

# QUARTERLY REPORT

## Fires on mobile plant

October – December 2018

*Photo1: Fuel truck fire – fuel spill from tank onto engine surface when reversing up grade*



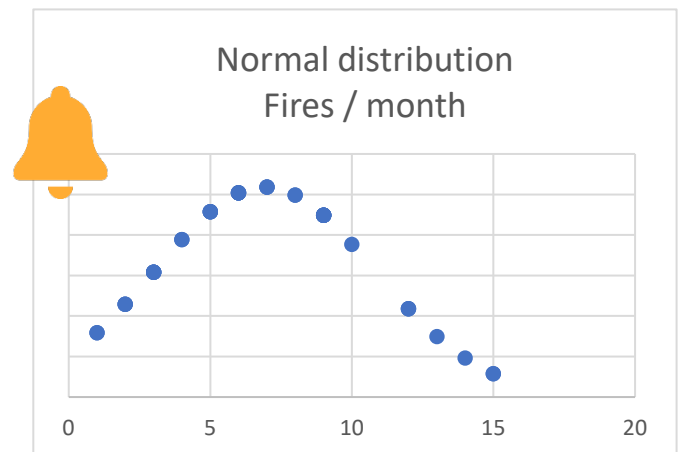
### Key observations

2018 data shows slight reduction in fires. NSW mines and quarries reported 104 fires on mobile plant during 2018, down from 112 fires reported in 2017. Through its assessment program focussing on fires on mobile plant, the NSW Resources Regulator has seen evidence of increasing focus on reducing the number of fires on mobile plant by mines but further work needs to be done to reduce the danger that is presented at a rate of 8.7 fires occurring each month.

**Continued focus and development required.** Mine operators should review maintenance practices due to an increasing number of fires due to poor-quality maintenance. Any uncontrolled escape of fluid, or residual fluid remaining after maintenance, is likely to initiate a fire given the proximity to exposed hot surfaces typical of mobile plant.

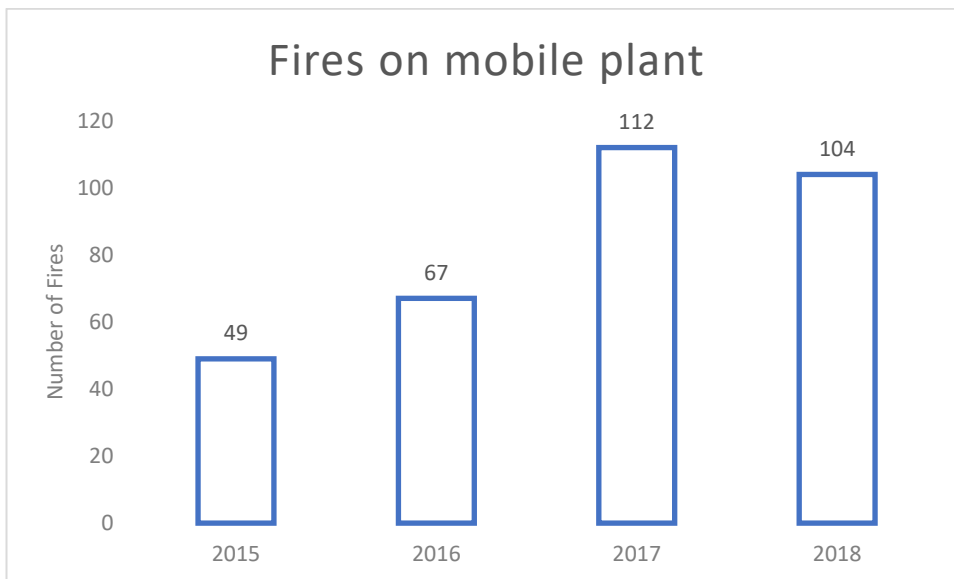
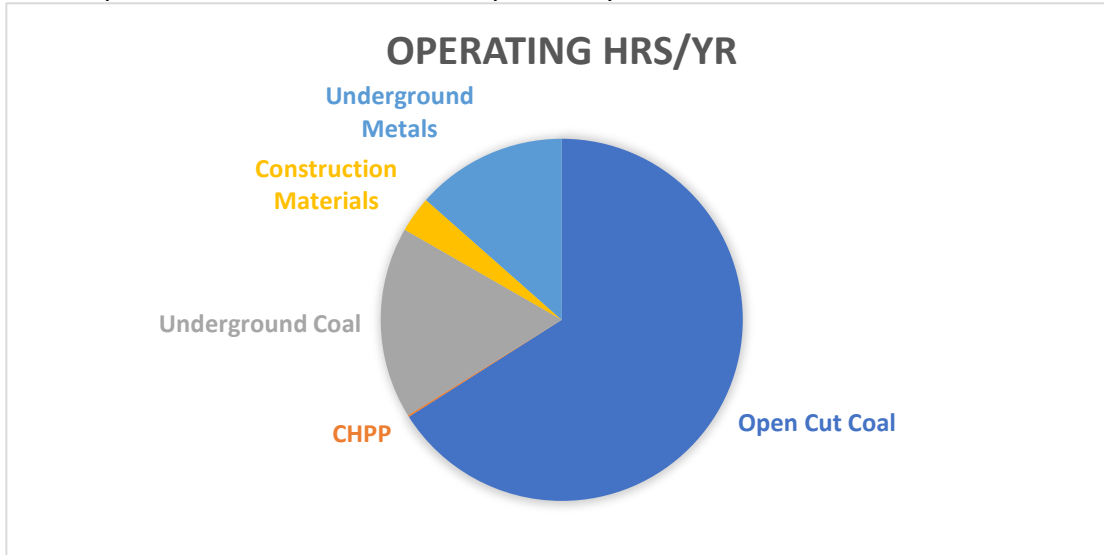
## Data summary

