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REEVALUATING THE PROCESS
AN ASSESSMENT OF THE IRAN NONPROLIFERATION ACT AND ITS IMPACT ON THE INTERNATIONAL SPACE STATION PROGRAM

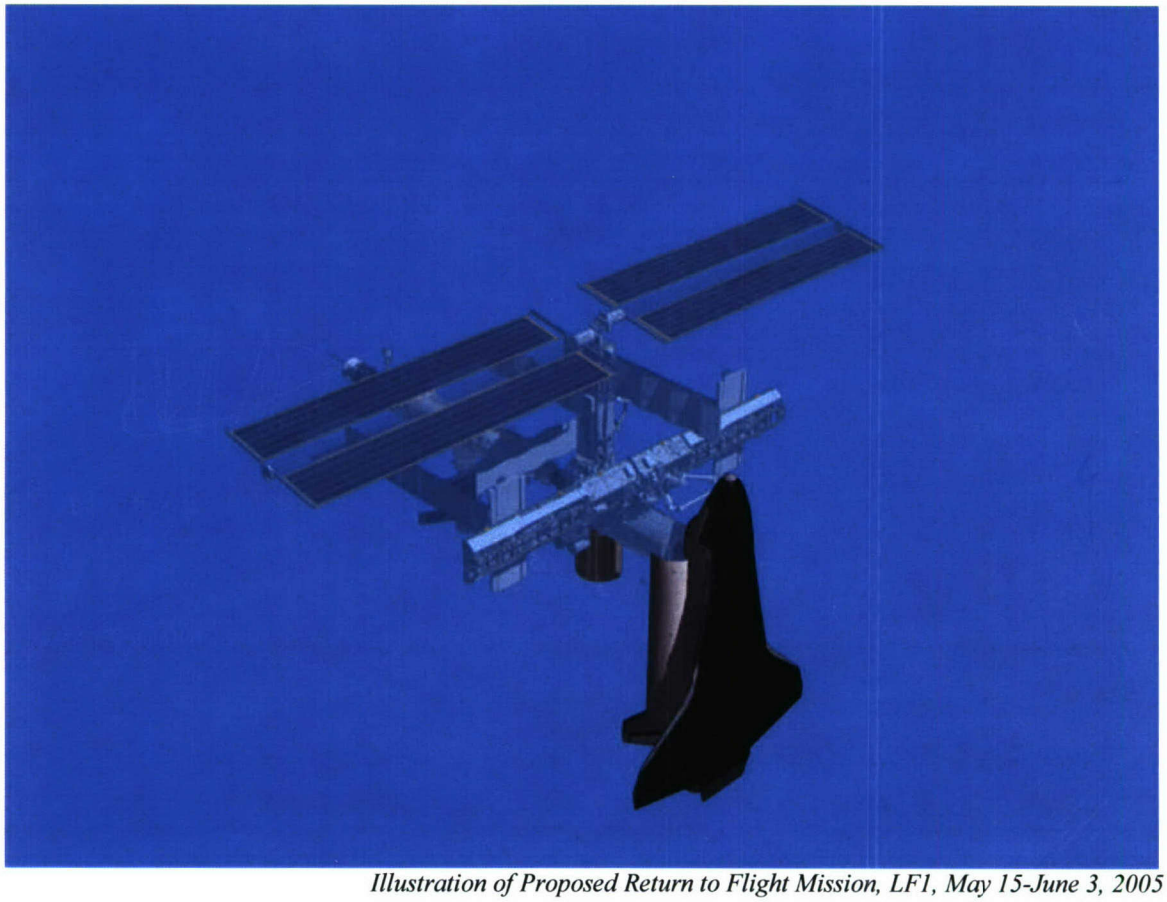

Illustration of Proposed Return to Flight Mission, LF1, May 15-June 3, 2005

5 APRIL 2005

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Submitted for

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The views expressed in this article are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the U.S. Government

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The Iran Nonproliferation Act (INA) was introduced on May 20, 1999 in the House International Relations Committee by Chairman Gilman, unanimously passed by Congress as HR-1883 and signed into law March 14, 2000. The Act was designed to be used as leverage in the United States' relationship with Russia on the International Space Station (ISS). The hope was to dissuade Russia from cooperating and assisting Iran with its nuclear program and what the U.S. thought were nuclear-weapon ambitions. The Act specifically restricts U.S. funding to Russia by limiting all purchases of goods and services for the ISS to those that were agreed upon before the Act's passing or those that are required in the event of an emergency that risks crew safety.

NASA is supportive of the Iran Nonproliferation Act but is concerned about the agency's ability to carry out normal operations while fulfilling the original U.S./Russian ISS agreement following funding and policy changes since 1999.[1] The combined effects of the 2002 deletion of the X-38 based Crew Rescue Vehicle from the Program, the 2003 Columbia tragedy and the introduction in 2004 of the Vision for Exploration that includes retiring the Space Shuttle by 2010 have dramatically increased the need to rely on the Russian Federal Space Agency (FSA or Roskosmos) for critical services. Absent an agreed non-legislative solution between the executive and legislative branches of the U.S. Government or a change in policy, both the International Space Station and international exploration activities will be severely impacted and limited.

[1] Saunders, Melanie.

NASA is obligated under a series of existing international agreements to provide certain services to the ISS Program such as crew rescue and transportation. Lacking either an American crew rescue vehicle or the Space Shuttle, purchase of these services from Roskosmos is the only means by which NASA can substantially meet its obligations under those agreements. Further, President Bush has explicitly stated his intention that NASA should continue to meet its obligations to international partners.

Broadly, findings indicate that Johnson Space Center, and particularly the ISS Program, has most acutely felt the impact of the Iran Nonproliferation Act. This assessment relies on information gathered from over twenty-five qualitative interviews with individuals from the ISS Program and NASA Headquarters, as well as with foreign and science policy experts. The staff in Houston largely reports that the Act has increasingly impacted the Program in the wake of the Crew Rescue Vehicle cancellation and the Columbia tragedy and promises to grow only more burdensome in the future as the Shuttle retirement date nears. It appears obvious that the times in which NASA could continue its commitment to the ISS within the constrictions of the INA have ended; some legislative relief or reinterpretation of existing certifications must be made.

Many remedies to this problem exist – each with their own package of costs and benefits. Three general options have been found that are most likely to meaningfully address these problems. In simplest terms these are: repeal of the Iran Nonproliferation Act; exemptions from the constraints of the Act for certain companies that are most trustworthy and reside on the critical path of the most frequent and essential acquisitions; and working

around the present problems by creating organizational synergies and a more structured process of approval.

As an entity, NASA must adopt some combination of the recommendations detailed herein or risk more serious inefficiencies and a growing inability to either meet its obligations to the international partners or to build any effective international coalition for exploration. Brinkmanship has been the tool of choice thus far but will no longer be an acceptable choice. Future mission success requires present action.

The Iran Nonproliferation Act (INA) passed by Congress in January of 2000 is designed to discourage U.S. dealings with individuals, corporations or states which have either the history or ability to proliferate nuclear materials to Iran. Due to both the collaboration between the United States and Russia on the International Space Station (ISS) and that country's history of involvement with Iran, the INA contains a section entitled "Restriction on Extraordinary Payments in Connection with the International Space Station." Although a minor component in a major act of foreign policy, this section has completely changed the nature of the relationship between the National Aeronautics and Space Agency (NASA) and her sister organization, the Russian Federal Space Agency (FSA or Roskosmos). Importantly, due to funding and policy changes since 1999, the effects of this change have grown much more dramatic. The combined effects of the 2002 deletion of the X-38 based Crew Rescue Vehicle from the Program, the 2003 Columbia tragedy and the introduction in 2004 of the Vision for Exploration that includes retiring the Space Shuttle by 2010 have dramatically increased the need to rely on Roskosmos for critical services such as crew rescue and rotation and logistics resupply. This paper seeks to (1) assess what impact the INA has had on the ISS, (2) explore and (3) recommend the best way to remove or mitigate any negative impacts so that the ISS may function efficiently and effectively.

