

Raymond Dickfos

Date of Interview: 2008

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Assisted by Bevan Kathage



My name is Raymond Dickfos and I did my apprenticeship as an electrician in the railway. I got a job at Aberdare Colliery in 1956 as an electrician (Aberdare No. 8). I also worked as needed at Aberdare No. 9 Whitwood shaft and Whitwood tunnel.

It was near where the Bundamba High School is now. It was just hand pick and shovel work for the men. Brian Barrett was the Chief Electrician there. Bobby Lewis, who is recently deceased, was the tradesman. Arthur Henderson was an apprentice. In amongst that I had to travel up to the Bluff in Central Queensland a few times where they had a small mine. I did a bit of routine maintenance and testing as required by the Mining Act.

While I was at Bundamba they had haulages to take the coal up to the surface in pick and shovel days but we were the first mine in Queensland to take the 11,000 volt cables underground (when SEQEB began to use 11,000 volts in the area). Box Flat had preceded that with 5000 volts which was the distribution voltage around the area from the power source, until it was upgraded. Aberdare was the first one with lead covered cables, steel wire armoured. Some of the

transformers were on skids in those days. The working voltage for haulages and pumps was 415 volts.

In 1962 I was retrenched from there but luckily I was able to get a mining job as an electrician at Tivoli mines at Haigmoor next to the Abermain (at Tivoli) power station. Their coal used to go direct (some of it) to that power station and the rest of it went by river barge to Brisbane. They had a continuous miner which was mechanised mining. They had one at that time.

In 1965 I came across to Southern Cross collieries at Swanbank. I had been studying for my Mine Electrician's ticket and I got a job there. Beres Evans' father was in charge at the time and he had a couple of years to go before he retired. When he retired I got his job. Beres was the Manager by then. He had been trained as an electrician in his earlier days. Southern Cross went fully mechanised in the time I was there. From pick and shovel to conveyor belts. There was one mine they couldn't get a conveyor belt in – they did eventually get it all the way to the surface. In the early days they had a self-tipping carriage to pull the coal up from the belts underground.

It was called an alligator. It used to haul up a wide gauge – I think about 5 and a half ton from memory and then it would tip into a surge bin about 50 ton capacity.

Interviewer: Was it the only one in the area?

Bevan Kathage: No. Box Flat had one at No 7 and no 5 might have had one in the early days but they replaced it with a belt. But they were the only ones.

They had a common boundary with Box Flat each side as it turned out. When we got the first continuous miner they basically put me in charge at the three Southern Cross mines – no. 9, 10, and 11. The other two were at the other side. This is where the first continuous miner went down. They ended up with a conveyor belt all the way to the surface. There was a 500 ton surge bin on the surface. It came by coal contractor's trucks to no 10 side where the washing plant was and then went by conveyor belt to the power station. Originally, before the power station was built, it went by rail to Bundamba, loaded in railway carriages.

From there it went to the Brisbane power stations. There was no export in those days.

Bevan Kathage: New Farm, Tennyson (although this was largely supplied via the river) and then down to Bulimba.

I started in 1965 and Swanbank power station was well on the way then. We were still sending coal by wagon to Brisbane.

Bevan Kathage: I was at Box Flat then for 16 weeks and I am sure they were building it then. A bloke got blown off the roof with a sheet of iron as he was putting the roof on.

Interviewer: What qualifications did you get at the railway?

Just an electrical fitter and electrical mechanic. Later I spent 3 years part time at the

Technical College to become a Mining Electrical Engineer and get an industrial electricians certificate.

Interviewer: That involves practical and theoretical work?

Yes until we had too many tradesmen and then I was banned from using tools. We had a fight over that.

Three mines working 3 shifts a day. We had about ten tradesmen and a couple of apprentices. We did repair work on cables. Even for New Hope our neighbours. In the early days we used to join the cables as Swanbank Driveway Engineering and Repairs had a method to joining cables. They used to weld the power chords. We'd send them down to get that done and then we'd vulcanise around it. After a period of time it evolved to join each strand of cable over a distance like that. Each join of each phase, which carried the three phase power, would be that thick in the mining cables. They would probably have about 20 odd different bunches of seven strands or something. They were joined individually so they wouldn't break when they were flexed. That was the trouble with the butt welded ones in the early days.

