SIPAI®
西派埃

Overview of Shanghai Institute of Process Automation Instrumentation

By Wang Ying

16th June 2011

Outline

- Brief Intro of SIPAI
- Nuclear Business at SIPAI
- SIPAI's Vision

Ⅰ. History

- 1956: Foundation of SIPAI
- 1956~1999: Belonging to the former Ministry of Machinery Industry of China
- 1999~2004: Belonging to Shanghai Municipal Economic Commission
- 2004~now: Belonging to Shanghai State-owned Assets Supervision and Administration Commission
- **SIPAI is now a state-owned institute in the area of process automation and instrumentation, as well as an advanced High-Tech Enterprise**

Ⅱ. Organization

Ⅲ. Remarkable Authorizations

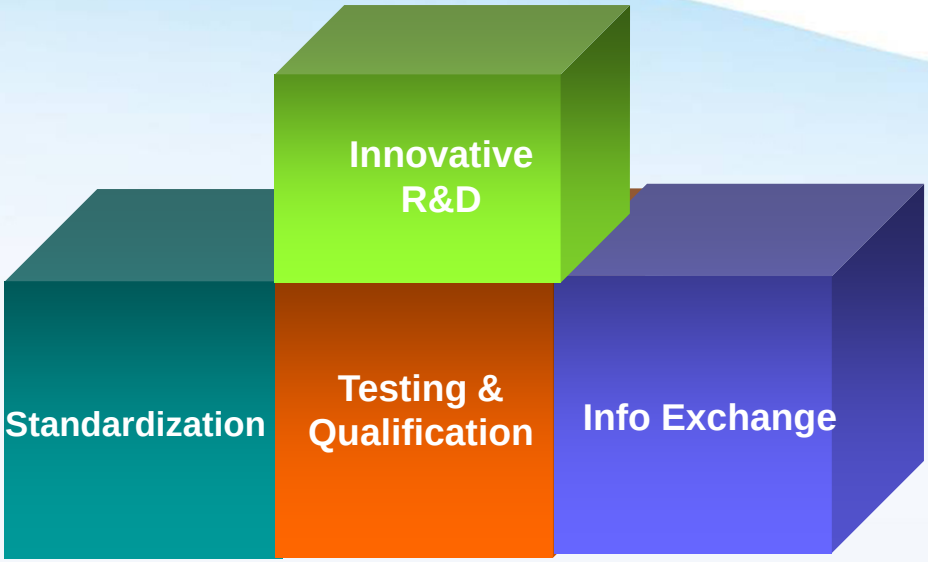
National Engineering Research Center for Process Automation

National Energy R&D and Testing Center for Instruments in Nuclear Power Plant

National Quality Supervision and Inspection Center for Products of Process Automation Instrumentation

Ⅲ. Remarkable Authorizations

- In 2010,SIPAI was awarded the title of ***National Energy R&D and Testing Center for Instruments in Nuclear Power Plant***, by National Energy Administration
- Main functions:



Ⅳ. Human Resources

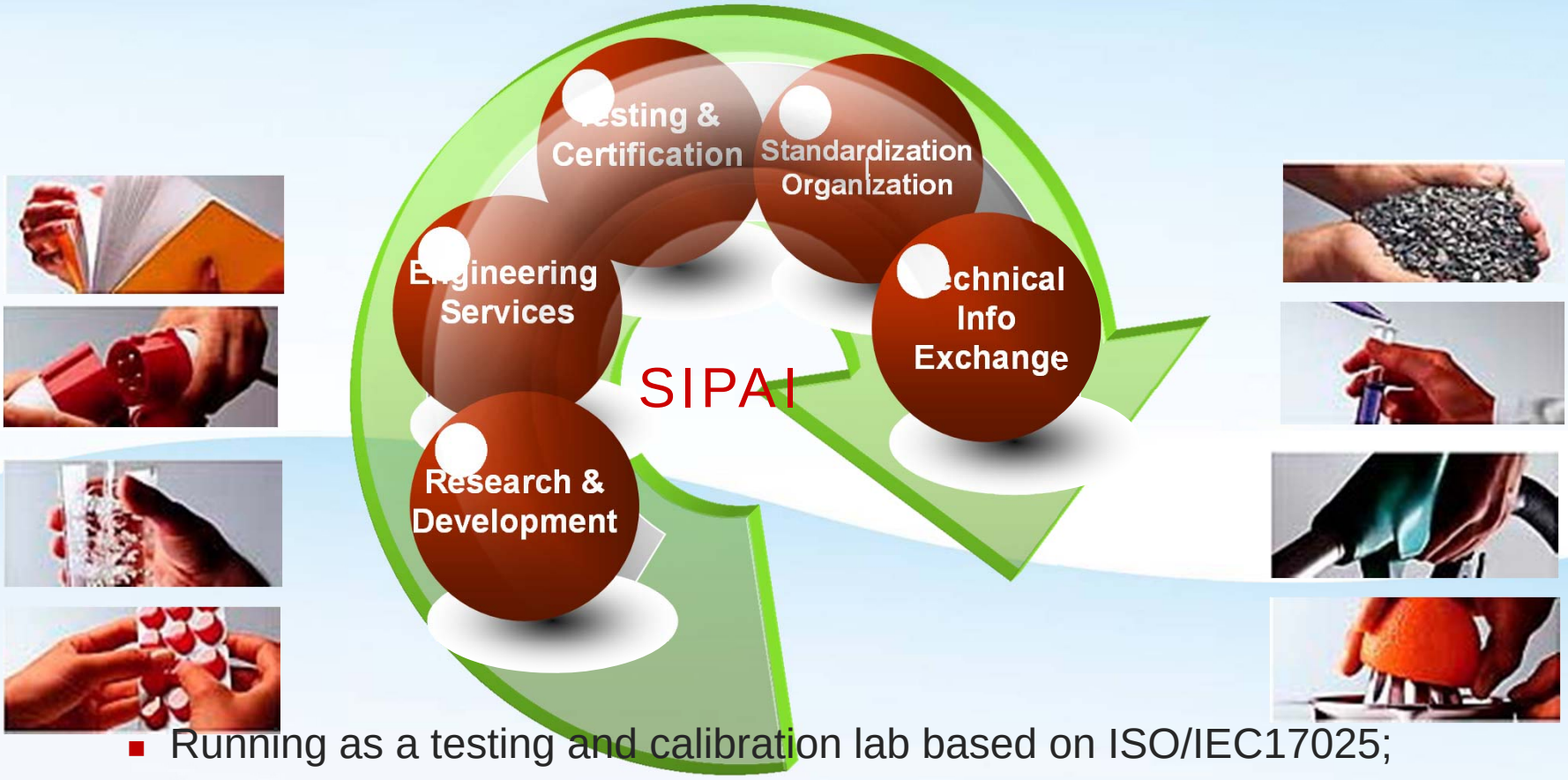
450 employees in total, including

- 70 senior engineers and professors
- 160 engineers or middle-level technicians
- 10 experts actively participating in various int'l
- 100 international/national professionals

More than ***80*** employees in the field of T&C, including

- 5 CCC auditors
- 5 TUV FS Engineers
- 1 IECEx lead assessor
- 4 CE/ATEX auditors
- 7 lead auditors for FM F&PA
- 13 QMS auditors
- 2 laboratory assessors
- 7 registered safety Engineer
- 1 Chartered Engineer, by ECUK

Ⅴ. Business Portfolios



- Running as a testing and calibration lab based on ISO/IEC17025;
- Running as an Inspection Body based on ISO/IEC17020, since 2003;
- Comply with ISO 9000, HAF 003, NQA-1 and so on.

Ⅴ. Business Portfolios: R&D

SIPAI has undertaken and completed thousands of research and product development projects, which more than 300 projects were awarded by the State, ministries and Shanghai Municipal as major scientific and technological advances.

