The Story of Konkan Railway of India: How the ideas have worked by E Shreedharan

(A story told by E Shreedharan himself, Railway Engineer, who is the Chairman of Delhi Metro now was the Project Director of Konkan Railway, one of the the toughest and most challanging railway construction projects in the world)

Today I would be unfolding before you the story of the Konkan Railway. The Konkan Railway is a classic case of an idea given to the right person at the right time and at the right place snow-balling into a resounding success story far exceeding the expectations of the originators of the idea itself. While unfolding this story, I have to take you back by about 11 years, to a cold winter morning, on the 7th January 1990, to the Raj Bhavan at Lucknow. But, before that, I would like to give a short description of the Konkan Railway project itself, so that you will appreciate how an idea that was seeded, an idea that was thrown, ultimately became a resounding success.

The Konkan Railway project is 760-km railway line connecting Bombay to Mangalore along the West Coast of the country. This strip of land along the West Coast, bounded by the majestic Sahyadri hills on the east and the mighty Arabian Sea on the west, is a very narrow strip of land, criss –crossed by mountain ranges and a large number of rivers and tidal estuaries. This is one of the most difficult terrian ever encountered in the history of railway construction. Although proposals for such a railway line between Bombay and Managalore had emanated a number of times, due to sheer difficulties in executing this project, the sheer size of the project, the complexity and the huge cost involved, this project could not be taken up earlier.

The fact that this particular project of 760 km long railway line has as many as 93 tunnels aggregating to a total length of 835 km. And some of the tunnels, at least 4 of them, more than 3 km in length, and the longest tunnel 6.5 km in length, will indicate to you the terrain that had to be traversed. Till the Konkan project came into existence, the longest tunnel in the Indian Railways was only 2.2 km under the Lonevala Ghats between Bombay and Pune. Today the Konkan Railway has got as I mentioned more than 4 tunnels, which are more than 3 km in length. Also we have to construct in this line as many as 179 major bridges, totalling a waterway of 21.1 km. and as many as about 8000 minor bridges. About 300 bridges were road over-bridges and road under bridges.

In spite of the difficulties of the terrain and the time schedule given for the execution of this project, this is one railway project executed incorporating only the front line technologies for the first time in the country. Also this is the first time a major infrastructure in the country was realized through the BOT (build, operate and transfer) route, where the government's participation was minimal. Most of the funds required for the project came from private agencies.

Now I will take you back again to that cold morning of 7th January 1990 at the Raj Bhavan, Lucknow. Shri George Fernandez took over as Railway Minister on the 5th December 1989. I was Member (Engineering), Railway Board and ex-officio Secretary to the Government of India. Immediately after taking charge as Railway Minister, Shri George Fernandez summoned the Railway Board Members. In his talk he made it very clear that there were 2 projects which were upper most in his mind, which were his dreams right from his childhood, and that he would like these projects to be given the highest priority. One of the projects was a railway link between Chithoni and Bogha in Bihar crossing the mighty Gantak River and the other one he mentioned was

the West Coast railway connecting Bombay to Mangalore. He turned towards me and said "as Member (Engineering), I will depend upon you for realizing these two projects".

After about one or two days I met him. The first project that he mentioned at Chithoni was an already sanctioned project, but languishing very badly for want of funds. This project was a joint project between the railways, the State Governments of UP and Bihar and the Ministry of Water Resources. All the four agencies were required to contribute funds for the success of this proejct. But money was not forthcoming. From the railways' point of view, this was not an important project operationally. So, the railway was not giving any attention at all for this project. So, I mentioned to him "if you really want to go ahead with this project, you must get the cooperation of the two governments fast and they should pay their share of the project cost". In my own presence, he telephoned the then Chief Minister of UP, Shri Mulayam Singh Yadav and the Chief Minister of Bihar, Shri Laloo Prasad Yadav and got the assurance from them. "Yes, the State Government would contribute their funds immediately". Then, he said, " I must lay the foundation stone for the Chithoni-Bogha Gantak project". He fixed the date also as 7th January 1990.

When the date was fixed, the previous day the Railway Minister and myself travelled by the Special State plane sent by the Chief Minister to fetch us. The previous evening we reached Lucknow. He stayed in the Raj Bhavan and I stayed in the Railway Officers' Rest House . Early next morning I rang up the Railway Minister and told him that "before we proceed to the function site for inauguration, I would like to have 15 to 20 minutes with you for discussing certain important issues". He immediately summoned me and wanted me to meet him over the breakfast or immediately after the breakfast. I met him round about 7 O' Clock. Then I mentioned to him " Today one of your dreams is going to be fulfilled. The Chithoni railway link is really a bridge acorss the Gantak River. At this bridge location, the Gantak River is as wide as 8 km between the two flood banks. The river used to meander every year causing a lot of destruction to the fields and to adjoining areas. With great difficulty we have been able to make a start in this project. But a railway bridge alone across the river is not going to give much benefit to the local people. Only occasionally a few trains will run and most of them will be freight trains. This is one of the most backward areas in the country and all the villages around are very poor." I said, "unless you make this a road-cum-rail bridge, it is not going to be of any use to the local people. In any case, this river, which is about 8 km wide at this location, we are training this river for the railway bridge, narrowing it to almost 800 metres. With a marginally extra cost, we can make this a road-cum-railway bridge, provided the State Governments agree for funding the additional cost involved".

The idea appealed to him so immensely that right in my presence he said " I must talk to the two Chief Ministers immediately and get their concurrence. I want to convert it into a road-cum-railway bridge". Of course, the Chief Minister of UP, Shri Mulayam Singh Yadav joined us in the helicopter flight to the bridge site. Shri Fernandez talked to him and got his consent. Similarly, he got in touch with the Chief Minister of Bihar and got his consent also. On that day, he announced that the bridge would be a road-cum-railway bridge. I am happy to inform you that this project is already over. The rail bridge was commissioned some time last year and the road bridge is now nearing completion, although it took up so much of time.

