

CURRICULUM VITAE

Name: **Angelo Vian**
Date of Birth: April 4, 1937
Nationality: Italian

Title:

EngD in Electrotechnical Engineering – Politécnico di Milano – 1957/61

Main recent duties:

- **Executive Officer at Themag Engenharia**
- **President of ABCE – Brazilian Association of Engineering Consultants (Associação Brasileira de Consultores de Engenharia) – until 2010**
- **President of FEPAC – Pan American Federation of Consultants (Federación Panamericana de Consultores) – until 2010**

Professional Experience

➤ **Since 1970: – Themag Engenharia**

Acting for four years as the Head of the Electric Power Systems Department, was responsible for several transmission studies involving major works of this nature in the country. Afterwards, represented Themag in the Itaipu Study Group for three years and, from that moment on, assumed the position of Officer, an office he still holds today.

Among the major works in which he participated as technical and administrative official, the following can be highlighted:

- i. Transmission System Studies, involving simulations in permanent and temporary regimes, reactive power compensation, technical & economic analyses and electromechanical project:
 - Cesp 460 kV Transmission System, integrating several hydroelectric power plants and transporting approximately 6000 MW to 600 km, with several intermediate substations;
 - Furnas 34 kV Transmission System, integrating several hydroelectric power plants in the Grande river to the 500 kV System and transporting power to the State of São Paulo;
 - Eletrosul 500/230 kV Transmission System (700 km);
 - Eletronorte 500 kV Transmission System, integrating the Tucuruí power plant to the North/Northeast System;
 - Endesa – Chile Transmission System;
 - Angola Transmission System;
 - Long-distance power transmission studies (transfer from the Amazon Region to the Northeast and Southeast Regions of Brazil).

- ii. Studies for the Itaipu Transmission System basic project – transportation of 12000 MV in a 900 km distance:
 - Basic requirements of lines, substations and equipment;
 - Technical specifications of the 600 kV DC transmission system, and the 750 kV AC system, to transport 6300 MW in each modality;
 - Technical & economic analyses of operating alternatives.
- iii. Development and project of Power and Control & Supervision Systems:
 - Development of studies of models and procedures for the planning of power systems, including technical and economic analyses for generation and transmission;
 - Feasibility analysis, study and planning for the implementation of control & supervision systems for electric power systems. Among the projects of this nature implanted by Themag, the following can be highlighted: SCS–Chesf, SCS for the paper manufacturing process to several manufacturers and SCS for Brazilian Navy Corvettes.
- iv. Feasibility analysis for the exploration of water resources and models of assessment for private investments in the Electricity Sector:
 - Feasibility study of the Pilar Hydroelectric Power Plant (150 MW), to be explored by the Fiat Group, integrating it to the South/Southeast System from its inclusion in the Cemig network.
- v. Since 1992 to date, he has been coordinating and orienting studies and feasibility analyses for the exploration of water resources, assessment of costs for the transportation of electric power along the S/SE-CO interconnected network and equity and economic & financial appraisals of electric utilities. The following activities can be highlighted:
 - Economic & financial appraisal of Alto Rio Pardo and Cesp power plants for privatization purposes; scenarios regarding the cost of electricity to the consumer, cost of transportation of electricity, operating and maintenance costs;
 - Equity appraisals of Light and Escelsa made for BNDES (the Brazilian Development Bank), covering all the electric part of its generation (power plants), transmission (lines and substations) and distribution systems;
 - Economic & financial appraisals of Light, Eletropaulo and Escelsa for BNDES involving cost and revenue forecasts with commercialization of electricity, operating and maintenance costs, market projections, import of power from Furnas and Itaipu, supply and provision fees and investment in generation, transmission and distribution;
 - Assessment of cost for transportation (“wheeling”), through the S/SE-CO interconnected system, of power generated by the Itá Hydroelectric Power Plant (1450 MW), located in the Uruguai river (SC/RS), for the provision of large industrial loads to the States of Minas Gerais, Rio de Janeiro and Espírito Santo;
 - Assessment of cost for transportation, through the Light and the Southeast Interconnected Systems, of power generated by the Valesul hydroelectric power plants, located in the State of Minas Gerais, to supply part of Valesul’s aluminum plant in Santa Cruz, RJ.
- vi. In 1997, participated, under the Engevix/Iesa/Promon/Themag Consortium, in electric and engineering studies, made for Eletrobrás, on the North/South interconnection (LT 500 kV from Imperatriz, MA, to the Serra da Mesa Hydroelectric Power Plant, GO).

