

## A Small Encounter with Coal Dust and Fly Ash

by T.K. Purushothaman

In 1979, I was given a new assignment away from Bombay (now Mumbai). My area of work was near my residence in Kalyan, India. I had to carry out routine maintenance and attend breakdowns of about 55 lifts with the help of an assistant. One of the major repair jobs that came up at this time was a Unit Multi Voltage goods/passenger lift. It was in a thermal power station of a semi-government organization. It had been commissioned four years before but kept idle after being only used for a few months.

This unit had a lot of damage. The controller parts, floor selector, generator brushes and even landing doors were damaged. The customer took more than a year to approve the quotation. As soon as the materials reached the site, I planned the work, for which I was supposed to go alone to carry out. The client was to provide the extra manpower. I met the engineer and arranged the work team. They gave me about six people – four temporary people for cleaning work, one semi skilled, one skilled and one supervisor. The team was much bigger than the requirement, but since they did not have any elevator experience, I had to do almost everything except cleaning. I had accommodation in their guest house, about two km from the power house. So, I was relieved from the trouble of finding lodging in the city (15 km away) and subsequent traveling to the site. I used to contact the superintendent at least every other day to give a report of the work.

I started the work with the cleaning of the machine room. The conveyor belt that carried coal power to the boiler passed right above the machine room. Most windows of the enclosure through which the conveyor passed had broken glass panes. There was always a heavy wind, so coal dust used to fall as though it were raining. Cleaning was a big problem there. The one big advantage was that the workers brought a pipe connected to an air compressor to every floor and the machine room. So, I could clean the controller and generator thoroughly whenever I worked in the machine room. It took more than two days to clean the machine room and pit. As soon as the machine room was cleaned, I started my work. The AC motor, generator and lift motor were overhauled, and I renewed the lubricants in the motor/generator bearing and gearbox.

Next, the motor and generator brushes were replaced and adjusted. After that, I replaced the broken controller parts and adjusted the contacts. When I started the motor/generator, I found that the correct voltage was not reaching the motor end. In those days, mostly aluminum wires were used for wiring as there was a shortage of copper. The low-voltage, high-current cables and joints inside were made of aluminum, so there was a lot of voltage dropping within the circuit. I received copper cables and other cable fittings and tools from the customer. The supervisor with me was a union

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leader, so there was no problem getting tools or material from any department.

After the aluminum wires were replaced, the proper voltage was available at the motor side. I decoupled the selector and tried to start the lift in slow speed. After some trouble, I succeeded, but only after bypassing almost all safety circuits. Somehow, I took the lift to the top floor. The car top was completely covered with coal dust. I got the car top cleaned and put the safeties in the circuit. Since the landing doors were damaged, I could run the lift in slow speed only after bypassing the landing-door circuit. Then I got the hoistway cleaned. That was another big task for the casual laborers. Since the landing door was bypassed, I couldn't allow the laborers to work alone. They were not used to such work. So, I ran the lift from the car top, eating and breathing the coal dust. The shaft was made of steel and covered with corrugated, galvanized iron sheets at the time of construction. Later, these were replaced with mild steel plates to reduce the dust problem. Still, a lot of dust collected on the steel beams, angles, door sill, door header, etc., inside the shaft.

I then started with the landing doors. Removal of landing-door shorting was very important. Some of the

doors were damaged willfully. Luckily, the door panels were not damaged. Most of the guide shoes were damaged and out of the sills. Some air cords were broken.

After putting the doors in circuit, I shifted to the limit and pit switches. After replacing some contacts, levers and conduits, I managed to put all the switches in circuit. Then, I took the floor selector work in hand. Almost all the contacts and cams were broken. Floor readings were painted on the selector, so I used the same readings to adjust the floor levels instead of taking new ones. Finally, I put the lift in fast speed. Here, I noticed that the speed of the lift was less than the rated speed. When I talked to the engineer, he told me not to worry about it, as they had another lift traveling at 1 mps. Since this one was running faster than that, they were happy. After making all the adjustments, I put the lift in normal working order.

