Department of Natural Resources, Mines and Energy

Incident periodical

High Potential Incidents summary

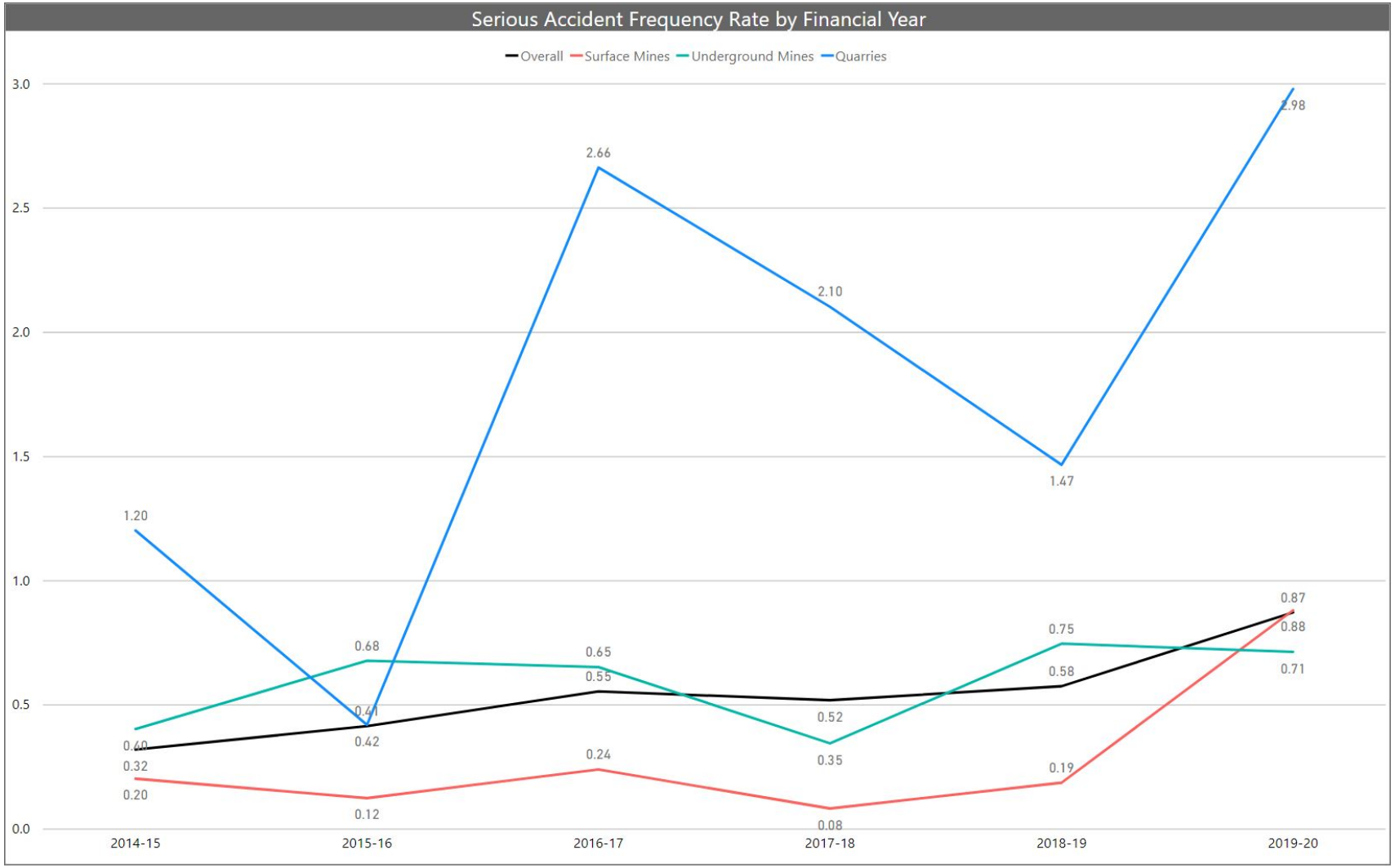
Queensland Mineral Mines & Quarries Inspectorate

April 2020

Vision: Zero Serious Harm

Queensland Government

Serious Injury Frequency Rate by industry



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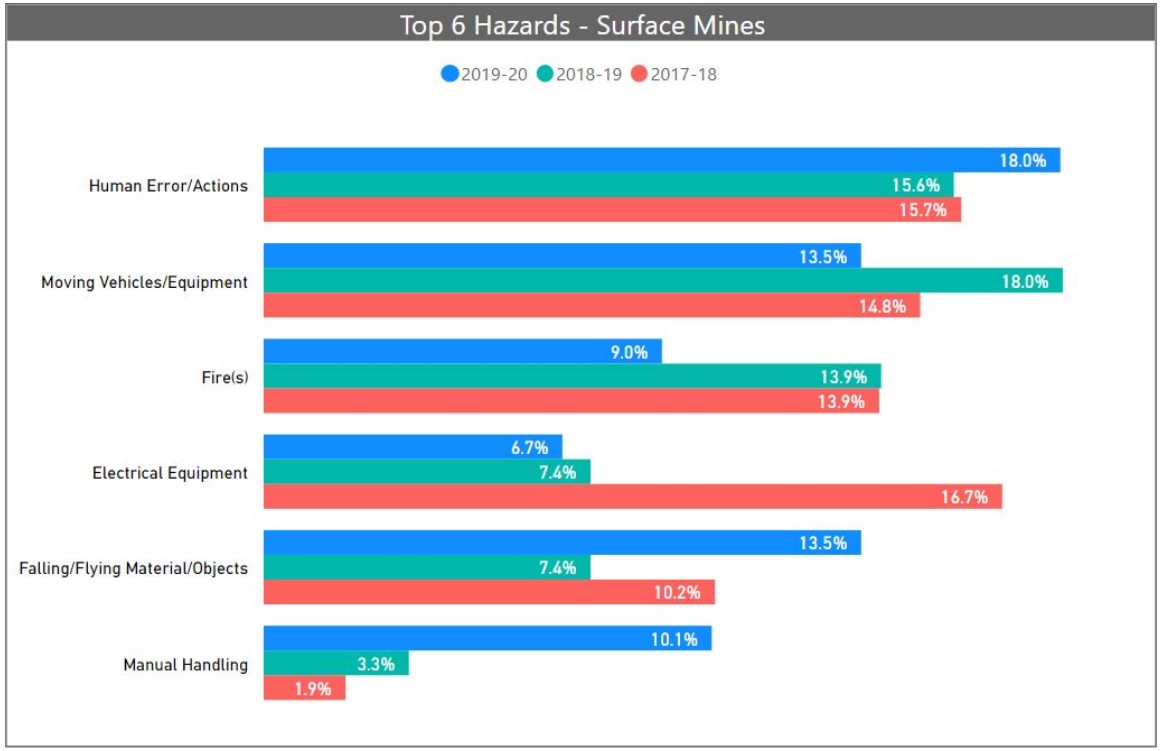

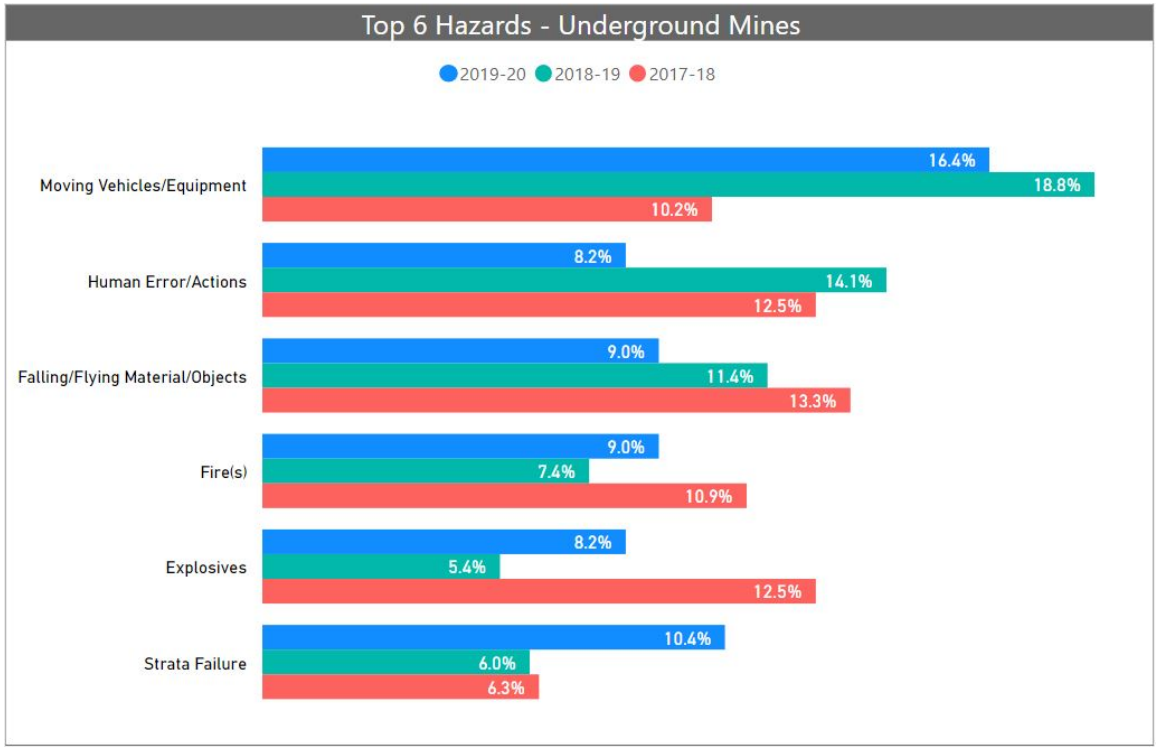

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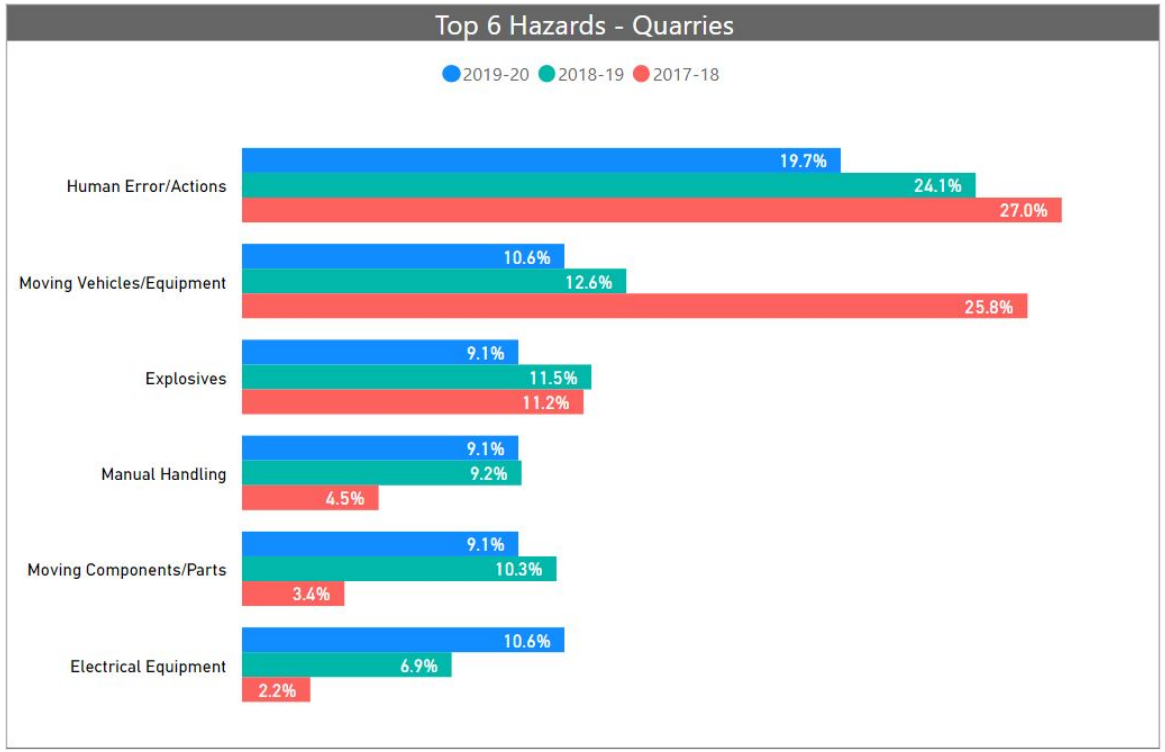
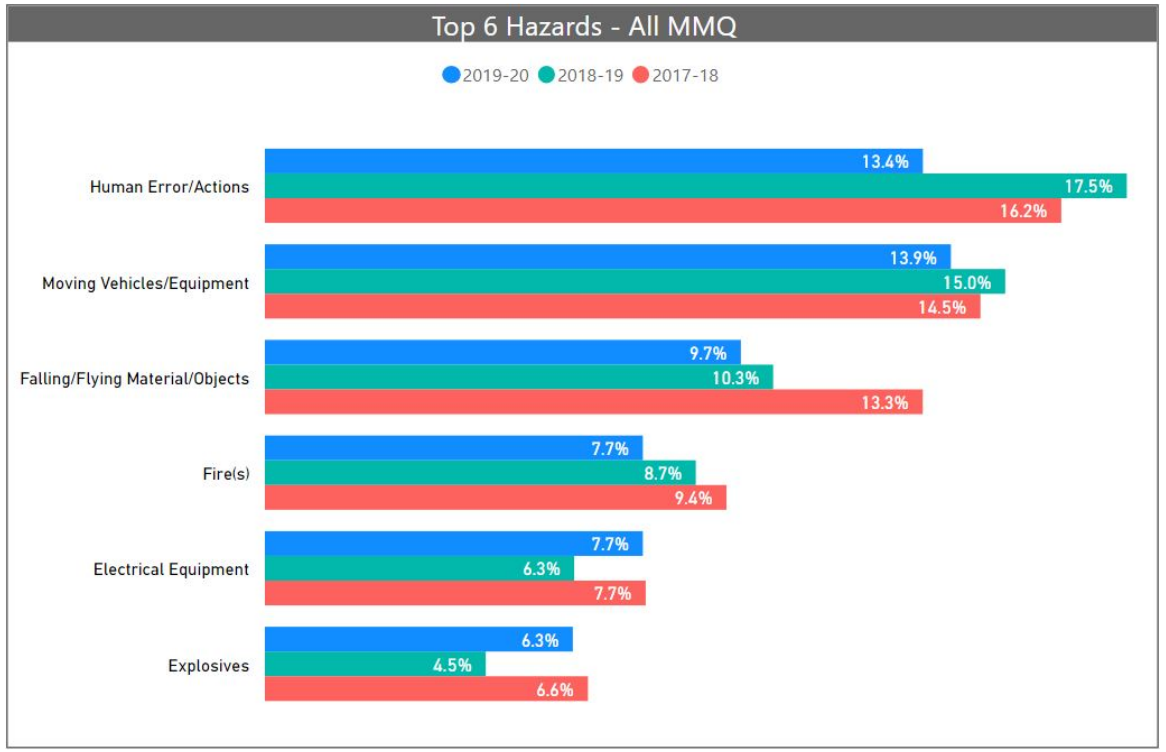




Runaway Getman

When the braking systems of a Getman EWP failed, the operator steered the unit into the wall to bring it to a stop. A worker positioned nearby evaded the unit and was unharmed. The vehicle came to a stop against the wall and in the process had pinned the self-rescuer of the nearby worker.

While attempting to reverse a Getman EWP up a decline, the operator selected reverse gear and disengaged the park brake. Despite reverse gear engaging the Getman has rolled forwards down the decline. The Operator then attempted to use the service brake and the park brake to stop the Getman rolling. Neither of these worked due to incorrect installation of the hydraulic dump valve two days previously.

Runaway Getman

Contributing Factors

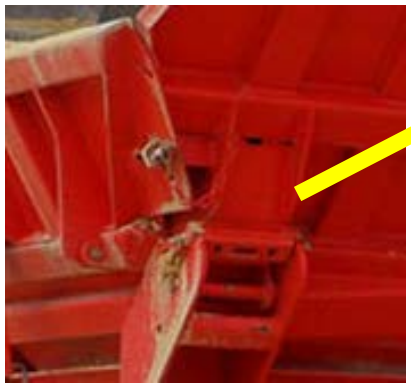
- Maintenance of the contractor's equipment was inconsistent and did not follow OEM requirements, and was not as required by the mine safety and health management system or standards for mobile plant
- Previous faults identified were not booked out
- The system for tracking and registering faults was not implemented effectively for Contractor supplied mobile plant.
- The hydraulic dump valve supplied was different to the one required for replacement
- An incorrect hydraulic schematic used to fault find park brake issue when installing the hydraulic dump valve

Recommendations

- All mobile plant prestart checklists, including contractor, must state required action to be taken for identified faults. [Administrative]
- The mine safety and health management system must document how all mobile plant prestart checklists, including contractors, are monitored for effectiveness. [Administrative]
- Review all contractor supplied plant to ensure it is maintained and repaired as per OEM requirements and correct technical information is available for workers carrying out repairs and maintenance. [Administrative]
- Maintenance procedures must state how work is checked to ensure reference was made to correct technical information when carrying out repairs or maintenance. [Administrative]

Crusher wing failure

Quarry workers were in the process of demobilising a mobile jaw crusher for transport. As part of this process the feed hopper wing walls can be folded down. A wing wall fell in an uncontrolled manner to its folded position striking a worker on the neck.



Crusher wing failure

Quarry workers were in the process of demobilising a mobile jaw crusher for transport.

As part of this process the feed hopper wing walls can be folded down. The mechanical wedges that tie the wing wall to the one at the rear of the hopper had been removed.

With the mechanical wedges removed, the wing wall can be lowered in a controlled manner using a hydraulic ram. The clevis pin and retaining pin which would normally attach one end of the ram to the folding wing wall was missing. This left the wing wall unsupported when the mechanical wedges were removed.

A worker climbed onto the track and frame of the jaw crusher in order to observe why the wing wall was not moving when the ram was being actuated. The wing wall fell in an uncontrolled manner to its folded position striking the worker on the neck.

Contributing Factors

- Clevis pin was missing on a hydraulic ram used for the lowering and raising of wing walls.

Recommendations

- Audit all plant hydraulic ram attachments to ensure that the design of the clevis pin retainer used is such that it cannot become dislodged as a result of shock loading or vibration. [Engineering]
- Implement a method to check that clevis and retaining pins are in place and secure. [Administrative]

Loss of braking – water truck

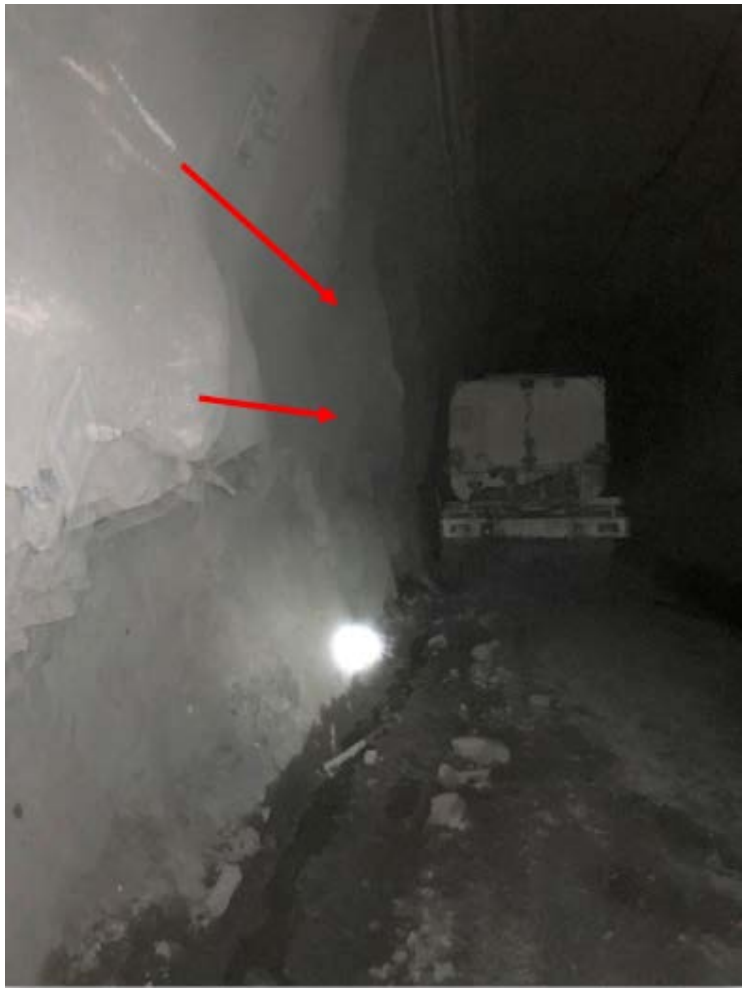
After losing braking, an operator has steered a water truck into the wall of an underground decline, causing minor injuries to the operator and damage to the truck.

While travelling down a decline with a 90% payload, an on-highway rigid-body water truck converted for underground use has lost braking function.

The operator reported the exhaust brake, service brake, parking brake and retarder were ineffective at stopping the vehicle.

The truck was then steered into the wall, coming to a stop.

The SIBS braking system fitted to the truck was not activated during the incident.



