PERSONAL INFORMATION

Elena Gaio

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Sex F | Date of birth 18/08/1958 | Nationality Italian

POSITION Senior Researcher with National Research Council, seconded to Consorzio RFX

TYPE OF BUSINESS Fusion machines systems and operation
electrical technologies, power circuits and systems

WORK EXPERIENCE

Jan 2015 – today

Coordinator of the design and R&D work on the "EU DEMO Plant Electrical System" (EUROfusion) – selected for the position of Project leader in FP9

- Coordination of the studies to outline the DEMO Plant Electrical System also with the aim to achieve a more complete and realistic Balance of Plant description.

Sector system design, R&D, general machine systems, engineering analysis

Jan 2009 – today

Power Systems Group Leader

- To program and coordinate the activities of the research group (10 researchers)
- To promote the competency growth and the scientific production of the researchers
- -To contribute to the actuation of the Consorzio RFX scientific programs

Sector R&D, engineering analysis, design and experimental activities on power supply systems. Electrical technologies, circuits and systems for fusion experiments: power supplies for ohmic and additional heating, for MHD plasma instabilities control, dc current interrupters.
The applications of the group research activities are in the frame of the main Consorzio RFX programs: the RFX-mod experiment, the development and realization of ITER Neutral Beam Test Facility (NBTF), the Italian Divertor Tokamak test Facility, the contribution to the Broader Approach, the studies for the european DEMO reactor under the Eurofusion program.

2007 – today

Responsible of the Consorzio RFX activities and projects for the JT-60SA tokamak in the frame of the BA Agreement

- Coordination of the Consorzio RFX activities (budget: 15 M€), within the JT-60SA international project team, for the realization of the satellite tokamak JT-60SA.
- The activities have been mainly addressed to general machine system studies, engineering analysis for identifications of requirements, for the selection of suitable design solutions, experimental activities for prototypes development and then all the accompanying activities for the procurement of the two systems to be provided by Consorzio RFX. More recently, the participation in the PS commissioning and integrated commissioning.

Dec 2009 – July 2015

- *Responsible of the contract for the QPC system procurement*

Dec 2009 – July 2015

- *Responsible of the contract for the procurement of the PS system for RWM control*
- Both the procurements were completed on time and on budget.
- Sector Management of R&D tasks, engineering analysis, projects and industrial contracts

Feb 2016 – July 2017

Project leader of the electrical area of the ITER Neutral Beam Test Facility

- Coordination of the activites related to the electrical components and systems of the NBTF plant and the SPIDER and MITICA projects.
- Coordination of the R&D task to investigate issues related to the design and operation of RF drivers for NB negative ion sources and to increase the knowledge and competences in the field
- Sector engineering analysis, management of scientific and technical tasks and of contracts follow-up

2003 – 2008 *Conceptual design development of the ITER NBI PS system*
- Substantial contribution in the R&D and design activities for conceiving the alternative design, finally adopted for the ITER NBI and those of MITICA and SPIDER
- Sector R&D, engineering analysis, design activities, preparation of specification for procurements

Nov 2000 –Dec 2003 *Project Leader and contract Responsible for the restoration and upgrade of the 400 MVA ac/dc converter system of RFX and of the system for the protection signals handling for RFX experiment:*
- To conduct the studies and analyses for the development of the design, "ad hoc" test definition, and integrated tests with the overall RFX power supply – machine
- To manage the industrial contract for the system procurement (3 M€)
- Sector engineering analysis, management of scientific projects and industrial contracts

Nov 2000 –Dec 2003 *Project Leader and contract Responsible for the development and procurement of the Power Supply System for MHD control for RFX experiment:*
- To conduct the studies and analyses for the development of the design, "ad hoc" test definition, and integrated tests with the overall RFX power supply – machine
- To manage the industrial contract for the system procurement (2 M€)
- Sector engineering analysis, management of scientific projects and industrial contracts

Nov 2000 –Dec 2003 *Project Leader for the restoration and upgrade of the Pulse Discharge Cleaning system for RFX:*
- To conduct the studies for the upgrade of the control system
- To manage the industrial contract for the system procurement (0,35 M€)
- Sector engineering analysis, management of scientific projects and industrial contracts

1997-1999
2004-2005 *Conduction of the RFX experimental session*
- technical management of the sessions
- coordination of the session team in charge for the plant system operation (about 20 persons)
- Sector General machine operation

