



**May 2021
Ottawa Reliability Report**

ALSTOM RS

2021-07-08
ANDERSON Gail
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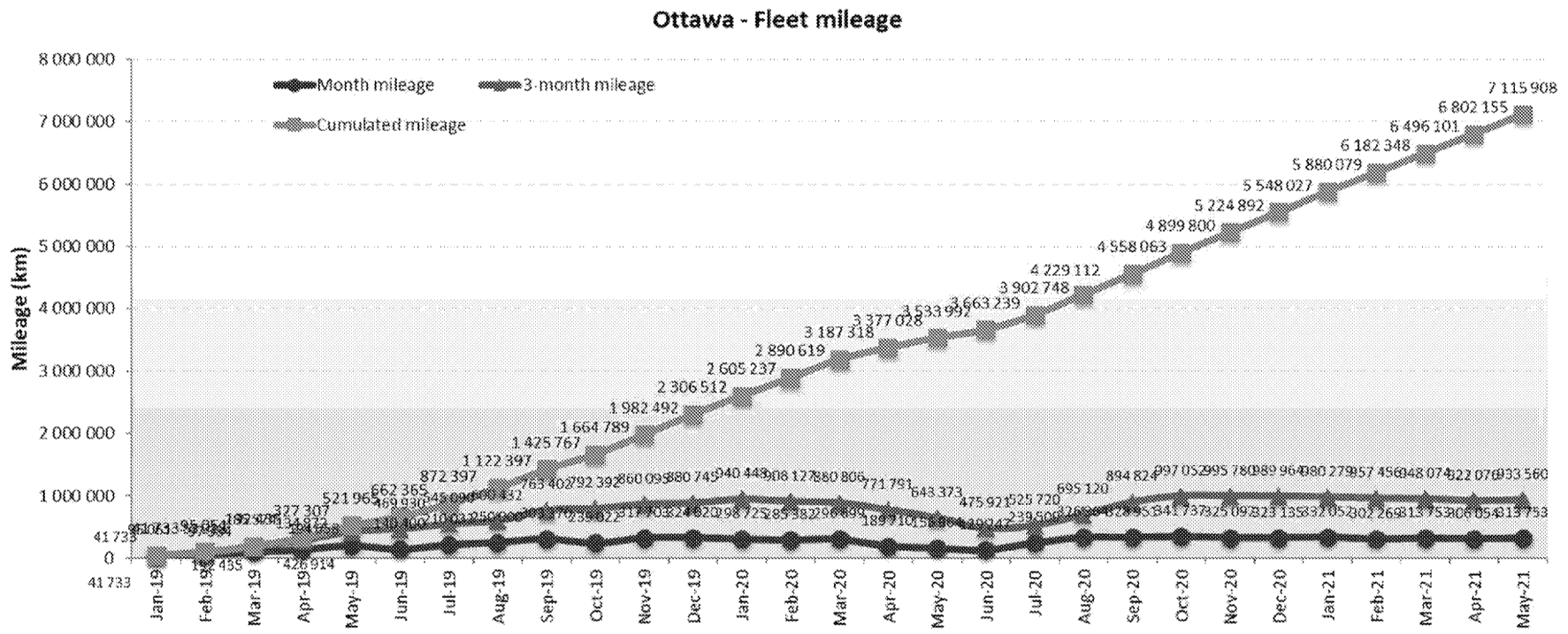
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• mobility by nature •



Agenda

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Reliability - Mileage



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LRVs Under Warranty Forecast

	Detail	01-2021	02-2021	03-2021	04-2021	05-2021	06-2021	07-2021	08-2021	09-2021	10-2021	11-2021	12-2021	01-2022	02-2022	03-2022
	Train in RS (Phase 1)	34	34	34	34	34	34	34	34	34	34	34	34			
	Train entering RS Phase 2 (37.38.39.40)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Monthly Forecast (Updated based on delivery)								1	1	1	1	1	1	1	1	1
									2	2	2	2	2	2	2	2
										2	2	2	2	2	2	2
											1	1	1	1	1	1
												2	2	2	2	2
													1	1	1	1
														1	1	1
															1	1
	Total															14

Main events (service affecting failure >5 min)

Date	Mileage	Air production	Auxiliary power	Boiler	Brakes	Carbody	Communication	Coupler	Door	High power voltage	HVAC	Lighting	On-board information system	Tractor	Fault
2021-05-01	10 357														0
2021-05-02	10 605												1		1
2021-05-03	10 252														0
2021-05-04	9 634														0
2021-05-05	10 709														0
2021-05-06	10 276													1	1
2021-05-07	7 953													1	1
2021-05-08	10 530														0
2021-05-09	10 694														0
2021-05-10	10 649												1		1
2021-05-11	10 613														0
2021-05-12	11 347														0
2021-05-13	10 031														0
2021-05-14	7 784														0
2021-05-15	10 457														0
2021-05-16	10 282														0
2021-05-17	10 624														0
2021-05-18	10 667								1						1
2021-05-19	10 632								1						1
2021-05-20	9 619													1	1
2021-05-21	7 581														0
2021-05-22	10 671														0
2021-05-23	8 937														0
2021-05-24	10 651														0
2021-05-25	10 651														0
2021-05-26	11 238												2		2
2021-05-27	10 328														0
2021-05-28	8 121														0
2021-05-29	10 581														0
2021-05-30	10 610														0
2021-05-31	10 659														0
Total	313 753	0	0	0	0	0	0	0	2	0	0	0	4	3	9

- The total mileage is 313 753 km

MKBF and MKBSF SUMMARY

- These objectives have been defined in order to achieve mileage target.
- These objectives are internal to Alstom in order to monitor subsystems and define action plans.

MONTH	May-21	KM	313,753					
System ID	Sub-System	Current Month Failures	MKBF TARGET (KM)	Monthly MKBF	%of Target	Current Month Failures (Service Affecting)	Monthly MKBSF	MKBSF TARGET (KM)
1	Communication*	97	16000	3,235	20%	0	313,753	159,000
2	On-board Information System *	37	62000	8,480	14%	4	78,438	1,666,000
3	Carbody*	20	25000	15,688	63%	0	313,753	1,886,000
4	Brakes	19	58000	16,513	28%	0	313,753	438,000
5	Door	18	16000	17,431	100%	2	156,877	578,000
6	Lighting	7	17000	44,822	100%	0	313,753	100,000,000
7	HVAC	8	39000	39,219	100%	0	313,753	617,000
8	Bogie	4	40000	78,438	100%	0	313,753	450,000
9	Auxiliary power	6	115000	52,292	45%	0	313,753	699,000
10	Traction	6	73000	52,292	72%	3	104,584	1,282,000
11	Air Production	0	162000	313,753	100%	0	313,753	6,250,000
12	High Voltage Power	0	115000	313,753	100%	0	313,753	699,000
13	Coupler	0	114000	313,753	100%	0	313,753	5,888,200
	Sub-System	Current Month Failures	MKBF TARGET (KM)	Monthly MKBF	%of Target	Current Month Failures (Service Affecting)	MKBSF TARGET (KM)	%of Target
	Vehicle	222	2,900	1,413	49%	9	52,000	67%

