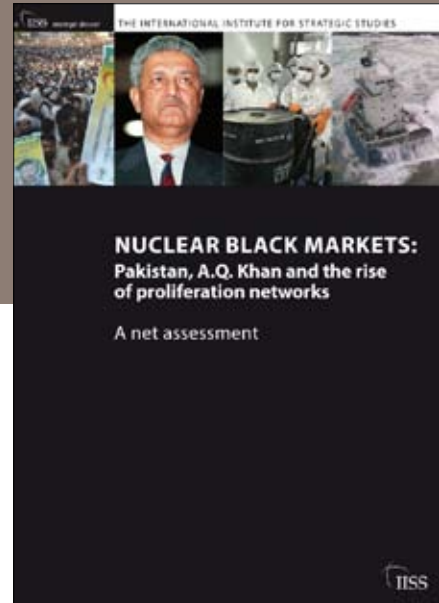


IISS Strategic Dossier

# NUCLEAR BLACK MARKETS: Pakistan, A.Q. Khan and the rise of proliferation networks

A net assessment



## Press Statement

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REMARKS BY

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Welcome to the press launch of the latest IISS Strategic Dossier – Nuclear Black Markets: Pakistan, A.Q. Khan and the rise of proliferation networks – A net assessment. This dossier is the fourth in a series, which has included similar publications assessing the strategic weapons programmes of Iraq, North Korea and most recently Iran, published in September 2005.

Our new dossier retains the proliferation focus, analytical rigour and methodology of these previous publications, but differs in important ways. Most significantly, the focus of this study is not one country, but the global problem of proliferation networks and nuclear black markets.

In this dossier, the term ‘nuclear black market’ denotes the trade in nuclear-related expertise, technologies, components or material that is being pursued for non-peaceful purposes and most often by covert or secretive means. Often the trade is not explicitly illegal, but exploits loopholes in national export regulations. ‘Black’, in this case, often means shades of grey.

### SOURCES AND ASSESSMENT CHALLENGES

Some nuclear black market activity has been well-documented by various sources, including the International Atomic Energy Agency and the press. The IISS has also benefited from discussions with knowledgeable experts employed in both the public and private sectors. Naturally, much of the open-source information concerning such clandestine activity is fragmentary or ambiguous. In addition, some countries are reluctant to share information on illicit activities within their borders or involving their citizens. Where information is too fragmentary to make a firm judgement, we have made this clear.

Recognising the open questions, we have tried to present a balanced and cautious set of assessments on nuclear

black markets. These include a history and overview of Pakistan’s nuclear programme and its imports; an analysis of A.Q. Khan’s proliferation activities involving Iran, North Korea and Libya; a review of the involvement of other states in the nuclear black market; an examination of the reforms made by Pakistan and the efforts undertaken by the international community to prevent the reoccurrence of another proliferation network and an assessment of illicit trafficking in radioactive materials.

The dossier’s final chapter summarises our judgements about the current and possible future state of the nuclear black market in materials and technology, and assesses the policy options available to governments to minimise further illicit trade.

### PAKISTAN’S NUCLEAR PROGRAMME AND A.Q. KHAN

Pakistan’s motivation to acquire nuclear weapons was sparked in large part by competition with India. Although the seeds of Pakistan’s weapons programme can be traced back to the early 1960s, the major boost came in December 1971 after Pakistan’s traumatic defeat by India. Embitterment over the loss of East Pakistan also provided a psychological motivation to Dr A.Q. Khan to offer his services to his home country by stealing enrichment technology from his workplace in the Netherlands. With that boost, it took Pakistan only ten years to reach the point where it could produce a nuclear weapon, despite the withdrawal of nuclear assistance from Western countries.

A.Q. Khan has been described incorrectly as ‘the father of the Pakistani bomb’, which exaggerates his contribution. Khan’s mission was to provide Pakistan with an indigenous capability to produce the enriched uranium required for an atomic bomb. After India’s ‘peaceful nuclear explosion’ in 1974, supplier countries became much more reluctant to

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sell sensitive technology to states suspected of harbouring nuclear ambitions. Part of Khan's mission therefore was to circumvent increased controls on technology so Pakistan could obtain the imports it required to feed its nuclear programme.