It should be first noted that the space station aids the U.S. in achieving many of its national interests. Chiefly, it is an important experiment in U.S./Russian relations. Additionally, the U.S. investment of more than $40B in the ISS helps assure that it continues to be a leader in science and technology development. Secondary general foreign policy interests are also supported by the sixteen country collaborative project. Involvement in such

a multinational venture provides the U.S. with another tool that can be exercised as a part of its foreign policy decision making and is looked upon favorably in world opinion.

Since the Space Shuttle Columbia disaster in February 2003 the U.S. has been completely reliant on Russian launch capabilities to service and transport supplies and astronauts to and from the ISS. Although President Bush has placed an emphasis on returning to manned space flight in his Vision for Exploration, at present the critical element of sustained ISS operations is in jeopardy.

Certain exceptions to the INA do exist but at present none of these exceptions has been utilized because of their exceptionally narrow allowances. NASA has said "it is not [our] intention to make foreign policy," but Russia does not have the financial capital to continue to serve as the primary provider of launch capabilities.[2] Beginning in February 2003 the U.S. has been forced to "call in favors" from Russia. To date the FSA has been able to "step up to the plate," providing previously agreed upon services and permitting scheduled U.S. missions to continue.[3]

But this process cannot be sustained further. Russia will soon no longer have any obligation to provide U.S. crew transport or continue servicing U.S.-owned hardware. America has for too long relied on brinkmanship successes rather than the reform truly needed to sustain its commitment and investment in the space station; as long as the U.S. intends to maintain its leadership role in the exploration and study of space this cannot continue. The spring training for next year's ISS crew is set to begin this month. Russia has made it clear that without INA reform in the coming weeks their level of involvement in U.S. operations will have to decrease.

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[2] Pace, Scott. NASA's deputy chief of staff, Feb. 19th 2003 (qtd. in Space News).
[3] Gerstenmaier, William H.

Indeed, Roskosmos is facing increasing pressure from its government to limit its ISS involvement to only those activities for which it is clearly obligated. Within Russia the FSA is seen as having invested a huge amount of money and effort into building the ISS only to watch the Americans reap the greatest benefit.[4] Unless NASA takes financial responsibility for the services it can no longer contribute directly through its own hardware, the U.S. cannot expect to maintain its significant role in the ISS Program; and without this precedent other spacefaring nations, the U.S.'s current partners in the ISS, will not play a substantial role in future exploration initiatives. The impact on research and human space flight development, absent full use of the ISS and constrained by exploration budget limits lacking significant international cooperation, would be deleterious at best.[5]

Congress, NASA and other relevant entities within the executive branch must work together to, at very least, agree on a non-legislative solution. Such an agreement might involve a collective legal interpretation that the existing contracts for the ISS already provide for updates and amendments and as such, NASA is able to procure the needed critical services within the confines of the Act as it currently exists. A more politically difficult but also more satisfactory long term solution would be to amend legislation to provide NASA the necessary flexibility to procure goods and services from Russia in support of approved human spaceflight activities. This would guarantee NASA's ability to meet its obligations to the ISS partners while securing significant involvement of the key spacefaring nations in a future exploration program.

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[4] Saunders, Melanie.
[5] Ibid.

NASA

Two major entities within NASA are affected by the INA and involved in the efforts to meet the agency's accordant obligations: NASA Headquarters (NASA HQ) located in Washington, D.C. and the ISS Program Office based at the Johnson Space Center (JSC) located in Houston, TX. NASA HQ is responsible for the administrative, legislative and legal concerns of the organization as well as all aspects of policy and organizational vision development. The ISS Program is responsible for Program implementation which includes all operational components such as mission planning, mission control and training. The ISS Program works with the Space Shuttle Program, also based at JSC, and the ISS Program Team at the Kennedy Space Center in Florida to implement launch planning.[6]

The ISS Program is headed by the Program Manager, William H. Gerstenmaier. Within the Program Office, the External Relations Office (Blake Ratcliff, Manager for Russian Integration, Contracts and Budget) is responsible for working with the JSC Chief Counsel, the HQ Office of External Relations, the Office of the General Counsel and the Space Operations Mission Directorate to review INA aspects of ongoing activities with Russian entities to ensure full compliance with the legislation. This process, although far from ideal, provides a mechanism for NASA to consider transactions under existing contracts and agreements to ensure the Program is able to meet its obligations within legal and policy constraints.

[6] Saunders, Melanie.

THE LEGISLATION

At the beginning of the 105th Congress, Congressman Sensenbrenner (R-WI 5th) was appointed Chairman of the House Science Committee. Prior to this office he had served as Chairman of the Subcommittee on Space and Aeronautics. At the time many members of Congress were growing concerned with the prospect of a nuclear Iran and looked towards employing the U.S. relationship with Russia through the ISS as a method of diminishing Iran's nuclear potential. In the years preceding the Act, Russia had continued to assist Iran with its nuclear power program despite international disapproval and fears related to the development of nuclear weapons. Political pressures were a considerable factor as well; nonproliferation efforts are difficult for any politician to vote against, especially when focused on an increasing threat to the U.S. and her allies. Many members of Congress were reluctant to support the INA and voted with significant reservation because of the impact they foresaw on the ISS. Yet the bill, HR-1883, eventually received 230 sponsors and passed in the House, 420-0, on March 14, 2000.

The INA seeks to use the joint space station involvements of the U.S. and Russia as a lever to affect Russian and Iranian technology trade. It is significant to note that the INA provides only this single channel through which to discourage such trade. Other, larger aspects of the countries' relationship, like those acting through contracts made with the Department of Defense or Department of Energy, are left unmentioned.

The legislation directly impacts only NASA and restricts only the ISS. It requires that all new contracts with Roskosmos or any entity under its jurisdiction and control at any time in the past or present be approved through the agency and the State Department. It limits transactions to those accomplished prior to the bill's passing or those few deemed safety

critical and even those few exceptions experience significant reporting and review. Under this system the Program works through the Russian Transaction Review Team to review any potential INA implications whenever a service must be purchased from the Russians (all of which only occurs under contracts predating the INA). Because the ISS was purposefully built through joint effort, when maintenance of NASA equipment produced by Russian entities is required it almost always involves some items available exclusively or most cheaply through Russia. JSC, then, is constantly seeking approval for one item or another; indeed, the legal team in Houston estimates that "almost all" of their time is now dedicated to preparing applications to the approval committee.[7]

The maintenance of the Shuttle Docking Mechanism that allows the Space Shuttle to dock to the ISS is a prime example. NASA bought the docking apparatus from Russia and requires an ongoing effort from the original equipment manufacturer to sustain the equipment. Absent such services NASA would be forced to expend a prohibitive sum to have a U.S. company sustain the hardware. Even if the budgetary difficulties were removed, it is unlikely any domestic contractor would be able or willing to assume such a responsibility without the ability to subcontract the original Russian equipment manufacturer.[8] Funding on the contract under which the sustaining engineering services have been obtained in the past is nearing depletion and lacking an ability to replenish that funding under the auspices of INA relief, NASA could be faced with the inability to dock the Shuttle to the ISS. This would, obviously, even further limit NASA's ability to complete assembly of the ISS and fulfill its obligations to the international partners.

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[7] Bartoe, Donna.
[8] Saunders, Melanie.

PREVIOUS ADDRESS

In the wake of the Columbia disaster, legislative relief from INA was put on the table during one particular Science Committee hearing. Understanding that the cancellation of all Shuttle missions in the immediate future would require a huge increase in reliance on Russian transport capacity, members of the committee asked if NASA needed help. Administrator Sean O'Keefe stated that such relief was unnecessary and that his agency could work within INA constraints.[9] Ostensibly, this response was part of a continuing effort to force the Russian partner to become more self-reliant and to wean them from the largely unchecked U.S. funding that propelled early efforts toward joint operations. However, in light of the Vision for Exploration and the decision to retire the Space Shuttle, it has since become apparent that the INA constraints have and will become too onerous to bear.[10]

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[9] Berger, Brian.
[10] Saunders, Melanie.

