



Systemic Safety Alert **Inflation of Tyres of Heavy Mechanical Vehicles**

Major systemic safety problems

Tyres inflation for heavy mechanical vehicles is a common process. However, improper inflation and handling of tyres may cause explosion and blowout of wheel components, and workers staying on the trajectory of the flying fragments or air blast could be seriously injured or killed. The following major systemic safety problems had attributed to the majority of serious/ fatal accidents that involved inflation of tyres in the past:-

- failure to conduct task-specific risk assessments;
- failure to formulate appropriate and adequate risk control measures;
- lack of proper design layouts and safety installations in workplaces;
- failure to strictly adhere to the vehicle manufacturers' service and safety manuals;
- slack control and monitoring to ensure that risk control measures stay effective; and
- failure to provide workers with adequate safety information, instruction, training and supervision.

Measures of preventing hit by the burst of wheel components/ blast of air¹

Registered Safety Officers (“RSOs”) should advise their employers/ clients to:

- (i) appoint a competent person to (a) conduct task-specific risk assessment(s) associated with the inflation of tyres of heavy mechanical vehicles to identify any foreseeable risks, taking into account the working environment, job sequence, use of equipment, traffic conditions and possible entry of other persons into the work area, etc.; and (b) devise appropriate and adequate safe work methods and procedures to eliminate the hazards;

¹ For details, please refer to the “Guidance Notes on Safety at Work for Demounting, Mounting and Inflation of Tyres of Heavy Mechanical Vehicles” issued by the Occupational Safety and Health Branch of the Labour Department.



- (ii) make reference to the manufacturers' specifications of tyres, rim components and any other equipment to be used when formulating safe work methods/ procedures, so as to understand the practice recommended by the manufacturers for inflation of tyres. The following control measures, among others, should be strictly adhered to:

Safe work procedures

- check all the wheels and tyres for signs of damage before inflating; and do not inflate a tyre where there is apparent or suspected damage to the wheel components, such as a tyre having been run flat or being well below its recommended operating pressure;
- ensure that both tyre and rim components are compatible, serviceable and correctly assembled prior to inflation of tyres;
- inflate the tyre with recommended pressure and never inflate it to a pressure exceeding that recommended by the manufacturers of the tyre and vehicle; and
- do not use air lines without a pressure gauge or pressure control device functioning properly.

Prevention of explosion and blowout of wheel components

- take adequate and effective steps to ensure that all workers stand clear of the trajectory danger zone during tyre inflation;
- use a clip-on air chuck with an in-line valve and a pressure gauge equipped with a pressure regulator for type inflation;
- use safety restraining devices, such as safety cages and frames of adequate strength and proper size, to absorb the explosion forces and restrain wheel components from popping up in the event of failures; and
- mount the wheel to the wheel hub before inflating the tyre of specific heavy mechanical vehicles, and tighten the nuts and clamps by using a torque wrench which is set at the value recommended by the manufacturer of the vehicle before inflation.



Preventive maintenance and periodic inspections

- formulate and implement preventive maintenance programmes with reference to the tyre manual as well as the manufacturer's manual of the heavy mechanical vehicle to ensure the sustainability of the safe condition of wheel components. A logbook system should be in place to record all maintenance details and hours of service of the respective wheel components; and
 - carry out periodic inspections to identify any damage of the wheel components. Damaged or worn parts must be replaced at once upon discovery.
- (iii) implement effective proactive safety inspection programmes and arrange stringent on-site supervision to:
- ensure that workers adopt the safe work methods/ procedures. A competent person with adequate safety knowledge and work experience should be appointed as a supervisor to oversee the conduct of work;
 - carry out tyres inflation work by competent workers with sufficient experience and knowledge; and
 - monitor the conduct of the work to ensure that the risk control measures for inflation of tyres of heavy mechanical vehicles are fully implemented. The safe work methods/ procedures should be regularly reviewed so as to improve the effectiveness of the system.
- (iv) provide all workers involved in tyre inflation work with necessary safety information, instruction and training to ensure that they are familiar with the safe work methods/ procedures, safety precautions/ measures and emergency procedures. Before they perform the duty, workers should also fully understand the type and the structure of the wheel components as well as their roles and responsibilities.
- (v) review the system of work periodically to ensure its workability and effectiveness, especially when there is a significant change in work method, team composition, use of equipment, working environment, etc.



Registered Safety Auditors (RSAs) should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

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Systemic Safety Alert **Good Housekeeping on Site –** **Protection of Workers against Protruding Rebars**

Major systemic safety problems

Protruding rebar is commonly found on construction sites. It poses tripping, scratching, cutting and impalement hazards when it is exposed without adequate protection. Serious bodily injuries or even fatalities caused by striking against protruding rebars, especially when workers working at height above exposed protruding rebars, on construction sites are not uncommon. The underlying systemic safety problems leading to the recurrence of these accidents mainly include: -

- undesirable layout design and sequencing of work processes which might lead to higher possibility of requiring workers to work above areas with protruding rebars;
- failure to provide adequate fall prevention measures to protect workers who are inevitably required to work above areas with protruding rebars;
- poor housekeeping, insufficient lighting and slippery floors on site such that workers may slip, trip and fall onto protruding rebars; and
- failure to safeguard all projecting ends of rebars to eliminate tripping, scratching, cutting and impalement hazards.

Accident prevention measures

RSOs should advise their employers/clients to: -

- adopt a systemic approach at planning stage to evaluate the work processes at different work phases, properly plan the workplace layout and work sequence in order to eliminate the hazard of impalement at source (e.g. change of work sequence to avoid workers working above areas with protruding rebars);
- adopt task-specific approach in conducting risk assessments, and devise and



implement appropriate task-specific safety measures for the work;

- if the risk cannot be designed out, exercise stringent access control to the restricted work zone associated with hazards of protruding rebars in order to minimize the number of workers exposed to the hazard (e.g. only those workers directly involved in the concrete pouring or in management of the rebar and formworks are allowed to enter the restricted work zone) and no unauthorized entry to the restricted work zone is allowed;
- provide and maintain suitable and adequate safe access to and egress from every place of work so as to avoid unnecessary access to areas with protruding rebars;
- provide and ensure the use of suitable working platforms (e.g. those with proper guard-rails and toe-boards) to prevent accidental fall onto the protruding rebars;
- ensure good housekeeping, sufficient lighting and non-slippery floors on site to prevent falling, tripping or slipping of workers;
- safeguard all projecting ends of rebars to eliminate any hazards to workers, e.g. provision of suitable protection caps; and
- put in place stringent monitoring and control to ensure the safety measures continue to be effective, such as by developing and implementing effective proactive inspection programme, timely reporting any violations to employers, and taking appropriate follow-up actions for prompt rectification.