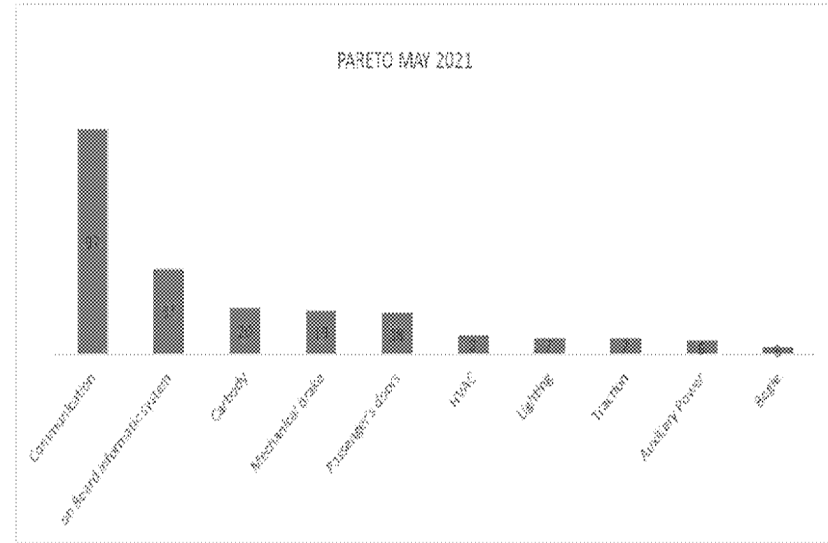
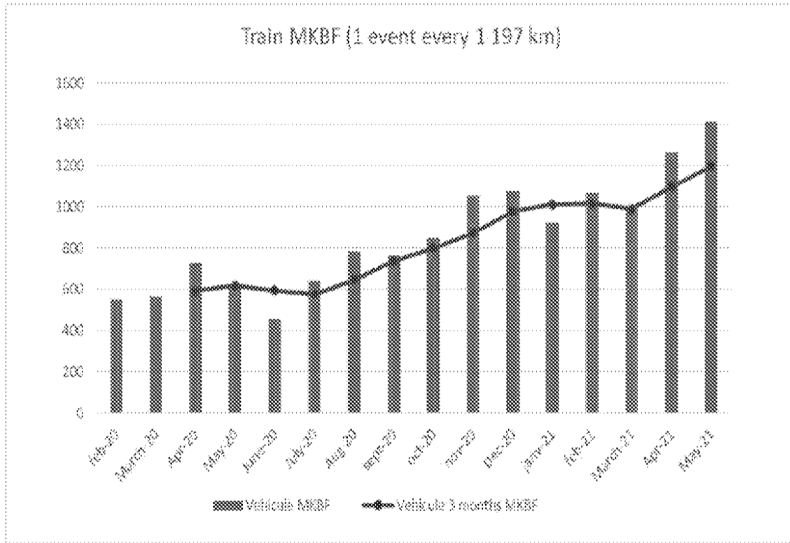
Communication : PAPIS

On-Board Information System : TCMS

Carbody includes : Wiper Washer Defroster, Sanding, Wheel Flange Lubrication, Deadman.

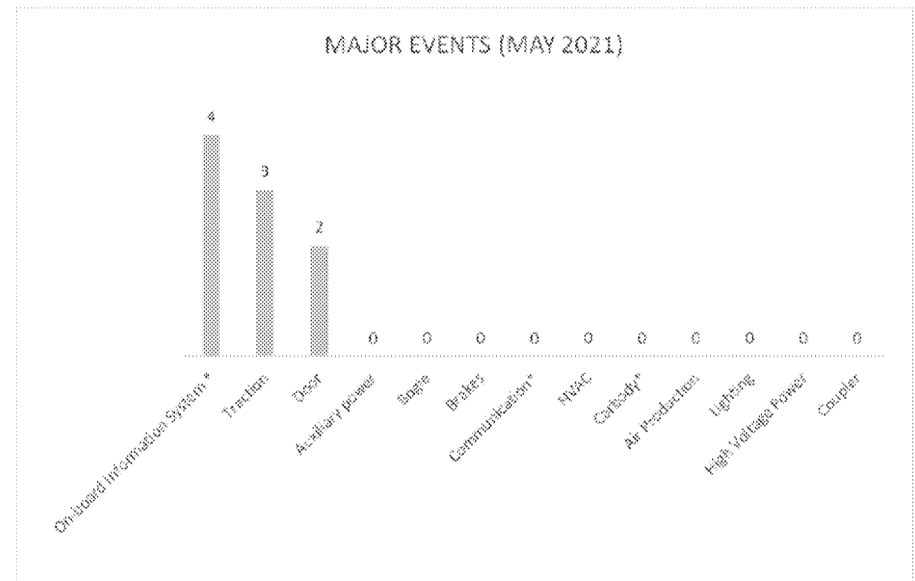
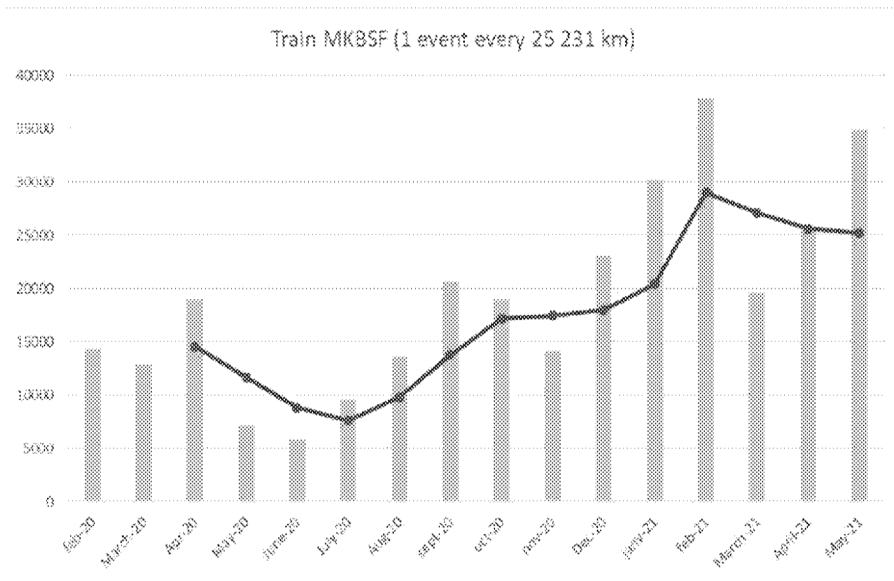
Train level all events - MKBF figures

222 Total events



Train level service affecting events - MKBSF figures

9 service affecting events total



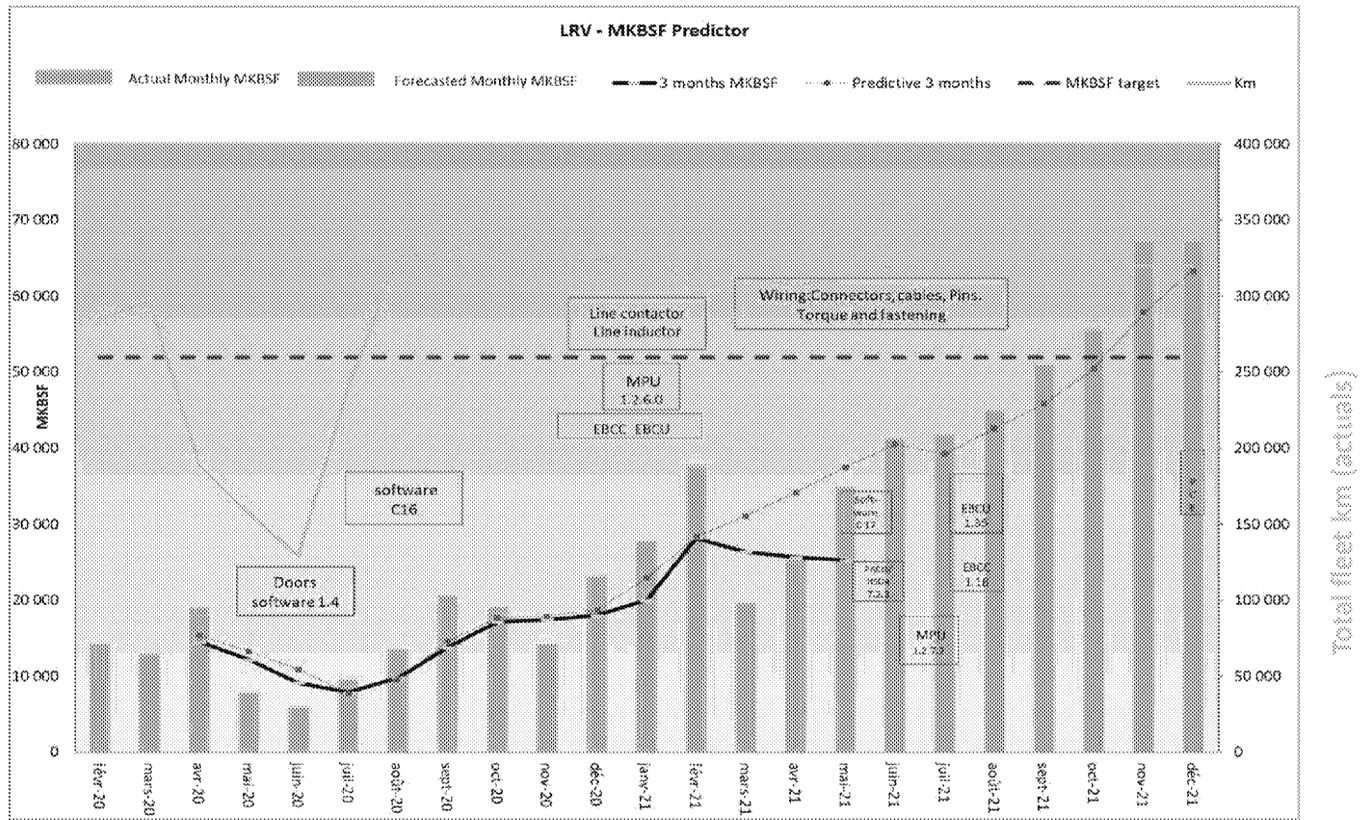
Train level service affecting events - MKBSF predictions

