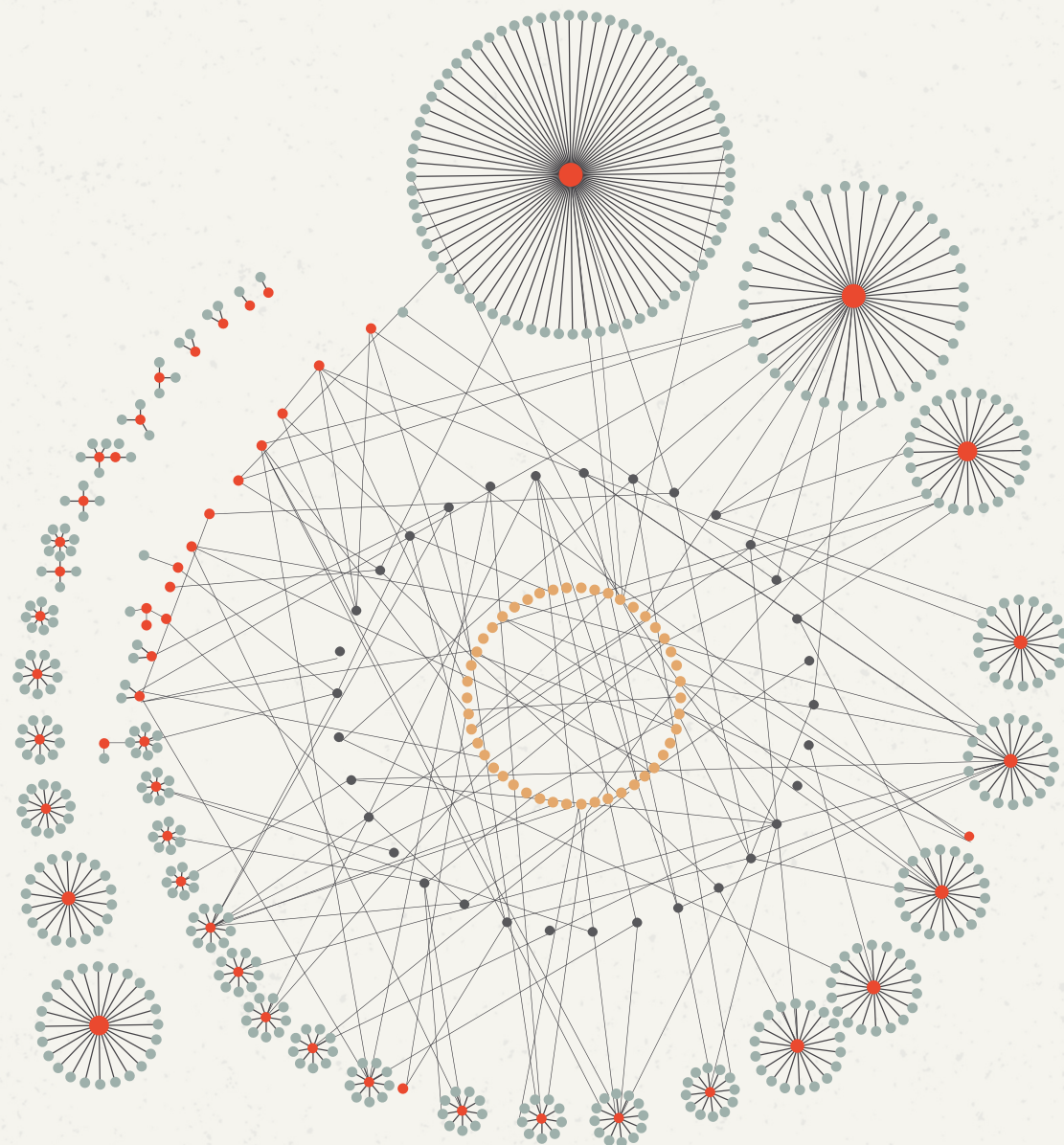


IDENTIFYING HIGH-RISK ENTITIES THROUGH TRADE NETWORK ANALYSIS: PAKISTAN



KNOWN ENTITY

A Pakistani company that has been listed as having procured products for Pakistan's nuclear program.



CENTRAL TRADE PARTNER OF KNOWN ENTITIES

One of 33 foreign companies who have transacted with two or more known Pakistani entity in 2016-2019



TRADE PARTNERS OF KNOWN ENTITY

Suppliers of single known entities. Foreign companies that have sent one or more shipments to only one known entity.