Loss of braking – water truck

Contributing factors

- Service brake failed a stall test at required rpm following recovery
- Electric retarder was non-functional due to burnt out control components
- The parking brake was not designed to bring a loaded truck to a stop
- The truck was being operated in a gear inappropriate for travelling down the decline
- The truck's pre-start calls for testing of the braking systems as per OEM requirements, but no procedures for testing or pass/fail criteria were available in the truck

Recommendations

- Ensure appropriate information is available to workers for them to determine the condition of equipment before it is operated. [Administrative]
- Assess and keep a record that workers can demonstrate the testing of critical safety systems on mobile equipment (e.g. braking and steering systems). [Administrative]
- Ensure there are clear-cut definitions of safe and unsafe conditions for mobile equipment and workers are assessed and a record kept that they can demonstrate when a piece of equipment should be stood down. [Administrative]
- Review all contractor supplied plant to ensure it is maintained and repaired as per OEM requirements and correct technical information is available for workers carrying out repairs and maintenance. [Administrative]

Conclusions

Uncontrolled vehicle movements, due to braking issues, are still occurring.

To maintain effective controls, monitoring must ensure:

- braking systems are understood by operators
- maintained correctly as per OEM requirements (minimum)
- tested for effectiveness

Mining and Quarrying Safety and Health Act 1999 S.198(1)(b) requires the Site Senior Executive to prepare a report about the accident or incident that includes recommendations to prevent the accident or incident happening again.

It also requires that when establishing controls to manage risk the hierarchy of controls is applied and higher order controls such and elimination, substitution and engineering are applied in preference to administrative and PPE controls.

Controls being implemented by sites in response to incidents continue to be primarily administrative. This is seen as an area of improvement opportunity.

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June 2020

Mineral Mines & Quarries Inspectorate

Resources Safety & Health
Queensland

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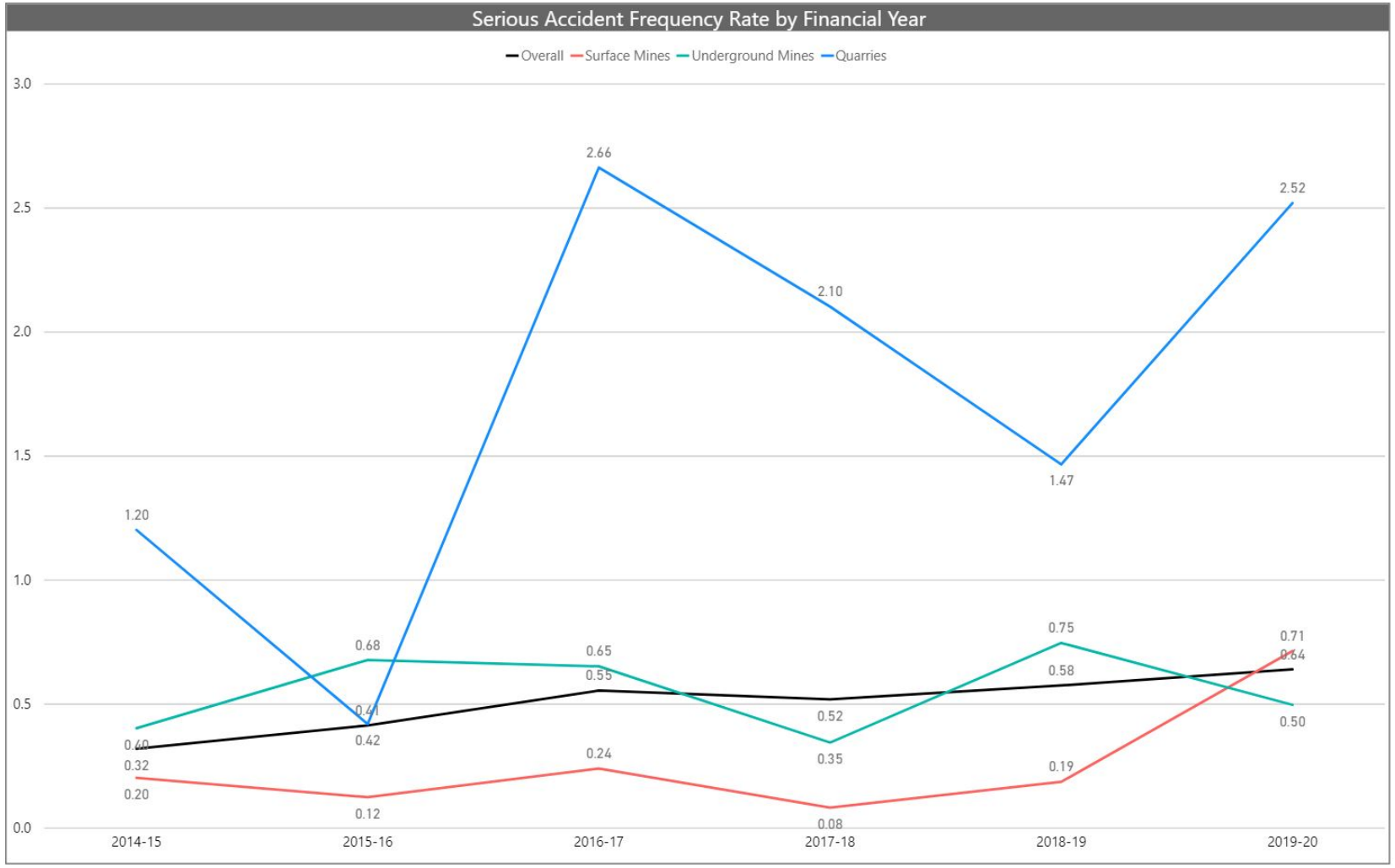

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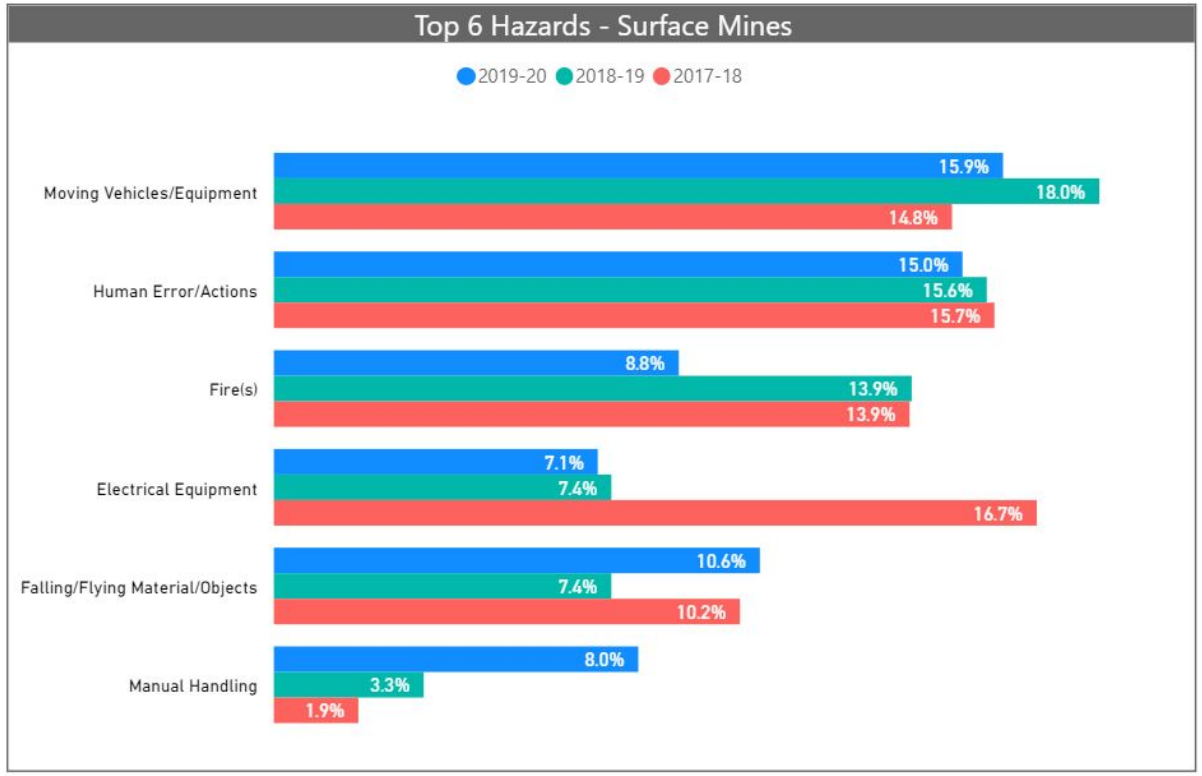

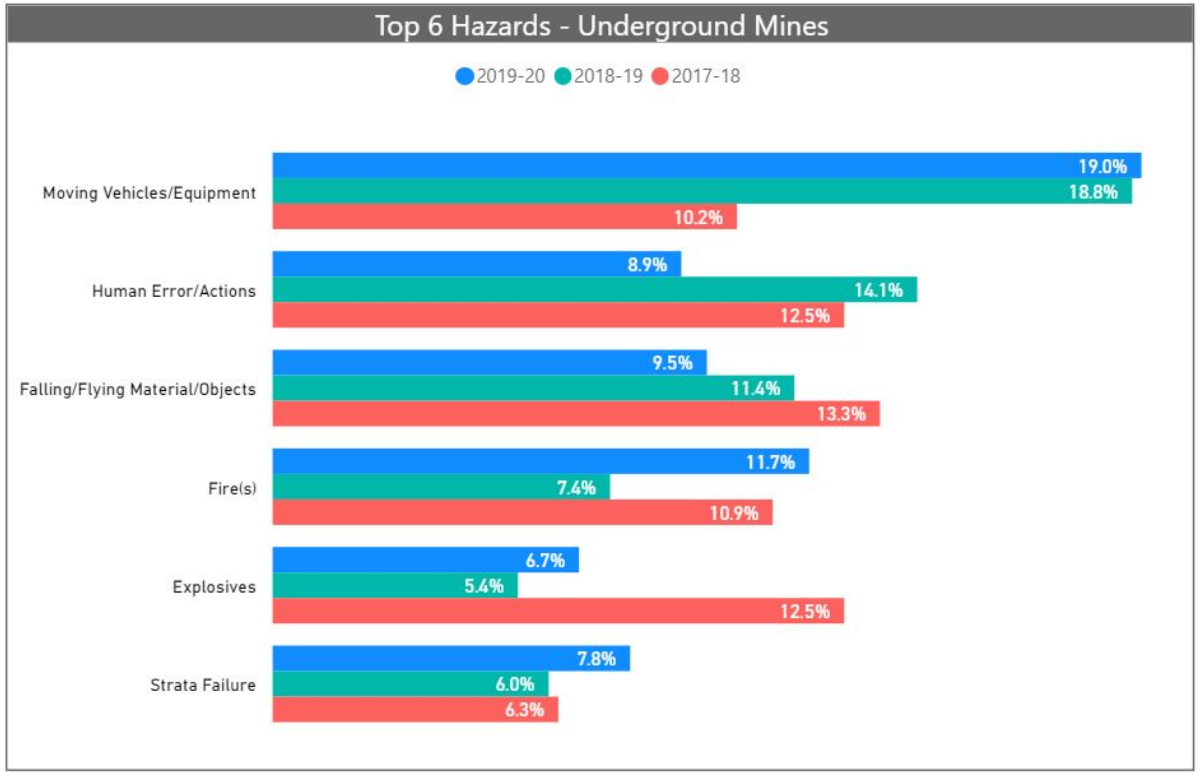

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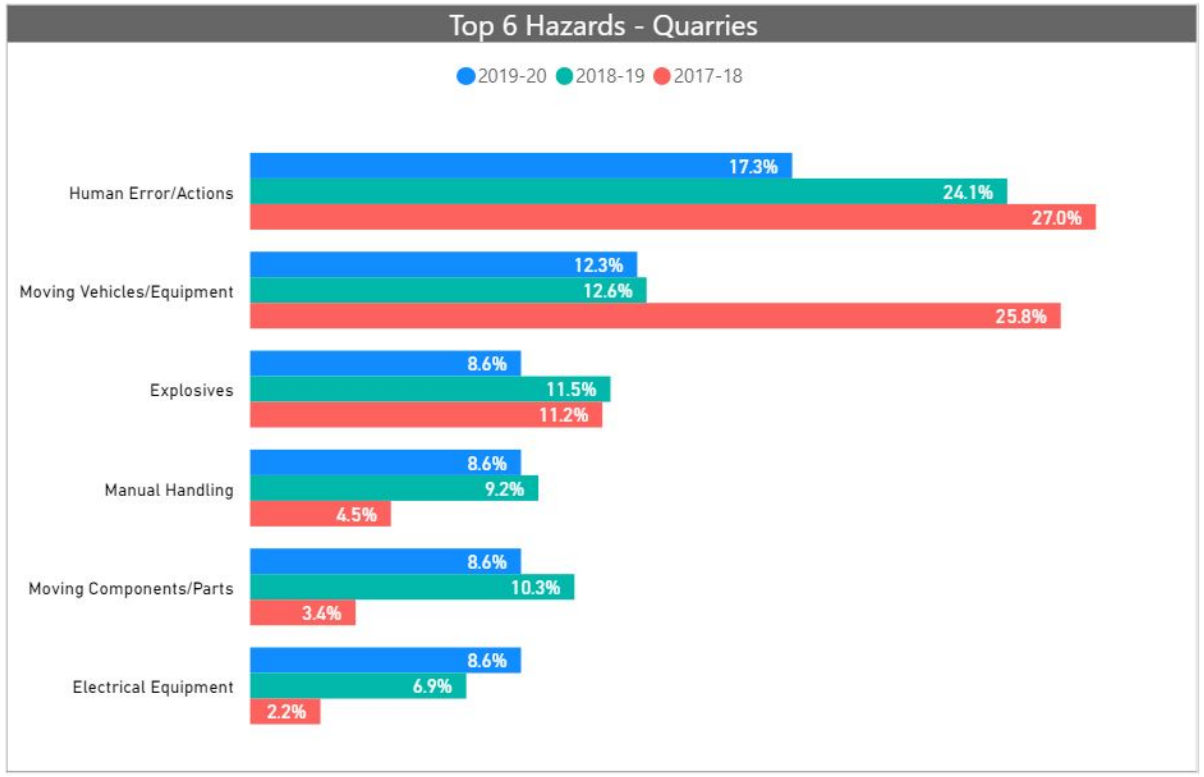
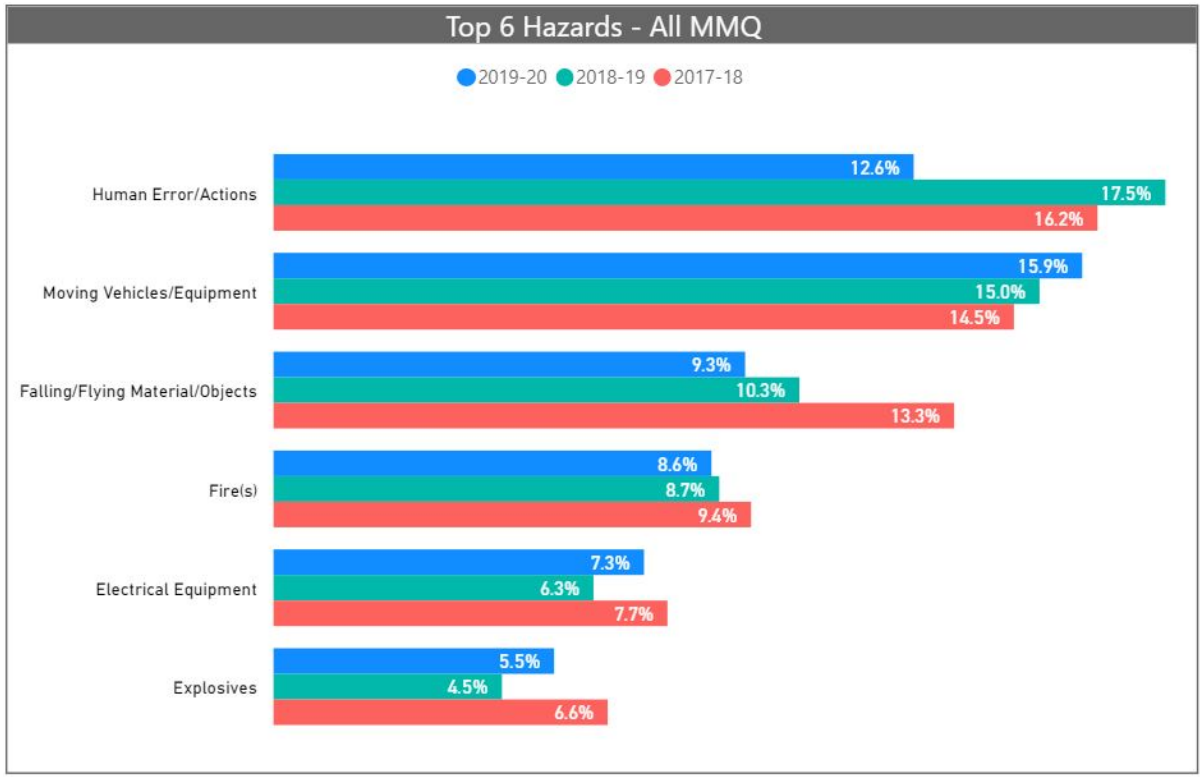
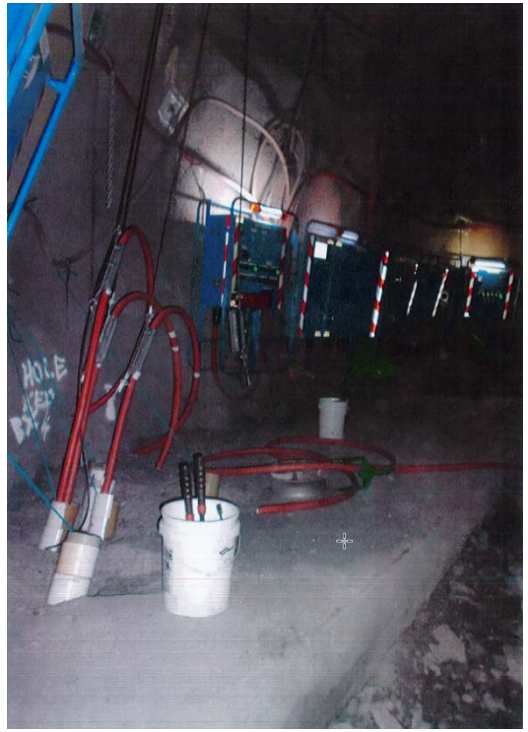




Failure of anchorage for cable pulley

A team of workers was tasked with installing 95mm, 3 core and earth steel wired armoured power cables down service. The set-up for this task involved installing a pulley off a resin bolt on the backs of the drive. Cable was to be wound off the drum, though the pulley and down the service holes. At the completion of the installation of the third cable the cable was cut and the job paused while two of the workers went to straighten the cables on the level below. During this time the pulley and the cable have detached from the backs of the drive falling to the floor. One of the workers was struck by the cable and suffered muscular-skeletal pain to his neck.



Failure of anchorage for cable pulley

Contributing Factors

- Use of non rated rigging equipment (D-Nut) and rigging not correctly installed (not enough thread left on bolt to enable D-Nut to be threaded on fully)
- The anchorage point for the cable pulley was not tested prior to use
- Competency of worker rigging cable drop (No rigging or dogging qualifications)
- Hazard identification – Line of fire (Drop zones not demarcated/barricaded)
- Installation methodology differed to cable installation procedure.

Recommendations

- Review/development of cable lowering procedure specific to installation methodology (supported by risk assessment) [Administrative]
    - Expected weight of cable/load to be calculated prior to installation (include a safety factor) [Administrative]
    - Ensure use of rated lifting equipment and the testing of all load points for expected cable/load [Engineering]
    - Use of a portable system independent from an anchor point in the backs [Engineering]
    - Drop zones should be barricaded or clearly demarcate to prevent entry [Separation]
- Training and assessment of workers in the mines cable installation procedure to include: [Administrative]
    - Requirements for workers with recognised competencies for rigging loads and required drop zone delineation
    - How to calculate expected cable weight and required load ratings for all lifting equipment and load points

Rock fall while bombing near draw point

While two persons were preparing to bomb oversize rock in a stope draw point they were struck by a rock fall of approx. 50kg that fell from the back approximately five metres back from the brow. Both workers were treated in hospital.

Rock fall while bombing near draw point

Contributing Factors

- The ground support had been damaged by previous firings and was no longer effective
- The ground had not been scaled of broken material
- The usual oversize blast bay was full.
- Neither the persons undertaking the bombing or the supervisor had recognised the deteriorated ground conditions and controls when undertaking the pre task risk assessment and while undertaking the task.
- The task flow chart did not trigger the need to have ground control checked following repeated blasting.

Recommendations

- Ensure scaling practices are thorough and remove loose rocks
    - Ground conditions inspected and re-scaled as part of a re-entry procedure [Administrative]
    - An inspection by an experienced and competent supervisor should be undertaken before persons work in close proximity to open brows [Administrative]
- Use mechanical scaling where necessary [Substitution]
- Damaged ground support must be re-established to ground support management plan standards prior to re-entry [Engineering]

Worker entangled in conveyor tail drum

A worker had their arm entangled in the tail drum of a conveyor while attempting to clear spillage from the return side of a belt.

The conveyor had been stopped to allow the blocked chute and spillage to be removed.

Worker entangled in conveyor tail drum

A worker was seriously injured at a quarry when his left arm became entangled in the rotating tail drum of a conveyor belt. Prior to the accident, the conveyor had been stopped to enable clearing of rock spillage from the tail drum area. The injured worker was attempting to clear rock from the nip point where the return side of the belt meets the tail drum, when the conveyor was briefly energised (jogged) by another worker from the plant switchboard located some distance away. The conveyor belt was cut in order to free the injured worker.

Contributing factors

- The incident is currently under investigation.
- Preliminary findings indicate that the plant was not isolated and that the conveyor was inadequately guarded.