Many of the techniques Khan perfected were replicated by other proliferating states. Pakistan has not been the only country to engage the private sector in nuclear technology to further a military programme. Others include Iraq, Iran, North Korea and, to a lesser degree, India. These countries have all relied on similar methods of black market procurement, including systematically using the country's foreign embassies, paying a premium over the market price, using multiple connections and buyers to search for a given item, using front companies, falsifying end users, and altering product specifications so they would appear to operate below the international guidelines. Iraq, Pakistan and Iran all made extensive use of free ports, some of which have since tightened controls, while others still have a long way to go.

#### **A.Q. KHAN'S ONWARD PROLIFERATION ACTIVITIES**

From the outset, Pakistani governments gave A.Q. Khan a remarkable degree of authority and autonomy, partly because of the highly sensitive nature of his work, and partly because he was able to achieve tangible results. Concerns about foreign intelligence operations targeting Pakistan's nuclear programme, and the increased secrecy and compartmentalisation that resulted, allowed Khan to operate more independently. An unhealthy rivalry with other Pakistani nuclear organisations contributed to even greater secrecy and shady business practices. Unquestioned, Khan began to order many more components than Pakistan's own enrichment programme required.

As Pakistan shifted to a more advanced centrifuge design during the 1980s, Khan was left with an excessive inventory of older centrifuges and components that gave him and his foreign-based partners the opportunity for a more profitable business model by exploring export markets. In two notable instances, however – those of Iran and Libya -- it may have been the interested customers reaching out to the network, rather than the other way around, although accounts differ on this and many other points. The dossier provides a comprehensive analysis of Khan's business deals with Iran, North Korea and Libya, which began in the mid 1980s, and only came to an end with the roll-up of the network in late 2003 and 2004.

Khan's contacts with Iran date from the mid 1980s, and extended into the following decade. Khan probably had some signal, if not explicit permission, from his superiors for nuclear cooperation with Iran. However, no evidence has yet emerged that a clear directive was ever given to Khan to provide nuclear technology to Iran. Khan provided Iran with centrifuges, technical designs, components and an 'address book' of suppliers. Some details concerning

exactly what Iran received are still uncertain. What is clear is that Khan's sales helped Iran to make significant advances in its clandestine nuclear programme.

In a written confession in 2004, Khan admitted to supplying North Korea with about two dozen centrifuge machines together with sets of drawings, sketches, technical data and depleted uranium hexafluoride (UF<sub>6</sub>) gas. These items were probably transported to North Korea in unmarked containers on chartered Pakistani air force flights. This small number of centrifuges would have been insufficient to produce enough highly enriched uranium for a nuclear bomb. Along with the centrifuge designs Khan provided, however, they gave North Korea a template on which to base their own centrifuge production plans. As with the Iranians, Khan also reportedly provided a 'shopping list' to the North Koreans, which enabled Pyongyang to purchase additional components directly from other foreign suppliers. The transfers precipitated the breakdown of the US–North Korea Agreed Framework and Pyongyang's resumption of its plutonium programme, with as yet unknown ripple effects.

Successive Pakistani governments have insisted that their country's ballistic missile cooperation with North Korea was based on a cash payment, and that there was no official nuclear-for-missile technology exchange. Khan may have acted largely on his own volition, for his own profit. The broad cooperation between Pyongyang and Islamabad, however, is significant reason to suspect state complicity, at least in terms of having knowledge of and thereby implicitly condoning the centrifuge deal.

The Khan network's business with Libya, which involved nuclear specialists, middlemen, and supplier companies from three continents, showcased the organisation's complex and transnational nature. Libya had almost no pre-existing nuclear capability and wanted the Khan network to provide the entire enrichment process from start to finish. By the time of the Libya deal, the network had become a 'globalised supply chain'. An official Pakistani nuclear connection with Iran and North Korea can be logically discerned, but the A.Q. Khan network's cooperation with Libya is more puzzling, unless understood as a straight business deal.

Khan cannot be characterised strictly as either a government representative or a businessman acting independently. He was in fact both, in varying degrees according to the circumstances. Pakistan's complicity in his proliferation ranged along a spectrum. At one end, his procurement for Pakistan's nuclear programme was state authorised, supported and funded, although he had great autonomy in making his own purchases. At the other end of the spectrum, the Khan network's sales to Libya of centrifuge equipment produced in Malaysia, Turkey, Europe and South Africa and transshipped in Dubai were almost exclusively private business transactions, beyond state control. A 1990 offer to provide Iraq with enrichment

technology and project designs for a nuclear bomb also appears to have been a private venture by the network, although the dearth of evidence makes it hard to draw conclusions.

