

Project Name

ACTIVITY– INSTALLATION, TESTING & COMMISSIONING OF WET CHEMICAL FIRE SUPPRESSION SYSTEM FOR KITCHEN HOODS

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Serial No.	Sub-Activities	Hazards Identified (Generic & Task)	Risks Involved (People & Property)	Risk Rating			Control Measures	Residual Risk
				Severity	Probability	Initial Risk		
1.	Prepare work area	<ul style="list-style-type: none"> Unauthorized, untrained workers 	<ul style="list-style-type: none"> Cuts Abrasions 	2	A	L	<ul style="list-style-type: none"> TBT/DSTI to be conducted by the foreman/ safety officer prior to work commencement Task specific safety training to be provided Authorized personnel to undertake the job Daily safety inspection should be carried and eliminate the hazard. 	Low (ALARP)
2.	Manual Handling	<ul style="list-style-type: none"> Incorrect lifting of loads Sharp edges. Placing the object while fingers underneath. Slip/trip/fall (same level) Unsafe posture 	<ul style="list-style-type: none"> Back Injuries Cut to finger Strain Musculoskeletal Injuries 	3	C	M	<ul style="list-style-type: none"> Any lifting tasks shall be carried out by persons physically capable to do so No employee should be asked to carry loads above his capacity and in any case no load shall exceed 30kg per man. Mass of the load is more then to be equally shared Deploy enough number of personnel for lifting shall be appointed to the task depending upon the type of load to be lifted. Use easy mode of transport like trolley etc. Load not to be lifted above your shoulder Height Keep your fingers away from pinch point While placing the load Area to be illuminated with adequate lighting. Proper personal protective equipments to be used while manual handling of materials and loads. 	Low (ALARP)

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3.	Unloading and shifting Pipes and accessories with using crane and forklift	<ul style="list-style-type: none"> • Unauthorized, Untrained Workers • Failure of lifting tools & tackles. • Failure of lifting equipments. • Swinging of material • Damaged sling/wire rope or a chain sling • Poor maintenance of vehicle • Speedy operation • Over turn • Over load 	<ul style="list-style-type: none"> • Fatality • Fractures • Property damage • Injury to personal • Sprain and strain 	4	C	H	<ul style="list-style-type: none"> • Ensure the crane and forklift engaged is tested and having valid license and the operator has valid license and approved 3rd party certificate. • Engage trained and certified banks man & rigger. • Barricade and warning signs in to the area where lifting operation is carried out and restrict the entry. • Check list should be carried out to their vehicles by the operator prior to start any work • Use tagline for control of swing and alignment. • The crane must be stopped when the wind speed exceeds 38km/hr. • SWL should be clearly marked on the crane and should be check that is functioning. • The crane and trucks shall be periodically maintained and a periodical check has been done by the maintenance team. • Vehicle not to be left unattended at site (ie, to be switched off mode if required and keys removed) • SWL shall not be exceeded. • Load should be secured properly with the equipment. • Operators and rigger must wear high level of reflecting vest and adequate PPE (Shoe, helmet, leather gloves, goggles, over all) • Any lifting/ reversing that is necessary should be overseen by a trained flagman / Banks man. • Operator should follow the site speed limit and obey the traffic rules. 	M (ALARP)

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							<ul style="list-style-type: none"> • Colour coded system to be implemented to all lifting equipments as per the month. • Vehicle routes kept free of obstructions (with spillages being cleaned up promptly) 	
4.	Stacking and Storing	<ul style="list-style-type: none"> • Unauthorized, untrained workers • Material fall from height • Improper stacking • Collapse of materials 	<ul style="list-style-type: none"> • Crush • Cut and abrasion • Damage to property 	3	B	M	<ul style="list-style-type: none"> • All materials shall be stored below 2 meter height. • If the material is too heavy, use hydraulic trolley to shift the material. • No storage of materials to be done in the work place, only required quantity to be taken for the job. • Personnel protective equipment must wear at all time during the activity. (Helmet, shoe, vest, overall, gloves, goggles, mask.) 	Low (ALARP)
5.	Working in excavated area	<ul style="list-style-type: none"> • Material/equipment fall from height • Slip/trip/fall • Workers/ Pedestrians/ fall into excavation 	<ul style="list-style-type: none"> • Serious injury • Fatality • Property Damage 	3	D	M	<ul style="list-style-type: none"> • Safe access and egress shall be provided • Barricade sensitive areas, • Ensure falling protection. • Use warning signboards in those areas. • Use Head protection strictly. • PTW to be applied and obtained prior to start work 	Low (ALARP)

