



September 18, 2008

Indian Nuclear Export Controls and Information Security: Important Questions Remain

Are Indian export controls and information security congruent with the promises and cheerleading?

David Albright and Paul Brannan

The Nuclear Suppliers Group (NSG) released a [statement](#) on September 6, 2008 outlining its conditions for allowing the transfer of nuclear technology to India for use in IAEA safeguarded facilities. According to the statement, the NSG “note(d) steps that India has voluntarily taken” to institute “a national export control system capable of effectively controlling transfers of multilaterally controlled...nuclear-related material, equipment and technology.”

ISIS believes that important questions remain about the adequacy and implementation of India’s export control and nuclear classification procedures. In addition, India’s illicit procurement of dual-use nuclear-related items for its unsafeguarded nuclear program belies its commitment to the NSG.

In assessing India’s nuclear procurement practices, ISIS found several incidents where India conducted illicit nuclear trade and leaked sensitive nuclear information.¹ Questions about past and current practices must be clarified as the U.S. Congress considers final approval of U.S.-India nuclear cooperation. The two following examples provide a basis to explore if India still leaks sensitive centrifuge information, engages in illicit nuclear trade and whether it will act in accordance with its promises to the NSG.

Leaks of Sensitive Centrifuge Component Design Drawings and Inadequate Information Security

India Rare Earths (IRE), a sub-entity of India’s Department of Atomic Energy, procures sensitive materials and technology for a secret gas centrifuge uranium enrichment plant

¹ <http://isis-online.org/publications/southasia/indianprocurement.pdf>
<http://isis-online.org/publications/southasia/indiacritique.pdf>
<http://www.isis-online.org/publications/southasia/indiagrowingcapacity.pdf>

codenamed “Rare Materials Project” (RMP) outside Mysore, India. IRE uses popular technology procurement websites and newspapers to solicit interested firms to purchase bid documents. These documents can be purchased for approximately ten dollars and some of them contained detailed drawings and manufacturing instructions for direct-use centrifuge components and other sensitive centrifuge-related items. In 2007, ISIS was easily able to attain component design drawings for the manufacture of sensitive centrifuge components. Figures 1, 2 and 3 show drawings for the manufacture of bellows in a supercritical centrifuge rotor made from maraging steel. The thin-walled rotor and bellows is considered one of the most sensitive centrifuge parts. ISIS removed specific dimensions and tolerances from the drawings, but otherwise did not change them. These drawings were in documents that also provide more details on the part’s manufacture. Aside from loosely worded propriety language stamped on some of the designs, there isn’t any notation prohibiting their export, nor any notation indicating that they are sensitive.

The level of detail in the documents is sufficient that they would be considered classified in supplier countries and not distributed without careful controls over their use and requirements for their protection. India may be releasing sensitive know-how to firms that may not intend to bid, may have forged their identity, or may be seeking centrifuge design information for secret nuclear programs. Another concern is that a winning bidder may be willing to manufacture and sell the same items to other, unknown clients. Other than the loosely worded propriety stamp on some of the drawings, any actual controls in place to stop such additional sales could not be discerned.

Illicit Procurement of Tributyl Phosphate in India

Before April 2003, India procured from China large quantities of tributyl phosphate (TBP), a dual-use chemical that is used in nuclear programs to separate plutonium. China enacted new end-user requirements after a 2002 sale of TBP to North Korea was criticized by the U.S. government. India’s subsequent attempts to procure TBP from China were unsuccessful, according to an Indian knowledgeable about India’s procurement of TBP. India was forced to look elsewhere for a reliable supply of TBP and utilized an array of Indian trading companies to procure TBP secretly from suppliers in Germany and Russia according to information provided by this Indian source. The Nuclear Fuel Complex (NFC) in Hyderabad, India put forward tenders for buying TBP. Indian trading companies, some of which were liaison offices for European companies, successfully bid on these tenders and ordered the TBP from German and Russian suppliers (see figure 4). One order for 160 metric tonnes of TBP passed through multiple trading companies in India and Europe. In each case, the TBP was then shipped to India with the Indian trading companies, and not the NFC, listed as the recipient. The trading companies then turned over the TBP to the NFC. In each instance, the Nuclear Fuel Complex hid behind trading companies and procured TBP without the suppliers knowing that the materials were for the unsafeguarded nuclear program.