Assumptions :

End of infant mortality phase, start of LRV useful life = constant failure rate over time

Systems	Issues	Corrective actions	References 8D	Forecasted efficiency	Evaluated efficiency	Status
Brakes	EBCU/EBCC brake response fail	External power supply	159006	100%	Under monitoring	Deployed
Brakes	Pressure drops to zero during EB	EBCU 1.35/ EBCC 1.13 (Under validation status in June 2021) ; Removal of the brake release information from the zero speed detection equation	156997	100%	-	Not started
Brakes	PCE locked out due to watchdog fault detection (LRV energized 12 days)	PCE : Improvement on the detection of watchdog fault through PUMA software- Scheduled for the end of the year.		100%	-	Not started
Communication	CCTV screens black (rearview), platform CCTV not populating 1screen	PACIS STR7.2 .3 software	183557	75%	Under monitoring	Deployed
Communication	CCTV screens black (rearview) , platform CCTV not populating 2screens	PACIS STR7.2 .3 software	183557	75%	Under monitoring	Deployed
Communication	Wrong station, station jumps with train in 7.1	PACIS STR7.2 .3 software		100%	Under monitoring	Deployed
Communication	Nuisance IOS 63 and 64 (IOS disappeared or intermittent)	PACIS STR7.2 .3 software	126188	80%	Under monitoring	Deployed
Communication	IOS 56 loss of The two NVR in one element	PACIS STR7.2 .3 software	126187			Deployed
Auxiliary Power	480v inverter stop (no air conditioning symptom)	Software C17 *	108933	15%	Under monitoring	Deployed
Auxiliary Power	Battery charger fault (fault not raised by the APS to the TCMS)	Software C17 *	108933	15%	Under monitoring	Deployed
		MPU patch and Field Notification: 11 transmitted	191017	100%	Under monitoring	Deployed
Auxiliary Power	Loss of both inverters due to short circuit on 480v system	MPU 1.2.7.2 version to be deployed in June (atverm01122579) and lot of minor faults solved (launch affecting)		100%	-	Not started

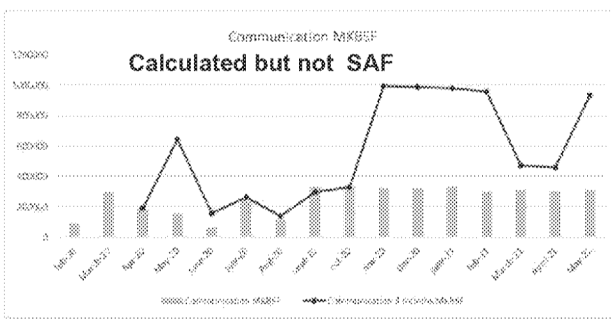
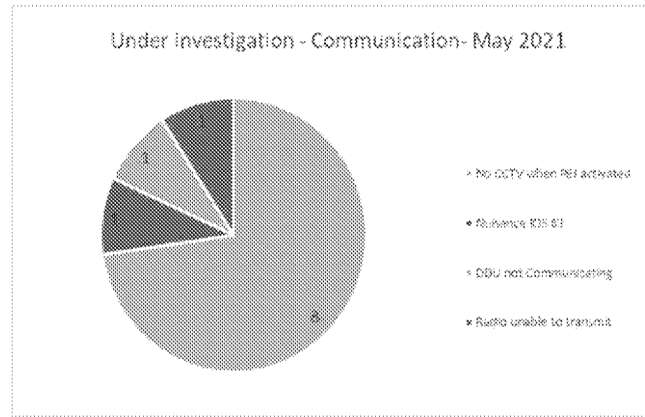
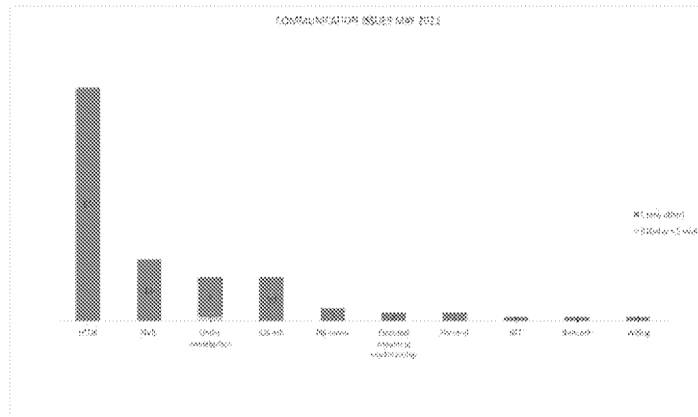
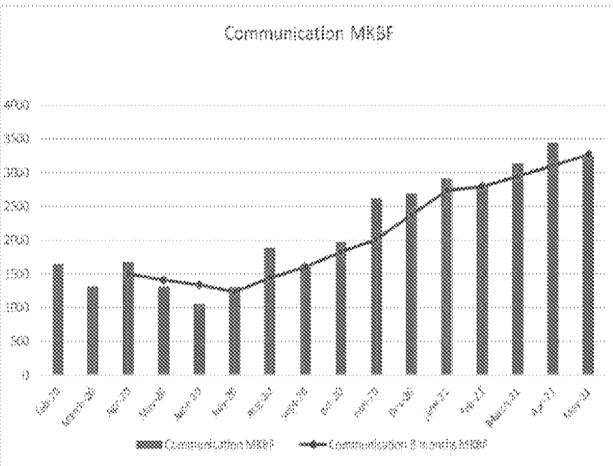
Train level service affecting events - MKBSF predictions



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Communication reliability figures

97 Events



Actions:

- HSDR :** Wrong station - station jumps, CCTV black screen - CCTV not populating, and incorrect IOS will be partially solved by new release of software (7.2.3). Fleet deployment ongoing at end of May
- NVR :** Some issues(incorrect IOS) will be solved by another software version and a case-by-case investigation for the rest.
- PIS server retrofit** Hardware modification , memory size extended is ongoing. 12 out of 15 trains retrofitted
- IDS issues (IOS 66):** internal logs to be monitored.