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6.	Working with ladder	<ul style="list-style-type: none"> • Fall from height • Over reaching • Over loading • Obstructing the access way • Slippery or uneven surface 	<ul style="list-style-type: none"> • Sprain and strain • Fracture • Injury to the person 	3	C	M	<ul style="list-style-type: none"> • The ladder should extend minimum one meter from the top for safe movement • Heavy materials should not be carried • Do not erect in slippery, uneven surface • Should be set up with a 4 vertical to 1 horizontal slope (4:1) • Inspection and maintenance to be registered and recorded by the store keeper • Step ladder must fully open and lock and the devices to be as per manufacturer • Defective ladder should not be used and report it immediately • Do not work from the top of two rungs • Remember the 3 point contact • Do not work in front of the door. If work is carried then locked the door or blocked off • Ladder to be used for short duration works only limited to 15 min. • Colour coded system to be implemented 	Low (ALARP)
7.	Working on mobile scaffold	<ul style="list-style-type: none"> • Uneven surface • Overhead structure and cable • Materials and worker fall from height • Untrained, unauthorized Workers • Collapse of scaffold 	<ul style="list-style-type: none"> • Sprain and strain • Fracture • Spinal cord damage • Musculoskeletal Injury • Fatality 	3	C	M	<ul style="list-style-type: none"> • Do not stack materials on to the scaffold • Visual inspection should carry before use • Out rigger fitted and breaks are locked on • Only trained scaffolders shall be involved in erection & dismantling activities. • No person to be on the scaffold while it is being moved • Scaffold only use in on level and surface area • Safety harness to be used above 2mtr height and anchored in above shoulder height at all time 	Low (ALARP)

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							<ul style="list-style-type: none"> • Tagging system to be implemented (i.e., all safe scaffolds shall be provided with green tags and unsafe scaffolds with red tag) • Keep walkways free of obstacles, tools and Equipment • Never stand and sit on the hand rails • Mobile scaffold height should be restricted to 3.5 to 4 times the shortest base width, If height of scaffold exceeds raker support or it should be tied to the structure properly. 	
8.	Working with Hand tools (Hacksaw, crimping, wire cutter, screw driver)	<ul style="list-style-type: none"> • Slip, trip and fall • Damaged warn out hand tools • Flying objects • Mushroom Heads • Using incorrect type 	<ul style="list-style-type: none"> • Fatigue • Trigger finger • Cuts and abrasions 	3	C	M	<ul style="list-style-type: none"> • Defective tools should not be issued or used to perform the task, to be checked by store keeper • Don't extend the spanner by using a pipe as an extension bar • Hand tools shall be free from oil, grease&etc. • Chisel's head shall have safety cap to avoid finger injury. • Never use a file as a lever • Never use a screw driver as a chisel • Don't work with oily or greased hands • Use eye/ face protection when there is flying materials hazard, wear gloves while required to protect the hands • Use right tools for the job 	Low (ALARP)

