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Over the past few years we have strengthened the safety policy of Metro

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Secretary General of ALAMYS

Safety is a fundamental aspect of the service provided to Metro de Madrid users. Currently, Metro de Madrid, as well as providing a fast, clean, punctual, etc. passenger transport service, must also be safe. Safety has become a social requirement of the first order and today no public service can be designed without safety being guaranteed. Passengers who use the Metro on a daily basis must feel safe while they are travelling in the trains or standing in our stations.

Date of birth: 04/11/1953

Education:
• Degree in Industrial Engineering awarded by the Universidad Politécnica de Madrid (E.T.S.I.I.). Diploma in Company Planning and Administration from the same university.

Career path:
• Lecturer in Electrical Machinery at the Escuela Técnica Superior de Ingenieros Industriales of Madrid, from 1979 to 1983. • From 1996 to 2000, lecturer in Electrical Traction at the Escuela Politécnica Superior de la Universidad Carlos III de Madrid. • Responsible for research projects on renewable energies at the Empresa Nacional Bazán from 1979 to 1981. • Joined Metro de Madrid in 1981 where he has held various positions such as Head of Trains Department, Head of Movement Division and Deputy Operations Manager. • Appointed Secretary General of ALAMYS (Asociación Latino Americana de Metros y Subterráneos) in December 2000.

Present position:
• Operations Director of Metro de Madrid, S.A., since 1996, being in charge of the management of lines (traffic), stations and depots, Central Control Station, Civil Defence and Safety.

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Can you give me a short history of Metro de Madrid from the opening of the first line by His Majesty King Alfonso XIII on 17th October 1919? What were the principal historical milestones?

Metro de Madrid opened its doors in October 1919 with a 3.5 km line and eight stations between Cuatro Caminos and Sol, in response to the need to provide a high capacity, fast transport medium on the routes that were beginning to generate a number of passengers who could not be accommodated by a somewhat saturated tram network in competition with a growing number of cars. This is how Metro de Madrid came about, emulating those which had sprung up in other major world cities: London, New York, Paris and Buenos Aires.

The first rolling stock acquired by the Compañía Metropolitano Alfonso XIII, as it was initially called, in honour of the significant financial contribution that the Royal House made to its construction, was 11 motor coaches and 10 passenger wagons, with a capacity for 24 seated passengers and 76 standing. In the first 12 months of operation, these wagons were used by 14 million people making the company the backbone of transport in Madrid in the following years.

The development of the network was paralysed in the 1930s by the civil war. At that time, the network consisted of four lines with 21 km and 38 stations. Financial problems during the postwar period and subsequent years limited development to a further 7 km and 14 stations. Economic development picked up again in the 60s and 70s. The 60s saw the birth of line 5 and the suburban line (currently line 10) and the first wide gauge lines (6, 7, 8 and 9) began construction in the 70s.

The Company passed into the hands of the Government between 1978 and 1985, during the so-called Intervention Period. During those years the network passed the 100 km mark with the completion of most of the wide gauge lines (6, 8 and 9).

The Consorcio Regional de Transportes, which operated a policy of promoting public transport, facilitating intermodal exchange, with socially affordable prices thanks to the various types of transport support, was created in 1985. Its success was spectacular since it managed to go from 950 million passengers in 1986 to 1,564 million in 2004 and increased the use of public transport in the Community of Madrid by more than 60%.

Date opened	Line	Route	Length (km)	No. of stations
1919	1	Plaza de Castilla-Congosto	16,700	27
1924	2	Ventas-Cuatro Caminos	7,862	15
1925	banch	Ópera-Príncipe Pío	1,092	2
1936	3	Legazpi-Moncloa	6,362	11
1944	4	Argüelles-Parque de Santa María	12,850	20
1968	5	Canillejas-Casa de Campo	20,790	30
1979	6	Circular	23,472	27
1974	7	Las Musas-Pitis	18,832	22
1998	8	Nuevos Ministerios-Barajas	13,895	6
1980	9	Herrera Oria-Puerta de Arganda	19,720	22
1999	9b TFM	Puerta de Arganda-Arganda del Rey	18,280	5
1961	10	Fuencarral-Puerta del Sur	24,010	19
1998	11	Plaza Elíptica-Pan Bendito	2,268	3
2003	12	MetroSur	40,596	28
TOTAL			226,729	237

What are Metro de Madrid's expansion plans and what are the various management and commissioning stages from the point a new Metro line is planned until it is actually being used by the end user?

