



## Aiding the Physics Research Center's Overseas Procurements: Role of Applied Science Co. and Akebono Boeki Co.

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A major unsettled issue between the International Atomic Energy Agency (IAEA) and Iran is the alleged undeclared nuclear activities, materials, and facilities of the Iranian defense organization called the Physics Research Center (PHRC). The PHRC, which operated from the late 1980s to at least 1998, is alleged to have been a key organization in the creation of a parallel military fuel cycle and nuclear weaponization programs. Much of the IAEA's evidence about the PHRC's undeclared nuclear activities and materials rests on information about the PHRC's attempted and actual purchases abroad. ISIS independently obtained 1,600 telexes between Western suppliers, the PHRC, its front companies, and financial institutions. These telexes support that the PHRC was part of a chain of secret organizations, the long-term aim of which was to lay the basis for nuclear weapons development.<sup>1</sup> The successor organizations of the PHRC, outlined in the [November 2011 IAEA Iran safeguards report](#), were allegedly halted abruptly by the end of 2003, but questions linger about their legacy and possible continuation.

The IAEA is seeking details about the PHRC's activities, and those of its successor organizations, as part of its mandate to verify the correctness and completeness of Iran's comprehensive safeguards agreement (CSA). The evidence in the telexes about the possibility of undeclared nuclear materials and activities necessarily leads to doubts as to whether Iran's declaration is complete and to indications that nuclear weapon-related activities existed during the time of the PHRC's activities.

As part of ISIS's continuing assessment of the telexes, this report discusses two companies that played a role in the PHRC obtaining goods abroad in the 1990s. Based on their websites, both companies appear active today or were so until recently. Their activities should be scrutinized to determine if they may have been involved more recently in efforts to circumvent sanctions or domestic trade controls of supplier countries in order to outfit Iranian entities. The first company is Applied Science Co. Ltd., which is a Tehran-based trading company, and the main topic of this report. The other company is the Japan-based company Akebono Boeki which is owned by the Iranian Nikan Corporation. Two telexes state that Akebono Boeki provided services to the PHRC and other Iranian entities in the 1990s.

### Background on the PHRC and Telexes

The available information supports that the PHRC was a military entity distinct from the Atomic Energy Organization of Iran's (AEOI) civilian nuclear program. Its head was Sayyed Abbas Shahmoradi-Zavareh, a

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<sup>1</sup> The ISIS results are in [reports on the ISIS web site](#) and in a [Washington Post article](#).

person who the IAEA has asked to interview. The 1,600 telexes provide a detailed picture of the PHRC's wide-ranging overseas procurement efforts, and form an important basis for concluding that the PHRC was acquiring the wherewithal to develop many aspects of the nuclear fuel cycle. The telexes outline efforts to obtain goods from overseas suppliers for various programs involving gas centrifuges, uranium conversion, heavy water production, computer codes useful to a nuclear weapons program, and scientific and engineering information important for developing the nuclear fuel cycle. They also contain information about innocuously-named Iranian trading companies that helped the PHRC obtain its goods. For earlier ISIS reports on other trading companies assisting the PHRC, see [here](#) and [here](#).

## **Applied Science Co. Ltd.**

The telexes show that the Iranian company Applied Science Co. Ltd. (telex name APSC IR) was an additional link in the large network of trading companies, banks, and other firms that helped the PHRC procure materials and services. Ten telexes dated from 1991 through 1995 [mention Applied Science specifically](#).

The Applied Science Co. in the telexes appears to be the same one found today on an Iranian [website](#). The company's web site states that it obtains scientific and laboratory equipment from various leading international companies for industries in Iran and the Middle East. A commercial credit report from International Company Profile on Applied Science Co. Ltd. dated March 27, 2004 states that the company's managing director is Jafar Ashraf Shafaei, close in spelling to a J. Afshar Shafee in a telex to Applied Science in 1992 (telex 1179). He appears to remain at Applied Science today. Another [website](#), apparently existing today, of an Iranian professional association called Iran Metallurgy.com, lists the "Director Manager" of Applied Science as Jafar Afshar Shafaei, and lists a similar line of business. It is not possible to establish without a doubt that the more recent Applied Science is the one in the telexes, but because they share the same name and senior person, they are likely the same.

