



February 2016

NUCLEAR NONPROLIFERATION

Preliminary Observations on IAEA's Role in Verifying the Iran Agreement

Accessible Version

GAO Highlights

Highlights of [GAO-16-417](#), a report to congressional requesters

Why GAO Did This Study

In July 2015, multilateral talks with Iran culminated in an agreement called the Joint Comprehensive Plan of Action (JCPOA), through which Iran committed to limits on its nuclear program in exchange for relief from sanctions put in place by the United States and other nations. The International Atomic Energy Agency (IAEA), an independent international organization that administers safeguards designed to detect and deter the diversion of nuclear material for non-peaceful purposes, was requested to monitor and verify Iran's adherence to these limits. The U.S. Department of State coordinates the United States' financial and policy relationship with IAEA.

GAO was asked to review the authorities and resources IAEA has to carry out its activities regarding the JCPOA. On the basis of preliminary results of ongoing work that GAO is conducting, this report provides observations on (1) the JCPOA commitments that IAEA has been asked to verify and its authorities to do so, (2) the resources IAEA has identified as necessary to verify the JCPOA, and (3) potential challenges and mitigating actions IAEA and others have identified with regard to verifying the JCPOA. GAO analyzed the JCPOA and key IAEA documents and interviewed current and former IAEA officials, U.S. government officials, national laboratory representatives, and experts from research institutions.

GAO is not making recommendations at this time and expects to issue a final report on this work later this year.

View [GAO-16-417](#). For more information, contact David C. Trimble at (202) 512-3841 or trimbled@gao.gov.

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What GAO Found

As outlined in the JCPOA, IAEA was asked to verify Iran's implementation of a range of nuclear-related commitments, and IAEA uses its authorities and conducts additional verification activities to do so, according to IAEA. Iran's commitments include limits on uranium enrichment levels and enriched uranium inventories. GAO's preliminary observations indicate that IAEA plans to verify Iran's implementation of these commitments through a range of activities conducted by its Safeguards Department, such as inspecting Iran's nuclear facilities and analyzing environmental samples. To verify Iran's implementation of its commitments under the JCPOA, IAEA officials told GAO that the agency uses its authorities and conducts additional verification activities agreed to by Iran under the JCPOA, such as monitoring Iran's uranium mines and mills. In addition, under the JCPOA, Iran agreed to provisionally apply the Additional Protocol, an agreement that will expand IAEA's access, including to locations where undeclared materials and activities—those that an IAEA member state is required to, but has not declared under its agreements with IAEA—may be suspected. The JCPOA also includes a mechanism in which participants to the agreement commit to resolve an access request from the agency within 24 days after the request is made.

GAO's preliminary observations indicate that IAEA has identified the resources necessary to verify the nuclear-related commitments in the JCPOA. IAEA has estimated that it needs approximately \$10 million per year for 15 years in additional funding above its current safeguards budget for JCPOA verification. In addition, IAEA plans to transfer 18 experienced inspectors to its Iran Task Force from other safeguards divisions and to hire and train additional inspectors. According to IAEA officials, existing safeguards technical resources are sufficient to implement the JCPOA. According to IAEA documents, all of IAEA's JCPOA work through 2016 will be funded through extra-budgetary contributions. IAEA officials said that the agency intends to propose that of the \$10 million, approximately \$5.7 million for all Additional Protocol activities and inspector costs attributable to the JCPOA be funded through IAEA's regular budget after 2016.

GAO's preliminary observations indicate that IAEA may face potential challenges in monitoring and verifying Iran's implementation of certain nuclear-related commitments in the JCPOA. According to current and former IAEA and U.S. officials and experts, these potential challenges include (1) integrating JCPOA-related funding into its regular budget and managing human resources in the safeguards program, (2) access challenges depending on Iran's cooperation and the untested JCPOA mechanism to resolve access requests, and (3) the inherent challenge of detecting undeclared nuclear materials and activities—such as potential weapons development activities that may not involve nuclear material. According to knowledgeable current and former U.S. government officials, detection of undeclared material and activities in Iran and worldwide is IAEA's greatest challenge. According to IAEA documents, Iran has previously failed to declare activity to IAEA. However, according to a former IAEA official as well as current IAEA and U.S. government officials GAO interviewed, IAEA has improved its capabilities in detecting undeclared activity, such as by adapting its inspector training program.

