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Present at the Creation: U.S. Perspectives on the Origins and Future Direction of the Proliferation Security Initiative

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Key Points

- Diplomatic efforts aimed at resolving the Iranian and North Korean nuclear crises have so far yielded few positive results. Although a political solution will ultimately be required in both cases, the Proliferation Security Initiative (PSI) has a role in denying Iran and North Korea access to technology, equipment and materials for their nuclear and missile programmes, while such solutions are sought.
- Participating states could attempt to apply the PSI to Iran and North Korea in three ways, by:
 - (a) conducting interdiction operations on key trading routes and entry points;
 - (b) acting against Tehran and Pyongyang's principal suppliers of nuclear hardware; and
 - (c) intercepting aspects of 'soft' proliferation including the tracking and seizure of financial transactions that support and enable the transfer of prohibited technology and equipment.
- If implemented successfully with the backing of regional powers and neighbouring states, all three approaches have the potential to slow Iran and North Korea's rate of technological development. Therefore, the PSI has the capacity to act as a limited enforcement mechanism and increase the political and financial costs of pursuing uranium enrichment (for Iran) and the maintenance of nuclear capability (for North Korea).
- However, although the PSI has utility in disrupting the progress of Iran and North Korea's nuclear and missile programmes, the effectiveness of the Initiative under all three scenarios is likely to be constrained by several political and operational obstacles:
 - The PSI does not have the firm support of either China or South Korea making interdiction efforts against North Korea more problematic. Furthermore, it is also unclear whether air and land interdiction against Iran can succeed without the co-operation of the surrounding countries, which may not be guaranteed.
 - Similarly, identifying all active and potential nuclear suppliers to Iran and North Korea, and being able to target them effectively, would be a major challenge, not least given the incomplete intelligence picture on global nuclear and missile proliferation.
 - In addition, intercepting transfers of technical data, knowledge and expertise and financial transactions – 'soft' proliferation – is a complex task given that much of this type of activity generally occurs electronically over the Internet.
- If PSI participants could (a) improve intelligence on Iran and North Korea's nuclear acquisitions and procurement networks and (b) develop a more integrated strategy that incorporates all three approaches then the effectiveness of the PSI is likely to increase, despite the lack of support from several key countries.

Introduction

BASIC's project on the PSI is supported by the UK Economic and Social Research Council (ESRC). For further details, see the special section on the PSI on the BASIC Web site at: <http://www.basicint.org/nuclear/counterproliferation/psi.htm>

During the most recent PSI interdiction exercise, which took place in the Persian Gulf in October 2006, a diplomat observing the naval manoeuvres was reported to have stated 'off the record' that Iran and North Korea were two main targets for the PSI.¹ Officially, the PSI is not targeted at any specific state or regime,² however, the proximity of the latest major interdiction exercise to Iran's territorial waters and recent political events in both Iran and North Korea suggest otherwise. For instance, since August 2002, when an Iranian opposition group revealed the construction of clandestine nuclear facilities at several key sites throughout Iran, the country's nuclear programme has been the subject of intense international scrutiny. Similarly, when North Korean officials admitted to their US counterparts in October 2002 that Pyongyang was currently engaged in a clandestine Highly Enriched Uranium (HEU) production programme, a rapid escalation of tensions on the Korean Peninsula ensued. Since then, a political stalemate has persisted in which North Korea has played a game of nuclear brinkmanship in an attempt to obtain security guarantees and economic aid. In short, Iran's continuing defiance of repeated UN Security Council demands to halt uranium enrichment and North Korea's provocative nuclear test on 9 October 2006 have exacerbated the problem of nuclear proliferation in international affairs.

In the case of Iran, the underlying concern of all key actors including the International Atomic Energy Agency (IAEA), the United States and the 'EU-3' – France, Germany and the United Kingdom – has been the question of whether the Iranian regime is attempting to covertly acquire a nuclear weapons capability. Like all signatories to the Non-Proliferation Treaty (NPT), Iran is legally entitled to develop civil nuclear energy for peaceful purposes. However, the exposure of a uranium enrichment facility at Natanz and a heavy water plant at Arak promptly raised international alarm as to the intentions that lay behind Iran's nuclear programme. Iranian officials profess that their nuclear programme is civilian in nature; nevertheless, the unwavering suspicion – particularly in the United States – is that Tehran's nuclear designs extend beyond the realm of peaceful uses of nuclear power.³