It took about 45 days to finish the work, though it could have been finished much sooner. The people at the plant were very lazy and easygoing in their ways. Their reporting time was 8:30 a.m., but nobody turned up before 10:30 a.m. — after tea time. 12:00-1:00 p.m. was their lunchtime. Before 12:00, they would be at the gate with their motorbikes started. As soon as the gate opened,

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there would be a rush of bikes speeding out as though on a rally. Even though they returned at 1:00 p.m., they would not get back to work until after tea, which was at 3:00 p.m. Until then, they would just hang around. In the evening, they would again be at the gate before 5:00 p.m., ready to leave. I had to manage with whatever work was completed in between.

After putting the lift in observation for two days, I took the engineers to show them the lift in operation. There were about 10 of them, all asking different questions. Some questions were genuine, but some were silly. After the junior-level engineers' turn, it was that of the senior engineers and top bosses. It was easy to answer their questions and convince them. As soon as I got the completion acceptance, I returned to the head office and was soon back to my routine work.

Within a year, I was again on a similar type of assignment. The lift belonged to the same client but at a distant site. Even though the lift was of the same type, the volume of work was much bigger. This site had a waterproofing problem in the pit and at the lowest landing, so the client wanted to remove the lowest floor.

I made an assessment of the work that would need to be done. First, I would have to take out such pit equipment as the idler pulley and spring buffers to the pit level from the second-lowest landing. Then, I had to shorten the main ropes and cables. The client also wanted to replace all wiring with copper wires.

I had to repeat almost all of the work I had done at the previous site. The number of people in the team was sufficient, but the speed of their work was the same as at the previous site. The day I started the work was the worst day of my life. I asked the team to get the machine room cleaned. All the arrangements for cleaning were done as at the previous site. So, I didn't go to the machine room. The team went to the machine room to start the cleaning work, where there was a big fan with filters fixed on the wall to pressurize it. They switched on the fan so that the dust would be blown off. Since the lift was not in working condition, no responsible person went to the machine room to check the fan. The fan was fitted wrong, and the leaf was loose. While they were doing their work, the leaf came out and hit one of them. It was a heavy fan, with a diameter of about 1.5 m. The leaves were made of aluminum casting, all in one piece. The man was badly injured.

Among the work team was a heavy-built man, who carried the injured person on his shoulder. He was immediately taken to a hospital, which was some 30 km away.

We didn't do any work the next day, either. On the third day, we started the work again. I repeated whatever work I did on the previous job and ran the lift in slow speed. When the lift was started, I contacted my superintendent to arrange a person for the wiring work. After the lift was started up in slow speed, I turned to the pit equipment.

Fixing an idler pulley is skilled work. If it is not fixed properly, the selector tape will come out. After I did this, I fixed the buffer springs. After the buffers, I turned to shorting the rope. That work was, comparatively, a little heavy. Hoisting the cabin with a chain block was next. My helpers were familiar with this type of work. The only problem was collecting the necessary tools; they took two full days. The cabin was hoisted, and I removed the thimble at car side. I removed only two of the six thimbles, because I didn't want to take any risks. The thimble rod was an old type. I cut the rope to the proper length. The extra length of rope was then cut and removed near the thimble side. Then, the lead was heated to remove the rope piece from the thimble socket. The rope was then passed through the thimble. A rosette was made with it, and the socket was filled with molten lead. I replaced all six ropes, two at a time.

After the ropes were shortened, next was the shortening of the cable so that I could run the lift up to the full rise. I completed that work and ran the lift up and down for the full stretch. The second day, the assistant reached the site, and I explained the wiring. I made a diagram explaining how to do the wiring and came back to my place. After a week, he came back and said that all the wires were cut and pulled through the conduit. Now, it was my turn to go to the site and complete the work. This took a few more days, and the lift was kept working for two more days to check its performance. Just like the previous site, all the engineers (about 15) came for the checking. I cleared all their doubts and returned to my place with the signed acceptance form.

When I look back at these experiences, I have a twinge of regret that I could not forestall an untoward incident. But on the whole, I feel satisfied with the way I completed these jobs with the constraints at hand. These experiences bring to the fore the importance of planning out the job, the anticipation of possible problems and the corrective action to be taken. 