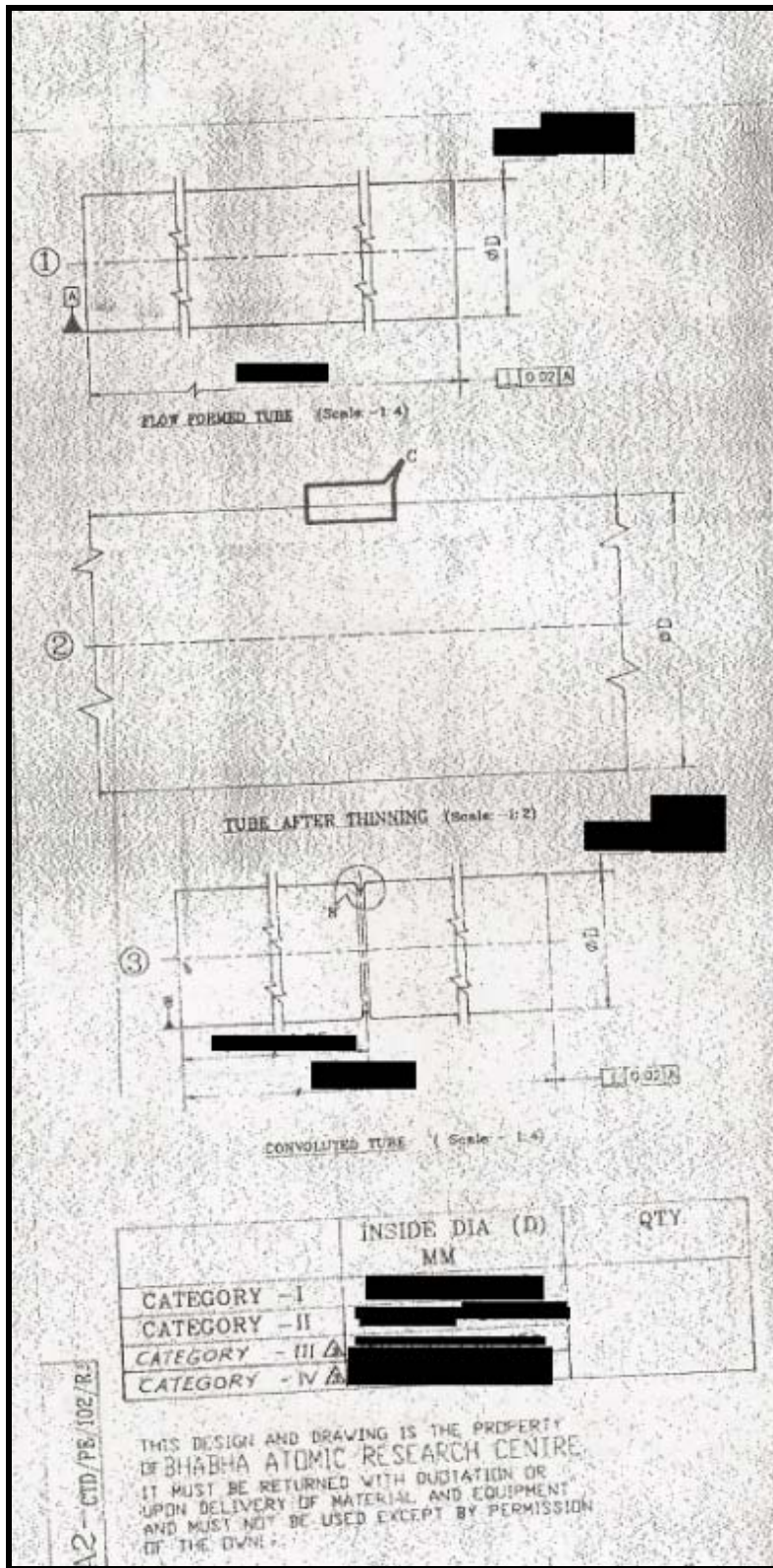


Figure 1. Drawing of a rotor tube with bellows for a supercritical gas centrifuge.