METHODOLOGY

The search for a policy recommendation has been primarily guided through interviews with the staffs at NASA HQ, the ISS Program and foreign and science policy experts at Harvard's Kennedy School of Government. In the end, we conclude that the consequences of existing policy have been made worse by the combination of the Shuttle disaster, the President's push for a return to manned spaceflight in the next few years, a drive towards returning an astronaut to the moon in those following, and the continuing concern over the proliferation of weapons and weapon technologies from Russia to Iran. What before might have been an understandable inefficiency in the acquisition process from NASA's view has become a real threat to maintaining the long-term operational capacity of the ISS. Through interviews with NASA personnel at many levels of the agency, including both Program personnel in Houston and policy experts in Washington, we think our team has gained a sufficiently informed and detached understanding of the problem to suggest a useful recommendation.

JSC PERSPECTIVE

As could be expected, the ISS Program Team at JSC has been severely challenged by the added constraint of the INA and the aggravation of this constraint by intervening events (CRV cancellation, Columbia, the Shuttle retirement decision). Indeed, by some descriptions from Houston the bureaucratic demands of the INA at present are a "living hell." For the ISS Program to function as a single lever through which the United States hoped to push the Russian Federation to exert some visible and meaningful influence over Iran's nuclear ambition, though, it is clear that some operational concessions would be necessary. But given interim events the costs have become too high and now conflict with other U.S. foreign policy goals.

NASA fully supports efforts to limit proliferation but the time has come for the U.S. government to decide if the actual benefits from the INA are worth its costs: the sacrifice of the U.S. investment in the ISS to date, the loss of credibility for NASA and the U.S. from the perspective of the international partners, who themselves have made huge investments in the program over several decades, and the very real possibility that the U.S. will not be a player in human spaceflight for the next decade. To understand the situation fully it is necessary to consider both the catalyst for and the nature of the relationship between NASA and her Russian sister agency before the INA.

THE U.S. AND INDIA

The path that lead the U.S. and Russia together can be traced through New Delhi. By 1994 India had begun the process of becoming a nuclear power. As the country began to

solicit rocket technology from the international community it found a willing and capable seller in Russia. Just as now, the U.S. then kept the general policy of nuclear containment. Faced with this challenge, legislators eventually crafted a policy that could benefit the cash-strapped FSA and, in so doing, undermine the negotiations.[11]

The result was the original $400M contract between Russia and the U.S. Serving as more than a temporary stymie to Indian ambition, though, this first allotment was designed to help NASA learn how to work with Russia in particular and the international community in general while accomplishing U.S. space interests.[12] But training for joint operations and executing collaboratively in orbit would require NASA to overcome a number of managerial and cultural obstacles.

NASA vs. FSA

By almost every estimate, although they share the unique capability to explore space and send man into it, the scientists in Russia bear little resemblance to their counterparts in the U.S. NASA operates with a rigid dedication to standard operating procedures and carefully measured risk management. FSA, in the estimate of their peers and collaborators at JSC, has developed with a largely *sui generis* mission approach. Indeed, in one well remembered case the death of a Russian scientist resulted not just in the loss of his expertise but also the loss of any significant understanding of the system he had developed.[13] This lack of detailed records is coupled with a general "trust us" attitude that has oftentimes prevented NASA employees from involving themselves deeply in the Russian side of ISS operations.

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[11] Bartoe, Donna.
[12] Saunders, Melanie.
[13] Ratcliff, Blake.

In form, the FSA exists in stark contrast to NASA as well. The U.S. government owns the American share of the ISS, the Space Shuttle and all of the agency's other materials and facilities. When parts must be manufactured or systems developed outside of NASA, civilian contractors such as Boeing or Lockheed Martin are hired for specific and discreet contracts. The product of that agreement, when the bill is settled, becomes the property of NASA. Just the opposite is true in Russia. As a significantly smaller organization, the FSA functions primarily as the manager of agreements between (now) independent firms. While it retains control over which operations are undertaken and which missions are approved for implementation inside of its borders, the contractors solicited for work with the agency maintain ownership of their assets.[14]

In the past this bureaucratic asymmetry has by some considerations actually served to benefit joint operations. When transactions were planned within the $400M original contract the Russian government could often be largely removed from the solicitation and acquisition processes. NASA could forge almost direct agreements with independent Russian companies and, as the purchaser, exert influence that would have in other instances been more difficult if not impossible.[15]

THE STRAIN OF THE INA

All this changed when the INA was introduced in 2000. Although members of Congress held some significant reservations, as mentioned previously, the resolution passed unanimously. From the highest levels the bargain might have seemed an acceptable one. Continuing the U.S. policy of nuclear containment, especially in a state such as Iran and at a

[14] Theall, Jeffery.
[15] Ibid.

time in history like the turn of the century, seemed a far greater concern than maintaining the ability to transfer funds to Russia on one project. But the view from Houston today is that the legislation, which originally was merely inconvenient, now has the potential to become a "showstopper."[16]

Looking back it seems clear that the policymakers overestimated the steady-state nature of U.S. and Russian involvement on the space station. At the time the INA was enacted, a significant fraction of the original $400M contract remained unspent. In the worst case scenario, understanding that the policy would still allow previously approved expenditures to continue, it was not imprudent to believe that the few remaining and unforeseen transactions yet to be made would not seriously impact mission accomplishment. In the more likely scenario, the INA would accomplish its goal as Russia would be persuaded to stop cooperating with Iran and then be certified compliant. Many arguments made in 2000 conjectured that the INA could even help to serve the ISS. By limiting unchecked supplemental contracting with Russia the U.S. could hope to "turn off the faucet" of money flowing from NASA to the FSA.[17] Additionally, gradually shifting away from such transactions with the Russians in primarily U.S. missions to the ISS would help to remove them from the critical path. This last point, preserving the independent capability of the U.S. to service its investment and conduct the experiments of its own interest, would serve as an especially attractive quality to Congressman Sensenbrenner and the coalition of support he built around the INA.

Still, the impact on ISS operations would be immediate and the ancillary benefits conceived during drafting hardly balanced it. With the INA in place NASA could no longer

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[16] Precourt, Charlie.
[17] Ibid.

treat Russian companies as they would American contractors. But forfeiting the benefits of direct solicitation and project control was just the first of concessions made to the INA.

The next sacrifice was the fiscally sensible use of comparative advantage. Russian contractors, in particular Energia and Krunichev, are comprised of a highly skilled and educated workforce. The efforts of this staff have produced many of the scientific discoveries and technologies that have made construction and maintenance of the ISS possible. And by design, use of these materials in balance with those developed in the U.S. was the guiding philosophy behind the ISS – the joint and complimentary implementation of American and Russian technology and scientific ambition. By severely limiting the allowable contribution from its partner, the U.S. made it necessary that any future repairs or additions to the ISS would have to either fit within the limits of the INA or be built domestically. Coupling the realization that Boeing often charges two and three times as much as its Russian counterpart with the shrinking balance of the original contract provides a global business perspective increasingly critical toward the INA.

COLUMBIA CRASHES

The Columbia breakup 40 miles above central Texas in February 2003 claimed the lives of seven astronauts and grounded the shuttle fleet. Its tragic consequences for the families and friends of the crew were immediately noted, as was the impact on the scheduled shuttle missions to follow. But the Columbia crash had further reaching impact into the human space flight program at NASA and particularly the ISS.