At that morning meeting I also mentioned to him, "your first dream has come true. The next project, that is the West Coast Project – at that time, the word "Konkan Railway" was not coined; we used to refer to it only as the West Coast railway line –if that project is to be done, it cannot be done in the normal course. You are aware, that normally all new railway lines in the country are constructed with budgetary support. Generally, the Planning Commission allocates about Rs.250 crores to 300 crores every year for new line projects. In the railway kitty there are

already about 20 to 25 new railway line projects sanctioned with the result that each line will get hardly Rs.4 to 5 crores as allocation. At this rate, if the Konkan Railway is to be constructed, it would take anything from 25 to 30 years. If the project is to be done in a time-bround programme, we have to follow an entirely different approach." I mentioned, "for these two steps would be necessary. One is a very bold and innovative funding approach to the project and the other is a special purpose vehicle to be formed; a special corporation or a special authority to raise funds for executing this project.

I had a lot of ideas in my mind in regard to the funding of this project. As I said, this is a highly viable project, financially very attractive, because it reduces distance between Bombay and Mangalore considerably. For your information, I will explain to you the advantages of this project. The normal haulage distance between Bombay and Mangalore is 2,041 km. If the Konkan Railway were constructed, it would be 914 km. Thus, there would be a saving of 1,127 km. when the line is completed. So, it is of immence advantage to the nation. A similar saving in railway distance between Mangalore and Ahmedabad would be something like 1,295 km. The saving in haulage distance between Mangalore and Delhi would be 764 km, between Cochin and Bombay it would be 513 km. As a corollary, the saving in travel time would also be immense. The saving between Bombay and Mangalore is something like 26 hours. Before the Konkan Railway project was completed the fastest train between Bombay and Mangalore used to take 41 hours. After this line was completed, it will take only 15 hours, a saving of 26 hours. Between Cochin and Bombay the saving was 12 hours and between Bombay and Goa 10 hours.

Because of the tremendous advantage, I said, it should not be difficult to raise money from the market. The IRR of the project was then assessed at 13.5 percent. I said the special purpose vehicle should be a joint sector company, with a majority share with the Railway Ministry of 51 percent and the remaining 49 percent share to be taken by the four beneficiary States of Maharashtra, Goa, Karnataka and Kerala.

The concept appealed to him so much that he said "this matter I must immediately take to the Prime Minister, to the Planning Commission and to the Finance Minister and get their clearance". He promised to get back to me within about 48 hours. Precisely, within 48 hours after he got back to Delhi, he summoned me to his chamber and said, "Today I have met the Deputy Chairman of the Planning Commission". At that time, Shri Ramakrishna Hedge was the Deputy Chairman of the Planning Commission and Shri Madhu Dandavate was the Finance Minister. Both of them were hailing from the Konkan region and they were really interested in the Konkan Railway project at that time. They have together gone to the Prime Minister and got his oral clearance for the whole project. So, Shri Fernandez said, now the Government have in principle agreed to take up the Konkan Railway project the way you have suggested. "Please start working on the details and come up with all the other details needed for this project".

It means that we have to go to the Planning Commssion and other bodies and get the necessary clearances. The most important thing was to get the support of the beneficiary State Governments. Shri Fernandez at that time thought that it was very easy to get the support of the four State Governments. In my presence, he rang up the Chief Minister of Maharashtra, Shri Sharad Pawar. Though he belonged to an opposite political parties, the Congress Party, the Janta Dal Government was at the Centre at that time, Shri Sharad Pawar readily agreed to support this project. Because he knew that we are going to take up this project in the Konkan region, he readily agreed to it. Next he rang up the Chief Minister of Goa, Shri Barboza. He belonged to the

Janta Dal Government and he also readily agreed, yes, the State Government would participate in this project.

But he drew a complete blank from the Chief Ministers of Karnataka and Kerala and both of them belonged to different parties, the Congress Party and the CPM. Then I mentioned to the Railway Minister, "let us not tackle these State Governments of Karnataka and Kerala at the political level, please leave it to me. I would like to take it up at the bureaucratic level". He said, "please go ahead".

Immediately I flew to Bangalore, met the Chief Secretary and Transport Secretary, put across to them the advantages of the scheme, which could be realized with their minimal financial participation. They saw the merit of the scheme and together they went to the Chief Minister and convinced him. Ultimately, I got the consent of the then Chief Minister, Shri Virendra Patil.

I undertook a similar trip to Trivandrum and again convinced the bureaucrats first, the Chief Secretary, the Transport Secretary etc. Together we went to the Chief Minister. Shri E.K. Nayanar, the present Chief Minister, was the Chief Minister at that time, I am talking about the early '90s. He was the first Chief Minister who gave in writing, "Yes, we will participate in the Konkan Railway project". Mind you, the Konkan Railway does not go into Kerala State at all. It stops short of the Kerala State. But he realized the immense benefit that will flow to the State and he readily agreed.

In that way, a part of the problem was over. But again a lot of formalities had to be gone through. So I called a meeting of the Chief Secretaries at Bombay, where we worked out all the modalities of the agreement that is to be signed between the State Governments and the Railway Ministry. Everything was finalized. I am happy that at that time, the Chief Secretary of Maharashtra, Shri Sukhtankar, was very positive and constructive. He played a major role in getting the consent of the other States and in finally resolving the conflicting issues.

On the 19th June 1990, the Chief Ministers and the Railway Minister, in the presence of the Chief Secretaries and the Railway Board Members, assembled in Karnataka Bhavan, and the historic agreement was signed to take up the Konkan Railway proejct as a joint sector project. In the meanwhile, we got the clearance of the Planning Commission.