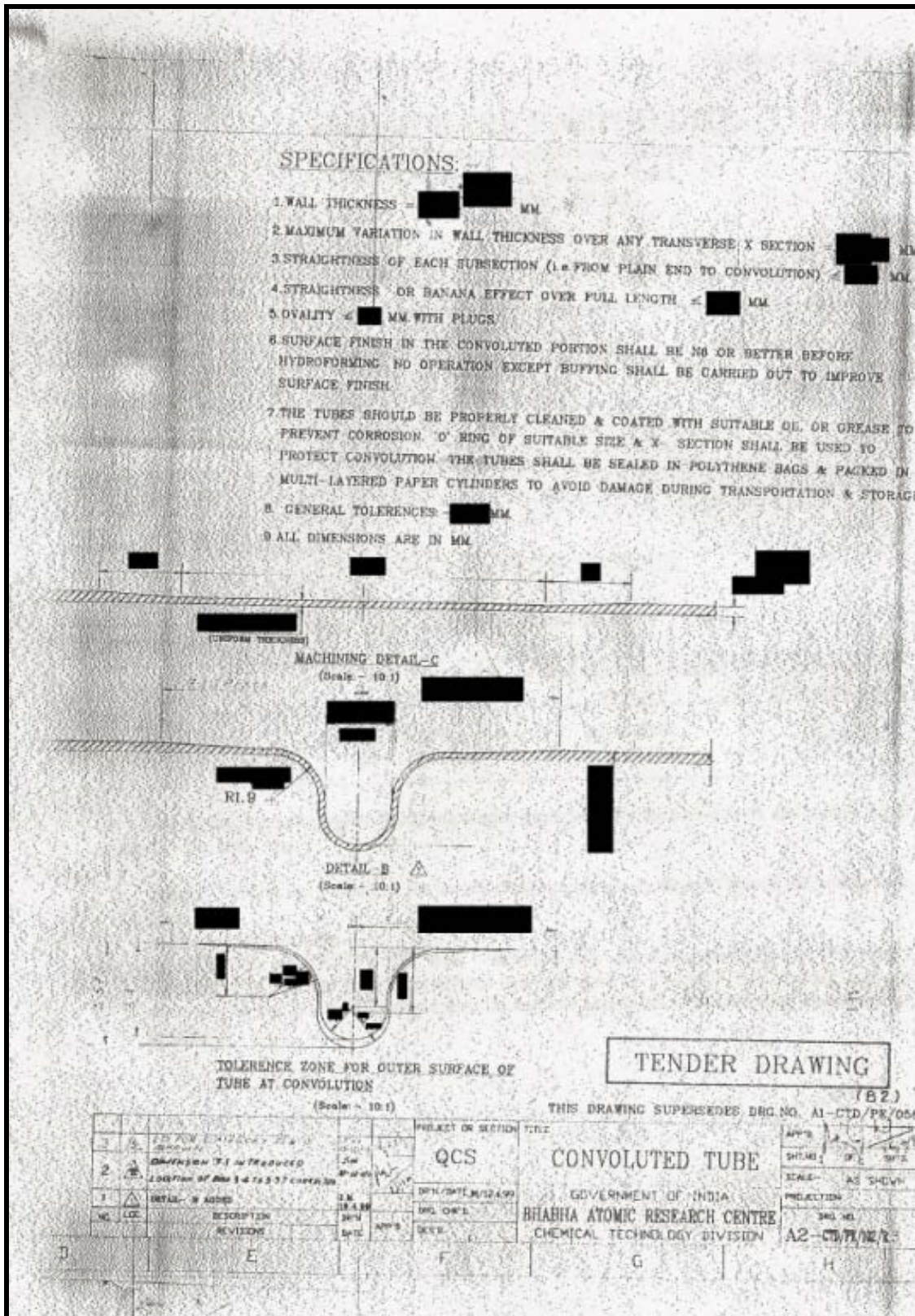


Figure 2. Drawing with detail for making bellows for a gas centrifuge.

