

UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF TENNESSEE  
AT KNOXVILLE

FILED

2016 APR -5 P 3:07

UNITED STATES OF AMERICA,

Plaintiff,

v.

SZUHSIUNG HO a/k/a ALLEN HO,  
CHINA GENERAL NUCLEAR POWER  
COMPANY a/k/a CHINA GUANGDONG  
NUCLEAR POWER COMPANY, and  
ENERGY TECHNOLOGY INT.

Defendants.

NO. 3:16-CR- 46

JUDGES Jordan/Shirley

INDICTMENT

The Grand Jury charges as follows:

INTRODUCTION

At all times relative to this indictment:

Parties, Persons, and Entities

1. The State-Owned Assets Supervision and Administration Commission of the State Council (SASAC) was a special government agency of the People's Republic of China (PRC). It was under the direct control of the State Council, the PRC's highest government authority. According to its website, SASAC "performs investor's responsibilities, supervises and manages the state-owned assets of the enterprises under the supervision of the Central Government ... and enhances the management of the state-owned assets." The appointment of senior officers and directors of central state-owned assets was controlled by the Organization Department of the Communist Party of China Central Committee and managed by SASAC.

2. The defendant, **CHINA GENERAL NUCLEAR POWER COMPANY (CGNPC)**, formerly known as China Guangdong Nuclear Power Company, was a state-owned enterprise controlled by SASAC. CGNPC was one of the top three power companies and was the largest nuclear power company in the PRC. CGNPC's Board of Directors was comprised of members of the Communist Party of China. CGNPC specialized in the development and manufacture of nuclear reactors. China Nuclear Power Technology Research Institute (CNPRI) was a subsidiary of CGNPC and served as CGNPC's main technology center, focused on the research, development, and design of nuclear power technologies.

3. The defendant, **SZUHSIUNG HO a/k/a ALLEN HO (HO)**, was a nuclear engineer employed by CGNPC as a Senior Adviser. HO was also the owner and president of defendant **ENERGY TECHNOLOGY INTERNATIONAL (ETI)**. HO was born in the PRC and was a naturalized U.S. citizen. HO was a resident of Delaware and the PRC.

4. The defendant, **ETI**, was a Delaware corporation with its principal place of business in Wilmington, Delaware. HO's Delaware residence served as ETI's principal business location.

5. U.S. Person 1(USP1) was a resident of Tennessee and was employed by the Tennessee Valley Authority (TVA) as a Senior Manager for Probabilistic Risk Assessment in the Nuclear Power Group from April 2010 through September 2014. USP1 was born in Taiwan and became a naturalized U.S. citizen in 1990. Prior to his employment with TVA, USP1 was a Probabilistic Risk Assessment Manager with Florida Power & Light (FPL). In the early 1990s USP1 was introduced to HO through the Chinese American Nuclear Technology Association (CANTA).

6. U.S. Person 2 (USP2) was a resident of South Carolina and was employed as a mechanical engineer by a Pennsylvania-based nuclear power company (U.S. Company 1). USP2 held a patent for nuclear assembly design that he obtained while working for U.S. Company 1.

7. U.S. Person 3 (USP3) was a resident of Pennsylvania and was a nuclear engineer specializing in nuclear fuel analysis. From 1974 to 1997, USP3 was employed by U.S. Company 1. In 1998, USP3 co-founded a consulting company based in Pennsylvania.

8. U.S. Person 4 (USP4) was a resident of South Carolina and was a nuclear engineer employed by U.S. Company 1. USP4 was born in the PRC and was a naturalized U.S. citizen. While at U.S. Company 1, USP4 was responsible for mechanical design and structural integrity evaluations of nuclear fuel assembly and core component designs and lead fuel development and design projects for utilities in both Japan and Korea.

9. U.S. Person 5 (USP5) was a resident of Pennsylvania and a former nuclear engineer employed by U.S. Company 1.

10. U.S. Person 6 (USP6) was a resident of Colorado and was a nuclear engineer employed by a North Carolina-based nuclear power company (U.S. Company 2) from 1974 until 1987. In 1987, USP6 founded a Colorado-based company that provides technical services to the nuclear power industry.