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Systemic Safety Alert **Excavation in the Vicinity of Underground Electricity Cables**

Major systemic safety problems

Excavation work may damage underground electricity cables nearby if proper safety precautions have not been taken. In the past, there were accidents involving workers who were injured or even killed as a result of the arcing current, fire or explosions that occurred when a live cable was inadvertently contacted and damaged in the course of excavation. The following are the major systemic safety problems attributed to the relevant accidents:-

- improper planning or lack of planning for working on or near underground electricity cables;
- failure to conduct task-specific risk assessments to identify hazards;
- failure to formulate appropriate and adequate risk control measures for safe excavation;
- slack in control and monitoring to ensure that risk control measures stay effective and are fully implemented; and
- failure to provide workers with adequate safety information, instruction, training and supervision.

Accident prevention measures

Registered Safety Officers (RSOs) should advise their employers/ clients to:

- (i) properly plan for the work, including the underground cable detection work:
 - obtaining drawings, including cable plans, from utilities companies and other relevant organisations to understand the underground services around the workplace prior to the commencement of work;
 - conducting task-specific risk assessments in identifying all potential hazards associated with the excavation work;



- appointing a competent person¹ for underground cable detection including carrying out passive cable detection to detect the most probable alignment of each underground cable and proposing trial hole locations to locate the most probable alignment of each underground cable –
 - digging trial holes by using hand tools² to expose the target underground cables and carrying out toroidal active cable detection to ascertain the alignment and depth of the unexposed cables under the supervision of the competent person;
 - marking the alignment and depth of underground cables based on common reference points (e.g. lamp pole, traffic light post or hydrant, etc.) on the ground;
- recording the findings in a Competent Person Written Report³ after the completion of cable detection;
- arranging site briefing given by the competent person to ensure the site personnel are conversant with the contents of the Competent Person Written Report including the meanings of markings at site, aware of the potential danger as a result of cable damage and the required safety precautions; and
- following strictly the requirements as stipulated in the latest “Code of Practice on Working near Electricity Supply Line” published by the Electrical and Mechanical Services Department.

(ii) formulate safe work methods/ procedures and adequate risk control measures for safe excavation. Among others, the following control measures should be strictly adhered to:

- detailing the methods, plant to be employed and the safety precautionary

¹ A competent person shall be approved by the Director of Electrical and Mechanical Services Department under section 3 of the Electricity Supply Lines (Protection) Regulation, Cap. 406H.

² Hand-held power tools can only be used to break the paved surface up to a depth of 150 mm in a footpath or 600 mm in a carriageway with at least 250 mm clearance from any cable alignment in any case.

³ For details, please refer to the latest “Code of Practice on Working near Electricity Supply Lines” issued by the Electrical and Mechanical Services Department.



measures in the safe work methods/ procedures;

- ensuring the adoption of the Competent Person Written Report and be vigilant for markings, alignment and depth of the underground cables;
- ensuring that the live underground cables located within the area to be excavated are rendered dead and securely isolated before and during the excavation work;
- in case rendering the cables dead is not reasonably practicable, ensuring that the excavation work should only be done under a stringent permit-to-work system with adequate and appropriate safety measures established and taken to prevent workers against electrical hazards;
- ensuring that no mechanical equipment or heavy power tools are used for digging in the close vicinity of underground pipes and cables, and maintaining adequate minimum safe working distance from underground cables when use of such equipment/ tools are unavoidable;
- providing proper support to any underground electricity cables exposed in an excavation and providing proper backfilling where appropriate; and
- stopping excavation immediately in case any unidentified utilities are found during the excavation, re-conducting risk assessment, and reviewing and adjusting where necessary the original safe work methods/ procedures.

(iii) implement effective proactive safety inspection programme and arrange stringent on-site supervision:

- ensuring that the safe work methods/ procedures are in place through the appointment of a supervisor who possesses adequate safety knowledge and work experience to oversee the performance of workers;
- arranging site briefing and ensure that workers understand the contents of the Competent Person Written Report including the safety precautions required before they perform the excavation work;
- ensuring that the risk control measures concerning work for excavating in the vicinity of underground electricity cables are fully implemented; and



➤ regularly monitoring and reviewing the condition of the workplace to make sure the risk assessment is still valid.

(iv) provide all workers involved in excavation work with necessary safety information, instruction and training to ensure that they are familiar with the safe work methods/ procedures, including information about the location and nature of underground services, safety precautions/ measures and emergency procedures.

(v) review the system of work periodically to ensure its workability and effectiveness whenever there is a significant change in work method, team composition, use of equipment, working environment, etc.

Registered Safety Auditors (RSAs) should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

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Systemic Safety Alert **Use of Mobile Cranes**

Major systemic safety problems

Most serious accidents related to mobile cranes were attributed to the absence of a safe system of work and slack on-site control. Major systemic safety problems detected include: -

- failure to conduct task specific risk assessment leading to absence of a relevant lifting plan, wrong choice of plant/equipment and improper siting of the crane;
- absence/unclear delineation of safety responsibilities, and ineffective coordination among parties like the principal contractor, lifting contractors and crane owners, all having pivotal role to play to ensure safe lifting operations;
- poor on-site management and control resulting in unsafe mobile cranes entering sites and unsafe lifting practices prevalent on sites;
- failure to designate, zone off and barricade areas for operation of mobile cranes, including lorry mounted cranes, to prevent persons from entering such areas and being endangered by the crane operations on sites;
- lack of competent lifting supervisors to oversee and control lifting operations on site;
- insufficient arrangement by contractors/crane owners to ensure that lifting personnel such as crane operators and signallers have the required competence in terms of knowledge, skills and experience to properly discharge their duties in connection with the lifting operations, resulting in, for instance, these personnel being ignorant about the operating instructions, functioning of safety devices, constraints/limitations unique to a particular crane; and
- improper maintenance leading to degradation of mechanical integrity and malfunctioning of the cranes.



Accident prevention measures

RSOs should advise their clients/employers to: -

- adopt task specific approach in conducting risk assessments of crane operations;
- devise and implement a task specific lifting plan covering selection of plant/equipment, siting of the crane and other control measures for the lifting operations;
- ensure clear delineation of the safety responsibilities and effective coordination among the principal contractor, lifting contractors and crane owners;
- exercise proper management and control over mobile cranes entering the site, including access control through checking for valid test/examination certificates of the cranes, etc.;
- designate, demarcate and properly barricade the lifting zone;
- ensure that the manufacturer's instructions are adhered to, such as levelling of the crane, outriggers beams and jacks properly extended and the lifting operations are restricted to the specified working ranges;
- appoint sufficient competent lifting supervisors to oversee and control the lifting operations;
- ensure that the lifting team members, including the crane operator and the signaller, are adequately trained and capable of discharging their duties safely in connection with the lifting operation. They should be provided with the required information about the safe system of work relating to the lifting operations, the manufacturer's instructions, functioning of the safety devices and constraints/limitations unique to the crane; and
- ensure that the cranes are checked and maintained regularly to confirm their state for safe operation with the frequency and extent in accordance with the manufacturer's instructions.