2015	2016	2017	2018
49	67	112	<b>104</b>



Mine type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Underground coal	0	0	0	0	0	0	0	0	0	0	0	0
Underground metex	3	0	1	2	1	1	2	0	3	4	1	2
Open cut coal	7	7	4	3	8	3	4	8	0	7	4	9
Surface operation	0	1	0	0	0	0	2	1	0	0	1	0
Quarry	2	0	2	1	1	0	1	1	0	3	2	2
	<b>12</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>10</b>	<b>4</b>	<b>9</b>	<b>10</b>	<b>3</b>	<b>14</b>	<b>8</b>	<b>13</b>

The underground coal sector continues to show the effectiveness of surface temperature control in minimising the likelihood of mobile plant fires. Underground coal has a significant portion (17%) of mobile plant use and no fires were reported by mines in this sector in 2018.



Mine Type	Annual operating hours	Average Fires/year	Fires per million hours	Fires in 2018
Open cut coal & CHPP	10,819,040	52	4.8	64
Underground coal	2,801,258	0.3	0.1	0
Construction Materials	526,803	7	13.3	1515
Underground metals	2,205,899	26	11.8	20
<b>Grand total</b>	<b>16,353,000</b>	<b>85</b>	<b>5.2</b>	<b>104</b>

- Use based on information derived from 2018 mobile fleet census. Averages based on ancillary reports over the period 2014 – 2018.

### Fires on mobile plant past three months causal factors details.

	Date of Incident	Event ID	Machine type	Machine Manufacturer	Machine Model	Causal factors comments
1	30/12/2018	AINST0010151	Shotcrete	Jacon		A piece of sound insulating material fell from inside engine bay onto a turbo.  Post investigation - failure of the sound proofing lining was not identified in any PM service inspections. The failure of the lining caused parts of the lining to fall onto the hot exhaust and catch fire.
2	25/12/2018	AINST0010078	Loader	Caterpillar	2900	A fitter who was undertaking repair of hydraulic hose failure smelled smoke and extinguished a small electrical fire with a hand-held fire extinguisher.  Electrical fault in general area of starter motor.
3	19/12/2018	AINST0010076	Dozer			A dozer operator in the Saddler's blast area shut down the machine due to a lightning storm. When he climbed off the machine he noticed a small fire around the right-hand turbo.  Ignition of leaking engine coolant ignited by hot exhaust gasses leaking from clamp on turbo.
4	17/12/2018	AINST0010062	Dozer	Caterpillar	D11T	An operator noticed smoke coming from the engine bay. The operator stopped the machine and the smoke thickened within the driver's cab. The operator saw a flame and activated the on-board fire suppressing system, which extinguished the fire.
5	12/12/2018	AINST0010070	Drill			The fire was caused by the failure of a gasket on a hydraulic filter housing that sprayed oil onto the exhaust components.  After a maintenance task on the filter housing, the bolts were not installed and torqued correctly. This caused the gasket to rupture and oil to escape.
6	10/12/2018	AINST0010038	Dozer	Caterpillar	D11T	Dozer 309 (Cat D11T) had a small fire in the engine bay after the low hydraulic alarm went off.
7	10/12/2018	AINST0010127	Loader			A frontend loader had a fire in the rear engine bay.
8	6/12/2018	AINST0010040	Light vehicle	Ford	Ranger	The apparent cause was the original equipment manufacturer-fitted clip that was used to hold the positive battery cable into position failed. This enabled the battery cable to come into contact with the water pump pulley resulting in a short circuit.
9	6/12/2018	INST0010030	Dump truck	Cat	789C	Premature failure of turbo bearing. This is considered to be a rare event.
10	3/12/2018	AINST0010025	Ute	Toyota	70	An electrician was called to conduct a jumpstart on a 12v lighting plant. The jump pack on the service vehicle was connected to the lighting plant. The electrician returned to the lighting plant to attempt to start. He looked back and noticed the jumper leads were connected to the 24v outlet.