The 2004 credit report states that Applied Science worked with several "principal agencies," including the British companies Instron Ltd., Fisons Scientific Equipment, Finnigan MAT, Syva, and Difco Laboratories, in addition to Baird Europe BV of the Netherlands, and various branches of Varian Associates (United States, Australia, and Switzerland). The purchases of goods from two of these companies are the subject of the telexes, which show that Applied Science played a number of roles in helping the PHRC buy goods from suppliers.<sup>2</sup>

Applied Science first appears in the telexes as assisting an early 1991 purchase by Sharif University of Technology, [a front organization for the PHRC](#), from what was at the time a leading British scientific equipment manufacturer named Gallenkamp International (later renamed Fisons Scientific Equipment) (telex 264).<sup>3</sup> Sharif University ordered about 150 items from Gallenkamp at a price of 44,475 British pounds (telexes 250 and 1179). Applied Science was involved in the preparation of a performance bank guarantee (PBG) (telex 250), which is a concrete commitment from the seller to the buyer — in this case Fisons PLC Gallenkamp and Shahmoradi, respectively.<sup>4</sup> The use of Shahmoradi's name conforms to a practice seen in many telexes where

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<sup>2</sup> Today, Applied Science Co.'s web site contains a different list of companies with which it claims to work: Scientific Lab, KB Prueftechnik, Vision, and Ibertest Internacional S.A.

<sup>3</sup> A history of Fisons is found here: <http://www.fundinguniverse.com/company-histories/fisons-plc-history/>

<sup>4</sup> The seller issues a Performance Bank Guarantee through its bank to provide the buyer with a concrete commitment. This method ensures the buyer that the seller will export or otherwise deliver the goods covered in an agreement in a timely manner. In the event that the seller defaults on the execution of the agreed terms, the Performance Bank

the PBG and letters of credit list the responsible person, almost always Shahmoradi, rather than a responsible Iranian company. In this case, Shahmoradi was promised a payment of 4,447 British pounds, or 10 percent of the goods' cost, by a British performance bank if these items were not delivered on time. Gallenkamp made the guarantee to Shahmoradi as a condition imposed by the Frankfurt branch of Bank Sepah before it would activate a letter of credit for this purchase. The complete set of telexes shows that Shahmoradi was a major buyer who is mentioned in over 160 telexes involving the Frankfurt branch of Bank Sepah.

Later telexes concerning this purchase were sent directly between the PHRC purchasing department and Gallenkamp, which is consistent with Sharif University being visible initially but often disappearing as the deal developed. One telex, which concerns the order discussed in telex 250, has the message number of the PHRC's department 6, which was the department involved with health physics or radiation protection (see telex 886). These telexes also imply that the PHRC made other orders with Gallenkamp. A telex dated August 28, 1991 to Gallenkamp from the PHRC has the message number implying that a new order was for department 4, which was associated with uranium conversion (telex 791). Figure 1 lists the departments of the PHRC.

<b>Major PHRC Departments:</b>
Dept. 1: Nuclear Physics or Neutronics
Dept. 2: Centrifuge Enrichment
Dept. 3: Laser Enrichment
Dept. 4: Uranium Conversion
Dept. 5: Geology, including Uranium Exploration
Dept. 6: Health Physics or Radiation Safety
Dept. 7: Workshop or Metallurgy
Dept. 8: Heavy Water Production

Figure 1. A list of departments under the Physics Research Center (PHRC) compiled by the IAEA and modified using information in the telexes in ISIS's possession. From Albright and Paul Brannan, *The Physics Research Center and Iran's Parallel Military Nuclear Program*, February 23, 2012. [http://isis-online.org/uploads/isis-reports/documents/PHRC\\_report\\_23February2012.pdf](http://isis-online.org/uploads/isis-reports/documents/PHRC_report_23February2012.pdf)