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Abbreviations

CSA	Comprehensive Safeguards Agreement
DOE	Department of Energy
IAEA	International Atomic Energy Agency
INFCIRC	Information circular
JCPOA	Joint Comprehensive Plan of Action
NNSA	National Nuclear Security Administration
NPT	Treaty on the Nonproliferation of Nuclear Weapons
PMD	Possible Military Dimensions
TC	Technical Cooperation
TCF	Technical Cooperation Fund
UN	United Nations

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February 12, 2016

The Honorable Mark Kirk
Chairman
Subcommittee on National Security and International Trade and Finance
Committee on Banking, Housing, and Urban Affairs
United States Senate

The Honorable Nita Lowey
Ranking Member
Subcommittee on State, Foreign Operations, and Related Programs
Committee on Appropriations
House of Representatives

The Honorable Robert Menendez
United States Senate

Iran's efforts to develop a nuclear program have threatened regional and global security and presented significant challenges to the United States. The United States and other nations imposed sanctions on Iran that have adversely affected the Iranian economy.¹ In July 2015, multilateral talks with Iran culminated in an agreement—the Joint Comprehensive Plan of Action (JCPOA)—in which the United States, France, Germany, the United Kingdom, Russia, and China, with the High Representative of the European Union for Foreign Affairs and Security Policy, agreed to reciprocal commitments with Iran.² These commitments include providing sanctions relief if Iran addressed those countries' concerns about its nuclear program. The JCPOA details, among other things, Iran's commitments related to its nuclear facilities, equipment, materials, and activities. The United Nations Security Council endorsed the JCPOA and requested that the

¹For a description of the effects of sanctions on Iran, see GAO, *Iran: U.S. and International Sanctions Have Adversely Affected the Iranian Economy*, [GAO-13-326](#) (Washington, D.C.: Feb. 25, 2013).

²In November 2013, these multilateral talks resulted in the interim Joint Plan of Action, an initial understanding with Iran to explicitly block near-term Iranian pathways to a nuclear weapon and allow further talks to reach a long-term comprehensive solution. The participants to the agreement in addition to Iran are collectively referred to as the E3+3 (i.e., France, Germany, and the United Kingdom plus China, Russia, and the United States).

International Atomic Energy Agency (IAEA) monitor and verify these commitments.³ IAEA—an independent international organization based in Vienna, Austria, and affiliated with the United Nations—has the dual mission of promoting the peaceful uses of nuclear energy and verifying that nuclear technologies and materials intended for peaceful purposes are not diverted to weapons development efforts.

The Treaty on the Nonproliferation of Nuclear Weapons (NPT), which came into force in 1970, requires non-nuclear weapon states that are party to the treaty—countries, such as Iran, that had not manufactured and detonated a nuclear device before January 1, 1967—to agree not to acquire nuclear weapons and to subject all nuclear material used in peaceful activities to IAEA safeguards.⁴ IAEA has found Iran to be in non-compliance with its safeguards obligations within the last 15 years.

You asked us to review the authorities and resources IAEA has to carry out its activities to monitor and verify certain nuclear-related commitments under the JCPOA. In response to that request, we have work ongoing on IAEA's authorities, resources, and potential challenges faced in supporting implementation of the JCPOA. In January 2016, we briefed your staff on the preliminary results of our work, and this report transmits information from that briefing. Specifically, this report provides our preliminary observations on (1) the JCPOA commitments that IAEA has been asked to verify and its authorities to do so; (2) the resources IAEA has identified as necessary to verify the JCPOA; and (3) potential challenges and mitigating actions, if any, IAEA and others have identified with regard to verifying the JCPOA. We will issue a separate report with the final results of our work later this year.

To identify the nuclear-related commitments in the JCPOA that IAEA has been asked to verify and IAEA's authorities for verifying these

³S.C. Res. 2231, U.N. Doc. S/RES/2231 (July 20, 2015).

