RISK ASSESSMENT FOR MULTIMEDIA FILTER, SOFTENERS, ULTRAVIOLET SYSTEM, COPPER IONIZATION UNIT

PROJECT	
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Activity	TESTING AND COMMISSIONING OF MULTIMEDIA FILTER, SOFTENERS, ULTRAVIOLET SYSTEM, COPPER IONIZATION UNIT				
Review Date:				Page	1 of 1

Sr. No.	Activity /Task	Hazarad	Personnel involved	Risk	Risk Rating P	S	R	Risk Level	Controls Measures	Residual Risk Ratings
1	Mobilization for the material for the filter, Softeners, Ultraviolet system, Copper ionization unit installation to Site	Transportation Hazards Manual Handling Falling Objects Traffic and Vehicle Weather Conditions Improper Equipment or Tools Training and Competency	General International Technicians, Employees/Client/Sub-Contractor/Visitiors	Accidents or damage can occur during the transportation of materials to the installation site. Workers may face musculoskeletal injuries, strains, or sprains when manually loading or unloading materials. Materials or equipment may shift or fall during loading, unloading, or transportation, posing a danger to workers or bystanders. Mobilization activities near traffic areas can lead to accidents involving vehicles or equipment. Adverse weather conditions, such as rain, snow, or wind, can affect transportation safety and the stability of materials. Using inappropriate or faulty equipment for loading, unloading, or transporting materials can lead to accidents or damage. Inadequately trained or inexperienced personnel may not be aware of potential hazards or may not use proper techniques when handling materials. Failure to comply with transportation regulations or document mobilization activities can result in legal issues or damage to materials.	2	2	2	N	Qualified Drivers: Ensure that drivers are qualified and experienced in handling materials of the type being transported. Secure Loading: Properly secure materials within the transport vehicle to prevent shifting or damage during transit. Vehicle Maintenance: Regularly maintain and inspect transport vehicles to reduce the risk of breakdowns or accidents. Route Planning: Plan transportation routes to minimize risks, such as avoiding hazardous roads or construction zones. Team Lift: Encourage two or more workers to lift heavy materials together. Use Mechanical Aids: Provide equipment like forklifts, pallet jacks, or cranes for heavy lifting. Proper Lifting Techniques: Train workers on correct lifting techniques to reduce the risk of injury. Ergonomic Design: Choose packaging and materials with ergonomic designs that facilitate safe handling. Secure Loads: Ensure that materials are securely fastened and stable within the transport vehicle. Safety Barriers: Erect safety barriers or cordoned-off areas during loading and unloading. PPE: Provide workers with appropriate PPE, including hard hats and safety vests. Traffic Control: Implement traffic control measures, such as barriers, cones, or flaggers, to redirect traffic or create safe zones. High-Visibility Clothing: Ensure workers wear high-visibility clothing when working near vehicles. Communication: Establish clear communication between workers and drivers. Weather Monitoring: Keep an eye on weather forecasts and postpone mobilization in unsafe conditions. Secure Materials: Ensure materials are adequately covered and secured to prevent damage from weather. Anti-Slip Measures: Use sand or ice melt on icy surfaces during winter mobilization. Equipment Inspection: Regularly inspect and maintain loading and transportation equipment. Proper Tools: Ensure that the right tools and equipment are used for securing loads and handling materials. Training: Provide comprehensive training to personnel involved in mobilization on safe handling practices and emergency procedures. Supervision: Ensure experienced personnel supervise less experienced workers during loading and unloading activities. Regulatory Compliance: Ensure that all mobilization activities comply with transportation regulations and permits. Documentation: Maintain accurate records of mobilization activities, including vehicle inspections, load securing, and route planning.	
