The Nuclear Piping Power Market in China Forecasts and opportunities 2009
Agenda

- Dynabond Profile
- Chinese Nuclear Power Industry
- Safety Regulation
- Piping’ Opportunity in China
- Our Services
- Our Proposal
Dynabond – Corporate Evaluation

- Joined by Emily Qian, the founding partner, set up Dynabond Consulting with the focus on Investment and Finance
- Peter Duan, the founding partner, founded Dynabond Tech with the focus on providing technology solutions
- 1997
- Joined by Arnaud Lefevre-Baril, the founding managing partner, with his new leadership, Dynabond Consulting expanded to areas of new technology
- 2003
- Dynabond Consulting narrowed down and strengthened its focus on Chinese Nuclear Power Market
- 2005
- Joined by Nicolas Schlumberger (left), the board chairman, and Frederic Mouen Makoua (right), the chief technology officer; The company changed its name to Dynabond Powertech Services
- 2007
- Mid 2010
- Joined by Simon Li, the partner; Dynabond Powertech Services set up its new Shanghai Office
- 2010
- 4 functional teams of BD, Technical Consultancy, Market Intelligence and Media & Advertising;
- 18 staff members across China, Europe, North America.
Dynabond – Value Proposition

Business Development - sponsoring clients to gain market share through Open Bid Procurement, localization, technology transfer, etc.

Promotion - maximizing the exposure of clients’ products and services though well established channels, say dynabondpowertech.com (8K industrial subscribers), syndicated industrial medias, operators’ internal news letters, etc.

Technical Consultancy - assuring precise comprehension and effective influence over technical specs; sponsor obtaining NNSA approval (HAF 604 & 601)

Market Intelligence - develop strategies and marketing plan over specific products & services; assure timely and accurate MI
Chinese Nuclear Status and Prospects

Operation NPP Sites: 6
NPPs: 11
Installed Capacity: 9068 MW
Electricity Output: 68.4 TWh (2008)

To 2020:
Nuclear power output ≥ 7%
Installed capacity ≥ 86GW
Capacity in construction ≥ 30GW
Nuclear Power Plants in China

Compared to other industrialized countries, China has less nuclear power plants

Source: IEAE 2008
The Future of Nuclear Power Market in China

The nuclear power market increases fast

Source: DPS 2009
## NPPs in Construction

<table>
<thead>
<tr>
<th>NPPs in Construction</th>
<th>Reactor type</th>
<th>Rated power (MWe)</th>
<th>Date of FCD</th>
<th>Owner</th>
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<tr>
<td>Lingao II</td>
<td>Unit 3</td>
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## NPPs Passed Safety Review

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<th>Reactor type</th>
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<tr>
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</table>
Locations in China
Nuclear Industry Organizations

Operators
- CNNC
- CGNPC
- CPI
- Datang
- Huaneng
- Huadian
- Guodian
- SNPTC
- CNPDC

Operators applicants
- Datang
- Huaneng
- Huadian
- Guodian

Third Generation Technology Importer
- SNPTC
- CNPE
- CIRP
- CNPRI
- CNPDC

Nuclear Research Institutes and Universities
- Tsinghua University
- Shanghai Jiaotong University
- CAMST

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Safety Regulations

- The regulation of the supervision and management of imported safety related nuclear equipment (HAF604) from the Ministry of Environmental Protection in China (MEPC) was announced on January 1st, 2008.

- Published on January 1st, 2008, it requires foreign corporations to register at the NNSA.

- Foreign companies which do not get the HAF604 certification cannot participate in any bidding in China.
Suppliers of safety related pipe and pipe fittings have to get a certificate to provide their products to NPPs in China.

- The HAF604 certificate is required for foreign suppliers
- The HAF601 certificate is required for local suppliers
Analysis of Chinese Nuclear Power Market

Current status: underexploited

- The installed capacity of nuclear power is only 9 GW, accounting less than 2% of total electricity output
- The design and manufacturing capacity of Chinese players is very limited

Prospect: booming

- By 2020 the installed capacity of nuclear power will reach 70 GW
- By 2020 the total investment will reach 70 billion USD

Overall needs: huge demand

- Procure large amount of safety related components
- Import state-of-the-art technologies
TW Metal’s Opportunity in China – Nuclear Piping Materials

Analysis of nuclear piping materials market

- Demand: **50,000 tonnes/year**
- Supply:
  - 98% piping materials used in Nuclear Island are imported, mainly from France, Italy, Japan, Sweden and Spain
  - Piping materials used in Conventional Island are partly imported and partly provided by local vendors
  - Piping materials used in BOP are totally localized
Main Foreign Vendors in China

- **France**: Manoir Industries Pitres, Valinox Nucleaire, Boccard
- **Germany**: Wilh. Schulz GmbH, H. Butting GmbH & Co.KG, V&M Deutschland GmbH
- **Sweden**: AB Sandvik Materials Technology
- **Japan**: Sumitomo Metal Industries
- **Austria**: Erne Fittings GmbH
- **Italy**: Tectubi Raccordi SPA
- **USA**: Swagelok
- **South Korea**: Hy-lok
Main Local Vendors in China

- China First Heavy Industries
- China National Erzhong Group
- Baoshan Iron & Steel Co., Ltd
- Wuhan Heavy Industry Casting & Forging
- Shanghai Heavy Machinery Plant Co., Ltd
- Zhongxing Energy Equipment Co., Ltd
- Wuyang Iron and Steel Co Ltd
- Zhejiang Jiuli Group
Trademark and Quantity