⁴Under Article II of the NPT, each non-nuclear weapon state party agrees, among other things, not to receive any transfer whatsoever of nuclear weapons or other nuclear explosive devices; not to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices; and not to seek or receive any assistance in the manufacture of nuclear weapons or other nuclear explosive devices. Under Article III of the NPT, each non-nuclear weapon state party agrees, among other things, to accept IAEA safeguards on all source or special fissionable material in all peaceful nuclear activities within the territory of such state, under its jurisdiction, or carried out under its control anywhere.

commitments, we analyzed the JCPOA, and IAEA documentation concerning the safeguards legal framework, including the Statute of the IAEA (the Statute),⁵ information circular (INFCIRC)/153, which provides the basis for a comprehensive safeguards agreement (CSA) that most countries have concluded with IAEA and that covers all of the countries' civilian nuclear activities, and INFCIRC/540, which provides the basis for an Additional Protocol that most countries with a CSA have concluded with IAEA to provide additional information about countries' nuclear and nuclear-related activities. To examine the resources IAEA has identified as necessary to verify the JCPOA, we reviewed IAEA planning and budget documents, such as "The Agency's Programme and Budget 2016–2017," and statements by the IAEA Director General. In addition, to further understand IAEA authorities and resource needs, and to examine potential challenges and mitigating actions IAEA and others have identified with regard to verifying the JCPOA, we interviewed officials of IAEA, the Department of State, and the Department of Energy's (DOE) National Nuclear Security Administration (NNSA);⁶ as well as representatives of Oak Ridge National Laboratory, Los Alamos National Laboratory, Sandia National Laboratories, Lawrence Livermore National Laboratory, and Brookhaven National Laboratory. We also interviewed 8 former IAEA and 10 former U.S. government and national laboratory officials, and representatives of 10 expert organizations—research institutions and nongovernmental organizations with knowledge in the areas of nuclear

⁵The Statute of the International Atomic Energy Agency, done Oct. 26, 1956, 8 U.S.T. 1093, 276 U.N.T.S. 3 (entered into force July 29, 1957).

⁶NNSA is a separate, semi-autonomous agency within the Department of Energy, with responsibility for the United States' nuclear weapons and nonproliferation programs, among other things. NNSA conducts its activities at headquarters and at research and development laboratories, production plants, and other facilities. NNSA also provides technical assistance to IAEA's safeguards and nuclear security programs.

verification, monitoring, and safeguards.⁷ Appendix I provides a more detailed discussion of our objectives, scope, and methodology.

Our preliminary observations are based on our ongoing work, which is being conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

IAEA safeguards are a set of technical measures and activities by which IAEA seeks to verify that nuclear material subject to safeguards is not diverted to nuclear weapons or other proscribed purposes. To carry out its safeguards activities, inspectors and analysts in IAEA's Safeguards Department collaborate to verify that the quantities of nuclear material that non-nuclear weapon states have formally declared to the agency are correct and complete. All NPT non-nuclear weapon states are required to have a CSA that covers all of their civilian nuclear activities and serves as the basis for the agency's safeguards activities. Iran's CSA entered into force in May 1974.⁸ Most countries with a CSA have also brought into force an Additional Protocol to their CSAs. IAEA developed the Additional Protocol to provide additional information about countries' nuclear and nuclear-related activities as part of its response to the 1991 discovery of a clandestine nuclear weapons program in Iraq. The Additional Protocol, when ratified or otherwise brought into force by a country, requires that country to provide IAEA with a broader range of information on the country's nuclear

⁷We selected these experts by first identifying organizations that had previously served as sources of IAEA subject matter experts for GAO. To ensure a wide range of viewpoints, we supplemented our initial selection with individuals and organizations identified through a literature search and by recommendations from our initial set of expert organizations. We requested interviews from all the identified experts and suggested contacts and interviewed all who agreed to participate (two experts provided written responses in lieu of in-person interviews). When referring to former U.S. and IAEA officials and expert organizations throughout the report, we use "some" to refer to three members of a group, "several" to refer to four or five members of a group, and "many" to refer to more than five members of a group.