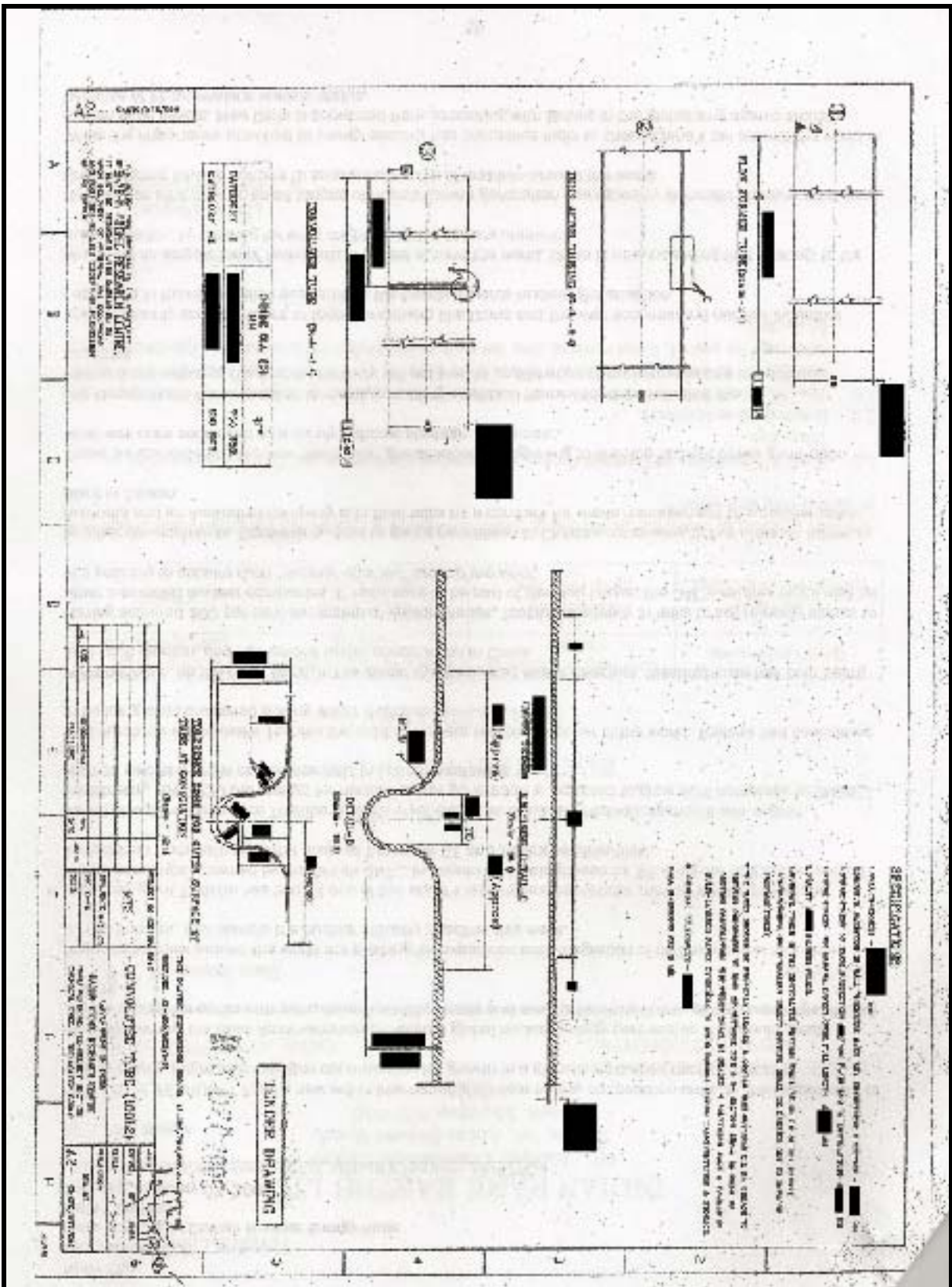


Figure 3. Drawing of another rotor tube with detail for making the bellows.