By the spring of 1992, Fisons Scientific Equipment, the successor to Gallenkamp International, was owed money by several Iranian customers, including Shahmoradi. A senior manager of Fisons in a May 7, 1992 telex asked J. Afshar Shafee at Applied Science for help straightening out the problems that were delaying the payments by the four Iranian customers, which the manager stated had unpaid "discrepant letters of credit" (telex 1179).<sup>5</sup> Before a bank will release the funds to a supplier under a letter of credit, it requires the fulfillment of a set of steps, and if one side fails to fulfill a condition, payment can be delayed. Shahmoradi's

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Guarantee ensures the buyer a payment by the issuing bank. Generally, the performance guarantee is ten percent of the total cost.

<sup>5</sup> In the fall of 1991 Gallenkamp International's name and telex number was changed to that of Fisons Scientific Equipment (see telexes 885, 888, and 1227).

purchase from Gallenkamp was one such instance mentioned in the telex. Another customer was Sharif University, which had a purchase totaling 67,110 British pounds. The third was the Iranian Steel Company. This was most likely a reference to the [National Iranian Steel Company](#), which was labeled an entity of concern for proliferation in 2005 by the German government. The last was Sasadja-Etahid Da Tvareh Res, which could not be identified.

In May 1993, H. Shahidi at Applied Science sent a telex on behalf of the PHRC to a Keith Watkins at an unspecified company (telex 1255).<sup>6</sup> It said that the PHRC “intends to purchase a vacuum furnace with butom puring [sic] for directional solidification.” Shahidi asked Watkins if he had any suggestions in this field and to send the technical information and price by facsimile. Such a furnace is “dual-use” and thus has many applications, but it often raises concerns because vacuum furnaces with the capability to bottom pour are useful for separating pure uranium metal from contaminants. The contaminants would float to the top of the crucible when heated, while the pure uranium could be poured out the bottom. Earlier, in September 1991, Sharif University had sent out a barrage of telexes to various potential suppliers requesting just such a furnace. However, the effort may have failed, judging by the resistance of at least one supplier. This supplier cited new, tighter domestic export control laws in a request to know the furnace’s end user, whether the end user was a private, state, or a military establishment, and the products to be manufactured with the furnace. This enquiry made in 1993 may have been another attempt to get such a furnace.

Applied Science provided a range of other services to the PHRC. It tracked down missing parts from PHRC orders (telex 1141). In another case, in 1994, a service engineer at Applied Science named A.O. Karimi sought training manuals and missing diagrams needed to complete another order (telex 1380). Karimi’s request was related to an order to Instron Limited for a Model 1127 universal testing machine, although the customer was not identified.<sup>7</sup> In early 1994, the PHRC ordered a similar machine from Instron, an Instron Model 4483 floor mounted universal testing machine at a cost of 63,267 British pounds plus shipping costs (telexes 1472 and 1464). Instron universal testing machines are highly reliable precision systems used for evaluating the mechanical properties of materials. They are equally useful for research and development activities and for the repetitive testing applications of production quality control. Applied Science contacted Instron several times concerning this PHRC order in 1995 for unstated reasons (telex 1345).

Fisons Scientific Equipment continued to have problems getting paid by the PHRC, and Applied Science sought to help. A telex dated August 21, 1994 from H. Shahidi at Applied Science to Fisons asked again for a copy of an invoice that was associated with a letter of credit for a purchase by the PHRC (telex 1177). The telexes do not explicitly state what was purchased, although the purchase appears to have occurred in 1992. A telex dated September 21, 1994, from the Foreign Debt Department of Bank Markazi Jomhuri Islami, Tehran to Fisons admits to the payment being late but does not promise a prompt payment (telex 1371). Mr. G. Kamiab of the Foreign Debt Department said that “our commercial banks are serving overdue items in chronological order. We hope your case will be settled in due course.” The telexes do not make clear whether Fisons received its payment.

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<sup>6</sup> The unspecified firm had a telex number of 163202.

<sup>7</sup> Established in 1946, according to its web site, Instron manufactures and services materials testing instruments, systems, and accessories, providing comprehensive solutions for research, quality, and service-life testing requirements. Its machines evaluate the mechanical properties of materials and components using tension, compression, flexure, fatigue, impact, torsion and hardness tests. It offers a broad range of service capabilities, including calibration, training, technical support, and assistance with laboratory management.

