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Tecnatom Group
1957
Company Foundation

1973
Spanish Electric Utilities became the Sole Shareholders

1975-79
Acquisition of Automated Inspection Systems and Full Scope Simulators

80’s
Technological Independence In Core Activities

90’s
Internationalization Diversification Strategic Alliances

00’s
Expansion Synergic Industries Acquisition & Control Shared Companies

2010 -
Expansion in Target Markets Alliances Acquisitions Establishment of the Group Tecnatom
Shareholders

- **Endesa**
  - Income: 21,512 M€
  - Staff: 10,699
  - Power: 22,619 MW
  - Customers: 11.25 M
  - Countries: 8

- **Iberdrola**
  - Income: 30,033 M€
  - Staff: 28,017
  - Power: 45,089 MW
  - Customers: 32.63 M
  - Countries: 12

- **GasNatural Fenosa**
  - Income: 24,742 M€
  - Staff: 23,000
  - Power: 14,000 MW
  - Customers: 23 M
  - Countries: 32

- **Tecnatom**
Figures (Year 2014)

**Turn Over**

- **2012**: 122,540
- **2013**: 117,993
- **2014**: 122,066

**Investment**

- **2012**: 17,250
- **2013**: 14,000
- **2014**: 12,927

**Workforce**

- **2012**: 956
- **2013**: 998
- **2014**: 1080
**Group Tecnatom**
- Tecnatom
- Tecnatom Metalscan
- Tecnatom USA
- Tecnatom do Brasil
- Tecnatom China
- Tecnatom Emirates (*)

**Technical Support Centres**
- M2M
- Tecnes
- Sertec
- Ibercal
- SNGC
- CITEC

**Agents**
- Argentina
- Russia
- South Korea
- China
- UAE
- Malaysia
- Mexico
- South Africa
- Taiwan
- Ukraine
- Israel
- USA

**Power Plants**
- Almaraz Nuclear Power Plant
- Cofrentes Nuclear Power Plant
- Garoña Nuclear Power Plant
- Trillo Nuclear Power Plant
Objectives: Development and manufacturing of inspection equipment and UT probes, consulting and non-destructive control services

Tecnatom Sharing: 100%

Objectives: Development and manufacturing of UT and Eddy-currents NDT systems, based on the most advanced Phased Array technologies

Tecnatom Sharing: 53.45%

Objectives: Management of the Emergency Support Center (CAE) and Operational Support to power plants

Tecnatom Sharing: 100%

Objectives: Support Tecnatom in the delivery of high added value services

Tecnatom Sharing: 100%

Objectives: Wide range of non destructive testing services and support within the industrial, energy and aerospace markets

Tecnatom Sharing: 100%
**Objectives:** Support and development of Tecnatom capabilities in the domestic and international market in nuclear and diversified activities.

**Tecnatom Sharing:** 100%

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**Objectives:** Support and develop the establishment of Tecnatom within the nuclear, thermal and aerospace markets in Brasil

**Tecnatom Sharing:** 90%
Objectives: Deliver a wide range of pre-service and in-service inspection services to the Chinese nuclear power plants

Tecnatom Sharing: 25%

Objectives: Promote and develop the power generation and aerospace markets in China in the areas of Safety, Operation, Training and inspection equipment

Tecnatom Sharing: 100%

Objectives: Promote and develop the power generation and aerospace markets in Arab Emirates and in the areas of Safety, Operation, Training and inspection equipment

Tecnatom Sharing: 100%
2 TECHNOLOGICAL CAPABILITIES
TECHNOLOGICAL CAPABILITIES

• Training
• Simulation
• Control Rooms
• Operation Support
• Emergency Support
• Engineering
• Inspection
• Tests
• END Systems
• END Products

MARKETS

ENERGY

• Reactors in Operation
• New Reactors
• Combined Cycle Thermal Renewable

INDUSTRIAL

• Aerospace
• Petrochemical
• Railway
Technological Capabilities
Training Services

✓ Training Centres Organization
  Design, Organization, Management

✓ Integral Training Services
  Recruitment, Selection, Qualification

✓ Development of Advanced Training Tools and e-learning
  Training Programs, Field Simulators, etc.

✓ Training Operation License & NLO Personnel

✓ Training based on SAT Methodology (INPO Standards)

✓ Training in Emergency Response

✓ Nuclearization Training Programs

✓ Master Courses in Electrical Generation
Technological Capabilities
Simulation Technologies

- Simulator Supply and Upgrade
  Different Scopes and Technologies

- Modernization of Simulator Platforms
  Best-estimate models implementation
  New Simulation Tools

- Operation and Maintenance of Simulators
  Management System Configuration
  SW and HW Corrective Maintenance
  Plant Modifications Implementation

- Simulator Assisted Engineering
  Safety Analysis Support
  Plant Design Modification Assessment
  Plant Procedures and I&C Systems Validation
  Virtual Reality
Technological Capabilities

Control Rooms

✓ Human Factor Engineering (HFE)

✓ Human Machine Interface Engineering (HMI)
  Analysis, Design and V&V

✓ Control Room Design and Supply

✓ I&C System Modernization
  Control Room Modernization
  Digital Control Systems
  Plant Process Computers

✓ Computerized Operation Support Systems
TechnologicalCapabilities
Operation & Emergency Support