Note:

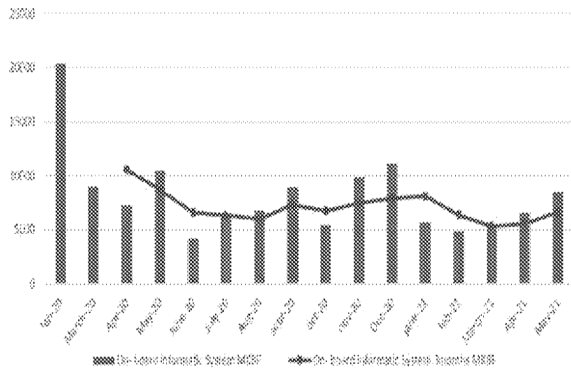
Handset : Potential Quality issue. Quality follow-up ongoing.
 PEI (Internal cameras not loading) issues will be addressed in MPU 1.2.7.2

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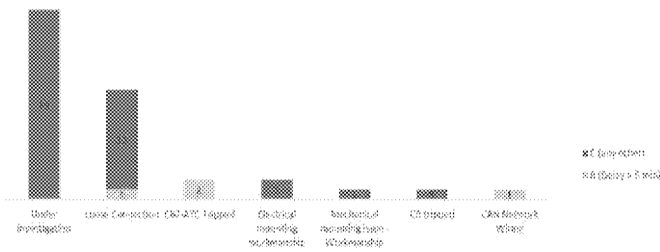
On board information system (TCMS) reliability figures

37 Events

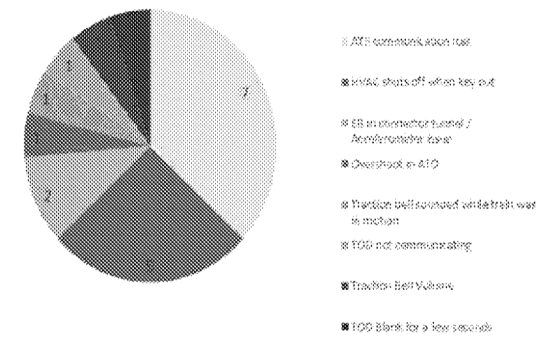
On board information system MKBF



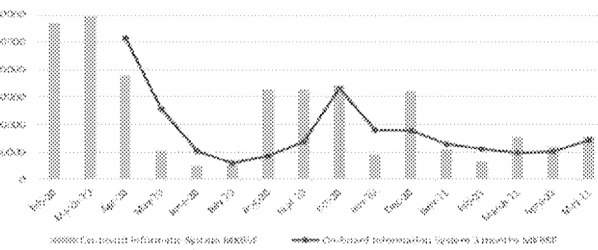
ON BOARD INFORMATION SYSTEM ISSUES MAY 2021



Under investigation - On board information System



On board information system MKBF

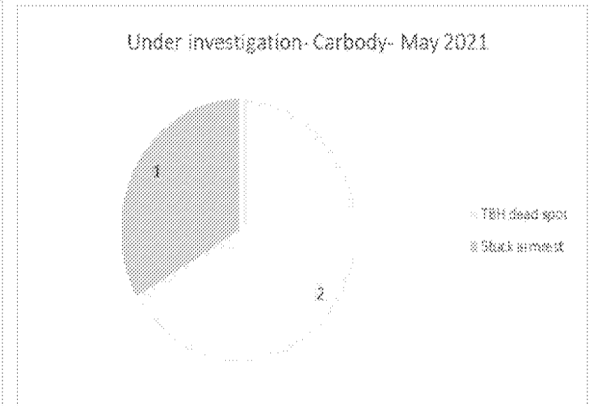
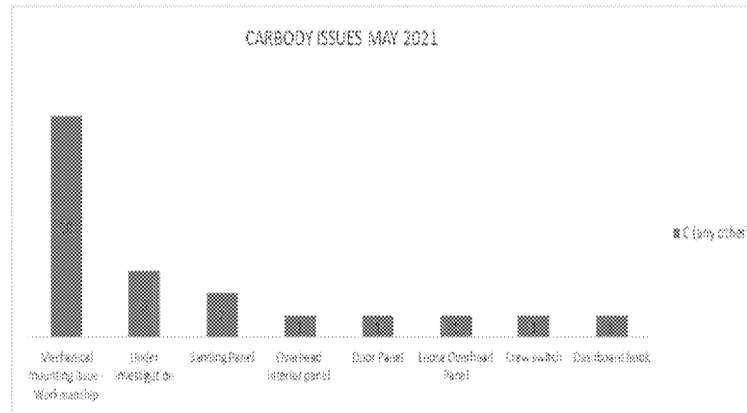
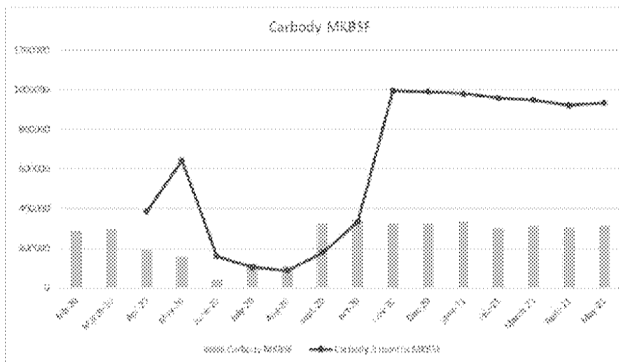
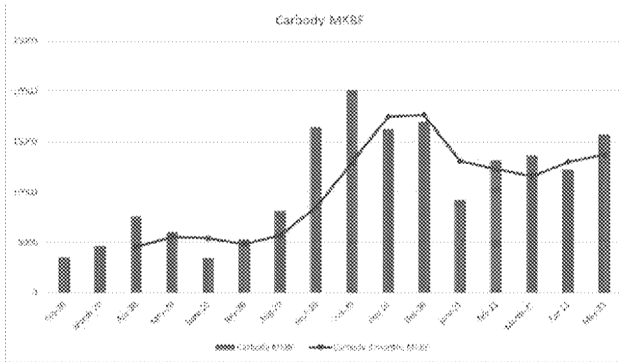


Actions :

- Wiring and Loose connection: Quality actions have been launched.
- CB 7- ATC tripped under monitoring. Awaiting city approval for LRV 02, to be tested on mainline.

Carbody reliability figures

20 Events



Actions :

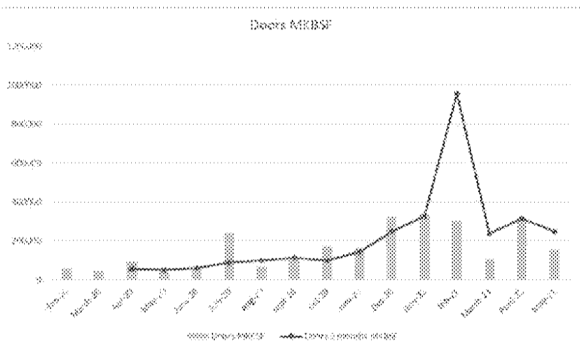
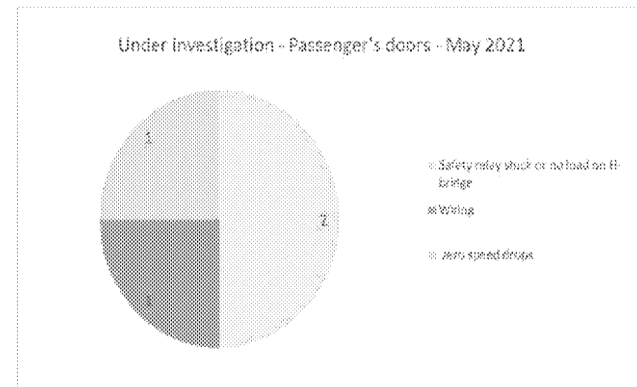
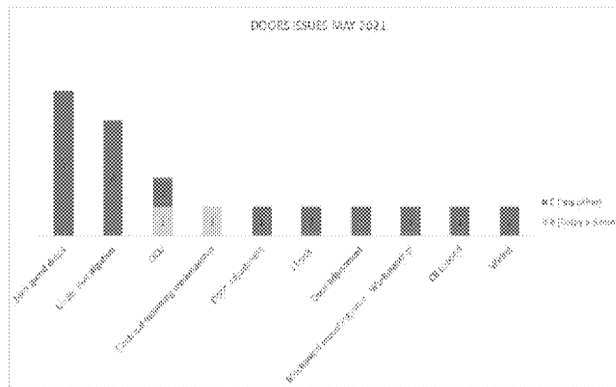
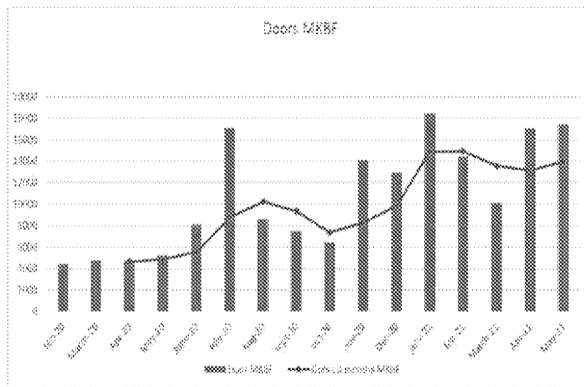
Mechanical mounting issues involves skirt panels, C pin, nuts. These issues are likely to be as result of workmanship.