Illicit Procurement of Tributyl Phosphate

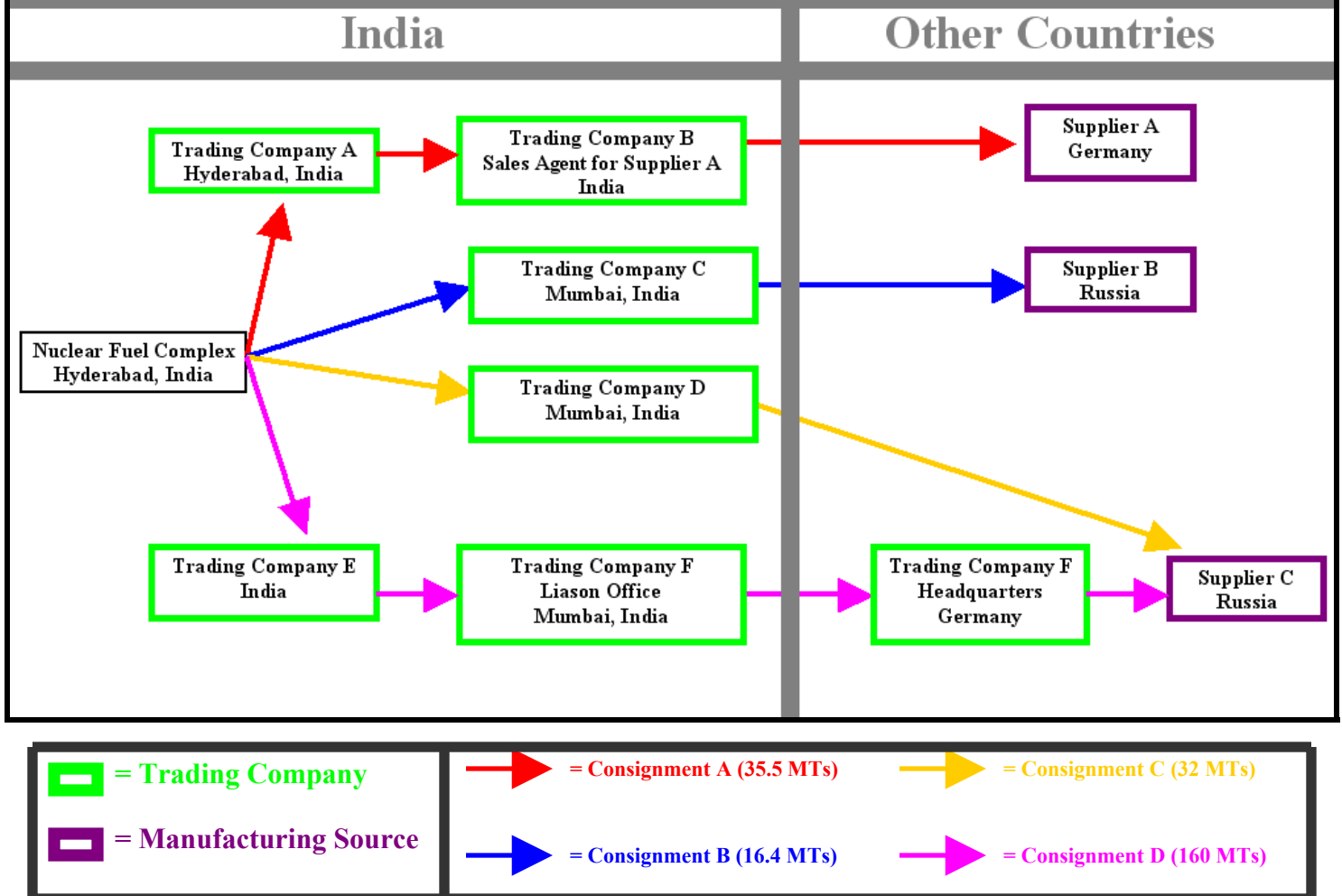


Figure 4. Diagram showing the route through which orders for tributyl phosphate (TBP), originating from the Nuclear Fuel Complex (NFC) in India, were made through Indian trading companies to suppliers in Russia and Germany. (ISIS removed the names of the companies from this chart) These suppliers or middlemen then shipped the TBP to these Indian trading companies and not the NFC. In each instance, the NFC hid behind these trading companies and procured TBP without the suppliers knowing that the materials were for the unsafeguarded nuclear program.