



Curriculum Vitae

Andrea Capriccioli

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- Born on 1955 July 27 in Rome, Italian citizen;
- Italian Laurea (cum laude) Master degree in Mechanical Engineering (Rome, 1979 March 30);
- Degree thesis presented at the XII International Conference of Medical and Biological Engineering in Jerusalem, Israel 1979;
- Postgraduate in Medical Engineering at the Engineering Department of Automation on 1982;
- Engineering diploma and on the official register of engineers since 1980;
- Military service as second lieutenant between 1979 and 1980
- ENEA Scholarship on Fast Reactor: setting-up and use of control methodology for nuclear components, PEC Project ENEA Department on 1981;
- Employed by FATME (ERICSSON) Company between 1981 and 1982;
- Employed by TECNOBIOMEDICA (Medical and Biological Engineering Research Company) between 1982 and 1983;
- Employed by ENEA as Mechanical Engineer in CIRENE Nuclear Department between 1983 and 1995;
- Responsible of CIRENE Fuel Manufacturing Unit between 1986 and 1994;
- ENEA Fusion Department task on Tokamak Poloidal Field Coils optimization and possibility of control of the Plasma position using Neural Network between 1995 and 1996;
- Member of ENEA Fusion Technology Unit in Frascati since 1997;
- On leave for research purpose to MAX PLANCK INSTITUTE between 2004 Nov. the 1st and 2005 Oct. the 31st;
- In ENEA Fusion Technology Unit with tasks from IPP (2005-2006) and EFDA, on ITER project, (2006-2007);
- Involved in FE ANSYS simulations of welding processes (2007-2008);
- Currently involved in **ProGeo** proposal as inventor (PCT/IT2012/000192; International Publication Number WO 2013/190581 A1) and responsible of ProGeo 20kW designing and manufacturing.

ProGeo is a system for the storage of electricity from renewable sources through the transformation of surplus into green-methane. The demonstrative plant, ProGeo20kW, funded by the private company PLC System, has been completed with the manufacture of the main innovative components and their connections. The experimental phase has started on June 2014.

*Activities carried out before **ENEA** recruitment:*

- Analysis of planning and control codes for manufacturing progress (IBM CLASS at FATME / ERICSSON company);
- Formulation of research plans in Medical and Biological Engineering with national financing (TECNOBIOMEDICA company).

*Activities carried out after ENEA recruitment at **Nuclear FISSION Department**:*

- Surveillance on manufacturing of Nuclear Fuel for CIRENE Reactor (CANDU type);
- Supplying of Zircalloy sheathes for fuel bundles at Mannesmann Company;
- Manufacturing processes qualification of the Uranium dioxide pellets at FN (Fabbricazioni Nucleari) Company;
- Drawing up of Product Specifications, Manufacturing and Control Plans, Qualification Manuals;
- Development of the statistical analysis code (DASA) to analyze the manufacturing data (code presented at the international Conference on Candu Fuel in Canada on 1989);
- Development of a CASTEM 2000 code to analyze the RBMK element fuel in static and accidental behavior, with the graphite moderator (program agreement on nuclear reactor safety with URSS after Chernobyl accident).

*Activities carried out after ENEA recruitment at **Nuclear FUSION Department**:*

- Welding Process: ANSYS FEM Simulation with Thermal and Structural Analyses for both Laser and TIG procedures;
- ITER project: Task EFDA TW6-TVV-CKSUP Title: Verification of the ITER Vacuum Vessel Supports Structures;
- W7-X project: development of the full torus ANSYS FE Global Model, including the Plasma Vessel, Outer Vessel and Machine Base (Cryostat System);
- W7-X project: Cryostat System structural analysis and Plasma Vessel Fine Adjustment System and Auto Centering System analysis.
- W7-X project: Bellows and Plasma Vessel Vertical Supports models and analysis. ECRH ports displacements analysis
- Involved with technical joint work in contractual activities (CITIF and ANSALDO);
- Responsible of contract with ALTECO Company (Italian engineering company) for the development of ANSYS models for Ignitor tokamak;
- Development of codes in Visual Basic for the calculation of the magnetic flux density, electromagnetic forces and temperatures in the Poloidal Field Coils (PFC) in Ignitor and FTU tokamaks.
- Analysis and comparison between Ignitor pre-loading systems: radial active press optimization.
- New proposal for an alternative radial loading system.
- ANSYS model for the structural analysis of OHT transformer Poloidal Coils with stratified materials and detailed pattern.