Note:

Cab door lock issues : removed from the reliability . Awaiting for the City approval

Passenger's doors reliability figures

18 Events



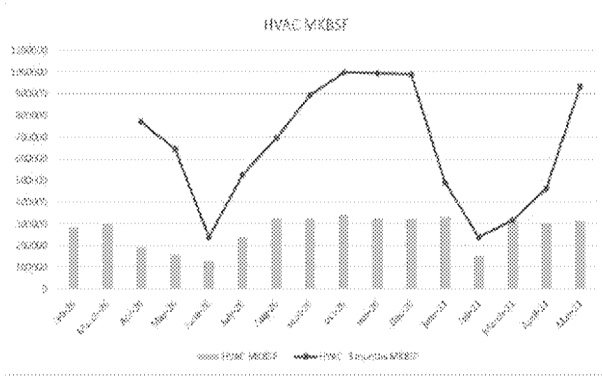
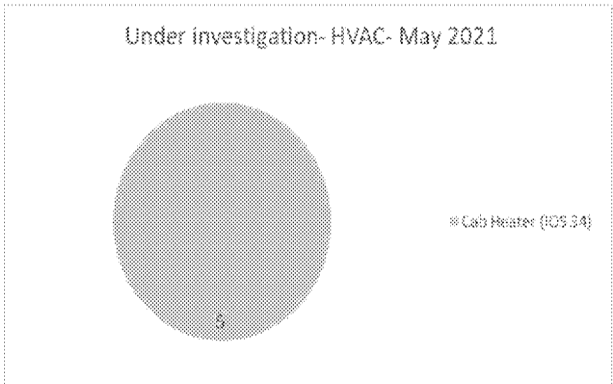
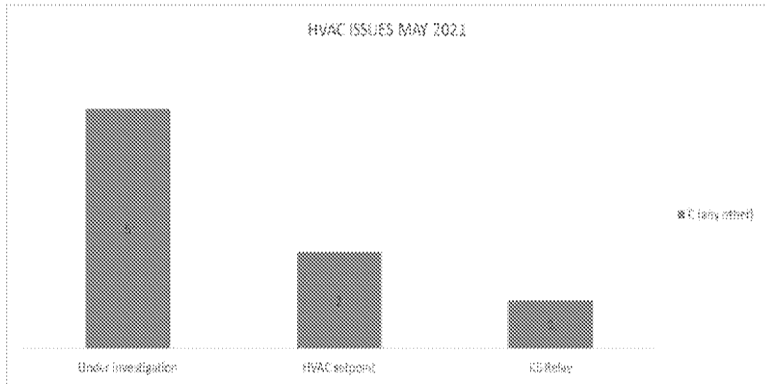
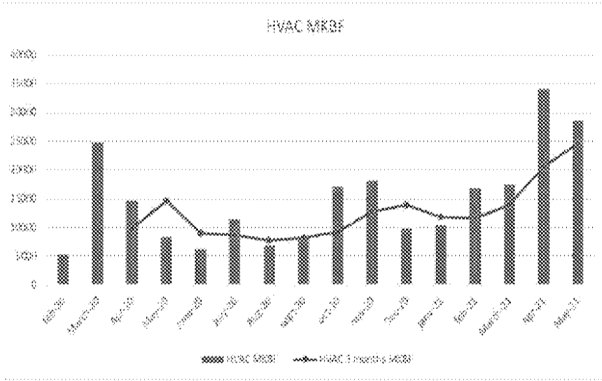
Action

- Zero speed drops issue will be addressed in the software EBCU 1.35
- DCU: issue observed on the same LRV within 24hrs
- Wiring :Quality actions have been launched (Sanity check inspection ongoing)

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HVAC reliability figures

8 Events

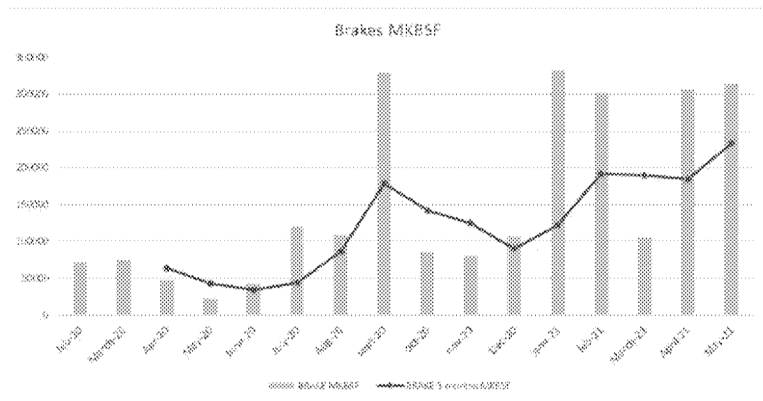
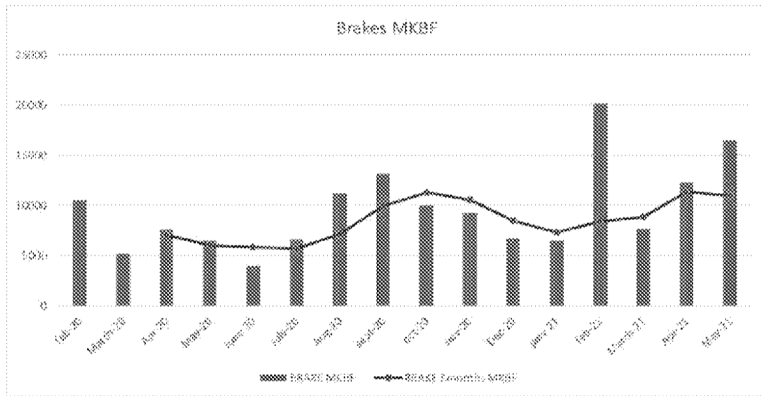


Actions

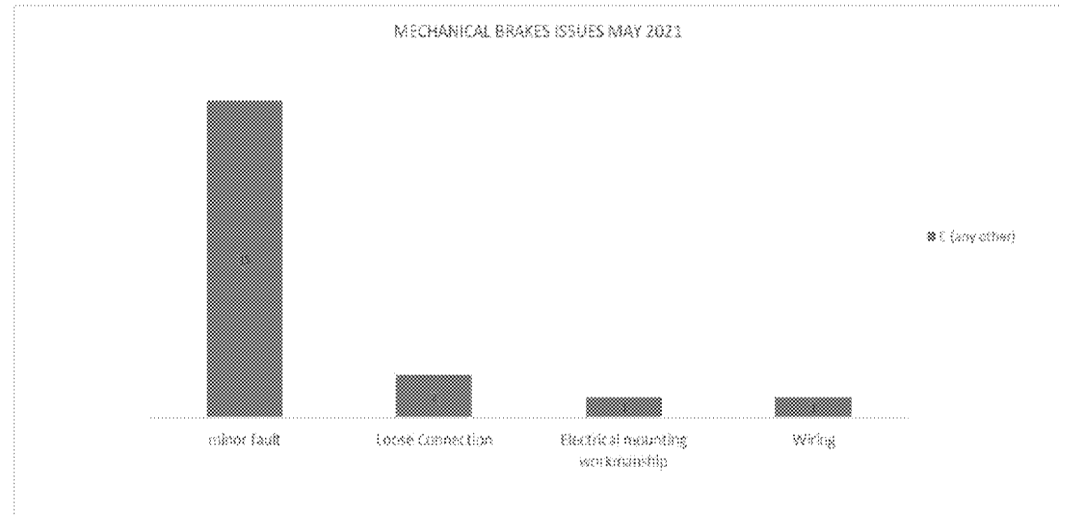
- Loss of cab heater issue: Root cause under analysis.