They would break because of the flexibility. The shuttle cars that took the coal from the continuous miners to the end of the conveyor belt they used to spool their cables up. They used to be a couple of hundred yards long and they used to spool up on board. They were anchored up at a point that they would drive past and then they would spool out again. It was pretty hard on the cables. It was hydraulically driven to spool it on. Those machines took a bit of maintenance. It was all flame proof equipment of course near the coal face. It was all heavy. It took a lot of maintenance and care.

Interviewer: When the continuous miner came in did you get extra training or do you learn on the job?

The companies that sold them were helpful. You'd probably get a trip to their plant where they assembled them – not always.

Then there was another course that you did in your own time at the Technical College in town.

Bevan Kathage: All that equipment was imported from America. It was a different voltage to start with.

When Southern Cross closed down in 1987 I got a job at New Hope on dog watch under their electrician there, Peter Hardie. He was the Chief Electrician there.

When Southern Cross closed down they open cut all the entrances to the mines. That kept me going and I started using some of the equipment from those mines on the washing plant they were building out a Jeebropilly. I took a switch board. I had something to do with that plant.

In 1988-9 I ended up at New Hope (retrenched). I got a job back down at Aberdare where I started.

Aberdare was closing down and it as a gradual process. I was there. The electrical staff that they needed went out to their open cut mine at Jeebropilly. It was supposed to be 18 months to 2 years but I was there 3 ¼ years. That was the last of it. They were washing some coal from the last of the open cuts at Dinmore.

There was no production just washing to get the coal to a saleable item. Gradually that died out and I finished in 1992 after the washing plant was dismantled and sold at auction.

I retired, although not quite retirement age but I had a phone call from up north “so do you want a job or don't you?” It must have been on records that I needed a job.

The industry was good to me. I put quite a few years in. The worst part was getting retrenched 2 weeks after getting back from our honeymoon.

They took me back later. It was all for the good as I got experience with the new mining equipment. My son was able to get an apprenticeship in the area in the New Hope/Southern Cross Group at Tivoli which was combined then. They'd moved their apprenticeships around a bit between the three different companies.

My son was a third generation miner. My father worked in the Rosewood area. Pick and shovel of course. In 1926 he was in the Rosewood area until it was flooded. He was at Oakleigh, Westfalen, the Bluff – all mines in the area.

In 1942 as part of the war effort two train loads of miners from this area went to Collinsville. There was state mine up there that was productive and it was closer to the area that the coal was needed at Bowen. We lived in huts at Collinsville but they were reasonable for the time. They had masonite walls and no lining inside. They had a kitchen dining room and two bedrooms and bathroom and outside toilet.

We didn't quite make it to the end of the war because Mum started to have kidney problems. So in 1945 until 1947 he worked at Rosewood.

Bevan Kathage: It was organised by the government. You were a volunteer but there wasn't much choice.

A lot went up there. There were 72 huts on our side of the road and then there were a few on the other side of the road out to Collinsville and then there were single men's quarters as well. They were close to the mine so they just had to walk to work.

Interviewer: The Tivoli mines got a continuous miner in 1962. Was it an early one?

Bevan Kathage: No the first one was at Box Flat in 1960. The second was at New Hope.

They were bigger and better as time went on. They started off with 50 horse power motors with three motors. Then they went to 90. Some of those were second hand. Then 150 horse power.

Interviewer: They all came from the States? How long had they been using them there?

About 6 came to the country in about 1954/55. One actually came from Tasmania – well it ended up in Tasmania - one of the original batch of 6. That style of continuous miner is different. They were a joy machine and they were first. They had probably been using them soon after the end of the war.

Interviewer: It would have been a huge investment of capital to bring them in?