I was retiring from the railways on the 30th June and this agreement was signed on the 19th. Shri George Fernandez called me and said "You are retiring. I would like you to take up the project and complete it. " I told him, I have no hesitation to do it, provided I have almost a blank cheque in regard to how to organize the project and how to execute the project. I would not like to have any interference either from politicians or from bureaucrats. He said, " here is the blank cheque for you, please go ahead" Even before my retirement, before I was selcted by the Public Enterprises Selection Board and appointed by the Appointments Committee of the Cabinet, he announced that Shri Sreedharan would be heading the Konkan Railway Project. Till the formal selection and appointment of the CMD of the Konkan Railway Project, till all the formalities were completed, he appointed me as Chairman of a one man Committee to take up all the preliminary steps for organizing this project.

At that time, althought certain preliminary studies were done for the project, no detailed studies were carried out. In the stretch between Bombay and Goa, there was a very preliminary survey done in the late '70s, but no up to date survey was done at all. Between Bombay and Mangalore, some sort of survey was done by Southern Railways, but that also was not the final survey.

Before we take up any railway project, it is the practice to carry out the final location survey, locate the railway alignment on the ground and then estimate the cost of the project very precisely, estimate of all the technical problems involved and then the project is taken up. None of these studies was at all carried out in regard to the Konkan Railway project. So, I started from almost scratch with the surveys, the final location, then administrative arrangements for the lands to be acquired, geo-technical investigations, hydraulic investigations of the rivers, the location of the tunnels, location of the bridges, all these have to be gone through. All work was put in motion at the same time.

The Konkan Railway Corporation was ultimately registered as a company on the 19th July 1990. I took charge as CMD of this Corporation on 30th October 1990. Within a week or so, the Janta Dal Government fell. Shri George Fernandez was no more the Railway Minister at that time.

This was a major idea, placed before Shri George Fernandez, which ultimately was converted into a very successful railway project. I want to mention before you that this was a major idea. But there were very many minor ideas, which I was nuturing, in my professional life in the railways. In the 36 years of my professional life in the railways, I had very many ideas, which I could not put into practice, merely because of the steel frame governmental working, the strict procedures to be followed. Because of the governmental method of working, very many ideas could not be implemented. I thought, here was an opportunity, where all my ideas on how a project is to be organized, how a project could be executed, how a modern type of railway line could be brought in, this can be tried for the first time here. Therefore, in executing this project, a number of new ideas, new techniques, new project management style was brought in, which very briefly I would like to explain before you.

The first thing is, we are constructing a railway line for the next 100 years. So, let this railway line be a modern line, a high-speed route. So, before the railway line was planned and executed, we decided to have at least a minimal speed potential of 160 km per hour. Today the maximum speed on Broad Gauge is 105 km. per hour.

No doubt, there are a few trains, like Shatabdi and Rajdhani Express, which run at 120 or 130 km. But these high-speed trains are really due to the capability of the rolling stock, not the capability of the line itself. I said, the line itself should be capable of carrying 160 km per hour. Today we do not have engines or coaches, which can run at that speed. But the country will definitely progress and the day will come when we will manufacture high speed engines and high-speed coaches. So, the lines should be planned and constructed for a minimum speed of 160 km. This is the first decision we took.

Secondly, enormous difficultires were involved in acquiring land. The Railway Minister had announced in Parliament itself that the whole project would be completed in five years' time. If the project is to be completed in five years' time from the word "go" then it means that preliminary surveys have to be conducted, land to be acquired, so many tunnels and so many bridges to be constructed, a lot of things have to be done all in 5 years.

We have to acquire land from something like 40,000 landowneres. An entirely new strategy was evolved to take possession of the land needed for this project. A very pragmatic and very practical approach we adopted for taking over the land, which included a combination of selling the project to the people of that area and getting them on our side. Then, if there were difficulties for the land owners, we saw to it that those difficulties are immediately redressed. In many cases, we have to take over the households and have them demolished. We said "please hand over your house. You can move to any other house you want. We will pay the rental charge for that house for the next one year or 1½ years till you are ready with your own house with the compensation we

give. You can dismantle from your own house and retrieve whatever you can, doors, windows, tiles, anything you want and construct your new house." This sort of very pragmetic approach we had adopted. To tell you very frankly, within 8 or 9 months, the entire land required for the project was in our possession. I feel that this is a very mighty achievement.

This 760 km line is passing through three States and it is really passing through 7 revenue districts. So, the third technique that we adopted was that we decided that the whole line would be divided into 7 zones, each zone almost concurrent with a revenue district, and a Chief Engineer was posted for each zone. The jurisdiction of the Chief Engineer was something like 100 to 120 km. My philosophy, was that a railway line of about 100-120 km. could be easily done in five years' time. That has been our practice. If the Chief Engineer can do his portion in five years' time, the whole project would be ready in five years' time. With that philogophy, we really started. The reason why I wanted each Chief Engineer for a revenue district was that it would be very easy for him to deal with the Collector concerned, with the SP concerned, because everything is within his reach and that worked wonderfully well.

The third step we took was to establish an excellent communication network. It was a very difficult terrain and communication was quite difficult. To reach from Bombay to Ratnagiri used to take so many hours. We hired DOT lines and then established a good communication network with the headquarters of each of the Chief Engineers. They were all given FAX machines, they were all given computers. A computer networking was done, so that everybody can have any information he wants from anywhere and any message can be passed on in no time. So, the communication problem was immediatley sorted out.

The other thing that I did was ample delegation of powers to the field people, because it was so difficult to reach them. The whole delegation of power to the Chief Engineer and down below was ample enough so that the day to day work they do not have to depend upon the corporate office at all. That is another step that we took.

Then the most important step was completely redesigning the role of finance in the whole organization. If you have been associated with railways, or have worked in the railways, you would have known that in the railway system finance has got a very major grip on every decision taken. This naturally delays the very decision processes. This is a system where finance is having control over everything and not having the responsibility for results. I said that this would not work. I said they would also be like any other executive. The entire power will be with the executive . Finance will only give their advice. The executive will have the powers, either to accept the advice or
go beyond the advice. That power was given to the executive and the system worked excellently well. We had taken some very enterprising and very smart finance officers from railways. They fine-tuned the system so well that there was no difficulty for any executive to function properly and I never saw any clash between a finance officer and the executive at any stage of the project implementation. So, this sort of congenial atmosphere was brought in.