Recommendations

- Review design of crushers and conveyors so that:
  - They can be maintained and operated in a way that eliminates spillage [Engineering]
  - Conveyor Zone A guarding requirements are as per - *AS/NZS 4024.3611:2015 Safety of machinery Conveyors - Belt conveyors for bulk materials handling* [Engineering]
  - Guards are securely fitted and require a tool for removal [Engineering]
  - The use of belt ploughs in front of the tail pulleys that would sweep off spillage is considered. [Engineering]
- Each worker must ensure they have effectively isolated and locked out plant prior to working on it [Administrative]
- Implement a monitoring program to ensure that guarding on conveyors remains effective. [Administrative]

Conclusions

A project is currently being undertaken by the Queensland Mines Inspectorate to better understand hazards associated with working near draw points. The results of this project will be published when complete.

The incident involving a worker being entangled in a conveyor has once again highlighted the need to ensure effective controls are implemented to manage this hazard. This incident comes after two recent fatalities in the Queensland quarrying sector:

- In 2018, a worker was fatally injured while performing a similar task after becoming entangled in the tail drum of a conveyor after removing guarding
- In 2012, a worker was fatally injured when entangled in a conveyors take up pulleys as the guarding was ineffective

Ensuring operations have implementing effective controls to manage risk to workers from conveyors will continue to be a focus of the Mines Inspectorate.

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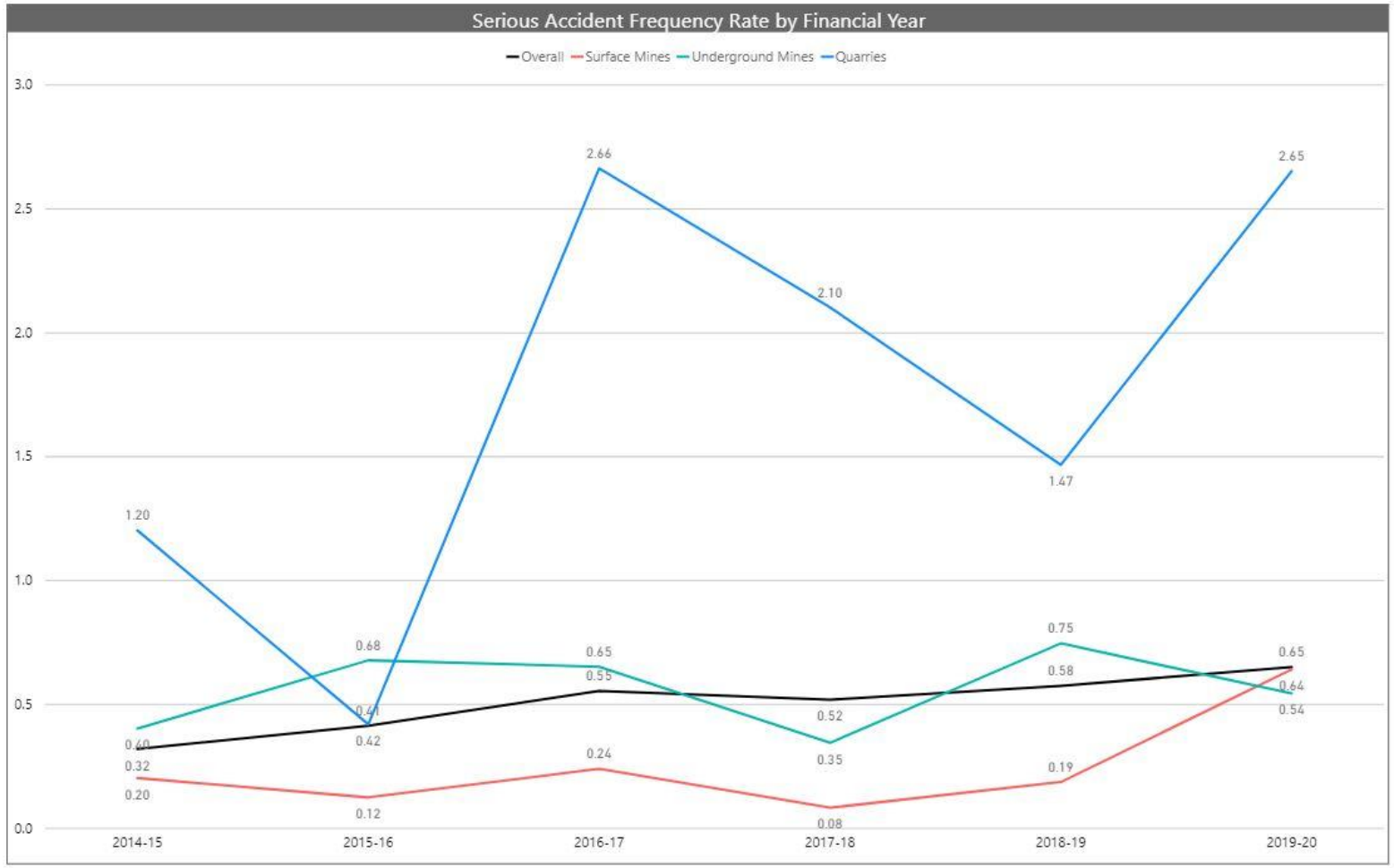

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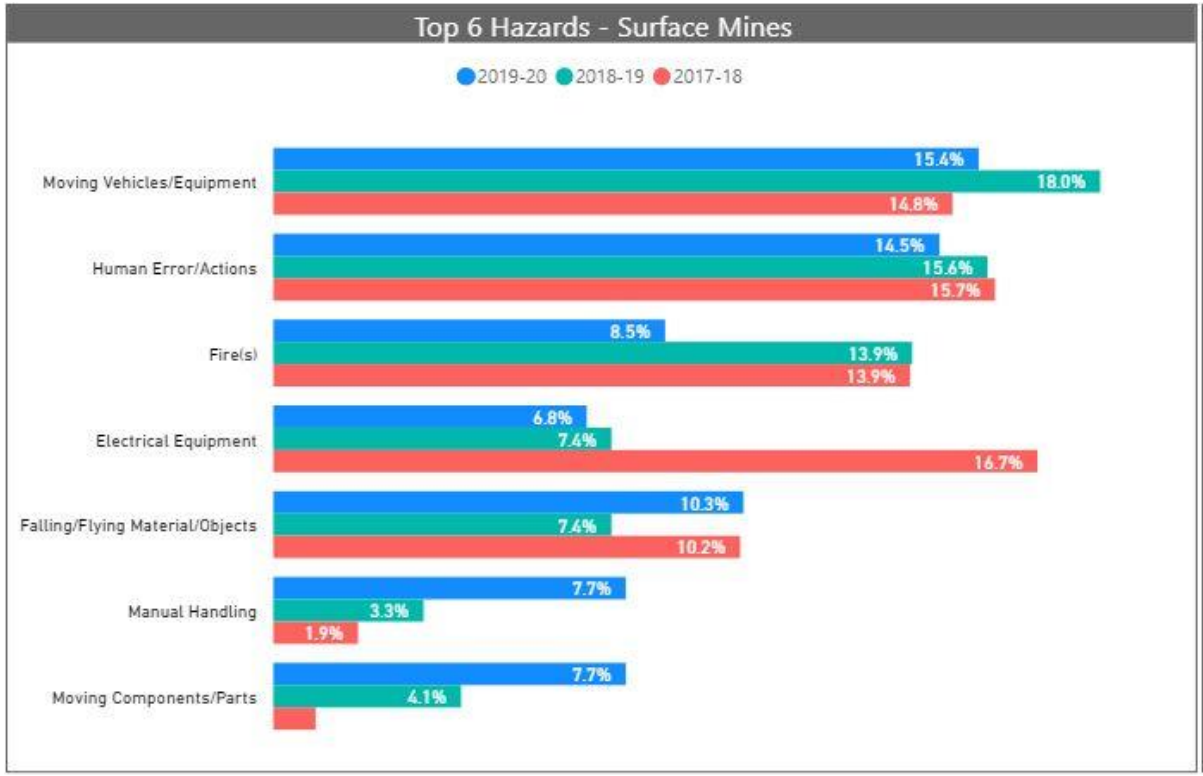

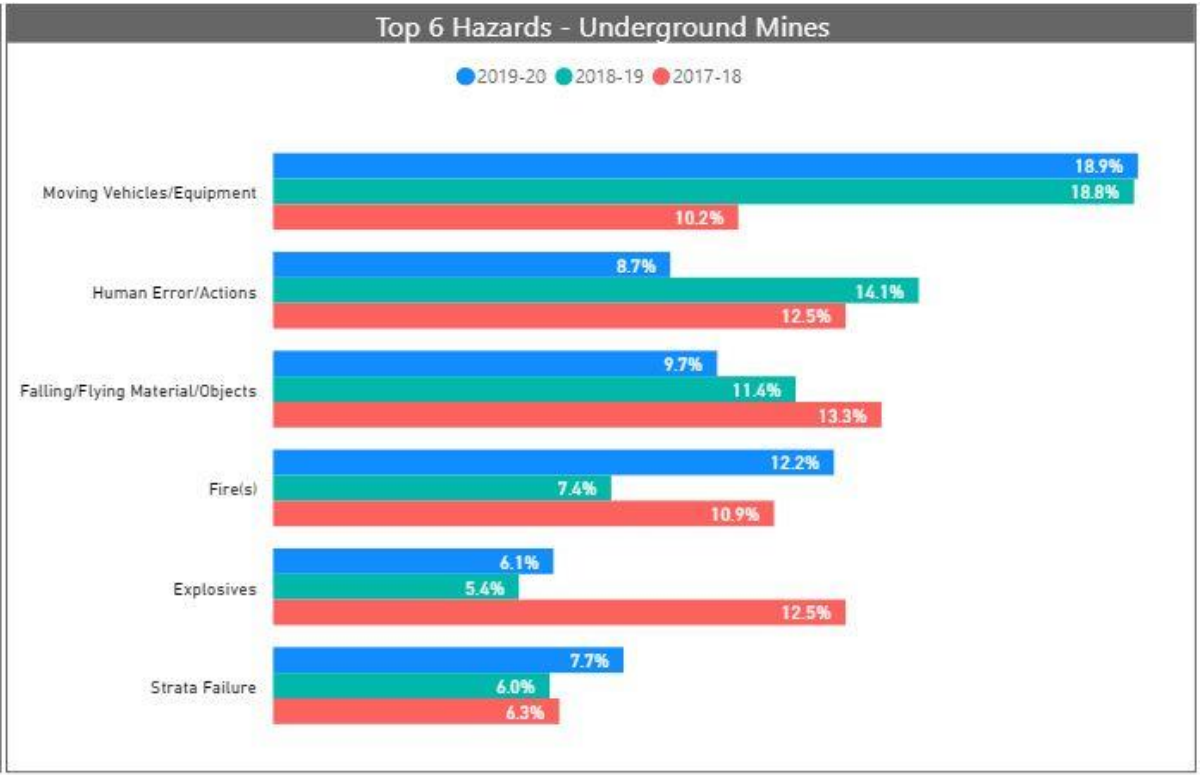

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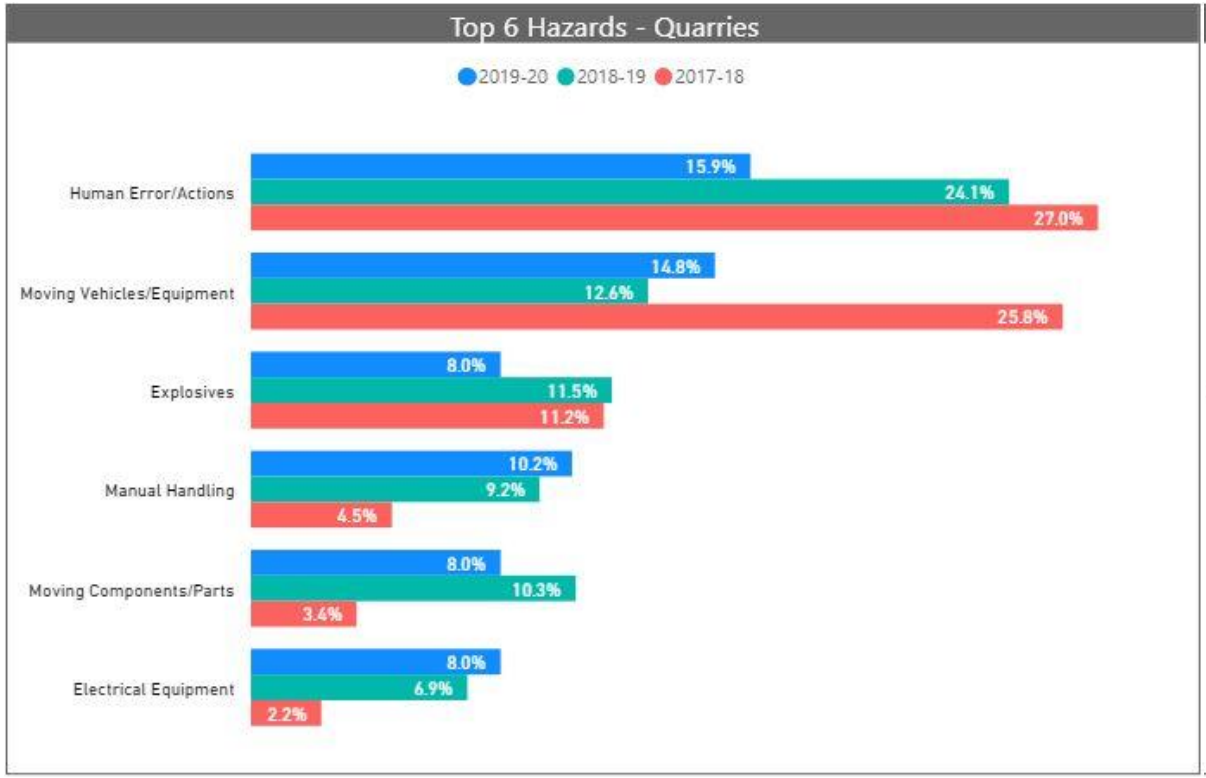
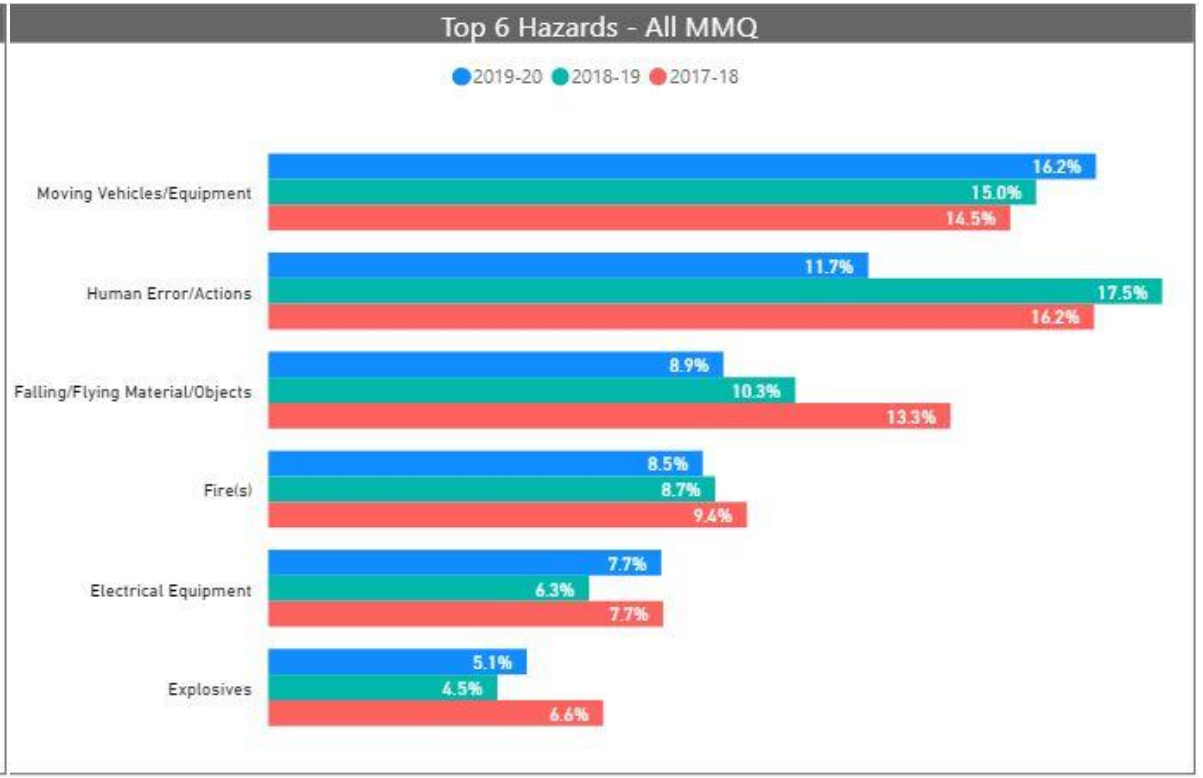




Haul Truck Steering Component Failure

On 6 July 2020, a haul truck suffered a steering component failure in the articulation area, causing the truck to slew and impact the road bunding.

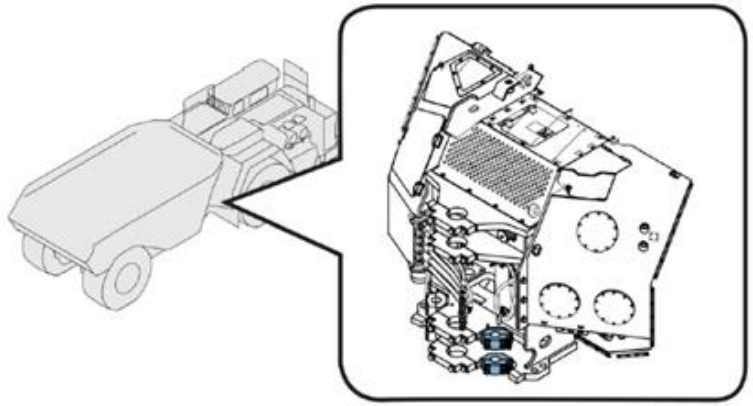
The investigation found that the retaining bolts of the right-hand steering cylinder had failed and allowed the retaining pin to fall under gravity.

Subsequently, one end of the steering cylinder detached from the truck frame.

11.29 Check Steering Pins

- Check steering pins to ensure that all marks are aligned.
- Check steering pins for wear and damage.

11.30 Check Steering Trunnion Caps



- Check trunnion caps to ensure that all marks are aligned.

OEM manual extract

Haul Truck Steering Component Failure

Contributing Factors

- Original Equipment Manufacture recommendations regarding steering components lost or not acted on.
- Existing procedure for inspection of steering bolts was insufficiently detailed.
- Equipment integrity - Bolts sheared – under normal operating conditions.

Haul Truck Steering Component Failure

Recommendations

- SSE should:
  - Replace steering cylinder retaining (trunnion cap) bolts on similar trucks. [Engineering]
  - Implement a system to detect pressure spikes in the steering system (e.g. from wall impact) that could potentially contribute to premature bolt failure [Engineering]
  - Establish a preventative maintenance task to regularly replace bolts - OEM recommends replacement at 4000 engine hours; the mine has adopted a more conservative 2000 hour replacement interval. [Engineering]
  - Implement a system to capture OEM service bulletins and to track implementation where applicable. [Administrative]
  - Ensure torque wrenches are not utilised if they are outside their calibration dates. [Administrative]
  - Develop a standardised process for inspecting the bolts on daily services. [Administrative]
- OEM and SSE should:
  - Investigate the opportunity to use more suitable bolts and/or more effective securing of steering cylinder pins [Substitution]
  - Review how safety critical information is communicated with end-users and acceptance confirmed [Administrative]

Hardox bar fell closely missing workers

On 23 July 2020, three workers were undertaking a mill reline. The workers were about to complete the last of the lifter bar replacements in the current shutdown.

Without warning, a Hardox wear bar from one of the mill liner plates fell from the top of the mill, narrowly missing the reline crew.

Hardox bar fell closely missing workers

The investigation by the manufacturer found that the interface between the rubber and steel layered structure in lifter bars and shell plates failed, severely reducing their load-bearing capacity.

The interface debonding has been attributed to the lapses in the manufacturing process of the second and third ring of lifter bars and shell plates. It was found that the gauge used for monitoring the time and temperature produced incorrect readings which led to faulty manufacture of the product.

Recommendations

- SSE should:
  - Remove all the reline bars from the suspect batch [Substitution]
  - Review contract for reline bars and include quality performance [Administrative]
  - Audit quality control of the supplier [Administrative]
- OEM should:
  - Contact other customers and notify them of the issue [Administrative]

Blade failure on surface ventilation fan

On 31 July 2020, a failure in the primary fan destroyed all fan blades and left palm-sized fragments within a 15 metre radius of the installation.

The fan cowling and evasé were not damaged by the disintegration of the fan components; the fragments were ejected out of the top of the evasé.

Had personnel been present in the area for daily inspections at this time, they would have been at risk of being struck by projectiles.

