AUCKLAND TRAMWAY SYSTEM OPERATIONS DURING POST-WAR YEARS

Presented by Laurie Everiss

INTRODUCTION: By John Wolf

Good afternoon everyone. Our first speaker this afternoon is Mr Laurie Everiss, former chief engineer with the Auckland Transport Board and Auckland Regional Authority. Laurie has been a tower of strength to us in our operation here and has helped steer us along the right path and, needless to say, ensured that we've maintained a high standard. Laurie is our inspecting engineer, appointed by the Government, to inspect our rolling stock, overhead and track work which is done on a regular basis. This afternoon, Laurie is going to give us a talk on our transport operations, from an engineers point of view, which will cover trams and buses.

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Thank you. During the war years, Auckland's trams travelled high mileages, carrying many millions of passengers. Maintenance materials were impossible to procure or were in very short supply. By war's end, rails were worn corrigated and some below the paving which were in poor condition. Tyres and suspensions were worn, allowing under gear which was also worn, to scrape on the roadway. I'll describe some of our problems and their solutions.

One difficulty was the fundamental difference between the workshop staff of skilled tradesmen working to precise measurements where time didn't appear to matter and the running depots where staff had the day to day problem of keeping enough trams serviceable to satisfy timetable demands and where time had already run out.

Axles and bearings were worn tapered and hot boxes were common. The ends of axles were built up by welding and then turned but this was very slow and because the full overhaul took several weeks, depots experienced an increase in problems. Depot staff made tapered hardwood blocks or used selected old bearings and installed these with coarse grinding paste and ran the tram to Pt Chevalier and back. New special tapered, white metal bearings were cast and then installed and Mobil Oil Company supplied a suitable oil to replace the cheap oil previously used. Within a short time, hot boxes became a thing of the past.

The rough state of the tracks caused a loss of the axle box covers which, being cast iron, were difficult to replace; so we made simple press metal covers which served their purpose at keeping the dirt out.

Another bearing problem was with motor suspension bearings which I think you suffer from here at MOTAT as well. During overhaul, the workshop staff fitted new bearings by bluing and scraping for a perfect fit. One trip in service caused the bearings to run hot, so the depot staff, who were used to measuring clearances with their fingers, prevailed on workshops to fit bearings with .004 - .005 clearance. That in itself took quite a while as it is difficult to convince tradesmen that near enough is good enough.

Brake gear was another badly worn area. Although hangers and other parts were being welded and re-machined, the wear on many trams caused the piston to come out the maximum travel of about 10 inches. By taking up the slack with the bar and measuring the distance to the equaliser, shorter shackles were made and fitted to bring the piston travel back to about 6 inches. The incidence of brake related accidents was very markedly reduced. EMB trams also suffered brake problems and the brake beams fell on the road. Derailment occurred when the front beam fell and was run over; usually at 5:00pm! When hangers wore badly, the spring on the hanger bolt was not strong enough to hold and the bolt broke. We removed the springs and used short bolts thus curing that problem. (This refers to the brake beam hanger links becoming supported on the bolts when the spring loaded ball and socket joints wore, resulting in bolt wear and eventual breakage).

Another major problem was axle box springs which weakened or broke, allowing the under gear to hit the road. Because suitable spring steel was in short supply, rubber buffers were tried out. The first experiment was with a large outer rubber and a higher inner core; the idea being that the higher central core would support low loads with heavy loads carried by the outer rubber. This experiment almost ended in disaster and everyone relaxed when the tram got back to the depot after a very slow journey. The combination of rubbers and rough tracks caused an alarming side to side oscilation which made the tram uncontrollable. Solid rubbers were successfully fitted and although their life was only about 2 years, they got us out of another problem area.

We had our fair share of electrical faults, and a common cure for a blown fuse was to use heavier wire until it stopped blowing, or screw up a circuit breaker to cure blowing. On 2 motor cars, 1 motor would throw solder while its "mate" would appear okay. Research showed the problem to be caused by weak fields in the apparently good motor. Over the years, insulation failure caused shorted coils and most faulty field coils rattled when shaken. Unfortunately, the depot staff didn't look kindly - its not a very pleasant job changing field coils. This fault, besides causing burnout of the motor carrying the extra workload, also caused failure and burning of reverse fingers and barrels due to the higher current draw off. Reverse barrels were patched with a specially made insulation filler but eventually it became necessary to make new barrels. We asked stores to purchase a suitable quantity of teak, but their idea of suitable resulted in the arrival of 2 huge balks of teak, enough to keep us in reverse barrels for hundreds of years.

A fully overhauled 2 motor tram also alerted us to another fault when the same motor burnt out twice for no apparent reason. Again the reason was found in the good motor. Brush holders were built up with welding and this had caused distortion resulting in the brush bridging too many segments. It was not possible to straighten the holder itself, so we made special wedges and inserted them during the fitting of the holders to square the brush with the commutator. Compressor armatures burnt out faster than they could be repaired and the electrical shop contained a mountain of them. We carried out an investigation to check on the fuses and we found that nearly always the current drawn was under 4½ amps. We took the fuses out and tried them out on our battery changer. Very few blew below 17 amps, a lot blew 17-20 amps and a lot of them we couldn't blow. (They carried 20 amps). The workshops made up special sealed 6 amp fuses and those were the only ones allowed to be fitted in the depots and our burnout problem disappeared.

