

# Railway Engineering

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**Special**

*Ferrovie Appulo Lucane:  
the Cinderella of the Apulia  
railways turns into a princess*

**Ferrocarriles del Ecuador  
is reborn with tourism  
as its vocation**

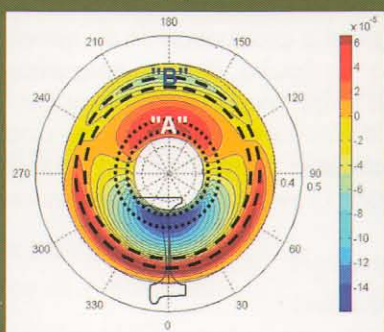


## Interview



*Giuseppe Arcoleo,  
RFI Civil Works  
and Superstructure  
Operating Department*

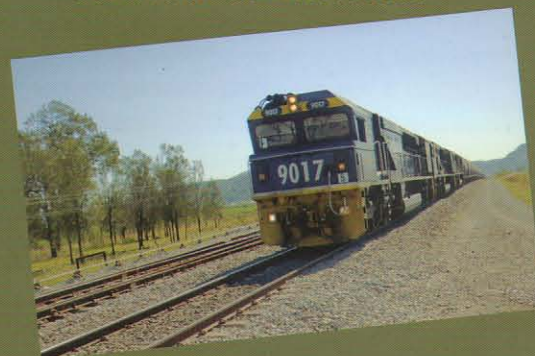
## Technology & Innovation



*Long-term contact force  
measurements with the  
CML method*

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*Ansaldo STS wins  
new EUR 118 million  
contract in Australia*







*Matteo Colamussi, Chairman of Ferrovie Appulo Lucane*

*Infrastructural projects and new trains give the Ferrovie Appulo Lucane a new look.*

## The Cinderella of the Apulia railways turns into a princess

*The Chairman, Matteo Colamussi, focuses strongly on the rail company's new course of action.*

The Ferrovie Appulo Lucane (FAL) network stretches between Apulia and Basilicata, linking the cities of Bari, Matera and Potenza. It is run by Ferrovie Appulo Lucane s.r.l. which, as well as providing rail services, also manages an extensive interurban bus network to complete and integrate a full range of services for the inhabitants of the two regions. The FAL railway lines cover a total of 183 km. The lines are all 950 mm narrow gauge track with diesel traction. The FAL, as an autonomous company, was established on 1 January 2001 from the division of the Ferrovie Calabro Lucane into two separate companies, the

Ferrovie Appulo Lucane which were given the Puglia and Basilicata lines to operate and the Ferrovie della Calabria which runs the narrow gauge lines in the Calabria region. The company took over from the Gestione Commissariale Governativa delle Ferrovie Appulo Lucane ed Autoservizi Integrativi (Governmental Commissarial Management of the Ferrovie Appulo Lucane and Integrative Road Services) established in 1990. In that year, Law 160 of 1989 had created separate regional catchment areas for public transport, dividing up the lines which were transferred from the State to the Gestione

Commissariale Governativa Ferrovie Calabro Lucane in 1963. The network was built between 1915 and 1934 by the Società Italiana per le Strade Ferrate del Mediterraneo (Italian Company for Railroads in the Mediterranean) with the idea of linking up the main coastal lines to the internal areas of Calabria, Basilicata and Apulia. Leading the FAL today is Matteo Colamussi, Chairman of the Board of Directors whom we met to find out more about the rail company, how it works today and to have a preview of the plans for its future.

**Railway Engineering: Mr. Colamussi, the railways lines you operate cover 183**

**km with the road services extending for over 1000 km. Up until 1990 the Ferrovie Calabro Lucane was one of the largest railways under franchise in the south of Italy, whereas nowadays its extent is very limited: is this a handicap and how do you integrate road and rail services?**

**Mr. Matteo Colamussi:** Without doubt, the situation of the Ferrovie Appulo Lucane is very singular: the first handicap comes from the fact that the 183 km of track crosses completely different geographical and social contexts. Our railway is isolated from the rest of the networks also due to the fact that the lines are narrow gauge. This matter has been under debate for years,



