How Does Technology Transfer by Insiders Work?

China Tech Transfer Vectors

- Multiple vectors used simultaneously to obtain key western technology identified in China’s Five Year Plans.
- Funded and supported by Chinese Government at all levels.
- Case Example shows five of these vectors in action.
INTRODUCTION

U.S. vs Shan Shi summary

- Sophisticated Chinese Government Economic Espionage
- Sought to steal critical U.S. syntactic foam manufacturing technology
- First economic espionage prosecution in District of Columbia
- 7 individuals and 2 companies indicted
- 4 guilty pleas and 1 trial conviction

2 Charged With Espionage In Chinese Trade Secrets Theft

Houston man convicted of stealing trade secrets for China

July 30, 2019
SYNTACTIC FOAM

Why Is It Important?

- Export-controlled: Provides key military and economic advantage
- Used in submarines, naval ships, and oil platforms
- $2-20 billion industry in oil and gas
- China cannot make high-quality syntactic foam
- Took victim company Trelleborg over 40 years and millions of dollars to develop
CHINA’S FIVE-YEAR PLANS

Why Does China Want Syntactic Foam?

- The 12th Five-Year Plan focuses on marine power
- Chinese Government Ministry of Information and Industry Technology (MIIT) names syntactic foam as a priority on “Made in 2025” list and sets aside $70M
- CSIC, CNOOC, Harbin Engineering University form China Buoyancy Materials in 2013
- CBMF fails to create syntactic foam, HEU turns to economic espionage
THE SCHEME
Stealing the Formula from the United States

- CBMF hires Harbin professor Shan Shi in 2014
- Shi was also a professor at Texas A&M
- China Buoyancy Materials becomes Create Better Materials
- Shi incorporates CBMI in Houston and receives $3M from China
1. Party A’s Obligations and Responsibilities:

(1) Party A, through his own knowledge, capability and the relevant technology that he masters, actively brings in cutting-edge knowledge and high-level talented people, trains and raises the level of the design ability of CBM-Future and sets up a design team for CBM-Future.

(4) responsible for the coordination with local government and relevant departments to earnestly receive preferential policies from the government for Party A and also to actively work with Party A in the applications related to the “Thousand Talents Program” at the provincial level and at the national level and the 500 Elites Plan of Taizhou City, etc.;
Since I have over 20-year experiences in design and engineering of marine engineering field in U.S. and taking into consideration the situational reality in relation to our country’s current implementation of the “Ocean Power” strategy, it is the right timing to return to the country for repaying with my services. I believe that I can make corresponding contributions to the development of our country’s marine engineering endeavor and the advancement of technology of related marine engineering industries.

[3] Carry on, based on Taizhou CBM-Future New Material Science and Technology Co., Ltd., the structural design, material design and process design of the buoyance materials for drilling riser, and introduce and digest/absorb the relevant, critical U.S. technology and build China’s first deepsea drilling buoyance material production line to satisfy the needs of our country’s marine engineering development.
THEFT OF TRADE SECRETS

- Subjects create “targeting packages” of Trelleborg employees who work on syntactic foam using LinkedIn, recruit two Trelleborg employees.
- Steal numerous trade secrets on macrosphere production, despite strict access controls at the company.
- Send trade secrets to CBMF, which still fails to make syntactic foam but copies a key sub-component: macrosphere technology.
Shi's Business Plan

- Shi offers to mass produce macrospheres for Trelleborg, using their own stolen technology.
- CBMF will offer joint venture to obtain rest of technology.
- CBMF will take over $20 billion industry.
- CBMF will supply both Chinese military and civilian entities.
- Subjects say: “U.S. company will exit industry.”
“absolutely inappropriate”

August 21, 2015

From: huanghui <huanghui@cbm-future.com>
To: sshi <sshi@cbm-intl.com>, Lei?Jiang <ljiang@cbm-intl.com>
Subject: Patent

First, the technical part of the macro-spheres came from LIU Gang, but the person(s) of the patent bureau is/are the opinion that LIU Gang is absolutely inappropriate because he is still within the non-competition period with Trellberg [sic]. Listing him as the inventor is in violation of the law which will cause significant risk to the company. I think [we] should explain this to LIU Gang.