The US Administration is convinced that Iran is attempting to develop a nuclear weapon. In March 2006, Under Secretary for Arms Control, Robert Joseph outlined six reasons why Iran must be prevented from developing a nuclear weapons capability.⁴ Likewise, Secretary of State Condoleezza Rice made the case again in May 2006 that Iran's pursuit of nuclear weapons "represents a direct threat to the entire international community" and puts at risk the "vital interests" of the United States.⁵ Currently, US policy is committed to achieving a diplomatic solution, although with a pre-condition that Iran must first "fully and verifiably" suspend uranium enrichment before negotiations can resume. Moreover, with the unanimous vote in the UN Security Council on 23 December 2006 to impose limited and targeted sanctions on Iran for its failure to halt uranium enrichment, the international pressure on Tehran has certainly increased.

Equally, the Bush Administration has long viewed the government in Pyongyang as an untrustworthy and hostile regime intent on developing nuclear weapons and threatening its neighbours for political gain. The bedrock of US policy towards North Korea has always been, as Under Secretary for Political Affairs Nicholas Burns reaffirmed in November 2006, that the North's pursuit of nuclear weapons and their means of delivery represents a "clear threat to international peace and security".⁶ US policy goals are therefore to achieve "full dismantlement" of North Korea's nuclear weapons programme, Pyongyang's acceptance of IAEA inspections and the North's return to the NPT.⁷ The preferred means of accomplishing these long-held objectives has been through diplomacy. Although, with the North's admission of a covert HEU production programme in October 2002 and its unprecedented nuclear test in October 2006, the Bush Administration has sought to increase the pressure on the North Korean regime, most recently through implementation of UN Security Council Resolution 1718. Nevertheless, despite UN sanctions, multilateral diplomacy remains the favoured mechanism of persuading the North to accept international demands.

To date, all efforts at solving the nuclear crises in the Middle East and Northeast Asia have not yielded a resolution. Diplomatic overtures initiated by the EU-3 as early as June 2003 and by the permanent five members of the UN Security Council plus Germany (P5+1), have failed to persuade Iran to co-operate

with UN demands to halt uranium enrichment. Furthermore, discussions within the framework of the Six-Party Talks between the US, North Korea and other regional powers have not convinced the North to relinquish its nuclear weapons programme and return to the NPT. Therefore, with diplomatic talks faltering, military action unpalatable and the effectiveness of UN sanctions debatable, the fundamental political problem remains how best to deal with Iran and North Korea.

This BASIC Paper looks at the potential for applying the Proliferation Security Initiative (PSI) against Iran and North Korea, as a means of checking and delaying clandestine development of WMD programmes in both states in order to buy more time for diplomatic solutions. It reviews three possible scenarios and their likely effectiveness and concludes with an assessment on the overall utility of PSI relative to Iran and North Korea.

Applying the PSI to Iran and North Korea

US officials have often claimed that the PSI – a US-led ad-hoc multilateral effort of more than 70 states aimed at controlling the spread of nuclear, chemical and biological material, delivery systems and related equipment in the international system – has already been successful in preventing nuclear and missile technology from reaching Iran. In a speech to PSI participants in the Polish capital Warsaw in June 2006, Under Secretary Joseph cited several examples of successful interdiction efforts conducted under the Initiative, including the seizure of dual-use technology related to Iran's missile programme and heavy water-related equipment destined for its nuclear programme.⁸ But, as few details have been released about these and other PSI operations carried out, it is difficult to judge the significance of purported successes, the strategy employed to achieve them and how the operations were conducted. Officials maintain that such secrecy is necessary in order to safeguard sensitive intelligence gathered either in the lead up to, during or after interdiction. Therefore, it is largely unclear how the Initiative has so far been employed against either Iran or North Korea.

Nevertheless, it is possible to determine three potential scenarios in which the PSI might be utilised to interdict Tehran and Pyongyang's attempts to procure or transfer nuclear or missile technology and related equipment:

- Scenario 1: quasi-blockade;
- Scenario 2: focus on state and non-state suppliers; and
- Scenario 3: 'soft' interdiction

Scenario 1: Quasi-blockade of Iran and North Korea

Participating states could attempt to concentrate PSI interdiction on key trading routes to Iran and North Korea in order to deny access through the interception and seizure of prohibited equipment and technology. Implementing this strategy would require PSI participants to identify the most likely supply routes and entry points into Iran and North Korea through which shipments would transit and also make available the necessary military forces to interdict suspicious cargo at these locations. Under this scenario, interception would occur while shipments were *en route* to their destination. The principal advantage of this approach is that it would prevent Tehran and Pyongyang from acquiring the necessary nuclear and missile hardware. But, it is clear from what is publicly known about Iran and North Korea's procurement history that both states have received shipments via land, sea and air routes, indicating that participating states must be able to operate against all means of supply in order for the PSI to succeed.