HIGH-RISK ENTITY

A Pakistani company that exhibits elevated risk of procuring for Pakistan's nuclear program, based on their patterns of purchasing from suppliers of known entities.

NUCLEAR DUAL-USE GOODS IN PAKISTAN ↓

By studying the most significant suppliers of known entities and high-risk entities, C4ADS was able to identify the products they frequently source. These include pressure transmitters, cutting tools and milling machines, frequency inverters, graphite powder, valves, and other metal products. Previously unidentified high-risk companies that bought from the same suppliers also frequently purchased these items. Some of these products may be export controlled nuclear dual-use goods under Nuclear Suppliers Group guidelines and national export control regulations. It is not possible to positively determine whether these goods are nuclear dual-use because product descriptions in trade data lack the specificity of export control regimes. However, some shipments contained products, like “electronic connectors,” that Pakistani companies have previously illicitly acquired from the United States for organizations including the Pakistan Atomic Energy Commission (PAEC).⁹⁶

FOREIGN SUPPLY CHAIN – TRANSSHIPMENT HUBS AND TRANSNATIONAL PROCUREMENT NETWORKS

On the theory that our high-risk entities could be part of wider procurement networks, C4ADS used the same methodology to identify the most central suppliers of the **high-risk entities** from the earlier section. This second-order analysis yielded an additional 54 foreign companies. By comparing them with the original **33 central suppliers** of our **known entities**, we can assess how closely intertwined the trading networks of known and unknown high-risk Pakistani proliferators are, and what characteristics are shared in their trade activity.

► **The 54 most central suppliers of high-risk entities are often located in the same jurisdictions as central suppliers of known entities:** 39% are based in mainland China, 11% in Hong Kong, 10% in the United Arab Emirates (UAE), 5% in Singapore, and 5% in Italy. This geographic distribution of central suppliers of high-risk entities reflects the distribution of the top suppliers of known entities, as well as the concentration of significant suppliers in transshipment hubs like Hong Kong, the UAE, and Singapore.⁹⁷

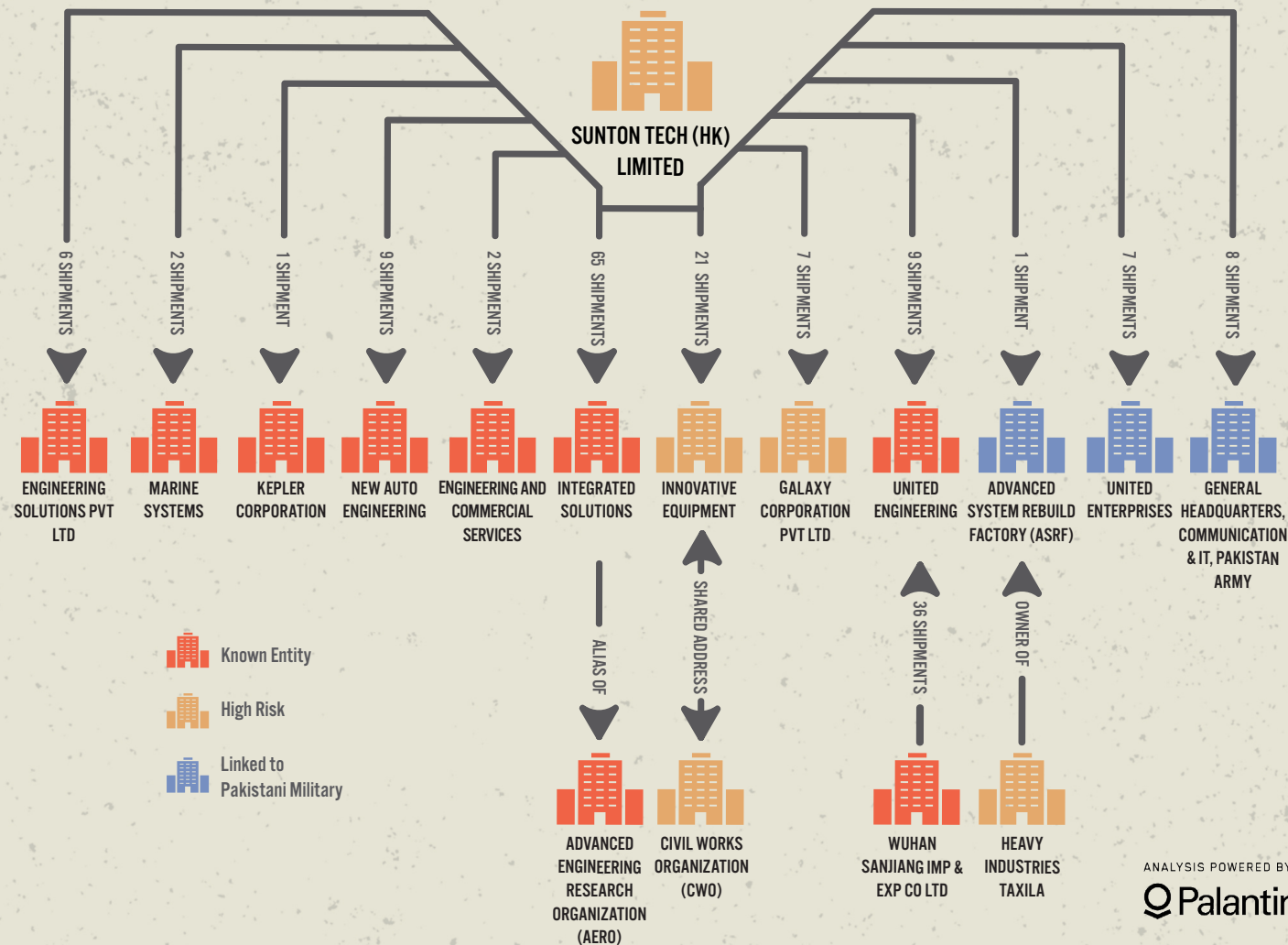
► **In the UAE, central suppliers are frequently located in free trade zones.** Free trade zones are duty-free areas that offer facilitated trade but are vulnerable to illicit trade due to their lack of transparency.^{98, 99, 100} Sixty percent of the most central suppliers located in the UAE are registered in free trade zones, and at least three of these companies appear to be connected