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Systemic Safety Alert **Lift Works**

Most accidents related to lift works were attributed to the absence of a safe system of work and slack on-site control. Common types of accidents are fall of person from height, struck by falling object, struck or trapped by moving parts of the lift system and fire, etc.

Major systemic safety problems

Proprietors/employers are required to adopt effective preventive measures and make necessary arrangements to ensure the safety and health at work of employees/workers engaged in lift works. Major systemic safety deficiencies include: -

- failure to conduct task-specific risk assessments and to formulate method statements, clearly specifying the safe working procedures and sequence of work for the lift works;
- failure to develop and fully implement effective a permit-to-work system as necessary;
- failure to properly communicate necessary safety information and instructions, including the potential hazards and their corresponding risk control measures, through specific safety training to workers/employees;
- slack control and monitoring to ensure conformity with the method statements;
- failure to formulate and/or implement an effective checking system for timely detection and prompt rectification of any irregularities in the work process; and
- lack of clear delineation of safety responsibilities and effective coordination and communication among the principal contractor, lift contractor, subcontractors, and any personnel involved in the work activities.

Accident prevention measures

RSOs should advise their employers/clients to: -



- appoint a competent person to conduct task-specific risk assessments to identify all potential hazards associated with the lift works, taking into account the type of works to be carried out, the working conditions of the lift shaft and the personnel undertaking the tasks;
- formulate detailed method statements specifying the sequence of work for the lift works with appropriate safe working procedures and safety precautions/measures based on the results of the risk assessments, complying with relevant codes of practice, industry guidelines, international standards, and in conformity with the lift manufacturer's specifications/instructions;
- develop and fully implement a permit-to-work system to ensure that all necessary safety precautions/measures against associated risks of lift works, including striking and trapping, fall from height, falling objects and fire, should have been taken before commencement of any kind of lift works and remain to be effective. Among others, the following safety precautions/measures should be strictly adhered to:
 - a) General safety precautions/measures for lift works:
 - É the lift should be rendered inoperative and locked out before carrying out any works, including inspection, cleaning, oiling or lubrication of wire ropes and moving parts;
 - É suitable scaffolds with proper working platforms should be provided and used for working-at-height while personal protection equipment should be regarded as a last resort to prevent falling from height;
 - É safe access to and egress from every place of work should be provided and properly maintained;
 - É safe working procedures for electric arc welding and hot work process should be developed and implemented; effective preventive measures should be taken to avoid incompatible work processes being carried out simultaneously;
 - É safety precautions should be taken to prevent sparks generated during hot work or electric arc welding process from falling



- into combustible materials; and sufficient and suitable firefighting facilities should be provided in the close vicinity of place of work;
- É all openings to a lift shaft should be fenced off and no building materials should be stored in front of them;
 - É loads under lifting inside the lift shaft should be securely rigged and fastened; and no lift worker should be allowed to stay or work below the suspended load;
 - É suitable personal protective equipment such as safety helmets with Y-type chin straps, should be provide and used by working personnel during the lift works;
 - É effective communication equipment should be provided and used by working personnel during the lift works; and key words/signals for clarity of use should be specified during communication process;
 - É suitable and sufficient safety signs/warning notices should be displayed in prominent positions to alert all workers involved of the essential safety information; and
 - É rescue procedures and evacuation arrangements in case of accident or other emergency situations during the lift works should be devised and maintained;
- b) Lift landing door or car door work:
- É the entrance of the landing door or car door of a lift should be suitably blocked by a barrier; and
 - É the automatic doors of a lift should be prevented from accidental opening;
- c) Working within a lift shaft:
- É the number of persons working within a lift shaft at the same time should be kept to a minimum and simultaneous working at two different levels inside the lift shaft should be avoided as far as practicable;



- É the safety devices in the lift shaft including the lift pit and the car top control station should be functioning properly;
- É working conditions, including temperature, ventilation, etc., should be confirmed to be suitable before the work commences;
- É adequate lighting should be provided;
- É the pit-stop switch should be activated to prevent any unauthorized movement of the lift car before allowing workers to enter into the lift pit;
- É counterweight screen of an appropriate height above the pit floor should be properly installed to avoid hazards created by descending counterweight; and
- É direct and effective communication between lift worker(s) staying in the lift shaft and lift worker(s), if any, on the lift car top should be ascertained before the lift car is allowed to be in motion;

d) Working on the car top of a lift car:

- É necessary safety device, e.g. inspection/operation switch lock, should be properly provided and used to ensure the safety of worker(s) working on the lift car top; and
- É one and only one person should be appointed to take the sole control of the car movement when worker(s) are/is working on the car top.

- liaise with relevant parties to prepare a lift works safety plan with details on the risk assessments and method statements, and safety precautions/measures to be adopted prior to the commencement of any lift works;
- ensure clear delineation of safety responsibilities and effective coordination and communication among the principal contractor, lift contractor, and subcontractors, project manager/engineer, design engineer, supervisor and any related personnel involved in the work activities for full implementation of the planned safe system of work;
- ensure that the lift works is conducted safely under the direct supervision of a



person who is competent by virtue of his substantial training and practical experience in relation to the lift works;

- ensure that only competent workers possessing adequate knowledge, skills and experience are employed to carry out the lift works;
- provide the workers involved with necessary safety information, instruction and training related to the lift works to ensure that they are familiar with the safe working procedures, safety precautions/measures, emergency procedures, and have fully understood their roles and responsibilities; and
- establish and implement an effective monitoring and control system to ensure that the devised safety precautions/measures are strictly followed.

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Systemic Safety Alert **Handling of Heavy Objects in Workplaces**

Major systemic safety problems

Handling of heavy objects are a common work process in various workplaces. The work carries a high level of risk that may cause serious injury or even fatality to employees. Employees handling/ working in the vicinity of the heavy objects are at risk of being crushed/ trapped by falling/ toppling of the objects unless the work is carried out in a safe manner. The following are major systemic safety problems attributed to the occurrence of the relevant accidents:

- failure to conduct task-specific risk assessments;
- failure to formulate or implement appropriate risk control measures;
- slack in control and monitoring to ensure that risk control measures stay effective; and
- failure to provide adequate safety information, instruction, training and supervision to employees concerned.