Unlike Iran, North Korea's activities are not limited to the acquisition of nuclear technology and equipment. For Pyongyang, overseas procurement of uranium enrichment technology and other hardware has been vital for its nuclear programme, but proliferation – the transfer of missile technology and related material to other states – comprises a major source of foreign currency for the North. PSI participants may seek to block North Korea's attempts to transfer missile technology to potential buyers, which if successful, would likely impinge on Pyongyang's foreign currency earnings and increase the pressure on the North Korean economy. Certainly, the transfer of ballistic missile technology by the North is undesirable from the perspective of international efforts to prevent proliferation. However, for PSI participants to fully implement this approach carries with it a high risk that Pyongyang may opt to retaliate militarily if the regime perceives that a state of economic collapse is likely to arise as a result of a successful interdiction regime.

Land routes: When Iran began receiving material assistance from the A Q Khan network in the late 1980s, Khan employed land-based routes to ship nuclear hardware from Pakistan to Iran,⁹ with cargo passing through Baluchistan, a known opiate smuggling route.¹⁰ Furthermore, since the late 1990s, incidents of nuclear and radioactive material smuggling have risen in the southern tier of the Former Soviet Union (FSU), with countries in the Middle East and South Asia – including Iran – reported to be the final destination. It is highly likely that nuclear trafficking along these routes follows traditional narcotics smuggling on the old silk roads from Kazakhstan, Turkmenistan and Tajikistan.¹¹ Clearly, the deployment of PSI participants' interdiction forces along Iran's borders with Turkmenistan, Afghanistan, Pakistan and the Caucasus would be necessary in order to interdict any transfer of nuclear- and missile-related technology on land.

Similarly, North Korea received uranium enrichment equipment from the Khan network via land routes along the Karakoram highway, which runs across northern China from Pakistan in the west to North Korea in the east.¹² It is highly plausible that North Korea and the Khan network agreed to employ this mode of transfer specifically because it minimised the likelihood of interdiction, at least compared to air or maritime transportation. Furthermore, since the beginning of 2001, Pakistan has received an increasing number of missile-related shipments from the North via the Karakoram highway. For instance, in August 2001 it was reported that US satellite monitoring had detected the transport of missiles by truck in the China-Pakistan border area. A few months before in a meeting with Pakistani government officials, China had apparently agreed to allow future missile shipments bound for Pakistan to transit Chinese territory, indicating that reliance on land routes between Pakistan and North Korea was to increase.¹³ Consequently, it is clear that for the PSI to be successful in curbing the North's use of land routes to receive or transfer nuclear and missile-related hardware to and from Pakistan, Chinese and Pakistani co-operation would be essential.

Maritime routes: Iran is also known to have received nuclear equipment from the Khan proliferation network through maritime routes. In 1994-95, centrifuge components were transported by freighter from Pakistan to Dubai – a major transshipment point for the Khan network – via the Arabian Sea and the Persian Gulf, then on to Iran.¹⁴ Such shipments would have passed through one of the world's critical 'chokepoints', the Straits of Hormuz. Therefore, to prevent Iran's future access to sensitive nuclear and missile components and equipment from the sea, it would be vital for participating states in the PSI to conduct intensive naval patrols in the Arabian Sea, Gulf of Oman (including the Straits of Hormuz) and Persian Gulf to interdict any movements of suspicious cargo.

North Korea has employed maritime routes extensively throughout its proliferation and procurement history. As early as 1991, a North Korean vessel, the *Mupo* attempted to transfer Scud-C missiles and launchers to Syria; however the *Mupo* returned to North Korea without having reached its destination.¹⁵ Nevertheless, US officials believe that the freighter's cargo was a second shipment of a total of 150 missiles purchased by Syria, 24 having already been delivered in March 1991.¹⁶ Eight years later, Indian authorities at the port of Kandla intercepted a North Korean cargo vessel, the *Ku Wol San*, which customs officials suspected of carrying armaments to Pakistan and demanded to inspect the ship. An extensive search revealed that the *Ku Wol San's* cargo comprised of complete Scud-B and Scud-C missiles, production capability, technical drawings and operations manuals all bound for Libya.¹⁷ Furthermore, in December 2002, a North Korean cargo vessel, the *So San* was boarded and searched in the Gulf of Aden. An inspection uncovered 15 complete Scud missiles with high-explosive warheads and rocket propellant. US intelligence agencies had tracked the vessel all the way from North Korea and concluded that its likely destination was Yemen, which was later confirmed by the Yemeni government who claimed ownership of the missiles.¹⁸