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9.	Working with power tools (Drill machine)	<ul style="list-style-type: none"> • Defective equipment • Electricity • Improper use of equipment • Poor maintenance • Untrained workers • Flying object • Noise and vibration • Fire • Dust 	<ul style="list-style-type: none"> • Hearing losses • Eye injury • Crushing • Back injury • Burns • Electrocutation • Ringing in the ear / Deafness 	3	C	M	<ul style="list-style-type: none"> • PTW to be applied and obtained prior to start, If spark producing activity is performed • Defective tools should not be issued or used to perform a task. • Monthly inspection should be carried out by the electrician and record to be kept at the store • All portable power tools should be fitted with adequate fuse protection either in the tool body or in its electrical plug. • The weight, size and type of tool should be selected to suit the job being carried out. • Don't lay the cables around the access way, it should be proper routing • Industrial distribution board and socket only to be used at site • No joints shall be made in electrical cable. • Cable hangers shall be used to avoid the direct contact of power tools cable with the scaffolding members. • Electrical connection shall be routed through ELCB only. • Correct rate of ELCB should be used (Ex:- 30ma only acceptable) • Only those persons who have been adequately trained and experienced in the use of the tool should be allowed to use the same. Power tools shall have inspection sticker. • Tools should be stored and maintained in good working condition. • Appropriate PPE Should use (Goggles, Mask, Ear plug, Gloves, Shoe, Helmet, Overall, Vest) 	M (ALARP)

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10.	Welding work (arc)	<ul style="list-style-type: none"> • Fire • Untrained, Unauthorized Worker • Poor signage and barricade • Lighting and ventilation 	<ul style="list-style-type: none"> • Electric Shock • Burns • Skin Effect • Eye Injury • Property damage 	4	C	H	<ul style="list-style-type: none"> • PTW to be applied and obtained prior to start, If spark producing activity is performed • Certified person only undertake the welding job • All Flammable /combustible materials should be removed from the area where welding & gas cutting operations are carried out. • Fire blankets should be used to contain sparks and molten metal's within the floor and should not be allowed to fall from height. • Warning signs and boards should be provided And area to be well barricaded • Appropriate fire extinguisher should be placed in to the work area (Dry powder, CO2, Fire blanket) • Adequate lighting and ventilation to be Provided. • Close supervision to be done at all times. • Hoses should be of approved type and should be free. • Appropriate PPE Should use (Face shield, Dust mask, Goggles, Gloves, Shoe, Helmet, Overall, Vest) 	Low (ALARP)
11.	Handling chemicals (Solvent cement)	<ul style="list-style-type: none"> • Unauthorized, untrained workers • Spillage • Poor ventilation • Fire • Health hazards (External / Internal) 	<ul style="list-style-type: none"> • Skin injury • Ingestion • Eye injury • Environment affect • Property damage • Occupational health 	3	C	M	<ul style="list-style-type: none"> • Ensure the chemicals are stored as per the manufacturer recommendation and identification. • Adequate lighting and ventilation to be provided • MSDS to be referred prior and to follow the manufacturer instruction • Trained and authorized person to do the job • Only required quantity to take for the work • Do not store chemicals at non designated areas. 	Low (ALARP)

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							<ul style="list-style-type: none"> • Old/ empty container return to store for proper Dispose • Container should check for leakage before Handling • Personnel hygiene to be maintained while after use of chemicals • All spillage shall be clean by sand or other absorbent materials • Rubber gloves, overall, helmet, vest, shoe, Goggles, mask to be worn while during the activity 	
12.	Operating with Thread Machine	<ul style="list-style-type: none"> •Defective Machine •Improper use of Machine •Poor maintenance •Untrained, Unauthorized Workers • Slip, trip and fall • Spillage 	<ul style="list-style-type: none"> • Cuts • Crush • Skin Effect • Entanglement • Eye, finger injury • Fracture 	3	C	M	<ul style="list-style-type: none"> • Polythene sheets to be laid and drip trays to be placed below the machine to prevent spillages. • Defective machine should not be used to perform a task. • Only those persons who have been adequately trained and experienced in the use of the machine should be allowed to use the same. • Machine should be maintained in good working Condition. • All spillages must be clean immediately • Waste oil should be disposed in an approved manner • Operator should check the machine condition prior to start the work. • Adequate lighting and ventilation to be Provided. • Don't lay the cables around the access way, it should be proper routing • Industrial distribution board and socket only to be used at site • No joints shall be made in electrical cable. 	M (ALARP)