# The Ferrovie Appulo Lucane (F.A.L.)



however we have decided to withdraw from these discussions as we believe that the right economic conditions for converting the lines from narrow to standard gauge simply don't exist. Obviously if the network was all standard gauge our strategies would be very different but we have to be realistic and therefore have opted to focus our attention on concrete expectations which take into account the facts as they stand. Our strategy therefore is to study the needs of the communities we run through, also looking into the current numbers involved in our operations, then based on this we are developing an offer of a completely metropolitan nature. 85% of our rail traffic focuses on the line between Bari and Palo del Colle, which runs approximately 30 km along the line to Matera, another very important city which is also a UNESCO World heritage Site. For Matera we are coming to an agreement to complete the metropolitan circuit which includes an extension of the line up to the Madonna delle Grazie hospital and we are currently signing the documentation to obtain "PISUS" funds (Piani Integrati di Sviluppo Urbano Sostenibile - Integrated Plans for Sustainable Urban Development) which the Apulia Region makes available for the provincial capitals to complete infrastructural interventions. As far as Potenza is

concerned we have already been running an overground metropolitan service for three years and we have 18 million Euros at our disposal to develop and extend the service. For the company this is also an opportunity for increased profitability, but for the city it is a chance to improve urban transport in that we contribute to reducing the number of cars in circulation on the roads. The works also envisage the creation of car park areas. This project, of which we at FAL are the implementers, came third (and first in the south of Italy) in the public awards notice issued by the Ministry of Infrastructures, thus obtaining financing to the sum of approximately 11 million Euros.

**RE: From this picture a company emerges which is very active in developing rail transport.....**

**MC:** Yes, and this for us is a very important aspect

because our company was considered very much an ugly duckling, whereas nowadays we are proving ourselves capable, also thanks to the keenness and enthusiasm of our staff, of constructive ideas and of being able to manage significant investments.

To complete the framework of investments which we have planned, for Bari the Apulia Region has granted us a financing plan amounting to approximately 70 million Euros which envisages doubling the Bari-Toritto track and a second financial package for moving the railway underground in the town of Modugno. In Bari we provide services to the most important hospital in the Apulia Region, with journey times from the main station of Bari Centrale taking just five minutes. Our station at the General Hospital has been the object of total restyling and is the destination of

around 30 trains a day. In the morning there is a train every half hour and for this route which runs from the main central station, we are discussing a strategy with the Apulia Region for doubling the track so that we can increase the frequency of trains, initially as far as the hospital and then later up to Modugno. In Bari station we and the Region are thinking in terms of a three-track setup; two operating tracks and one for stopping. Then from Bari Scalo station up to the hospital stop there are no real problems for track doubling operations.

At the moment we have some difficulties at certain peak times, especially in the morning, when we cannot meet 40% of the demand: paradoxically our problem is not one of encouraging commuters to take to the trains but of meeting current demand.

**RE: These are projects for the future, but you have already completed an important plan for modernizing the company and structures...**

**MC:** We have already upgraded all of our stations, the last will be Bari Centrale (work on which has already started) and all stations have recently been fitted out with automatic ticket vending machine as well as CCTV security systems and information desks. On the road transport front, the last 8 new vehicles were







delivered at the end of last November to complete our objective of renewing 50% of the suburban fleet for services in Apulia. The buses are all in compliance with the Euro 5 standard and come complete with air-conditioning and special safety devices. Overall we have renewed 30% of the whole fleet, a result which puts us amongst the top companies in the country for bus fleet upgrading. While this year our objective of 50% renewal will also be met in Basilicata, allowing us to raise the level of services considerably and respect our territory even more from an environmental point of view.

**RE: Are any new trains on the agenda?**

**MC:** We published a call to tender which was won by the Swiss company, Stadler, for the purchase of 11 new diesel railcars which are

due to be delivered in 24 months' time. This is thanks to 43 million Euros in funds made available by the Region. The time schedule for the delivery envisages the first railcars being delivered by December 2012 with the others arriving at a rhythm of 2 per month thereafter with the aim of completing the whole delivery by the end of June 2013. With regards the railway itself we have awarded a contract for the value of 8,800,000.00 Euros for signaling.