Bevan Kathage: It was beyond the family companies of Ipswich to buy continuous miners. A lot of that was funded through the coal board and the coal board got its money back at \times shillings per ton on the coal that was produced.

I can't tell you what the price was then but in 1975 we bought a 48 HD Norse. The original price was 1/2 million dollars and we ended up paying a million dollars for it. The worst part was that the Noyes Brothers didn't tell us the price had gone up and just presented us with the invoice. I just refused to pay it. That is when inflation took off when Gough Whitlam was in charge. Today an ABM 25 machine is \$6 million – just the machine.

Interviewer: When you say that is just the machine what other equipment do you need?

Bevan Kathage: Two shuttle cars, transformer, cables. Today a shuttle car is about \$600,000. Then it might have been \$150,000. We were getting \$25 per ton for

coal. That was not shillings. A big expenditure. Remember that any mines that had been established had very small roadways. These machines couldn't get down them.

Interviewer: There must have been some mines that couldn't accommodate them.

Bevan Kathage: They couldn't. Tunnels and shafts were very small. They couldn't compete and in the early 1960s. There were closures. There was a step that Ray has not mentioned. You went from pick and shovel to what I call conventional which is cutters, loaders and shuttle cars and then the continuous miner replaced the cutter and loader.

Interviewer: What did electricians do in the conventional step?

By the time that came in we had to take the high voltage cables underground and have transformers underground which you didn't need with pick and shovel. They used compressed air in the early days for their drilling machines. They did it by hand. They used horses to drag the wagons in and they had haulage on the surface to pull the wagons up. As time went on we took a conveyor down on the bigger productions. These were low voltage cables and big transformers down there. There was too much voltage lost in low voltage cables. 11,000 volts became the main. You had to take big transformers down there to convert it to 415 volts for the machinery. The continuous miners used more power than conventional mining. I forget the horse power of the coal cutters.

Bevan Kathage: There were two different types of coal cutter. One was the Joy machine which was four rubber tyres and a bar out the front which you could swivel around and twist around. That used to cut about 6 inches and cut its way across from one side of the board to the other and cut a slot. This varied from seam to seam but usually about 3 foot 6 inch to 4 feet off the floor in the thicker seams. The depth of the cut would be about 8 or 9 feet. It would cut across. They would sometimes put a vertical slot in as well down

towards the floor. It didn't happen in this order but then the blokes would drill the face with their hand held drilling machines, the scroll bit. It had a tip on it and it would go about 6 feet. Then they would charge the holes and blow it. Down it would come and they would bring in the loader. This was usually a gathering arm loader with two gathering arms. Track mounted with two gathering arms on the front which would drag the coal across the shuttle and on to the conveyer chain. In many cases it would be put on the shuttle car. That was the conventional method.

The shuttle car carried about 10 ton.

Bevan Kathage: The Joy machine was the American equivalent but the other cutter was an Anderson Boys, an AB cutter. It was track mounted. The beauty was that it was tack mounted and it didn't move as much as the rubber tyre cutter. This wasn't dead level ground and it was rough and steep. You needed a machine that stayed there and didn't slide back because if you put the cutter bar in it would want to push the machine back.

Interviewer: It was wet too?

Bevan Kathage: Not up hill. It used to drain in. But generally the mines around here weren't wet. I have seen a lot wetter. They were damp but not wet. Some of the pits in Newcastle that went under the ocean, they were working in water up to their knees. That is the background to conventional.

Conventional started in the mid to late 1950s and probably the last conventional pits were 1970. The continuous miners took over.

They did the best they could with what they had is really what it amounted to. The other beauty about the continuous miner as opposed to conventional mining was that conventional mining used about 10 or 11 blokes. A miner would be 7 or 8 so you saved manpower.

Interviewer: So you get a decreasing number of men underground with each phase?

When you change from hand mining you get more tradesmen in the mines.

Interviewer: Did you see more electricians employed by the end of your career?

I had about 11 electricians at one time? We had three mines and did the repair work for New Hope as well.