The procedure for building a Metro line in the Community of Madrid is as follows:

1. Consorcio Regional de Transportes study which ascertains the preliminary route and location of stations.

2. The Department of Infrastructure of the Community of Madrid produces the basic plans and infrastructure construction plans and constructs the infrastructure and installations.

3. Metro de Madrid produces the functional plans, defines the design criteria for the new lines, produces the installation plans and supervises their implementation, produces the specifications for the construction of the rolling stock, puts the installations and trains into service and finally operates the network.

After this initial introduction to the background, future and various characteristics of Metro de Madrid, we come to the important question of safety. Conceptually, what does making such a large urban infrastructure safe involve? Is it a priority? What makes Metro de Madrid particularly safe?

Safety is a fundamental aspect of the service provided to Metro de Madrid users. Currently, Metro de Madrid, as well as providing a fast, clean, punctual, etc. passenger transport service, must also be safe. Safety has become a social requirement of the first order and today no public service can be designed without safety being guaranteed. Passengers who use the Metro on a daily basis must feel safe while they are travelling in the trains or standing in our stations.

Safety has also shown itself to be a direct requirement of Metro users. The opinion polls that the company conducts periodically have for years revealed it to be one of the main factors in assessing the service provided, together with the speed of or waiting time for trains. It appears as both a general priority and particular priority for Metro passengers.

Accordingly, the management of the company has over the past few years strengthened its Metro safety policy to ensure that it is operating under optimum safety conditions for both passengers and employees. One aspect of this, among others, is the increase in the number of security staff hired by Metro de Madrid over the last few years as well as the increase in the installation of security systems to reinforce the overall safety of Metro de Madrid.

Could you describe the risk management process in this type of transport infrastructure?

It is very complex to summarise the whole risk management process conducted within a company such as Metro de Madrid which carries more

How does Metro de Madrid stand on the basis of its infrastructure, operation and service indicators in comparison with the underground transport systems of the capitals of the world's most advanced nations? Is it a competitive infra-structure?

Again, I have to use objective data to answer that question.

Network	Length (km)	Number of stations	Stations (railway)(1)	Coaches*km(2)
Madrid	227	190	237	150 Mill
Berlin	153	170	225	129 "
London	408	175	377	482 "
Moscow	275	155	170	641 "
Paris	212	297	378	217 "
New York	471	424	488	538 "
Sao Paulo	57	52	55	88 "
Mexico	201	147	175	331 "
Tokyo	270	202	240	415 "
Hong Kong	80	49	59	112 "

(1) Total of stations (counting all stops).
(2) Number of kilometers in one year (all coaches).

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What are the principal characteristics of Metro de Madrid?	
Total length of the network:	227 km.
Number of lines:	12 + Ópera-Príncipe Pio branch
No. of km underground:	211
No. of km elevated:	0
No. of km on surface:	16
No. of coaches:	1576
No. of stations:	237
No. of underground stations:	221
No. of elevated stations:	3
No. of surface stations:	3
No. of escalators:	1216
No. of lifts:	254
No. of moving walkways (travelators):	24
No. of mobile ramps:	2
No. of passengers:	615 million (2004)
No. of employees:	5,713 (dec. 2004)
Opening time:	06:00 hrs (service starts at 06:05)
Closing time:	02:00 hrs (last train starts its journey at 01:33)
Track width:	1445 mm.
Signalling systems:	All lines fitted with Auto-matic Train Protection Systems (ATP). All lines fitted with Auto-matic Drive Systems (ATO) except line 2 and the Principe Pio branch line
Information boards:	1029
CCTV cameras:	2944
Interphones	3261

than two and half million people per day through more than 200 stations.