Blade failure on surface ventilation fan

Contributing Factors

- Only visual inspections had been undertaken
- Mechanical inspections, testing and maintenance of ventilation fans had not been included in maintenance contractor's scope.
- The pitch of the fan blades was too high, increasing risk of blade fatigue

Recommendations

- SSE should:
  - Reduce pitch of fans from 54 to 43 degrees. [Engineering]
  - Establish mechanical maintenance strategy as per OEM documentation [Administration]
  - Conduct detailed mechanical inspections of all fans onsite [Administration]

Conclusions

General recommendations for mine sites:

- Review contractual arrangements to ensure that quality control measures are incorporated within the supply agreements
- Audit quality control of suppliers including the OEM
- Ensure that plant is inspected and maintained in accordance with OEM requirements

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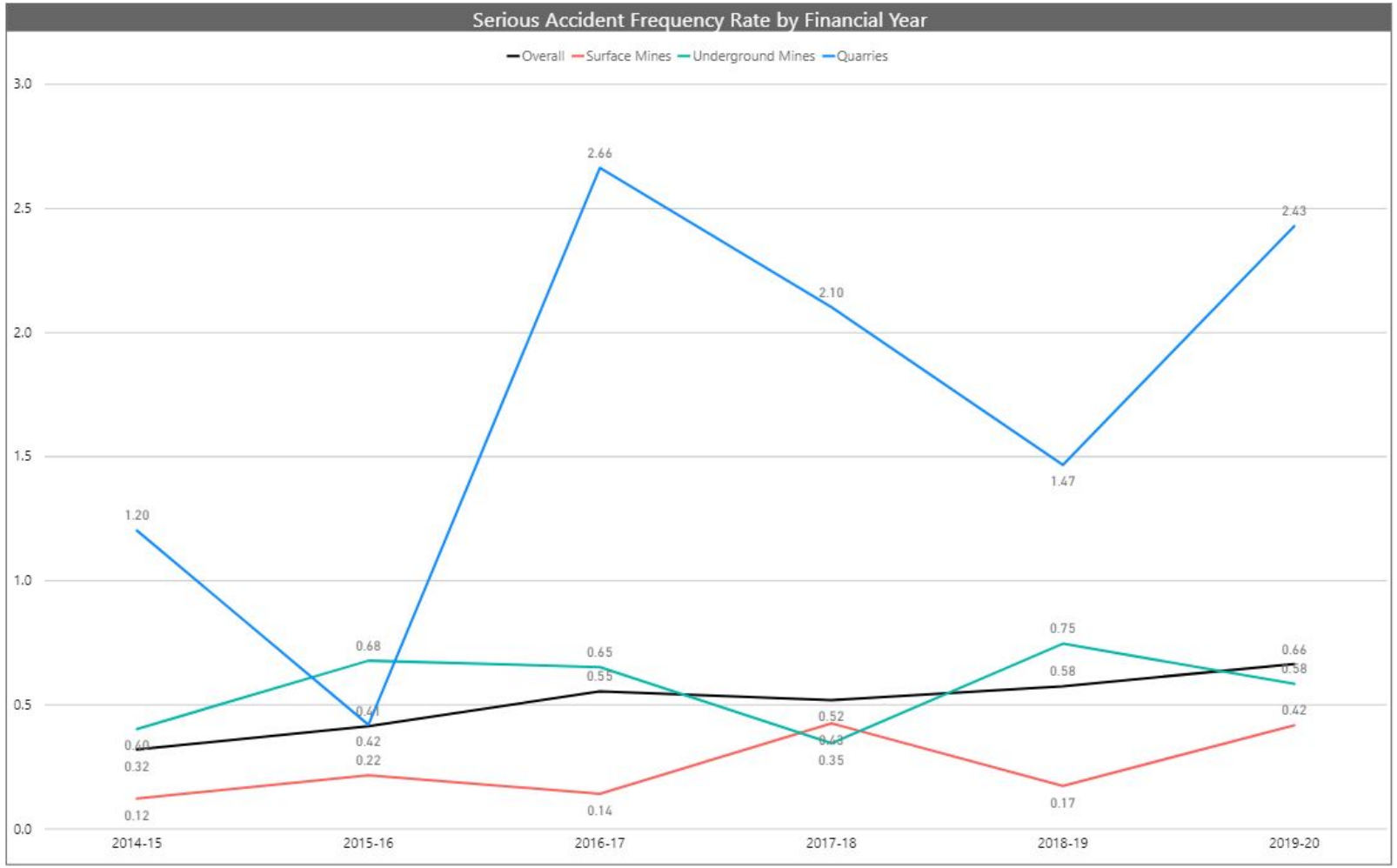

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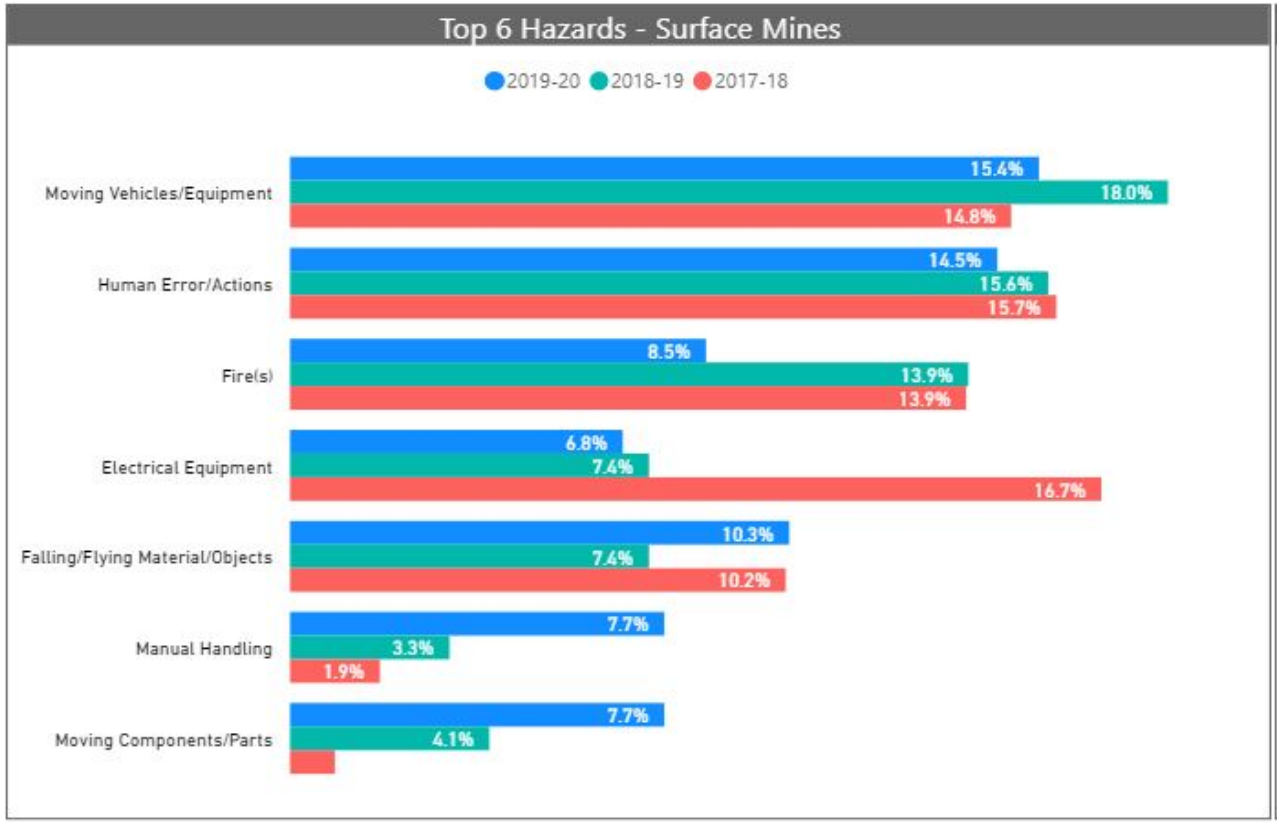

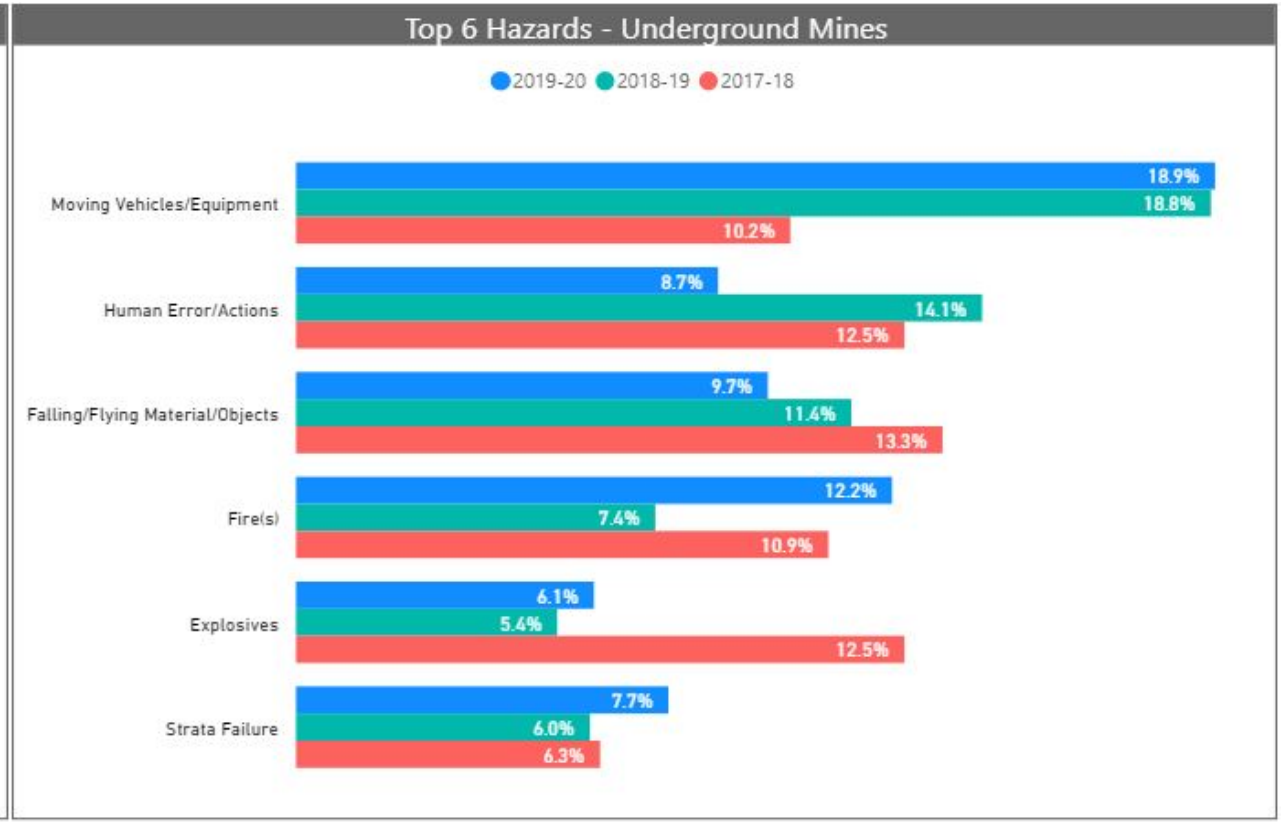

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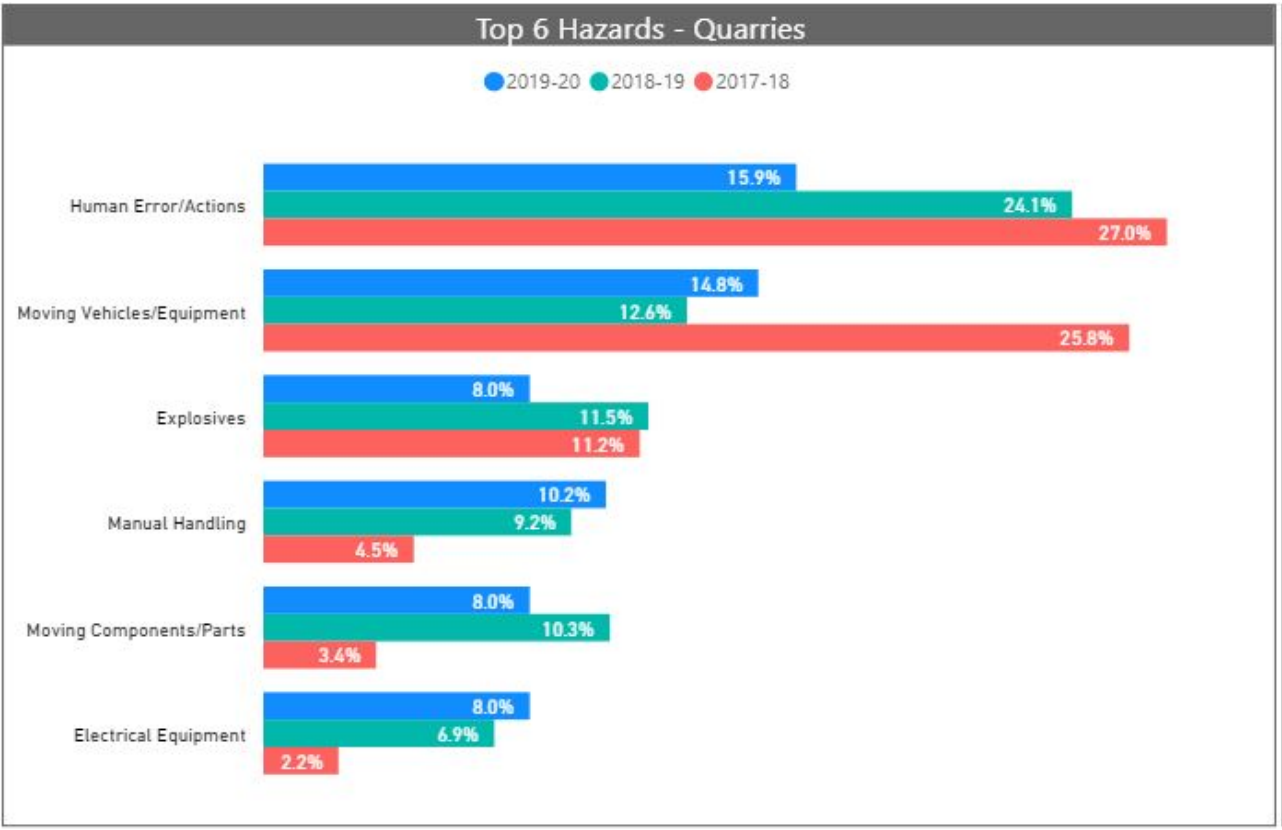
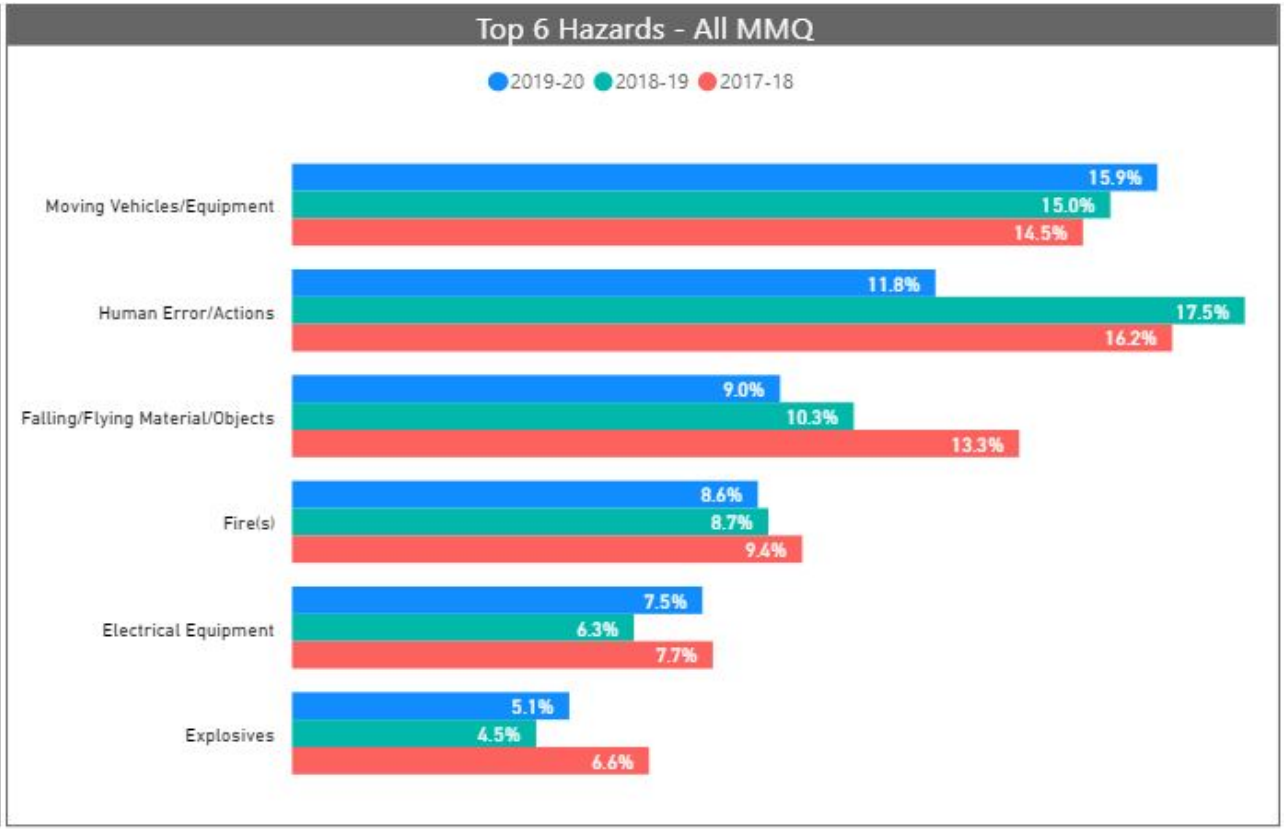




1000 tonne rockfall

On 30 August 2020, an excavator operator had scaled a face and was loading the resultant material into a truck when approximately 1000 tonne of ground fell and partially buried the excavator and the truck.

Displacement was identified in the area a few days earlier by a radar scanner

The operators were uninjured and exited the area without assistance.

1000 tonne rockfall

The excavator operator has inadvertently removed the key-block that triggered the rockfall.

Several factors may have contributed to this rockfall arising either individually or in combination over time:

- Presplit blasting
- The degradation of the effectiveness of the crest pins
- Water ingress

1000 tonne rockfall

Recommendations

- Ensure geotechnical input is included in risk assessments carried out by operators when they are going to perform scaling of this nature. [Administration]
- Catch bunds must be constructed based on information about the kinetic energy and predicted location of impact on a barrier. This information must also be used to determine the optimal capacity, size and location of barriers. [Engineering]
- Use engineering methods to reduce the kinetic energy so that catch bunds are effective. These methods include but are not limited to drape meshing, rock deflectors and engineered edge protection. [Engineering]
- Design the pit presplit so that it does not induce instability.[Engineering]
- Use methods of maintaining rock stability in the pit design that will be remain effective for the life of the mine. [Administration]
- A worker within the management structure is responsible to ensure that slope stability is continually reviewed as per the requirements of the Ground Control Management Plan. [Administration]

Loader rolls 360 degrees and then onto its side.

On 31 August 2020 a loader was stockpiling road base and travelling up the stockpile ramp nearing the top when it veered to the left, tipped over and rolled down the side of the stockpile.

The investigation by the quarry found that the loaded bucket was raised and the loader was articulated.

Loader rolls 360 degrees and then onto its side.

The loader operator had been trained and assessed as being competent and had been operating loaders for over 30 years.

The operator was not wearing the seat belt even though he had signed off on the requirement on two recent occasions. The seat belt was fastened and then sat on so that the reminder indicator and recording system were defeated.

It is more than extremely fortunate that the operator only required three stitches to the back of his head.

Loader rolls 360 degrees and then onto its side.

Recommendations

- Loaders should travel with the bucket low so that good visibility and stability are maintained. [Administration]

- Training and being signed off as being competent should be followed up by periodic observations by supervisors to ensure safe methods of operation and critical safety features are adhered to. [Administration]

Note - All workers have a part to play when they notice unacceptable practices and should be encouraged to speak up. It should be recognised that workers accept different levels of risk.

Drill rod breaks through into active mining level

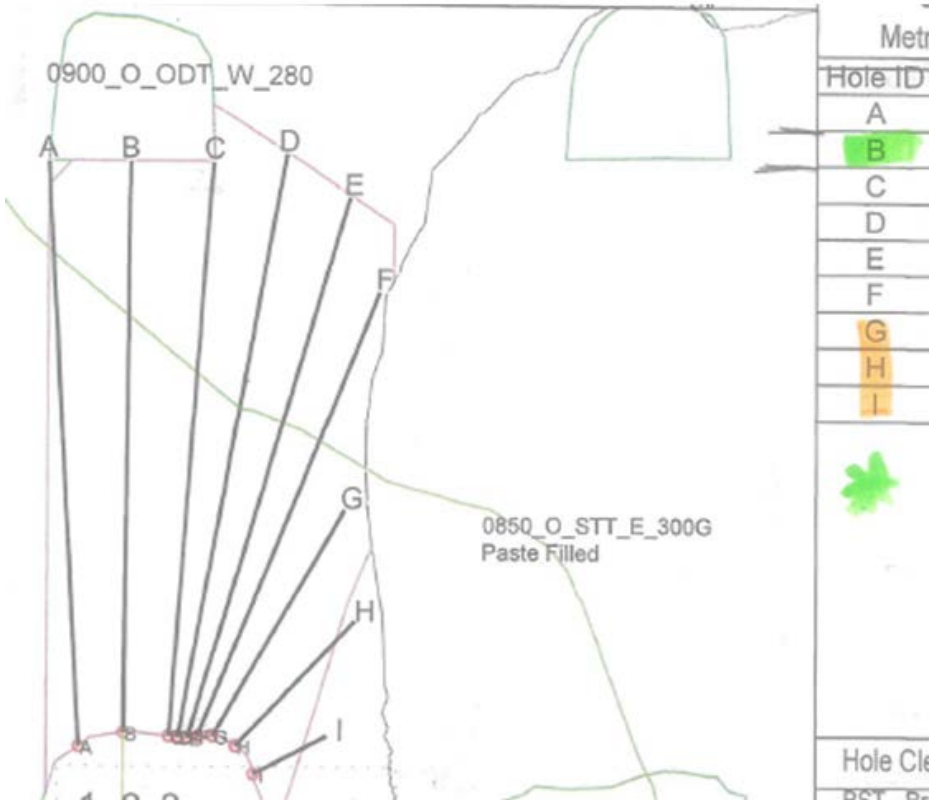
On 26 August 2020 a production uphole was being drilled from one level to an upper level. A truck operator was about to move off when he saw a drill rod break through into the drive 7 metres ahead of his planned travel route.