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							<ul style="list-style-type: none"> • Electrical connection shall be routed through ELCB only and should be used (Ex:-30ma only acceptable) • Fire extinguisher to be provided • Area to be barricade and provide signage. 	
13.	Installation of pipes, fire suppression system, conduits and fittings.	<ul style="list-style-type: none"> • Untrained, unauthorized Workers • Material Fall • Sharp edges • Unsafe posture • Slip, trip and fall 	<ul style="list-style-type: none"> • Cut and abrasion • Back Injuries • Fatigue • Musculoskeletal Injuries 	3	C	M	<ul style="list-style-type: none"> • Authorized personnel to undertake the job • Work location shall be inspected by concerned supervisor / foreman. • Close supervision to be done at all times • Materials should not kept in walkways, edge of the opening. • Deploy enough number of personnel for material lifting shall be appointed to the task depending upon the distance • Proper communication to be maintained between the workers while doing the installation • Avoid over reaching the pipes to reduce from strain and pain. • Maintain a good housekeeping policy to prevent from slip, trip, and fall hazards. • Two level works to the openings and edges not to be performed. • PPE to be worn at all times(Gloves, goggles, mask, helmet, shoe, vest, overall) 	Low (ALARP)

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14	Flushing, pressure and leakage testing	<ul style="list-style-type: none"> • Untrained, unauthorized Workers • Pressure pump hazards • Blind flanges • Bursting • Poor lighting • Improper identification 	<ul style="list-style-type: none"> • Fatality • Property damage • Fractures • Full body injury 	4	B	M	<ul style="list-style-type: none"> • PTW to be applied and obtained prior to start work • Follow approved procedure & method Statement. • Engage experienced employees for installation of gauges & flanges. • Never exceed the testing limit • Increase the pressure gradually with holding period. • Never position in front of blind flanges during pressurized condition. • Calibrated pressure gauge only to be used for pressure testing • Close supervision to be done at all times • Never do hot work on a pressurized system (always de-pressurize) • Proper lighting to be provided in around the working area • Warning boards should be provided and Barricaded 	Low (ALARP)
15.	While working at night shift	<ul style="list-style-type: none"> • Poor illumination • Slip/trip/fall 	<ul style="list-style-type: none"> • Fatality • Cuts 	3	B	M	<ul style="list-style-type: none"> • Proper illumination to be provided • light post to be secured from fall • Proper cable management system to be Followed • All materials to be staged in proper manner without obstacles 	Low (ALARP)

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16.	Working in hot weather	<ul style="list-style-type: none"> Heat 	<ul style="list-style-type: none"> Dehydration Sunburn Skin Cancer 	2	B	M	<ul style="list-style-type: none"> Drink plenty of water Proper awareness of heat stress symptoms Avoid highly physical tasks during the hottest part of the day Isotonic drinks to be provided 	Low (ALARP)
17.	Work Completion	<ul style="list-style-type: none"> Poor housekeeping Slip/trip/fall 	<ul style="list-style-type: none"> Fire 	2	A	L	<ul style="list-style-type: none"> General housekeeping, Remove all surface, unwanted waste materials from the building All necessary precautions will be adopted to prevent fire 	Low (ALARP)

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RISK MATRIX

					Probability				
					A	B	C	D	E
Severity	People	Assets	Environment	Reputation	Improbable 1 in 100,000 Years	Remote 1 in 10,000 Years	Occasional 1 in 1000 years	Probable 1 in 100 years	Frequent 1 in 10 years
5-Catstrophic	Multiple fatalities or permanent total disabilities	Extensive damage	Massive effect	International impact	<p align="center">High Risk</p> <p align="center">Medium Risk (ALARP)</p> <p align="center">Low Risk</p>				
4-Severe	Single fatalities or permanent total disabilities	Major damage	Major effect	National impact					
3-critical	Major injury or health effects	Local damage	Localised effect	Considerable impact					
2-Marginal	Minor injury or health effects	Minor damage	Minor effect	Minor impact					
1-Negligible	Slight injury or health effects	Slight Damage	Slight effect	Slight impact					

HIGH	<p>3-E</p> <p>4-C,D,E</p> <p>5-B,C,D,E</p>
	<p>1-D,E</p> <p>2-B,C,D,E</p> <p>3-A,B,C,D</p>

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MEDIUM

4-A,B
5-A

LOW

1-A,B,C
2A