Other problems causing the overload could then be repaired. With all our motor problems one could well ask why didn't the circuit breakers blow? We found that some could never blow due to wear, shorted coils or bad adjustment. (As one of the foremen of the depot said, "If you switched Arapuni to them, it wouldn't have blown!") We decided to cycle all the circuit breakers through the workshops and we set up equipment to test them and we were setting them at 600 amps. At first, we used a resistance bank but we found that heated up so much and the current was practically uncontrollable, so we made up a fairly simple carbon pile and from then on we set and sealed the circuit breakers; and again in the depots they had a lot of difficulty trying to stop the staff from breaking the seals and screwing the breakers up.

One of our more spectacular incidents occurred when an Indian woman, wearing a sari containing metal threads of decoration, boarded a tram and sat down. The motorman applied power and the sari disappeared in a sheet of flame, leaving a very frightened, but otherwise unhurt, woman. To find the reason, we checked the tram and others and found that she sat down in the only seat in the fleet which was earthed with a screw going through to the metal chassis; that the dress trailed over the only bolt in the floor holding a resistance that had lost its wooden covering plug; and that the resistance was the only one in the fleet in which the splash guard had been pushed back onto the grids. The resulting short circuit is called Murphy's Law.

Some trams had an annoying loud rumble from the trolley wheels. We found that the casting core had slipped and they were out of balance so when we machined them, as well as drilling and turning the outside, we also had to turn the core and that stopped the noise.

At the railway station, a motorman stopped a tram and left the brake lever on the lap position without releasing the brakes. While he was putting the rear pole up the tram ran back onto the tram behind, resulting in the loss of his leg. The stop light wires had rubbed and burnt a hole through the airpipe.

Collisions could occur even with good brakes. One morning a tram stopped on the straight and level at the Blind Institute in Parnell. The next tram braked normally but slammed into the first; the third tram came along and braked normally but slammed into the other two resulting in very considerable damage. A truck carrying sulphur from the wharves had spilled some on the rails and we found that that made a perfect lubricant of steel on steel.

Now a word on Auckland's only regenerative tram car 253 which was known as the Queen Mary and is now here at MOTAT. Unlike other trams, moving the control handle backwards pushed power back to the overhead and gave good electrical braking. Unfortunately, that same feature caused other problems. Most of our system was supplied from rectifiers which don't like power back. The tram was very hard on lightbulbs and although an over-voltage relay operated to bring a resistance into the light circuit, we could never make it operate fast enough. In later years, wear on the electro-neumatic contractors and the complicated control circuit caused maintenance problems and these, coupled with the limited routes and inexperienced motormen, resulted in conversion back to conventional equipment.

From time to time we have motor cars stolen; we lose buses from depots but have any of you ever lost a tram car? We did one day! The depot check showed one missing. They checked with other depots; they checked with the workshops; they checked on the road; they checked everywhere a tram could be. They checked at the tram termini to see if the tram had run away. The tram couldn't be found until somebody had the bright idea of counting how many trams we had and we had the right number. It turned out the tram had

gone to the workshops for a full overhaul and repaint and somebody had painted the wrong number on it!

I'll close with a few incidents involving our bus fleet.

A trolley bus, one morning, lost a pole on the corner approaching the Pt Chevalier turning circle which was supported by wooden poles. The clip on the rope hooked the trolley wire and when it reached the next span the overhead became a giant crossbow. The trolley pole broke and the length of several feet shot about a hundred feet and buried itself into the roadway outside a shop. The owner told us that her daughter always parked her car there but this particular morning she had rung up saying she had the flu and she wouldn't be coming into work.

Operators sometimes held their trolleybuses on the power pedal at the top of Queen Street. One morning an overheated resistance set fire to the floor and somebody called the fire brigade. The firemen got stuck in with axes and chopped the floor to pieces - its not so much fun to squirt a hose underneath.

A petrol bus was going into service one hot summer afternoon with all the windows open and fortunately, no passengers. As it passed a tar sprayer at roadworks, the hose burst and sprayed the inside of the bus with tar. It was a case of all hands with buckets of kerosene and rags to clean the stuff off before it dried. In those days everybody got stuck in; nobody wanted extra payments - dirt money, etc.

Another time a diesel was going along Karangahape Road and a van came out of a side entrance and stopped to give way to it. What nobody noticed was the van had a metal rod mounted on the roof which was protruding into the roadway and the rod hit the pillars of the bus and broke every window along the side.

"LEYLANDS" - Sometimes an operator would leave his bus in a hurry, push his stop button and let go just before the engine stopped. The engine could kick over backwards and take off. The vacuum governor was no longer effective having no vacuum; the rack was in the excess fuel position for restarting so the oil cleaner became the exhaust, and it blasted all the oil out of the cleaner onto the engine. The whole bus would become enveloped in smoke and the noise! If any of you have ever heard an engine running away its rather a terrifying sound. One of the drivers did it in the depot one day coming off duty. He got out of his bus and took off and beat all olympic records down the depot. The secret is to hold your finger on the button until the engine stopped.

An operator rang the dispatcher one day wanting another bus and he said the engine's out. The front engine mount had broken and dropped the engine on the road and when the breakdown wagon got there the engine was still merrily ticking over.

We now have a generation in New Zealand whose only opportunity to see trams and trolleybuses is at Museums such as yours where so much dedicated service keeps them in running order. I wish you all well for the future.

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