Drill rod breaks through into active mining level

Mine Technical Services issued a drill plan showing the whole drill pattern, which included breaking through to the upper level. Later the plan was marked up intending to show that only the wall fan holes G, H and I were to be drilled.

The drillers attended the shift prestart meeting but the interaction between the mining on the upper level and the drilling was not raised and the change of plan was missed.

The drillers were working to the drill plan that was not marked up and knew they would break through into the upper level drilling hole B. The drillers thought that the cross shifts had put the barricading in place and did not check it themselves.



Drill rod breaks through into active mining level

Recommendations

- Mine Technical Services to only issue the drill pattern to be drilled. [Administration]
- Interactions between different groups of workers should be flagged and communicated at prestart meetings. [Administration]
- Responsibility for actions to be taken to prevent unintended interactions should be clearly assigned. [Administration]
- The erection and confirmation that barricading is in place is crucial and must be in place even if the drillers do have a correctly marked up plan. [Engineering]
- Barricading should be in place even when there is no planned interaction. [Engineering]

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- Brisbane: (07) 3330 4273

Incident periodical

High Potential Incidents summary

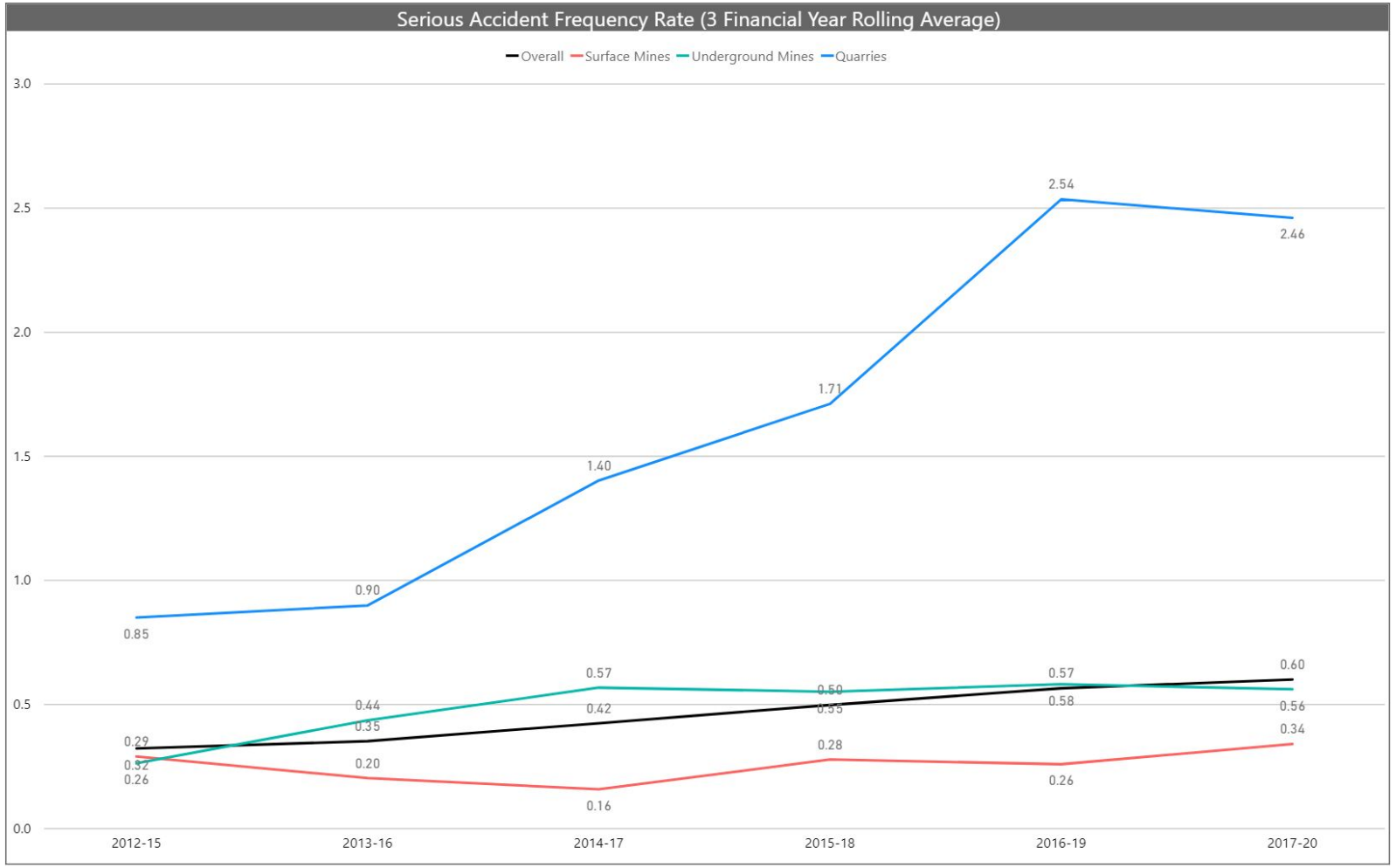
Queensland Mineral Mines & Quarries Inspectorate

September 2020

Mineral Mines & Quarries Inspectorate

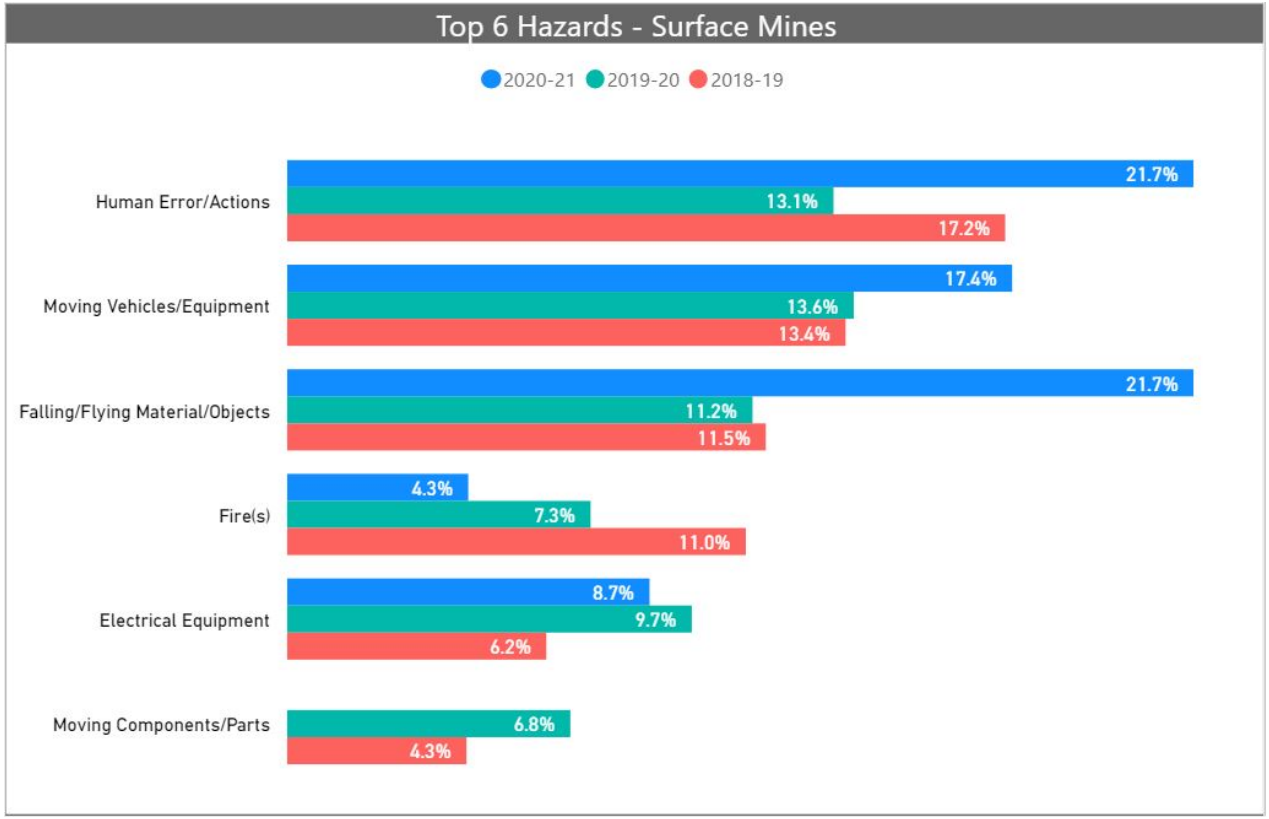
Resources Safety & Health
Queensland

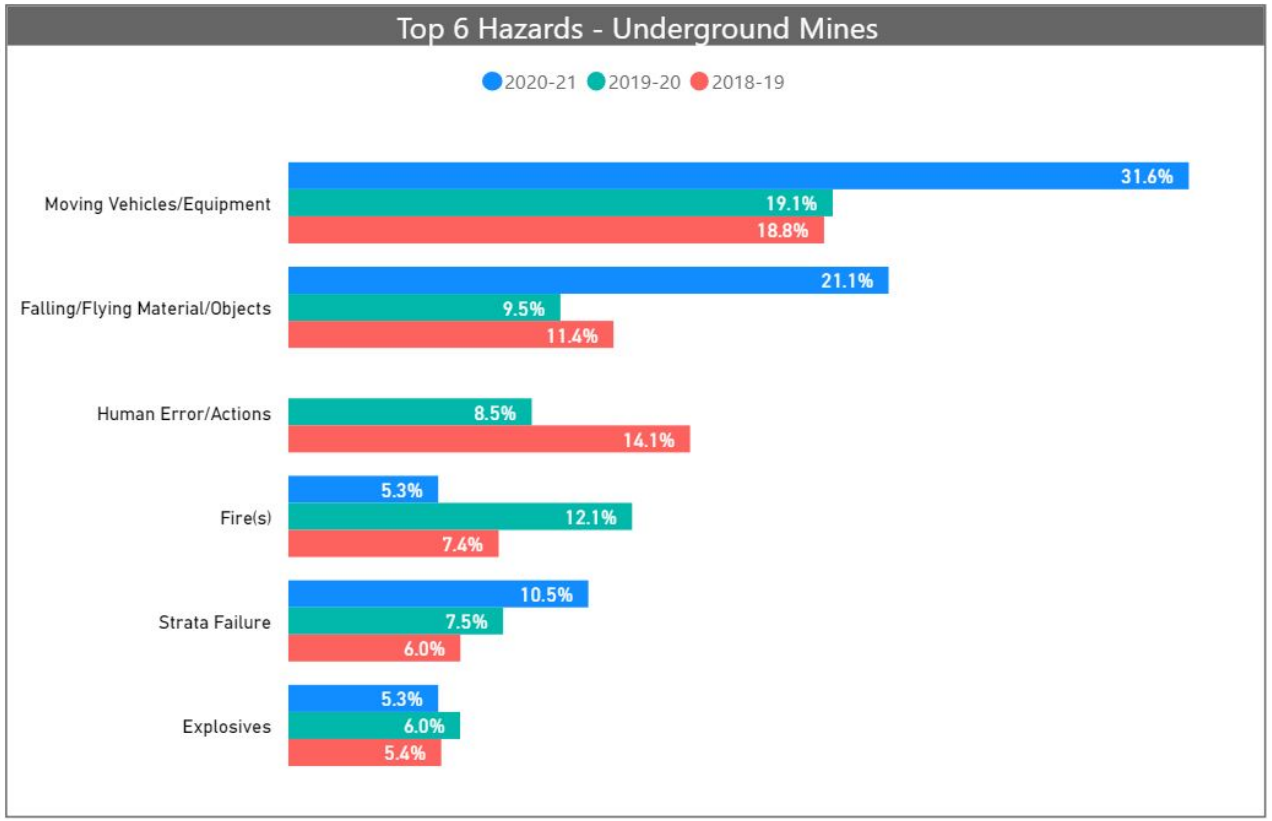
Serious Injury Frequency Rate by industry



Top 6 hazards

These graphs compare annual data of the top 6 hazards involving Serious Injuries by mine type.





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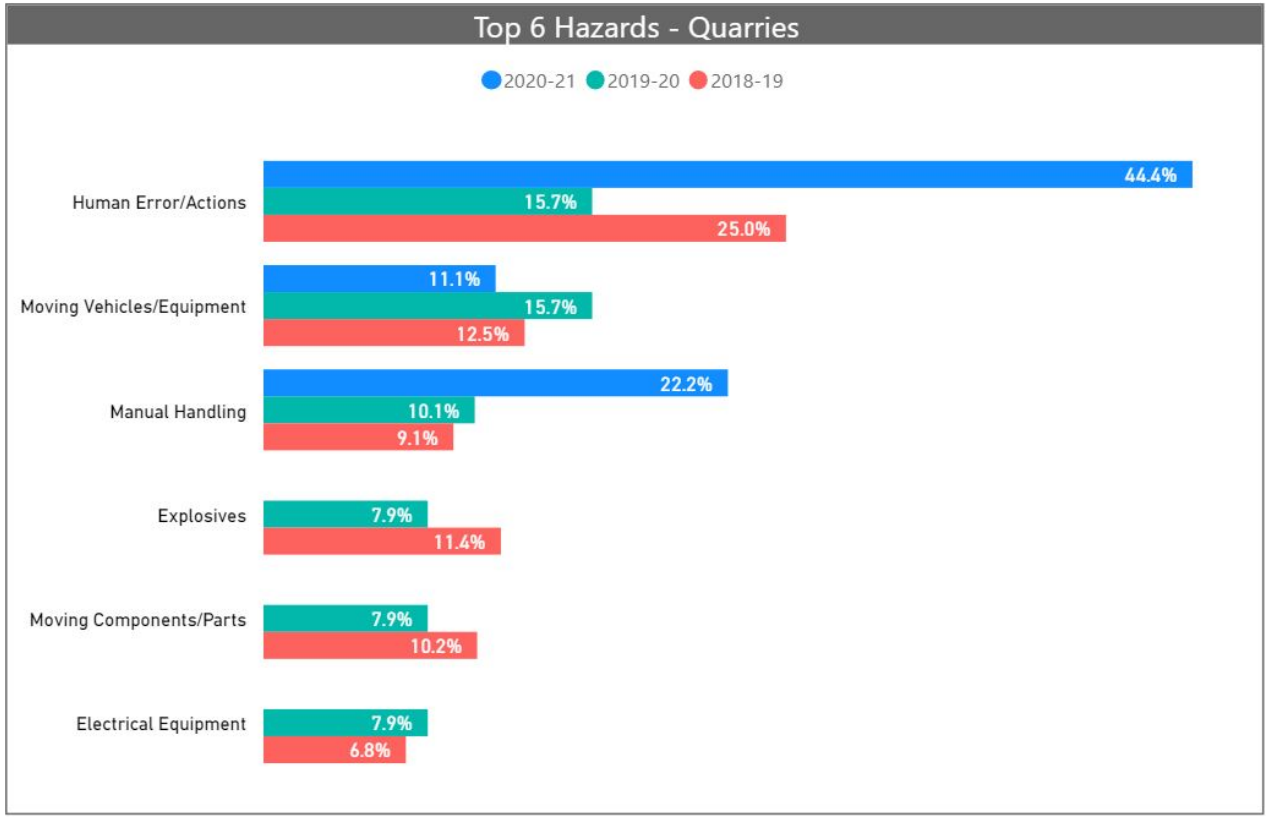
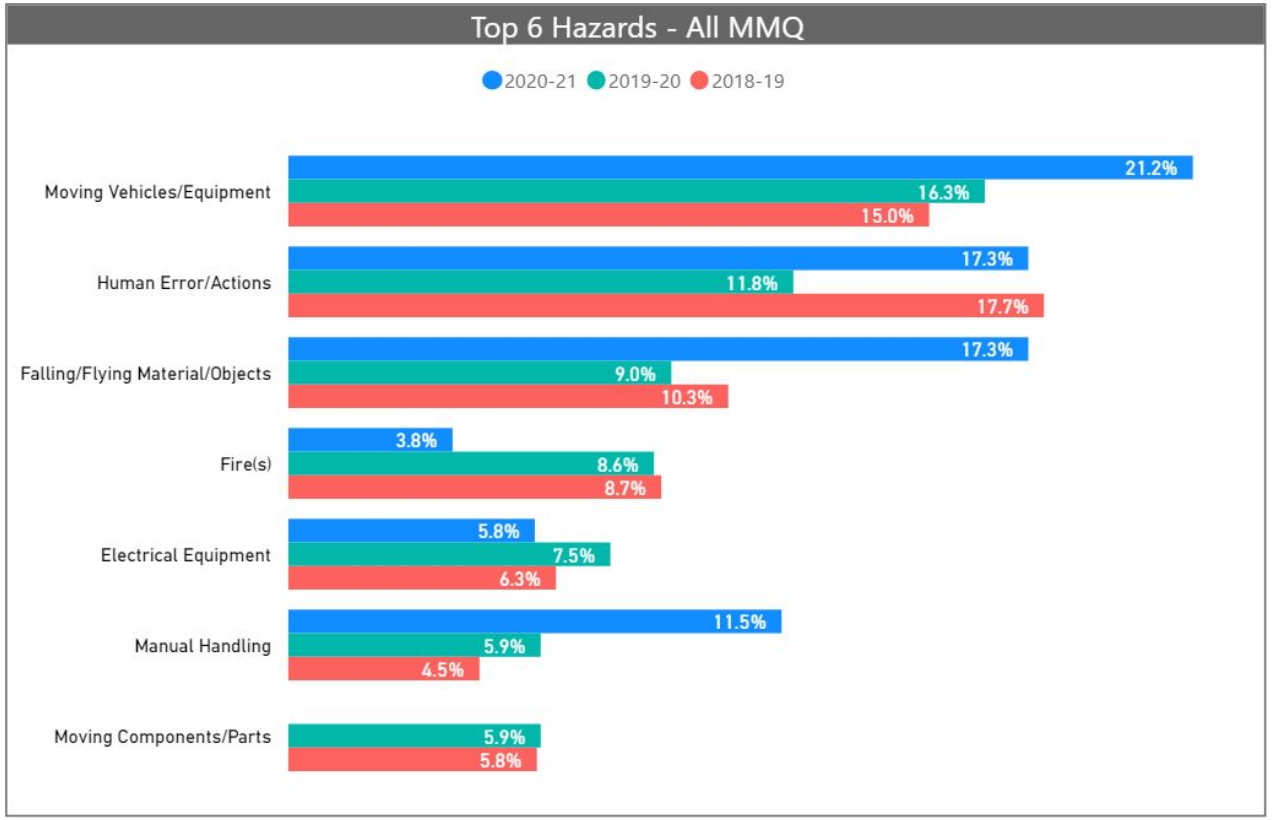




Excavator contacts overhead power line.

On 7 September 2020, an Excavator was travelling towards the exploration core shed area when it struck and severed the11 kV overhead power line (OHL) The operator knew to stay in the cab which had been part of his training, The electrician also advised the operator to stay in the cab until Ergon confirmed that the power was isolated.

The operator was not injured.

Conductor entangled around excavator boom

Excavator contacts overhead power line.

Causes

The excavator was being trammed with the boom in a raised position resulting in a maximum height of approximately 8.5 metres from ground level.

The clearance under the OHL was 6.5 metres. Even if the excavator was being trammed in its travel position the height would be approximately 4.5 metres and would still encroach the exclusion zone of the OHL.

The excavator operator was familiar with the travel route and knew the power line was there. On this occasion the operator simply forgot about it.

The supervisor knew that the excavator operator was familiar with the area and so he went ahead to prepare the area for the intended task.

No warning signs were in place on the approach to the OHL.

Excavator contacts overhead power line.

Recommendations

Redesign travel ways or restrict travel to ensure alternate travel route is taken so that mobile plant does not have to travel under the OHL. [Elimination]

Preventing mobile plant from travelling under the OHL by bunding it off along its entire length as the mine have now done. [Separation]

Use the recently issued Safety Bulletin # 188 Mobile Plant Contacting Energised Overhead Powerlines to assist with the identification of the hazards associated with your OHLs and implementing the most effective preventative and mitigating controls. The link is https://www.dnrme.qld.gov.au/business/mining/safety-and-health/alerts-and-bulletins/mines-safety/mobile-plant-contacting-energised-overhead-powerlines

A process to monitor control effectiveness to prevent inadvertent contact with OHLs must be implemented that includes how the monitoring is undertaken and who is responsible. [Administration]

Create an emergency response plan specifically for plant contacting an OHL [Administration]

Dozer roll over

On 15 September 2020, a dozer operator was creating a track on a the ridge of a sand dune when the dozer slid sideways and veered to the right hand side. The dozer was still stable at this point and only rolled over when the operator tried to reverse back up onto the ridge. The operator was wearing the seat belt and was not injured.

Dozer roll over

Ridge of sand dune

The technique for creating a track is to staddle the ridge and keep the blade height so that sufficient material comes around both ends of the blade to form a window on either side. This will ensure that there is a sound bed for the tracks to run on.

Dozer roll over

Causes.

The blade was raised too high, consequently no windrow was being created on the right hand side and there was no material to support the track on this side.

After the dozer slid sideways and was stable at that point, the operator did not use the radio to ask for advice from their supervisor.

To rectify the situation the dozer should have been driven forwards down the slope.

The operator had not created a track by straddling a sand dune ridge before.