Accident prevention measures

Registered Safety Officers (RSOs) should advise their employers/ clients to:

- (i) appoint a competent person to conduct task-specific risk assessments to identify all potential hazards associated with the work, after taking into account the size, weight, shape and stability of heavy objects, the working environment, the nature of work, the workforce required and the necessary equipment for such handling work;
- (ii) formulate suitable precautionary measures for the work with due regard to the results of risk assessments by:
 - properly segregating and clearly demarcating storage zones which should be kept away from the main pedestrians of workplaces. Traffic of heavy vehicles should also be considered as they may cause vibration, resulting in instability of the objects;



- providing and using suitable mechanical aids where necessary, such as forklift trucks or trolley of sufficient capacity and personal protective equipment to ensure safe handling of the objects;
 - arranging sufficient number of employees to handle heavy objects after assessments and under the supervision of a competent person if it is not practicable to use mechanical aids for the work;
 - exercising due care on the movement speed and the centre of gravity of heavy objects in the course of handling to prevent them from overturning or displacing;
 - keeping sufficient clearance to prevent disturbing adjacent objects as well as keeping routes clear of people and other traffic during the handling of heavy objects;
 - properly storing and stacking heavy objects on a flat, level and rigid surface;
 - providing and using suitable storage racks/ support systems to prevent heavy objects, in particular those unbalanced ones, from overturning;
 - storing and stacking heavy objects in accordance with their size, weight, pattern, frequency of movements, etc. so as to prevent the objects from fall, movement or displacement. Narrow-base freestanding objects, e.g. strapped bundles, should be secured from slipping or toppling; and
 - storing objects of different types and sizes separately so far as practicable to simplify sorting process.
- (iii) provide all employees concerned with the necessary safety information, instruction and training, and ensure that they are familiar with the safe work procedures and safety measures;
- (iv) establish and implement an effective monitoring and control system to ensure all safety measures are strictly followed; and
- (v) review the system of work periodically to ensure its workability and effectiveness whenever there is a significant change in team composition, use of equipment, objects to be handled, work method, working environment, etc.

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Systemic Safety Alert **Falsework Safety**

Major systemic safety problems

Falsework collapse which may lead to multiple casualties is often attributed to improper design, use of sub-standard materials, missing bracing/lacing/wedging, misalignment of structural members, and/or improper concrete placing sequence thereon. Common systemic safety problems leading to collapse of falsework include:-

- failure to conduct task-specific risk assessment and to formulate method statements for the erection, alteration, use and dismantling of the falsework;
- lack of design drawings/specifications clearly specifying the method and sequence of erection/dismantling, number/locations of lacing/bracing, material standard, sequence of concrete placing thereon, etc.;
- failure to communicate the above essential information to site personnel and workers involved;
- lack of control and monitoring to ensure conformity with the falsework design/specifications and method statements;
- failure to formulate/implement an effective checking system for timely detection and prompt rectification of any irregularities such as missing essential falsework components, improper connections and misalignment, to ensure the mechanical integrity and stability of the falsework;
- lack of specific trainings for site personnel and workers involved; and
- lack of clear delineation of safety responsibilities and effective coordination and communication among the principal contractor, subcontractors, the design engineer and site personnel involved in the aforesaid activities.

Accident prevention measures

RSOs should advise their clients/employers to: -



- adopt task-specific approach in conducting risk assessment;
- formulate task-specific method statement detailing the proper sequence of work and appropriate safety control measures;
- ensure a professional engineer with adequate competence and experience be appointed to design a falsework that is in conformity with established standards, of sufficient load bearing capacity and stability;
- ensure that all site personnel and workers involved are competent by virtue of their knowledge, skills and experience with regard to their respective duties;
- ensure that the falsework is only erected, altered, used or dismantled under the direct supervision of a competent supervisor;
- ensure that the falsework is used only if it has been thoroughly checked by a competent person and further cross-checked by an independent checking engineer after erection/substantial alteration;
- ensure clear delineation of safety responsibilities and effective coordination and communication among the principal contractor, subcontractors and the design engineer; and
- suspend all work immediately in the event of any undue movement of the falsework until the irregularities causing the movement have been clearly identified and fully rectified, and the falsework has been certified safe by both the competent person and the independent checking engineer.

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Systemic Safety Alert **Road/Roadside Work Safety**

Employees/workers required to work on road/roadside include those engaged in road construction and maintenance, utilities management (e.g. electricity, communications, water and gas), service maintenance (e.g. drains, replacing street bulbs/lamps, and tree cutting) and traffic management (e.g. tunnels, bridges, and expressway operation establishments). Being struck by moving vehicles is one of the major threats to those employees/workers.

Major systemic safety problems

Proprietors/employers/occupiers are required to adopt effective preventive measures and make necessary arrangements to ensure the safety and health at work of employees/workers engaged in road/roadside works. Major systemic safety problems include: -

- failure to devise and implement a safe system of work by conducting task-specific risk assessments and formulating safe working procedures and measures to safeguard the employees/workers at work;
- poor temporary traffic management control such as unclear and insufficient traffic signs, insufficient buffer space, and detour/temporary route causing drivers' confusion;
- insufficient clearance provided between the work zone and live traffic;
- inadequate arrangements to warn drivers or control their movement close to employees/workers at work;
- insufficient lighting, signing and guarding in place to protect the employees/workers engaged in roadway or roadside work;
- the procedure of installing and removing traffic cones, signs and traffic control measures not well planned; and
- inadequate training and supervision provided to the employees/workers involved, particularly lookout men at ingress/egress of construction sites.



Accident prevention measures

RSOs should advise their clients/employers/contractors to adopt a safe system of work including, but not limited to, the following preventive measures: -

- i. Task-specific risk assessments should be conducted by a competent person, taking into account the specific nature of work (e.g. handling of vehicle breakdown, handling of traffic incident/accident, diversion of traffic, cordoning off of incident/accident scene, lane closure, stopping of vehicle, vehicle recovery and various type of roadworks), work location (e.g. toll booth, toll plaza, trunk road, carriageway, footway, junction of expressway, tunnel and bridge) and all major risk factors namely, estimated approach speed of vehicles, weather condition, visibility, layout of the road, road condition, flow of traffic and traffic volume;
- ii. Safe working procedures and measures should be formulated and implemented to safeguard the employees/workers, having due regard to the result of the risk assessments, and in line with relevant codes of practice / guidelines. The safe working procedures and measures should enable safe conduct of the road works as a whole, including the setting up and removal of lighting, signaling and guarding for the works, which not only should take care of the safety of the workers involved but that of other road users as well;
- iii. The control measures to tackle the hazard of being struck by moving vehicles should include, but not limited to, the following:
 - as far as practicable, provide direct access to toll booths, such as tunnels or bridges without requiring workers/employees to cross active traffic lanes;
 - install suitable metal railing along the pathway within a toll area to safeguard the workers/employees while they are walking along the pathway;
 - display suitable and adequate warning signs in respect of road-crossing



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safety within a toll area;