The Space Shuttle is a remarkably capable tool for moving large amounts of material to and from space. Unequalled by any other reusable craft, it is able to carry more than

30,000 pounds into and down from space in a single trip. Notably, it is the only U.S. craft capable of docking with and servicing the ISS. When the shuttle fleet was grounded in 2003, American transport capacity both to and from the ISS became entirely dependent on its international partner.[18]

The Russian vehicle for crew transport and rescue to the ISS is the Soyuz, which is able to carry three crew members. The Russian Progress vehicle provides logistics re-supply and re-boost services for the Space Station. It is an unmanned vehicle with an effective payload of 2600 pounds that can carry both dry cargo such as food in addition to propellant and life support gases or water. While the loss of up-mass capability per mission by an order of magnitude is a serious constraint on ISS mission planners, an even greater difficultly is presented by its supply.

Although increased numbers of each craft were requested after the Columbia crash the stock available to NASA remained at pre-disaster levels.[19] Unlike the Space Shuttle, the Soyuz and Progress are built for one-time use. The product of the consistently underfunded Russian space industry, these vehicles must be specifically commissioned and purchased before the two year fabrication process begins. Lacking the fiscal discretion they once had before the INA, ISS mission managers must now wait until the Russian side has been granted approval to accomplish any specific purchase of Soyuz or Progress vehicles.[20]

O'KEEFE SPEAKS

Faced with these challenges, then NASA Administrator Sean O'Keefe was called to testify before Congress. When asked whether or not his agency needed relief from the INA

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[18] Theall, Jeffery.
[19] Ibid.
[20] Saunders, Melanie.

to continue its mission following the shuttle disaster he replied that NASA needed no waivers from INA stipulations.[21] The response to his declination at JSC and NASA HQ could not have been more different.

Some members of the ISS Program Team at JSC can still remember their surprise at hearing his refusal. Facing consistent challenges that required extraordinary legal efforts for even the most predictable and precedented expenditures had made it clear that something needed to change. Hoping for relief even before the Columbia disaster, with the shuttle grounded and the original contract running low, it seemed that now they would escape from the burden of the INA and return to the more efficient operations of the 1990s. To pass on this opportunity for assistance from Congress was perplexing to working troops.[22] But Headquarters saw things differently.

NASA HQ Perspective

President Bush announced his plan to shift the primary mission of NASA back to one of space exploration in January 2003. In contrast to the normal operational demands of sustaining life and conducting scientific experiments on the ISS in orbit around the earth, expedition into space requires the ability to supply a vehicle with every necessary material from launch. Once deployed, spacecraft in route to the moon or to surrounding planets can hardly be recalled for maintenance or sent replacement parts in the event of any emergency. Inasmuch, a strong argument can and has been made that the restricted access to the ISS due to the INA has provided important lessons in mission planning for a NASA rededicated to exploration beyond orbit altitude.

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[21] Berger, Brian.
[22] Saunders, Melanie.

Next, it has been noted that the INA has forced NASA to more closely monitor its dealings with the FSA. While ensuring compliance, budgets are examined with far greater scrutiny than before and one significant result has been to encourage that almost every line item has dual use for the Russians and the U.S.[23] Such an effect furthers the larger mission of the ISS to develop joint operations and forces the FSA to step up to their previous commitments.[24]

Another argument made frequently at NASA HQ is against the unguarded optimism of counterfactual thinking. By that rationale, those who try to predict the progress and success of the ISS absent the INA presume that the difference in funding that might have been allowed would have in fact been allocated. In truth that is impossible to know. Some inside NASA believed that there was a general policy of "no money to the Russians" in the several months from the Columbia crash to the 2004 presidential election.[25]

SOMETHING MUST GIVE

Although the intervening events previously discussed have been the major impediments to full utilization of the ISS, the INA has made a difficult situation worse. The inefficiencies of the review process and its narrow exception tolerance have, by every argument, introduced a significant amount of friction into the process of managing the space station.[26]

In the critical path of steps necessary to accomplish the President's Vision for Exploration is completion of the ISS and the retirement of the shuttle by 2010. If the shuttle

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[23] Gerstenmaier, William H.
[24] Hawes, Michael.
[25] Gerstenmaier, William H.
[26] Ratcliff, Blake.

returns to flight this summer, the earliest and best case estimate, and can successfully accomplish every ISS service mission on its manifest it will fly 28 more times. But even in this ideal scenario the planned additions are oversubscribed and the gap in U.S. up-mass capability must be filled by Progress vehicles.

Furthermore, the 1996 Balance Agreement between NASA and Roskosmos only provided for Russia to provide crew rescue and rotation for non-Russian crews on eleven Soyuz vehicles. The last purchased Soyuz will launch this fall and land next spring. In the absence of any formal relief or reinterpretation of existing policy the U.S. faces the real possibility of losing its investment in the ISS by being unable to crew the station with U.S. astronauts. The U.S. *must* have the Soyuz available as a rescue vehicle in order to leave crewmembers at the ISS when the Shuttle is not docked.

NATIONAL INTERESTS & OBJECTIVES

In order to assess any policy option, operational objectives must be defined. These operational objectives are the methods by which national interests are met. They lay out in clear terms how the U.S. is to succeed in securing their national interests. In the case of the ISS/INA relationship we must consider national interests and objectives germane to the International Space Station, Russia, and Iran. Each of these objectives satisfies a portion of the aggregate national interests that reside within these three areas. There are four operational objectives that are affected by the ISS/INA relationship.

U.S. interests related to Russia and science and technology are most obviously impacted by the ISS Program. There is one extremely important and one vital national interest that must be considered. These are, respectively:

- "That the United States maintain a technological lead in key military-related information technologies."[27]
- "That the U.S. establish a productive relationship with Russia."[28]

OBJECTIVE 1: *Maintain a critical stake in the International Space Station.*

This objective supports the U.S. national interest of acting as a leader in science and technology around the world. Though some contend that the "space station has very few uses we could think of," other members of the scientific community believe that the ISS provides

[27] Commission on America's National Interests, pp. 48.
[28] Ibid 27.

unique research opportunities whose results may prove invaluable in the future of U.S. space exploration and presence.[29] The ISS also contributes to bioastronautics, earth science, biology, and the physical sciences.[30] Further, the fields of space product development and space enterprise are highly benefited as well. Inherent in this objective is the continued partnership of the U.S. with all other states who are a part of the ISS collaboration. This aspect aids the U.S. in meeting its foreign policy objectives towards these countries.

OBJECTIVE 2: *Nurture the U.S./Russian Relationship via the ISS.*

This objective aids the U.S. national interest of maintaining a friendly relationship with Russia. Russia is a major player on the world stage and both its domestic and foreign policies significantly impact the United States. The more input the U.S. can have in the formation of these policies the easier it is to meet the national interests relating to Russia. The ISS is a high profile joint venture and the majority of efforts are made by these two states. It provides a significant amount of access and if properly handled a significant amount of influence.

U.S. policy towards Iran must also be considered and operational objectives related to Iran detailed. These objectives were the genesis of the INA and were understood in such a way that called for the use of the ISS in their accomplishment. There are three vital national interests impacted by Iran's nuclear ambitions. These are:

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[29] Robert P. Kirshner, Professor of astronomy at Harvard and the president of the American Astronomical Society, Mar 21st 2005, (qtd. in New York Times).
[30] "Why Do Research Off The Planet."

- "That no state in the region hostile to the U.S. acquire new or additional weapons of mass destruction capabilities."[31]
- "That all global stockpiles of nuclear weapons and weapons-usable nuclear material be maintained in conditions of security, safety and accountability."[32]
- "That the nuclear danger to the U.S. be reduced to the achievable minimum."[33]
- Two additional objectives flow from these interests.

OBJECTIVE 3: *Prevent Iran from developing a nuclear profile capable of being used for nuclear weapons.*

As Iran is generally a state hostile towards the U.S., this objective is directly in line with U.S. national interests. Satisfying this objective was the goal of the INA and the purpose of its leveraging the ISS against Russia. At this point, however, the stipulations made in the INA are no long applicable and the issue now is one of uranium enrichment and plutonium reprocessing.