Another step we took was to take a decision that the organisation should be very slim but effective. I said that we would not go for a normal type of railway construction organisation. Whatever work can be done outside by other parties, let us leave it to them, we will only concentrate on core areas of safety, guidance, management, payment to contractors and that sort of thing. The rest of it, small things can be done by other agencies so that the organisation is kept very small.

Then we wanted to bring in almost paperless type of functioning. The whole work of the administration was on the basis of trust. The delegation of powers has been given on the basis of trust, mutual trust. I made it sure that anyone, who joins the organization, his background will be gone into thoroughly and only persons with impeachable integrity are brought into the organisation.

If there is any doubt about any person's character, he will nor be a part of our organisation. They were all hand-picked and brought in. That is how it was a very small team, but it functioned extremely well.

The other areas of concern, as I mentioned, were the bringing of front line technology in the operation of the railway system. For the first time, some new technologies were brought. This is not an audience consisting of technical people but I can refer to some of them.

The main technology was to cater to the high-speed route of 160 km per hour. The incremental launching method is a technique, which we brought into the country for the first time to cross very deep viaduct, because you cannot support the bridge from the bottom. The viaduct was so high. The highest viaduct on this project was having piers of 68 metres high, just 4 metres short of the Kutub Minar. You can imagine piers almost as tall as the Kutab Minar. They cannot be supported from the bottom of the bridge. So, we have to go in for new technology as to how the bridge was to be constructed.

For your information, the same technology we have today adopted for constructing the new Metro Bridge very near to ISBT, a bridge that is nearing completion. The same incremental launching method has been adopted there, where the whole bridge duck has been done from the bank and pushed forward to the full length. There is no work at all on the riverbed. Everything is from one side. It is a continuous hollow box girder. It is something like 12,500 tonnes in weight, pushed from one end over the piers. That technology was brought in.

Many other new technologies were there. One was ballastless track inside the tunnel. As I told you, there were lots of tunnels. Almost 11 or 12 percent of the length of the project was inside the tunnels. In the tunnels it is difficult to maintain permanent way. So, I said, let the permanent way be a permanent fixture all the time. So, we wanted to go for ballastless track i.e. no ballast at all. Again, a new technology has been developed by the Konkan Railway and put in, which has been a resounding success. It requires no maintenance at all, no attention at all. There is no change in the alignment of the railway at any time.

The turnout is where the train has to go from the main line to a loop line. We went for high-speed turn out, again for the first time in the country. The turnout adopted for the Konkan Railway is with thick web switch, which is capable of allowing a train to negotiate the turnout at 50 km per hour, whereas the normal speed permitted in the Indian Railways is only 15 km. So, high-speed operation is possible even on a turnout.

There are 8,000 bridges, as I mentioned, out of which 179 were major bridges. The longest bridge in the section was more than 2 km in length. We decided that all bridges should be with ballasted deck so that maintenance of the permanent way can be done mechanically by tampers. So, all the bridges were designed with concrete decking, except for three spans, 2 across the Zuari River in Goa and one across the Mandavi River, again in Goa, where navigation of ocean going vessels have to be permitted. There alone we went for steel girders, where a span of 125 metres was necessary. Even for these steel girders, we went for novel designs. For the first time in India, welded steel triangular girders were designed and installed. These girders have Neoperene bearings, a gain for the first time in India. Neoperene bearings are not used for steel girders in India so far. This bearing has what is known as Teflon bearing surface where friction is so little. So, a new type of bearing was designed by us and was put into practice.

Now I come to rail welding. These days the rails are welded to reduce vibration and noise. Here again we went for a new technology that is known as gas pressure welding. We had to import special machines and get our people trained in Japan for this purpose. The machines are imported and all the welds were with pressure gas welding. The advantage of pressure gas welding is that

they can be done at site itself. Bacause, in such a difficult terrian, you cannot weld rails in advance somewhere in a central welding workshop. Normally, what the railways do is, they have the central welding depots, where rails are welded in long panels and transported by train to the required site. Here there is no train, we cannot transport such long welded panels. So, we went for site welding by gas pressure and the cost of this gas pressure welding was only one-third of the normal welding cost.

Then the Tele-communication network. At that time, we decided to go in for optic fibre based Tele-communication network, what was an entirely new area at that time for Indian railways. They have not thought of optic fibres at all. There was a lot of opposition from the Indian Railways for optic fibre-based Tele-communication. Today it has become a common thing. At that time, there was a lot of resistance, a lot of opposition, they were not allowing me to proceed with the optic fibre cable network. But we persisted and that has been again a great success. Today in the Indian Railway system, the Konkan Railways have the longest stretch of optic fibre available.

In the case of bridge foundation again a lot of innovative work was done. Some of the foundation wells, particularly for the Zuari River and Mandvi River, very close to the sea, the foundation which had to be taken are very deep. As much as 45 to 50 metres deep the well foundation had to be done. Normally, the well foundation is done under compressed air conditions. People go in compressed chambers and work and do the digging.These are depths with 5 atmospheres. People cannot work in such depths. So, we went for a new system of foundation, where the piles were driven first and at a particular level, they were cut off. Above these piles and the well was sunk, and made to rest on the group of piles. For the first time, this new technology was adopted on the Konkan Railway Project.

Another major problem we were facing was the ventilation in the long tunnels. As I told you, there are at least 4 tunnels longer than 3 km, one is 4.5 km and another one 5 km; the longest tunnel was 6.5 km. What about ventilation inside these tunnels? When the train moves, the exhaust fumes from the engine should not suffocate the passengers. The tunnel ventilisation was an entirely new field in this country. This has not been done anywhere. We sent our engineers to other countries, to study the tunnel ventilation and this novel type of tunnel ventilation arrangements were installed in all these long tunnels on the Konkan Railways for the first time. Today, apart from the Delhi Metro Corporation, Konkan Railway is the only organisation in this country, which has got expertise in the tunnel ventilation. I am happy to note that the Konkan Railways expertise has been borrowed by the Border Roads Organisation for ventilating some of the tunnels in Jammu and Kashmir area. The railways themselves have borrowed this technology for some other long tunnels in other areas. For the new highway between Pune and Bombay, the Konkan Railway has given expertise for ventillating the tunnels.