Briefly, we could say that risk management is based on an ongoing analysis of the situation, the influence of external factors on our environment, prevention in its various facets as a way of avoiding undesirable events or at least minimising them, the introduction of a range of very different types of security measures as and when the need arises and very close coordination and collaboration with the state organisations that deal with safety: police, fire brigade, health services etc.

Within the field of safety and the other factors which make it up, such as prevention, protection and precaution, how important are each of those factors? How is the company's risk map drawn up?

Metro de Madrid, S.A. separates the various aspects of risk management. There is the Prevention of Risks in the Workplace Department which deals exclusively with risks that can affect employees. At the same time, there is the Security Department which deals with aspects relating to the safety of personnel and assets. Finally, there is the Civil Defence Department which deals with all those risks to which users may be exposed.

Therefore, each of these departments is responsible for specific areas relating to prevention, protection and precaution. Thus the Prevention of Risks in the Workplace Department is defined by the Prevention of Risks in the Workplace Law. In the case of the Security Department, its responsibilities are related to prevention and protection against crime. And finally, the Civil Defence Department's prevention policy is defined by the Metro de Madrid S.A. Emergency Plan which contains a list of the company's risks and specific contingency and action plans.

Let us start with prevention. What is the basis behind the prevention programme, and what factors does it cover?

We look at safety as a global concept. It involves a set of actions in very different fields which, in addition to being juxtaposed, are interrelated. Therefore we are able to distinguish a set of seven different areas of action:

1. Actions relating to what to do in the event of an incident or emergency in the control centre (traffic, installations, energy and safety).

Metro and Light Railway extensions in the Madrid region up to 2007 1-VI-05		
Metro work	**Stations**	**Kilometres**
Extension of Line 1 from Plaza Castilla to Pinar de Chamartín	3	3.1
Extension of Line 1 from Congosto to PAUS de Vallecas	3	3.0
Extension of Line 2 from Ventas to La Elipa	1	1.4
Extension of Line 3 from Legazpi to Villaverde Alto	7	7.6
Extension of Line 4 from Parque de Santa María to Pinar de Chamartín	3	2.4
Extension of Line 5 Canillejas-Alameda de Osuna	2	2.2
New station on Line 6 (Arganzuela)	1	-
Extension of Line 7 Las Musas-La Peineta-Coslada-San Fernando (MetroEste 7b)	7	8.3
Extension of Line 8 to new airport terminals	1	2.6
New station on Line 8 at Pinar del Rey	1	-
New station on Line 9 b (TFM) Rivas Centro	1	-
Extension of Line 10 Fuencarral-Tres Olivos-Alcobendas-San Sebastián de los Reyes (MetroNorte 10b)	11	16.0
New station on Line 10 (Aviación Española)	1	-
Extension of Line 11 from Pan Bendito to Carabanchel Alto	3	3.1
TOTAL	45	49.7(1)
Light Railway		
New Line A Pinar de Chamartín-Sanchinarro-Las Tablas (2)	10	5.3
New Line B from Colonia Jardín to Aravaca	17	10
New Line C from Colonia Jardín to Boadilla del Monte	19	13.6
TOTAL	46	28.9
Total Metro + Light Railway	91	78.6
Móstoles - Navalcarnero	(3)	10

(1) *49.7 km of Metro are underground.*
(2) *70% of the new Line A, Pinar de Chamartín-Sanchinarro-Las Tablas, will be underground.*
(3) *No decision has yet been taken as to the type of rolling stock to be used on the Line which will join Móstoles to Navalcarnero (Suburban or Light Railway).*
Only the overall track length has been calculated; if the connections to the depots are included, the total will be approximately 90 km.

2. Actions relating to emergency work which range from drafting emergency plans, producing the list of risks, emergency statistics and monitoring as well as coordination work with outside assistance services (fire extinguishing, health and police).