through personnel and identifiers to high-risk entities in Pakistan. Consequently, these companies may be controlled by entities in Pakistan, and may be acting on behalf of Pakistan's strategic industries.

► **In Hong Kong, supply chains for known entities and high-risk entities appear to be highly concentrated.** Only about 1.5% of shipments to known entities and high-risk entities were sent by Hong Kong companies, but these companies are much more likely to supply multiple listed entities. Of the shipments sent by Hong Kong-based companies to known and high-risk entities, 73% were sent by companies that C4ADS identified among the 86 most central suppliers.

► **Some central suppliers in Hong Kong and the UAE appear to be controlled by entities in Pakistan and may be acting on behalf of Pakistan's strategic industries.** This is indicated by an analysis of their trade with Pakistan, which almost exclusively serves high-risk companies, known entities, and military enterprises, and analysis of their corporate networks, which indicate ownership by Pakistan entities. This report explores one such case in Hong Kong, involving **Sunton Tech (HK) Ltd**, while a C4ADS blog post examines a similar case in UAE, involving **Pegasus General Trading FZE**.¹⁰¹ This finding is consistent with US BIS listings and US law enforcement actions directed at UAE and Hong Kong entities supporting Pakistan's nuclear and missile programs, as well as with 2016 findings by Project Alpha.^{102, 103, 104}

SUNTON TECH: UNIDENTIFIED HIGH-RISK SUPPLIER



Sunton Tech (HK) Limited is a company in Hong Kong that advertises the sale of electronics and communication system components.¹⁰⁵ The company is not listed as a proliferation concern by any national authorities, and it has not previously been publicly reported as having any association with Pakistan's nuclear or missile programs. However, trade data indicates that Sunton Tech is one of 33

companies globally and 6 companies in Hong Kong that have supplied two or more BIS-listed entities in Pakistan. In fact, according to available trade data, Sunton Tech is a supplier of at least seven BIS-listed entities in Pakistan and has additionally sought to procure technology with nuclear and/or missile applications from a US company as recently as 2017.