Then, to get this project completed in five years' time, I thought that a very dynamic and transparent style of project management was necessary. The essence of this was that everybody should know what he is expected to do, what are the deadlines for him, how much time is available for each work. So, the first thing that we did was, we laid down what is known as the corporate objectives; a three-point corporate objective, which clearly defined what exactly is expected out of this Corporation. Then I laid down 10 items of corporate culture, the culture that is needed to achieve the objective. That is the very first thing we did. So, everybody had the same work ethos, same approach and same objective.

The second thing that we did was to make everybody time conscious. The time available for the completion of the project, was exhibited in every office, which is a reverse clock. A similar clock I am following in the Delhi Metro project also. In every office there is a reverse clock, where each day the clock comes down by one day. The number of days available for completion of

the project is exhibited everywhere so that everybody knows how many days are left for the completion of the project. At the work site also, at every important work site, like tunnel site or bridge site, a board was exhibited in which the number of days left for that particular major work was shown exhibited, bacause for that particular major work the number of days given was much less than for the total project. Everybody knew when a particular item of work connected with that project had to be completed. Everybody was on his toes, be it the contractors, executives or workers. Everybody knew how much time was available for that particular work. It kept everybody on his toes.

Thirdly, this is essentially a railway project, essentially a civil engineering job. So, many odd jobs were got executed through contractors. We realized right from the beginning that the success of the Konkan Railways will depend upon the success of the contractors. If the contractors succeed, the project succeeds. So, we brought in an environment in which we made the contractors to succeed. The essential steps in these were, first of all, in the selection of the contractors themselves. We did not allow anybody and everybody to quote for a work. The contractors were all pre-qualified. We selected contractors only from the pre-qualified list. We gave very good terms and liberal advances to the contractors, because we have seen that normally a contractor fails or fumbles basically because there is no adquate cash flow for him, he does not get money in time, or he does not get any decisions in time.

We made sure that any decision or plans needed by the contractors was available on the spot, immmediately, even if it means that the CMD had to rush to the site and give a decision. Yes, I was available at the site for any major decision. In a complex project like this, when so many tunnels were going on, when so many bridges were going on, so many decisions are required at every stage. Particularly in the tunnel work, we suddenly come across a difficult geological stratum and we have to decide how to deal with that particular area. We gave an assurance to the contractors that any decision they want will be given in 48 hours. That was the assurance given to every contractor.

Another change we brought about was in the preparation of bills for the contractors. The Department does not prepare the bill. We brought in a new system of billing when taking measurement and preparing the bill was by the contractor. We deviated from the normal railway system of billing for work and paying the contractors. We said that the contractors would have to prepare the bill. Any bill that he prepares, the payment on the bill was guaranteed. It is a guarantee, it was a part of the contract condition that within 48 hours of the submission, 75 percent of the bill will be paid and within one week he will get the balance amount, after proper check. So that there is no cash flow problem at all for any contractors. We also gave very liberal mobilisation advances of 10 per cent or even 15 per cent when a lot of equipments were involved.

Another thing we did was, for very difficult works, like the incremental launching method or the longest tunnel under consturction, we have a system by which every month on a nominated date I sit with the contractors and concerned engineers and see what are the problems facing this particular work and sort out the problems then and there across the table, so that there is no difficulty at all for the progress of the work.

Then some critical items were needed for the work, like cement, steel and different types of explosives. And there are very rigid laws on the transport or use of explosives. So, we said, we will handle those things ourselves and not leave it to the contractors.

Similarly, reaching petroleum products to the work site was so difficult. So, we set up our own departmental outlets at critical areas. Any contractor can come and collect petrol or diesel that he wants. The cost of that is deducted from his next bill. That facility of departmental petroleum outlets was provided all along the line. This arrangement was very helpful to us when the Iraq-Kuwait war started and the country went dry in petroleum products. It is not an exaggeration to say that Konkan Railway project was the only project going on at that time, because we had a sufficient stock in our own outlets and the work did not suffer at all, although in other projects work suffered very badly, because of shortage of petroleum products.

As a number of tunnels were involved and all the tunnels had to be completed in such a short time, and as a number of highly sophisiticated high-speed tunneling equipment were needed for the work, we said that we will import or procure them and give them to contractors free, not even charging them for the hire. We only wanted to fix up the time needed for using it. If he does not complete the work within time, yes, there is a penalty. This also helped tremendously, as the contractor does not need to run from pillar to post and try to find out what sort of equipment will be needed for this particular tunnel work. We knew what type of equipment was necessary and these were imported from Sweden. Fortunately, we were able to get interest-free loan from the Swedish Government for the import of all this machinery and these were available to the contractors even before they were on the field.

I started a novel experiment or a new style to keep everybody well informed. Every Monday we had a meeting of the Heads of Departments, where all the problems connected with the whole project was gone into. We analyze the slippage in the previous week and then we decide what is required to be done in the next week. When all the managers sit together, a consensus is evolved. On the first Monday of the month, the field engineers are also brought into this meeting, so that everybody contributes and everybody knows what are the priorities of management, what is the view of the management on any issue. There is hardly any paper work in these matters. I insisted that even the minutes of such meeting be not recorded, because I do not believe in this, it is waste of time and paper work distributing the minutes of the meeting. Because, we knew what was happening every day and everybody was involved in this. This sort of very transparent and dynamic approach to the problems helped considerably in completing the project on time.

With all these things, ladies and gentlemen, the project, which the Railway Minister said would be completed in five years' time, ultimately took 7 years for completion. I must explain to you what delayed this project, because this is a good lesson for other similar type of project management. With all the measures that we had taken, the main reasons for the slippage in time were there.