**RE: We have talked about interventions in the Potenza, Matera and obviously the Bari areas but what kind of modernizing activities have you got planned for the rest of the route? And then, have you considered the possibility of future electrification?**

**MC:** In the infrastructural

plan agreed upon with the Region, upgrading of most of the line is envisaged: one of the long-rooted problems of these railways is the fact that for years no-one has bothered to improve the lines.

Let's tell it the way it is: when I arrived in this company, about three years ago, I found a flat structure which I had to thoroughly reorganize. I am correcting the costs, I have blocked the turnover and last year we registered a profit of 900 thousand Euros, after years of difficult balance sheets. All with sobriety as the key word, we don't have luxury company cars for bosses, nor sumptuous offices.

You were asking about future electrification. Today it certainly isn't one of our top priorities. We have thought about it as a possible option for the future but the truth of the matter is that this kind of decision would entail not only the already significant cost of the necessary infrastructures but also the expense incurred by us having to purchase new electric trains. My priority at the moment is doubling the track up to Toritto. The rest will be left as a single track although of course it will be upgraded and modernized.

**RE: The Region, in its strategic outlook, is thinking of putting together all the former railways which are franchised in the region, in other words you in FAL, the Bari-Nord railways and the**

**Ferrovie del Gargano. How do you fit into this project?**

**MC:** First of all we have to put into action the Region's commitment to upgrading rail transport, also via the numerous funds made available. It's a long-term project which began under the previous term of office and is continuing consistently in this one. We were considered the "ugly duckling" of the various rail companies, now we have caught up and we can to all intents and purposes be a part of this project. It is a plan which first of all requires availability of valid infrastructures; only afterwards can we start thinking about integrated timetables or a single ticket policy. For example, for the time being I am not promoting the service for the Hospital because with the trains we can timetable at present, the service is already struggling to meet demand: so until we have a double track and new rolling stock, I simply can't do this. I wish to underline the sense of responsibility shown by all the Apulian administrators involved: we have some opportunities in economic terms for closing the gaps we are suffering from and the managing class, be it public or private - is making the very most of these opportunities, fully aware of the fact that we are dealing with a unique chance, especially if one looks at the country's overall economic situation. The regional transport councilor Minervini does well to check that the companies fully observe the times and use of resources. As southerners, one of our age-old problems is that of not sticking to time schedules. My aim is that in five years, in other words my time of office, this company shall become an economically solid and relaunched reality in terms of infrastructures and business. As a matter of fact, I and all the employees and members of the BoD dream of a Normal Company.





# The Ferrovie Appulo Lucane (F.A.L.)

**RE:** *FAL runs services astride two regions; Apulia and Basilicata, how is this situation regulated?*

**MC:** We have two different service contracts, one with the Apulia Region and one with the Basilicata Region: of course, there are trains which provide links between the two Regions, but most of the services are run in a local context. Both Regions are very committed to developing public transport, maybe the actions in Apulia are more apparent on a mass media level.

**RE:** *Is the concept of a metropolitan service extended to the whole network and not just to the main centers of Bari and Matera.*

**MC:** Of course. The "metropolitan" strategy has been made based on elementary reasoning: how far our stations lie from built-up areas. Particularly in Basilicata we have a problem that the railways were historically built away from built-up areas and consequently do not transit through them. Consequently the means of transport most frequently used by the people living in the various towns is the car or the public bus services. The stations are maybe even five - eight kilometers from town. On the Potenza line we are trying to improve safety aspects on the entire route, eliminating delays caused by the age of the track so that rail links can be faster. At present a trip from Potenza to Bari takes about 4 hours but once works have been completed this should drop to 2 hours 20 minutes, almost half the time. By car the journey would take roughly two, two and a half hours, depending on speed and traffic. By speeding up the rail journey it could become a real alternative to road travel also because it has the advantage of taking people right into the center of town. The strategy, as I mentioned earlier, also involves



technological adaptation by mean of updating the signaling systems and the installation of relay based interlocking systems and automation of a large number of level crossings. So, with the relay based interlocking systems we will no longer need attended stations. One important aspect we will be concentrating our efforts on is communication, it is important for passengers to know exactly what we are doing. For example, we need to clearly explain that the idea of no longer having attended stations, thanks to the installation of relay based interlocking system, is not the first step towards abandoning the line but on the contrary represents an important aspect for relaunching the infrastructure. Quite often it only takes limited interventions to make use of the trains easier. For example, at Matera there is a problem with providing an airport connection because the city, like all those in Basilicata does not have its own airport and uses the one in Bari. In just a matter of days we will be installing a lift between our building where trains arriving from Matera stop and the neighboring station belonging to the Ferrovie Bari Nord which stands at a level a few meters lower than ours.