⁸IAEA, "The Text of the Agreement between Iran and the Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons." INFCIRC/214 (Dec. 13, 1974.)

and nuclear-related activities. It also gives the agency's inspectors access to an expanded range of declared activities and locations, including buildings at nuclear sites, as well as locations where undeclared activities may be suspected. Undeclared nuclear material and activities are those a state has not declared and placed under safeguards but is required to do so pursuant to its CSA.⁹

In addition to its safeguards program, IAEA's other programs include nuclear safety and security, nuclear energy, nuclear sciences, and technical cooperation. For example, IAEA's technical cooperation program helps member states achieve their sustainable development priorities by furnishing them with relevant nuclear technologies and expertise. IAEA funds its programs primarily through (1) its regular budget, for which all member countries are assessed,¹⁰ and (2) voluntary extra-budgetary cash contributions from certain member countries and other donors to meet critical needs.¹¹ In 2015, IAEA reported that its regular budget was \$375.8 million, of which the nuclear verification program (i.e., safeguards) budget comprised \$144.2 million. IAEA has a Board of Governors that provides overall policy direction and oversight for the agency. A Secretariat, headed by the Director General, is responsible for implementing the policies and programs of the IAEA General Conference and the Board of Governors.¹² The U.S. Department of State coordinates the United States' financial and policy relationship with IAEA.

Under the JCPOA, IAEA verification of Iran's implementation of its nuclear-related commitments was a condition to the lifting of specified U.S., European Union, and United Nations nuclear-related sanctions on

⁹Additionally, for a state that has an Additional Protocol in force, undeclared nuclear material also covers nuclear material which that state has not declared but is required to do so under the Additional Protocol.

¹⁰Assessed contributions are payments made as part of the obligations that countries undertake as members of the United Nations. The current payment structure for assessed contributions to IAEA is based on the United Nations scale of assessment, adjusted for membership, with a maximum rate (25 percent) and a minimum rate (.001 percent). The scale for IAEA also includes a slight premium to cover the costs of the nuclear safeguards program.

¹¹In addition, financing of Technical Cooperation (TC) projects is generally supported through the annual voluntary contributions of member states to IAEA's Technical Cooperation Fund (TCF).

¹²The General Conference is composed of representatives of 167 countries (member states) that contribute to IAEA's budget.

Iran. These sanctions were lifted on the JCPOA's "Implementation Day" (January 16, 2016), when IAEA verified and reported that Iran had fully implemented its commitments defined in Annex V, paragraph 15, of the JCPOA.¹³ In addition, the JCPOA provides for a "Transition Day," when the United States and European Union will take further steps to eliminate nuclear-related sanctions on Iran, either on October 18, 2023, or before if IAEA reaches what it calls a "broader conclusion." A broader conclusion refers to the agency's determination that for a given year, a country has demonstrated that all declared nuclear material within its borders remained in peaceful activities and that there are no indications of diversion of declared nuclear material or of undeclared nuclear activities.

IAEA Uses Its Authorities to Carry out Its Verification Activities under the JCPOA

IAEA has been requested to verify Iran's implementation of a range of nuclear-related commitments, and our preliminary observations indicate that IAEA is using existing authorities to do so. Iran's commitments include limits on, among other things, Iran's enrichment facilities, including numbers of centrifuges (for example, no more than 5,060 of specified centrifuges for 10 years), uranium enrichment levels of no more than 3.67 percent for 15 years, and stocks of enriched uranium of no more than 300 kilograms for 15 years.¹⁴ In addition, Iran agreed to (1) limits on its heavy water inventories;¹⁵ (2) limits on centrifuge manufacturing; and

¹³These commitments are specified in Sections 15.1-15.11 of Annex V of the JCPOA. The JCPOA also contains provisions describing the circumstances under which a participant may cease performance of its commitments. These commitments include the provision of sanctions relief. Furthermore, the United Nations Security Council Resolution endorsing the JCPOA details the circumstances under which United Nations Security Council sanctions might be re-imposed.