Finally, evidence emerged recently that North Korea has also sought to use maritime transportation to procure materials for its uranium enrichment programme. In April 2003, the container ship, *Ville de Virgo*, which was bound for Asia was tracked and intercepted by French and German authorities in the Mediterranean. Prior to departure, a consignment of 214 high-strength aluminium pipes had been loaded onto the *Ville de Virgo*; however, only hours after the vessel left Hamburg German intelligence officials discovered that the pipes were destined for North Korea and naval forces were sent to interdict and remove the shipment. It was estimated that the amount of aluminium purchased by the North would have been sufficient to construct approximately 3,500 gas centrifuges for enriching uranium.¹⁹

Air routes: Although there is little evidence available of Iran receiving nuclear materials by air, US officials have claimed that on one occasion, they prevented Iran from loading a cargo plane on North

Korean soil.²⁰ This indicates that Tehran may have employed air transport as a means of gaining access to nuclear and missile technology. In the case of North Korea, the Khan network supplied Pyongyang with centrifuge and enrichment machines and depleted uranium hexafluoride gas (UF₆) using air routes from late 1997 onwards.²¹ Likewise, North Korean technicians and missile components were flown from Pyongyang to Islamabad in late 1997 and April 1998.²² Indeed, the frequency of cargo flights between North Korea and Pakistan reportedly increased from three per month in the autumn of 1997 to three times that in January the following year, indicating that air transportation along with land routes have been used extensively in North Korean-Pakistani nuclear and missile transfers.²³

Apart from Pakistan, the North has supplied other customers using air routes. During the 1990s, North Korea sold production capability, materials and key components for longer-range Scud-C missiles to Egypt, evidence of which was revealed in 1996 when Swiss airport authorities intercepted a large shipment of missile components at Zurich airport.²⁴ Furthermore, in January 2000 British police interdicted 32 crates of North Korean missile propulsion systems at Gatwick airport, which were to be flown to Libya via Malta.²⁵ For the PSI then, effective surveillance of air routes and accurate and timely intelligence on transfers of nuclear and missile hardware by Iran and North Korea would be a prerequisite for success. Moreover, denying suspect air traffic a clear path to and from Iranian and North Korean airspace, or better still, forcing them to divert from their flight-plan and land in a PSI participant state – enabling the aircraft to be searched – would also be necessary for the success of this strategy.

It is clear from successful interdiction operations mentioned earlier that the PSI was designed principally to intercept the transfer of hardware. Although it is not entirely clear how operations have been carried out, current implementation of the PSI may bear a resemblance to Scenario 1 as the aim of this approach and the means (military forces) employed are similar to the stated objectives of the PSI. In any case, applying the PSI either in its current format or under the first scenario is likely to lead to further cases of interdiction, especially on maritime routes and may yield additional successes, depending on the quality of intelligence supplied.

But, if the PSI is implemented under the above scenario, its effectiveness is likely to be compromised by several political and operational obstacles. For example, a prerequisite for conducting successful land and air interdiction on trading routes and entry points to Iran and North Korea would be for participating states to obtain the support or permission of the surrounding countries. Only with these states' acquiescence could PSI participants intercept all suspicious cargo travelling by road or rail and successfully divert air traffic entering or leaving Iranian and North Korean territory or airspace. With current US and NATO military deployments in the Middle East and South Asia, PSI participants could patrol Iran's borders with Iraq and Afghanistan. But, given the state of internal security and insufficient numbers of troops in both countries, the detection and seizure of suspicious cargo is likely to be a low priority.