						Too many various types of jump start units. No consistency in design. The same outlet is used for 12v and 24v machines.
11	3/12/2018	AINST0010018	Drill	Reedrill	SK50	The cause of the fire was hydraulic oil being sprayed over the exhaust from a failed rotation hose fitting on the mast. The fitting was a two- piece silver soldered fitting.
12	4/12/2018	AINST0010016	Water cart	Caterpillar	777	Failed steering hose.
13	2/12/2018		Water cart	Caterpillar	777	O ring failure. The O ring failed, spraying hydraulic oil onto the turbo/ exhaust lagging where it eventually came into contact with a hot surface.
14	26/11/2018	AINST0010157	Drill	Reedrill	SKF-50	A fitter was cleaning a blast hole production drill rig. He used a flammable degreaser that caught on fire. Apparent cause was using a flammable degreaser on a hot exhaust manifold that was lagged.
15	24/11/2018	AI	Refuelling tanker	Caterpillar	777	Fuel came out of the top of the service cart and ran down between the cab and the bulk tank and ignited.
16	24/11/2018	AINST0010046	Water cart	Caterpillar	777	Poor installation and inspection of hoses allowed the hydraulic hose to rub on a bracket and spray oil on to the engine.
17	22/11/2018	SInAnc-2018/00198	Loader - underground - include LHD, scoop, scraper loader, bobcat, etc	Caterpillar (CAT)	R3000	Audit on loader fleet for possible light disconnection. Review and change circuit breaker protection to suit change in light type from halogen to LED.
18	13/11/2018	SInAnc-2018/00193 AINST0010155	Excavator - backhoe etc; exclude hydraulic shovel	Leibherr	996	A broken clamp bolt on a hose clamp of a swing hydraulic hose caused oil to spray and ignite. The actual source of the ignition of the oil was undetermined
19	13/11/2018	SInAnc-2018/00194	Feeder/feeder breaker - include ratio feeder breaker; exclude longwall crusher/stage loader	Hitachi	EX5500	All hoses on the hydraulic isolator circuit were replaced in March 2017. The hoses used were a thermoplastic type and were chosen for their colour (orange) to enable them to be distinguished from the normal excavator hoses. While this seemed like a good idea at the time an investigation into this incident found that the thermoplastic hoses, while adequate for the required pressures were susceptible to heat compared to rubber hoses. As the area where the hoses are connected experiences hot air from the hydraulic coolers, this has been the cause of the hose failure. Examination of the failed hose supports this theory as well.
20	12/11/2018	SInAnc-2018/00191	Truck dump - include off-highway rear dump truck and coal hauler dump truck	Komatsu	HD 325	No details provided.
21	05/11/2018	SInAnc-2018/00187	Truck dump - include off-highway rear dump truck and coal	Caterpillar (CAT)	785B	Engine damage has resulted from the truck's engine over speed. This has resulted in damaging valves and injectors on 8 and 12 cylinders. Raw diesel was introduced in the truck's