OBJECTIVE 4: *Prevent the distribution of nuclear fuel and weapons-capabilities from Iran and/or Russia to other countries or groups & ensure all weapon-usable materials be kept safe, secure and accounted for.*

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[31] Commission on America's National Interests, pp. 32.
[32] Ibid 38.
[33] Ibid 32.

Russia's dealings with Iran are a matter of its own foreign policy but that relationship can be influenced by the U.S. It has signed an agreement with Iran to provide nuclear fuel for the Bushehr reactor but requires that this fuel be returned. In the scenario that the Bushehr reactor comes on-line it is the U.S. interest that the nuclear fuel be maintained with the highest degree of security.

INA AS POLICY

Almost all judgments of the effectiveness of the INA as a policy to serve the U.S. interest of Iran not becoming a nuclear state conclude that it has failed. "The INA has been limitedly effective except against the ISS."[34] The concept behind the INA was creative and had a reasonable chance of resolving a large problem with a very small tool. The tool, however, has at this point proven itself fairly useless and its exercise harmful to other national interests and NASA. "It seems that the issues that the ISS are being used a lever on are much larger than the space station."[35] The longer this tool is used and this policy remains in place in its present state the more the U.S. will hinder itself, its relationship with Russia, and whatever proper focus and policy should be adopted towards Iran.

"As a part of the list of carrots and sticks space cooperation is a good idea."[36] Given what we know concerning the effectiveness of the INA and its impact on the ISS Program, however, we should consider whether "right now would we still pass the INA if we didn't want Iran to have a bomb. Bushehr is not the problem; enrichment and reprocessing are the problem."[37] The answer to this question helps to (1) determine what redress or actions should

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[34] Allison, Graham.
[35] Holdren, John.
[36] Allison, Graham.
[37] Ibid.

be taken towards the INA and (2) directs us to other policy options that could be more effective in meeting America's national interests. The answer may be that the reason the INA has survived this long is because "[the U.S.] has been too caught up in the sale of the reactor."[38]

Whether or not the INA served its broader purpose, given intervening events its impact on the ISS Program and human spaceflight is approaching the point of critical harm. It is time to take a fresh look at the situation and weigh the costs against the benefits as they can now be accurately measured. Policy makers need to take action in reforming the legislation or developing new interpretations of the existing Act that redress the most problematic aspects of the INA. In the following pages these options are defined and the details of each explored.

[38] Allison, Graham.

The general solution to the issues confronting the ISS is clear. The impediments currently faced by NASA must be either removed or lessened. Most obviously this can be accomplished by the addition of an exception to the INA which, if necessary, could be constrained to that time when the U.S. lacks manned spaceflight capabilities; a broader exception may be more valuable to the program in the long run but is not required. Given the impact of the shuttle grounding and world change since September 11, 2001, it is not implausible to consider an entire redrafting of the INA. A new INA would certainly contain a very different section relating to the ISS, one that might reflect not only the international developments since 2000 but the changes in space policy and capability as well. Rewriting or slightly expanding existing exceptions to the INA could also give NASA the negotiating room needed to offer not previously approved funding or in bartering goods to Russia. Internationally, another possible solution resides in the potential of increased funding from a variety of outside parties. The Russian Federal Space Agency's budget for the ISS is only a slight fraction of the U.S. contribution. An appeal to the European Space Agency may garner enough funding to supplement Russia's budget to working levels. Appeals to Canada and Japan could accomplish the same but may come with a higher price tag. Still, to date none of the other partners have demonstrated any willingness or ability to step up and solve the problem through expenditure of their own national resources.[39]

There are three policy options that will reasonably meet NASA's objectives in dealing with the INA and ISS. Each of these options brings along a unique set of costs and benefits as well as probability for success. The remainder of this section explores these options, their

[39] Saunders, Melanie.

positives and negatives, and makes a recommendation as to which policy is most feasible given the multiple dimensions of the issue. It is likely that a combination of these potential policy options may be the best fit as a solution.

OPTION 1: *INA Repeal*

This option calls for repel of the INA by the House. NASA must work with the President and make a very strong case to Congress if there is any chance of this occurring. Showing that the INA has failed to accomplish any of its objectives and demonstrating that it has negatively impacted the ISS may provide enough political pressure for such a repeal to occur.

Pros:

- Would provide total INA relief for NASA.

Cons:

- Low political feasibility.
- Would likely require a long time to go through Congress.
- Removes any benefits that are delivered by the INA.

OPTION 2: *Exemptions to Companies*

The Arms Export Control Act and many other U.S. policies provide exemptions for companies working on international projects. The Department of Defense and Department of Energy work with multiple foreign governments and contractors under such exemptions. Initially, after the INA was passed it was thought that these exemptions were in effect for

companies that NASA worked with on ISS matters. The current interpretation of the INA, however, is that no exemptions exist and that the President must certify Russia as compliant before any INA restrictions are removed. NASA primarily contracts with three Russian companies: Russia's space agency Roscosmos; the rocket and space corporation Energia that builds the Soyuz; and Krunichev that manufactures proton rockets. This option calls for the certification of these three entities and thereby their exemption from the INA sanctions.

Pros:

- Does not require INA repeal – more politically feasible than Option 1.
- Models already exist – Department of Defense and Department of Energy.

Cons:

- The White House may consider this as backing down from the hard-line of the INA.[40]
- The Congress may intervene and say that the President does not have this authority.
- Does not remove all INA burdens.

OPTION 3: *Working Together, Increasing Efficiency*

In the case that no statutory relief comes along or in the interim of its pursuit NASA still needs a plan to overcome the problems and difficulties brought on by the INA. This is the thrust of the third option. It does not address the INA legislatively at all but builds efficiencies by improving the working dynamics between JSC and NASA HQ. It is clear that these two bodies view the INA and its impact on the ISS very differently. Resolving these differences by increasing communication between responsible committees and individuals and designing a mechanism of feedback to involved parties is the first step. If this is the most

[40] Carter, Ashton.

preferred option a joint ISS Program–NASA HQ team should be assembled to assess and formulize what improvements could be made and what improvements are most needed, yet for some external reason are prevented from being made.

Pros:

- Does not involve the INA – less politically difficult than Options 1 or 2.
- Keeps any benefits that are delivered by the INA.
- Keeps everything "in-house" and can use those most familiar with the problems and needs to fix the problems and still meet the needs.
- Fosters intra-agency cohesion – gets people talking with each other.

Cons:

- No guaranteed success – joint team my find no real resolution.
- Would require a good deal of time that NASA does not have.
- Does not remove any INA constraint, only works within them.

LOOKING AT THE OPTIONS

The three options above increase in political feasibility as they decrease in likely effectiveness and real impact on INA difficulties. This relationship must be kept in mind when seeking which option or combination of options to adopt. Clearly there are other courses of action that could be suggested. Many of these ideas, such as scrapping the ISS altogether or passing new legislation to address and remedy specific INA issues, are not outside of the larger marketplace of ideas. In our opinion, however, these actions do not adequately or appropriately answer the questions on which we are focusing – what impact the

INA has had on the ISS and what is the best way to remove or mitigate any negative impacts so that the ISS may continue functioning efficiently and effectively.

The options explored above each pass an initial cost-benefit analysis and are flexible enough to include potential policymakers' differences of opinions on programmatic specificities. This adaptability allows each of the three options to be tailored or combined in such a manner that maximizes the option's final viability and net-benefit.

Full INA repeal does most to alleviate NASA's problems, does not conflict with and actually helps further U.S. interests. Full repeal, however, is, as mentioned, politically infeasible as it would require Congress to completely reverse its previous decision. Additionally, some may believe that repeal will make the U.S. appear unable to effectively influence Russia's nuclear decisions. All of these things considered, it is our recommendation that NASA adopt a mix of strategies to deal with the impact of the INA. This mix combines the most politically realistic aspects of Option 1 and the easiest, and potentially most helpful, aspects of Option 3.