SUPPLYING BIS-LISTED COMPANIES

Trade data indicates that Sunton Tech regularly supplies companies which are reported to procure for Pakistan's nuclear and missile programs. This trade data indicates that, in 2016 and 2017, Sunton Tech sent at least 60 shipments to Integrated Solutions, which is a known alias of Advanced Engineering Research Organization (AERO).¹⁰⁶ AERO has been listed by BIS since 18 September 2014 for its involvement in the illicit procurement of sensitive technology in support of Pakistan's missile and strategic unmanned aerial vehicle programs.¹⁰⁷

Between 29 December 2015 and 23 May 2019, Sunton Tech is also reported in trade data to have sent 23 shipments to Kepler Corporation, United Engineering, Engineering and Commercial Services, Marine Systems Pvt. Ltd, New Auto Engineering, and Engineering Solutions Pvt. Ltd. BIS listed all of these companies between December 2016 and March 2020 for offenses relating to illicit procurement of sensitive technology or "actions contrary to the national security or foreign policy interests of the United States."^{108, 109}

Sunton Tech also sent shipments, as reported in available trade data, to the Pakistani company **United Engineering** (United Engineering was added to the BIS Entity List on 16 March 2020 for contributing Pakistan's missile program*), which has transacted with entities designated by the US Department of the Treasury's Office of Foreign Assets Control (OFAC) for proliferation activities relating to Iran and North Korea.^{113, 114} United Engineering received at least six shipments in the past five years from **Wuhan Sanjiang Import and Export Co. Ltd.**, which OFAC designated in November 2017 for supporting Iranian proliferation activities.¹¹⁵ According to OFAC and the United Nations Panel of Experts on North Korea, Wuhan Sanjiang also supplied North Korea with four WS51200 vehicles, which were used as transporter-erector-launchers (TELs) for North Korea's Hwasong-13 and Hwasong-14 intercontinental ballistic missiles.^{116, 117}

SUPPLYING HIGH-RISK COMPANIES

According to trade records, Sunton Tech has also sent shipments to two of the 46 high-risk Pakistani companies not on national export control lists that were identified by C4ADS. For example, these trade records indicate that Sunton Tech sent at least ten shipments to a Pakistani company called

Innovative Equipment, some as recently as August 2019. The trade records also indicate that Innovative Equipment listed an address shared by the **Civil Works Organization** (CWO). The CWO has been reported to have acted as a procurement agent for **Khan Research Laboratories** (KRL), according to the verdict of a 1993 German court case. This case resulted in the conviction of two individuals who had illegally transferred equipment for KRL's isotope separation plant in Pakistan.^{110, 111} KRL has been listed by BIS since 1998 for its role in Pakistan's nuclear weapons program.¹¹²

According to customs records, Sunton Tech also sent shipments of electronics to **Galaxy Corporation** in December 2017. Project Alpha at King's College London identified Galaxy Corporation as a probable front company for the Pakistan Atomic Energy Commission (PAEC) in 2016.¹¹⁸

SUPPLYING MILITARY-LINKED COMPANIES

Sunton Tech has also supplied at least two entities affiliated with the Pakistani military. For example, in the past three years, trade records indicate that Sunton Tech sent four shipments to **United Enterprises**, which lists the Pakistani military as one of its key customers on its website.¹¹⁹ One of these shipments has the HS code 930190, which corresponds with military weapons, including automatic firearms.¹²⁰ Additionally, according to customs records, Sunton Tech sent at least one shipment of electronic components to the Advanced System Rebuild Factory (ASRF). ASRF is a subsidiary of Heavy Industries Taxila, which produces gun control systems and other electronics for tanks and armored personnel carriers.¹²¹

PROCUREMENT OF SENSITIVE TECHNOLOGY FROM THE UNITED STATES

Sunton Tech reportedly sought to acquire goods from a New York-based company whose products have application in missiles, torpedoes, and aircraft, and which has supplied other high-risk companies. Publicly available information indicates that Sunton Tech attempted to procure 10 dual axis inclinometers from this US-based manufacturer in 2017.¹²² dual-axis inclinometers have applications in gravity reference for missiles, torpedoes, antennae, and manufacturing equipment.¹²³ According to trade data, the aforementioned Pakistani company Galaxy Corporation, which Project Alpha identified as a probably front company for PAEC, received shipments of sensors and other unknown products from this same New York-based company in July 2017.