Similarly, in the case of North Korea, both China and South Korea's co-operation is far from guaranteed. Seoul has refused to fully implement the PSI and interdict North Korean cargo vessels suspected of involvement in nuclear or missile proliferation for fear that this will not only lead to the end of the South's "engagement policy" but may result in confrontation and armed conflict with the North. Indeed, although the South Korean government is apparently divided on how best to deal with North Korea, there is general agreement that peace and prosperity and reconciliation with Pyongyang are higher priorities than resolving the nuclear dispute.²⁶ Likewise, China voted for Security Council Resolution 1718 perhaps due to frustration with the North's intransigence and Beijing's apparent declining influence over Pyongyang, but China remains suspicious of the PSI and has pledged only to 'inspect' rather than 'interdict' cargo destined for the North. The Chinese government is of course seeking to avoid a collapse of North Korea and is therefore highly unlikely to support any action that may increase this possibility. In short, without the full and complete participation of China and South Korea in the PSI, not all trading routes and entry points to and from North Korea will be subject to interdiction, limiting the effectiveness of the PSI.

Scenario 2: Focus on state and non-state suppliers

An alternative approach would be for PSI participants to act against major suppliers of nuclear hardware to Tehran and Pyongyang. Successful implementation of this strategy would likely increase the political and financial costs of clandestine procurement. Indeed, under this scenario the objective would be to restrict or, if possible, remove procurement options for Iran and North Korea by persuading potential state and non-state suppliers of nuclear equipment and technology from co-operating with either country.

The role of the PSI would be two-fold: firstly, actual interdiction operations would act as an enforcement mechanism for an international sanctions regime that had previously established the illegality of supplying prescribed technology. For example, Security Council Resolution 1718 placed sanctions on North Korea after its nuclear test in October. In addition, interception would occur earlier in the proliferation process, ideally before the shipment left the territory or possession of the supplier rather than *en route* to its destination as under Scenario 1. Secondly, the threat of PSI interdiction – in concert with international diplomatic pressure – may serve as a deterrent to some suppliers not to transfer sensitive technology or materials to Pyongyang or Tehran. Certainly, for a state to be exposed supplying nuclear hardware – especially if this contravenes internationally-imposed sanctions – to a regime like North Korea’s would carry political costs likely to outweigh any economic benefits derived from the initial sale. Identifying all major potential state and non-state suppliers to Iran and North Korea and being able to act against them would be vital for the success of this approach.

State suppliers:

In the last two decades Tehran has received considerable assistance from both Russia and China for its nuclear programme. In the early 1990s, Beijing provided Iran with several small research reactors. In addition, China began construction of an industrial-scale uranium-conversion plant at Esfahan and transferred a ton of natural uranium to Iran, allowing Iranian scientists to carry out undeclared conversion and enrichment experiments throughout the 1990s.²⁷ But, by the end of the decade, China had scaled down its assistance to Iran, reflecting Beijing’s suspicions that Tehran was attempting to develop nuclear weapons and also due to US pressure. In January 1995 Iran signed an agreement with the Russian Ministry of Atomic Energy to complete the nuclear reactor plant at Bushehr, initially scheduled to finish in 2005 but now delayed with an uncertain completion date.²⁸ Since Iran’s clandestine nuclear activities came to light in 2002, diplomatic pressure has been applied to Russia to cease its technical assistance to Tehran. However, Russian engineers have continued their work at Bushehr and the Kremlin remains committed to its nuclear partnership with Iran.

North Korea’s nuclear programme began in the mid-1950s three decades earlier than Iran’s and until the end of the Cold War, the Soviet Union was the North’s principal supplier of nuclear and missile technology, equipment and expertise. This relationship saw the transfer of a small research reactor to North Korea in the late 1950s and enabled North Korean scientists to receive training in the former Soviet Union. However, it was not until the late 1970s that Pyongyang began its attempt to develop infrastructure for a nuclear weapons programme. Scientists started work on nuclear fuel enrichment technology and delivery systems such as the *No-dong 1*. However, as the 1980s unfolded, North Korea’s nuclear programme developed at a slower rate due in large part to the economic and scientific problems associated with the technological process and the decline of its main patron.

The loss of co-operation suffered by Tehran and Pyongyang prompted both countries to seek alternative suppliers of nuclear hardware. Indeed, throughout the last decade Iran and North Korea have worked together on missile technology for mutual benefit. In the mid-1990s, Iran acquired *No-dong* technology, which enabled Tehran to develop an indigenous ballistic missile capability and provided the North with a source of foreign currency and an indirect means of missile testing. Since then, Iran has been able to enhance the range of its liquid-fuelled missiles, culminating with the first flight test of the *Shahab-3* in July 1998.²⁹ For the PSI, it would be imperative for participating states to monitor bilateral contacts between Iran and North Korea and intercept any transfers of nuclear or missile hardware in order to prevent collaboration for mutual benefit. Nevertheless, regardless of their joint efforts, both Iran and North Korea have also independently sought the assistance of non-state suppliers.