Within the next few months Bari Nord will provide a rail link to the airport with trains running every 15 minutes so our users will find it easier to go down to the Ferrovia Bari Nord trains with their suitcases and get to the airport by train. I am really committed to this challenge because we are proving that a public company such as ours and a privately owned company like Bari Nord can interconnect and achieve that overall change in pace in providing the offer of transport services which Apulia needs.

**RE:** *So integration between all the Apulian railways is an achievable dream....*

**MC:** I'll mention again the much talked about "single ticket", it only makes sense if the infrastructures make it possible to achieve train frequencies and connections between the various railways and the railways and buses which are closely interlinked. I've seen some railways in Switzerland where the buses arrive at a stop which is just ten meters from the platform; passengers get off the bus and onto the train which leaves a minute later and the frequency of trains is really high. So the system has to work for the single ticket solution to make sense. For us it is of the utmost

importance to increase the frequency of our trains and buses. We have to review our plans in terms of the services offered, because we could already do much better even now. And we need to study an offer of services specifically for each territorial reality, because the timetables in the cities are different.

**RE:** *So the FAL which passengers once jokingly called the "Snail Trains" are a thing of the past.*

**MC:** We don't wish to hide the problems we have had and we fully understand the inconveniences which passengers had to put up with in the past. But now FAL is changing. And we can start to look back on the nickname we were given with a bit of a smile. So we were the Snail Trains and not the Ferrovie Appulo Lucane? Fine, now as a symbol for the company's new image we have adopted a snail, but a snail which is trying to run, to offer excellent services in keeping with the times and which are adequate to meet passenger needs and be a source of pride for our employees.

*Franco Tanel*



*The FAL lines used to be part of a much bigger network.*

## Tracks providing services for almost a century



*A passenger catchment area with a population of almost a million.*

Ferrovie Appulo-Lucane S.r.l was established as an autonomous company on 1 January 2001. The company took over from the Gestione Commissariale Governativa delle Ferrovie Appulo Lucane ed Autoservizi Integrativi (State-run Commissariat for the Appulo Lucane Railways and Integrated Road Services) set up in 1990.

In fact, Law no. 160 of 5 May 1989 divided up the various regional user areas

and grouped the lines which the government had transferred to the Gestione Commissariale Governativa Ferrovie Calabro - Lucane (*State-run Commissariat for the Calabria - Lucane Railways*) back in 1963 into two distinct organizations. The 950-mm narrow gauge railway network was built in the first half of the 1900s by the Società Italiana per le Strade Ferrate del Mediterraneo (Italian Company for the Railways of the Mediterranean) with