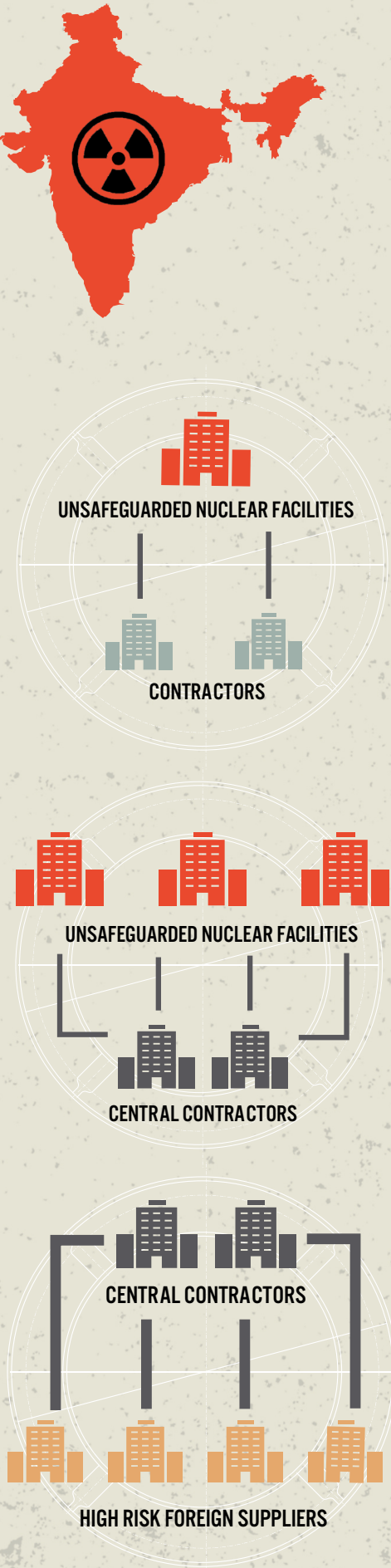
Procurement for Unsafeguarded Facilities in India

India relies on private contractors to procure goods for use in unsafeguarded nuclear facilities, which are not subject to IAEA verification. These contractors import primarily from a small group of countries, including Germany, China, and the United States — all NSG member states.

C4ADS analyzed tenders for Indian nuclear facilities and identified **86 companies** that procured products or conducted works at two or more unsafeguarded nuclear facilities. Transactions involving contractors for unsafeguarded nuclear facilities are not necessarily illicit, particularly given India's status in the global nuclear community.^{124, 125} These findings, however, provide context for monitoring and verification agreements by providing an ecosystem picture of the states and foreign companies that are most exposed to procurement for unsafeguarded Indian civilian and military nuclear facilities.

MAPPING THE EXTENDED PROCUREMENT SYSTEM

There are no publicly available lists of entities procuring for India's nuclear program, and there are few restricted end users in India.¹²⁶ Instead, C4ADS used more than 40,000 publicly available tender records to map Indian companies involved in nuclear procurement. These records contain information on specific companies that have procured material for specific facilities, allowing analysts to distinguish between companies servicing unsafeguarded civilian and military facilities from the larger nuclear technology procurement apparatus.^{127, 128, 129} We used these records to generate a list of 222 companies that contract for seven known unsafeguarded facilities in India. Of these, 86 companies contracted with two or more unsafeguarded nuclear facilities.



IDENTIFYING HIGH-RISK ENTITIES THROUGH PUBLICLY AVAILABLE INFORMATION: INDIA

1 KALPAKKAM ATOMIC REPROCESSING PLANT (KARP)

A civilian reprocessing facility outside of IAEA safeguards. KARP uses the plutonium-uranium extraction (PUREX) process to produce plutonium from spent fuel. It is unclear whether KARP provides plutonium for India's nuclear weapons program.

Supplied by 34 Contractors

2 KAIGA GENERATING STATION (KGS)

A civilian power reactor facility, with four Pressurized Heavy Water Power Reactors (PHWRs) that are not under IAEA safeguards.

Supplied by 65 Contractors

3 KAKRAPAR ATOMIC POWER STATION (KAPS)

A civilian power reactor facility, with two Pressurized Heavy Water Power Reactors (PHWRs) that are not under IAEA safeguards.