Non-state suppliers:

From the late 1980s until the mid-1990s, Iran obtained blueprints, technical design data and enrichment equipment – first- and second- generation P1 and P2 centrifuges – from the Khan network, all of which was instrumental in the development of Iranian nuclear research.³⁰ North Korea received similar assistance from the network between 1997 and 1999. However, since the arrest of A Q Khan in Pakistan and the exposure of his network’s activities, a major non-state supplier of nuclear technology and equipment has now largely evaporated. Although the PSI played no role in this success, the dismantling of the Khan network demonstrates that action against non-state suppliers can be effective in removing sources of nuclear technology and expertise that support and enable clandestine nuclear programmes.

Further evidence indicates that both Iran and North Korea have attempted to utilise non-state sources of supply in order to obtain the necessary technology, equipment and expertise. Iran has cultivated an

extensive network of front companies and businesses in Western Europe and the FSU dedicated to acquiring the expertise and materials for Tehran's suspected nuclear weapons programme.³¹ Likewise, the interdiction of the cargo ship *Ville de Virgo* in April 2003 was proof of North Korea's attempts to use front companies in Europe to purchase materials for enriching uranium. In 2002, German intelligence officials warned that the North's agents in Europe were known to be using front companies to acquire "sensitive goods". Later that year, a North Korean businessman claiming to represent a North Korean import-export company, Nam Chon Gang, approached the owner of a small German export firm, Optronic with an order for a supply of aluminium pipes. After locating the pipes, Optronic succeeded in obtaining an export licence. However, customs officials, aware of the possible uses of such a large quantity of aluminium pipes, were able to arrange for the interdiction of the shipment on the *Ville de Virgo* after it was revealed that North Korea and not China was the final destination of the shipment.³²

The unravelling of the Khan network and the operation against the *Ville de Virgo* are evidence that success in targeting sources of supply at the beginning of the proliferation chain is possible. In which case, if the PSI were to be successfully implemented under Scenario 2, the key benefit of this approach is that it would restrict the ability of future suppliers to transfer nuclear and missile technology and related material and equipment to Tehran or Pyongyang. Ultimately, this is likely to increase the difficulty for Iran and North Korea of acquiring the nuclear and missile hardware necessary to maintain and develop their nuclear programmes. Of course, implementing this scenario would not be free of problems. For instance, identifying all active and potential suppliers to Iran and North Korea – given the diffusion of nuclear technology and expertise that occurred after the Cold War – and having the capacity to act against them would be a tall order even for the combined capabilities of PSI participants.

Furthermore, in targeting Iran and North Korea's known suppliers, PSI participants would require a legal basis to actively prevent the transfer of controlled components and equipment. UN Security Council Resolutions 1718 (regarding North Korea) and 1737 (regarding Iran) do provide some degree of legality as they call on member states to take the 'necessary measures' to prevent the supply or transfer of nuclear and missile related hardware to Iran and North Korea. But, neither resolution offers an explicit legal basis for PSI operations against either country, although Security Council Resolution 1718 does call on member states to take co-operative measures to prevent illicit trafficking of nuclear, chemical and biological weapons and delivery systems, including inspection of cargo to and from North Korea. Moreover, both resolutions invoke Article 41 of Chapter VII of the UN Charter limiting efforts to prevent procurement or proliferation by Iran and North Korea strictly to non-military means. This is likely to impede PSI participants' efforts to intercept suspect vehicles, aircraft and shipping in the event that force is required to carry out interdiction and inspection.

Gaining the support of Iran's key technical partner, Russia, for PSI operations against Iran would also be crucial for success. But, Russia's full co-operation is unlikely in the near term, not only because Moscow derives economic benefits from its continuing partnership with Iran on the Bushehr nuclear facility, but also because the Kremlin appears not to share the same acute security concerns as the United States and EU-3. The irony is that as well as providing Iran with technical and material assistance, Russia is also a PSI participant. However, as the PSI is an ad-hoc multilateral partnership, obtaining the agreement of all participating states for PSI interdiction is not a necessary condition for action.