Ⅴ. Business Portfolios: T&C

- Equipped with ***700*** sets of advanced research & testing facilities














National Authorizations

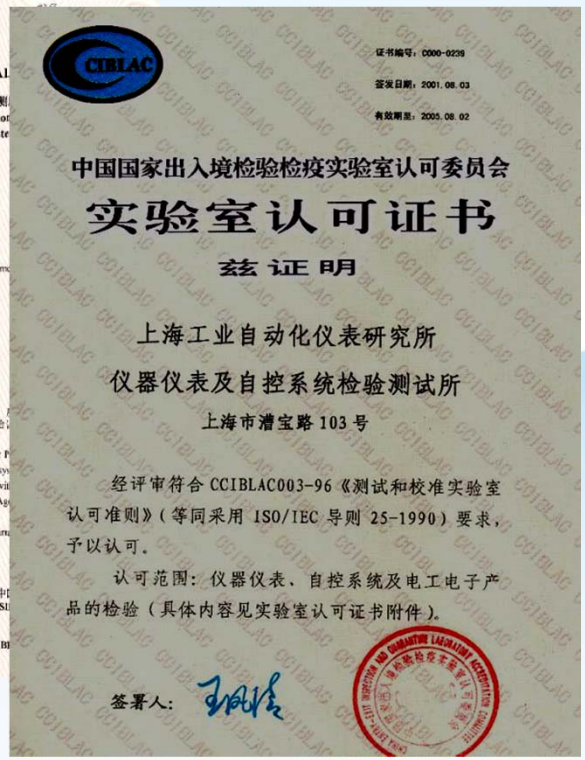
- **National Quality Supervision and Inspection Center for Products of Process Automation Instrumentation**, by AQSIQ and CNCA
- Quality Supervision and Inspection Center for Automotive Parts, by MI
- National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation(NEPSI)
- CCC testing organization, by CNCA
- Pattern Approval Org. for New Metrological Devices (CPA), by AQSIQ
- Type test organization for elements of pressurized pipe line, by AQSIQ
- Technical Testing Center for Marine Electrical Apparatus, CCS
- Reliability Technology Center of MI
- No. 1 Central Station of Metrology of MI
- Accredited Lab for Process Instr., and accredited Lab for Quality License of Water Meter for Export, CCIB
- Social Public Metrological Standard certification, authorized by SBTS

National Accreditations

ISO/IEC 17025
By CNAL

ISO/IEC 17020
By CNAL

ISO/IEC 17025
By CCS



ISO/IEC 17025
By CCIB

Int'l Accreditations and Corporations

- Accredited by DNV, Norway in 2007
- Accredited by IECEx System since 2005
- Accredited by Natlabs, Finland, 2004
- Registered by FCC, USA since 1999
- Accredited by Lloyd's, UK since 1987
- Extensive Cooperation:
  - NO: DNV
  - DE: GL, TUV, BSH
  - FR: BV
  - JP: NK
  - KR: KR
  - RU: RS
  - US: ABS, GMNA