One was government's own action. When the project was going on in the second or third year - I do not exactly remember the time- a decision came from the Central Government that all works in the Goa sector should be stopped. That was bacause threre was a controversy in regard to the alignment in the Goa sector and there was political interference in this particular alignment. The Government of India did not want to ruffle the feather of that particular Government in Goa at that time. I was asked to stop the work. The work was stopped in the Goa sector for about 9 months. This had a cascading effect, because the people knew that in one sector, the most important sector of the project, the work was stopped by the Government. It had a terrible demoralizing effect on the rest of the project as well, among the contractors, among the managers, among the top management itself. This was one main reason. The Goa sector was the last sector to

be completed. This particular decision of the Government was most unwarranted. The decision was given only because of political compultions at that time, not on technical reasons. Ultimately, the alignment question had to be referred to a one-man committee, under a retired Supreme Court Judge. He came and arbitrated that whatever the Konkan Railways had decided was the best alignment possible only after he gave his report the work could be restarted.

The second was finance. The success of any project depends upon timely availability of funds for the project. The Government contribution was only one-third, not even one-third but only one-fourth by way of equity. Three-fourths of the project funds had to be raised in the market. The expectations were that we could raise the money from the internal market through bonds, either tax-free bonds or taxable bonds. Unfortunately, that was a time when there was real convulsion in the capital market, following the Harshad Mehta scam. All of you are aware of it. The entire capital market dried up. We were not able to raise money either through taxable bonds or tax-free bonds. Even tax-free bonds had to be sold at a terrible discount at that time. 10 to 10.5 percent taxable bonds had to be sold at a discount of 10 to 12 percent to raise money, because that was the best rate available. This seriously affected the project. Ultimately, we got clearance from the government to raise money abroad through the ECB route. We raised about Rs.400 crores for the project and ultimately we tided over this difficulty.

The third was unexpected adverse geological conditions in some of the tunnels. The project took off so fast that there was no time to do detailed geo-technical investigations at every tunnel site. Even for one tunnel, the investigations have got to be at very close intervals between bore holes. For this there was no time. We found that in certain areas the geology encountered was totally unexpected, particularly in some of the tunnels in Goa area. This also delayed the project. Ultimately, the whole project got delayed by about two years. So, instead of 5 years, it took us 7 years.

Even so, ladies and gentlemen, I feel, considering the immense size of the project, the complexities involved, the difficult terrain through which it has got to be done, completing this project from Day One, when the word "go" was given, till the first train running in 7 years' time, was a great achievement even by international standards.

This is in brief the story of the Konkan Railways. No doubt, Konkan Railway project will go down in history as a project well-conceived and well-executed through a very novel and very imaginative funding route.
What the Railway Minister almost casually mentioned on the 7th January 1990 snowballed into a real success story and the Konkan Railway project is available to the nation, a project so vital in that particular area to close the gaping gap in the railway network.

Ladies and gentlemen, I have only tried to give you the positive side of my experience in regard to this project. While executing the project, naturally, I had to face very many problems, many hurdles, lot of frustrations, lot of interferences, lot of humiliations as well, and most of them from my own Minister or from the Railway Board itself. I do not want to spoil the atmosphere of this assembly by relating to the problems that I had to face in executing this project. But I am happy to tell you that I look back on this saga of Konkan Railway execution as one of the high watermarks in my professional career.

I must thank the Department of Administrative Reforms and Public Grievances, Government of India, the Andhra Pradesh Government and the Civil Service Officers Institute for giving me this opportunity to speak about the Konkan Railway Project. Thank you very much (Loud Cheers).

ORGANIZER : Shri Sreedharan is available for answering a few questions.

SHRI J P. SHUKLA : What is the present financial and operational position of the Konkan Railways?

SHRI E SREEDHARAN: In fact, I wanted to mention that. As I mentioned, when the Konkan Railway project was conceived, it was conceived as a highly viable project, with an internal rate of return of 13.5 per cent. Today the project is in serious financial problems, basically for one reason. This project report was not prepared either by me or by the Konkan Railway Corporation. The project was conceived and the report was prepared by the Indian Railways. They had estimated the tariff that would flow through this project. In their estimation, they had envisaged at least 8 goods trains to run of which 5 trains to run from north India to south India, along this route, because of the tremendous advantage in the haulage distance. I had explained to you what is the saving in the haulage distance and the travel time. 8 goods train were supposed to run on this line. This is the assessment of the Indian Railways, based on which the Planning Commission cleared the project. Today not even single goods train is allowed to run. I am using the word "allowed to run" - in this route. If one goods train is run on this line, there will be Rs.10 lakhs net saving, net benefit to the Corporation. If 8 trains are run, that means Rs. 80 lakhs per day earning, which is not available to the Corporation today. That is the reason why financially the project is facing a serious problem.

PARTICIPANT : What is the operational reason why goods trains are not being allowed to be run ?

SHRI E SREEDHARAN ; Well, I did not want to go into further details. When this project was taken up, I immediately brought to the notice of the Railway Ministry that this project is filling up a gap in the railway network. I said, adjoining sections should have adequate capacity to handle all the trains coming through that route. That involved the doubling of the section on the Central Railways from Panvel to Diva and on the Southern Railway from Shoranur to Mangalore. When the Agreement was signed by the Chief Ministers on the 19th June 1990 in Karnataka Bhavan, the Kerala Chief Minister raised the issue that this project was not going to be of much use to Kerala unless you double the section from Magalore to Shoranur. Then the Railway Ministry gave an assurance, I was a witness to that, saying that this doubling work will also be completed to synchronize with the completion of the Konkan Railways. No steps were taken to take up the doubling on both sides.