¹⁴The JCPOA specifies that Iran will maintain a total enriched uranium stockpile of no more than 300 kilograms of up to 3.67 percent enriched uranium hexafluoride (UF₆) (or the equivalent in different chemical forms) for 15 years. However, the agreement also details cases when certain enriched uranium will not count against the limit. For example, Russian-designed, fabricated and licensed fuel assemblies for use in Russian-supplied reactors in Iran do not count against the 300 kilograms UF₆ stockpile limit.

¹⁵Heavy water, which contains deuterium (heavy hydrogen), is used in heavy water reactors as a moderator. Heavy water reactors can be efficient at producing plutonium under certain conditions.

(3) conditions on uranium ore concentrate.¹⁶ Iran also agreed not to engage in spent fuel reprocessing, uranium or plutonium metallurgy, or activities that could contribute to the design and development of a nuclear explosive device. The duration of certain commitments is from 8 (for certain centrifuge restrictions) to 25 years (for monitoring of Iran's uranium ore concentrate). Iran also agreed to fully implement the "Roadmap for Clarification of Past and Present Outstanding Issues" agreed to with IAEA. The Roadmap sets out a process for IAEA to address issues relating to the "possible military dimensions" (PMD) of Iran's nuclear program.¹⁷ IAEA issued a report on the results of its PMD investigation in December 2015,¹⁸ and the Board of Governors subsequently issued a resolution closing its consideration of PMD. State officials noted that the Board, in its resolution, stated that it will be watching closely to verify that Iran fully implements its commitments under the JCPOA and will remain focused going forward on the full implementation of the JCPOA in order to ensure the exclusively peaceful nature of Iran's nuclear program.

According to officials in IAEA's Office of the Legal Affairs, the agency will draw on existing authorities to verify Iran's implementation of these commitments. For example, using its safeguards authorities, including the CSA, IAEA will verify implementation of most of Iran's nuclear-related commitments largely through a range of traditional safeguards approaches and techniques that it has used in the past, such as inspecting nuclear facilities and conducting nuclear material accountancy to verify quantities of nuclear material declared to the agency and any changes in the quantities over time. For example, to verify non-diversion of nuclear material, IAEA inspectors count items (e.g., containers of uranium or plutonium), measure attributes of these items (e.g., isotopic

¹⁶The JCPOA states that Iran will permit IAEA to monitor, through agreed measures that will include containment and surveillance measures, for 25 years, that all uranium ore concentrate produced in Iran or obtained from any other source, is transferred to a uranium conversion facility in Iran. Uranium ore is the product of uranium mining, and uranium ore concentrate is the product of uranium milling. The two steps in the uranium nuclear fuel cycle prior to conversion are mining and milling. IAEA discusses its activities related to uranium ore concentrate as monitoring mines and mills.

¹⁷In 2002, IAEA became increasingly concerned about the possible existence in Iran of undisclosed nuclear-related activities involving military-related organizations. Information indicated that Iran had carried out activities relevant to the development of a nuclear explosive device.

¹⁸IAEA, "Final Assessment on Past and Present Outstanding Issues regarding Iran's Nuclear Programme," GOV/2015/68 (Dec. 2, 2015).

composition), and compare their findings with records and declared amounts. Other IAEA safeguards activities include environmental sampling,¹⁹ remote monitoring, analysis of commercial satellite imagery, and analysis of open source documents.

Under the JCPOA, IAEA also conducts certain activities agreed to by Iran, such as monitoring of Iran's uranium mines and mills, according to IAEA officials. Such activities include containment and surveillance measures. Containment and surveillance measures include using video cameras to detect movement of nuclear material and tampering with agency equipment as well as seals that indicate whether the state has tampered with installed IAEA safeguards systems. Further, under the JCPOA, Iran agreed to provisionally apply, and seek ratification of the Additional Protocol, which gives the agency's inspectors access to an expanded range of declared activities and locations, including buildings at nuclear sites, and locations where undeclared activities may be suspected.²⁰ Under the JCPOA, Iran also agreed to fully implement "Modified Code 3.1" of the subsidiary arrangement to its CSA.²¹ According to IAEA, the text of the Modified Code 3.1 in Iran's subsidiary arrangement is based on model language under which a country is generally required to provide preliminary design information for new nuclear facilities "as soon

¹⁹IAEA inspectors collect environmental samples from nuclear facilities and other locations, and IAEA's Network of Analytical Laboratories analyzes these samples to detect traces, if any, of undeclared nuclear material.