			hauler dump truck			exhaust system and this was evident with reports of white smoke being emitted from the exhaust before the incident. The raw fuel atomised in the hot exhaust. This has become hot once it was at peak operating revs on the haul road. The raw fuel ignited and discharged out the truck's exhaust pipe'
22	29/10/2018	SInAnc-2018/00192	Passenger motor vehicle - include ute, panel van, bus (manhaul), land cruiser/rover, etc	Toyota	Landcruiser Military Workmate	A contractor's light vehicle was coming up the decline at end of shift when workers in a following light vehicle saw flames coming from the front vehicle's engine area. Maintenance procedures from the original equipment manufacturer were not followed by the third party maintenance contractor.
23	29/10/2018	SInAnc-2018/00199	Dozer	Caterpillar (CAT)	D11T	The hose had only been fitted five days earlier as part of a proactive maintenance program, which had identified the defective hose before it failed. The mechanical technician who fitted the hose identified that the incorrect tool may have caused the fitting to be not tightened correctly.
24	7/10/2018	AINST0010048	UG haul truck	Caterpillar	AD55B	Caterpillar AD55 underground haul truck was tipping load on surface ROM when the operator noticed a fire in the engine bay.  Onboard AFFF system was deployed, extinguishing the flames.
25	24/10/2018	SInAnc-2018/00181	Excavator - backhoe etc; exclude hydraulic shovel	Caterpillar (CAT)	345C	This type of connection was made when an isolation switch was fitted to the machine after market.
26	19/10/2018	SInAnc-2018/00196 AINST0010186	Loader - surface mining	Le Tourneau	L1850	The right-hand rear turbo oil feed line has rubbed through on an intake pipe clamp allowing low pressure engine oil to spray/leak onto hot engine surfaces nearby causing the fire.  Poor attention to detail during routine maintenance.
27	19/10/2018	SInAnc-2018/00197	Dozer	Caterpillar (CAT)	D10T	No details provided.
28	17/10/2018	AINST0010142	Haul truck	Komatsu	830E	During load box testing of Komatsu 830E haul truck (plant No. TR037) flames were witnessed within the engine bay on inspection of centre deck engine bay cover.
29	13/10/2018	AINST0010148	Haul truck (underground)			Underground haul truck HT17 was travelling underground unloaded along an internal decline. The operator heard a grinding noise and noticed sparks on the rear vision camera.  Bearing housing inadequately retained hence it was allowed to move out of alignment over time.
30	11/10/2018	SInAnc-2018/00178	Passenger motor vehicle - include ute, panel van, bus (manhaul), land cruiser/rover, etc	Toyota	Troop carrier	Under investigation
31	11/10/2018	SInAnc-2018/00200 AINST0010161	Excavator - backhoe etc; exclude hydraulic shovel	Caterpillar (CAT)	345	Unable to determine exact cause of fire.

32	06/10/2018	SInAnc-2018/00185	Loader - surface mining	Kubota	SUL75	Poor maintenance and pre-start inspection process led to the separation of the exhaust manifold coming into contact with wiring.  Preventative maintenance program to check exhaust mounts and exhaust integrity.
33	04/10/2018	SInAnc-2018/00177	Scraper	Caterpillar (CAT)	637G	Steering hose full sheath protection to be implemented to restrain fluid should the hydraulic hose fail catastrophically.
34	02/10/2018	SInAnc-2018/00175	Dozer	Komatsu	155 AX	Main earth strap had a short circuit, causing the plastic outer cover to melt, which then melted the water trap plastic bowl on the primary fuel filter, which then allowed a further 2.5 litres of fuel to ignite.  Ensure pre-start covers all leads for tightness.
35	02/10/2018	SInAnc-2018/00180 AINST0010160	Truck dump - include off-highway rear dump truck and coal hauler dump truck	Caterpillar (CAT)	789C	A UNO hydraulic fitting has eroded and allowed the O ring to be extruded from the pressure regulator body. This caused fuel to be sprayed into the engine bay. There was no evidence that the fitting came loose in service.

© State of New South Wales through the NSW Department of Planning and Environment 2019.

This publication is copyright. You may download, display, print and reproduce this material in an unaltered form only (retaining this notice) for your personal use or for non-commercial use within your organisation. To copy, adapt, publish, distribute or commercialise any of this publication you will need to seek permission from the NSW Department of Planning and Environment.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (April 2019). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of the NSW Department of Planning and Environment or the user's independent advisor.