Then, when I was the CMD, I said that if the railways cannot do the doubling work, the Konkan Railways would carry out the doubling work, because this was essential for the very success of the Konkan Railway project. For the very existence of the Konkan Railway project, the doubling of the two adjoining areas was very essential. I said, we would take up this project, again on BOT, the railways need not put any money in this doubling project. I only wanted a comfort letter from the railways to cover the borrowings from the banks, just a comfort letter. That was all I wanted. Initially, the railways were very accommodative. They even said, yes, the Konkan

Railways could take up the doubling between Panvel and Diva. In regard to Shoranur and Mangalore, they said, the Konkan Railway should quote with other contractors on BOT basis. I said, we would never quote with the contractors on BOT basis. I said, we would never quote with the contractors for the Indian Railways, because we are part of the Indian Railways. Why should we quote along with the rest of the contractors? So, that did not come through.

On the Central Railway portion doubling work was given to Konkan Railway but within a month it was withdrawn just on some flimsy reason. It was taken back. So even today the two ends are not doubled and there is no adequate capacity to run the trains. There are orders that no further passenger train can be run on this route unless doubling is completed. Today with all these things, the Konkan Railway is the only newly constructed railway line, which is making an operational profit. It is definitely earning more than what it is spending. The only thing is that it is not able to service and pay back all the loans they have taken, only because the Indian Railways are not diverting goods trains. They still want to run the goods train along the longer route. A lot of goods train they are still running along the GT route.

SHRI SARVESWAR JHA : First I must thank you for your excellent presentation on project management. Of course, the Konkan Railway is a landmark in project management history. We have been watching the progress of Delhi Metro on a day today basis and we know how nicely the proejct is being managed.

Two aspects I would like to mention. One is the land acquisition process and procedures. We find that in most of the projects, particularly in the railway side and also in the areas where forest and environmental issues are involved, land acquisition is a very painful process and that has been one of the major factors for delaying a project.

You made a mention of taking the landowners into confidence and also looking into their problems on a pragmatic basis. I do not know whether the lessons which have been drawn and which should have been drawn, from the Konkan Railway experience, have been adopted by the railways in other areas. Because, only the other day, I was looking into a very small railway project in our division and I found that out of about 200 land acquisition cases, which were involved, they have been able to acquire only one during the last one and a half years. Obviously, it appears that the lessons of Konkan railway project management have not been learnt as adequately or as appropriately as they should have been.

Another area, which I would like to make a mention and I would like to request you for your comments, is this. You referred to contract management and you said you were quite liberal while dealing with the contractors. You also talked of making advance payment almost immediately and balance payment to be made within a week's time. This is certainly a path-breaking kind of exercise. Because, in most of the cases, we have seen that the contract documents is heavily weighted in favour of the Government or the organisation awarding the contract. We assume that whatever faults, defaults or deficiencies take place, the responsibility should go to the contractors. Perhaps that is one of the reasons for failure of contractual arrangement.

Now I would request you to kindly reflect on these two aspects, because we are evolving something like standard of contract management, which can be serving as norms for others to follow. So, I would request you to throw some specific light on what kind of paramenters you

would like to suggest to other project managers, particularly in managing land acquisition cases and also managing contractors.

SHRI E SREEDHARAN : Well, taking about land acquisition cases, yes, as I told you, we evolved a very dynamic approach in the Konkan Railway. There is no reason why this approach cannot be adopted by the other railway projects as well. The lands are mainly to be acquired by the State Government through the Land Acquisition Act. This Act provides for taking possession of land on consent letters. If you follow the land acquisition proceedings step by step, it takes considerable time. It is inevitable. But you can always approach the party concerned, take his consent in the presence of the revenue people and take over the land on his consent letter and start work. That is possible. This is what we have done in the Konkan Railways, so that the work did not suffer at any time.

Then certain grievances of the parties concerned have got to be addressed, like what we did. We cannot suddenly evict him from his house, unless we provide an alternative accommodation for him. Under the Delhi Metro project also, we are facing a lot of difficulties. But we are able to solve every issue one by one. We have to go out of the way in certain things, in giving certain facilities to the people concerned. We even aid them to transport their household things to new locations, we give them advances for incurring expenses, and we help them to get electricity and water. For all these things we will make our own arrangements, so that these people have no difficulty at all to move out to the new areas. That sort of practical approach is necessary. It all depends on what interest the project management takes in these matters.

In regard to handling contractors, yes, this is very essential. Any manager of the project must understand that his success depends upon the success of the contractor. The contractors have to be made to succeed. They may have many problems. We cannot always talk within the rigid boundaries of a contract document. No. Without hesitation, I used to go beyond the contract agreement document. If I know that a contractor has got a genuine problem, I will see to it that the problem is redressed. For example, in the Konkan Railways, in a few cases, the rates were given for tunneling. After a certain stage, because of the general inflation in the country, we found that the rates were just not workable for him. Since we were also doing certain departmental works, we knew what exactly it was going to cost for a tunnel work. We never hesitated to renegotiate the rates with the contractors at that time and see that they are allowed to proceed further. Often he may have a genuine cash flow problem. He might need advance in between, which even in the Delhi Metro Project we are making. Whenever certain contractors are having difficulty, we are trying to find out what exactly are their difficulties and trying to solve those difficulties for the contractor. We may have to go outside the terms of the contract agreement to some extent.

As I mentioned, it is the question of integrity that matters. If the person concerned has got impeachable integrity in dealing with these things, nobody will question this sort of action. One of our main yardsticks in selecting people to join the project is what is his background, what is his integrity standard.

DR CHAKRAVARTY : I have two questions to ask, one a pedestrian question and the other more substantial question. The pedestrian question is this. We have the Land Acquisition Act of 1894, where for government, governmental company purposes and so on, where public interest is involved, there is a procedure set in the Land Acquisition Act itself that one has to go through like the draft notification, draft declaration and all that kind of thing. You said that you are

able to manage land acquisition by talking to the owners and somehow manage it. The question is, how did you find it so comfortable and easy to go outside the ambit of the statute?