- Sensitivity analysis of the state of stress in the Ignitor TFC/OHT system.
- ANSYS model for static electromagnetic calculation of PFC system and transient calculation of Toroidal Field Coils (TFC).
- ANSYS models for PFC and TFC thermal calculation.
- ANSYS routine for out of plane forces in Ignitor TFC.
- ANSYS model for the structural analysis of the whole Ignitor Load Assembly with in-plane and out-of-plane forces.
- ANSYS model for the structural analysis of Ignitor Vacuum Vessel (VV).
- VB code for the calculation of main parameters in a circular plasma using a Neural Network
- VB code for the evaluation of the cooling time in Ignitor TFC and adjacent structures.
- Poloidal and toroidal coils and VV prototypes: critical review of the manufacturing process.

The activity reports and other interesting data are available at the web page (at the moment the web site is in Italian):

<http://www.afs.enea.it/capricci/andrea.html>

Publications:

- Book: Membranes for clean and renewable power applications. Woodhead Publishing Limited, 2014. Series in Energy: Number 13, cap.14 "Membrane Technologies for the storage as methane of energy generated by wind power and other renewable sources". ISSN 2044-9364 Woodhead Publishing Series in Energy ISBN 978-0-85709-545-0 A. A. Gugliuzza, A. Basile and A. Capriccioli.
- A. Capriccioli, R. Seynoa, G. Valli DASA- A software for Evaluating Quality of Fuel Production ENERGIA NUCLEARE ENEA 1984
- A. Cucchiaro, A. Capriccioli, G. Celentano, C. Crescenzi, M. Gasparotto, C. Rita, M. Roccella, A. Bianchi, G. Ferrari, B. Parodi, G.P. Sanguinetti, G. Galasso, B. Coppi The Ignitor radial electromagnetic press system (new concept) Fusion Engineering and Design ELSEVIER 2001
- A. Pizzuto, A. Capriccioli, M. Gasparotto, A. Palmieri, C. Rita, M. Roccella Radial Electromagnetic Press for Ignitor ENEA Erg-Fus Tecn- Mec IGN/MAC/001/96 APS 1996
- M. Roccella, A. Capriccioli, M. Ferrari, M. Gasparotto, A. Pizzuto, S. Chiocchio, F. Lucca 3-D Electromagnetic Model and Electromagnetic Analysis of the ITER In-Vessel Components APS 1996
- A. Capriccioli, A. Cucchiaro, M. Gasparotto, C. Rita, M. Roccella, A. Bianchi The Ignitor Radial Press System APS 1999
- A. Cucchiaro, A. Capriccioli, G. Celentano, C. Crescenzi, M. Gasparotto, C. Rita, M. Roccella, A. Bianchi, G. Ferrari, B. Parodi, G.P. Sanguinetti, G. Galasso, B. Coppi The Ignitor radial electromagnetic press system (new concept) SOFT 2000