- Licensing and Start-up Support
- Operation Procedure Development
  Operation, Radiologica l Protection, etc.
- Incident Analysis
- Operation Experience Management
- Severe Accident Management Guidelines Tools
- Emergency Plans Development
- Dosimetry Services:
  Internal and Bioassay
- Emergency Support Center (CAE)
  Design Development and Management
- Monitorized System & Cycle Optimization
  TECSOLCEP©
- Safety Culture Management
  Leadership, Coaching, Safety Assessments
Technological Capabilities

Engineering Services

- Engineering and ISI Programs
- Structural Integrity Assessment
- Materials Characterisation
- Long Term Operation Engineering (LTO)
- Qualification of Safety-Related Component
- Dedication of Commercial Grade Component
- Warehouse Optimization Services
- Maintenance Optimization Services
- Supply of Nuclear Class Equipment & Spares
Technological Capabilities

Inspection Services

- Automated In-Service Inspections
- Inspections of Mechanical Component
- NSSS Component
- Nuclear Fuel
- Safety-Related Component
- BOP and Turbo Generators
Technological Capabilities
Testing Services

- Valves Diagnosis and Leak Testing
- Calibration & PSV Leak Testing
- Containment Leak Testing (ILRT)
- HVAC Testing
- Electrical Testing
- Plant and Cycle Efficiency Testing
- I&C Testing
- Snubbers & Springs Testing
- Certified Laboratories

Pressure, Temperature & Gas Flow Rate
Technological Capabilities
Automated Robotized NDT Systems

- Tailored for Metallic and Composite Materials
- Suitable for Energy and Aerospace Industries
- Highly Integrated NDT & Motion Controlled Products
- In-line and Off-line Inspections
- Robotized Immersion Tanks
- Portal Gantry & Robotized Systems
- UT, Eddy Current and Phased-Array Technologies
Technological Capabilities
NDT Products

✓ Instruments & Sensors (Electronic & Software)
  Ultrasonic (SONIA, Inspectview)
  Eddy Current (Etbox, Teddy)

✓ END Methods
  Ultrasonic
  Eddy Current,
  Visual
  Thermography

✓ Sensors for Gammagraphy

✓ Technological Independence

✓ Markets
  Energy
  Aerospace
  Oil&Gas
  Railway
Activities
Nuclear Power Plants

✓ All Technologies
  PWR, BWR, PHWR

✓ All Reactor Models
  Westinghouse, GE, VVER, KWU, APR-1400, CNP-600, CPR-1000, AP-1000, ABWR, ESBWR, CANDU

✓ NSSS & BOP
✓ Integral Training Services
✓ Training Programs and Advanced Tools
✓ Simulators
✓ Control Rooms Design and Upgrading
✓ Plant Operation Support
✓ Testing and Inspection Services
✓ Maintenance
✓ Spare Parts and Component Supply
Activities
Fossil and Renewable Plants

- All Technologies
  - CCGT
  - Fossil Plants
  - Renewables

- Training Services
  - Integral Training Service (SIF)
  - Specific Courses
  - Training Programs
  - Advanced Training Tools

- Plant Operation Support

- Simulators

- Maintenance

- Testing and Inspection Services
  - NDT (principal components)
  - Leak Testing
  - Electrical Testing

- Spare Parts and Component Supply
Activities
Aerospace

- Automatic Inspection Systems
  Robot, Cartesian, Customized System, Immersion Pool

- Semi-Automatic & Manual Inspection Systems

- Different Inspection Techniques
  Ultrasonic (Pulse-Echo, Transmission, Multi-techniques)
  Eddy Current
  Other Technique (Visual, Thermography, etc.)

- Technologies
  Conventional
  Phased Array
  Ultrasonic by Laser
  Multi-frequency

- Data Acquisition Systems

- Inspection Services

- Engineering & Technical Assistance
Activities
Industrial

✓ Industrial Sector
  Oil & Gas (Upstream & Downstream)
  Petrochemical
  Process Industry
  Railway

✓ Operation Support

✓ Human Factors Engineering
  Control Room Modernization

✓ Simulation

✓ Training Services

✓ Human Factors
  Safety Culture, Organizational Culture & Behaviour

✓ Testing and Inspection Services
  END Components and critical equipment
  Leak Testing
  Electrical Testing
Activities

Advanced Reactors

Started in **1991**
- “SBWR and ABWR Reactors of General Electric”
- “AP600 of Westinghouse”

Since **1997**
- “Lungmen NPP” (Taiwan): ABWR of General Electric”

Now
- ABWR and ESBWR of General Electric-Hitachi
- AP1000 and ABWR of Westinghouse-Toshiba
- CPR1000 / CNP600 of CNPE
- APR-1400 and EPR: advanced reactors PWR
- Halden – Generation IV research (Norway)
- JHR – Jules Horowitz Reactor (France)
- ITER – Fusion Technology (France)
- IFMIF – Materials Irradiation Facility (Japan)
Our Clients

Certified by Customers at 30 different countries
QA System extensively Audited: Average of 25 audits/year as Service and Technology Provider
Market Breakdown (Year 2014)
Tecnatom S.A

Activities

- Safety Operation Training: 50%
- Engineering Inspection Equipment: 50%

Markets

- Energy South America: 54%
- Energy East Europe, Middle East & Asia: 9%
- Energy Europe & North America: 21%
- Industrial: 7%

National / Exportation

- Energy Spain: 56%
- National: 44%
Projects in more than 40 countries worldwide
Large Portfolio of Technical Capabilities and Services Range
All Reactor Technologies and Advanced Reactors
Fossil and Renewable Power Plants
Aerospace and Industrial Systems
Oil & gas
Technological Independence for Services and Equipment Supply
Business Group with a global presence
Highly Qualified Professionals