- demarcate and isolate the work areas on carriageways by suitable and adequate warning lights, traffic cones, traffic signs and barriers in accordance with the established safety procedures/relevant codes of practice;
- ensure that the setting-up and removal procedures and requirements of warning lights, traffic signs, traffic cones and barriers are in accordance with the established safety procedures/ relevant codes of practice;
- consider using work zone protection barriers designed to appropriate standard for absorbing the energy of colliding vehicle(s) in order to minimize damage and injuries to workers/employees concerned;
- as far as practicable, give advance warning to alert road users about any emergency situations, such as road accidents ahead through the display/broadcasting/radio systems of the highways/ tunnels;
- as far as practicable, use suitable flashing arrow signs with barricade signs to indicate the beginning of temporary traffic diversion;
- ensure that shadow vehicles equipped with suitable truck-mounted attenuator, high mount strobe light bar, flashing arrow signs and rear marking are used when conducting road works on roads with a speed limit of 70 kilometres per hour or above (including expressways);
- where appropriate, impose temporary speed limits on traffic routes through erecting speed limit signs;
- place plant, equipment and tools as far away as practicable from moving vehicles;
- maintain adequate buffer distance from the barriers to the work areas;
- arrange the operation to be performed with the workers/employees concerned facing the oncoming traffic as far as possible;
- arrange the workers/employees who guide vehicles to carry out their duties at safe positions as far as possible and provide them with suitable personal protective equipment as necessary, such as high visibility reflective clothing and traffic control baton, and ensure their proper use of the equipment; and
- without prejudice to the safety of other road users, consider upkeeping



the lighting, signing and guarding requirements for carrying out road works and adopting new innovations to enhance road works safety, by making reference to the latest relevant technologies and overseas standards/ practices and taking into account their technical capability, implementation procedures and constraints.

- iv. An effective coordination/communication system among the employers/contractors, different levels of management/supervisory personnel and workers/employees should be established and maintained to ensure full appreciation of potential traffic hazards and clear understanding of the associated hazard control program and delineation of safety responsibilities;
- v. The workers/employees and management/supervisory personnel should be provided with the necessary safety information, instruction and training to ensure that all workers/employees involved are familiar with the safe working procedures and safety measures in the traffic hazard control system; and
- vi. An effective monitoring and control system should be established and maintained to ensure that the safe working procedures and safety measures for potential traffic hazards are strictly followed. The works vehicle(s), the shadow vehicle, the truck mounted attenuator, the flashing arrow signs and the telecommunication equipment, etc. should be maintained and checked periodically to ensure that they function properly.

RSAs should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.



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Systemic Safety Alert Work-at-Height

Major systemic safety problems

Majority of serious/fatal fall-from-height accidents are attributed to absence of suitable and safe working platform/means of support to workers on scaffolds, and failure to provide and ensure proper use of suitable fall arresting system. Major systemic safety problems detected include: -

- failure to conduct task specific risk assessments and to formulate task specific method statements;
- absence of or unclear delineation of safety responsibilities and ineffective coordination (e.g. on provision of planks on scaffolds) among principal contractor and subcontractors;
- lack of control & monitoring of subcontractors;
- failure to implement effective proactive inspection programme; and
- inadequate hazard communication through safety instruction, training and supervision.

Accident prevention measures

RSOs should advise their employers/clients to: -

- conduct task specific risk assessments of work-at-height, and devise and implement appropriate task-specific control measures having regard to the hierarchy of hazard control, viz : safer work methods to avoid work-at-height, adoption of safe facilities (e.g. gondola) for access to external walls, provision of proper working platforms on scaffolds, with the provision/use of fall arresting system being the last resort;
- ensure clear understanding of the safety responsibilities among the principal contractor, sub-contractors, different levels of site management/supervision



personnel and workers, and in case of work-at-height on bamboo scaffolds, the delineation of responsibilities between the principal contractor and sub-contractors¹; and

- develop and implement effective proactive inspection programme on compliance checking and follow-up of the planking and other safety requirements.

RSAs should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

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¹ For detailed delineation of responsibilities between the principal contractor and sub-contractors, please refer to the “Guidelines on Planking Arrangement for Providing Working Platforms on Bamboo Scaffolds” issued by the Construction Industry Council in May 2014



Systemic Safety Alert Prevention of Heat Stroke at Work

Summer days in Hong Kong are hot and humid. Workers are at risk of heat stroke while working in a hot environment, indoor and outdoor alike. The Labour Department (“LD”) has serious concerns about workers exposing to the risk of heat stress at such workplaces.

Safety Precautions

RSOs should advise their clients/employers to adopt the following heat stroke preventive measures:-

- i. a task-specific risk assessment having due regard to the specific nature (e.g. long or short duration of work), location (e.g. indoor or outdoor, or remote location), job methods (e.g. manual or with mechanical aid) and plant/equipment to be used in question should be carried out, with the major risk factors in connection with heat stroke, namely temperature, humidity, heat radiation, air movement, workload, clothing and acclimatization, been taken into account;
- ii. The hierarchy of hazard control should be observed in that priority should be accorded to avoid exposing workers to potential heat stroke hazard (e.g. ceasing outdoor extensive manual work under hot climate) or provision of engineering measures/deployment of hazard mitigation measures. The control measures to tackle the hazard of heat stroke should include, but not limited to, the following:
 - Sheltering the workplaces if practicable;
 - Rescheduling outdoor work to cooler periods;
 - Avoiding prolonged working in a hot environment;
 - Providing fans or blowers, if reasonably practicable, at workplaces or rest areas;
 - Providing sufficient potable drinking water to workers or at locations within close proximity to the workers;



- Developing and implementing a suitable emergency plan for the workers working alone at distant workplaces;
 - Wearing suitable clothing such as wide-brimmed hats, thin and air permeable clothing, reflective vests;
 - Taking adequate precautions (e.g. providing cooling vests) when workers have to wear air impermeable coveralls and respirators (e.g. fogging insecticide) while at work on a hot day; and
 - Duly considering the acclimatization factor.
- iii. An effective coordination/communication system among the employer/proprietor (principal contractor and sub-contractors in case of a construction site), different levels of management/supervisory personnel and workers should be established and maintained to ensure clear understanding of potential heat stroke hazards, the associated hazard control program and the delineation of safety responsibilities;
- iv. The workers and management/supervisory personnel should be provided with necessary safety information, instruction and training to ensure that all workers/personnel involved are familiar with the safe working procedures and safety measures in the hazard control system; and
- v. An effective monitoring and control system should be established and maintained to ensure that the safe working procedures and safety measures for heat stroke are strictly followed.

RSAs should take into account these safety precautions in executing safety audit functions.



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Systemic Safety Alert **Tunnelling Works**

Major systemic safety problems

Due to the confined nature of a tunnel under construction, any inadequately controlled work hazards may lead to incidents with disastrous consequence. As an illustration, in case of fire/explosion, the confined environment of a tunnel work site will quickly be filled with smoke, rendering escape and rescue of persons inside the tunnel extremely difficult. Major systemic safety problems detected include: -

- slack control over access/egress of workers/vehicles at tunnel entrance (e.g. no physical barrier and/or ineffective tally system at entrance);
- poor site management with inadequate control measures to prevent persons from being struck by vehicles or other mobile plant;
- lack of safe system of work/measures to control fire/explosion hazards by, for example, allowing the conduct of incompatible activities, like fueling and welding, in close proximity in a confined environment ;
- lack of effective control systems to prevent uncontrolled entry of persons/vehicles into the danger zone near tunnel face and unauthorized commencement of mucking out activities in the drill-and-blast cycle;
- inadequate supervision of designated personnel responsible for execution of safety requirements and independent certification of permit-to-work system; and
- ineffective hazard communication through safety instruction and task specific training to workers, especially those of ethnic minorities.