3. Action within specific civil defence and security installations. In the first case we have everything relating to civil defence installations, both on the rolling stock and in the installations, lighting, evacuation, signage etc. In the second case, CCTV, access control, alarm management etc. systems.

4. Communication systems.

5. Training programmes which allow people to work with real installations through the use of simulators.

6. Research and development programmes such as digital computer modelling of evacuation and civil defence.

7. Implementation of new technology, particularly in the field of civil defence.

Once we get to the question of protection, we should refer to

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insurance as protection by means of an all risks policy. And also as an addition to the financial protection of a company capable of generating and consuming resources in a year, but which must also take into account the question of depreciation, because rolling stock wears out, etc. What is Metro de Madrid's insurance programme?

This is organised into various types of insurance, depending on the interest or item which is to be insured in each case, resulting in the various insurance policies which make up the said programme and cover the basic risks affecting our company. Thus, among other things, we can mention insuring injuries that may be occasioned to users by accidents related to the provision of the transport service, according to the various categories on the officially produced scale, by means of policies that give our passengers more comprehensive and efficient protection than that provided by the governing regulations.

Other areas in which our insurance programme stands out and on which we endeavour to place special emphasis, are those relating to insuring the public liability that the performance of our corporate activities may generate –by means of policies that cover the various areas and amounts involved– as well as those relating to insuring the material damage that may be occasioned to the facilities with which the transport service is provided (buildings, installations, equipment, tooling, furniture, rolling stock, etc.) and the group of policies by which we provide various social benefits for our company's employees.

Although the law makes it compulsory to take out Compulsory Passenger Insurance, its cover is limited both qualitatively and quantitatively. How do you take care of and insure your public liability?

We need to differentiate between taking care of the "causes" and "consequences". The former constitute a risk prevention problem which transcends public liability since passenger and employee safety is, logically, an essential priority in any type of transport. The multiple aspects in which it manifests itself –safety of structures, in the operation of trains, in driving them, etc.– compels us to deal with it in a special way with particular attention in each area to the state of in-house and external technology and experience.

With regard to the consequences of public liability, our care consists of preventing the wrong assignment of liability, which involves obtaining the maximum amount of information as to what really happened, the circumstances in which the incident

could have occurred, the true condition of the facilities, the people who may have been present, etc. To this end, we endeavour to provide the various technical and documentary resources –interphones in stations, radio telephones on trains, claim forms, incident reports, reports, etc.– which enable the facts and data to be communicated and, as far as possible, proven.

This influences the insurance of our liability insofar as it reduces the risk of our being held liable. The said insurance is taken out on a staggered basis, taking into account the non-uniform nature of claims, which makes it difficult to cover both large and often improbable possible claims, as well as much smaller ones, but also much less improbable, with a single premium. Therefore, in the same way as happens in other large companies, our liability is insured in tranches, the first subject to an excess and successive ones under separate policies.

"How many claims do you have per year?"

According to the latest information received from our insurance broker, and without getting into assessing the individual merits and grounds of each of them included in this overall figure, the average has been about 600 claims per annum, of which about 40 usually end up in court. In relative terms, Metro's claims history is very low given that we undertake approximately two and a half million journeys on our railway network every day.

"What frequency and what are the reasons?"

Approximately one or two claims per day on average although many of them have very limited financial implications. The most common reasons by far are falls, although they differ in terms of the places where they occur and above all the real or alleged circumstances that are attributed to us, which are not very diverse, ranging from a spilled substance or something thrown on the ground which is then trodden on, to pushing by other passengers or loss of balance attributed to the movement of the train.

"How are they resolved?"

With regard to out of court settlements, we have avoided any routine approach which involves indiscriminate acceptance or rejection of any claim, endeavouring on the contrary to examine each case individually and exhaustively in order to come to a proper and fair conclusion. One thing is certain, ultimately, the decision as to our liability and its quantification remains in the hands of the courts; but we do not believe that we have to stubbornly resort to them without listening to reason. Neither can we disregard the attitude of the insurance company which ultimately has to pay all or part of the compensation, for which reason the handling of out of court settlements is channelled through an insurance broker who coordinates the aforementioned guidelines with the insurance company's opinion in each case.