#### **PAKISTAN'S REFORMS**

Whatever reasons led Pakistani leaders to ignore, acquiesce in, and in some cases possibly abet Khan's nuclear-related sales, the terrorist attacks on New York and Washington on 11 September 2001 dramatically changed the dynamic, forcing President Musharraf to ensure that his country was not on the wrong side of the United States.

Many of Pakistan's internal reforms since 2001, and then following Khan's confession and confinement to house arrest in 2004, have been transparent and appear to have worked well. A robust command-and-control system is now in place to protect Pakistan's nuclear assets from diversion, theft and accidental misuse. A.Q. Khan and his known cohorts are out of business and Khan Research Laboratories is now confined exclusively to enrichment work. These steps go some way toward overcoming the international opprobrium and label of irresponsibility that Pakistan earned as a result of the Khan saga.

However, there are still too many unanswered questions about the role Pakistani technology played in aiding nuclear programmes in Iran and North Korea for other countries to conclude that Pakistan has done all it can to account for Khan's activities. His nuclear assistance to Iran led to a further breakdown in the global non-proliferation regime and an international crisis over a budding uranium enrichment capability that many fear could escalate to armed conflict. By freely selling enrichment equipment to at least three countries and putting the designs on computer disks, Khan significantly lowered the technical barriers to nuclear weapons development. Who else might have access to the nuclear technology he and his network proliferated remains a daunting question.

Pakistan has never made public Khan's confession, the details of its investigation into the network, including who was arrested and who was simply detained 'for debriefing,' the charges and laws under which Khan's associates were detained, the grounds for their release, or the identities of those who were put under a form of continued 'house arrest'. The lack of transparency extends to Pakistan's interactions with other governments. Privately, officials in various Western capitals are frustrated that Pakistan has stopped providing information on the grounds that the Khan interrogation is complete.

Light sentences meted out to nuclear scientists who met Osama bin Laden reflect a disturbing pattern reminiscent of the secrecy with which Khan was dealt. The understandable need to protect national security secrets conflicts with the government's desire to dispel hints of lingering corruption in the nuclear programme, notwithstanding the multilayered internal security system

that Pakistan has implemented since Khan's heyday.

International conclusions about whether the Khan case is truly closed will depend on the world seeing a sustained record of responsible nuclear stewardship that lasts for successive administrations in Islamabad.

Fears that the India-US nuclear cooperation agreement will free up Indian domestic uranium for additional weapons purposes gives Pakistan an additional motivation to continue to produce weapons-grade fissile material of its own. Pakistan has resisted any nonproliferation regimes that it believes would give a 'perpetual edge' to India. This is one reason Pakistan has been the country most resistant to negotiating a fissile material cut-off treaty. However, an FMCT that froze arsenals at current levels, before India's greater capacity took off, would appear to be in Pakistan's advantage. Estimates of the number of warheads in both Indian and Pakistani arsenals vary widely, and each country tends to adopt a worst-case assessment of the other. Based on the best available information, there does not appear to be a significant overall imbalance in favour of either side.

If Pakistan were to conclude that it already has a sufficient credible nuclear deterrent and if India capped its own fissile material production then Pakistan would have no further reason to continue enriching uranium and producing weapons-usable plutonium. Nor, in this case, would it have an incentive to keep black market suppliers in place for its own nuclear weapons programme. An end to Pakistan's enrichment-related foreign procurement and the evasion of foreign export controls that this entails would remove one obstacle blocking Pakistan's receipt of the same exemption to nuclear supplier rules that President Bush offered India.

#### **INTERNATIONAL REFORMS**

In failing to exact harsh punishment on the domestic end of Khan's black market network, Pakistan is hardly exceptional. Most of Khan's foreign accomplices remain free and only three have been convicted and imprisoned. The international framework of export controls still contains serious gaps that could be exploited by a network similar to that of A.Q. Khan.

Firstly, many countries still lack laws and regulations governing trade in nuclear-related goods and technologies. Secondly, an even larger number of countries have yet to implement controls, as reflected by the lack of licences issued by national authorities. In many cases, governments have not identified potential exporting companies and educated them about export licensing requirements. As a result, firms sometimes unknowingly export controlled items without approval. Thirdly, only a handful of countries are actually enforcing controls with thorough investigations and strict penalties. As a result, exporters of dual-use items may calculate that the risk of being caught for exporting controlled goods without a licence is minimal. In fact, enforcement officials in most countries

have few resources upon which to draw for targeting dual-use trade. Even worse, most Customs authorities are ill-equipped and poorly motivated to identify and detain controlled goods. Thus, although many states have officially committed themselves to enacting export controls, their effective implementation is still years, if not decades, away.