11. The Electric Power Research Institute, Inc. (EPRI) was a non-profit organization that conducted research, development, and demonstrations relating to the generation, delivery, and use of electricity. Among other things, EPRI published reports on various topics related to nuclear power. Access to some EPRI reports was restricted to only those individuals and entities that were EPRI members. TVA was an EPRI member and TVA employees had access to EPRI reports via TVA's EPRI membership.



### **The Atomic Energy Act**

12. The Atomic Energy Act (AEA), 42 U.S.C. § 2011 *et seq.*, empowers the Secretary of Energy to authorize persons to directly or indirectly engage or participate in the development or production of special nuclear material outside the United States. Pursuant to 42 U.S.C. § 2077, “[i]t shall be unlawful for any person to directly or indirectly engage or participate in the development or production of any special nuclear material outside the United States except (1) as specifically authorized under an agreement for cooperation made pursuant to [the AEA], or (2) upon authorization by the Secretary of Energy after a determination that such activity will not be inimical to the interest of the United States.”

13. In order to implement the AEA, the Department of Energy, National Nuclear Security Administration promulgated 10 C.F.R. Part 810—Assistance to Foreign Atomic Energy Activities. Under 10 C.F.R. § 810.8, specific authorization from the Secretary of Energy is required before engaging directly or indirectly in the production of special nuclear material in the PRC.

14. Under 10 C.F.R. § 810.3, the term “special nuclear material” means “(1) plutonium, (2) uranium-233, or (3) uranium enriched above 0.711 percent by weight in the isotope uranium-235.”

15. Section 2272 of the AEA makes it a crime to willfully violate, attempt to violate, or conspire to violate any provision of 42 U.S.C. § 2077.

16. At no time did the defendants obtain specific authorization from the Secretary of Energy to engage in any of the conduct described in this indictment as required under 10 C.F.R. § 810 and the AEA.

## COUNT ONE

### **(Conspiracy To Unlawfully Engage and Participate in the Production and Development of Special Nuclear Material Outside the U.S.)**

17. Beginning in or about 1997 and continuing until the date of the return of this indictment, within the Eastern District of Tennessee and elsewhere, the defendants, **SZUHSIUNG HO a/k/a ALLEN HO, CHINA GENERAL NUCLEAR POWER COMPANY a/k/a CHINA GUANGDONG NUCLEAR POWER GROUP, and ENERGY TECHNOLOGY INTERNATIONAL**, did conspire with each other and with others known and unknown to willfully and knowingly engage and participate, both directly and indirectly, in the development and production of special nuclear material outside of the United States, namely, in the People's Republic of China, with the intent to secure an advantage to the People's Republic of China, without being specifically authorized to do so by law or the Secretary of Energy, in violation of Title 42, United States Code, Sections 2077(b) and 2272(a).

### OBJECTS OF THE CONSPIRACY

18. It was an object of the conspiracy that the defendants and other conspirators would profit by engaging and participating, both directly and indirectly, in the development and production of special nuclear material in the PRC.

19. It was an object of the conspiracy that, as a result of the unlawful conduct, CGNPC would design and manufacture certain components for nuclear reactors more quickly by reducing the time and financial costs of research and development.

### MANNER AND MEANS

The manner and means by which the conspiracy was sought to be accomplished included, among other things, the following:

20. It was part of the conspiracy that CGNPC, through HO and ETI, illegally sought and obtained technical assistance from U.S.-based experts related to the development and production of special nuclear material without authorization from the Secretary of Energy as required by the AEA. Such technical assistance was related to the following, among other matters: (1) CGNPC's Small Modular Reactor (SMR) Program; (2) CGNPC's Advanced Fuel Assembly Program; (3) CGNPC's Fixed In-Core Detector System; and (4) verification and validation of nuclear reactor-related computer codes.

21. It was further part of the conspiracy that HO, under the direction of CGNPC, identified and recruited USP1 and other U.S.-based experts to provide technical assistance related to the development and production of special nuclear material for CGNPC in the PRC.

