



Curriculum Vitae - Roberto Cipollone

Roberto Cipollone was born in Chieti (Italy), April 21st, 1957. He graduated as Electric Engineer with honours in December 1980 at the University of L'Aquila (Italy). Since this date he started a continuous cooperation with the Thermal Engine Division of the Department of Energetics, University of L'Aquila.

In 1987 he got the Philosophy Doctor Degree on "Engineering of thermal engines" at the University of L'Aquila after a two years period during which he joined the Von Karman Institute for Fluid Dynamics (Brussels, Belgium), winning the Belgian Government Prize in 1984, discussing a novel theoretical approach to represent the three-dimensional flow inside high speed centrifugal compressor impellers. The PhD thesis was referred to an original theoretical and experimental treatment of the unsteady convective heat transfer in reciprocating internal combustion engines (ICE). Since these years, the ICE will represent one of the main research topic.

Roberto Cipollone has been contract professor of different official courses (Mechanics and Machines, Dynamics and control of machines, etc...) during the years 1987-1989 at the Engineering Faculty, University of L'Aquila founding new academic courses which started to appear of great a new interest in the sector ("Interaction between Environment and Thermal Engines, Environmental and Energetic planning of a territory, Dynamics and control of thermal engines). In this way he participated very effectively to the important continuous updating which is important for engineering students. Thanks to this deep academic engagement and to some strategic research projects of which he was responsible, Roberto Cipollone joined the Department of Energy of the University of L'Aquila (DIMEG) as Researcher in 1990, in 1991 as Senior Researcher, in 1992 as Associate Professor, and in 1993 as Full Professor on *Interactions between the Environment and thermal engines* and on *Dynamics and control of thermal engines* reaching the top level of University degree.

From a scientific point of view his career was mainly oriented toward the evaluation of the engineering interactions between energy transformation and the environment. Unconventional thermodynamics approaches were discerned to machines and thermal engines & energy optimization systems. Also the sector of the Dynamics of thermal engines, mainly referred to reciprocating internal combustion engines, represented one of the main research activities. Inside these areas, the aspects treated are:

- Renewable energy conversion systems (wind, photovoltaic, concentrated solar power, biomasses) and integration with conventional thermal and mechanical energy plants;
- District heating and cogeneration plants;
- Internal combustion engine control (air/fuel ratio, injection, heat transfer, advanced thermal management, variable valve actuations, power transmission, component innovation, exhaust gas recirculation, intake and exhaust air and gas dynamics, ...) & transportation focusing the attention to the most important technologies which will characterize their future evolution. In this sector, research Roberto Cipollone was responsible of different research project at European level in which all the European thermal engine manufacturers were involved;

- Unconventional propulsion systems in the road transportation sector which revealed of a great interest: in the framework of a project of relevant national interest, a hybrid bus *Colibrì* (methane+ electric) was designed, built and operated at DIMEG. It still represents a mobile lab where control strategies are still in development;
- Energetic and environmental regional planning (efficiency increases in the final forms of energy –thermal, mechanical, electrical - intersections between services and resource consumption, etc...); One of the most important result was the Regional Environmental and Energetic Plan (Abruzzo's Region) which gave the opportunity to open a new research frontier toward regional planning;
- Oil and gas management in on and off shore conditions at cryogenic temperature allowing the management of the liquefied natural gas in off shore conditions;
- Optimization of processes of components and the energy conversion systems in industrial areas; one important result was the founding of a Consortium called "Fucino Energia" where 40 Companies and several Institutions joined together to make profit from the liberalization of the electric and methane markets, in the light of the green, white and blue certificates (energy saving, renewable energy production and CO2 trading);
- Innovative energy conversion technologies (renewable & fossil based) and energy saving in specific areas.
- Life cycle analysis and life costing and design; sustainability in the industrial and service sectors (waste management, water distribution, etc...);
- Pollutant diffusion in atmosphere using an intermediate approach between a lagrangian and eulerian formulation;

All these activities are shared with a specific involved research group where more than ten people are continuously involved at different level and responsibility areas.

In those themes Prof Roberto Cipollone published about two hundred scientific papers, chapter of books, books, etc... ; he has also the intellectual property of several national and European patents of industrial interest concerning thermal management in Internal Combustion Engines, model based vehicles controls, concentrated solar power, sealing devices for the automotive sectors and specific heavy duty application.

He actually is and was responsible of many research projects with Private national and international companies, National Public Authorities, European Community, Private Research Centers, etc.... concerning energy planning, environmental opportunities related to the energy production, energy conversion systems, etc... He is responsible of a relevant national Research Program concerning pollutant reduction in combustion engines. Mean turn over of the research activities is close to one million of US \$/year.

Roberto Cipollone had many important functions (President of the Environmental Commission of the University of L'Aquila, President of the Council of the Environmental and Soil Engineering Course at the University of L'Aquila, etc...) as support at the University Organization. He was co-founder of "Fucino Energia" a new Consortium between eleven industries and University of L'Aquila to create synergies between industry and University. Actually he is President and CEO. He's vice Director of the Department of Mechanical Engineering, Energy & Management, University of L'Aquila. He is member of many Board of Directors of Companies, Consortium, Commissions and he is involved in many strategic development in R & D of new products referred to engines, pumps & compressors, sealing technology, energy saving.

PUBLICATION LIST (selected)

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SAE 2000 Int. Fall Fuels & Lubricants Meeting & Exposition, 16-19 Ottobre 2000, Baltimora (USA), SAE Technical Paper Series (ISSN: 0148-7191) n. 2000-01-2974, SAE Special Publication n. 1565: "Alternative Fuels 2000" and SAE Transactions (ISSN: 0096-736X) – Journal of Fuel & Lubricants 2000
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9. R. Cipollone, V. Giovannangelo "A scientific approach to the design of an energetic and environmental planning", Energy and the Environment International Congress, Opatija, Croatia 2008
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12. R. Cipollone, V. Giovannangelo, L. Scarpone “La Pianificazione Energetica ed Ambientale a livello Territoriale”, Quaderni di studio del DIMEG, Università degli Studi dell'Aquila
13. Cipollone R. et Al. - A theoretical and experimental procedure for design optimization of CVT belts. SAE PAPER. vol. SP-1760 ISSN: 0148-7191 Paper 2003-10-0973.
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30. R. Cipollone; C. Villante - una modellistica sistema per la gestione termica integrata del veicolo 59° Congresso Nazionale ATI - Genova 14-17 settembre 2004
31. R. Cipollone; C. Villante - Il controllo model-based della dinamica del combustibile in motori a GPL - 59° Congresso Nazionale ATI - Genova 14-17 settembre 2004

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47. Cipollone R. et al., Solarcar: an Environmental Friendly Vehicle for Individual Mobility. FISITA 98, 29 September-1 October, Paris, France
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