylinder may fall on the foot	115	Injury		2	1	2	L											
Power hack saw operation	Clamp the blade		NR	Sharp edges may contact with skin	116	Cut injury		2	2	4	M											
	Fix the Job to be cutted		NR	Slipping of the material	117	Cut injury		2	2	4	M											
	Switch on the machine		NR	Exposure to electrical energy	118	Electric shock		2	2	4	M											
	Adjust the speed of the machine		NR	Manual handling	119	Sprain		2	1	2	L											
	After completion of the operation stop the machine		NR	Exposure to electrical energy	120	Electric shock		2	2	4	M											
	Remove the blade		NR	Sharp edges may contact with skin	121	Cut injury		2	2	4	M											
Dross Reclamination	Put the wet dross into the bucket.		R	Falling of dross	122	Burn		3	2	6	H	1	2							✓	EOHS/OCP/28	
			R	Exposure to heat radiation	123	Skin irritation		3	1	3	M											
	Down the ram(Fork) into the dross.		R	Exposure to heat radiation	124	Skin irritation		3	1	3	M											
	Start the rotation of the ram.		R	Exposure to electrical energy	125	Electrocution		3	1	3	M											
			R	Fumes may inahale	126	Respiratory inhalation	P	3	1	3	M	2	1							✓	EOHS/OCP/28	
			R	In adequate thermal environment	127	Heat stroke		3	1	3	M											
	Start the blower		R	Fumes may inahale	128	Respiratory inhalation	P	3	1	3	M	3	1							✓	EOHS/OCP/28	
			R	Exposure to electrical energy	129	Electrocution		3	1	3	M											
	After completion of the process stop the rotation of the ram		R	Exposure to heat radiation	130	Skin irritation		3	1	3	M											
			R	Fumes may inahale	131	Respiratory inhalation	P	3	1	3	M	4	1							✓	EOHS/OCP/28	
	Up the fork		R	Exposure to heat radiation	132	Skin irritation		3	1	3	M											
	Stop the blower		R	Exposure to electrical energy	133	Electrocution		3	1	3	M											
	Collect the metal into the bin.		R	Fall of metal contact with skin	134	Burn		3	1	3	M											
Fettling																						
Filing	Collect the castings after heat treatment by manual moving trolley.		R	Sprain due to manual handling of the trolley	Sprain			2	2	4	M				✓							
			R	Fall of material on the level	Incident			2	2	4	M											
	Fixing the casting inside the bench vice		R	Sharp edges that may contact with skin	Cut injury			2	2	4	M											
	Removal of the un wanted material with the help of file and chisel		R	Sliding of hand between stationary and movable part.	Cut injury			2	2	4	M											
			R	Fall of casting from height	Foot injury			2	1	2	L											
			R	Slipping of tool	Injury			2	1	2	L											
	After completion of filing Keep the casting in the designated bin.		R	Fall of casting	Foot Injury			2	1	2	L											

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	Collect the chips.		R	Chips may contact with skin	Cut injury		2	2	4	M												
			R	Burr may inhale	Respirator y inhalation		2	1	2	L												
	Disposal of chips		R																			
ting/Band																						
	Receive the castings from the GDC department by fork lift.		R	Fall of casting	Foot Injury		2	1	2	L												
			R	Site tranasport	Incident		2	2	4	M												
	Keep the casting on table.		R	Manual handling of the casting	Sprain		2	1	2	L												
			R	Sharp edges that may contact with skin	Cut injury		2	2	4	M												
	Switch on the machine		R	Exposure to elecrical energy	Electric shock		2	1	2	L												
	(A)Push the casting against the vertical moving blade.		R	Sharp edges that may contact with skin	Cut injury		2	2	4	M												
			R	Slipping of the casting	Cut injury		2	2	4	M												
			R	Sliding of hand between stationary and movable part.	Cut injury		2	2	4	M												
			R	Hot casting may contact with skin	Burn		1	1	1	L												
	After completion of gate cutting remove the casting, runner and risers and deposit in the respect bin.		R	Sharp edges that may contact with skin	Cut injury		2	2	4	M												
t																						
	Collect the castings from band saw		R	Fall of casting	Incident		2	1	2	L												
	Fixing the casting inside the bench vice		R	Sharp edges that may contact with skin	Cut injury		2	2	4	M												
	Removal of the un wanted material with the help of file		R	Sliding of hand between stationary and movable part.	Cut injury		2	2	4	M												
			R	Fall of casting from height	Foot injury		2	1	2	L												
	Keep the casting in the designated bin.		R	Manual handling of the casting	Sprain		2	1	2	L												
	Collect the burr		R	Burr may contact with skin	Cut injury		2	1	2	L												
			R	Burr may inhale	Respirator y inhalation		2	1	2	L												
g			R																			
nder	Collect the castings from filing		R	Fall of casting	Incident		2	1	2	L												
	Switch on the belt grinder.		R	Exposure to electricity	Electric shock		2	1	2	L												
	Hold the casting against the abrasive wheel.		R	Sliding of hand between stationary and movable part.	Cut injury		2	2	4	M												
			R	Burr may contact with eye	Eye injury		2	1	2	L												
			R	Burr may ingest through mouth	Respirator y inhalation		2	1	2	L												
			R	Al dust may inhale	Respirator y inhalation		2	1	2	L												
	Keep the casting in the designated bin.		R	Manual handling of the casting	Sprain		2	1	2	L												
			R	Hot casting may contact with skin	Burn		2	1	2	L												
	Collect the burr		R	Burr may contact with skin	Cut injury		2	1	2	L												
			R	Burr may inhale	Respirator y inhalation		3	1	3	M												
atic grinder			R																			
	Collect the castings for grinding		R	Fall of casting	Incident		2	1	2	L												
	By the application of pneumatic grinder remove the un wanted material		R	Al dust may inhale	Respirator y inhalation		2	1	2	L												
			R	Slipping of tool	Cut injury		2	2	4	M												
			R	Burr may fall in the eye	Eye injury		2	1	2	L												
	Keep the casting in the designated bin.		R	Manual handling of the casting	Sprain		2	1	2	L												
	Collect the burr.		R	Burr may contact with skin	Cut injury		2	1	2	L												

			R	Burr may inhale	Respirator y inhalation		2	1	2	L									
	R		Routine	P	Probability			RISK LEVE		L	Low		H		High				
	NR		Non-routine	C	Consequences					M	Medium		E		Emergency				

Rating	POO		
1	UNLIKELY	Injury not calling for	Illness having momentary discomfort
2	LIKELY	Injury calling for first aid	Illness due to acute exposure or hospitalisation for more
3	VERY LIKELY	Injury leading to temporar y / permane nt disability	Illness due to chronic exposure having last long effect.

POO - Probability of Occurrence

MATRIX

nsequenc				
3	3/M	6/H	9/E	
2	2/L	4/M	6/H	
1	1/L	2/L	3/M	
	1	2	3	
		Probab		

Abb	Description	Input For
E	Elimination	MP
S	Substitution	MP
EC	Engineering Control	MP
W	Warnings/Signage/Admin Controls	OCP
P	Personal Protective Equipments	OCP

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