There was a reliance on workers to speak up if an allocated task is beyond their capability

The Job Safety Analysis did not document why the height of the blade was critical

Dozer rollover

Recommendations

The workers carrying out the job safety analysis should include an operator familiar with the task. [Administration]

Effective controls must be in place to prevent uncontrolled movements associated with operating mobile plant on steep gradients. [Administration]

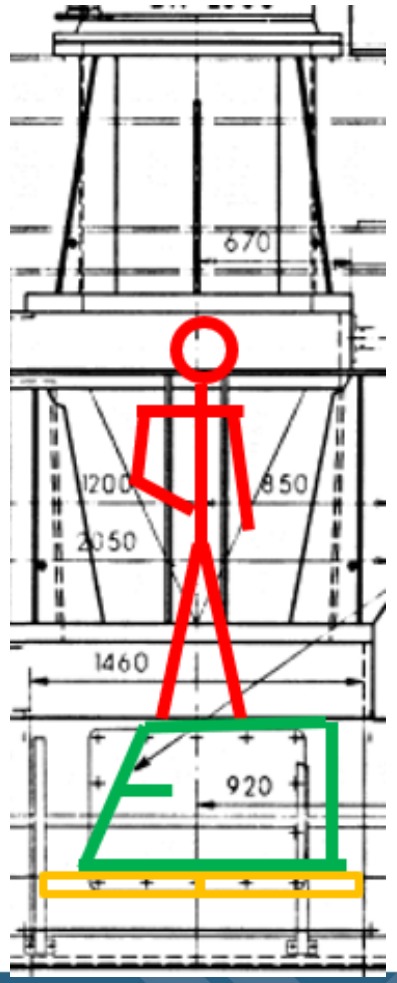
Operator training should be reviewed to ensure they understand that when faced with a difficult situation they should contact their supervisors for advice. [Administration]

The supervisor should check and record that operators are competent and confident they can implement the agreed controls. [Administration]

Worker struck by product falling inside filter plant discharge chamber

On 27 September 2020, a worker entered the bottom of a filter plant discharge chamber and was hosing down a build up of material. The worker was standing on a step up platform when product from the top of the chamber fell on him causing him to fall off the platform. The height of the platform was <1 metre.

The worker sustained a compound fracture to their right leg.



Cross sectional illustration of discharge chamber.

Worker struck by product falling inside filter plant discharge chamber

Causes

Every scheduled 24 hours the hung up product was cleaned off the inside of the chamber from the top prior to entering the chamber at the bottom. However It had become accepted practice not clean down the chamber from the top prior to entering the chamber at the bottom during breakdowns because it was assumed that the product build up would be minimal.

The Standard Work Instruction (SWI) related to cleaning the chamber from the top before entering the chamber at the bottom and was not followed. The SWI required a SLAM (Stop, Look, Analyze, and Manage) to be completed but was not found after the incident.

Inside the chamber after the incident

Worker struck by product falling inside filter plant discharge chamber

Recommendations

As proposed by the mine, eliminate the hazard by installing: [Elimination]

- Non-stick lining at the top
- An automated system to clean the chamber which will minimise the occasions that workers have to enter it.

- Review all routine tasks or practices that have evolved over time and become accepted without being risk assessed. [Administration]
- Explain to workers why it is necessary to use on-the-job risk assessment tools even when carrying out repetitive tasks. Consider doing risk assessment with workers not familiar with the task to identify accepted risks. [Administration]

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Incident periodical

High Potential Incidents summary

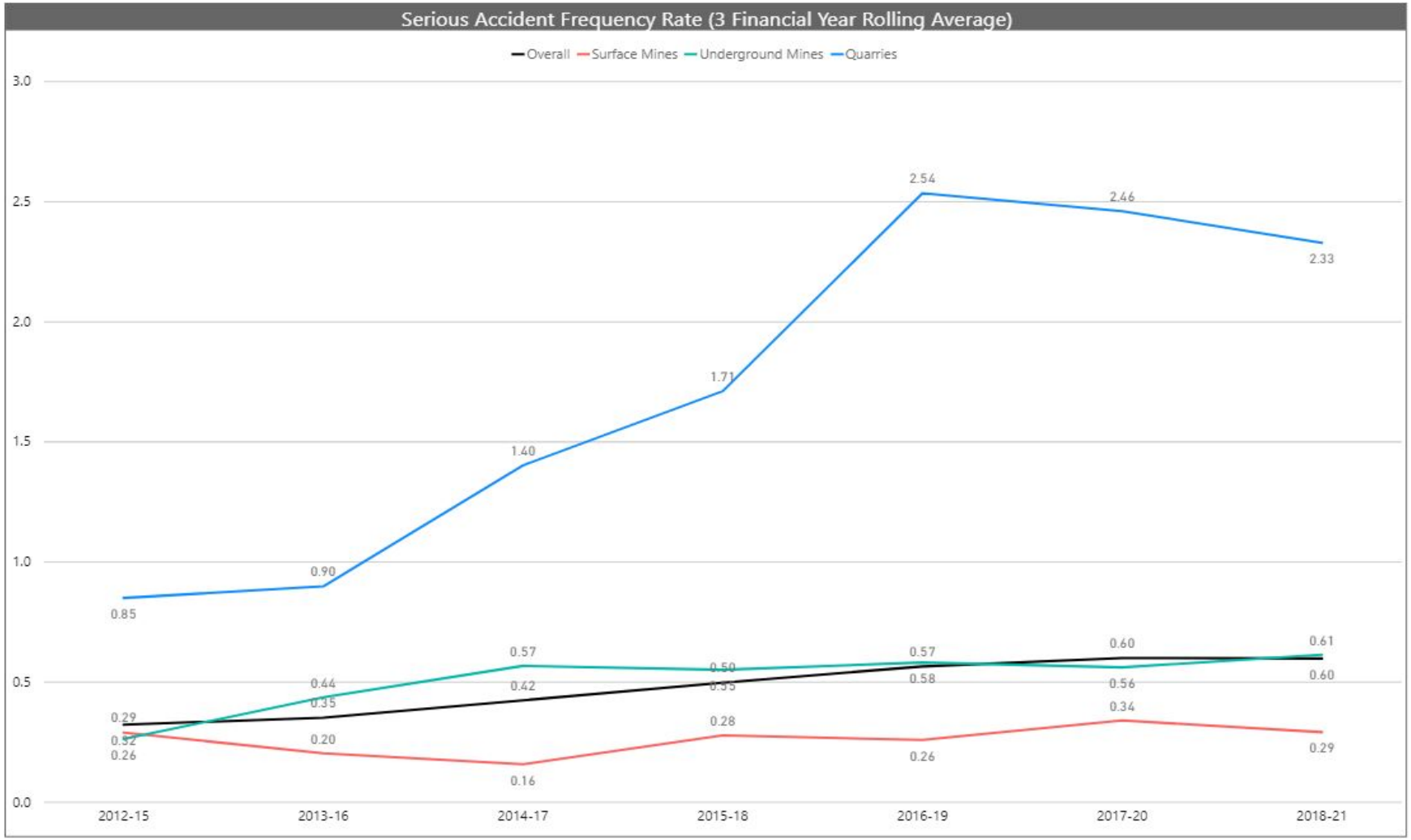
Queensland Mineral Mines & Quarries Inspectorate

October 2020

Mineral Mines & Quarries Inspectorate

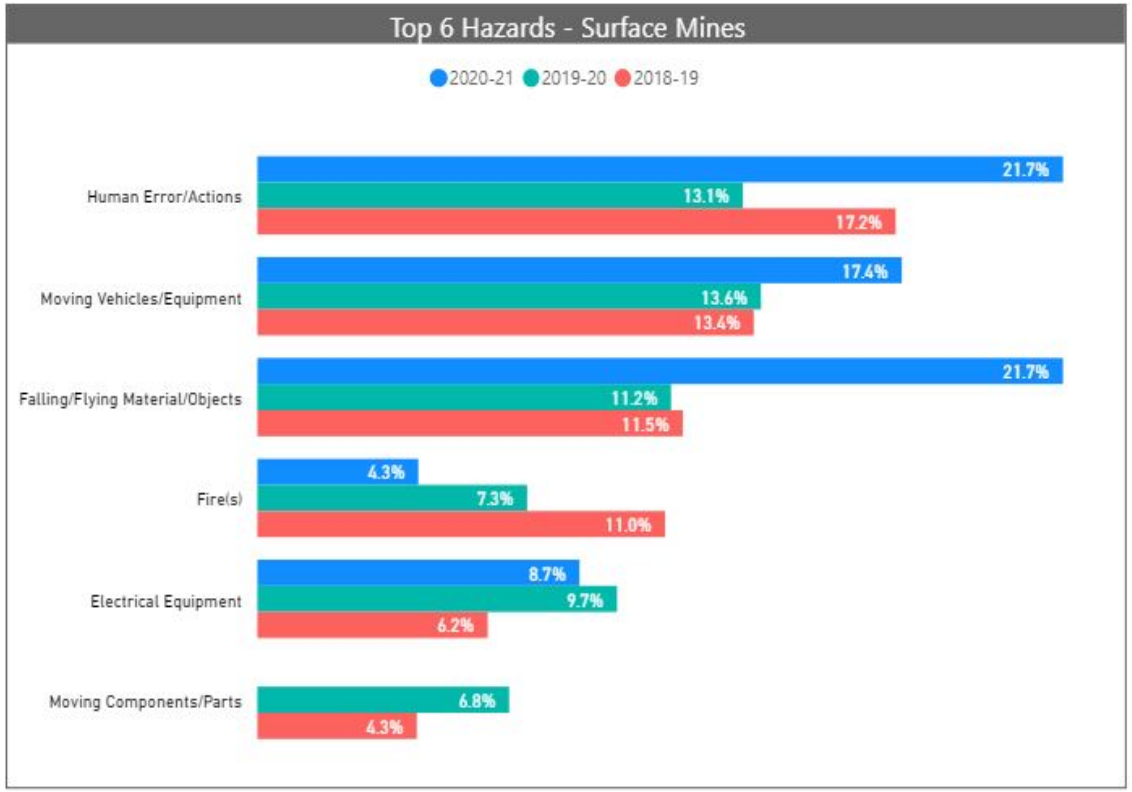
Resources Safety & Health
Queensland

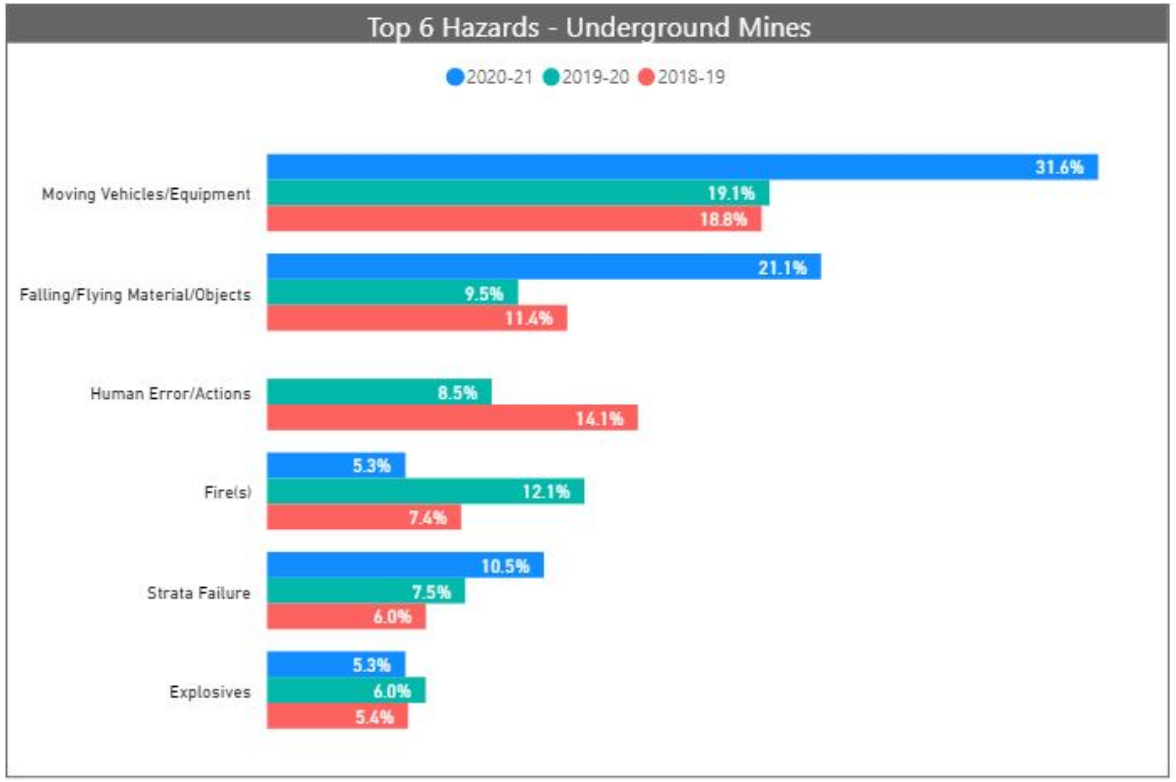
Serious Injury Frequency Rate by industry



Top 6 hazards

These graphs compare annual data of the top 6 hazards involving Serious Injuries by mine type.





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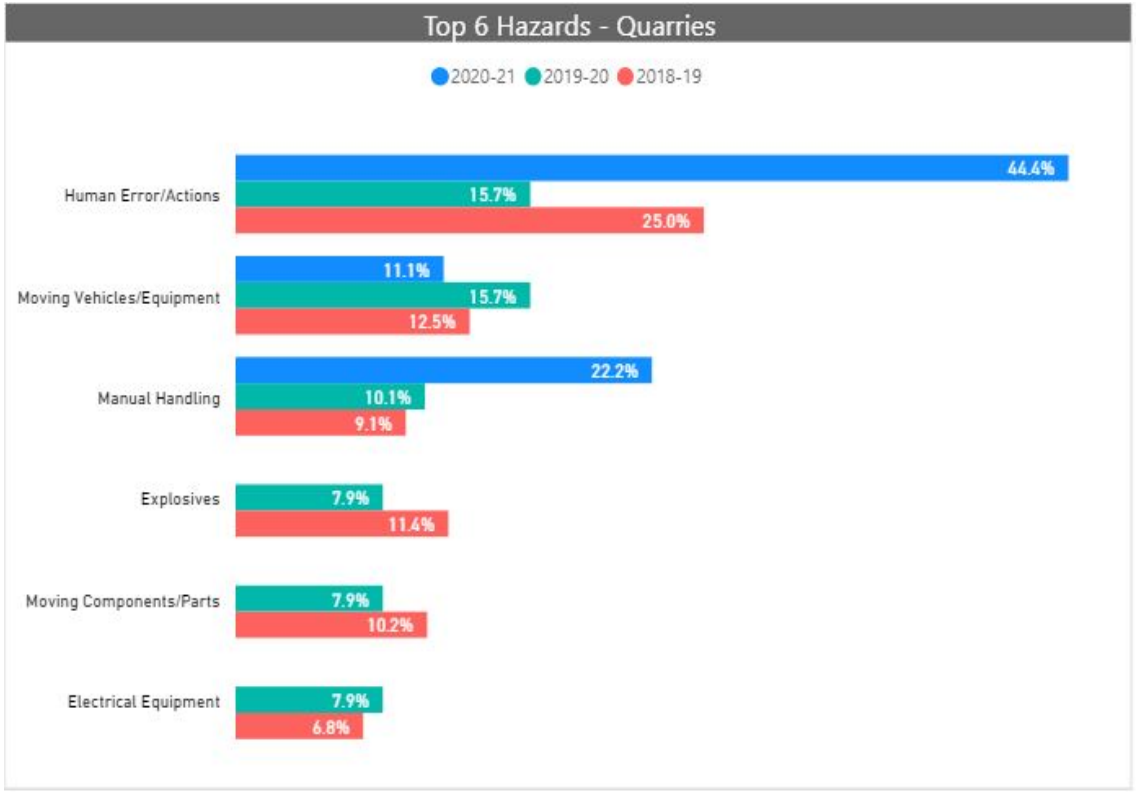

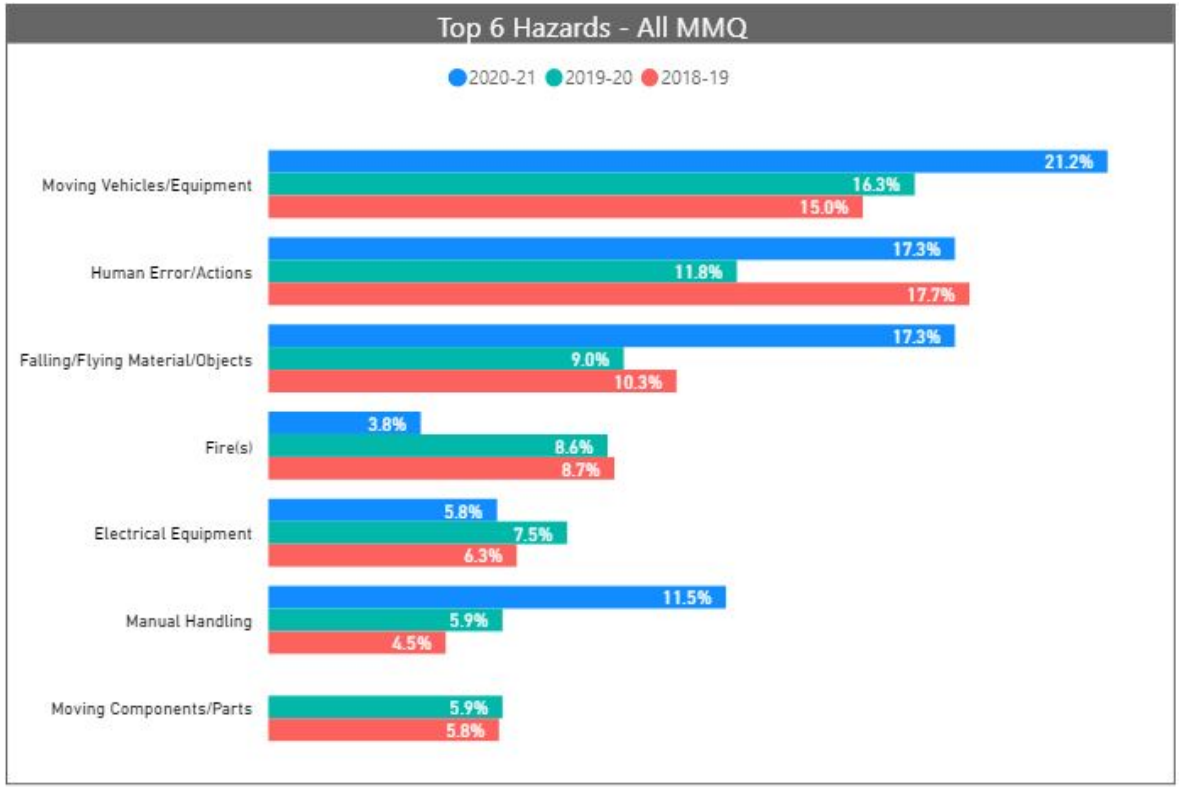

Water at high pressure strikes worker

On 5 October 2020, a tank cleaning head was being used to clean internal pipework when it was ejected through the open hatch. The worker was struck by the high pressure water at 540 bar (7800 psi) from their knee up to their neck causing:

- Minor abrasions/lacerations and swelling to knee
- Pressure marks on neck area.

Cleaning head

Water at high pressure strikes worker

Causes

There were two options for preventing the cleaning head from being ejected from the 1.5 m pipe but neither of them were in place:

- An anti-withdrawal device fitted into the cover which only allows the hose to be fed through it.
- Fitting the cover back in such a way that the remaining gap does not allow it to escape.

The JSA was signed off requiring the cover be put back, this did not happen.

The JSA stated that the reason for putting the cover back on was to prevent flying scale, not to prevent the cleaning head from escaping.

The cleaning head turned around inside the pipe on its own accord as there was no device fitted to prevent this occurring. This turn around is thought to be a rare event,

One of the Life Saving Rules was to use the High Pressure Water Jetting Checklist. This checklist was not used.

Water at high pressure strikes worker.

JSAs must identify all the foreseeable hazards at each job step, even if they are rare events, so that effective controls can be in place prior to a job commencing.

Recommendations

- The ejection of the high pressure cleaning head through the open hatch must be considered as part of the JSA development. [Administration]
- Hatches and other protective barriers must be in place prior to high pressure cleaning tasks. [Separation]
- The mine management structure must provide for a worker to be appointed who has the responsibilities and competencies to oversee contractor tasks. [Administration]
- Original equipment manufacturer, where possible, should be involved in risk assessments to ensure that all hazards have been identified especially when the plant is of a specialist nature. [Administration]

Inrush of water and tailings

On 27 October 2020, a crosscut was blasted underground and after a while water started to seep out from the base of the drive. The photo on the right shows the water flowing out from the shear zone after it had diminished. The flow increased to 50 l/s and included tailings from the adjacent old underground workings.

The inrush then went along the level and down to the charged decline face 60 m below. The water then backed up to the development level.

No workers were in the decline at the time but this does not detract from the seriousness of the incident.

Inrush of water and tailings.

Causes

Water was encountered previously during the development of the ore drive 20 m above. The water source was believed to be from old workings 50 m below that had been flooded and had a hydraulic head pressure which was able to flow up through a shear zone.

This shear zone was mapped from information from the old workings development and the new development drive 20 m above, but was not added to the design plan of the level below.

The existence of the shear zone was not shared widely with the mining teams by the geology section. As a consequence no probe drilling was identified to check for water during the design or at a meeting prior to taking the development cut.

Access to geological information was restricted to local drives on the server limiting access between geology and engineering.

Inrush of water and tailings.