1998-2008 *Leader of the technical electrical area for RFX machine*
- Coordination of the group of technicians in charge for the electrical systems of the RFX
- Sector General machine operation

Responsible Officer for RFX machine systems:

1993 – 2009
- ac/dc converter system, rated for a power of more than 400 MVA

2004 -2007
- power supply system for MHD control

2004 - 2009
- pulse discharge cleaning system
- Activities management of the system operation, maintenance, documentation and upgrades
- Sector General machine operation

Participation in other projects and spin – offs:

Sep 2008 – Dec 2011
- Design studies for the PS of the active in-vessel coils for MHD control in Asdex Upgrade

Nov 2009 – June 2010
- Design studies for the realization of the Enhanced Radial Field Amplifier (ERFA)

June 2000 – April 2003
- Experimental Assessment of Switches for the ITER Discharge Circuits

June 2000 – June 2001
- Studies on the dynamic response of the ITER converter for plasma vertical stabilization

1996 – Dec 1999
- R&D / realization / operation of fast converters for active control of field errors at the RFX shell gaps

Oct. 2000 – Dec. 1999
- New bypass protection of a series compensation system in arc furnace plants

Oct. 2000 – Dec. 1999
- High-voltage booster project for railways

June 1996 – July 1998
- Technological development for the ITER 45 kA -1.5kV thyristor bridge prototype

1990 – 1995
- Development of the first real time control for RFX
- Activities R&D, engineering analyses
- Sector electrical technologies, power supply and protection systems

Main educational activities

PHD supervision

2019 - today
- Advanced converter topologies and energy storage schemes for fusion experiments (funded by industry)

2017- 19
- Development and validation of suitable models of power supply systems in support of the SPIDER integrated tests and first operation

2015 – 17
- Studies and experimental activities to qualify the behavior of RF power circuits for Negative Ion Sources of Neutral Beam Injectors for ITER and fusion experiments.

2014 - 16
- Characterization of the dielectric strength in vacuum of RF drivers for fusion Neutral Beam Injectors

2009 - 11
- Studies on the impact of the ITER Power Supply system on the Pulsed Power Electrical Network

2008 - 10
- Analyses and experimental tests for the development of the Quench protection Systems for the superconducting magnets of the satellite tokamak JT-60SA

EFDA Fellowship

2014 - 15
- Dynamic stability of the ITER electrical network - Development and validation of suitable analytical models

Coordination of the EFDA Task Agreement WP08-GOT-PSE - the European Goal Oriented Training programme in the field of Power Systems Engineering

2010 - 12
- Five Institutions: Consorzio RFX, CEA, CCFE, Enea-Frascati and KIT participate in this Program.
- The aim of this training was to prepare researchers for activities in the field of Power Supply Engineering to support the ITER project and the long-term fusion program.

Contract Professor at the Electronic Engineering Department of the Padova University - -

a. y. 2003/04 - 2008/2009
- Teacher of the Industrial Electronic course (54 hours) - III year of the Bachelor Degree in Electronic Engineering
- Supervisor of several bachelor and doctor degree thesis in Electrical or Electronic Engineering – Padova University

EDUCATION AND TRAINING

1984 Master in engineering of plasma and controlled thermonuclear fusion

1977-1982 Master degree in Electronic Engineering at the University of Padova

ADDITIONAL INFORMATION

Publications

155 papers, H-index=25
Source: publons - web of science

Membership

Jan 2017 – 2019 *Member of the Technical Advisory Panel (TAP) of Fusion for Energy*

Jan 2020 – today *Vice-chair of the Technical Advisory Panel (TAP) of Fusion for Energy*

Jan 2019 – today *Member of the International Organizing Committee of the Symposium on Fusion Technology*

2007 – today *Member of the Technical Coordination Group of JT-60SA*

June 2012 *Member of the Review Panel, as external expert, for the Preliminary Design Review of the Korean DA contributions to the ITER Coil Power Supply System*

June 2010 *Member of the Review Panel, as external expert, for the Conceptual Design of the ITER Coil Power Supply System*

May 2008 – Dec 2008 *Member of the Review Panel, as external expert, to evaluate key aspects of the magnet ac/dc Converters and Reactive Power Compensation System design*

English use Upper intermediate in understanding, speaking and writing