- G. Celentano, A. Capriccioli, A. Cucchiaro, M. Gasparotto, C. Rita, M. Roccella, A. Bianchi, G. Ferrari, B. Parodi, G.P. Sanguinetti, F. Vivaldi, S. Orlandi, B. Coppi Engineering evolution of the Ignitor Machine SOFT 2000
 - A. Cucchiaro, A. Capriccioli, G. Celentano, M. Gasparotto, C. Rita, M. Roccella, B. Macco, I. Micheli, G. Ferrari, S. Orlandi, B. Coppi Plasma Chamber restraints in Ignitor and relevant Disruption Analysis
 - A. Cucchiaro, A. Capriccioli, G. Celentano, C. Crescenzi, M. Gasparotto, A. Bianchi, G. Chiesura, G. Ferrari, A. Macco, S. Orlandi, B. Parodi, G.P. Sanguinetti, B. Coppi Global Structural Concept of Ignitor and Assembly Procedure
 - A. Capriccioli, L. Cornaggia, P. Frosi, A. Pizzuto Ignitor Double-Null Configuration: Electromagnetic, Thermal and Structural Analysis with integrated FEM models SOFE 2003
 - A. Cucchiaro, A. Bianchi, A. Capriccioli, G. Celentano, C. Crescenzi, P. Frosi, F. Lucca, A. Marin, G. Mazzone, B. Parodi, A. Pizzuto, G. Zanutelli, G. Ramogida, M. Roccella Plasma Chamber of the Ignitor Machine APS 2003
 - A. Cucchiaro, A. Bianchi, A. Capriccioli, G. Celentano, C. Crescenzi, P. Frosi, F. Lucca, A. Marin, B. Parodi, A. Pizzuto, R. Zanutelli, G. Ramogida, M. Roccella First Wall of the Ignitor Machine APS 2003
 - A. Cucchiaro, F. Boert, A. Capriccioli, G. Celentano, C. Crescenzi, F. Keiser, A. Pizzuto, H.G. Wobker Advanced design and construction of Toroidal Magnet Plates APS 2003
 - Jens Reich(1), Antonio Cardella(1), Andrea Capriccioli(2), Torsten Koppe(1), Bernd Missal(1), Werner Löhner(3), Stefano Langone(4), Piero Carlo Sassone(5): Experimental verification of the axial and lateral stiffness of large W7-X rectangular bellows SOTF 2006
1. Max Planck Institut für Plasmaphysik IPP Wendelsteinstrasse 1 17491 Greifswald Germany
 2. Associazione EURATOM- ENEA sulla Fusione, Via Enrico Fermi 45, I-00044 Frascati (RM), Italy
 3. Komplaflex AG Amriswiler Straße 92 9314 Steinebrunn Switzerland
 4. Romabau-Gerinox AG Fohlenweide 8570 Weinfelden Switzerland
 5. Idrosapiens S.r.l. Strada Volpiano 49 10040 Leini Italy

Internal documents:

- A. Capriccioli: several Technical Specifications and Reports of Modeling Simulations (ANSYS and ANSYS/FLUENT) of the main components of ProGeo Prototype (2012-2014).
- A. Capriccioli: Autocad 3D design of the full ProGeo20kW prototype (2014, in progress).
- A. Capriccioli, A. Cardella ITER Vacuum Vessel Supports - Final Report; Doc. FUSTEC-TVV-CKSUP-002 Rev.0, 10/2007
- W7-X: A. Capriccioli Plasma Vessel, Outer Vessel and Machine Base Global Model: Finite Element Model description; Doc. Rev.0, 10/2005
- W7-X: A. Capriccioli Plasma Vessel, Outer Vessel and Machine Base: Analyses of MB; Doc. Rev.0, 10/2005
- W7-X: A. Capriccioli Connections between Plasma and Outer Vessels Ports: Bellows FE Models; Doc. Rev.0, 10/2005
- W7-X: A. Capriccioli Plasma Vessel, Outer Vessel and Machine Base FE Global Model: Analysis of ECRH Ports Displacements; Doc. Rev.0, 10/2005

- W7-X: A.Capriccioli Plasma Vessel, Outer Vessel and Machine Base FE Global Model: Analyses of OV; Doc. Rev.0, 10/2005
- W7-X: A.Capriccioli Plasma Vessel, Outer Vessel and Machine Base FE Global Model: Analysis of PV Fine Adjustment and Auto Centering Systems; Doc. Rev.0 10/2005
- W7-X: A.Capriccioli Plasma Vessel Vertical Supports Pendulum solution: Equivalent Friction Factor calculation; Doc. Rev.0 10/2005
- A.Capriccioli Neural Network: an example for the assessment of the main parameters.. 1996
- A.Capriccioli Pre-loading Systems ERG FUS RT 98/5, 1998
- A.Capriccioli Ignitor Electromagnetic radial Press 1998
- A.Capriccioli Alternative solution at the reference radial loading system IGNITOR RT 00/7, 2000
- A.Capriccioli Ignitor OHT Transformer: Poloidal coil n°1 Structural Model IGNITOR RT 00/12, 2000
- A.Capriccioli, P.Frosi Design and stress analysis of the Ignitor wedge tensioning system IGNITOR RT 01/01, 2001
- A.Capriccioli Sensitivity analysis of the state of the stress in the TTFC/OHT system IGNITOR RT 01/06, 2001
- A.Capriccioli, P. Frosi Poloidal Field Coils: Electromagnetic and Thermal Model 2002

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