Recommendations

- A current old workings management plan based upon sound geological data and historical records must be available and communicated to all workers who have been identified as needing to know. Plans must include all variations and critical information on the old workings characteristics. [Administration]
- Controlled drainage of old workings should be undertaken prior to working in proximity. [Elimination]
- Working in proximity to old workings must not be undertaken unless it is known that there is no head of water that can impact on current mining operations. [Administration]
- Changes to a design plan must be communicated widely (where possible face to face) to all workers who have been identified as needing to know. [Administration]

For further reading a link is provided to the report on the Gretley Mine Disaster in 1996 where four workers drowned - https://www.resourcesregulator.nsw.gov.au/__data/assets/pdf_file/0004/87160/Gretley-Inquiry-summary.pdf

Road train trailer rollover

On 20 October 2020, at the leach pad, the driver of the road train tried to empty the rear trailer first but approximately 25 tonne of material was left in it. The driver then emptied the lead trailer. When the road train then travelled down the exit ramp, it became out of control and the rear trailer went off the side of the haul road dragging the lead trailer with it.

The driver was not injured.

Road train trailer rollover

Causes.

- Emptying the lead trailer first which was against acknowledged procedure.
- Travelling down the ramp with an empty lead trailer and material inside the rear trailer.
- Load distribution lowering braking effectiveness.

Other potential causes.

- Travelling too fast for the loaded condition.
- In a hurry as it was the last load of the day.
- Fatigue – Allowed to work in excess of the rostered timetable.

Road train trailer rollover.

Recommendations

- Truck driver training and verification of competencies must include instructions on how to dump and why the rear trailer should be dumped first. [Administration]
- Truck drivers should adhere to routine cycle times at all times. Truck driver must be warned against extra loads at end shifts that compromise the routine cycle times. [Administration]
- The mines management structure must provide for a worker to be appointed who has the responsibilities and competencies to oversee contractor tasks. [Administration]

Note - The cameras on mobile plant should be downloaded on a schedule basis. This will ensure that the camera is working and recording the required data.

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Incident periodical

High Potential Incidents summary

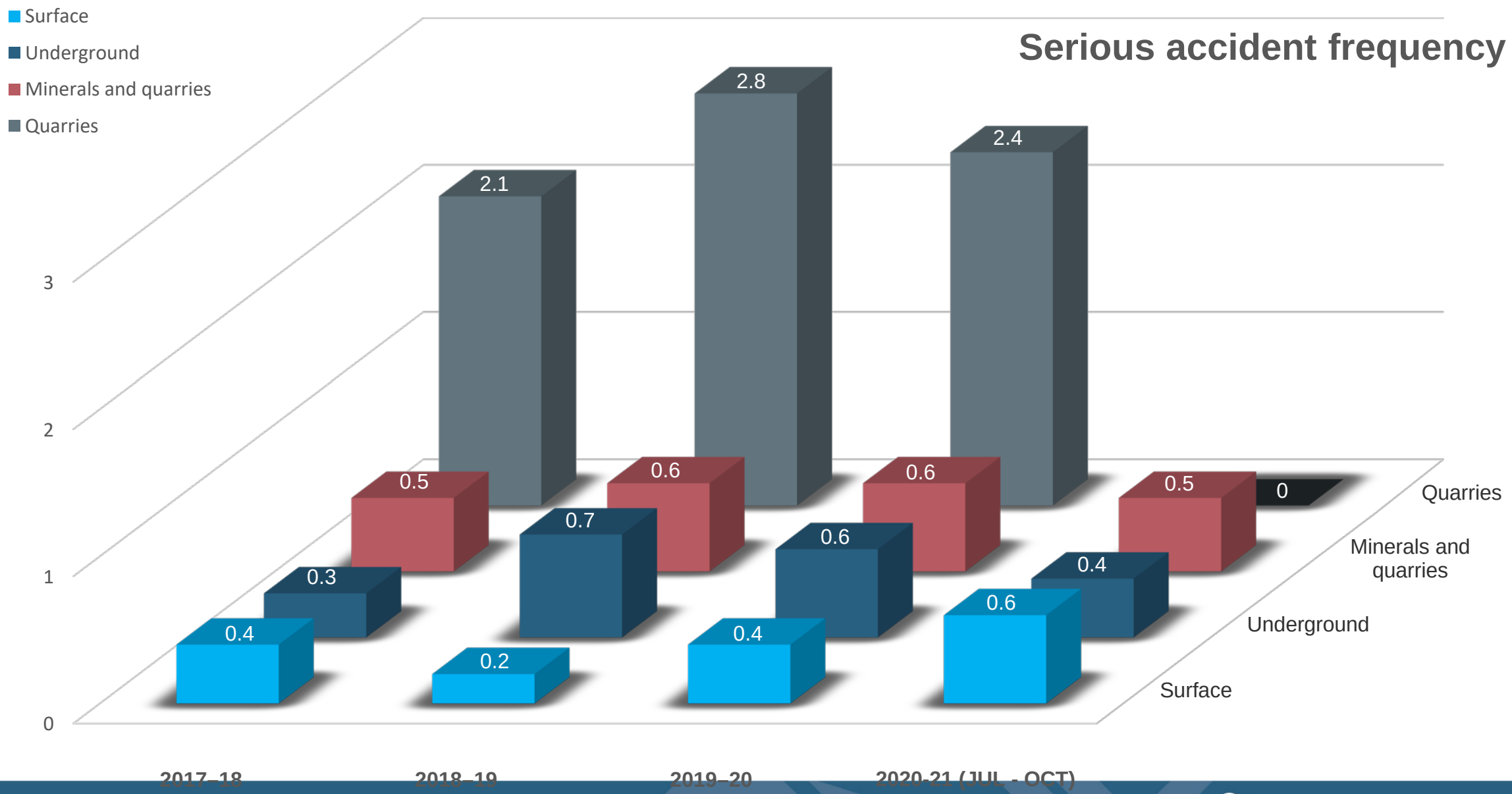
Queensland Mineral Mines & Quarries Inspectorate

November 2020

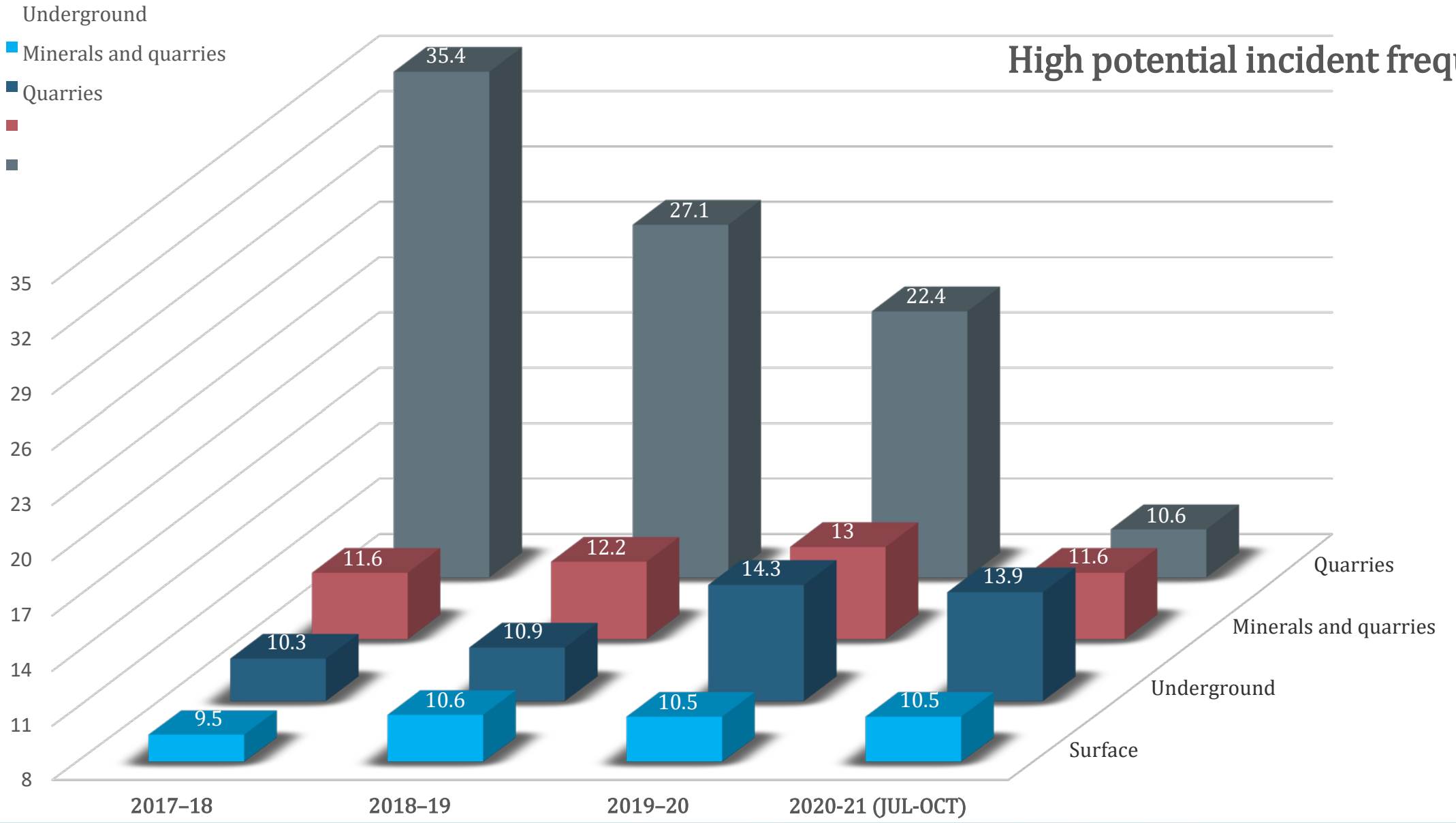
Mineral Mines & Quarries Inspectorate

Resources Safety & Health
Queensland

Serious accident frequency rate

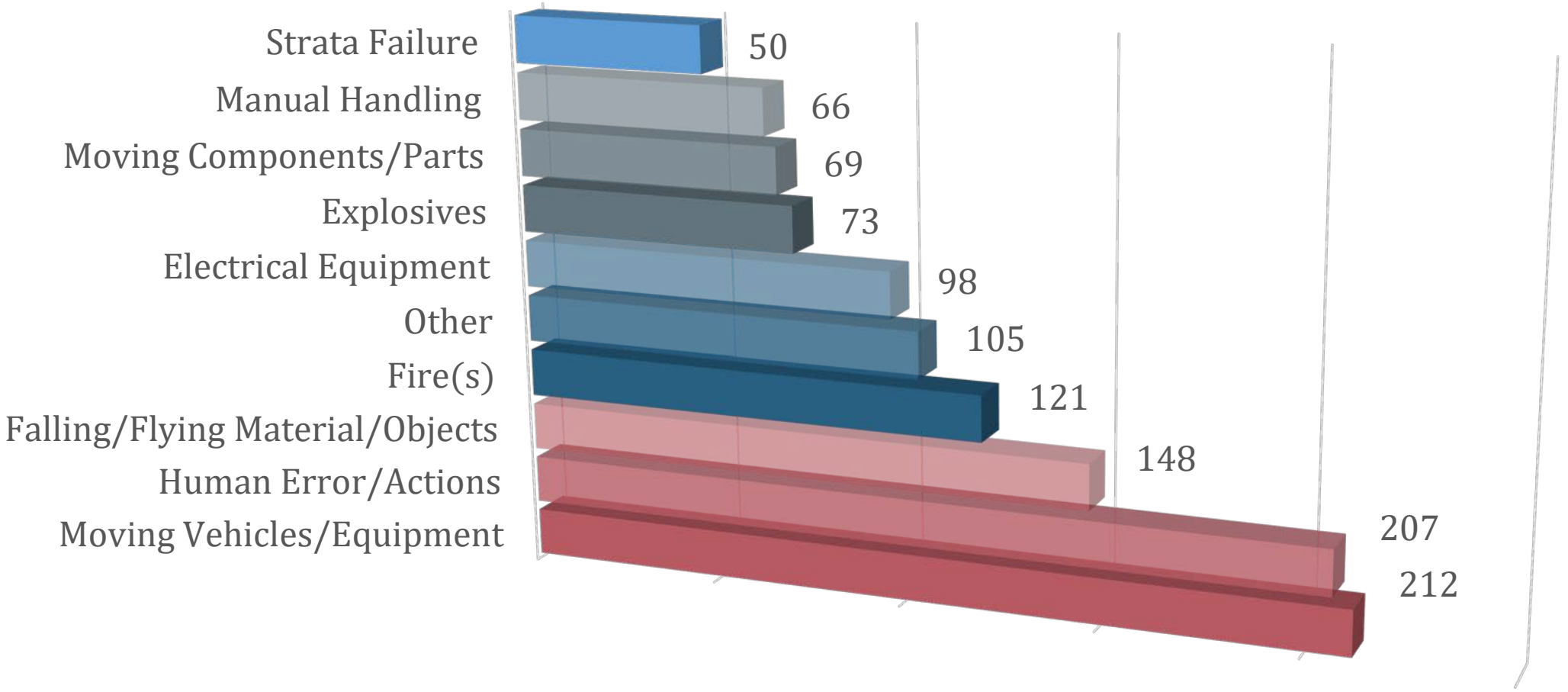


High potential incident frequency rate



Top 10 hazards

These graphs compare annual data of the top 10 hazards involving all mineral mine types. **2017-2020 FY**



Top 10 hazards

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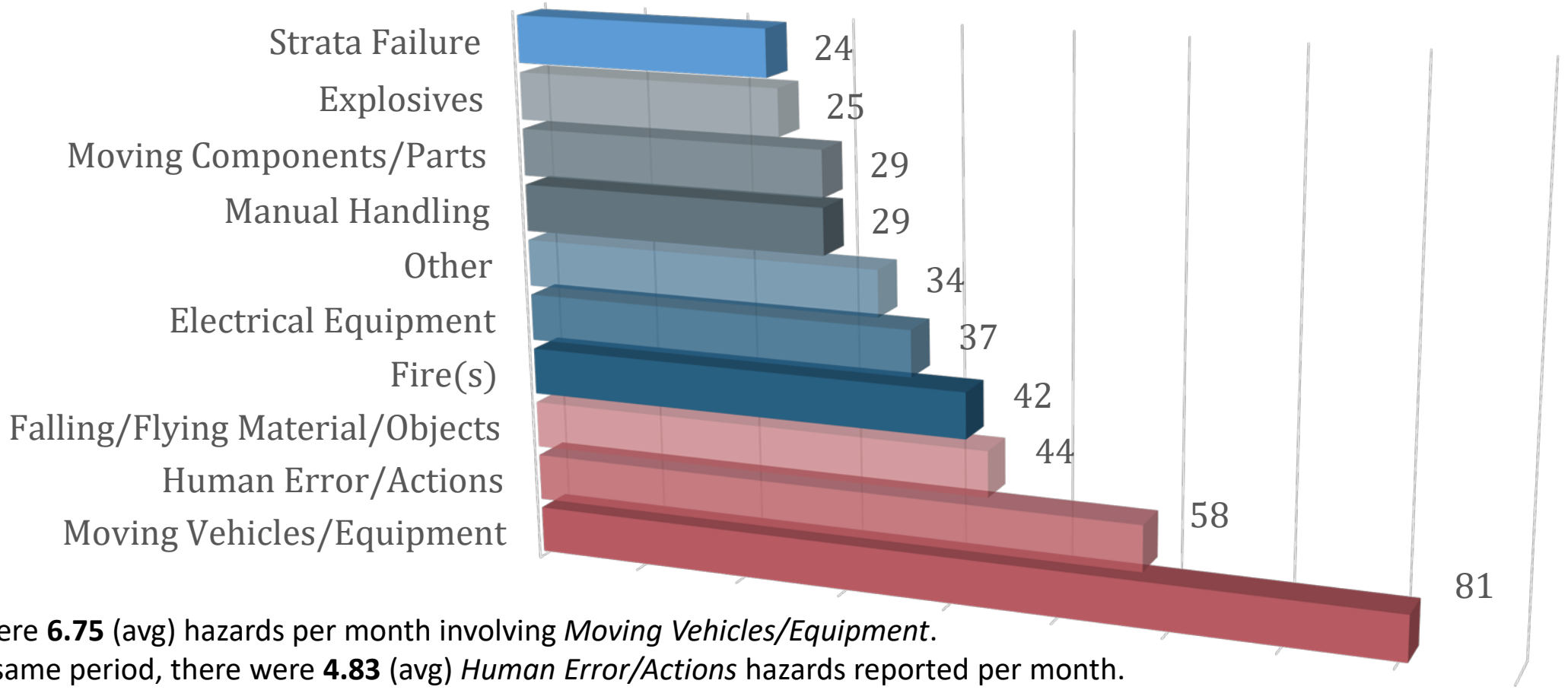
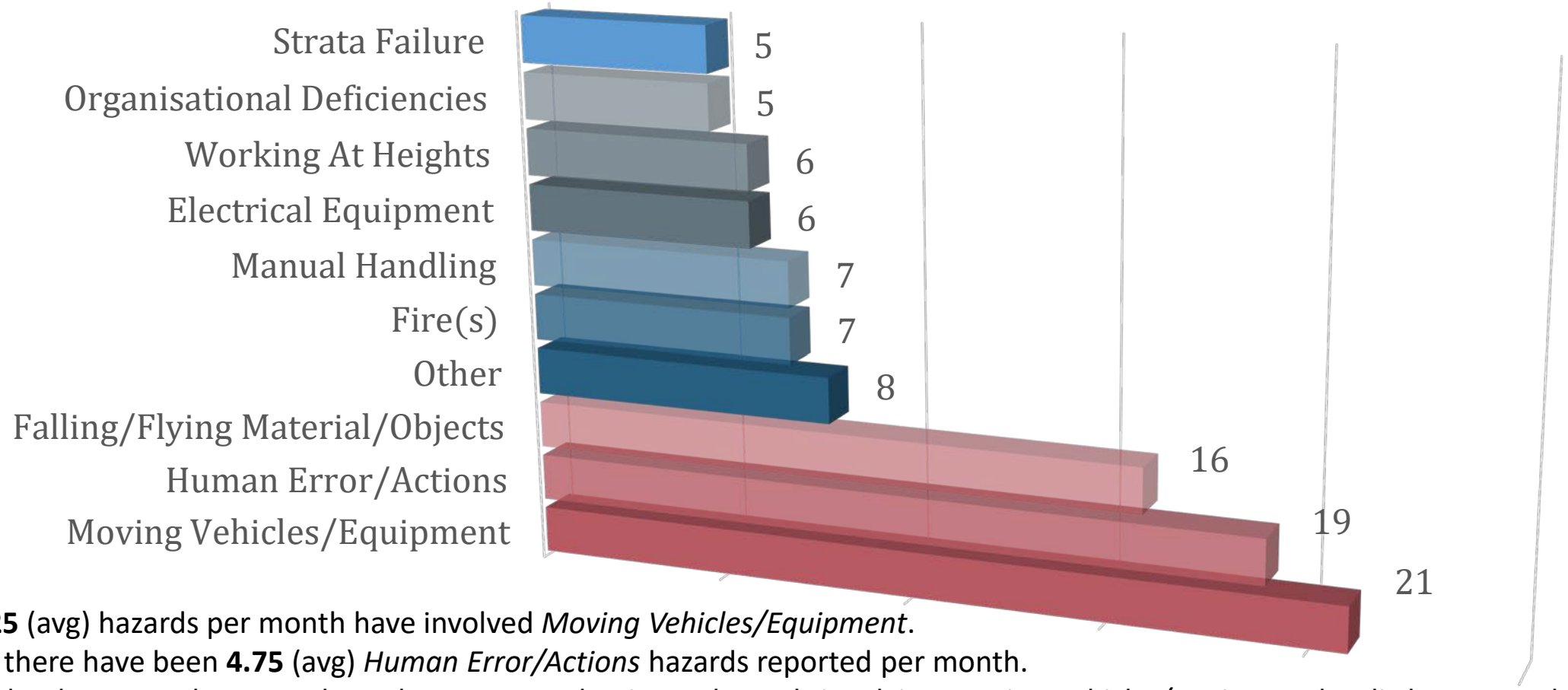


- There were **6.75** (avg) hazards per month involving *Moving Vehicles/Equipment*.
- For the same period, there were **4.83** (avg) *Human Error/Actions* hazards reported per month.