²⁰Iran signed an Additional Protocol in December 2003 but has not brought it into force, and ceased implementing it in February 2006. According to IAEA officials, since Implementation Day (January 16, 2016), Iran has been provisionally applying its Additional Protocol. IAEA regards this as if the Additional Protocol were "in force."

²¹According to reports from the IAEA Director General to the Board of Governors, IAEA agreed to implement Modified Code 3.1 beginning in 2003 and ceased to implement it in 2007. In March 2007, Iran notified IAEA that it had suspended the implementation of Modified Code 3.1, and that it would revert to the previous version of the code, which only required submission of design information for a new facility 180 days before introducing nuclear material into it. The Director General disagreed and asserted that Iran remained bound by the revised Code 3.1. See IAEA, "Implementation of the NPT Safeguards Agreement and Relevant Provisions of Security Council Resolutions in the Islamic Republic of Iran," GOV/2007/22 (May 23, 2007), and IAEA, "Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions 1737 (2006), 1747 (2007), 1803 (2008) and 1835 (2008) in the Islamic Republic of Iran," GOV/2009/74 (Nov. 16, 2009).

as the decision to construct, or to authorize construction, of such a facility has been taken, whichever is earlier.”²²

In addition, Iran made commitments under the JCPOA to cooperate with IAEA and facilitate its safeguards activities. For example, Iran agreed to make arrangements to allow for the long-term presence of IAEA inspectors by issuing long-term visas, among other things. Iran also agreed to permit the use of modern technologies such as online enrichment monitors to increase the efficiency of monitoring activities. The JCPOA includes a mechanism in which its participants commit to resolve an access request from the agency within 24 days after the request is made. The JCPOA also describes a dispute resolution mechanism through which a participant in the agreement can bring a complaint if it feels that commitments are not being met and that allows the participant to cease performance of its commitments in certain cases if dispute resolution fails to resolve the participant’s concerns.

Iran has also agreed to import enumerated nuclear-related and nuclear-related dual-use materials and equipment exclusively through a new “procurement channel” established under the JCPOA.²³ The JCPOA details the establishment of a Joint Commission comprised of representatives of participants in the agreement, whose “procurement working group” will provide information to IAEA on these proposed imports.²⁴ Under the JCPOA, IAEA may access the locations of intended use of such nuclear-related imports.²⁵ IAEA officials told us that they expect the information

²²According to IAEA, the text of Iran’s Modified Code 3.1 is based on language contained in the Model Subsidiary Arrangements General Part (Fifth Revision) dated July 3, 1992.

²³The items to be imported through the procurement channel include certain nuclear material, equipment, and technology as well as certain nuclear-related dual-use equipment, materials, software and related technology listed in two IAEA documents: INFCIRC/254/Rev.12/Part 1 and INFCIRC/254/Rev.9/Part 2.

²⁴The JCPOA details the establishment of a Joint Commission comprising representatives of participants in the agreement (i.e., Iran and the E3+3) and provides that the Joint Commission may establish Working Groups in particular areas, as appropriate. The JCPOA states that the Joint Commission is to establish a Procurement Working Group to review and make recommendations on proposals by states seeking to engage in nuclear commerce with Iran.

²⁵ The JCPOA states that, “Iran will provide to the IAEA access to the locations of intended use of all items, materials, equipment, goods and technology set out in INFCIRC/254/Rev.12/Part 1 (or the most recent version of these documents as updated by the Security Council) ...”

provided through the procurement channel to support the agency's efforts to detect undeclared activity.

IAEA Has Identified the Financial, Human, and Technical Resources Necessary to Verify the Nuclear-Related Commitments in the JCPOA

Our preliminary observations indicate that IAEA has estimated the financial, human, and technical resources necessary to verify Iran's implementation of nuclear-related commitments in the JCPOA. IAEA has estimated that it needs approximately \$10 million per year for 15 years in additional funding above its current safeguards budget to fund additional inspections, among other things.²⁶ Of this amount, IAEA estimates that it will need about \$3.3 million for costs associated with implementing the Additional Protocol, about \$2.4 million for other inspector and direct staff costs, and about \$4.4 million in other costs, such as travel, equipment, and support services beyond those associated with Additional Protocol implementation (see table 1).