NASA should appeal to Congress to have the terms of the INA more clearly defined and in many cases loosened. Particularly:

- It should be specified that items that have been approved since the Act's passing should not require an entirely new approval process.
- "Extraordinary payments" should be defined and what constitutes these payments not a matter of interpretation by NASA HQ, the State Department or any other body.
- The transfer of funds should not be wholly forbidden. Services such as Soyuz astronaut transport and rescue, Progress up-mass and docking mechanism sustainment engineering should be approved as a category of acquisitions not requiring any further review.

NASA must also work within itself to alleviate problems which may have been caused by gaps in communication. It is our recommendation that NASA could benefit from a more efficient internal process for reviewing transactions for INA implications. Toward this end, NASA should employ the Option 3 assessment team and hold this team to produce recommendations concerning how to streamline its current internal INA review process.

Conclusion

The INA has greatly impacted the ISS Program over the last five years. Although originally well-intentioned and useful, the combined effects of the 2002 cancellation of the X-38 based Crew Rescue Vehicle, the 2003 Columbia crash and the introduction in 2004 of the Vision for Exploration have dramatically increased the need to rely on the FSA for critical services.

The President has made it clear that he intends to meet all of the United States' obligations to international partners, including those within the ISS Program. Lacking either the development of an American crew rescue vehicle or an INA exception for Space Shuttle docking mechanism maintenance, purchase of services from Roskosmos is the only means by which NASA can meet its obligations under the original agreement. Responsibilities such as crew rescue and transportation services are critical to the ISS Program; further, the ISS Program is an important element of greater national interests.

The United States cannot expect to guarantee its place as a leader in science and technology if it is unable to actively participate in researching and exploring space. The ISS Program is vital in meeting this interest. Relationships with Russia and with other international partners are benefited from a well functioning ISS Program that allows and fosters international cooperation.

Though the impact of the INA has to present been experienced almost exclusively by the ISS Program at Johnson Space Center, if the policy continues to exist in its present form its effect will spread to the rest of NASA as well as the greater American scientific community. At a minimum, Congress, NASA and the other parties involved must agree on a non-legislative solution.

Through research, qualitative interviews, and discussions with NASA personnel and policy experts this team has formulated three potential options to address the INA-related difficulties from intervening events. Each option has its own particular impact on the relationship between NASA and the INA and all are not equally feasible. From these options, it is our recommendation that NASA should appeal to Congress to have the terms of the INA more clearly defined and in some cases loosened. Particularly, items that have been approved since the Act's passing should not require an entirely new approval process; "extraordinary payments" should be explicitly defined by the State Department and NASA together; and the transfer of funds should not be wholly forbidden. Services such as Soyuz astronaut transport and rescue, Progress up-mass and docking mechanism sustainment engineering should be approved as a category of acquisitions not requiring any further review.

This option best positions NASA to meet all of its ISS Program obligations and allows the U.S. to continue to use the ISS and NASA to further its national interests. In the case that this option is not adopted it remains imperative that some change take place. The cost of the *status quo* is the increased risk of more serious inefficiencies and, potentially soon, a failure of the United States to meet its obligations to the international partners or to build an effective international coalition for space exploration. As detailed above, this cost seems too high. Present action and meaningful relief from the INA are needed.

INDEX OF APPENDICES

H.R.1883 as found in the Library of Congress.

One Hundred Sixth Congress
of the
United States of America
AT THE SECOND SESSION

Begun and held at the City of Washington on Monday,

the twenty-fourth day of January, two thousand

An Act

To provide for the application of measures to foreign persons who transfer to Iran certain goods, services, or technology, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the `Iran Nonproliferation Act of 2000'.

SEC. 2. REPORTS ON PROLIFERATION TO IRAN.

(a) REPORTS- The President shall, at the times specified in subsection (b), submit to the Committee on International Relations of the House of Representatives and the Committee on Foreign Relations of the Senate a report identifying every foreign person with respect to whom there is credible information indicating that that person, on or after January 1, 1999, transferred to Iran--

(1) goods, services, or technology listed on--

(A) the Nuclear Suppliers Group Guidelines for the Export of Nuclear Material, Equipment and Technology (published by the International Atomic Energy Agency as Information Circular INFCIRC/254/Rev.3/Part 1, and subsequent revisions) and Guidelines for Transfers of Nuclear-Related Dual-Use Equipment, Material, and Related Technology (published by the International Atomic Energy Agency as Information Circular INFCIRC/254/Rev.3/Part 2, and subsequent revisions);

(B) the Missile Technology Control Regime Equipment and Technology Annex of June 11, 1996, and subsequent revisions;

(C) the lists of items and substances relating to biological and chemical weapons the export of which is controlled by the Australia Group;

(D) the Schedule One or Schedule Two list of toxic chemicals and precursors the export of which is controlled pursuant to the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction; or

(E) the Wassenaar Arrangement list of Dual Use Goods and Technologies and Munitions list of July 12, 1996, and subsequent revisions; or

(2) goods, services, or technology not listed on any list identified in paragraph (1) but which nevertheless would be, if they were United States goods, services, or technology, prohibited for export to Iran because of their potential to make a material contribution to the development of nuclear, biological, or chemical weapons, or of ballistic or cruise missile systems.

(b) TIMING OF REPORTS- The reports under subsection (a) shall be submitted not later than 90 days after the date of the enactment of this Act, not later than 6 months after such date of enactment, and not later than the end of each 6-month period thereafter.

(c) EXCEPTIONS- Any foreign person who--

(1) was identified in a previous report submitted under subsection (a) on account of a particular transfer; or

(2) has engaged in a transfer on behalf of, or in concert with, the Government of the United States,

is not required to be identified on account of that same transfer in any report submitted thereafter under this section, except to the degree that new information has emerged indicating that the particular transfer may have continued, or been larger, more significant, or different in nature than previously reported under this section.

(d) SUBMISSION IN CLASSIFIED FORM- When the President considers it appropriate, reports submitted under subsection (a), or appropriate parts thereof, may be submitted in classified form.

SEC. 3. APPLICATION OF MEASURES TO CERTAIN FOREIGN PERSONS.

(a) APPLICATION OF MEASURES- Subject to sections 4 and 5, the President is authorized to apply with respect to each foreign person identified in a report submitted pursuant to section 2(a), for such period of time as he may determine, any or all of the measures described in subsection (b).

(b) DESCRIPTION OF MEASURES- The measures referred to in subsection (a) are the following:

(1) EXECUTIVE ORDER NO. 12938 PROHIBITIONS- The measures set forth in subsections (b) and (c) of section 4 of Executive Order No. 12938.

(2) ARMS EXPORT PROHIBITION- Prohibition on United States Government sales to that foreign person of any item on the United States Munitions List as in effect on August 8, 1995, and termination of sales to that person of any defense articles, defense services, or design and construction services under the Arms Export Control Act.

(3) DUAL USE EXPORT PROHIBITION- Denial of licenses and suspension of existing licenses for the transfer to that person of items the export of which is controlled under the Export Administration Act of 1979 or the Export Administration Regulations.

(c) EFFECTIVE DATE OF MEASURES- Measures applied pursuant to subsection (a) shall be effective with respect to a foreign person no later than--

(1) 90 days after the report identifying the foreign person is submitted, if the report is submitted on or before the date required by section 2(b);

(2) 90 days after the date required by section 2(b) for submitting the report, if the report identifying the foreign person is submitted within 60 days after that date; or

(3) on the date that the report identifying the foreign person is submitted, if that report is submitted more than 60 days after the date required by section 2(b).

(d) PUBLICATION IN FEDERAL REGISTER- The application of measures to a foreign person pursuant to subsection (a) shall be announced by notice published in the Federal Register.

SEC. 4. PROCEDURES IF MEASURES ARE NOT APPLIED.

(a) REQUIREMENT TO NOTIFY CONGRESS- Should the President not exercise the authority of section 3(a) to apply any or all of the measures described in section 3(b) with respect to a foreign person identified in a report submitted pursuant to section 2(a), he shall so notify the Committee on International Relations of the House of Representatives and the Committee on Foreign Relations of the Senate no later than the effective date under section 3(c) for measures with respect to that person.