Scenario 3: 'Soft' interdiction

In addition to developing a strategy to interdict 'hard' proliferation – the physical transfer of nuclear and missile hardware such as technology, material and equipment – a third scenario involves PSI participants building the capacity to intercept aspects of 'soft' proliferation. This type of activity consists primarily of the transfer of technical drawings, blueprints, data, intellectual property, knowledge and expertise and financial transactions all of which are vital to the technological development of nuclear and missile programmes. Indeed, acquiring the hardware for a nuclear weapons programme is necessary but not sufficient to construct a usable weapon. Without access to the relevant technical data, expertise and trained personnel, achieving a nuclear weapons capability – covertly or otherwise – will be more time-consuming and present additional technical barriers for any state, including Iran or North Korea. Therefore, the benefits of this approach are that by targeting soft proliferation, PSI participants can still disrupt the technological progress of Tehran and Pyongyang's nuclear and missile programmes even if they were to obtain the necessary nuclear hardware.

At the PSI High Level Political Meeting (HLPM) in June 2006, participating states acknowledged that the interdiction of financial mechanisms that support and enable proliferation should be a priority for the PSI

and agreed to consider how to utilise and strengthen national laws and capabilities to achieve this.³³ In fact, in the case of Iran, the US blacklisted one of Iran's largest banks, state-owned Bank Sepah in January 2007, accusing the organisation of facilitating Iran's international purchases of material for its missile programme. The move freezes Bank Sepah's US assets and prohibits US companies and citizens from doing business with the bank.³⁴ Similarly, North Korean banks such as the Vienna-based Golden Star Bank – the North's only financial institution in Europe – provide financial and logistical support for North Korea's proliferation activities. According to the Austrian government, the Golden Star Bank's illicit activities include money-laundering, distribution of forged currency and trading in radioactive substances.³⁵ North Korean embassies and diplomatic officials – under cover of diplomatic immunity – are also reported to facilitate Pyongyang's illicit nuclear and missile dealings. Therefore, the interception of soft proliferation activities and the tracking and seizure of financial transactions made by the Iranian and North Korean governments, known front companies, businesses and middlemen is crucial if co-operative efforts under the PSI are to be successful.

Like the previous scenarios, implementing this strategy would require high quality joint intelligence collection and analysis in order to track Iran and North Korea's nuclear dealings with key suppliers in the legal, grey and black markets and to accurately pinpoint any related financial transactions and 'soft' transfers. In addition, close co-operation, not just sharing intelligence, between all PSI participants would also be essential given that Iran and North Korea's activities span a host of countries around the world and that no one participant can unilaterally prevent soft proliferation. Moreover, developing effective national and international legal authorities to freeze financial transactions and seize assets, as proposed at the HLP, would provide legality for interdiction. Although, in the case of North Korea, Security Council Resolution 1718 already obliges UN member states to immediately freeze the financial assets of those involved in the North's proliferation activities.³⁶

However, despite the benefits of this approach to proliferation, several obstacles are likely to hinder its effectiveness. Firstly, the task of tracking Tehran and Pyongyang's nuclear dealings is likely to become increasingly difficult as more legitimate supply routes are closed down, and procurement efforts move from legal to grey or illicit markets. Secondly, this type of proliferation and procurement activity is much less easily identified, tracked and intercepted than nuclear or missile hardware because it is usually transferred electronically or through direct person to person contact. Lastly, not all aspects of soft proliferation are necessarily vulnerable to interdiction, such as the training of scientists at research institutes and universities or the acquisition of knowledge and human expertise on nuclear physics.

Conclusion: the utility of the PSI applied to Iran and North Korea

Iran's determination to proceed with uranium enrichment in defiance of UN demands and North Korea's missile and nuclear tests in July and October 2006 are likely to drive forward implementation of the PSI. Participating states have already targeted Iran and North Korea for their attempts to procure and transfer nuclear and missile hardware and are highly likely to continue to do so. In fact, since the Security Council passed Resolution 1718 two North Korean vessels suspected of involvement in nuclear or missile proliferation have been boarded and searched in Hong Kong and India, although no prohibited technology or equipment was discovered.³⁷ For its proponents, the attraction of the Initiative is that while diplomatic talks remain deadlocked and military action is unfeasible, the PSI offers an indirect means of forestalling the development of Iran and North Korea's nuclear programmes. Certainly, the Initiative does have some utility as an enforcement mechanism relative to Iran and North Korea as it remains one of the better counter-proliferation options available for slowing the rate of nuclear and missile development in both states