²⁶IAEA, "Verification and Monitoring in the Islamic Republic of Iran in light of United Nations Security Council Resolution 2231 (Aug. 14, 2015)," a report by the Director General to the Board of Governors. This report provides this estimate based on activities foreseen as being applicable for 15 years. IAEA officials told us that after 10 years, they will consider incoming information to refine the estimate going forward. The preliminary estimate for the safeguards budget for 2016 and 2017 is approximately \$146.9 million per year, according to "The Agency's Programme and Budget 2016 –2017."

Table 1: International Atomic Energy Agency (IAEA) Estimates for Its Annual Funding Requirements for Joint Comprehensive Plan of Action (JCPOA) Activities

Note: Dollars in millions

Funding requirements by category	Human resources	Other costs	Total
Additional Protocol: inspector and direct staff costs	1.6	N/A	1.6
Additional Protocol: travel, equipment, support staff from other safeguards divisions, and other	1.0	0.7	1.6
Subtotal: Additional Protocol	2.6	0.7	3.3
Other nuclear-related commitments: inspector and direct staff costs	2.4	N/A	2.4
Other nuclear-related commitments: travel, equipment, support staff from other safeguards divisions, and other	2.5	1.8	4.4
Subtotal: Other nuclear-related commitments	4.9	1.8	6.7
Total JCPOA	7.5	2.5	10

Source: GAO analysis of IAEA data. | GAO-16-417

Notes: Costs were calculated at the average exchange rate used by the Department of Treasury of \$1 to €.919. Numbers may not add to totals because of rounding.

IAEA officials said that, pursuant to the Statute, the agency intends to propose to the Board of Governors that the approximately \$5.7 million for all Additional Protocol activities and inspector costs attributable to the JCPOA be funded through IAEA’s regular budget after 2016. These officials said that the remaining \$4.4 million in estimated funding needs for the following 15 years will remain unfunded in the regular budget and will therefore be supported through extra-budgetary funding. Under the Statute of the IAEA, IAEA is to apportion the costs of implementing safeguards, which would include inspector salaries and the cost of implementing the Additional Protocol, through assessments on member countries.²⁷ As previously noted, such assessments form IAEA’s regular budget. The Statute also states that any voluntary contributions may be used as the Board of Governors, with the approval of the General Conference, may determine.²⁸ The JCPOA was not finalized in time for the agency to include these costs for 2016 in its assessments. Consequently, according to a 2015 IAEA report, all of IAEA’s JCPOA work through 2016 will be

²⁷ Article XIV(B)1.(b) and Article XIV.D of the Statute of the IAEA, respectively.

²⁸ Article XIV.F of the Statute of the IAEA.

funded through extra-budgetary contributions.²⁹ According to IAEA officials, how quickly the \$5.7 million in JCPOA costs are incorporated into the regular budget depends on member state support. These officials told us that IAEA hopes to resolve the questions about funding the JCPOA through the regular budget by the June 2016 Board of Governors meeting.

IAEA's annual \$10 million funding estimate includes approximately \$7.5 million in funding to cover estimated human resource costs associated with additional inspectors and support services under the JCPOA. IAEA officials told us that the agency plans to transfer 18 experienced inspectors and nearly twice that number of other staff to its Iran Task Force from other divisions within its Safeguards Department that cover countries and regions beyond Iran.³⁰ According to IAEA officials, the other Safeguards divisions would backfill the vacancies created by the transfer of inspectors to the Iran Task Force by hiring and training new inspectors. In addition, according to IAEA officials, existing safeguards technical resources are sufficient to implement IAEA's activities under the JCPOA.