Accident prevention measures

In view of the severity of risks associated with tunnelling works, RSOs should keep vigilant surveillance of the safety conditions of the tunnels and where appropriate review the systems and hazard control measures to keep abreast with the progress of



the tunnelling activities, changes in job methods, plant, etc.

RSOs should advise their employers/clients to: -

- adopt specific approach in conducting risk assessments and formulating safe system of work and devise appropriate task-specific control measures;
- put in place stringent control and monitoring mechanism to ensure proper discharge of the safety duties by the designated personnel vested with specific safety responsibilities, e.g. compliance checking and independent certification in connection with the implementation of the system of work;
- develop and implement effective proactive inspection programme specific to tunnelling activities, timely report any violations to his employers, and take appropriate follow-up actions for prompt rectification;
- establish and implement effective coordination mechanism to facilitate better coordination and communication among different levels of project staff involved and different sub-contractors in implementation of the system of work; and
- arrange suitable and specific training to enhance the competence and performance of project staff vested with specific responsibilities in implementing the safe system of work.

Refueling of diesel plant and equipment inside tunnels under construction, especially when bulk transportation, storage and handling diesel fuel are involved as well as in a confined space environment, could give rise to imminent fire/explosion risks and thus disastrous consequences. Therefore, effective safe systems of work and control measures, including the safety measures in Annex, should be put in place.

RSAs should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.



List of Safety Measures for Diesel Refueling on Tunneling Sites

A	Safe System of Work
	Specific risk assessment for diesel refueling work inside tunnels
	Hazard identification, including but not limited to the following: <ul style="list-style-type: none"> • Elimination of hazards, i.e. avoidance of refueling inside tunnels as far as reasonably practicable • In case refueling outside tunnel is impracticable, number of vehicle(s)/ plant(s) to be refueled and refueling frequency should be minimized
	Formulation of fire safety management plan, including but not limited to the following: <ul style="list-style-type: none"> • Planning of work • Formulation of method statement/ safe working procedures • Emergency preparedness, e.g. contingency plan, fire evacuation drills to be arranged with Fire Services Department (FSD)
	Proper implementation of the safe work method
	Regular monitoring of the safe work method
B	Storage of Diesel
	Diesel to be stored within exempt quantity unless otherwise approved by FSD
	Diesel to be contained in tightly-sealed metal container
	All containers of diesel to be properly labelled
	Drip pans to catch any leakage
	Oil-absorbent materials for spillage control
C	Designated Diesel Transporting Vehicle
	Properly-constructed vehicles with suitable warning signs
	Diesel to be conveyed shall be within exempt quantity
	With suitable fire extinguishers, e.g. two 5kg dry powder type on each side of the vehicle and accessible from outside the cab
D	Designated Refueling Bay
	Engine to be switched off before refueling
	No hot work/ naked flame within 10m from the refueling areas/points
	Provision of warning signs of “SWITCH-OFF ENGINE” and “NO NAKED LIGHT” near the designated refueling bay
	Adequately ventilated
	Safe distance for traffic and roads
	Partitions, etc. to be made of non-inflammable materials
	Sill to prevent fuel spillage and all spillage to be treated promptly
	Separated from vehicle repair/ servicing bay
	Suitable fire extinguishers, e.g. fire watcher equipped with 1 dry powder type fire extinguisher and 2 sand buckets
	Combustible gas detectors to be installed at/near the refueling bay in the tunnels
	Anti-static hose/ pump with self-closing nozzle/ shut off tap
	Refueling work to be conducted by designated and trained personnel
	No diesel to be kept inside tunnels except when refueling work is actually done
E	Electric Pump
	Electric pumps to be conformed to BS EN 60079 or other relevant international standards

Remarks: The above safety measures should be endorsed by an independent fire safety consultant.



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For enquiry about storage of diesel exceeding exempt quantity, please contact the Fire Services Department at telephone 2417 5757 or e-mail fsdgd@hkfsd.gov.hk.

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Systemic Safety Alert **Preventing trapping hazard for work** **underneath the raised dump body of truck**

Performing inspection, maintenance and repair underneath the raised dump body of truck pose imminent trapping hazards to maintenance/ servicing personnel. Common work activities requiring workers to perform their work underneath the raised dump body include inspection, maintenance and repair to air or hydraulic lines, electrical wires, hydraulic pumps, fuel pumps, and other activities such as routine cleaning, lubrication and framework welding. Workers are subject to the risk of being struck or trapped between the truck chassis and the dump body by its sudden lowering or collapse. Such sudden movement may be induced by inadvertent control operation, inadvertently pulling a release cable, hydraulic failure, and premature reconnecting of an air-line. Most of these accidents were attributed to the absence of a safe system of work and slack on-site control.

Major systemic safety problems

Proprietors/employers are required to adopt effective preventive measures and make necessary arrangements to ensure the safety and health at work of employees/workers engaged in work underneath the raised dump body of truck. Major systemic safety deficiencies include: -

- failure to conduct task-specific risk assessments, formulate method statements and clearly specify the safe working procedures and sequence of work;
- failure to develop and fully implement an effective permit-to-work system as necessary;
- slack monitoring and control to ensure the necessary safety precautions continue to be effective;
- failure to properly communicate necessary safety information and instructions, including the potential hazards and their corresponding risk control measures, through specific safety training to workers;



- failure to provide proper support to prevent the raised dump body from unexpected lowering;
- lack of proper repair or preventive maintenance for the truck and its auxiliary devices leading to degradation of mechanical integrity and malfunctioning;
- failure to designate and fence off the affected area for conducting inspection, maintenance or repair under the raised dump body to prevent unauthorized persons from approaching and interfering with the truck and put themselves at risk; and
- insufficient arrangement to ensure that the operating personnel such as dump truck operators and servicing personnel have the required competence in terms of knowledge, skills and experience to properly discharge their duties in connection with the work, resulting in, for instance, these personnel being ignorant about the operating instructions or functioning of safety devices.