### **TRAFFICKING IN NUCLEAR MATERIALS**

Nuclear-material trafficking differs from the nuclear technology black market insofar as it only involves radioactive materials. Although the final objective of both activities is the same – construction of a workable nuclear device – the means of achieving it are quite different: illegal acquisition of weapons-usable nuclear material from existing stockpiles versus the development of a complete infrastructure to produce such material.

The available data on nuclear-material smuggling are less alarming than the comparable known incidents in the illicit trade in nuclear technology. Assessing the magnitude of nuclear trafficking is a complex task, however, because the available data on thefts and seizures – while offering useful insights into the diversion schemes, trafficking methods, routes and actors involved – provide only a partial glimpse into what may be taking place. Thus far, little hard evidence of the direct complicity of proliferating states in any nuclear-materials trafficking cases has surfaced. In contrast, there have been various reports of attempted purchases of both nuclear material and actual warheads by terrorist groups, although none of these appear to have been successful.

### **UNANSWERED QUESTIONS**

How much help Khan gave Iran and North Korea and whether the Khan network had other customers are questions of intense interest to investigative agencies. What happened with the rest of the nuclear equipment the Khan network had but did not send to Libya is another of the major questions remaining after the network was broken up, along with what other countries or non-state actors may also have received copies of a nuclear weapon design besides Libya. The bomb designs were apparently digitalised and copied onto computer disks at one of Khan's offices in Dubai. One of the Swiss members of the network admitted to having atomic bomb construction plans in his own office. Swiss and American authorities, as well as the IAEA, have been trying to discover what other use may have been made of these bomb designs, including the alarming scenario of whether any copies were sold to terrorist groups.

### **CONCLUSIONS**

Past Pakistani government knowledge of and even involvement in A.Q. Khan's secondary proliferation activities remains open to debate. The connection between A.Q. Khan and the Pakistani government does not lend

itself to easy delineation. The Pakistani government should have known what key officials such as Khan were up to in an area so fundamental to Pakistan's national security and international reputation, and it is logical to assume that its intelligence apparatus did know more than Pakistan has ever let on. While knowledge of a transaction implies complicity, however, it does not necessarily denote authorisation. Most of Khan's dealings were carried out on his own initiative.

Today, Iran remains the most active customer in the international nuclear black market and it has built a network equivalent to, if not larger than, Khan's. Iran has sought dual-use goods from some of the same people and firms previously linked to Khan, but has also turned to new technology brokers. Although supplier countries have heightened their vigilance, Iran still tries to evade export controls by repeatedly changing front companies and financing arrangements.

Today's black market suppliers are far less integrated than Khan's 'one-stop shopping'. His enterprise was unique in its ability to provide nearly the entire array of materials and services needed to produce highly enriched uranium. The supply side of the post-Khan market is comprised of individuals selling selected dual-use goods. It is the demand side, most prominently in Iran, that is centralised.

However, at least some of Khan's associates appear to have escaped law enforcement attention and could, after a period of lying low, resume their black market business. Decapitating the nodes of non-hierarchical networks does not necessarily eradicate the enterprise. In seeking to pre-empt proliferation trends of the future, concerned governments should anticipate new ways in which black market suppliers may integrate their services. Future proliferation networks may assume various forms of quasi-state involvement, building on Khan's previous blurring of the lines distinguishing private criminality from state-authorised activity. They will also follow Khan's lead in fully exploiting the globalisation of manufacturing capabilities, which allows complex components to be produced in less industrially-developed states, and has further complicated efforts to control nuclear technology.

Up to now, the history of the non-proliferation regime has been a game of catch-up: regulators belatedly tighten controls after digesting the lessons learned from previous rounds of proliferation, but states intent on acquiring strategic weapons capabilities find new ways to keep one step ahead. Unless further reforms are made, and then rigorously enforced, it seems likely that this pattern will repeat itself.

The governments and international bodies that seek to control the trade in nuclear technology and related goods face a daunting task. Not only by analysing the historical and current activities of nuclear procurement and proliferation networks, but also by providing a thorough list of policy options, this dossier seeks to assist those engaged in this vital effort.