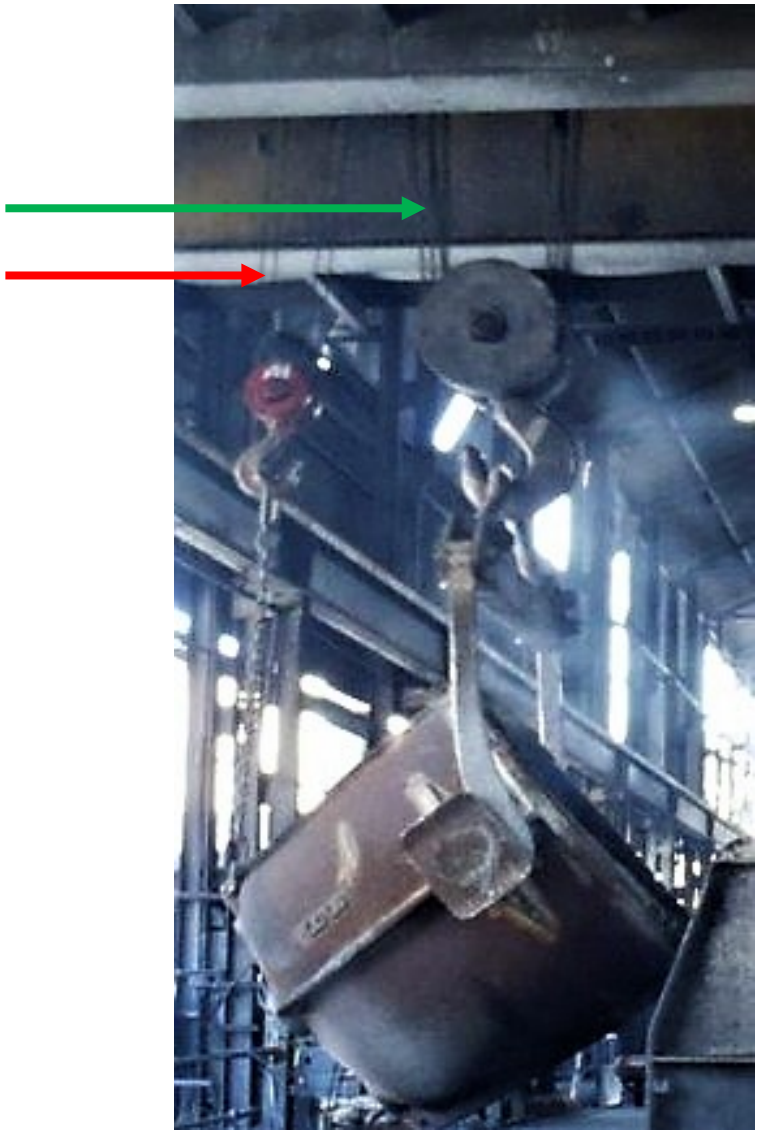
Top 10 hazards

These graphs compare data of the top 10 hazards involving all mineral mine types from: **July 2020 – October 2020**



- So far **5.25** (avg) hazards per month have involved *Moving Vehicles/Equipment*.
- Likewise, there have been **4.75** (avg) *Human Error/Actions* hazards reported per month.
- Compared to last year, these numbers show some reduction to hazards involving *Moving Vehicles/Equipment* but little to no reduction with *Human Error/Actions* hazards.

Wire rope failure.



On 13 November 2020, the 10 mm diameter auxiliary rope on a overhead gantry crane in a hot metal plant failed during a lift. The auxiliary hoist tilts the pot and allows it to return its vertical position. The main hoist rope raises and lowers the pot.

There were no injuries because the incident occurred within an exclusion zone.

Wire rope failure.

Causes

Multiple broken wires were identified after the incident, as seen in the picture.

The monthly inspections did not identify the broken wires which met the discard criteria. The discard criteria was three or more adjacent broken wires in a strand.

412	Drum
413	Wire rope* (mm)

The monthly inspection template:

- Details only one item referencing the rope which calls for the diameter of the rope to be measured and recorded
- Does not have an item requiring to report on broken wires

Wire rope failure.

Recommendations

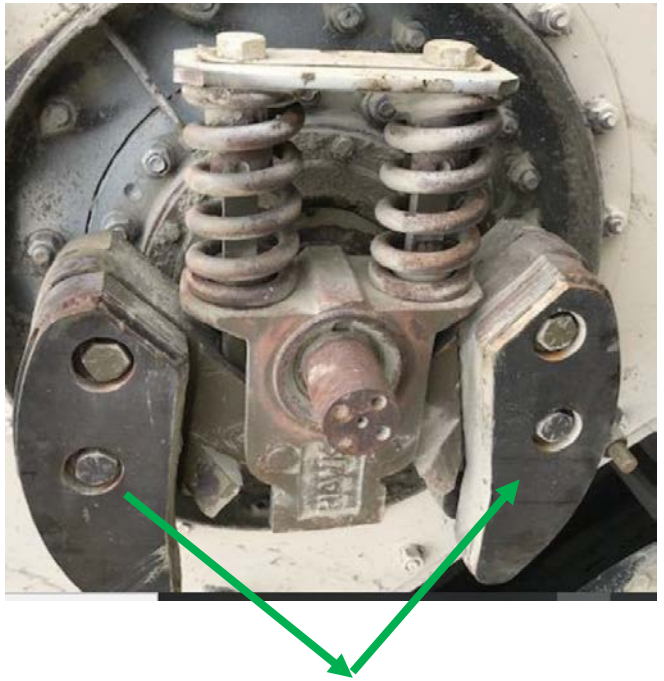
- The outcome of an inspection should be to identify whether the rope is still serviceable or should be discarded. [Administration]
- The Monthly Inspection template should provide task outcomes that support whether the rope is still serviceable or should be discarded. [Administration]
- Train and assess workers who are carrying out prestarts and monthly Inspections so that wire ropes are identified as being fit for further use or should be discarded. [Administration]
- Provide pictures of the rope discard criteria at appropriate workplaces for general information. [Administration]

Failure of screen counterweight attachment.

On 10 November 2020, the attachment of a counterweight, which is part of the Spring Controlled Mechanism, failed on the drive side of a triple deck vibrating screen. One of the two bob weights, on the drive side of the screen, broke away from the pin holding it onto the hub attached to the screen shaft

The bob weight weighed approximately 5 kg and went through the counterweight guard.

There were no injuries.



The two bob weights in place on the non-drive side

Failure of screen counterweight attachment.

Causes

It was known that during the time of the previous ownership before 2005, that there had been failures of the attachment of the bob weights to the hub mounted on the shaft. Subsequently an updated design was introduced.

The problem had been that the castings were uneven and the bob weights were not opening an equal distance.

The screen involved in this incident was manufactured in 1998 and had been in storage up until this recent installation.

Note: After 1999 the screens were fitted with fixed counterweights fitted directly onto the shaft.

Failure of screen counterweight attachment.

Recommendations

- After purchasing second hand plant, mines and quarries should make contact with the original equipment manufacturer to obtain the instructions manuals and information about any design changes. [Administration]

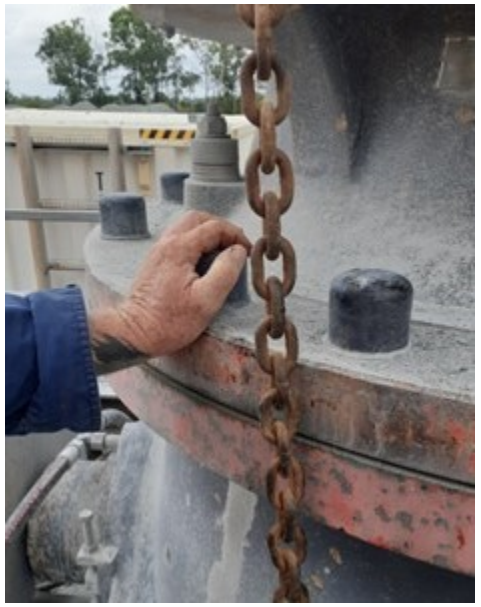
The current manufacturer has stated that they are not aware of any screens now operating with bob weights attached using the original design.

- Nevertheless owners or users of any screens manufactured before 1999 by Hawk Machinery Pty Ltd and fitted with Spring Controlled Mechanisms should contact them if they do not know whether or not the screen is fitted with the upgraded design. [Administration]
- Until the status of the design is known and the upgraded design is installed, an effective exclusion zone should be put in place while the screen is operating. [Separation]

Hand struck by lifting chain

On 20 November 2020, a cone crusher was about to be lifted onto a truck by an excavator in crane mode. As the load was taken up by the four legged chain slings, one of the chain legs trapped the worker's hand against a bolt on the crusher.

The worker received soft tissue injuries to their thumb.



This is a static re-enactment

Hand struck by lifting chain

Causes

The injured worker had their hand on the cone crusher in anticipation that it would swing once the load was freely suspended.

The injured worker was giving directions to the excavator operator and had not been trained or assessed to perform the role of a dogger.

The excavator operator was trained and assessed to operate the excavator but this worker was also the supervisor.

Hand struck by lifting chain.

Recommendations

- A tag line should be attached to loads prior to becoming lifted to prevent it swinging or if it requires guidance when being lowered onto a specific location. [Engineering]
- Workers giving directions to excavator operators, when they are lifting a load, must be trained and assessed as doggers. [Administration]
- Operators of excavators, which are used in crane mode, must be trained and assessed to demonstrate their competency in that role. [Administration]
- Operators of excavators in crane mode should not also be the supervisor at the same time. [Administration]

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Incident periodical

High Potential Incidents & Serious Accident summary

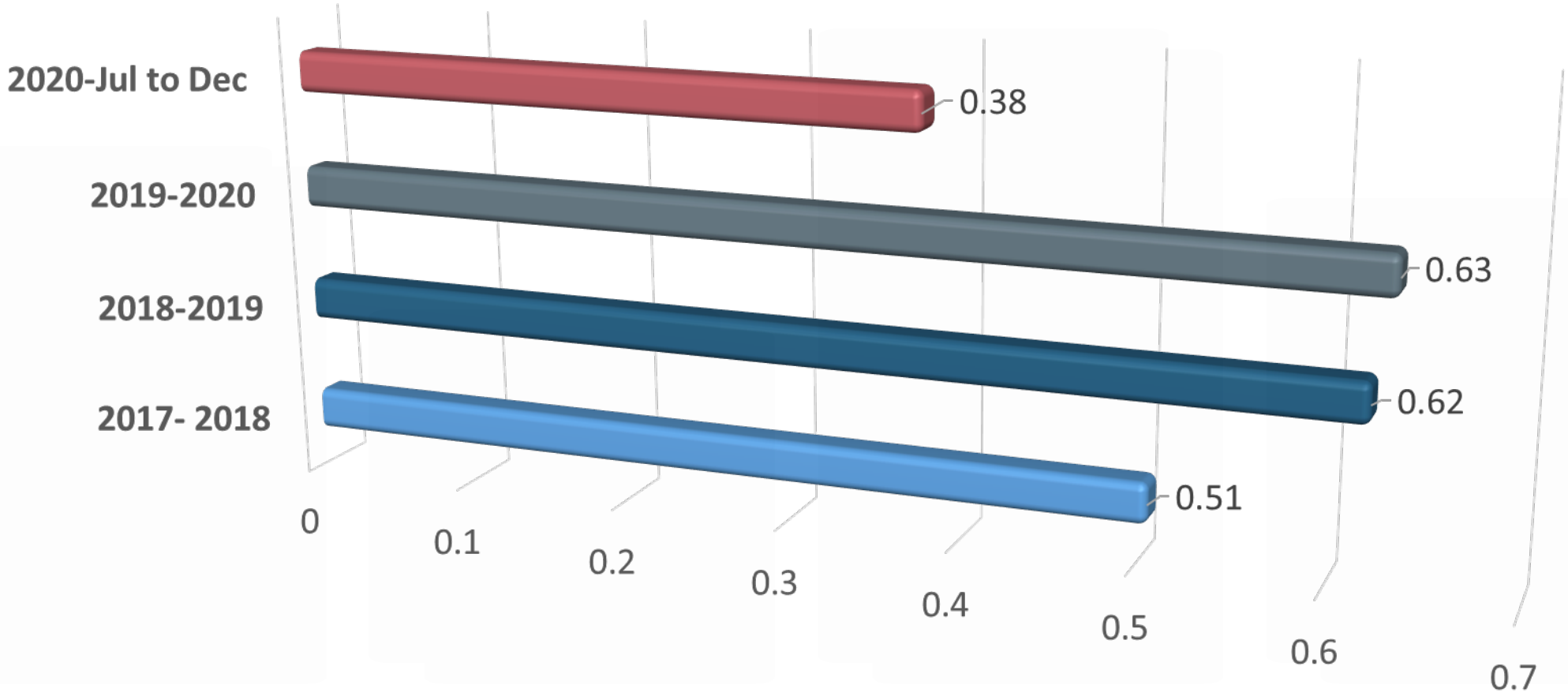
Queensland Mineral Mines & Quarries Inspectorate

December 2020

Mineral Mines & Quarries Inspectorate

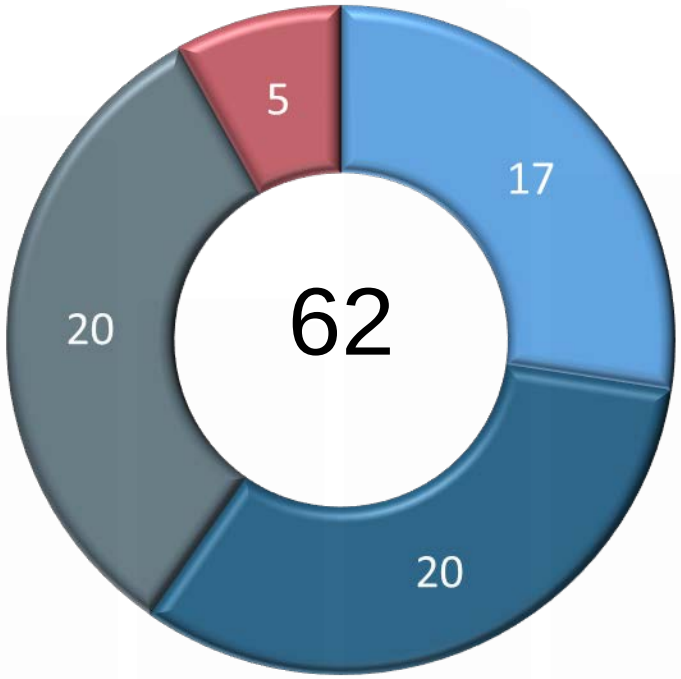
Resources Safety & Health
Queensland

Serious Accident Frequency Rate



Serious Accidents and High Potential Incidents

Number of Serious Accidents



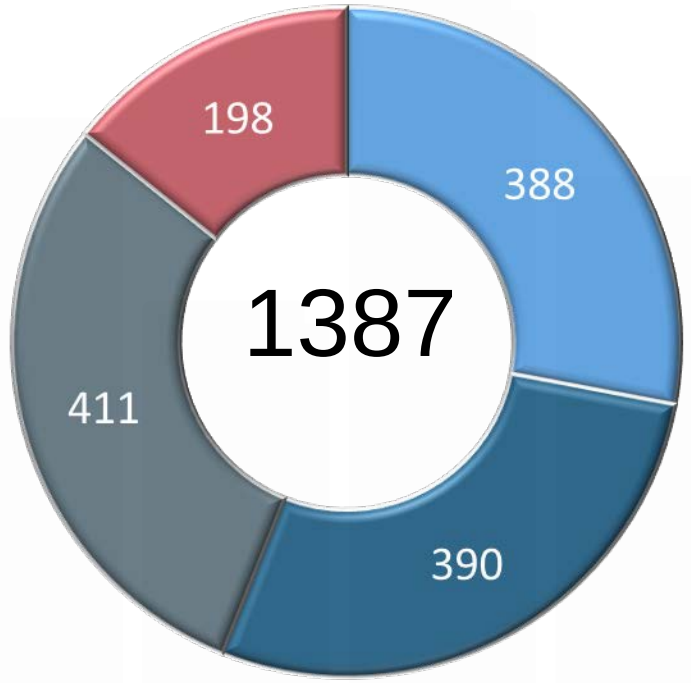
2020- Jul to Dec

2019-2020

2018-2019

2017-2018

Number of High Potential Incidents



High Potential Incidents for December 2020

For the month of December 2020 there were 35 high potential incidents.

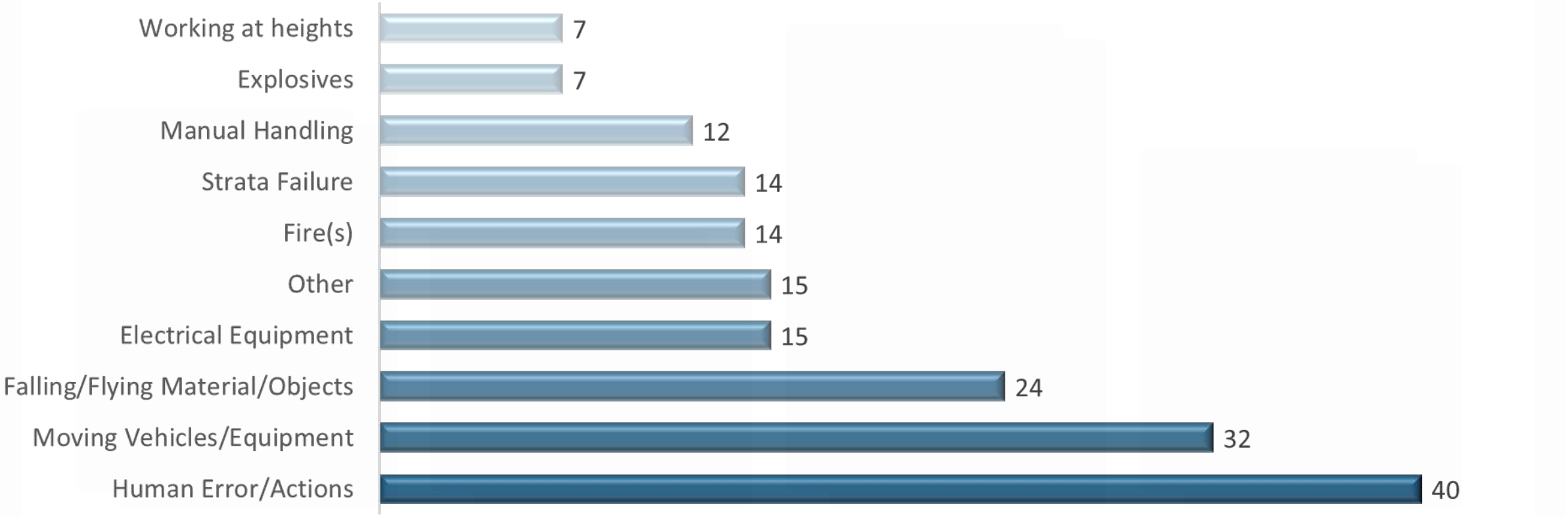
The most common reported contributors were operator, truck and fire

Serious Accidents for December 2020

There was one serious accident for December

Rock Fall, one person struck by rock while carrying out bombing of hung up draw point

Top ten hazards 1st July 2020 to 22nd February 2021



Truck and trailer reversed into a skip which was pushed into the wall of the laboratory.

On 9 December 2020, a truck and trailer  reversed out from under a silo after loading. As the truck and trailer was reversing it pushed a skip into the laboratory wall, damaging the wall and tripping the power. The silo load out operator alerted the driver to stop.

A worker who was inside the laboratory and on break moved away from the wall and was not injured.

Truck and trailer reversed into a skip which was pushed into the wall of the laboratory.

Causes

On arrival at the quarry the truck driver tared off but failed to communicate with the office or sales despatch and drove straight under the silo to load.

The arrival of the truck was unexpected as it was several days late.

Without communicating with anyone the truck driver began to reverse out because of maintenance activity on the road past the drive through exit.

There was no alternative traffic plan as it had not been foreseen that silo load out and the maintenance activities would occur at the same time.

Truck and trailer reversed into a skip which was pushed into the wall of the laboratory.

Recommendations

- Signage to require truck drivers to communicate with the office at the weighbridge on arrival even if they have a current induction. [Administrative]
- Traffic management plans should identify activities that will have an impact on the normal traffic flow around the site and changes/controls required to manage changed traffic flow. [Administrative]
- Alternative travel routes should be put in place and communicated to drivers on arrival at the quarry. [Engineering]
- Consider controlling entry to the mine by installing a boom gate that can only be opened by a valid swipe card or an authorised worker. When there is a short term change to the traffic flow, the gate can then only be raised by an authorised worker who would communicate the change. [Engineering]
- Consider moving infrastructure to relieve the congested areas. [Engineering]

Mobile elevating work platform operator pinned between steel beam and safety bar.

On 11 December 2020, a mobile elevating work platform (MEWP) operator was manoeuvring the work platform over a handrail and under an overhead steel beam. The operator became pinned between the beam and the safety bar causing them to lose consciousness.

The safety bar was activated and cut the power to the platform controls. A spotter was in place but was unable to utilise the controls to get the worker down. The spotter alerted another MEWP operator who then lowered the platform, Once free from being trapped, the operator regained consciousness. Without this swift action the consequences could have been fatal.

Note: The investigation should include all safety features that may also have the potential to play a part in lessening the consequences when the safety bar is activated.

Mobile elevating work platform operator pinned between steel beam and safety bar.

Causes

The steel beam had been installed on the previous shift. The gap through which the MEWP operator could manoeuvre the work platform between it and the handrail below was reduced to 250 mm.

The operator was facing the controls with the steel beam behind his head.

There was a perception amongst the work group that MEWPs could routinely operate within very restricted spaces.

Mobile elevating work platform operator pinned between steel beam and safety bar.

Recommendations

- Spotters for MEWPs should be trained and assessed on how to lower the work platform using the emergency ground controls. [Administrative]
- As the mine was doing in this case, prestarts must include checking activation of the safety bar. [Engineering]
- Supervisors and operators must be trained and assessed on how to check all the other associated safety features which are also initiated. [Administrative]
- Plan work to prevent workers from getting into a situation that could have the potential to pin or crush them. [Administrative]

Note: Involve the original equipment manufacturer at the early stages of an investigation.

Split set punctures fuel tank.

On 26 December 2020, a service crew worker drove through a puddle and heard a noise coming from underneath the light vehicle. The worker stopped to look for the cause of the noise and found that a 900 mm split set had punctured the fuel tank.

Split set punctures fuel tank.

Causes

Split sets were used for development face bolting and they were amongst the development waste being used as road base.

The split set was concealed in an area of uneven floor in a pool of muddy water.

Split set punctures fuel tank.

Recommendations

- Cease using development waste that could contain split sets to sheet the floor as the mine has done. [Elimination]
- Look into why the corrective action from similar incidents failed to prevent it happening again. In the previous incident one of the contributing factors was that muddy conditions on the decline potentially limiting visibility of materials such as a short split set. The relevant recommendation was awareness to crews of the event and the importance of housekeeping and always checking for hazards. [Administrative]

Contact us

Mineral Mines and Quarries Inspectorate

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- Contact your regional inspectorate staff

Report emergencies, incidents or illness:

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- Brisbane: (07) 3330 4273