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Mechanical brake reliability figures



19 Events

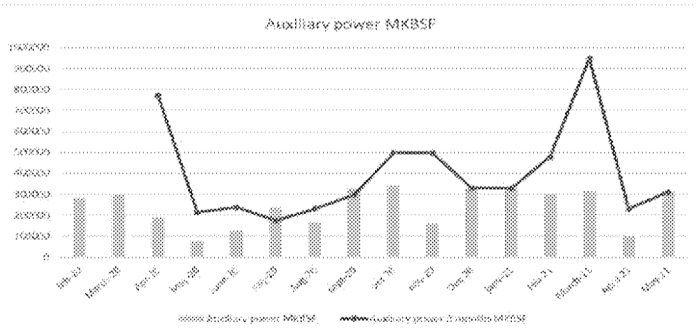
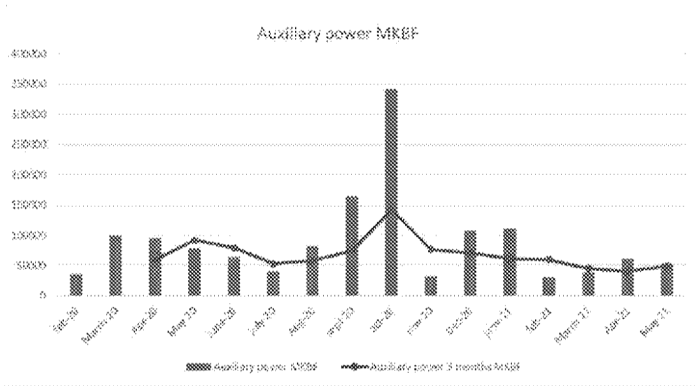


Actions :

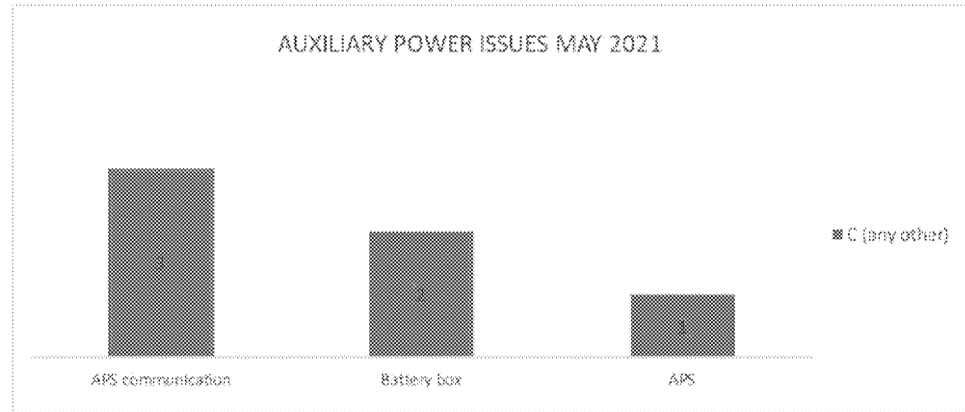
- Minor fault in manual mode (during the driver practice in the revenue service) will be filtered by MPU 1.2.7.2.
- Wiring and Loose connection: Quality actions have been launched (Sanity check inspection ongoing)

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Auxiliary power reliability figures



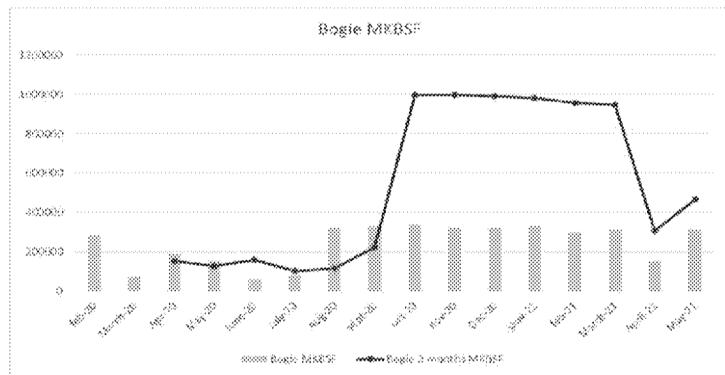
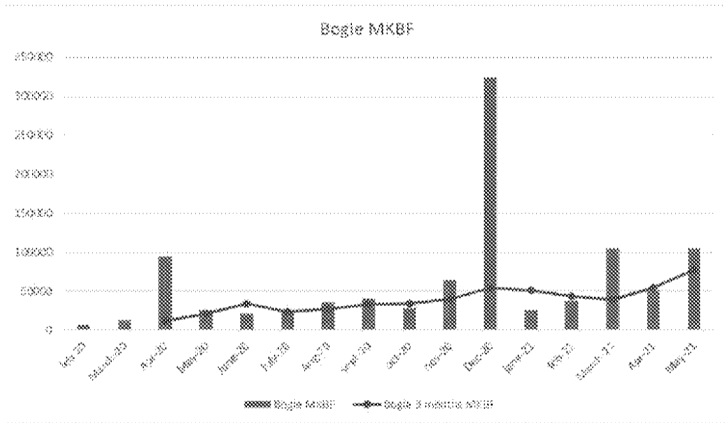
6 Events



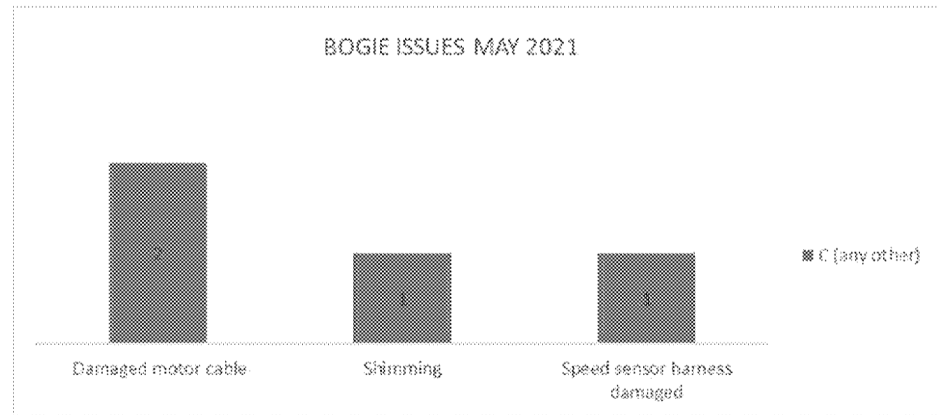
Actions:

- General investigation ongoing with Adetel and Alstom engineering team.
- Software C17 is deployed.

Bogies reliability figures



4 Events

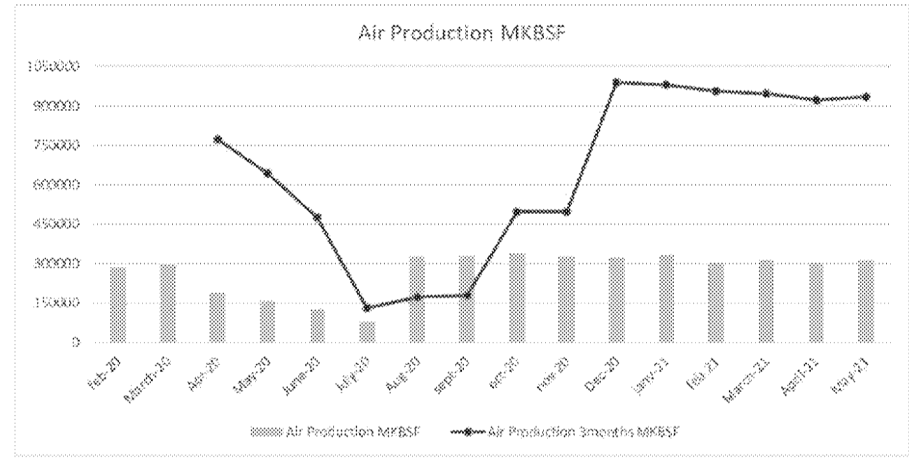
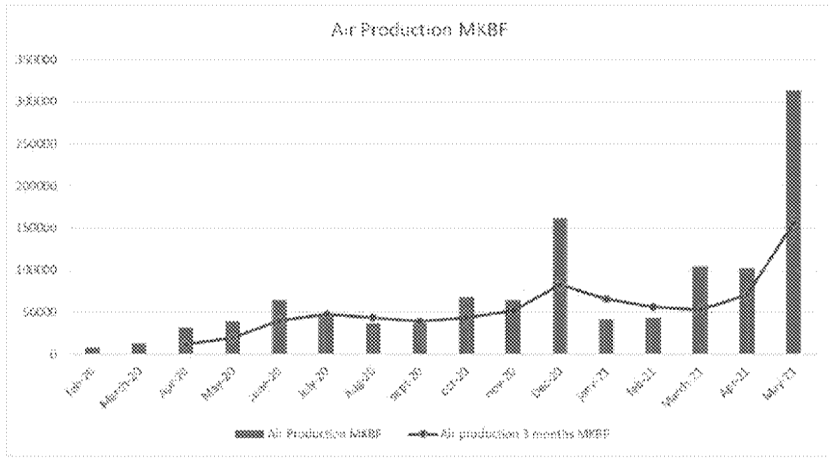