Consistent with findings in other ISIS studies of the telexes, by 1993 Sharif University's role as a front organization for the PHRC's procurements was coming to an end, as Figure 2 illustrates.

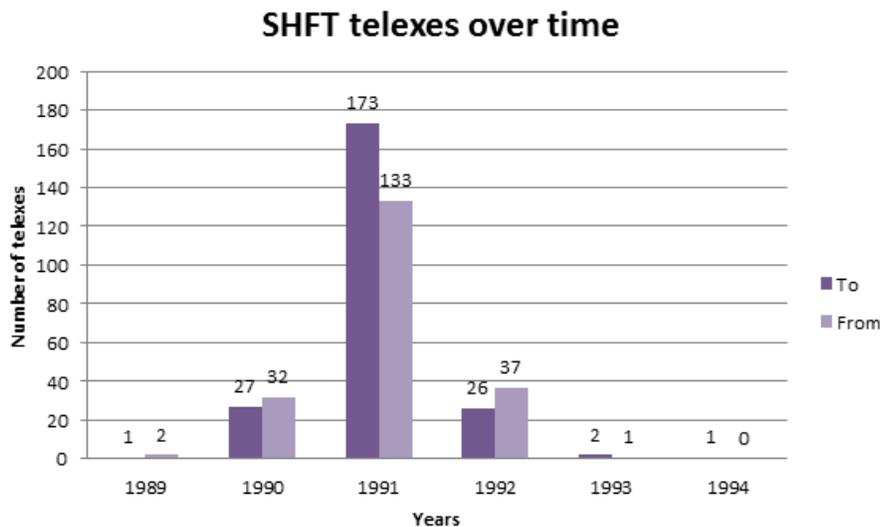


Figure 2: A chart showing the frequency of telexes mentioning Sharif University of Technology (SHFT).

Sharif University's procurements were arousing suspicion among Western governments and high tech suppliers. This trend is consistent with the view that Sharif University was no longer a viable front for purchases by the PHRC. One telex also suggests that the PHRC itself was becoming a suspicious entity.

**Akebono Boeki Co.**

In a telex sent in May 1993 from Applied Science to Fisons Scientific Equipment, the sender indicates that the name of the customer (PHRC) had been changed, and that Applied Science had accordingly changed the name to Akebond [sic] Boeki Co. Ltd. on the proforma invoice (Telex 1307). The question is whether Applied Science was seeking to hide the true end user by having it appear that a Japanese company was the recipient, while the goods still went to the PHRC.

Akebono Boeki Co. Ltd is an import/export business founded in 1986 in Japan but owned or controlled by an Iranian company called the [Nikan Corporation](#).<sup>8</sup> According to a [1997 credit report](#) from International Company

<sup>8</sup> According to its web site, "the NIKAN Corporation started its commercial activities in 1986, by establishing 'AKEBONO BOEKI CO., LTD.' in Tokyo. We chose Japan to start our activities because this country is among the seven top industrial countries of the world and also the major trade partner of Iran. Furthermore, Iran and Japan have certain common characteristics in the world trade. The Establishment of trade relations between these two countries requires wide recognition in the field of the markets and the trade cultures of both countries. With the broad knowledge of Iran's market, this group planned to expand its trade activities in the fields of imports, export, technology transfer, etc. ... Having succeeded in Japan Market, in later years we expanded our trade activities into southeast Asian countries such as Korea, Hong Kong, China, Taiwan and Singapore which have trade cultures similar to those of Japan. Today, 'Akebono Boeki Company' is considered as one of the most active trading companies in Japan and generally in the southeast Asian region with the highest degree of trade relations with Iran. The establishment of 'Najm Al-Afaq General Trading Company' in Dubai, U.A.E. in 1993 was our next step towards expansion of trade activities between the Europe and the Middle East at the same time we began to expand our commercial activities in Iran in 1993 by inclining towards production activities and by shifting our trading view into supplying the raw materials for factories and manufacturing plants. The new strategy was in accordance with the national development plans of Iran. "NIKAN CORPORATION" can always be considered as a reliable trading partner for buyers and manufacturers in Iranian market that is one of the biggest markets of the Middle