22. It was further part of the conspiracy that HO, through ETI, executed contracts with CGNPC for projects which required technical assistance from U.S.-based experts related to the production and development of special nuclear material in the PRC.

23. It was further part of the conspiracy that HO, as president of ETI, entered into contracts with USP1 and other U.S.-based experts to provide assistance to CGNPC related to the development and production of special nuclear material in the PRC.

24. It was further part of the conspiracy that HO and CGNPC facilitated the travel of USP1 and other U.S.-based experts to the PRC in order to facilitate the provision of technical assistance related to the development and production of special nuclear material in the PRC.

25. It was further part of the conspiracy that HO, through ETI, caused payments to be made to USP1 and other U.S.-based experts in exchange for their services.



26. It was further part of the conspiracy that HO, and conspirators, used email accounts, the Internet, the telephone, and other forms of communication to communicate with conspirators located in the U.S. and the PRC.

### **OVERT ACTS**

In furtherance of the conspiracy and to bring about its objects, the defendants, and other unnamed coconspirators both known and unknown, committed the following overt acts, among others, in the Eastern District of Tennessee and elsewhere:

27. In 2004, at the direction of HO, USP1 provided FPL information regarding nuclear power plant outage times to HO for use at CGNPC's Daya Bay Nuclear Power Plant (Daya Bay).

28. On or about March 17, 2004, HO instructed USP1 "Daya bay hopes you can bring them as many paper reports and documents as you could..."

29. From on or about April 26, 2004 to April 30, 2004, USP1 provided consulting services to Daya Bay in the PRC.

30. On or about September 8, 2013, a CGNPC employee sent an email to USP1 requesting several EPRI reports, which USP1 had access to via TVA's EPRI membership.

31. From on or about November 25, 2013 to November 29, 2013, USP1 traveled to the PRC at CGNPC's request to provide nuclear consulting to CGNPC. During this trip, USP1 provided the following EPRI reports to CGNPC: (1) Program on Technology Innovation: EPRI Material Management Matrix; EPRI Report Number 1016334; (2) A Method to Predict Cavitation and the Extent of Damage in Power Plant Piping; EPRI Report Number TR-103198-T2; and (3) Assessment of EPRI Fuel Reliability Guidelines for New Nuclear Plant Design; EPRI Report Number 1019211.

32. In December 2015, HO mailed a check from Delaware to USP1 in Chattanooga, Tennessee totaling \$15,555.20 for USP1's 2013 and 2014 services to CGNPC. The payment included, in part, compensation for USP1's November 2013 consulting trip to the PRC. The payment was from what HO described as "his company's slush fund."

**CGNPC's Advanced Fuel Assembly R&D Program**

33. In December 2009, HO recruited USP2, USP3, and USP4 to assist CGNPC with its fuel design program.

34. On or about December 8, 2009, HO sent an email to USP4 stating "I am looking for experienced fuel design/manufacturing/testing people (across the entire spectrum) for an upcoming project in Shenzhen, Guangdong .... Retired or active [U.S. Company 1] people are all acceptable. Please help but do not openly announce this news. I don't want to alert [U.S. Company 1]."

35. On or about December 9, 2009, USP3 sent an email to HO and USP2 stating, "We need to check that there won't be any legal issues in participating in a nuclear technology transfer to China ... we do need to make sure there won't be any problems for us as individual consultants."

36. On or about July 29, 2010, USP2 sent an email to HO, copying USP3 and others. In the email, USP2 sought guidance from HO regarding USP2's and USP3's presentations during a planned trip to the PRC. USP2 stated, "Should we be preparing about 4-hours of presentation each or is that too much for this trip? ... The issue of [U.S. Company 1] and [French Company] proprietary information is uppermost on my mind. We need to go slowly/carefully for ALL parties rights. ... [USP3's] sources for fuel rod models data is widely used, mine are heavily [U.S. Company 1]."



37. On or about August 16, 2010, USP2 sent an email with the subject line, "Draft 1 of Fuel Assembly Design PPT slides for CGNPC Meeting," to USP3, copying HO and others. USP1's draft presentation was attached to the email.