Actions:

- Speed sensor harness: containment (reduce PMA length) validated. fleet implementation to be started
- Traction motor, damaged motor cable: Quality actions have been launched

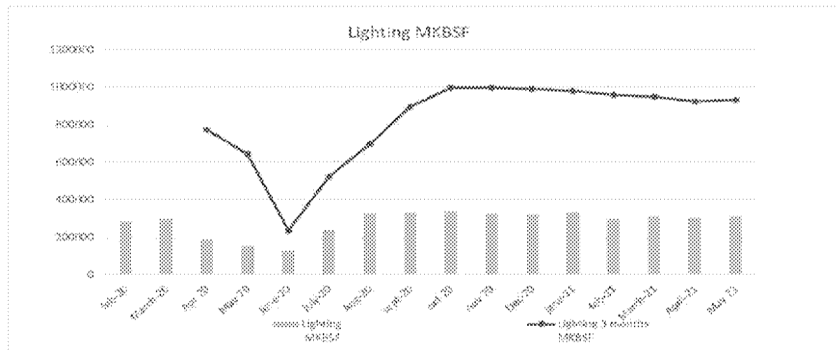
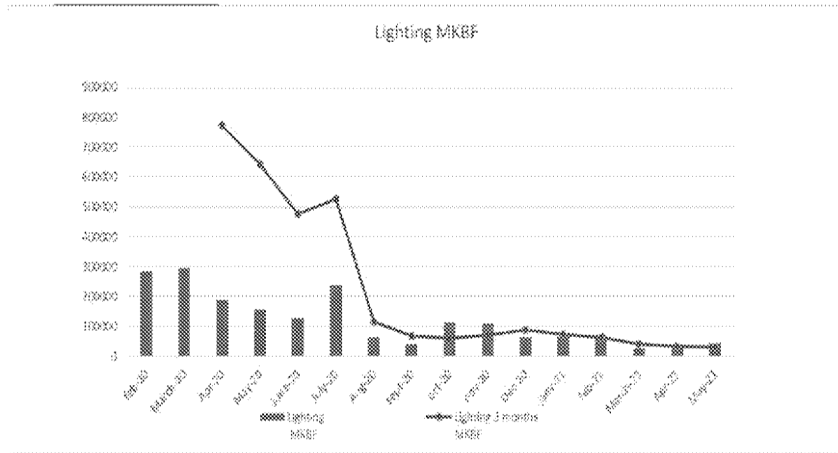
Air production system reliability figures

0 Event

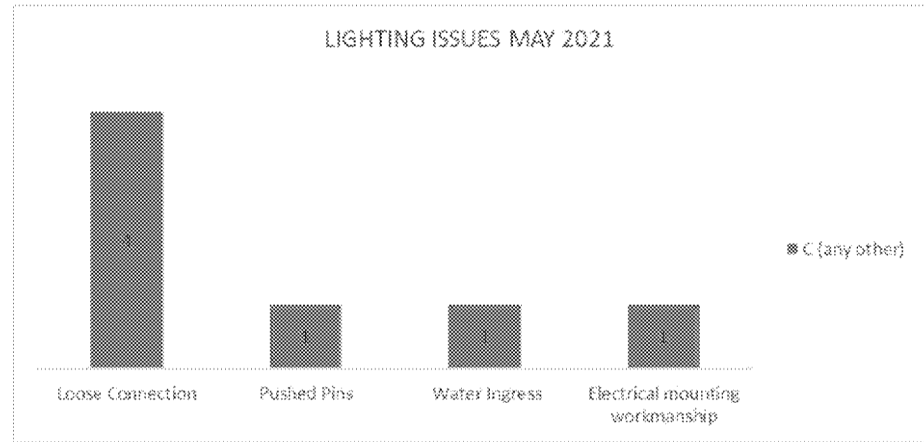


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Lighting reliability figures



7 Events

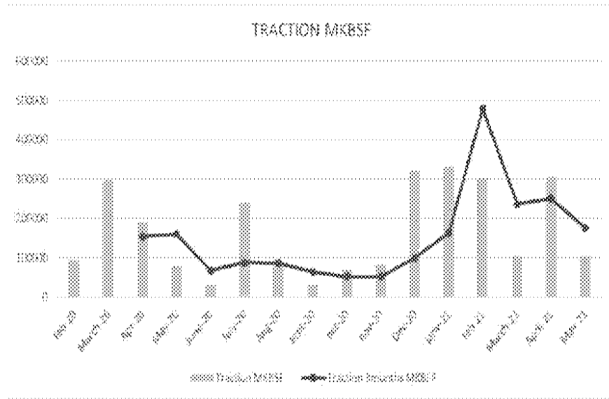
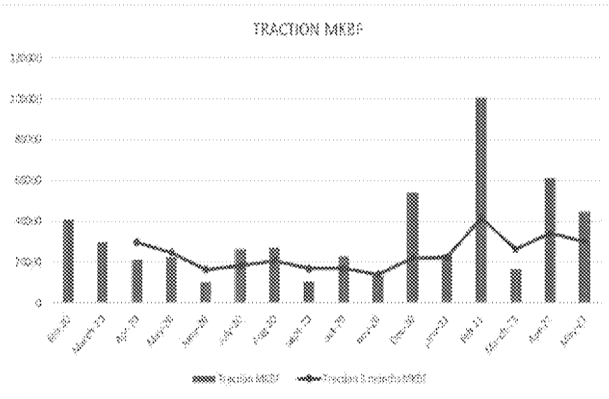


Action :

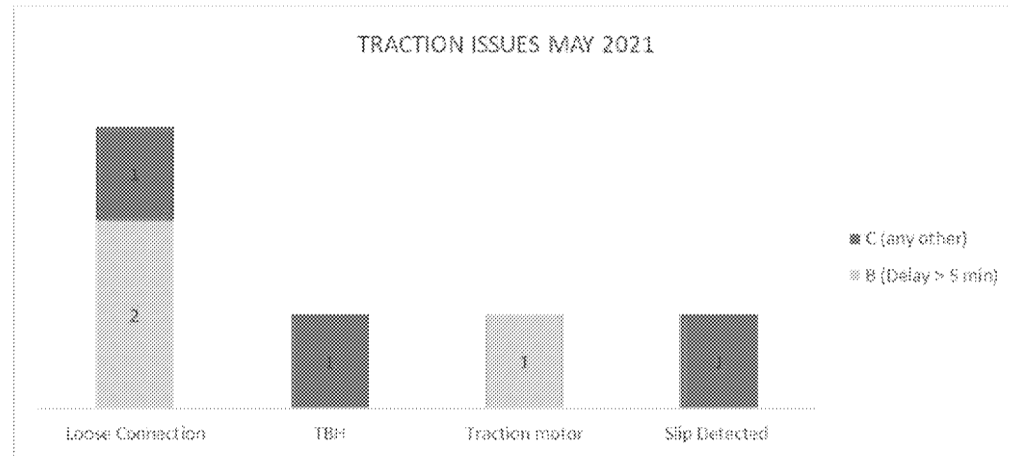
- Loose connection : Quality actions have been launched.