(b) WRITTEN JUSTIFICATION- Any notification submitted by the President under subsection (a) shall include a written justification describing in detail the facts and circumstances relating specifically to the foreign person identified in a report submitted pursuant to section 2(a) that support the President's decision not to exercise the authority of section 3(a) with respect to that person.

(c) SUBMISSION IN CLASSIFIED FORM- When the President considers it appropriate, the notification of the President under subsection (a), and the written justification under subsection (b), or appropriate parts thereof, may be submitted in classified form.

SEC. 5. DETERMINATION EXEMPTING FOREIGN PERSON FROM SECTIONS 3 AND 4.

(a) IN GENERAL- Sections 3 and 4 shall not apply to a foreign person 15 days after the President reports to the Committee on International Relations of the House of Representatives and the Committee on Foreign Relations of the Senate that the President has determined, on the basis of information provided by that person, or otherwise obtained by the President, that--

(1) the person did not, on or after January 1, 1999, knowingly transfer to Iran the goods, services, or technology the apparent transfer of which caused that person to be identified in a report submitted pursuant to section 2(a);

(2) the goods, services, or technology the transfer of which caused that person to be identified in a report submitted pursuant to section 2(a) did not materially contribute to Iran's efforts to develop nuclear, biological, or chemical weapons, or ballistic or cruise missile systems;

(3) the person is subject to the primary jurisdiction of a government that is an adherent to one or more relevant nonproliferation regimes, the person was identified in a report submitted pursuant to section 2(a) with respect to a transfer of goods, services, or technology described in section 2(a)(1), and such transfer was made consistent with the guidelines and parameters of all such relevant regimes of which such government is an adherent; or

(4) the government with primary jurisdiction over the person has imposed meaningful penalties on that person on account of the transfer of the goods, services, or technology which caused that person to be identified in a report submitted pursuant to section 2(a).

(b) OPPORTUNITY TO PROVIDE INFORMATION- Congress urges the President--

(1) in every appropriate case, to contact in a timely fashion each foreign person identified in each report submitted pursuant to section 2(a), or the government with primary jurisdiction over such person, in order to afford such person, or governments, the opportunity to provide explanatory, exculpatory, or other additional information with respect to the transfer that caused such person to be identified in a report submitted pursuant to section 2(a); and

(2) to exercise the authority in subsection (a) in all cases where information obtained from a foreign person identified in a report submitted pursuant to section 2(a), or from the government with primary jurisdiction over such person, establishes that the exercise of such authority is warranted.

(c) SUBMISSION IN CLASSIFIED FORM- When the President considers it appropriate, the determination and report of the President under subsection (a), or appropriate parts thereof, may be submitted in classified form.

SEC. 6. RESTRICTION ON EXTRAORDINARY PAYMENTS IN CONNECTION WITH THE INTERNATIONAL SPACE STATION.

(a) RESTRICTION ON EXTRAORDINARY PAYMENTS IN CONNECTION WITH THE INTERNATIONAL SPACE STATION- Notwithstanding any other provision of law, no agency of the United States Government may make extraordinary payments in connection with the International Space Station to the Russian Aviation and Space Agency, any organization or entity under the jurisdiction or control of the Russian Aviation and Space Agency, or any other organization, entity, or element of the Government of the Russian Federation, unless, during the fiscal year in which the extraordinary payments in connection with the International Space Station are to be made, the President has made the determination described in subsection (b), and reported such determination to the Committee on International Relations and the Committee on Science of the House of Representatives and the Committee on Foreign Relations and the Committee on Commerce, Science, and Transportation of the Senate.

(b) DETERMINATION REGARDING RUSSIAN COOPERATION IN PREVENTING PROLIFERATION TO IRAN- The determination referred to in subsection (a) is a determination by the President that--

(1) it is the policy of the Government of the Russian Federation to oppose the proliferation to Iran of weapons of mass destruction and missile systems capable of delivering such weapons;

(2) the Government of the Russian Federation (including the law enforcement, export promotion, export control, and intelligence agencies of such government) has demonstrated and continues to demonstrate a sustained commitment to seek out and prevent the transfer to Iran of goods, services, and technology that could make a material contribution to the development of nuclear, biological, or chemical weapons, or of ballistic or cruise missile systems; and

(3) neither the Russian Aviation and Space Agency, nor any organization or entity under the jurisdiction or control of the Russian Aviation and Space Agency, has, during the 1-year period prior to the date of the determination pursuant to this subsection, made transfers to Iran reportable under section 2(a) of this Act (other than transfers with respect to which a determination pursuant to section 5 has been or will be made).

(c) PRIOR NOTIFICATION- Not less than 5 days before making a determination under subsection (b), the President shall notify the Committee on International Relations and the Committee on Science of the House of Representatives and the Committee on Foreign Relations and the Committee on Commerce, Science, and Transportation of the Senate of his intention to make such determination.

(d) WRITTEN JUSTIFICATION- A determination of the President under subsection (b) shall include a written justification describing in detail the facts and circumstances supporting the President's conclusion.

(e) SUBMISSION IN CLASSIFIED FORM- When the President considers it appropriate, a determination of the President under subsection (b), a prior notification under subsection (c), and a written justification under subsection (d), or appropriate parts thereof, may be submitted in classified form.

(f) EXCEPTION FOR CREW SAFETY-

(1) EXCEPTION- The National Aeronautics and Space Administration may make extraordinary payments that would otherwise be prohibited under this section to the Russian Aviation and Space Agency or any organization or entity under the jurisdiction or control of the Russian Aviation and Space Agency if the President has notified the Congress in writing that such payments are necessary to prevent the imminent loss of life by or grievous injury to individuals aboard the International Space Station.

(2) REPORT- Not later than 30 days after notifying Congress that the National Aeronautics and Space Administration will make extraordinary payments under paragraph (1), the President shall submit to Congress a report describing--

(A) the extent to which the provisions of subsection (b) had been met as of the date of notification; and

(B) the measures that the National Aeronautics and Space Administration is taking to ensure that--

(i) the conditions posing a threat of imminent loss of life by or grievous injury to individuals aboard the International Space Station necessitating the extraordinary payments are not repeated; and

(ii) it is no longer necessary to make extraordinary payments in order to prevent imminent loss of life by or grievous injury to individuals aboard the International Space Station.

(g) SERVICE MODULE EXCEPTION- (1) The National Aeronautics and Space Administration may make extraordinary payments that would otherwise be prohibited under this section to the Russian Aviation and Space Agency, any organization or entity under the jurisdiction or control of the Russian Aviation and Space Agency, or any subcontractor thereof for the construction, testing, preparation, delivery, launch, or maintenance of the Service Module, and for the purchase (at a total cost not to exceed $14,000,000) of the pressure dome for the Interim Control Module and the Androgynous Peripheral Docking Adapter and related hardware for the United States propulsion module, if--

(A) the President has notified Congress at least 5 days before making such payments;

(B) no report has been made under section 2 with respect to an activity of the entity to receive such payment, and the President has no credible information of any activity that would require such a report; and

(C) the United States will receive goods or services of value to the United States commensurate with the value of the extraordinary payments made.

(2) For purposes of this subsection, the term `maintenance' means activities which cannot be performed by the National Aeronautics and Space Administration and which must be performed in order for the Service Module to provide environmental control, life support, and orbital maintenance functions which cannot be performed by an alternative means at the time of payment.

(3) This subsection shall cease to be effective 60 days after a United States propulsion module is in place at the International Space Station.

(h) EXCEPTION- Notwithstanding subsections (a) and (b), no agency of the United States Government may make extraordinary payments in connection with the International Space Station to any foreign person subject to measures applied pursuant to--

(1) section 3 of this Act; or

(2) section 4 of Executive Order No. 12938 (November 14, 1994), as amended by Executive Order No. 13094 (July 28, 1998).