(H. Huang Email to S. Shi)  Source: Authorized Search
May 23, 2017 - Undercover operation

Bid on Lockheed proposal

Provided list of projects for PLA Navy

Arrests after presentation

Sales Record

<table>
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<tr>
<th>No.</th>
<th>Customer</th>
<th>Project</th>
<th>Product / Service</th>
<th>Specifications</th>
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Project Photos

UNCLASSIFIED
Outcome

Shan Shi
Convicted at trial

JW Randall
Plead ed Guilty

Uka Uche
Plead ed Guilty

Gang Liu
Fugitive

Kui Bo
Plead ed Guilty

Sam Ogoe
Plead ed Guilty

Huang Hui
Fugitive
“Technology Transfer Central to China’s Development”

“We should make use of the intellectual resources of other countries... We should not be reluctant to spend money on recruiting foreigners... It is a matter of strategic importance”

Deng Xiaoping, 1983

“In today’s world S&T innovation has become critical for increasing comprehensive national strength... whoever holds the key to S&T innovation will be able to preempt the rivals and win the advantage...”

Xi Jinping, June 9, 2014
Non-Traditional Collectors

National Priorities
- National Development and Reform Commission
- Five-Year Plans
- Medium- and Long-Term Science and Technology Development Plan
- 16 Major Projects

Industry and Ministry Priorities
- Ministries
- Chinese Academy of Sciences
- State-Owned Enterprises
- Provincial and Municipal Governments

Incentives
- 1000 Talents Program
- 863/973 Programs
- Torch Plan
- Non-monetary incentives

Facilitation Platforms
- Consular Officials, especially S&Ts
- Professional and Cultural Organizations
- Companies with Government Ties
- Delegation Visits
- Joint Ventures/Acquisitions

Acquisition
- Co-opted Employees
- Hired Talent Under Contract
- Reverse Engineering
- Cyber Exfiltration
## Current Situation

**China’s Five-Year Plans For Worldwide Monopolies**

| New 13th Five-Year Plan National S&T Development Projects through 2030 |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| Aircraft Engines and Gas Turbines               | Brain Science and Artificial Intelligence       | Smart-Grid Technology                           | New Materials                                   |
| Big Data                                        | Clean Coal                                     | Intelligent Manufacturing and Robotics           | National Cyberspace Security                    |
| Seed-Industry Innovation                        | Deep-Sea Space Station                         | Satellite Broadband Mobile Communications       | Precision Medicine and Health Security          |
| Quantum Communication and Computing             | Deep-Space Exploration                          | Environmental Governance                         |                                                 |

“The Chinese government is a company—disguised as a country--engaged in economic warfare.”

_John Ferrierla, Chairman and CEO, Nucor Corp, The Wall Street Journal, October 17, 2017_
The Potential Cost

- We understand the Chinese Market is crucial but we want you to know that it will not be on a level playing field:
  - If your products are on the 13\textsuperscript{th} Five Year Plan or Made in 2025 List, your company is a target.
  - The goal of the Chinese Government is to create “monopolies”, which means eventually they want your company out of business.
  - The Chinese company you compete against or enter into a joint venture with has the full support of the Chinese Government and the tools of its security services and regulatory agencies at their disposal.
  - The Chinese company you compete against will have financial backing from the Chinese Government and will not have to make a profit.
What Can We Do?

IDENTIFY  Identify your most valuable assets
If your competitors would want them, so do foreign countries.

ENGAGE  Develop a partnership with the FBI
Have a two-way dialogue on threats, indicators, and vulnerabilities.
Don’t wait until after your assets have been stolen: then it’s too late.

PROTECT  Make your assets harder to steal
Strengthen cyber-security; screen new hires; be aware of employees’ abnormal behavior, foreign travel, or other foreign ties; and keep an eye on people who visit your facilities.
Corporation Diagnostic Review

- Consider implementing policy banning members of Talent Programs and screening for visitors from denied entity listed universities or foreign military facilities. Employ appropriate screen processes to hire new employees.
- Ensure proprietary information/trade secrets are carefully protected, monitored, and access is limited.
- Engage with your local FBI office and ask for threat briefs.
- Educate and regularly train employees on security policies and protocols.
- Provide non-threatening, convenient methods for employees to report suspicious behavior.
- Ensure physical security personnel and IT personnel are talking and have the tools they need.
- Implement continuous evaluation programs to consistently screen onboard employees.
- Provide security personnel with access to human resources data.
- Develop strong risk management and compliance programs.
- Monitor computer networks routinely for suspicious activity.
- Establish Virtual Private Networks (VPN) for added protection.
- Install Intrusion Detection Systems (IDS) and strong portable electronic media/digital storage device policies.
- Ensure joint ventures protect your IP and there are clear/enforceable penalties for violations.
- Thoroughly vet companies in your supply chain.
QUESTIONS?

CHINA’S STRATEGIC GOALS

Comprehensive National Power
Innovation Driven Economic Growth Model
Military Modernization

UNCLASSIFIED