38. On or about August 20, 2010, USP3 sent an email with the subject line, "Draft 1 of Fuel Rod Design PPT slides for CGNPC Meeting," to USP2, copying HO. USP3's draft presentation was attached to the email.

39. On or about August 30, 2010, USP2 sent an email with the subject line, "Questions related to Trip to CGNPC," to HO, copying USP3, attaching his final Fuel Assembly Design presentation.

40. On or about August 31, 2010, USP3 sent an email to HO, copying USP2. USP3's presentation for CGNPC was attached to the email.

41. On or about September 3, 2010, USP2 and USP3 traveled to the PRC and returned to the U.S. on or about September 22, 2010.

42. In April 2012, HO recruited USP5 to assist CGNPC with its fuel design program.

43. On or about April 6, 2012, HO sent an email to USP5 which stated in part, "CGNPC, the power company in Shenzhen is looking for some technical support in the fuel assembly/T&H area. I would like to know if you would be available for roughly 3 to 6 weeks in the next 12 months."

44. On or about July 3, 2012, USP5 sent an email to HO which stated, "I would be able to give them some useful information on the following which would not be in normal [U.S. Company 1] presentations .... I am adding more to the above (and writing details) as I continue to review in my mind my past work at [U.S. Company 1]."

45. On or about July 23, 2012, a CGNPC employee sent an email to HO which stated in part, "If possible for now we hope to get offline support by thermal engineering and hydro engineering experts."

46. On or about July 23, 2012, HO responded to the CGNPC employee by stating, "Thermal engineering expert [USP5] has agreed to come to provide technical support."

47. On or about September 26, 2012, USP5 sent an email to HO which stated, "Attached are the slides that I need to have made for my presentation in Shenzen." Attached to the email was a presentation regarding reactor core thermal hydraulic design analysis.

48. On or about October 29, 2012, USP5 traveled to the PRC.

49. On or about February 25, 2013, HO sent an email to USP2 which stated in part, "From now on, all Q&A communications will go thru me."

50. On or about March 15, 2014, HO sent an email to USP2, attaching a document with questions from CGNPC regarding dynamic force testing of a nuclear fuel assembly structural grid with flow mixing vanes.

51. On or about March 20, 2014, HO sent an email to USP4, attaching a document from CGNPC requesting assistance with the installation test setup for dynamic force testing of a nuclear fuel assembly structural grid with flow mixing vanes.

52. On or about March 21, 2014, USP4 provided HO with his response to CGNPC's request.

53. On or about March 28, 2014, HO sent USP4's response regarding the installation test setup for dynamic force testing of a nuclear fuel assembly structural grid with flow mixing vanes to a CGNPC employee.

54. On or about March 29, 2014, USP2 sent an email to HO attaching his response to CGNPC's questions regarding dynamic force testing of a nuclear fuel assembly structural grid with flow mixing vanes.

55. On or about April 3, 2014, HO sent USP2's response regarding dynamic force testing of a nuclear assembly structural grid with flow mixing vanes to a CGNPC employee.

56. On or about April 3, 2014, HO sent an email to USP2. Attached to the email was a document containing questions from CGNPC employees. The questions from CGNPC related to the design and testing of in-core Stationary Control Component Assemblies and instrumentation of a nuclear fuel rod for seismic-related testing using an accelerometer sensing probe. HO instructed USP2 to "[p]lease send your response to me when it is ready."

57. On or about April 10, 2014, HO sent an email to a CGNPC employee, attaching USP2's responses to CGNPC's questions regarding the design and testing of in-core Stationary Control Component Assemblies and instrumentation of a nuclear fuel rod for seismic-related testing using an accelerometer sensing probe.

58. On or about June 1, 2014, USP3 sent an email to a CGNPC employee, copying HO. The email contained technical assistance on improving/debugging the JASMINE and COPERNIC nuclear fuel performance codes.

59. On or about June 2, 2014, the CGNPC employee responded to USP3, copying HO, and stating in part, "Thank you very much for your helps [sic] in the past few months, I have learned something about preparing data for the tests, finding bugs in the code and some other aspects about work. You are a real good teacher for me. Thank you so much."