- vii. In 1999/2001, coordinated, for Themag, a technical & economic feasibility study for a 700 MW thermal power plant located in the Northeast Region and integrated to the Brazilian Electric Power System using imported coal as fuel and natural gas as an alternative.
- viii. In 2000, participated in the studies for Enelpower do Brasil concerning the inclusion of the Sepetiba coal-fired Thermal Power Plant (1250 MW) in the Brazilian Electric Power System's basic network.
- ix. In 2000/01, participated in the basic engineering studies related to the implementation of a coal-fired 800 MW thermal power plant in São Luís, MA.
- x. Starting at the end of 1990s, and so far, has done systematic analyses of the model adopted for the Brazilian Electricity Sector through the study of the institutional and normative framework that characterizes this sector. Has also been studying the technical and economic aspects of the systems and subsystems of generation, transmission and distribution of electric energy, which comprise the interconnected System currently deployed in Brazil.
- xi. From the early 2000s, as President of ABCE (Brazilian Association of Engineering Consultants) and of FEPAC (Pan American Federation of Consultants), went on to promote the development of Brazilian Engineering Consulting along governmental institutions, agencies for the Brazilian technological development and major potential customers, both domestic and foreign. In this context, has published articles covering the broad diagnosis and long-term solutions for the strengthening of the engineering consulting sector, besides presenting several lectures and conferences on this theme.

► 1961/70: – CESI (Centro Elettrotécnico Sperimentale Italiano)

Started as an engineer in the Studies and Systems Sector, where remained for three years, being promoted to Head of the Digital Application Division for another three years and then finally acting as the Head of the Power Systems Department.

Carried out studies in network analyzers, introduced and developed digital techniques for analysis and simulation of power systems.

Participated in several power system studies, serving many clients in Europe (France, Switzerland and Germany), in Latin America (Brazil, Ecuador and Venezuela), United States and Canada.

Publications

1. Teste de Campo no Comissionamento da Linha 345 kV Jaguará/Taquaril da CEMIG – II SNPTEE – Belo Horizonte, Brasil, 1973 – Vian A e Sato W. (*Field Testing in CEMIG's Jaguará/Taquaril 345 kV Line Commissioning*)
2. Sobreensões Dinâmicas e de Manobra no Sistema 345 kV de Furnas – II SNPTEE – Belo Horizonte, Brasil, 1973 – Vian A. (*Dynamic and Maneuvering Overvoltage in Furnas' 345 kV System*)

3. Rádio Interferência nas Linhas 345 kV da CEMIG – II SNPTEE – Belo Horizonte, Brasil, 1973 – Vian A e Sato W. (*Radio Interference in CEMIG's 345 kV Lines*)
4. Estudos Preliminares para Aplicação de Compensação Estática em Alternativas com Suporte de Tensão para o Sistema de Transmissão de Itaipu – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Jardini J A, Vian A et alii. (*Preliminary Studies for the Application of Static Var Compensation with Support of Voltage to the Itaipu Transmission System*)
5. Determinação das Sobretensões de Manobra no Sistema de Transmissão de Itaipu – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Jardini J A, Sato W e Zanetta Jr. L C. (*Determination of Maneuvering Overvoltage in Itaipu Transmission System*)
6. Coordenação de Isolamento das Linhas do Sistema de Transmissão de Itaipu – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Jardini J A, Sato W, Masuda M et alii. (*Itaipu Transmission System's Lines Isolation Coordination*)
7. Linhas 800 kV de Itaipu – Interferência em Sinais de Rádio e TV, Ruído Audível e Efeito Corona Visível – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Jardini J A, Sato W et alii. (*Itaipu's 800 kV Lines – Interference in Radio and TV Signals, Audible Noise and the Visible Corona Discharge*)
8. Investigações dos Níveis de Sinais de Rádio na Rota das Linhas 800 kV do Sistema de Transmissão de Itaipu – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Sato W et alii. (*Research on the Levels of Radio Signals in the Route of Itaipu Transmission System's 800 kV Lines*)
9. Desempenho das Linhas 800 kV de Itaipu durante Descargas Atmosféricas – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Jardini J A, Brasil D O C et alii. (*Performance of Itaipu's 800 kV Lines during Atmospheric Discharges*)
10. Investigação sobre Efeitos do Campo Eletrostático das Linhas 800 kV de Itaipu – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Jardini J A, Brasil D O C et alii. (*Research on the Effects of the Electrostatic Field of Itaipu's 800 kV Lines*)
11. Coordenação do Isolamento das Subestações 800 kV de Itaipu – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Jardini J A, Brasil D O C, Zanetta Jr. L C et alii. (*Coordination of the Isolation of Itaipu's 800 kV Substations*)
12. Planejamento do Sistema de Transmissão 500 kV da ELETROSUL – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A et alii. (*The Planning of ELETROSUL's 500 kV Transmission System*)
13. Torres 500 kV da ELETROSUL – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Bugni Filho D e Brochado A C. (*ELETROSUL's 500 kV Towers*)
14. Torres 500 kV da ELETROSUL – Estudos em TNA – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Bugni Filho D e Brochado A C. (*ELETROSUL's 500 kV Towers – Studies in TNA*)
15. RI, TVI, AN e Corona Visível em Subestações 500 kV – IV SNPTEE – Rio de Janeiro, Brasil, 1977 – Vian A, Jardini J A, Sato W et alii. (*RI, TVI, NA and Visible Corona in 500 kV Substations*)