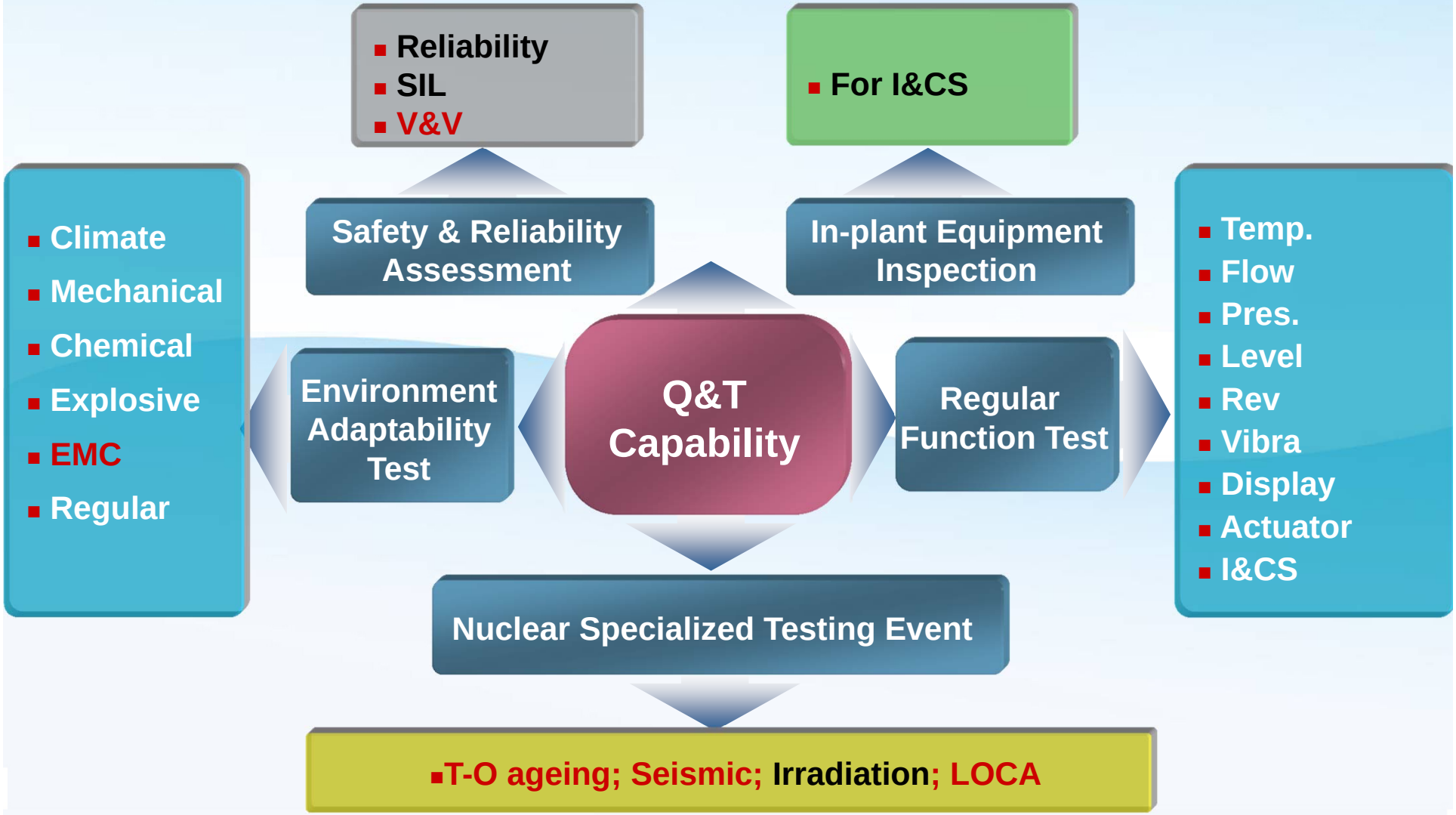
Int'l Corporations in Ex Field

18 partners in the world

- Netherlands KEMA
- Seoul KTL, KGS
- KOSHA
- Tokyo TIIS
- Sydney TestSate
- Norway DNV
- Moscow CCVE
- Buxton Baseefa
- Chester Sira, UK
- Paris LCIE
- Madrid LOM
- Hannover TUV Nord
- Braunschweig PTB
- Bochum EXAM(BVS)
- France INERIS
- Boston FM Global
- Budapest BKI

EQ Centre for NI&CS

Ability extended for NI&CS according to AP1000, NRC and RCC-E:



Ⅴ. Business Portfolios: SO

- Secretariat of SC1 of China Technical Committee of Standardization for Industrial Process Measurement and Control (SAC/TC124/SC1) - temperature, flow, mechanical quantity, level, display, final control element – with more than 80 members involved;
- Managing about 400 standards in process automation instrumentation, including continuous maintenance;
- ***10*** experts actively participating in the corresponding IEC/ISO TCs, ***50*** experts involve in domestic TCs;
- Conducting a study on building the domestic standard system for the I&CS in the third generation NPP in China;