### **CGNPC's Fixed In-Core Detector System**

60. In 2011, HO recruited USP6 to begin working on a project pursuant to a contract between ETI and CGNPC for technical support and software related to CGNPC's Fixed In-Core Detector system.

61. In December 2011, USP6 traveled to the PRC to provide technical support to CGNPC related to its core detector system. In connection with the trip, on or about December 4, 2011, USP6 sent an email to HO, copying a CGNPC employee. Attached to the email was a document containing USP6's answers to a series of questions from CGNPC related to its in-core detector system.

62. On or about December 13, 2011, USP6 sent an email to a CGNPC employee, copying HO and other CGNPC employees, with a subject line, "System Design of [U.S. Company 2] Fixed Incore System." Attached to the email was a document titled, "System Design of the [U.S. Company 2] Fixed Incore Monitoring System" which contained four subparts: Purpose, Hardware, Software, and Function.

63. On or about December 14, 2011, USP6 sent an email to a CGNPC employee, copying HO and other CGNPC employees. Attached to the email was a document titled "Nuclear Application Software Package" which contained information related to nuclear plant instrumentation and how the data will be used.

64. On or about December 17, 2011, USP6 sent an email to a CGNPC employee, copying HO and other CGNPC employees, with the subject, "Trip Report." Attached to the email was a trip report that included items raised during USP6's trip to the PRC, including in-core detector systems and nuclear application software. The trip report also included additional tasks that USP6 stated he would address "in the next few months."

65. On or about December 23, 2011, HO sent a preliminary work order, prepared by a CGNPC employee, to USP6 for some of the additional tasks identified in the Trip Report. Among the additional tasks identified in the work order, USP6 was asked to investigate (1) “how to curve fit the data when using long emitter detectors, recommendations on how to flag ‘suspect’ signals, list of sources of uncertainty, and how to estimate them, the calculation procedure for processing the data” and (2) continue to work and provide additional details regarding the Nuclear Application Software Package. These tasks were identified in the work order as Items Number 4 and 5, respectively.

66. On or about February 7, 2012, USP6 sent an email with the subject “Task 4” to CGNPC employees, copying HO and other CGNPC employees. In the email, USP6 stated, “Attached is a writeup for the items described in Task 4 along with other supporting attachments. This completes Task 4.” Attached to the email were multiple technical documents related to, among other things, signal processing techniques and incore detector systems.

67. On or about February 13, 2012, USP6 sent an email with the subject “Task 5” to CGNPC employees, copying HO and other CGNPC employees. In the email, USP6 stated, “Attached are two documents which summarize the description of the [U.S. Company 2] fixed incore system. These, along with previous attachments, complete Task 5.” Attached to the email were documents related to the nuclear application software package and the system design of the U.S. Company 2 fixed in-core monitoring system.

### **PRC Nuclear Reactor-Related Computer Codes**

68. On or about July 15, 2013, USP6 sent an email with a subject line "Work Plan for V&V [Verification and Validation] Project" to a CGNPC employee, copying HO. In the email, USP6 provided details about his planned travel to the PRC and asks for details about the work plan for the project.

69. On or about July 16, 2013, a CGNPC employee responded to USP6 stating that the work plan will include verification and validation for three nuclear reactor-related PRC computer codes: PINE (nuclear fuel lattice code), COCO (3-dimensional neutronics code), and MAPLE (core neutron flux mapping code).

70. On or about August 22, 2013, USP6 sent an email to a CGNPC employee, copying HO and another CGNPC employee. Attached to the email was a plan for validating COCO and MAPLE.

71. On or about August 24, 2013, USP6 sent an email to a CGNPC employee, copying HO, providing an update on the verification and validation project. USP6 indicated there were problems with PINE and offered to "stay for another week or two if you think that extending the contract would be helpful."

72. On or about August 27, 2013, USP6 sent an email to a CGNPC employee, copying HO and another CGNPC employee, discussing reaction rate comparisons between COCO and MAPLE and providing an update on the problems with PINE. Attached to the email was a validation and verification matrix for PINE, COCO, and MAPLE.