Bevan Kathage: There were usually more fitters.

Interviewer: So is an electrician underground?

Bevan Kathage: Usually in the cren. As we got further from the surface and more mechanised.

Time was money and if you weren't producing you weren't making any money. Neither were the blokes actually. They got paid wages but they did not get bonus. The aim of the game was always to be productive.

Interviewer: I was told that by the end the dog watch was also for production not just for maintenance. Is that too general?

Bevan Kathage: It was horses for courses. I can tell you mines that never did any maintenance. We did our maintenance when we had to.

If it broke down you fixed it and did something else but you were constrained by the system. The system meant that you had to advance the roadways, drive the cut throughs, move the belts and transformer forward. That was usually at least a shift. It would be done on dog watch. So you always had this interruption to the process caused by having to bring your services forward. Then you had to stone dust.

At Southern Cross we did electrical routine maintenance on a three monthly basis of all underground machines and equipment and employed SEQEB to do testing of all 11,000 volt equipment cables. Every dog watch.

Bevan Kathage: At the completion of production for a day. So you had to stone dust a board usually on dog

watch. So there were interruptions. So to say they produced on dog watch the answer is probably yes, but they had to do all these other things as well.

Sometimes we had to shift the phone in. We had a phone underground and I could ring from my house phone in Wollongong and take to a Deputy underground at Camira, 7 miles in. That was before mobiles. That was 1968.

Bevan Kathage: It was illegal.

We started off with old wooden phones second hand from the PMG. Then when we got down deeper there was a worry with gas. We had to get a system that was intrinsically safe that wouldn't have enough voltage to cause a gas explosion. That meant a complete rehash with automark switch boards on the surface and special phones. There were phone cables running here and there. At every transfer point on the belt you would have a phone. Every haulage underground you would have a phone. It was to keep production more productive and more efficient.

Bevan Kathage: It has gone further now so they have pagers underground. They can get text messages.

They also had tea urns. We didn't eat underground because we were visitors really but the crew ate underground.

They weren't all working the same time. When the miner would stop the timberman would come in and put up timber or something like that. A tradesman would get a chance to move a borer box in. A hand held borer was used to bore the face in.

Interviewer: What is a borer box?

A borer box would bring the voltage down from 415 to 110. The borer would have a cable. The borer was used for roof support and to bore the coal face to use explosive in the early days before roof bolting machines

which were mobile and 415 volt trailing cables.

Bevan Kathage: There were other methods like hydraulic rigs on the machines but these were more sophisticated.

Interviewer: Was there a big variation between mines and mining companies?

Time wise the first mechanisation was at Box Flat and other people caught up. At Southern Cross they had three pick and shovel mines. They put the shuttle cars and loaders in one at a time. Being a private company they couldn't afford to it in one go.

Bevan Kathage: They were all family companies that had grown up in their own way. There were the Walkers at Aberdare, Viv Walker at Haignmoor and Derek Cribb at Southern Cross. In the 1970s investment companies moved into the area. New Hope was part of Washington Soul. Bundaberg Sugar bought Rhondda. It became a different ball park again. Prior to that they were all private family companies.

People ended up having a fierce loyalty not to the company but to the family. You never said you worked at Westfalen you worked for the Kathages. They worked for Bob McQueen not Box Flat.

At Southern Cross it was Andrew Wright. He had daughters. One married Derek Cribb. One married a Foote of Cribb and Foote. That was the class of people they were.

Bevan Kathage: Andy Wright – two of his sons drowned at Eclipse in the 1893 floods. That is why Andy never had sons to pass it on. We ended up open cutting in the 1980s. Derek never would open cut that piece of ground because it had the family attachment. They got the bodies but Derek would never touch it. We didn't have any qualms. I don't mean to be disrespectful but we had a different arrangement. It was the source of a lot of problems anyway because it was behind the Tivoli School and there were a lot of openings. We had awful trouble getting the mining

lease to open cut it. When we did it we made an oval for the school and that took the heat off from them and we mined the rest of it. Everyone was pleased. We made a buck out of it. I don't deny that. It got rid of a hazard.