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Traction reliability figures



6 Events



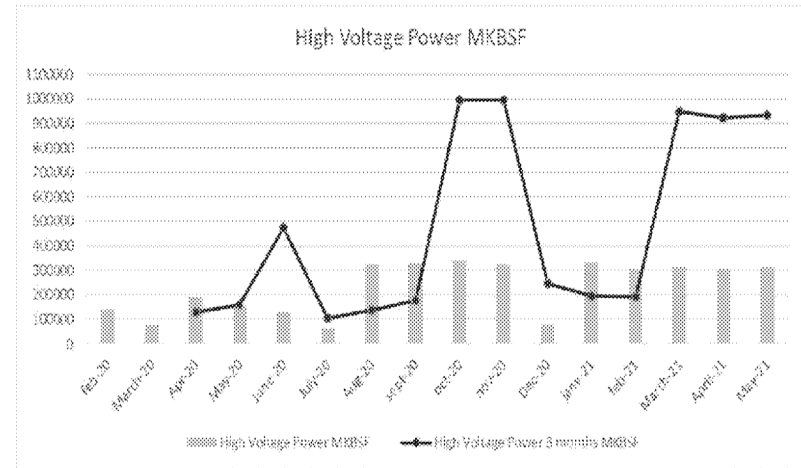
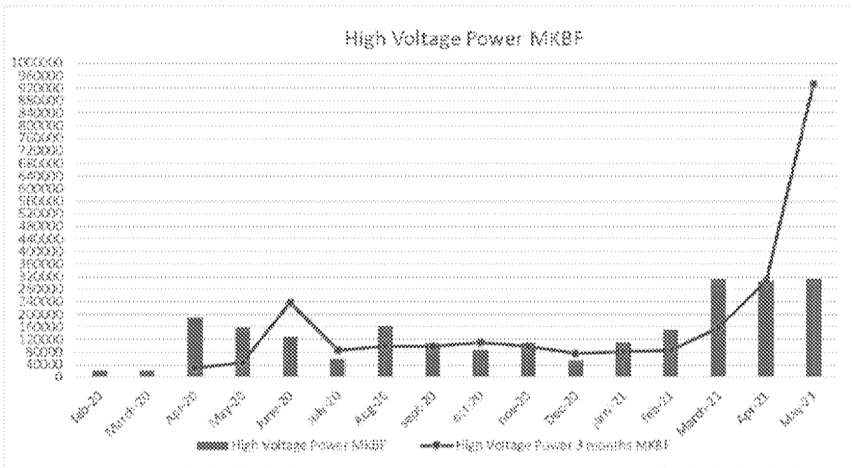
Action :

- Loose connection: Quality actions have been launched (Sanity check inspection ongoing).

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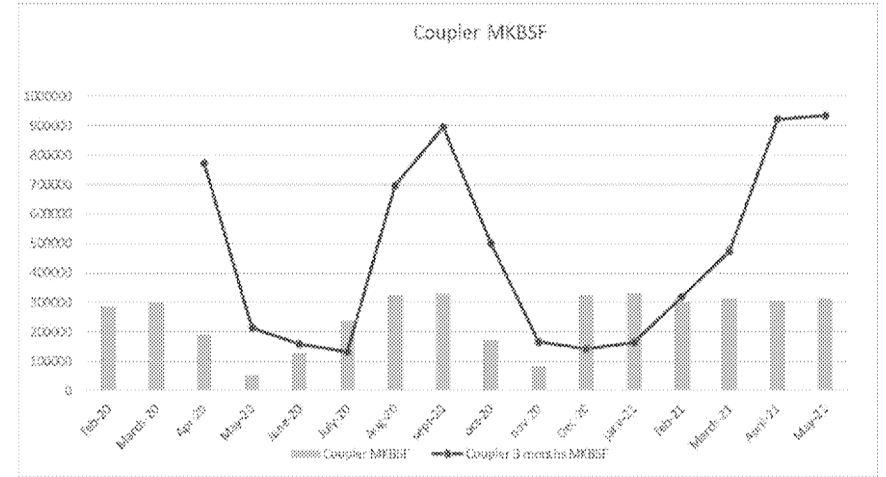
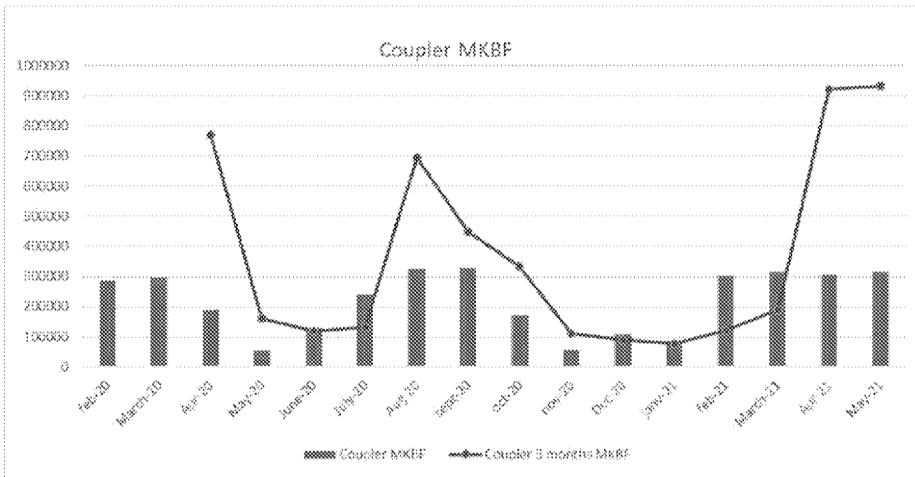
High Voltage Power reliability figures

0 Event

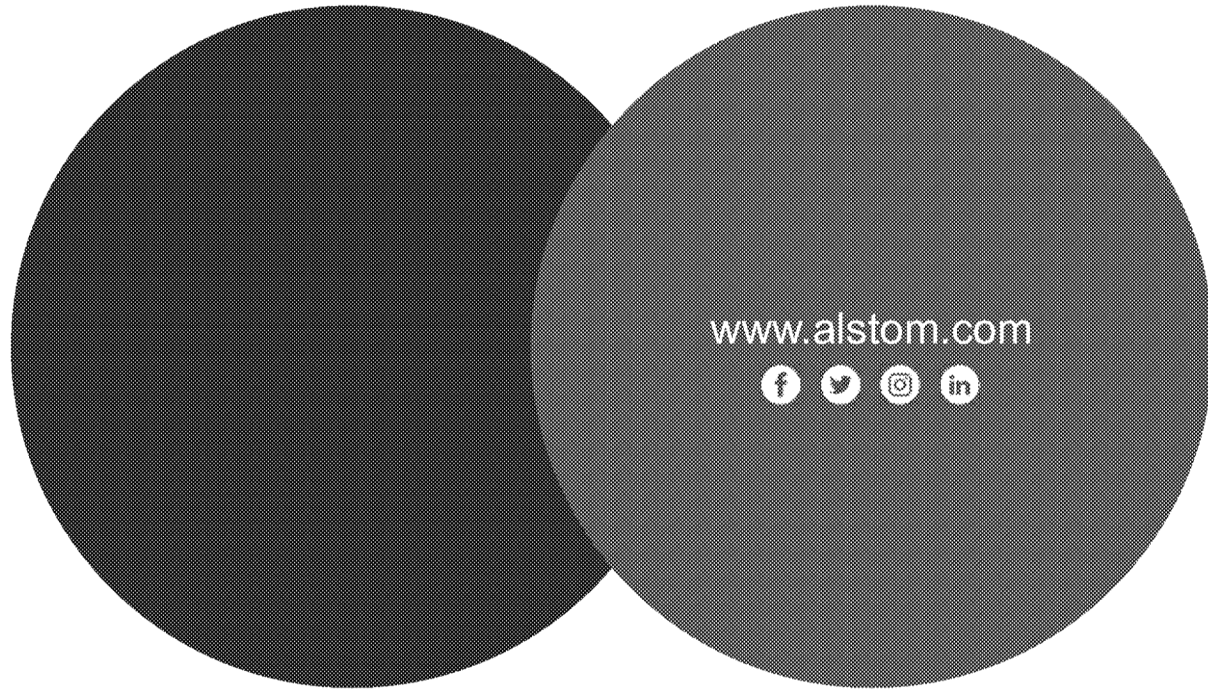


Coupler reliability figures

0 Event



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• mobility by nature •