The more substantial question is this. I was listening fairly aptly when you were mentioning about the ideas that have worked and the idea that struck you in Lucknow Raj Bhavan, you have stated in your presentation, that is a very viable project. Now the viability of a project is based on certain assessments. You have added that neither you nor the Konkan Railway Corporation have prepared the viability of 13.5 per cent. Now the viability is a pre-requisite for the success of a project. How is it that the Konkan Railway Corporation did not bother to check on the auhenticity or correctness of the earlier viability issue?

Secondly, the Indian Railways themselves said that according to their estimates 8 freight trains could run. That was their estimate, which you have emphasized. Later on, they are now saying, no, we are going to run trains through the old route, may be, because the linkage at the two ends are not ready, the doubling of the track or whatever it is. If that is the case, is it total lack of coordination and cooperation that is bedeviling this project ultimately? If you say that it is in financial difficulties and you are not able to pay the debt, which you have borrowed, what does this mean? When you say this project is successful, yes, technically you have done a marvellous job, fine. But, then, ultimately the proof of the pudding is in the eating. If there is going to be a financial loss because no train will run, what is your reaction?

SHRI E SREEDHARAN : Both are pertinent areas that you have covered. One is about the land acquisition. Yes, we have the Land Acquisition Act, of 1890. No doubt, it is an old Act, but still it has stood the test of time. It is a very excellent document. We can go beyond the Land Acquisition Act, provided the State Government is taken into confidence. We have done it even in the case of the Delhi Metro project. The State Government is doing the land acquisition. But, with their consent, we do something else, a little beyond that. We are doing that to see that we take over the land very fast. So long as the State Governments have no objection to that, there should be no difficulty to go beyond the Act and do something to see that the land is taken possession quickly. Because, by waiting for the land, you would be spending much more money, the project gets delayed. The implication would be much more catastrophic them spending this extra money to get the land fast.

I do not think the Land Acquisition Act prevents this being done. You have to talk to the people, motivate the people, a lot of spade work is necessary. That is why I said we sold the project to the people first, a lot of publicity, what the project means, what benefit the project will give, how it will benefit that area. That sort of marketing was done well in advance and we conditioned the people first. Then we talked to each individual. There was no difficulty , not even in a single case, where a person refused to hand over the land to us on the consent letter. We told them, you hand over the land, we will see that your immediate difficulties are looked after by us. The compensation is with the State Government. They always have the option to go to any court of law, if they are not satisfied with the compensation. I have always given an assurance that if they are going to the court of law, I am not going to dispute or contest that act; only the State Government will do it.

The other thing is about the viability of the project. You are very correct about this particular aspect. Even midway through the project and towards the end of the project, we did a complete assessment of the traffic potential of this project. That potential also proved that the

project was eminently viable. When the project was nearing completion – we were beind the schedule at that time - I was pressing the Railway Ministry that you must enter into an understanding, an MOU with the Konkan Railways. Because, you have told us that 8 goods trains would be run, 5 trains would be diverted to this route. That diversion was justified only because it reduces the haulage distance, a tremendous benefit to the nation. So, we requested them to come forward and sign the MOU. Unfortunately, in this project, the Corporation depends upon the Indian Railways for all the rolling stock, engines and coaches. They control it. Even today the Konkan Railways has got the innate capacity to run more trains. This new railway line is still making an operational profit. They can run more passenger trains and make still more profit.

The Indian Railways are not allowing it to run more passenger trains, stating that after some time we may have to run goods train, if you give passenger train today, it cannot be cancelled later and we will not have paths for goods train. On that basis, they are not allowing us to run more passenger trains. On the goods train itself, the present stand of the railways is, because in the last three years there has been a downward trend in the freight traffic on the Indian Railways, they do not want to part with their cake today. The goods trains, which are identified to run, they want to run along the old route, and the reason for the railways to run them on a longer route is that the longer the route the better the earnings. So, they get more earnings out of it. They do not want to part with those earnings.

This matter was taken up at the highest level. After I left the Konkan Railways, I met the then Railway Minister, Shri Nitish Kumar, I said, from the national point of view, this is a catastrophe; we have constructed a line, sunk so much of money and we have space to run so many goods trains. The Indian Railways are still not operating goods train in this route. Shri Nitish Kumar was so convinced about that he set up a Working Group immediately to identify the goods trains, which should be run on the Konkan Railways. He gave those orders, but the Working Group never met.

There is another angle to this whole issue. I do not know whether any of my erstwhile railway friends are here. Right from the beginning, for the Konkan Railway project there was opposition from a certain section of the railway people, particularly the operating branch. They thought that the Konkan Railway Project was being conceived and construted by the civil engineers, to feather the nest of the civil engineers of the Indian Railways. So, the other departments started opposing it. Even today that feeling continues. My own assessment is that the operation department is not prepared to make this project a success. That is the fact of the case.

SHRI MANCHANDA : Before I raise my question, I would like to say that while making a performance evaluation of the various bridges, regarding their adequacy. I noticed that it is not possible to get basic data of the bridges all along the Ganga Basin, right from Himachal Pradesh to the Bay of Bengal. My specific question is this. It is a very good project, well-conceived project, with a lot of data input, including on certain failures. Has this data been documented properly and, if so, is it available or accessible easily?

SHRI E SREEDHARAN: This is a very important issue. In the British days, this used to be done very meticulously. Whatever they do, they used to immediately put it in writing, document it very properly. I am sorry, that the Konkan Railway project has not been properly and fully documented. It has been documented partly. There are two books brought out by the Konkan Railway Corporation. One is known as “Dream Come True” , the other is “History of

Konkan Railways". A lot of very intimate details of the project have not been documented still. I should have taken the lead for this, or I should have given what has been the precise position in regard to many of the things which till today are not known. For example, take the meeting of the Railway Minister on the 7th January 1990. I do not think it is known to anyone except Shri George Fernandez and myself. I do not think even my Private Secretary knows about these things. Nobody in the Railway Board knew about these things. The public does not know these things. Unfortunately, this information is not documented. I am partly responsible for it. Because, honestly. I did not have the time to sit down and write the Konkan Railway story.
(16th January 2001)