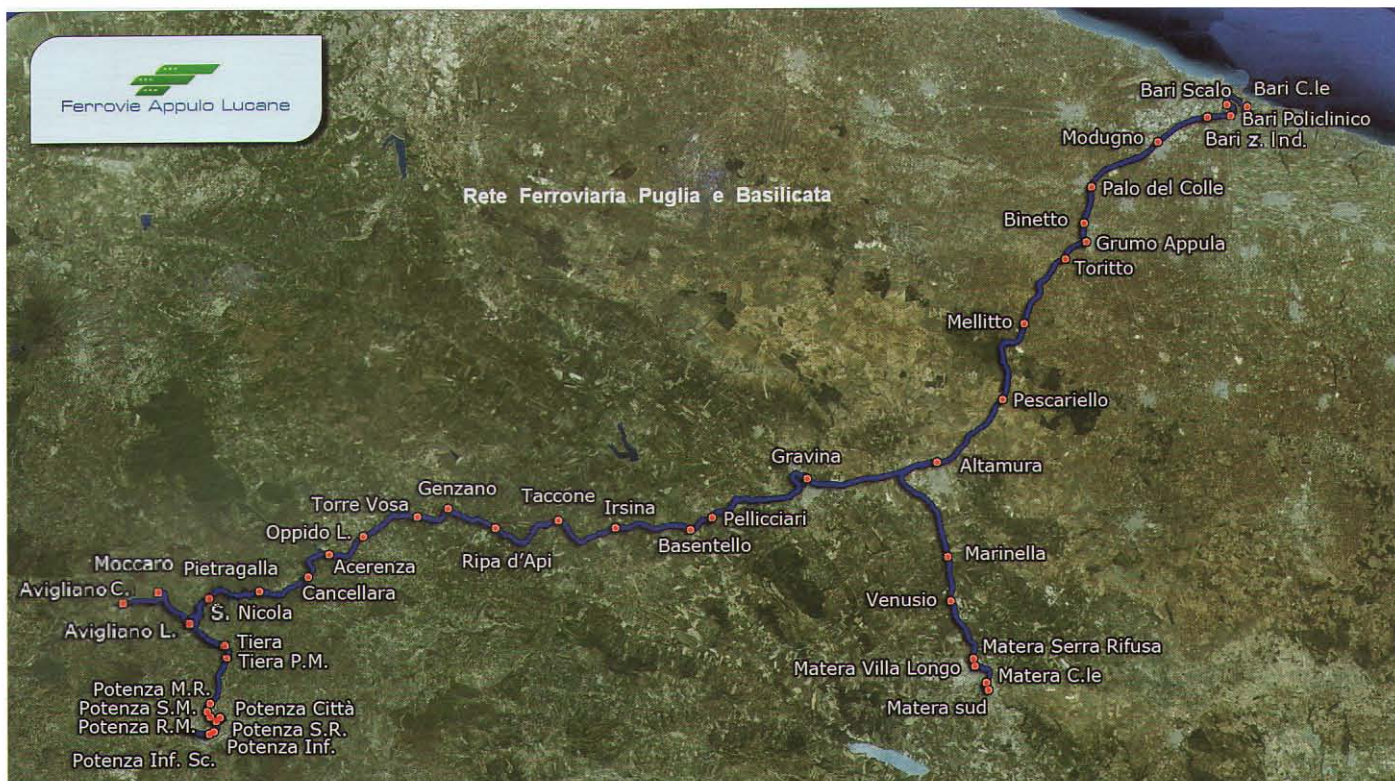
the aim of providing a rail link between the Tyrrhenian coast and the Ionian coast as well as to connect the internal regions of Apulia, Basilicata and Calabria to the two main coastal lines. The network operated by FAL covers territory in both Apulia and Basilicata and is made up of three lines: the Bari - Altamura - Matera line, the Altamura - Avigliano Lucania line and the Avigliano City - Potenza line. The Bari-Matera line, covering 76 km, came into

service on 9 August 1915 and was built by the Società Italiana per le Strade Ferrate del Mediterraneo. In 1928 and 1932 it was extended first to Miglionico and then to Montalbano Jonico, thus reaching an overall length of 142 kilometres. The Altamura - Avigliano Lucania and Avigliano City - Potenza lines on the other hand went into service between 1930 and 1934. During the same period the Avigliano di Lucania - Avigliano City branch line, measuring approximately 8 km, was also opened. Between Avigliano di Lucania and Potenza S. Maria, by means of an interposed rail, FAL use the same rail bed as the FS Foggia - Potenza RFI line. Development of the road network and road transport in the 1970s led to the progressive suppression of rail services until the situation we have today was reached. The transport network, restructured and modernized still follows the original route except for the route variation at Marinella along the Altamura-Matera line which was built in 2001. The Ferrovie Appulo Lucane rail network





# The Ferrovie Appulo Lucane (F.A.L.)



serves three provincial capitals (Bari, Potenza and Matera) and a large part the territories in the Lucane provinces. The main Bari - Potenza line runs across a territory which is by no means uniform and can be divided up into several sections. Bari - Modugno, in the metropolitan area of Bari; Modugno - Gravina in Apulia, an area of relatively small town districts (approx. 10,000 inhabitants) located

along the line and two regional poles (Altamura and Gravina) with 40/50,000 inhabitants served directly by the railway; Gravina - Avigliano Lucania which covers mountainous areas occupied by villages and very small town districts (1,000/6,000 inhabitants) situated even as far as 10 kilometres away from the railway line and finally the Avigliano - Avigliano Lucania - Potenza section.