2	Unloading of materials from vehicle by manually	Falling of materials from Truck while unloading Manual Handling Hazards Falling Objects Slips, Trips, and Falls Crushing Hazards Chemical Exposure Traffic and Vehicle Hazards Weather Conditions Equipment Familiarity	General International Technicians, Employees/Client/Sub-Contractor/Visitiors	Workers may face musculoskeletal injuries, strains, or sprains when lifting heavy or awkwardly shaped equipment. Materials or equipment may shift or fall during unloading, posing a danger to workers below. Uneven or slippery surfaces, debris, or clutter around the unloading area can result in slips, trips, and falls. Workers may get caught between materials or equipment during unloading, leading to crushing injuries. Some materials or equipment may contain chemicals or substances that can be hazardous if improperly handled. Unloading materials from vehicles near traffic areas can lead to accidents involving vehicles or equipment. Adverse weather conditions, such as rain, snow, or wind, can affect the stability of materials and create slippery surfaces Workers may not be familiar with the specific equipment they are unloading, which can lead to mishandling or accidents.	4	3	3	L	Team Lift: Encourage two or more workers to lift heavy objects together. Use Mechanical Aids: Provide equipment like hand trucks, pallet jacks, or forklifts for unloading heavy items. Proper Lifting Techniques: Train workers on correct lifting techniques to reduce the risk of injury. Ergonomic Design: Choose equipment with ergonomic designs that facilitate safe lifting. Secure Loads: Ensure that materials are securely fastened and stable within the vehicle. Safety Barriers: Erect safety barriers or cordoned-off areas to keep workers at a safe distance during unloading. PPE: Provide workers with appropriate PPE, including hard hats and safety vests. Clear Pathways: Maintain clear and unobstructed pathways for workers to move materials. Non-Slip Surfaces: Ensure the unloading area has non-slip flooring or mats. Good Housekeeping: Keep the area clean and free of debris. Safety Procedures: Develop and communicate clear safety procedures for unloading. Safe Distance: Ensure workers maintain a safe distance from equipment during unloading. Visual Communication: Use hand signals or communication devices to coordinate safe unloading. Material Safety Data Sheets (MSDS): Provide access to MSDS for any materials with potential chemical hazards. PPE: Equip workers with appropriate PPE, such as gloves and eye protection. Safe Handling: Train workers on safe handling procedures for materials with chemical hazards. Traffic Control: Implement traffic control measures, such as barriers, cones, or flaggers, to redirect traffic or create safe zones. High-Visibility Clothing: Ensure workers wear high-visibility clothing when working near vehicles. Communication: Establish clear communication between workers and drivers. Weather Monitoring: Keep an eye on weather forecasts and postpone unloading in unsafe conditions. Covering: Use tarps or covers to protect materials from adverse weather. Anti-Slip Measures: Use sand or ice melt on icy surfaces. Training: Provide training to workers on the equipment they will be unloading, including its proper handling and safety features. Read Labels: Ensure workers read and understand labels and markings on equipment for handling instructions.	
3	Installation of Multimedia filter, Softeners, Ultraviolet system, Copper ionization unit	• Biological • Chemical • Metals • Inhalation • Electrical Hazards • Chemical Exposure • Mechanical Hazards • UV Radiation Exposure • Falling Objects • Falling of object • t while installing of the new filtration system • Fine sand dust/ash	General International Technicians, Employees/Client/Sub-Contractor/Visitiors	Electric shock, burns, and potential fatality Skin or eye irritation, respiratory issues, chemical burns, or allergic reactions. Crush injuries, entanglement, or limb amputation Skin and eye damage, increased risk of skin cancer, and vision impairment Head injuries, fractures, or other trauma. Health Impacts: Exposure to hazards can lead to injuries, illnesses, and long-term health issues for workers and occupants. Environmental Impact: Improper handling of chemicals or materials can result in contamination of the environment and water sources. Structural Issues: Incorrect installation or operation of filtration systems, UV sterilizers, and copper ionization units can lead to system inefficiencies, reduced performance, and even structural damage. Leg and arm critical injury Head injury due to the slip & trip Asthma Breathing issues Eye irritation	2	2	4	L	and offer training on safe chemical handling. Implement lockout/tagout procedures, use guards on moving parts, and provide proper training for equipment operation and maintenance. Limit access to UV sterilization areas, provide warning signs, ensure