16. Uma Introdução à Análise de Ressonância Subsíncrona no Sistema de Transmissão de Itaipu – V SNPTEE, Recife, Brasil, 1979 – Vian A. (*An Introduction to the Analysis of Subsynchronous Resonance in Itaipu Transmission System*)
17. Energização de Transformadores de Grande Potência com Fontes Capacitivas de Baixa Potência – V SNPTEE – Recife, Brasil, 1979 – Vian A, Sato W et alii. (*Energization of High Power Transformers with Low Capacitive Power Supply*)
18. Itaipu 800 kV Transmission System Surge Arrester and Circuit Breaker Special Duties – CIGRÉ – Paris, France, 1980 – Vian A, Jardini J A et alii.
19. Sistema de Transmissão de Itaipu – Definição da Configuração Básica – VI SNPTEE – Camboriú, Brasil, 1981 – Vian A et alii. (*Itaipu Transmisssion System – Definition of Basic Configuration*)
20. Impacto de Atrasos na Construção na Confiabilidade de Sistemas – Uma Experiência Brasileira – VI SNPTEE – Camboriú, Brasil, 1981 – Vian A et alii. (*Impact of Construction Delays in the Reliability of Systems – A Brazilian Experience*)
21. Guia para Especificações de Projetos Turn-key – VI SNPTEE – Camboriú, Brasil, 1981 – Vian A. (*Guidelines for Turn-key Project Specifications*)
22. Metodologia para Avaliação Estatística de Confiabilidade de Sistemas Elétricos – VI SNPTEE – Camboriú, Brasil, 1981 – Vian A e Robba E J. (*Methodology for Statistical Evaluation of Electrical Systems' Realiability*)
23. Determinação dos Surtos de Manobra no Sistema de Transmissão 800 kV de Itaipu – 1982 – Vian A et alii. (*Determination of Maneuver Outbreaks in Itaipu 800 kV Transmission System*)
24. Resultados da Análise de Campo nas Áreas do Rio de Janeiro e São Paulo para Modelagem Dinâmica da Carga – 1982 – Vian A et alii. (*Results of Field Analyses in the Areas of Rio de Janeiro and São Paulo for Dynamic Load Modeling*)
25. Um Estudo para a Escolha da Configuração Final do Sistema de Transmissão de Itaipu – 1983 – Vian A et alii. (*A Study to Determine the Final Configuration of the Itaipu Transmission System*)
26. Coordenação do Isolamento das Linhas do Sistema de Transmissão de Itaipu – 1983 – Vian A et alii. (*Lines Isolation Coordination in the Itaipu Transmission System*)
27. Present Limits of Very Long Distance Transmission Systems – CIGRÉ Session – Paris, France, 1984 – Vian A et alii.
28. DC Alternative for the 8 GW / 2,400 km Transmission System from the Amazon Basin to the Southeast of Brasil – IV International Conference on AC and DC Power Transmission, IEE – London, England, 1985 – Vian A, Bressane J M, Brochado A C et alii.
29. Some Aspects of the Energy Supply to Small Loads Located Near Long Distance Transmission Trunks – CIGRÉ/UPDEA Symposium on Electric Power Systems in Developing Countries – Dakar, Senegal, 1985 – Vian A, Bressane J M, Ferraz A V et alii.
30. Efeito da Disponibilidade de Geração de Ponta sobre a Confiabilidade do Suprimento de Grandes Cargas (Áreas do Rio de Janeiro e Nilo Peçanha) – 1985 – Vian A, Lima J L A et

alii. (*Effect of the Availability of High-end Generation on the Reliability of Large Load Supplies (Rio de Janeiro and Nilo Peçanha Areas)*)