One of my last jobs at New Hope was selling off the Haigmoor washing plant. There was a fitter and me out there. A private mob bought it and they sold all the stuff. Some went out to Texas, Queensland, to mine for gold. The bins were scrapped. Anything that New Hope needed they took.

Bevan Kathage: Around here, people reused whatever they had to spend their money to buy something else. It doesn't happen in big companies. It's old, get rid of it. Put something new in its place. Here we reused, reused and reused. It was all part of the cycle of doing business.

Interviewer: With the open cut, what resources are required?

Not as many electricians are required that's for sure. We didn't really supply electricians except for lighting.

Bevan Kathage: Earth movers. Drill rig, shot firer, loader operator and truck driver. They move the spoil, dig the coal and they take the coal up to a pad. The coal is drawn off the pad, through the prep plant and then processed. The coal goes to market and the reject is sent back to the void and helps backfill the void before the dozers are used to put the topsoil back over it and restore it

The truck drivers associated with Southern Cross were private contractors. They carried coal from one side to the power station where 9 and 11 mines were and then to the other side to 12 and 14 which were just small mines and come into the washing plant, this side of the power station..

Interviewer: Did you work the same hours as the miners?

Basically if needed. In the early days there was no need to be an electrician on the dog watch shift. As they got busier they needed an electrician to do more than one mine in the group. Otherwise you had electricians on the surface. We were paid on production not on efficiently or company profit.

Interviewer: Same formula across the mines?

Bevan Kathage: The same across a mine, not from mine to mine.

Not the same between companies and each one had to be fought for.

Bevan Kathage: Or resisted. Negotiated might be the word. You were always on call. 24 hours a day.

For sure. It was a bugger when there wasn't anyone on dogwatch in the early days.

Interviewer: And you did get called?

We could be called on three or four times a month. That's only on night shift. It was different on contract days because they only had to work one shift. Then they went to two shifts, then three shifts.

Bevan Kathage: You could be called in the middle of the night. In those days the mines were out in the bush. The road system was not good. You had to drive and know where you were going at night time to get there. They were not lit up and in the night some of them were hard to find.

In my case it wasn't too bad. I was at Swanbank as I wasn't in charge at Jeebropilly. At Aberdare there wasn't too much going on. If they had an electrician there he would try to fix it first but if he couldn't he'd send for the Chief Electrician for help.

Interviewer: Some of the Rosewood mines would be remote.

Bevan Kathage: Mechanisation didn't really go into Rosewood. Norm Rule had a continuous miner but that was about the only one.

Normanton had the little short wall. Did you ever go down there? What a sensation! The seam was 2'6" high and when I was studying for my mine electrician's ticket they took us up there to have a look because it was different. It was 50 metres long and they had a coal cutter similar to what Bevan explained before but it only cut in a few feet and it slid on the floor. It was self-propelled. It pulled the chain and bar across and the men blew it down and they lay on their sides with explosives and shovelled it. It was claustrophobic. As you move your props along the roof falls in. So you are in a narrow area with coal here and a conveyor and 5 or 7 men lying on their sides shovelling coal I don't know how they did it!

Most of the Rosewood seam was 4 or 5 feet. The Bluff seam at Southern Cross, Swanbank, was 28 feet, something like that.

Bevan Kathage: Westfalen No 3 got to 59 feet. They mined 59 feet. The seam was that thick.

There was an anticline. All the seams from here went down that way, as you went to Swanbank they went another way and they changed again.

Bevan Kathage: Rhondda No 5 went down and came back through faults and came up through Blackstone.

Behind Bremer High School there are two concrete blocks but they couldn't get into it. That's the Grange. It was too steep for the shaft. They tried to sink it but pulled out.

The first mines were down at Redbank in the side of the riverbank in 1843. The one that they had city view came down to the east and came up near Kerner's butcher shop on Warwick Road. They got that far. It was pretty steep. 1 in 3. It was Aberdare and fiery. They ended up losing it because of fires. They had the

Extended down here. It went underneath Raceview School and got us far as Thornton Street.