Such payments shall also not be made to any other entity if the agency of the United States Government anticipates that such payments will be passed on to such a foreign person.

SEC. 7. DEFINITIONS.

For purposes of this Act, the following terms have the following meanings:

(1) EXTRAORDINARY PAYMENTS IN CONNECTION WITH THE INTERNATIONAL SPACE STATION- The term `extraordinary payments in connection with the International Space Station' means payments in cash or in kind made or to be made by the United States Government--

(A) for work on the International Space Station which the Russian Government pledged at any time to provide at its expense; or

(B) for work on the International Space Station, or for the purchase of goods or services relating to human space flight, that are not required to be made under the terms of a contract or other agreement that was in effect on January 1, 1999, as those terms were in effect on such date.

(2) FOREIGN PERSON; PERSON- The terms `foreign person' and `person' mean--

(A) a natural person that is an alien;

(B) a corporation, business association, partnership, society, trust, or any other nongovernmental entity, organization, or group, that is organized under the laws of a foreign country or has its principal place of business in a foreign country;

(C) any foreign governmental entity operating as a business enterprise; and

(D) any successor, subunit, or subsidiary of any entity described in subparagraph (B) or (C).

(3) EXECUTIVE ORDER NO. 12938- The term `Executive Order No. 12938' means Executive Order No. 12938 as in effect on January 1, 1999.

(4) ADHERENT TO RELEVANT NONPROLIFERATION REGIME- A government is an `adherent' to a `relevant nonproliferation regime' if that government--

(A) is a member of the Nuclear Suppliers Group with respect to a transfer of goods, services, or technology described in section 2(a)(1)(A);

(B) is a member of the Missile Technology Control Regime with respect to a transfer of goods, services, or technology described in section 2(a)(1)(B), or is a party to a binding international agreement with the United States that was in effect on January 1, 1999, to control the transfer of such goods, services, or technology in accordance with the criteria and standards set forth in the Missile Technology Control Regime;

(C) is a member of the Australia Group with respect to a transfer of goods, services, or technology described in section 2(a)(1)(C);

(D) is a party to the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction with respect to a transfer of goods, services, or technology described in section 2(a)(1)(D); or

(E) is a member of the Wassenaar Arrangement with respect to a transfer of goods, services, or technology described in section 2(a)(1)(E).

(5) ORGANIZATION OR ENTITY UNDER THE JURISDICTION OR CONTROL OF THE RUSSIAN AVIATION AND SPACE AGENCY- (A) The term `organization or entity under the jurisdiction or control of the Russian Aviation and Space Agency' means an organization or entity that--

(i) was made part of the Russian Space Agency upon its establishment on February 25, 1992;

(ii) was transferred to the Russian Space Agency by decree of the Russian Government on July 25, 1994, or May 12, 1998;

(iii) was or is transferred to the Russian Aviation and Space Agency or Russian Space Agency by decree of the Russian Government at any other time before, on, or after the date of the enactment of this Act; or

(iv) is a joint stock company in which the Russian Aviation and Space Agency or Russian Space Agency has at any time held controlling interest.

(B) Any organization or entity described in subparagraph (A) shall be deemed to be under the jurisdiction or control of the Russian Aviation and Space Agency regardless of whether--

(i) such organization or entity, after being part of or transferred to the Russian Aviation and Space Agency or Russian Space Agency, is removed from or transferred out of the Russian Aviation and Space Agency or Russian Space Agency; or

(ii) the Russian Aviation and Space Agency or Russian Space Agency, after holding a controlling interest in such organization or entity, divests its controlling interest.

Speaker of the House of Representatives.

Vice President of the United States and

President of the Senate.

END

Allison, Graham. Professor of Government and Director of the Belfer Center for Science and International Affairs, Harvard University and Former Assistant Secretary of Defense for Policy and Plans. Personal interview. Mar. 9th 2005.

"Arms proliferation and the Space Station." The Economist Mar. 12th 2005.

Ashton Carter, Brenda Shaffer, Henry Sokolski, Graham Allison, "The Iranian Nuclear Challenge," Harvard University Institute of Politics Forum, Harvard University, John F. Kennedy, Jr. Forum, Cambridge MA, Mar. 15th 2005.

Barry, Bill. Senior International Programs Specialist. Personal interview. Feb. 7th 2005.

Bartoe, Donna. Assistant Chief Counsel, International and Commercial Matters. Personal interview. Jan. 14th 2005.

Bresnik, Rebecca. Attorney Advisor, JSC. Personal interview. Jan. 14th 2005.

Commission of America's National Interests, *America's National Interests* (Cambridge: Commission on America's National Interests Copyright 2000), pp. 1-55.

"Committee expresses concern over Soyuz support to ISS." Aerospace Daily & Defense Report Mar. 8th 2005.

Cornelia Dean. "At NASA, Clouds Are What You Zoom Through to Get to Mars," New York Times 21 Mar. 21, 2005, 24 Mar. 2005 <http://www.nytimes.com/2005/ 03/21/ science/21nasa.html>.

Berger, Brian. "Current International Space Station Crew to Return on Soyuz in Late-April/Early-May," Space News, Feb. 27th 2003, Mar. 20th 2005, <http:// www.space.com/missionlaunches/iss_okeefe_030227.html>.

Frank, Robin. Senior Counselor for International Law. Personal interview. Feb. 7th 2005.

Gerstenmaier, William H. Manager, International Space Station Program. Personal interview. Jan. 14th 2005.

Graphic. *LF1*. Return to Flight Test Mission. April 1st 2005. <http://spaceflight.nasa.gov/station/assembly/flights/lf1.html>.

Grau, Ralph. NASA ISS Liaison to the Canadian Space Agency. Personal interview. Jan. 14th 2005.

Hawes, Michael. Special Assistant to the Associate Administrator, Space Operations Mission Directorate and Former ISS Program Director. Personal interview. Feb. 7th 2005.

Holdren, John. Professor of Environmental Policy and Director of the Program on Science, Technology, and Public Policy, Harvard University and Chair of the Committee on International Security and Arms Control of the National Academy of Sciences. Personal interview. Mar. 22nd 2005.

"Human space-flight." The Economist Nov. 16th 2002.

Kelly, Brian. Manager, International Space Station External Relations. Personal interview. Jan. 14th 2005.

McSweeney, Dennis. Senior International Programs Specialist and Former NASA Representative to Russia. Personal interview. Feb. 7th 2005.

Patterson, Thomas E. Professor of Government and the Press, Harvard University. Multiple personal discussions. Fall 2004, Spring 2005.

Precourt, Charlie. Deputy Manager, International Space Station Program and Former Chief Astronaut. Personal interview. Jan. 13th 2005.

Ratcliff, Blake. Manager Russian Integration. Personal interview. Jan. 13th 2005.

"Russia warns USA and partners of urgent need for ISS support funds." Flight International Mar. 11th 2003.

Saunders, Melanie. Deputy Manager, International Space Station External Relations. Personal interview. Jan. 14th 2005.

Schillinger, Ian. Nuclear Engineer Officer, U.S. Navy. Multiple personal discussions. Fall 2004, Spring 2005.

Suffredini, Michael. Deputy Manager, International Space Station Program. Personal interview. Jan. 14th 2005.

Theall, Jeff. Manager, Russian Elements Integration Office. Personal interview. Jan. 14th 2005.

"Time to scuttle the Space Shuttle." The Economist Aug. 30th 2003.

"Unanswered Questions; NASA budget hearing foreshadows coming debate on exploration plans." Aviation Week & Space Technology Feb. 21st 2005.

"Where next for the shuttle." The Economist Feb. 8th 2003.

"Why Do Research Off The Planet," NASA, ed. John Ira Petty, June 26th 2003, Mar. 24th 2005, < http://spaceflight.nasa.gov/station/science/>.

Zinberg, Dorothy Shore. Lecturer in Science, Technology and Public Policy, Harvard University. Multiple personal discussions. Fall 2004, Spring 2005.