Yet, it is evident that the effectiveness of the PSI will continue to suffer from several political, legal and operational flaws. Some key states, most notably China and South Korea still refuse to participate in the activities of the PSI, while others such as Russia are likely to be unwilling participants at best. If the PSI does not have political support from regional powers and countries surrounding Iran and North Korea then its effectiveness will surely be compromised. Maritime interdiction against Iran, for example, would be relatively straightforward to implement as naval forces under the Combined Task Force-150 (CTF-150) have been patrolling the Gulf of Oman and Arabian Sea extensively in recent years.³⁸ But by itself, maritime interception is unlikely to be sufficient in preventing Tehran from acquiring the materiel, technology and equipment needed for its nuclear and missile programmes as the regime has also received such supplies via land and air routes. In short, without complete coverage on all transit routes

and entry points to both Iran and North Korea, the PSI will at best only be partially effective in intercepting shipments of nuclear and missile hardware.

Furthermore, the legality of vessel interdiction in international law is still a point of contention between supporters and opponents of the PSI. Security Council Resolution 1718 does provide a legal basis for preventing the supply of nuclear- and missile-related items to North Korea. However, the resolution does not sanction the use of force in order to intercept suspect cargo and no explicit legal basis for interdiction exists in the case of Iran, despite the provisions of Security Council Resolution 1737.

The limitations of the PSI are even more apparent if Iran and North Korea's current capabilities are considered. The PSI cannot 'turn back the clock' and eliminate the nuclear facilities and missile systems already constructed and both Iran and North Korea have also demonstrated some degree of indigenous developmental capability, at least in the sphere of short-range delivery systems. Therefore, the limitations of interdiction options (and sanctions) are such that they only have the potential to impede the future development of Iran and North Korea's nuclear and missile programmes.

Finally, the wider political impact of interdiction must also be factored into the equation. Iran has the capability to raise the political and economic costs of PSI interdiction, possibly to levels that many participating states will consider outweigh the benefits. For example, Iran could use its proxy Hezbollah to re-ignite armed conflict in southern Lebanon, escalate attacks against coalition forces in southern Iraq or disrupt maritime traffic in the Straits of Hormuz interrupting the flow of international commerce. Tehran has already stated that it is prepared to use military force to "shut down" the supply of oil shipments through the Straits if European states support economic sanctions against Iran.³⁹ Furthermore, Iranian military forces undertook a series of intensive exercises and war games in the Straits in March, August and November 2006. Indeed, if badly timed, PSI interdiction may disrupt the progress of any ongoing diplomatic initiatives or at worst provoke another military confrontation in a region already engulfed in turmoil.

A similar situation exists with regard to North Korea. In response to a PSI interdiction operation, the North may choose to retaliate militarily against South Korea or Japan using its missile capability or perhaps through maritime incursions across the Northern Limit Line. This scenario is likely if PSI interdiction is regarded as a direct threat to the survival of the regime. Alternatively, the North may respond with further missile or nuclear tests designed to escalate tension in Northeast Asia but keeping this within non-military bounds. But perhaps the most likely response is Pyongyang's political disengagement from the Six-Party Talks and continuing defiance of international demands to dismantle its nuclear weapons programme.

The effectiveness of the PSI relative to Iran and North Korea would likely improve if participating states were to develop an integrated strategy based on all three scenarios outlined in this BASIC Paper. Even then, there is no guarantee that a combined approach would preclude Tehran and Pyongyang from acquiring the components or equipment needed to develop their nuclear and missile programmes. It would, however, dramatically raise the cost to both regimes of illicit procurement activities and significantly delay progress towards a nuclear weapon capability. Moreover, if the legitimacy and operational effectiveness of the PSI were to be further strengthened by a more inclusive membership, then a more effective interdiction operation against Iran can be envisaged. In any case, it is evident that the PSI must be employed within the wider structure of the international non-proliferation regime and as part of a more inventive and wide-ranging solution to both crises.

Ultimately, it will take a political settlement to resolve the underlying conflict over Iran and North Korea's nuclear programmes. Clearly, the PSI does not offer a permanent solution to either dispute; however, if implemented successfully, the Initiative does provide the option of forestalling the development of Iran and North Korea's nuclear and missile programmes. Of course, the PSI is not a perfect counter-proliferation tool, but currently there do not appear to be any better options for curbing the spread of nuclear and missile hardware and 'software' in the international security environment. In fact, given the international problem of controlling nuclear material, technology, equipment and expertise since the end of the Cold War, nuclear proliferation is at present a security risk to managed rather than solved.

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