proper shielding of UV lamps, and provide protective eyewear and clothing. Implement safety barriers, provide hard hats, ensure proper storage of materials, and secure equipment during installation. Training and Education: Provide thorough training to workers about equipment operation, chemical handling, and safety protocols. Personal Protective Equipment (PPE): Ensure that workers have access to and use appropriate PPE, including gloves, goggles, masks, and protective clothing. Risk Assessment: Conduct a comprehensive risk assessment before installation to identify potential hazards and develop mitigation strategies. Safe Work Procedures: Develop and implement clear and detailed safe work procedures for equipment installation, maintenance, and operation. Qualified Personnel: Employ skilled and trained technicians for equipment installation, maintenance, and repairs. Emergency Preparedness: Have emergency response plans in place, including procedures for chemical spills, electrical failures, and other potential incidents. Ventilation and Air Quality: Ensure proper ventilation systems are in place to prevent chemical exposure and maintain air quality in enclosed spaces. Regulatory Compliance: Adhere to local, national, and international regulations and standards related to electrical work, chemical handling, and equipment installation. Inspections and Maintenance: Regularly inspect and maintain equipment to ensure its proper functioning and identify potential issues before they escalate. Communication: Clearly communicate safety instructions, warning signs, and access restrictions to workers, occupants, and visitors. Observe and make sure the platform is Plain and proper level. Ensure there are no unwanted objects on the platform Competent and well-trained manpower Continuous monitoring by the Site/project engineer. Use of proper PPE e.g., safety shoes, dust mask, goggles, gloves, Safety helmet etc. Proper housekeeping Proper use of tools & equipment Safety toolbox talks/pre-task briefings Risk assessment before the start of work	
4	Plumbing work	Falling of object Physical injuries Electrical Hazards Chemical Exposure Heavy Lifting Infection Control Fall Hazards Waterborne Hazards	General International Technicians, Employees/Client/Sub-Contractor/Visitiors	Slip and trip injuries due to draining water from the existing system Working with electrical components in UV systems and copper ionization units can lead to electrical shocks or fires. Handling chemicals used in softeners or water treatment systems can lead to skin irritation, inhalation hazards, or chemical burns. Moving heavy equipment and plumbing materials can lead to musculoskeletal injuries. During the installation of water treatment systems, there's a risk of contamination if not handled properly. Working at heights or on elevated platforms can lead to falls. Exposure to contaminated water during installation or maintenance.	5	4	4	M	Competent and well-trained manpower Continuous monitoring by the site/project engineer. Use of proper PPE eg, safety shoes, Safety helmet etc. Proper housekeeping Proper use of tools & equipment Safety toolbox talks/pre-task briefings Risk assessment before the start of work Ensure that qualified electricians install and connect electrical components. Use ground fault circuit interrupters (GFCIs) for electrical outlets near water sources. Properly label electrical components and circuits. Provide personal protective equipment (PPE) like gloves and safety goggles. Store chemicals in well-ventilated areas. Train workers on the safe handling of chemicals and emergency procedures. Use mechanical aids like hoists or forklifts when lifting heavy equipment. Train workers on proper lifting techniques. Provide ergonomic tools and equipment. Shut off water sources when working on plumbing systems. Use appropriate PPE, like waterproof gear, when working in wet environments. Ensure water sources are properly disinfected before connecting to the treatment	
5	Electrical Work	Electrical Shocks Electrical Fires Arc Flash and Arc Blast Overloaded Circuits Poor Wiring Practices Equipment Malfunctions Working at Heights	General International Technicians, Employees/Client/Sub-Contractor/Visitiors	Exposure to live electrical components during installation can result in electrical shocks, which can be fatal or cause serious injuries. Faulty wiring or equipment can lead to electrical fires during or after installation. Arc flashes and arc blasts can occur during electrical work, leading to severe burns and blast-related injuries. Overloading circuits can lead to overheating, equipment damage, and fires. Poor Wiring Practices Incorrect wiring practices can result in electrical malfunctions and hazards. Malfunctions or defects in electrical equipment can lead to hazardous situations. Installing electrical components at elevated locations can lead to falls and injuries.	