31. Viabilidade e Custos Associados à Transmissão da Amazônia – VIII SNPTEE – São Paulo, Brasil, 1986 – Vian A, Bressane J M et alii. (*Feasibility and Costs Associated to the Transmission from the Amazon*)
32. Differences Between System Operation Planning and System Expansion Planning in Relation to Objectives, Criteria and Procedures of Analysis – I Symposium of Specialists in Electric Operational and Expansion Planning (SEPOPE) – Rio de Janeiro, Brasil, 1986 – Vian A.
33. DC Alternative for the Transmission from the Amazon Basin: Dynamic Performance of the AC/DC Brazilian Interconnected System During Severe Transients – Boston, USA, 1987 – Vian A, Brochado A C, Ferraz A V et alii.
34. Reactive Power Balance Optimization to Improve the Energy Transfer through AC Transmission System over Very Long Distance – CIGRÉ Session – Paris, France, 1988 – Vian A et alii.
35. AC and DC Medium Voltage Long Distance Transmission Systems to Supply Small and Medium Isolated Loads – II Symposium of Specialists in Electric Operational and Expansion Planning (SEPOPE) – São Paulo, Brasil, 1989 – Vian A, Brochado A C, Ferraz A V and Cerqueira S M.
36. The Security and Cost Analysis in the Enhancement of the Interconnected System Utilization through the Intensive Application of Special Control Actions – CIGRÉ Symposium – Paris, France, 1990 – Vian A et alii.

Lectures and Conferences

1. “Desafios para a Expansão do Parque Hidrelétrico Brasileiro”, ABCE – Associação Brasileira de Consultores de Engenharia, 1999. (*Challenges for the Expansion of the Brazilian Hydroelectric Park*).
2. “Empreendimentos Hidroenergéticos”, VDI Associação Técnica Brasil Alemanha, São Paulo, 2001. (*Hydro-Energy Ventures*)
3. “Novos Modelos Contratuais”, Grupo Camargo Correa, 2001. (*New Contractual Models*)
4. “Indústria Nacional: Barreiras e Desafios”, Encontro sobre a Inserção das Tecnologias de Turbinas a Gás no Brasil, FIRJAN – Federação das Indústrias do Estado do Rio de Janeiro, 2001. (*Brazilian Industry: Barriers and Challenges*)
5. “A Engenharia e P&D - A Iniciativa Privada”, Academia Brasileira de Ciências, Encontro Nacional de Acadêmicos, Rio de Janeiro, Brasil, 2002. (*The Engineering and R & D - The Private Sector*)
6. “ALCA e Engenharia”, Clube de Engenharia, Rio de Janeiro, Brasil, 2002. (*ALCA - Free Trade Area of the Americas – and Engineering*)
7. “La Consultoría hoy: Oportunidades y riesgos”, FEPAC – Federação Pan-americana de Consultores, Santiago, Chile, 2002. (*Consulting Today: Opportunities and Risks*)

8. *“Programa de Concesiones: la Experiencia Brasileña - Sector Electrico”*, FEPAC – Federação Pan-americana de Consultores, Chile, 2003. (*Grant Program: the Brazilian Experience - Electric Sector*)
9. *“Proyecciones para la Consultoria de Ingeniería en el Nuevo Contexto de la Globalización”*, FEPAC – Federação Pan-americana de Consultores, Chile, 2003. (*Projections for the Consulting Engineering in the Global New Context*)
10. *“A necessidade da infra-estrutura como mola propulsora do desenvolvimento”*, 5º CONSE, Florianópolis, Brasil, 2003. (*The necessity of the infrastructure such as a propelling development spring*)
11. *“Energia elétrica - seus aspectos relacionados com a engenharia”*, Universidade São Paulo, São Paulo, Brasil, 2003. (*Electric energy - related engineering aspects*)
12. *“A ALCA e a Engenharia Brasileira”*, Clube de Engenharia, Rio de Janeiro, Brasil, 2004. (*The ALCA and the Brazilian Engineering*)
13. *“Engenharia & Desenvolvimento - Proposições da Engenharia Consultiva (I)”*, BNDES – Banco Nacional de Desenvolvimento Econômico e Social, Rio de Janeiro, Brasil, 2004. (*Engineering & Development – Propositions of the Consulting Engineering (I)*)
14. *“A importância de uma Engenharia Nacional forte para o desenvolvimento do país”*, Clube de Engenharia, Rio de Janeiro, Brasil, 2004. (*The importance of a strong National Engineering for the development of the country*)
15. *“Integración Regional y Comercio Internacional en el Mercado de la Consultoría”*, FEPAC – Federação Pan-americana de Consultores, Cidade do México, México, 2004. (*Regional Integration and International Trade in the Consulting Market*)
16. *“Painel Sobre Geração Distribuída”*, 2004 IEEE/PES Transmission and Distribution Conference and Exposition - Latin America, São Paulo, Brasil, 2004. (*Panel on Distributed Generation*)
17. *“Alianzas Regionales en el Mercado de la Consultoría”*, FEPAC – Federação Pan-americana de Consultores, Honduras, 2005. (*Regional Alliances in the Consulting Market*)
18. *“Propostas para a organização e definição de uma política de exportação de serviços - A exportação de serviços de Consultoria de Engenharia”*, 26º ENAEX – Encontro Nacional de Comércio Exterior, Rio de Janeiro, Brasil, 2006. (*Proposals for the organization and definition of a policy of export of services – The export of engineering Consultancy Services*)
19. *“Contratación de la ingeniería de consulta”*, Coloquio Internacional FEPAC – CCI, Bogotá, Colômbia, 2006. (*Recruitment of Consulting Engineering*)
20. *“FEPAC’s paper for discussion # 1”*, Biennial Meeting International Lending Agencies and Consulting Industry – BIMILACI, Washington D.C., USA, 2007.
21. *“FEPAC’s paper for discussion # 2”*, Biennial Meeting International Lending Agencies and Consulting Industry – BIMILACI, Washington D.C., USA, 2007.
22. *“Desarrollo de la Consultoría en América Latina”*, Seminário ACCE-FEPAC, Quito, Equador, 2007. (*Development of Consulting in Latin America*)
23. *“Engineering Consulting in South America”*, FIDIC Conference, Quebec, Canada, 2008