Accident prevention measures

RSOs should advise their employers/clients to: -

- appoint a competent person to conduct task-specific risk assessments to identify all potential hazards associated with the work, taking into account the type of works to be carried out, the working conditions of the workplace and the personnel undertaking the tasks;
- formulate detailed method statements specifying the sequence of work with appropriate safe working procedures and safety precautions/measures based on the results of the risk assessments;
- ensure clear delineation of safety responsibilities and effective coordination and communication among the plant owner, supervisor, co-workers and any related personnel involved in the work activities for full implementation of the safe system of work;
- ensure the following safety precautions/measures are strictly adhered to:
 - as far as practicable the truck should be rendered inoperative and the



engine should be switched off before carrying out any works, including inspection, cleaning, oiling or lubrication of the parts of the truck;

- avoid working under a raised dump body unless it is adequately supported by suitable supporting device (e.g. suitable props) with sufficient capacity to prevent its undue movement. Do not rely on the trucks hydraulic system to hold the dump body up while working on it;
 - if the supporting device is damaged, it should be repaired or replaced immediately before usage;
 - the operating zone for the work underneath the dump body should be properly demarcated and barricaded by exercising strict access control with suitable warning notices displayed at prominent positions to prohibit unauthorized entry into the zone;
 - every lever, handle or similar device for controlling the raising and lowering of the dump body is suitably constructed and positioned to avoid accidental actuation, e.g. equipped with locking control levers; and
 - every control device should be clearly marked to indicate its purpose and mode of operation, and prohibiting unauthorized access to these control device when the work is being carried out underneath the raised dump body.
- liaise with relevant parties to prepare a safety plan with details on the risk assessments and method statements, and safety precautions to be adopted prior to the commencement of the work;
 - ensure that only competent workers possessing adequate knowledge, skills and experience are employed to carry out the work;
 - provide the workers involved with the necessary safety information, instruction and training to ensure that they are familiar with the manufacturer's instructions, limitation unique to the dump body, the safe working procedures, safety precautions/measures, emergency procedures, and have fully understood their roles and responsibilities; and
 - establish and implement an effective monitoring and control system to ensure that the devised safe working procedures and safety precautions are strictly followed.



RSAs should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

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Systemic Safety Alert **Fall from Height through Floor Openings**

Major systemic safety problems

Floor openings are commonly found on construction sites and persons falling through these openings may sustain serious or even fatal injuries. Most accidents related to falling through floor openings were attributable to slack on-site control over protection of these openings and absence of a safe system of work, leading to the failure to ensure that adequate measures have been taken to prevent any persons from falling through the ineffectively protected openings. Major systemic safety deficiencies include:

- failure to conduct task-specific risk assessments and to formulate appropriate and adequate risk control measures;
- failure to implement an effective proactive inspection programme;
- slack control and monitoring to ensure that the risk control measures stay effective; and
- inadequate hazard communication through safety instruction, training and supervision.

Accident prevention measures¹

Registered Safety Officers (RSOs) should advise their employers/clients to:

- i) appoint a competent person to conduct task-specific risk assessments regarding the access to or work over/near floor openings to identify any foreseeable fall hazards in the workplaces and devise all necessary safety precautions/procedures to eliminate the hazards;

¹ For the details of fall prevention measures, please refer to the “Overview of Work-at-Height Safety” issued by the Occupational Safety and Health Branch of the Labour Department.



- ii) devise and fully implement the corresponding risk control measures based on the results of the risk assessments. The following risk control measures, among others, shall be strictly adhered to:

Covering for openings

- ensure that all openings are adequately covered by suitable and sound materials of sufficient strength and capacity and the coverings are so constructed to prevent the fall of persons, materials and articles;
- replace the coverings immediately if they are defective or improperly constructed;
- secure the coverings of floor openings in position so that they will not be displaced accidentally; and
- mark the coverings of floor openings clearly and boldly with readable signs or markings to alert workers of the openings underneath.

Guarding for openings

ensure that all floor openings are effectively protected with (a) suitable guard-rails with the height of top guard-rails not less than 900 mm and not more than 1150 mm; and that of intermediate guard-rails not less than 450 mm and not more than 600 mm; and (b) toe-boards with the height of not less than 200 mm.

- iii) implement effective proactive safety inspection programme and arrange stringent on-site supervision to:
- ensure that all ineffectively protected floor openings are identified promptly;
 - ensure that the risk control measures as mentioned in item (ii) above concerning covering/guarding for openings are fully implemented as soon as possible; and
 - ensure that if the coverings, guard-rails and toe-boards are temporarily removed or remain unerected for the time and to the extent necessary for the access of persons or the movement of materials or other purposes of



the work concerned, they shall be put back or erected as soon as practicable after the expiration of that time.

- iv) provide all the workers involved with necessary safety information, instruction and training to ensure that they are familiar with the safe working procedures, safety precautions/measures and emergency procedures, and have fully understood their roles and responsibilities.

Registered Safety Auditors (RSAs) should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

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Systemic Safety Alert **Truss-out Bamboo Scaffold Safety**

Major systemic safety problems

Truss-out bamboo scaffolds (TOSs) are widely used in building repair and maintenance works. Many fatal/ serious fall-of-person accidents, however, occurred in the course of the erection, alteration, use and dismantling of TOSs due to the attribution of one or a combination of the following major systemic safety problems:

- failure to conduct task-specific risk assessments and to formulate appropriate method statements for the “erection/ alteration/ use/ dismantling of TOSs”;
- lack of design drawings, specifications of supporting brackets/ anchor bolts/ construction materials, and method statements for “erection/ alteration/ use/ dismantling of TOSs”;
- lack of control and monitoring to ensure conformity with the TOSs design drawings/ specifications and method statements;
- failure to provide suitable fall arresting systems/ personal protective equipment and ensure the proper use of such;
- absence of suitable and safe working platforms/ means of supports on TOS; and
- failure to provide adequate safety information, instruction, training and supervision.

Accident prevention measures¹

Registered Safety Officers (RSOs) should advise their employers/ clients to:

- appoint a competent person to conduct task-specific risk assessments to identify any foreseeable hazards associated with the work;
- draw up the specifications of TOSs, and formulate method statements with

¹ For details of fall prevention measures, please refer to the “Overview of Work-at-Height Safety” issued by the Labour Department.



proper sequence of work as well as appropriate safety precautions to be taken in detail to eliminate or mitigate the hazards identified. Factors to be considered include but not limited to the following:

- TOSs should be designed to cope with their self-weights, loads to be imposed and extra loads resulting from wind forces;
- structural characteristics of external walls should be duly considered prior to the erection of TOSs so as to ensure that they can support the loads;
- TOSs should be adequately supported on construction materials such as structural walls, and prohibited from resting on decorative structures of a building;
- each bracket must be fitted by three or more anchor bolts with particular attention to the following aspects:
 - appropriate anchor bolts should be selected according to the strength of construction materials;
 - anchor bolts should be installed in accordance with the installation procedures specified by the manufacturers;
 - diameter and depth of boreholes as well as tightening torque of anchor bolts should meet the installation requirements set out by the manufacturer;
 - depth of the boreholes should be adequate and should fully penetrate into construction materials (e.g. concrete walls). Plastering on the external walls should not be relied on for load bearing purpose; and
 - anchor bolts should be fixed at appropriate distances from the edges of construction materials which is at least 3 times the embedment depth. Fixing of a metal bracket to the bottom edge of the tie beam should be avoided; and
- all components of TOSs are of sound materials, good construction, adequate strength and free from patent defects;
- provide all personnel involved with necessary safety information, instruction and training to ensure that they are familiar with method statements, safety measures and have fully understood their roles and responsibilities;
- ensure TOSs are erected/ altered/ dismantled by trained workmen with adequate experience and under the immediate supervision of a competent person who is appointed by the contractor for this purpose;



- provide every workman engaged in “erecting/ altering/ using/ dismantling of TOSs” with a suitable full body harness that is attached continuously to a suitable and secure anchorage or an independent lifeline with a suitable fall arrester, and ensure the proper use of them;
- regularly maintain TOSs, and inspect as well as certify safe working order of TOSs in accordance with the design drawings by a competent person; and
- exercise adequate monitoring and effective supervision to ensure that the above safety measures are strictly implemented, followed and maintained.