Profile, Akebono Boeki also maintained a small branch in Tehran. Akebono's web site says it was established to sell Iranian agricultural products and import into Iran from Japan and other locations a wide range of goods and services, including machinery, parts, tools, industrial supplies, motor vehicles and related manufacturing equipment, communication equipment, and electrical and electronic equipment. As a result, any procurement listing Akebono Boeki as the purchaser could actually be intended for another Iranian customer, in this case likely the PHRC.

Akebono Boeki also offered financial services that Iran may have used to disguise its U.S. purchases. A telex in August 1995 from the Tehran branch of Saderbank to its New York branch stated that reimbursement claims in nine letters of credit in the amount of about \$3 million "should not be honored" in view of the "inclusion of certain letters of credits in the framework of agreement with Akebono Boeki (Hong Kong)" (telex 1435). This telex is several months after President Bill Clinton imposed comprehensive sanctions on Iran. Although the purchases associated with the letters of credit are not listed in the telex, they may have been banned under the new sanctions. As a result, the Iranian buyers may have sought a duplicitous way to purchase the goods by developing a false end user that involved Akebono Boeki.

## Findings and Recommendations

Applied Science fulfilled a range of services for the PHRC and other Iranian entities in acquiring goods abroad. In summary, it helped finish financial arrangements and obtain payments for suppliers, it submitted an enquiry in 1993 for a vacuum furnace, it tracked down missing items in orders, and it apparently changed the name in a proforma invoice to remove the PHRC from the financial documents. In many ways, it served as both a troubleshooter and an intermediary for the PHRC and Western suppliers.

Applied Science appears to have been or acted like a Tehran-based agent for several European and American suppliers. The telexes show no evidence that the suppliers associated with Applied Science exercised scrutiny of Applied Science or their Iranian customers in regard to the end use of their sales. Applied Science had every incentive to facilitate sales to the PHRC, fronts such as Sharif University, and other Iranian companies. In an effort to maximize profits, it was unlikely to worry about the end use of any sale. Moreover, as a company operating in an authoritarian state such as Iran, it likely could not exercise such oversight, in any case. Today, suppliers should avoid dealing with Iranian trading companies such as Applied Science, and they need to exercise caution in dealing with non-Iranian trading companies to ensure that they are not fronts for Iranian trading companies or sanctioned entities.

The significance of Akebono Boeki and its parent company Nikan Corporation's activities are difficult to determine. The telexes do not provide a clear indication of the significance of what either did for the PHRC or other Iranian companies or entities. Certainly, the telexes do not suggest they broke any laws. Nonetheless, the telexes raise significant questions about whether Akebono Boeki's activities could have aided the PHRC and other Iranian entities in defeating export control laws and evading sanctions. Its financial services may have offered a way to bypass U.S. sanctions enacted in 1995.

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East. Following this strategy, the mission in which we strongly believe is competition, high quality, suitable delivery time, continuity of business and pursuit of any problem faced by buyers and sellers. We are aware of the fact that the only way in which we can remain as a highly reliable group in the international trade market is to sustain and adhere to this honorable mission." From: <http://www.nikangroup.com/About.html>

Both Applied Science and Akebono Boeki may have evolved considerably over the last two decades. Nonetheless, their past behavior and possibly current activities require that the question be asked if they more recently engaged in procuring for Iranian military or nuclear entities, perhaps in violation of domestic laws or U.N. Security Council sanctions. As a result, national authorities should scrutinize them for their past and possibly more recent activities assisting Iran's sanctioned nuclear and military programs.

More generally, the IAEA needs to continue investigating the PHRC. It should insist that Iran answer questions derived from PHRC procurement information as part of the IAEA verifying the completeness of Iran's declarations under its comprehensive safeguards agreement. The IAEA has the legal mandate to do so and the international community should support this effort.