24. *“Conflicto Energía vs Medio Ambiente”*, VII Congreso Panamericano de Consultoría, FEPAC – Federação Pan-americana de Consultores, Santiago, Chile, 2008. (*Conflict Energy vs. Environment*)
25. *“Contratación de la ingeniería de consulta I – Contrataciones en Brasil”*, FEPAC – Federação Pan-americana de Consultores, Lima, Peru, 2008. (*Recruitment of Consulting Engineering I - Procurement in Brazil*)
26. *“Contratación de la ingeniería de consulta II – Guidelines del Banco Mundial”*, FEPAC – Federação Pan-americana de Consultores, Lima, Peru, 2008. (*Recruitment of Consulting Engineering II - Guidelines of the World Bank*)
27. *“La importancia de la consultoría en un mundo moderno”*, FEPAC – Federação Pan-americana de Consultores, Lima, Peru, 2008. (*The importance of consulting in a modern world*)
28. *“Crise: riscos e oportunidades para a Consultoria de Engenharia”*, Seminário Internacional FIDIC – FEPAC – ABCE, São Paulo, Brasil, 2009. (*Crisis: risks and opportunities for Engineering Consulting*)
29. *“Crise: riscos e oportunidades para a Consultoria de Engenharia - A visão das empresas de Consultoria de Engenharia”*, Seminário Internacional FIDIC – FEPAC – ABCE, São Paulo, Brasil, 2009. (*Crisis: risks and opportunities for Engineering Consulting - The vision of Engineering Consulting firms*)
30. *“Consultoría de Ingeniería en América Latina (Área de FEPAC)”*, FEPAC – Federação Pan-americana de Consultores, El Salvador, 2009. (*Engineering Consulting in Latin America*)
31. *“Engineering Consulting in Brazil 2009”*, International Federation of Consulting Engineers, Londres, Inglaterra, 2009.
32. *“Report of Chilean Global Situation and Consulting Activity (Asociación de Empresas Consultoras de Ingeniería de Chile, A.G.)”*, International Federation of Consulting Engineers, Londres, Inglaterra, 2009.
33. *“Cámara Colombiana de la Infraestructura”*, International Federation of Consulting Engineers, Londres, Inglaterra, 2009. (*Colombian Infrastructure Chamber*)
34. *“CAVECON – Cámara Venezolana de Empresas Consultoras de Venezuela”*, International Federation of Consulting Engineers, Londres, Inglaterra, 2009. (*CAVECON - Venezuelan Chamber of Venezuela Consulting Firms*)
35. *“Veículos Eléctricos - Impactos sobre a rede de distribuição”*, VE 2009, Campinas, Brazil, 2009. (*Electric Vehicles - Impacts on distribution network*)
36. *“La Experiencia Brasileña en la Exploración en Aguas Profundas”*, 12º Congresso Nacional e Internacional de Consultoría - XXV Aniversário CNEC, México, 2010. (*The Brazilian Experience in Exploration in Deep Water*)
37. *“Consultores de Ingeniería en Brasil 2010”*, 12º Congresso Nacional e Internacional de Consultoría - XXV Aniversário CNEC, México, 2010. (*Engineering Consultants in Brazil 2010*)