Interviewer: Can you explain fiery?

Bevan Kathage: All coal naturally oxidizes in the air. Oxidation produces heat. Some coal is more prone to oxidation than others. If you can't take the heat that is generated as the rate at which it is generated it heats up and gets hotter and the rate of oxidation increases and it breaks out into what is called a spon, com. event.

It can vary from seam to seam and we now know it can vary across one lease even in one seam.

You can only manage it if you know what is going on which means you have to have very good detection systems. Once it has started you can't put it out and you have to smother it by denying it oxygen and that is usually the process of sealing it off or flooding it with nitrogen or some inert gas.

The Bluff seam at Southern Cross it had a heating problem. When I started there it was still using pick and shovel. They didn't get all they wanted there. They had to pull out and seal the mine.

Bevan Kathage: North Ipswich seams were fiery and one of them was known as The Fiery. Not sure which one it was. In the Bundamba area it seems it is the upper seam – The Aberdare and The Bluff- that are the most fiery. They were low ash and very fine vitronetic coal. That may well be part of the cause. I don't know.

Interviewer: Does the low ash make it better coal?

Bevan Kathage: Yes. It doesn't follow. But without going too far into the detail we know if the virgin rock temperature is less than 25 degrees you won't have a spon com event. This means most seams north of Redbank Plains are probably liable to spon-com events. If you leave more than 2 metres in the room you could get a spon com event as it collapses and oxidizes. So you should take as much of the coal seam as possible. They are the sorts of things we are finding out about now.

I work for the Coal Associations' research program and we are on the cutting edge of some of that. We know things now that we didn't 5 years ago. Even though people like to talk about explosions, explosions are the result of an ignition. A spark has ignited a gaseous mixture and away it goes. Spon Com is a much more insidious problem and can lead to ignitions like Box Flat and Kianga and probably Moura No 2. Kianga is the southern end of the Moura Basin. It blew in 1975.

Interviewer: What was the detection equipment?

Bevan Kathage: Smell. We used to use smell but it is too late once you can smell it. In the early days we used to use a draga hand tube with a glass file into the end of it. You suck the air through it, a given amount. We used a co tube. An increase in the carbon monoxide was an indication that the chances of a spon com were increasing. You ignored it at your peril.

Interviewer: Was this something the mines inspectors checked?

Bevan Kathage: No. These things happened. We lost New Hope No 5 in April 1979 with a spon com event. Where we normally tested it, it was 7 parts per million and on Monday afternoon Jimbuck Lawrie, the manager, detected 9 parts. That was the indicator. He went down into the pit and found where the problem was. That happened over the weekend. We lost a mine but we didn't lose any men. No one was injured. We didn't even have to put anyone off. That was a major effort, I thought. We had 250 men at the time. We didn't make a profit for a long time.

You know a little about the safety lights they used. That's Bevan's department.

Bevan Kathage: Originally the men had carbide lights. When they adjusted a flow of water into a poulder, it produced acetylene gas. That's all the light they had. Before that they had candles on their hats and that was all the light they had. From there they went to battery powered cap lamps and moved from the cloth hat to a harder (not plastic) helmet. In amongst that there was the Davey light which was the forerunner of the oil-flamed safety light. That was the devise that is

used to detect gas. Without getting into the detail, it was protected by gauzes which meant if you walked into a high methane concentration the light would flare up through the gauze but would not go outside the gauze and would snuff out the ignition. That is what we thought until Moura No 4 which the oil light ignited the gas. That is a story in itself. Those oil lights and their various models were invented by Davey in about 1850 and they were finally taken out of all mines in Queensland in 1987. They got to be quite sophisticated. You could take samples and squeeze it in a little tube. What you had to do was turn the wick down and the flame would reduce and then you injected the methane and there would be a cap formed on top of the flame and the size of the cap indicated the approximate percentage of methane.