Registered Safety Auditors (RSAs) should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

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Systemic Safety Alert **Electrical Works**

Major systemic safety problems

Safe isolation of electricity is of paramount importance, and can be achieved through implementing a safe system of work, i.e. a lock-out and tag-out system. The following high-risk situations require your special attention: -

- modification/repair works on electrical installation already put in service: making the uncompleted installation live would result in serious burns, electrocution, or even fire and explosion;
- restrictive or conductive workplaces: a worker working in a restrictive workplace (e.g. the void above the false ceiling) would find it difficult to set himself free if his body makes contact with live part accidentally, whereas a conductive workplace (e.g. inside an earthed steel tank) would provide a good return path for earth leakage/fault current;
- working at height: electrical work on step ladders should be avoided as even a mild electrical shock would likely cause loss of balance of the worker resulting in fall from height.

Accident prevention measures

RSOs should advise their employers/clients to: -

- conduct task specific risk assessments of electrical works and formulate a safe system of work having due regard to the high-risk situations/tasks mentioned above;
- take effective arrangements before and during electrical work to ensure that the electricity source involved is safely isolated, for instance, by implementing the lock-out and tag-out system with suitable warning notices displayed;
- ensure that electrical work is only carried out by Registered Electrical Worker



("REW") and a non-REW is not allowed to carry out electrical work without effective supervision of an REW;

- clearly communicate with all workers and supervisors involved about the hazards, the system of work and the control measures in place to ensure that they all understand their roles and responsibilities;
- adopt effective engineering control measures through the use of suitable and adequate fuses/circuit breakers, residual current device for earth leakage protection and double-insulated or properly earthed portable electrical apparatus;
- provide tailored-made safety training to workers and supervisors involved having due regard to the specific nature, location, job methods and plant/equipment to be used in carrying out the electrical works in question;
- conduct proactive inspection and take prompt rectification to ensure that the electrical apparatus and the associated plugs, sockets and wiring are in conformity with relevant safety standards and free from damage and faults;
- provide and ensure the use of suitable personal protective equipment, such as insulating gloves and mat, to afford additional protection to the workers concerned ; and
- exercise adequate monitoring and effective supervision to ensure that the above safety precautionary measures are strictly followed.

RSAs should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

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Systemic Safety Alert **Risk Control of Workplace Vehicles and Mobile Plant**

Major systemic safety problems

Vehicles and mobile plant are commonly used in workplaces. Serious accidents, particularly persons being knocked down by the moving vehicles/plant are prone to happen in the absence of a safe system of work and tight on-site monitoring and control. Major systemic safety problems include: -

- failure to conduct task-specific risk assessments and to formulate a safe system of work in areas involving the traffic or operation of workplace vehicles or mobile plant;
- lack of effective monitoring and control system to prevent uncontrolled entry of persons into the operating zone with moving workplace vehicles or mobile plant;
- poor traffic management with inadequate control measures to prevent persons from being struck by moving workplace vehicles or mobile plant;
- slack monitoring and control on the use of workplace vehicles or mobile plant (e.g. leaving a vehicle or mobile plant unattended with its engine switching on, improper keeping of the ignition key of a workplace vehicle or mobile plant such that person(s) without proper training and qualification are able to get the key easily to operate the workplace vehicle or mobile plant, etc.);
- ineffective hazard communication through safety signs, safety instruction and task-specific training to relevant personnel, such as drivers, operators and workers on the traffic routes and rules on the site; and
- lack of proper repair or preventive maintenance for the workplace vehicles and mobile plant, and their auxiliary devices to ensure that they are properly maintained and in safe and serviceable conditions.

Accident prevention measures

RSOs should advise their employers/clients to: -



- adopt task-specific approach in conducting risk assessments and formulating safe system of work and devise appropriate task-specific control measures;
- properly segregate and clearly demarcate the operating zone of moving workplace vehicles or mobile plant by physical barriers, signs and notices; and, as far as practicable, avoid persons entering or working inside the zone. If persons entering or working inside the zone is unavoidable, then put in place stringent monitoring and control (e.g. by adopting a permit-to-enter/work system with necessary control measures);
- provide appropriate facilities (e.g. pedestrian-only routes, clear demarcation of pedestrian routes by physical barriers, proper pedestrian crossing points, etc.) to facilitate safe movement of personnel inside the zone;
- impose speed limits on traffic routes through erecting speed limit signs, road humps or other similar devices;
- install reversing video devices and rear view mirrors on workplace vehicles and mobile plant to eliminate blind spots of drivers/operators. This may also be complemented by other reversing safety devices such as parking sensor, and reversing alarm and warning light. Besides, as far as practicable, a trained and competent signaller should be provided to assist in the reversing of workplace vehicles and mobile plant;
- put in place stringent monitoring and control on use of workplace vehicles and mobile plant to prevent unauthorized operation. Measures include but not limited to affixing the list of authorized drivers and operators to workplace vehicles and mobile plant, assigning designated person(s) to properly keep ignition keys of the workplace vehicles and mobile plant, etc.;
- provide job-specific induction and refresher training to drivers and operators for safe operation of workplace vehicles and mobile plant, and provide briefing for relevant personnel, such as drivers, operators and workers on the traffic routes and rules on site (e.g. speed limits, wearing of reflective vests within or in the vicinity of the operating zone, etc.);
- implement proper repair and preventive maintenance for the workplace vehicles/mobile plant and their auxiliaries devices (e.g. audible and visible warning alarm, CCTV monitoring system etc.);



- exercise stringent supervision to ensure the effective implementation of risk control measures in workplaces; and
- regularly review the system of work in workplace traffic management to ensure the risk control measures continue to be effective.

RSAs should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

DISCLAIMER

This Systemic Safety Alert (the Alert) is issued to drawing the attention of interested parties to the relevant systemic safety problems and accident prevention measures necessary to protect people engaging in similar work activities. The material contained in the Alert constitutes general guidance only. It does not reduce, limit, or replace, any legal obligations upon any person to comply with any statutory duties under relevant legislation. Users such as Managers and Supervisors should make their own evaluation of the information contained in the Alert to determine if it can be applied to their own situations and practices. The Labour Department does NOT accept any responsibilities for any loss or damage resulting from the use of or failure to use of the information on the Alert.