Supplied by 22 Contractors

4 TARAPUR ATOMIC POWER STATION (TAPS) UNITS 3 AND 4

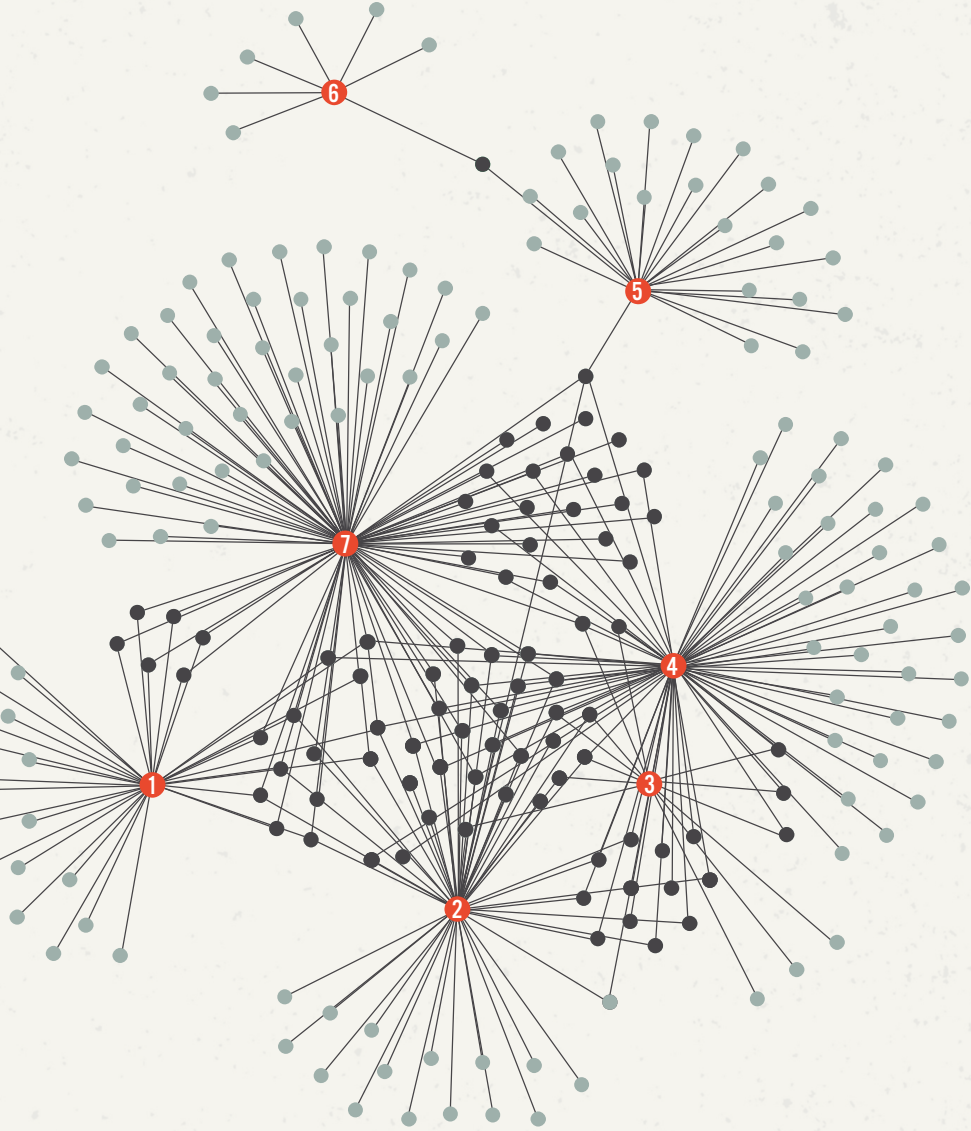
A civilian power reactor facility, with two Pressurized Heavy Water Power Reactors (PHWRs) that are not under IAEA safeguards. Another two PHWRs at this facility are under safeguards (units 1 and 2).

Supplied by 100 Contractors

5 BHABHA ATOMIC RESEARCH CENTER (BARC)

A research center housing centrifuge enrichment facilities, research reactors, and fuel reprocessing. Some enrichment and reprocessing at BARC produces weapons grade plutonium and highly enriched uranium for either naval fuel or nuclear weapons. BARC is one of the only Indian nuclear entities listed by the US Department of Commerce Entity List.

Supplied by 21 Contractors



6 RARE MATERIALS PLANT (RMP)

A gas-centrifuge plant that produces highly enriched uranium for naval reactor fuel. RMP may produce uranium for use in nuclear weapons.

Supplied by 7 Contractors

7 MADRAS ATOMIC POWER STATION (MAPS)

A civilian power reactor facility, with two Pressurized Heavy Water Power Reactors (PHWRs) that are not under IAEA safeguards. Spent fuel from MAPS has been reprocessed to produce plutonium that could be used in nuclear weapons.

Supplied by 108 Contractors

CONTRACTOR

Indian company that has received contracts to procure goods or provide services at one unsafeguarded nuclear facility.

There are 222 contractors supplying at least 1 unsafeguarded facility

CENTRAL CONTRACTOR

Indian company that has received contracts to procure goods or provide services for two or more unsafeguarded facilities.

There are 86 contractors supplying at least 2 unsafeguarded facilities