- Analysis of piping materials used in a typical 1000 MWe NPP

<table>
<thead>
<tr>
<th>Name</th>
<th>Trademark</th>
<th>Quantity/t</th>
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<tbody>
<tr>
<td>Fuel Sheathing Tube</td>
<td>Zirealoy-4</td>
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<tr>
<td>Internal Structural Pipe</td>
<td>AIS1316</td>
<td>9</td>
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<tr>
<td>Control Rod Pipe</td>
<td>AIS1410</td>
<td>10</td>
</tr>
<tr>
<td>Steam Generator Pipe</td>
<td>inconel-600/800</td>
<td>200</td>
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<tr>
<td>Main pipe</td>
<td>STPT42</td>
<td>86</td>
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<tr>
<td>Cooling Water Pipe</td>
<td>SIS1304</td>
<td>320</td>
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<td>Cooling Water Pipe</td>
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<td>350</td>
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<tr>
<td>Cooling Water Heater</td>
<td>AIS1304</td>
<td>230</td>
</tr>
<tr>
<td>Auxiliary Heat Exchanger</td>
<td>AIS1305</td>
<td>50</td>
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</table>
Piping’ Opportunity

- Piping materials used in Nuclear Island:
  - large demand and less competition

- Piping materials used in Conventional Island:
  - strong competition from local vendors
Dynabond – Our Services

1. Marketing Consulting
   - develop marketing plan and strategy for TW Metals

2. Sales Representation
   - help TW Metals to sell its products in China

3. Safety Registration
   - help TW Metals to get the HAF certificate for its safety related pipes
Marketing Consulting

- Business opportunities
- Market status and prospect
- Customized marketing plan and business strategy
- International and national competitors
- Contact information of clients
Sales Representation

Advertising
- Advertising over the Internet and
- Advertising on selected publications

Industrial Events
- Participate in the main exhibitions in China
- Presence on targeted events in Europe and USA

Win Bids
- Fixed target of cold calls and monthly meetings with Chinese suppliers
- Regular consultation with the main design institutes and buyers
HAF604 Registration

1. Draft a proper registration strategy
2. Prepare qualified application
3. Act as a liaison between customer and NNSA
4. High level lobby to speed up registration
5. Get HAF Certificate from NNSA
Dynabond - Our strengths

- **Multinational sales**: Dynabond has a dynamic sales and marketing staff fluent in Chinese, English, French, German and Russian.

- **Engineering specialism and in-house legal advisors**: Dynabond has a nuclear senior engineer with 19 years of experience in the nuclear field. Dynabond also has an in-house lawyer.

- **Extensive operating experience in China with Chinese companies and the government**: Dynabond benefits from highly experienced and connected management, such as Peter Duan, whom has had over 20 years working within commerce and government.
Our network…

- BRIUG
- CHINERY
- CIRP (CNNC)
- CNPRI (CGNPC)
- CNPDC (CGNPC)
- CNPEC (CGNPC)
- Everyclean
- Guodian
- Shanghai Jiaotong University
- SNERDI
- Tsinghua University (INET)
- ............
Conclusion

- The Chinese nuclear power market is the most ambitious in the world with an actual investment of EU120 Billion.

- China does not have manufacturing capacity for its industrial projects
  => China is seeking strong international support.

- Good communication concerning the Chinese needs is the key to success: i.e. Shanghai Electric Heavy Industry Group.
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Shortlist of the Chinese industry (1)

China

- CNNC: China National Nuclear Corporation 中核集团
  - CIAE: China Institute of Atomic Energy 原子能院
  - CIRP: China Institute for Radiation Protection 中国辐射防护研究院
  - CNPE: China Nuclear Power Engineering Co., Ltd 中国核电工程有限公司
  - CNPOTECH: China Nuclear Power operation Technology Corporation., Ltd 中核武汉核电运行技术股份有限公司
  - RINPO: Research Institute of Nuclear Power operation 核动力运行研究院
  - NPIC: Nuclear Power Institute of China 核动力院
- EverClean Co., Ltd 中核清原
- CGNPC: 中广核
  - CNPDC: China Nuclear Power Design Company LTD 中广核工程设计有限公司
  - CGNPC China Nuclear Power Engineering Co., Ltd (CNPEC) 中广核工程有限公司
  - CNPRI: China Nuclear Power Research Institute 中科华核电技术研究院
  - SNPI: Suzhou Nuclear Power Research Institute Co., Ltd 苏州热工院
  - CNPEC: China Nuclear Power Engineering Co., Ltd 中广核工程有限公司
  - DNMC: Daya Bay Nuclear Power operation and Management Co., Ltd 大亚湾核电运营管理有限责任公司
Shortlist of the Chinese industry (2)

- SNPTC: National Nuclear Power Technology Corporation 国家核电技术公司
- SNEDI: Shanghai Nuclear Energy & Design Institute 上海核工程设计研究院
- SNPDR: State Nuclear Electric Power Planning Design & Research Institute 国核电力规划设计研究院
- SNPEC: State Nuclear Power Engineering Co., Ltd 国核工程有限公司
- CNECC: China Nuclear Engineering Group Co 中国核工业建设集团公司
- COSTIND: 国防科工委
- NNSA: National Nuclear Safety Administration 国家核安全局
- NSC: Nuclear and Radiation Safety Center 核与辐射安全中心
- HPEC: 哈尔滨电站设备集团公司
- NCPE: North China Power Engineering Co., Ltd 北京国电华北电力工程公司
- IFRI: Tianjin Fire Research Institute 天津消防研究院
- Tsinghua University: 清华大学