5	4	4	M	Qualified Personnel: Ensure that only qualified electricians perform electrical work. Lockout/Tagout: Implement lockout/tagout procedures to de-energize circuits during installation. Electrical Testing: Use appropriate electrical testing equipment to confirm circuits are de-energized before working on them. Personal Protective Equipment (PPE): Provide workers with proper PPE, including insulated gloves and safety goggles. Ground Fault Circuit Interrupters (GFCIs): Install GFCIs in areas where electrical equipment is used near water sources to protect against shocks. Wiring Inspection: Ensure that all wiring and connections comply with electrical codes and standards. Circuit Protection: Install circuit breakers and fuses to protect against overloads and short circuits. Fire Extinguishers: Keep fire extinguishers nearby and train workers on their use. Emergency Procedures: Establish clear emergency procedures for responding to electrical fires. Arc Flash Analysis: Conduct an arc flash hazard analysis and label equipment accordingly. PPE: Provide workers with arc-rated clothing, face shields, and other appropriate PPE. Safe Work Practices: Follow safe work practices, such as working on de-energized equipment when possible and using insulated tools. Load Calculations: Perform load calculations to ensure that circuits are not overloaded. Circuit Protection: Install proper circuit protection devices like circuit breakers and fuses. Regular Inspections: Periodically inspect and maintain electrical systems to detect and address overloads Follow Codes and Standards: Adhere to electrical codes and standards relevant to your location. Qualified Electricians: Ensure that only qualified electricians perform wiring and electrical connections.	

6	Testing & commissioning of Multimedia filter, Softeners, Ultraviolet system, Copper ionization unit	Electrical Hazards Chemical Exposure Waterborne Hazards Pressure and Mechanical Hazards Chemical and System Performance Hazards Environmental Impact Documentation and Compliance Training and Competency	General International Technicians, Employees/Client/Sub-Contractor/Visitiors	Testing and commissioning often involve working with live electrical components, which can lead to electrical shocks or fires. Some water treatment systems involve the use of chemicals that can be hazardous if mishandled during testing and commissioning. Water sources used during testing and commissioning may contain contaminants that pose health risks. Testing and commissioning activities may involve high-pressure water or mechanical systems, which can lead to injuries if not handled correctly. Improper functioning of treatment systems can lead to inadequate water quality or other performance issues. Improper handling of chemicals or system malfunctions	5	4	4	M	Qualified Personnel: Ensure that only qualified electricians perform electrical testing and commissioning. Lockout/Tagout: De-energize circuits whenever possible before testing and commissioning activities. Personal Protective Equipment (PPE): Provide appropriate PPE, including insulated gloves and safety goggles. Electrical Testing Equipment: Use calibrated and appropriate electrical testing equipment for safe and accurate testing. Emergency Procedures: Establish clear emergency procedures for responding to electrical incidents. Chemical Handling: Ensure that chemicals are handled and dosed in accordance with safety guidelines and protocols. PPE: Provide workers with appropriate PPE, such as gloves and eye protection. Ventilation: Use proper ventilation and ensure adequate airflow when working with chemicals. Training: Train personnel on safe chemical handling and emergency response procedures. Water Quality Testing: Test water sources for contaminants before use. Personal Hygiene: Emphasize personal hygiene practices, such as handwashing, when handling water. PPE: Use waterproof gear when working with water and potentially contaminated components. Disinfection: Ensure that water sources are properly disinfected before connecting them to the treatment systems. Pressure Relief: Install pressure relief valves and devices where necessary to prevent overpressure incidents.
7	Housekeeping	Slip/Trip/Fall	General International Technicians, Employees/Client/Sub-Contractor/Visitiors	Personal injury Property damage	2	2	4	L	• Maintain good housekeeping at all times • Clean up spills/leaks instantly • Properly route cables and extension cords • Do not leave tools scattered around the workplace • Ensure timely removal of waste from site

Risk Rating	Severity Factors	Probality factor	Risk Level
8: High Risk	8 : Fatality, Permanent Disability	5 : Extremely High	17-21: High Risk (H)
6: Medium Risk	6 : Serious injury	4 : Highly probable	12-16: Medium Risk (M)
4: Low Risk	4 : Major injury	3 : Probable	9-11 : Low Risk (L)
2: Negligible	2 : Minor injury	2 : Rare	6-8 : Negligible (N)

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