I met an old under manager at Aberdare North and he didn't like what was going on so he went down and I went with him because I was the new bloke in the pit. He took a sample and he reckoned he found 1/2 percent of methane from the light. Of course we had never had gas in the pit.

He had worked there all his life. He was about 65. All the blokes were like that. Not all the Ipswich pits were gassy. In my experience though once we found gas all the men looked for it. They were extra careful. They were aware but after it was found it went to another level.

Interviewer: What haven't we covered?

Bevan Kathage: It never went to 4 shifts as it did in NSW. It ran for 24 hours.

It ran for 24 hours here on 3 shifts.

Bevan Kathage: 7 to 3, 1 to 8, and it was an hour run to get in.

Interviewer: How long was it for some of them to get in here?

Bevan Kathage: About 40 minutes. It was difficult in some of these pits as some were very steep, One in 5 or 1 in 6, 8 or 9 degrees. At Camira it was dead flat. New Hope No. 6, 1 to 2 and a half was so steep we had trouble running shuttle cars up the hill. That was

probably the steepest. No 9 you had to uphill and round a corner.

They didn't think they could get a conveyor belt up there.

Interviewer: How did they?

You change you conveyor belts, one tips on to the other. That was the main tunnel. That was a steel chord – that was a monster. 250 horse power motor. 3 foot wide. That as the main one to the surface.

Bevan Kathage: You need the coal to stick to the conveyor surface. You can get it to stay if you change the surface material. You can help it to stick if you load it correctly at the boot end. You don't just load it going up hill, you try and get it as flat as you can before going up the hill. We used to put bars on the delivery on the side so the fine coal would go on first and the lumps would go on and stick to the fine coal. Tricks of the trade.

Because it was a steel chord it didn't go down into the rollers as much because they were more flexible. It was a very heavy thing.

Bevan Kathage: We had a steel chord in No 6 tunnel and it had a horizontal curve in it as well. That was 1978. People these days can't remember these things.

I hadn't heard of that. How many degrees?

Bevan Kathage: 15 to 20 degrees in the angle. It was done by tilting the anglers and making the belt to maintain its position as it went t round the curve. The chord was 800 or 900 metres long.

You had 2 or 3 more belts further in and then at right angles.

Interviewer: Did safety impact on your work?

We had tested flame proof equipment and they had to be maintained that way. Surfaces that came together had to be tight and there could be no dirt between them. All the bolts

had to have an allen key. You couldn't use an ordinary spanner for safety reasons. Transformers had to be kept more than 100 metres from the face. The stale air was sucked out by a fan of 150 horse power or so. 8 foot in diameter. All pumps were flame proof.

Bevan Kathage: The other change that happened was the wide spread use of diesel vehicles which replaced rope haulages. Rope haulages were replaced by Joy scout cars and similar vehicles to get men and materials into the mines.

The other change was chain conveyors up at Rosewood.

Bevan Kathage: We had chain conveyors at Dinmore. We had a calf dozen to push the material along the chain. I think generally it could be said that people around here were pretty innovative. Taking what they had and putting it to good use. They didn't have the capital to go and buy the biggest, greatest and newest.

The hand borers would go into the coal and they would wind it. In my dad's day they had a breast plate ion it that they had to push with their chest to get more purchase. They paid for their own explosives as they were on contract. They modified something that was used in the railways on sleepers.

When I started at Aberdare Collieries, one of the mines, Whitwood shaft, used their coal in a steam boiler to power the steam engine on the surface to drive the haulage to lift the wooden coal wagons up to the vertical shaft. The wagons were then hauled about 100 -150 metres by horses to be hand picked for stones etc and loaded into railway wagons. This is the area where the coal washing plant was eventually built and washed the coal from all of Aberdare mines at the time.

The steam engine was also used to generate DC electricity used on surface and underground for haulage of the coal etc.

We installed 11,000 volt switch gear and transformers etc to convert the AC power when it became available in the area, and removed the old DC power from the underground mine.