With regard to claims involving the courts, the aforementioned treatment means that only cases where this company or its insurance company feels they have good reason not to accept liability end up in court, which results in a fairly good balance of results although logically it cannot prevent certain claims from prospering which, in our opinion, should have been

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dismissed or simply in reality we were wrong to have brought.

"Any funny stories?"

They do not happen very often because true claims are very clear and those that are not are usually handled carefully. But on occasions people do not pay attention to details and then funny stories come about such as accidents in installations that do not exist, falling out of a door that in fact opens inwards, leaks from a roof when the installation does not have one, sudden braking on a train that has been stationary for several hours, or two consecutive falls on the same stair.

With regard to benefits for company personnel, how is the programme designed? Perhaps group life, accident, sickness etc. insurance? Is there a group savings plan for employees?

Our company has a social welfare insurance programme designed in accordance with agreements reached over time with employees, taking into account improved protection for them and without losing sight of the peculiarities of our company and the sector to which it belongs.

Specific protective measures have been established in an attempt to harmonise situations that can arise in our employees' working life with the nature of our company.

Leaving aside the arid casuistry that this question raises, it is worth pointing out in general terms that these measures are catered for in a range of policies that insure our employees and their families in the event of disablement, retirement, death and old age according the varying circumstances that can arise.

What is the Latin American Association of Metros and Undergrounds? What does it do and what is it for? In what ways does Metro de Madrid collaborate with that association?

ALAMYS, the Latin-American Association of Metros and Undergrounds, is an international association of metropolitan public rail transport system operators, companies and associations which carry out related activities, within the framework of the metropolitan railways of Latin American Countries and the Iberian Peninsula.

This non-profit making organisation arose in response to the need to pool concerns and experiences of the sector to take care of the affinities of its members both in respect of their technical specifications and their geographic origin.

Its aim is to contribute to increasing productivity, optimising resources and modernising infrastructures and management methods. And, primarily, to improve the services offered to the general public by the rail transport networks of major cities which affect the quality of life in those cities.

Metro de Madrid is a senior member of ALAMYS. Currently, the managing director of Metro de Madrid, Mr. Ildefonso de Matías, is president of ALAMYS and I, as operations director of Metro de Madrid, am the secretary of the organisation.

Which Latin American cities have a metro system? What are they like? Does Metro de Madrid collaborate directly with any of those companies?

There are 35 companies operating in cities in Argentina, Brazil, Chile, Colombia, Peru, Venezuela, Mexico, Puerto Rico, Portugal and Spain.

Metro de Madrid has collaboration agreements with:

– Subterráneos de Buenos Aires (Argentina).

– TRENSURB, Empresa de Trens Urbanos de Porto Alegre (Brazil).

From the point of view of sustainability of the cities, in relation to economic, social and environmental aspects, what impact does opening a new metro station have?

Metropolitan rail transport is, by its very nature, virtually always underground, a means of transport that allows the public to travel quicker than using the congested surface roads, where vehicle noise and contamination makes cities an unhealthy and unsustainable environment.

The efficiency of a metro train or tram measured by the amount of energy required for movement is much greater than that of other vehicles; this is the main advantage of rail transport. The second advantage is the use of electricity, which is non-contaminating, in areas where mobility needs means that users can replace their private vehicles or less efficient transport systems with modern trams or trains to transport them whilst using much less surface space to carry a larger number of people.

It is very difficult to assess a single metro station. The results of a system such as the metro are assessed according to their overall impact on the population and the transport channels they use, for example, a Regional Transport Consortium study found that the construction of MetroSur and its connection to Metro Line 10 (1,000,000 inhabitants) will save 47,700 hours per working day in addition to other positive effects such as:

– Reduced energy consumption.
– Environmental benefits for the atmosphere.
– Reduced operating costs in the overall transport system.
– Improved accessibility.
– Saving space on surface travel.
– Reduction of background noise.
– Improved health, etc. ■