Here the land is still mountainous but the reasonably large town district of Avigliano, (11,000 inhabitants) does not have any decent road connections linking it to the provincial capital so the railway represents an excellent alternative, especially during the winter months. The Altamura - Matera line crosses territory where there are no intermediate built-up areas and consequently

constitute a bipolar connection. In Apulia the line crosses a territory of predominantly flat land and runs parallel to the state highway 96 up to Gravina. The user area it serves holds approximately 700,000 inhabitants, 80% of which are concentrated within a 30 km radius from Bari. In Basilicata the railway line runs through countryside which is all hilly; from Altamura to Matera it runs parallel to state highway 99. The catchment area, 70% of which is in the Potenza area, amounts to approximately 250,000 inhabitants. Passengers are almost exclusively commuters. Demand is concentrated mainly in the suburban areas of Bari and Potenza and on the extremity connections of Matera - Bari, Gravina - Bari and Altamura - Bari.

*Franco Tanel*





*Rolling stock under renewal.*

## New trains built by Stadler arriving soon

*Air conditioning  
and bike storage  
facilities among the  
new features on the  
latest trains.*

Ferrovie Appulo Lucane (FAL) are about to see a radical renewal of their rolling stock, starting at the beginning of next year with the arrival of the first new trains built by the Swiss company, Stadler. The contract signed by FAL envisages the overall supply of nine new 950-mm narrow gauge multiple-unit trains, five two-carriage trains and four three-carriage trains. All the vehicles should be delivered by the end of 2013.

The two-carriage trains are made up of two symmetrical, permanently-coupled, single-cab traction units, each fitted with two driven bogies and two support bogies (Bo'2' + 2'Bo' wheel arrangement), while the three-carriage include a towed unit, identical to the other two but without a cab.

The trains are diesel-electric vehicles, a choice which offers the benefit of being able to make the most out of rail adhesion. They have optimized diesel engine speed for less energy consumption which allows for energy to be recovered during braking. All the trains are fitted with an automatic coupling system.

The access platform is lowered to provide easier passenger access to the vehicle, while on-board comfort is guaranteed by an air-conditioning system which is separate for the passenger area and the train driver's cabin.

The three-carriage trains are also fitted with disabled toilet facilities while all nine trains will offer bicycle storage facilities. The main technical characteristics are as follows: the trains will travel at a maximum speed

of 120 km/h with the two-carriage vehicles offering standard seating for 92 passengers plus 8 tip-up seats and space to accommodate 84 - 56 standing passengers (respectively 6 and 4 passengers/m<sup>2</sup>). The three-carriage vehicles can accommodate a total of 157 seated passengers (147 regular seats plus 10 tip-up seats) and 96 - 145 standing passengers. The overall coupled length is 35.8 metres for the two-carriage trains and 52.5 metres for the

three-carriage trains with a width of 2.5 metres and a bogie pivot pitch of 10.6 metres. The driven bogies have a 2000-mm pitch and the support bogies have a 1800-mm pitch and are fitted with wheels of an 810-mm and 685-mm diameter respectively. The two diesel generators in compliance with Stage IIIA each deliver 390 kW of power.

Up until today, services on the FAL lines were carried out using diesel trains with bogies belonging to different groups, in many case identical to the ones running on the Ferrovie della Calabria. For the more demanding rail links M4 trains are in service (numbered from 301 - 315) built by Ferrosud between 1987 and 1991 which are equipped with two Fiat 206-kW engines. Towards the end of the 1990s, the Ferrosud plants in Matera built six twin complexes created by combining two M4 type units, but with a single cab and only one engine per element, classified as M4 351-362. FAL also owns a number of diesel locomotives with LM4 bogies used for construction site trains (in the past also with trains in tow) and two steam locomotives built by Cernia, classified as 402 and 421 dating back to the 1930s, one of which is used at the head of the vintage train which has recently been put back into service.

*Franco Tanel*