Ⅴ. Business Portfolios: SO

The secretariat, the president, and the secretary-general of the TCs in SIPAI:

China Instrument and Control Society (CIS)

- Process Control and Instrumentation TC(过程检测控制仪表分会)
- Management Science TC (管理科学分会)
- Reliability Engineering TC (可靠性工程分会)

Chinese Association of Automation (CAA)

- TC of Instruments & Apparatus (仪表与装置专业委员会)

China Instrument Manufacturers Association (CIMA)

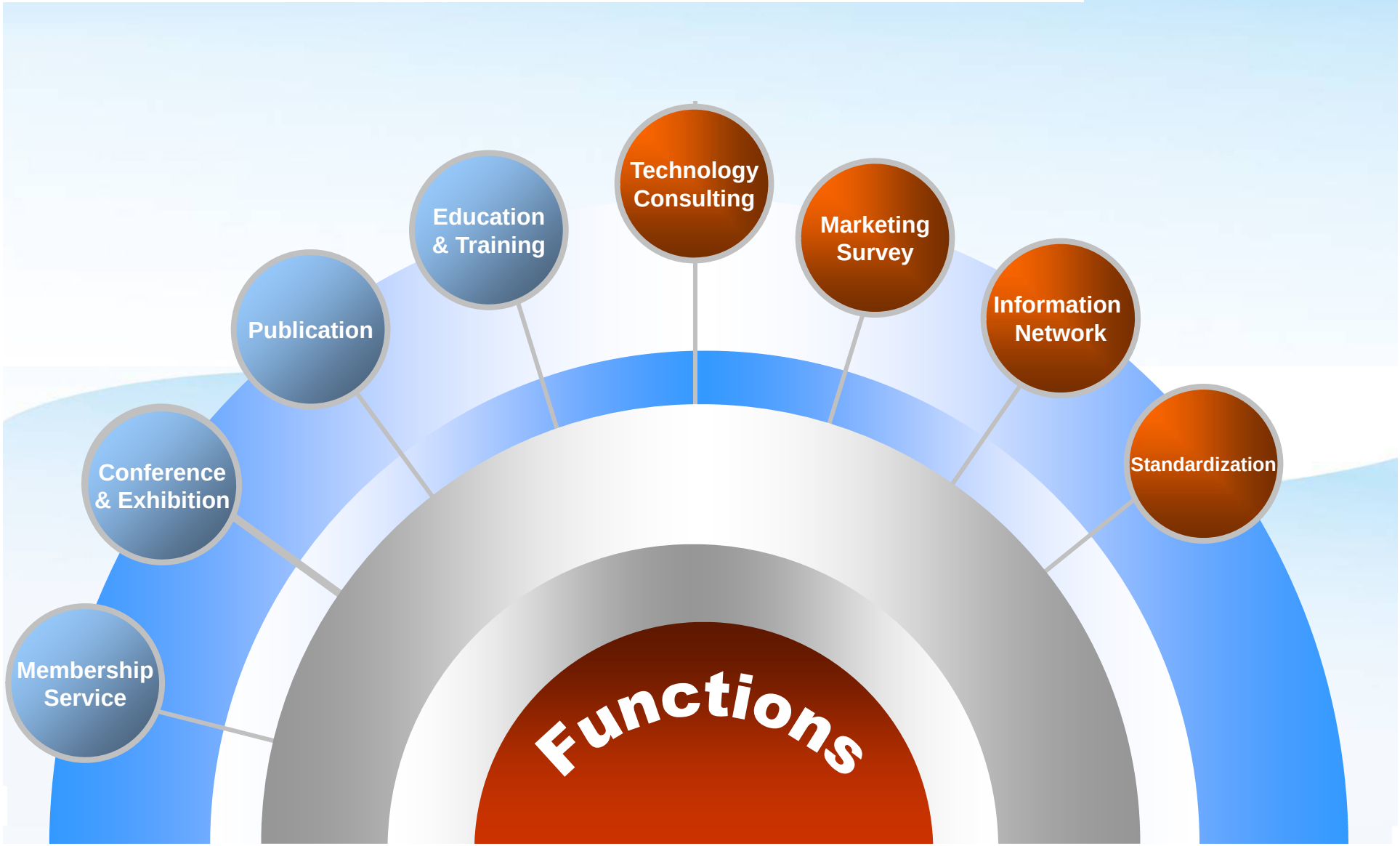
- Process Automation Instrumentation Sub-Association (工业自动化仪表分会)