73. On or about June 26, 2014, a CGNPC employee sent an email to USP6, copying HO, inviting USP6 to return to the PRC to continue assisting CGNPC with verification and validation of PINE and COCO.



74. On or about November 15, 2014, USP6 traveled to the PRC.

75. On or about December 2, 2014, USP6 sent an email with a subject line "Summary Report and Invoice" to HO, copying a CGNPC employee. A summary report of USP6's activities and invoice was attached to the email. According to the summary report, USP6 conducted a review of COCO and PINE validation.

76. On or about January 30, 2015, HO caused a payment to be sent to USP6 from ETI in the amount of \$22,698.54 for consulting services and travel expenses.

All in violation of Title 42, United States Code, Sections 2077(b) and 2272(a).

### **COUNT TWO**

#### **(Conspiracy to Act in the United States as an Agent of a Foreign Government)**

77. The allegations contained in Paragraphs 1 through 16 are realleged and incorporated as if fully set forth herein.

78. Beginning in or about 1997 and continuing until the date of the return of this indictment, within the Eastern District of Tennessee and elsewhere, defendant **SZUHSIUNG HO a/k/a ALLEN HO** did unlawfully, knowingly and willfully conspire with others, known and unknown, to commit an offense against the United States, namely to knowingly act in the United States as an agent of a foreign government, to wit, the People's Republic of China, without prior notification to the Attorney General as required by law in violation of Title 18, United States Code, Section 951.

### **OBJECTS OF THE CONSPIRACY**

79. The allegations contained in Paragraphs 18 and 19 are realleged and incorporated as if fully set forth herein.

### MANNER AND MEANS

80. The objects of the conspiracy were carried out, in part, as alleged in Paragraphs 20 through 26 above.

### OVERT ACTS

81. In furtherance of the conspiracy and to bring about its objects, the defendant, and other unnamed coconspirators both known and unknown, committed the overt acts alleged in Paragraphs 27 through 76, among others, in the Eastern District of Tennessee and elsewhere.

82. On or about October 4, 2009, HO sought assistance from an individual in the U.S. with recruiting U.S.-based experts to assist CGNPC with its nuclear instrumentations system design and manufacturing, informing the individual: "China has the budget to spend. They asked me if I could form a comprehensive team to provide technology transfer in design and manufacturing, related training, and technical supports. The delivered product for ETI is that China will be able to design their Nuclear Instrumentation System independently and manufacturing them independently after the project is complete.... They want to bypass the research stage and go directly to the final design and manufacturing phase. They said budget is no issue."

83. In February 2012, at the direction of CGNPC, HO began recruiting individuals based in the United States to assist with CGNPC's SMR Program.

84. On or about February 2, 2012, HO sent an email to a potential recruit located in the United States, stating, "I have been charged to obtain all the expertise that will be needed (and available) from the US."

85. On or about February 7, 2012, HO sought assistance from a person in the United States in recruiting experts for CGNPC's SMR Program, stating: "CGNPC is contemplating to

initiate a Small Modular [Pressurized Water Reactor] Design Program. They asked me to round up experienced (available) people to help them do the conceptual design ... Could you spread the words to your [U.S. Company 1] colleagues (current or retired colleagues) but without revealing CGNPC intention to build such reactors?"

86. On or about July 24, 2013, HO sent an email to an individual in the United States stating, "Could you please give me a very brief summary of your July 30 1:00pm meeting with [U.S.-based nuclear engineer] after it is over? I need to report back to CNPRI SMR management as soon as I arrive in SZ."

All in violation of Title 18, United States Code, Section 371.

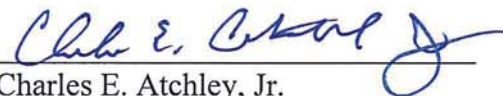
A TRUE BILL:



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GRAND JURY FOREPERSON


NANCY STALLARD HARR  
ACTING UNITED STATES ATTORNEY



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Charles E. Atchley, Jr.  
Assistant United States Attorney  
Deputy Chief, Criminal Division

JOHN P. CARLIN  
ASSISTANT ATTORNEY GENERAL  
NATIONAL SECURITY DIVISION



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Casey T. Arrowood  
Trial Attorney