Ⅴ. Business Portfolios: SO

Participated int'l organizations including:

IEC TC65B	• Industrial Process Measurement and Control;
ISO TC30	• Measurement of Fluid Flow in Closed Conduits;
ISA SP12	• Electrical Equipment for Hazardous Locations;
ASTM E20	• Temperature Measurement ;
ASME V&V 30	• Verification and Validation in Computational Simulation of Nuclear System Thermal Fluid Behavior.

Ⅴ. Business Portfolios: TIE



Generic Tech Research

To conduct projects of common interests:

- ***V***alidity Research on embedded software in level 1E digital instrument and apparatus;
- ***E***MC Research on digital nuclear I&CS;
- ***V***alidity Research on digital nuclear reactor protection system;
- ***A***geing management Research on digital nuclear I&CS;

To develop safety-critical instrumentations:

- SIPAI first clarified the NPP instruments into 9 categories and will play the role of organizer & manager in localization.

Standardization

To research on qualification methods:

- ***D***raft the Qualification Outline for NPP typical instrumentation;
- ***D***raft the Annual Inspection Guidance for running I&CS in NPP;
- ***D***raft the Assessing Guidance of functional safety and software V&V for digital I&CS;

To research and develop Chinese nuclear I&CS standard system:

- Standard system research;
- Standards developing.

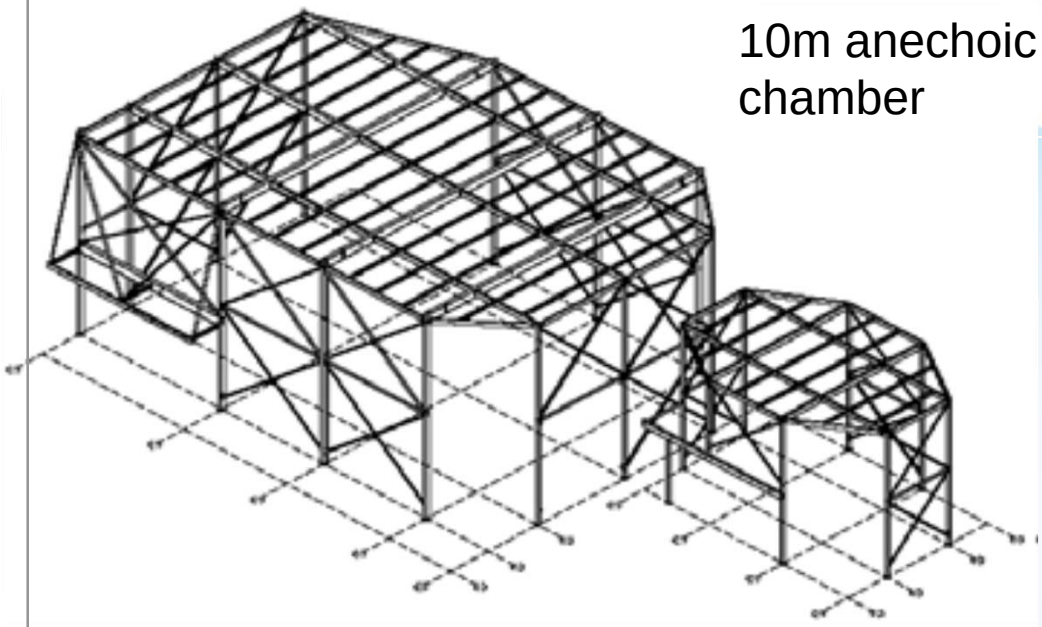
Qualification and Testing

To build a Evaluation and Qualification Center for Nuclear I&CS:

- *I*nt'l V&V Conference and Seminar in Nov, 2010;
- Mapping objective and plan;
- Infrastructure and hardware construction;
- Personnel training and software preparation;
- Acquire the approval from National Nuclear Safety Administration;
- Domestic and international marketing;
- QMS and Maintenance Mechanism construction, such as HAF003, NQA-1,CFR21;
- Internal Organization for Instruments Localization;
- Continuously tuning and reforming during business running

EMC Lab

- Fulfill requirements from all relative standards including NRC RG 1.180, RCC-E, MIL, IEC , IEEE and GB/T 11684:
  - Equipments Facilities: Anechoic Chamber, EMC Immunity Test System, Emission Test System and Surge Test System;

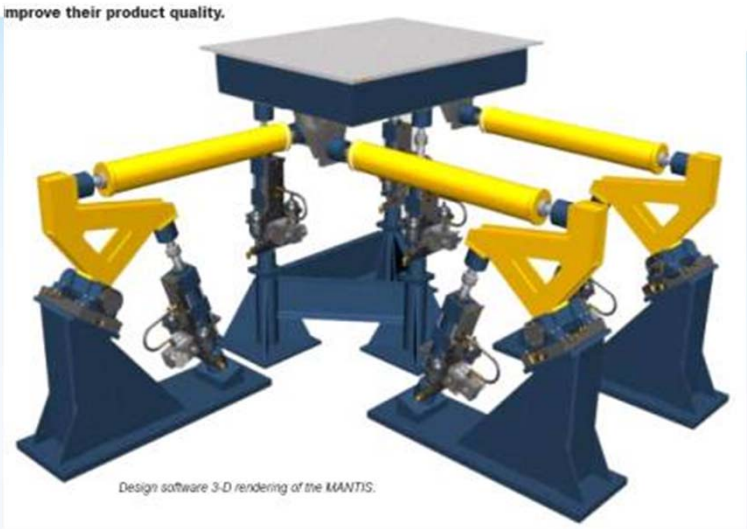


10m anechoic chamber

Thermo-oxidative Ageing/ Anti-Seismic Lab

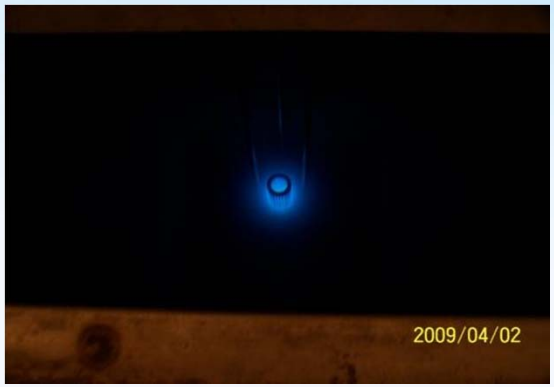
- To fulfill requirements of AP1000, RCC-E, IEEE, IEC and GB/T12727：
  - To enhance the ability of regular thermo ageing
  - To acquire the thermo-oxidative ageing test chamber

- To fulfill requirements of AP1000, RCC-E, IEEE, IEC and GB/T12727：
  - To acquire a custom made seismic test-bed with 3 axis and 6 degree of freedom, and relative sensors and collectors



Radiation Capability

- Cooperation with Shanghai Institute of Applied Physics
- Requirements of RCC-E,IEC, IEEE and GB/T12727 achieved already
- Construction needed to meet the requirements for AP1000



LOCA Test Capability

- Comply with the IEC, IEEE, GB/T12727 and AP1000 requirements.

V&V Evaluation Center

- ***C***onstruct according to IEC61508, IEC60880, IEC 62138 and IEEE1012;
- ***T***echnical research on functional safety of NPP reactor safety control system;
- ***D***evelop the SIL assessment guidance for Nuclear I&CS;
- ***D***evelop the ability of individual assessing for safety software V&V;

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Many thanks for your attentions!

For more information, please visit ***www.sipai.com***