Verifying the JCPOA's Nuclear-Related Commitments May Present Potential Challenges to IAEA's Safeguards Efforts

Our preliminary observations indicate that IAEA may face some potential challenges in monitoring and verifying Iran's implementation of certain nuclear-related commitments in the JCPOA, according to current U.S. and IAEA officials as well as some former U.S. officials, several former IAEA officials, and many expert organizations we interviewed. These potential challenges include (1) the inherent challenge of detecting undeclared nuclear materials and activities, (2) potential access challenges to sites in Iran, and (3) safeguards resource management challenges.

²⁹IAEA, Report by the Director General to the Board of Governors, "Verification and Monitoring in the Islamic Republic of Iran in light of United Nations Security Council Resolution 2231 (2015)."

³⁰According to the Director General's opening statement to the January 2016 Board of Governors meeting, the Director General plans to establish an Office in the Department of Safeguards to take charge of the agency's safeguards, and verification and monitoring activities in Iran. This will replace the existing Iran Task Force.

IAEA Faces an Inherent Challenge in Detecting Undeclared Nuclear Materials and Activities

Our preliminary observations indicate that detection of undeclared nuclear materials and activities is an inherent challenge for IAEA particularly with regard to activities that do not involve nuclear material, such as some weapons development activities and centrifuge manufacturing, according to current U.S. officials, a former U.S. official, several former IAEA officials, and several expert organizations we interviewed. According to U.S. government officials, as well as a former U.S. official, detection of undeclared material and activities in Iran and worldwide is IAEA's greatest challenge. Iran has previously failed to declare activity to IAEA. For example, according to IAEA documents, prior to 2003, Iran failed to provide IAEA information on a number of nuclear-fuel-cycle-related activities and nuclear material.³¹ In addition, according to IAEA documents and officials, Iran failed to notify the agency before 2009 that it had constructed the Fordow enrichment facility, as required under Modified Code 3.1 of the subsidiary arrangement to Iran's CSA.

To detect undeclared materials and activities,³² IAEA looks for indicators of such activities, including equipment, nuclear and non-nuclear material, infrastructure support, and traces in the environment, according to an IAEA document. However, some activities may not be visible through satellite imagery or do not involve nuclear material, and may not leave traces in the environment, such as some weapons development activities. According to a former U.S. government official, some former IAEA officials, and several expert organization interviews, this creates a challenge for IAEA in detecting undeclared activity.

Furthermore, according to one expert organization we interviewed, the Board of Governors' vote to close its consideration of the PMD issue without a complete accounting of Iran's past nuclear program could reduce the indicators at IAEA's disposal to detect potential undeclared activity. However, DOE officials noted that under the JCPOA, IAEA will have the authorities of the Additional Protocol and enhanced transparency measures of the JCPOA with which to investigate any indication of undeclared activities. In addition, IAEA officials told us that

³¹The nuclear fuel cycle refers to the series of processes used to make fuel for nuclear reactors that may also be used to produce material for nuclear weapons.

³²For all states with a CSA and an Additional Protocol in force, the IAEA looks for indications of (1) the diversion of declared nuclear material from peaceful activities, and (2) undeclared nuclear material or activities.

any uncertainties regarding the peaceful nature of Iran's nuclear program that may arise during the course of the agency's verification and monitoring under the JCPOA would have to be resolved for the agency to reach a broader conclusion that all nuclear material in Iran remains in peaceful activities. IAEA officials told us that the agency does not draw a broader conclusion lightly, for any state, and that it has traditionally taken 3 to 5 years for most member states.

According to a former IAEA official as well as current IAEA and U.S. government officials we interviewed, IAEA has improved its capabilities in detecting undeclared activity. For example, according to U.S. government officials and national laboratory representatives, IAEA has adapted its inspector training program to focus on potential indicators of undeclared activity, beyond the agency's traditional safeguards focus on nuclear materials accountancy. IAEA also has analytical tools at its disposal, some of which IAEA officials demonstrated to us, to detect undeclared activity worldwide. Furthermore, IAEA receives member-state support in detecting undeclared activity. For example, member states provided some of the information that formed the basis of IAEA's PMD investigation. State officials agreed that the detection of undeclared nuclear material and activities in Iran, and all states, is a serious challenge for IAEA, but added that the JCPOA puts IAEA in a better position to detect such activities in Iran.

The procurement channel established under the JCPOA may also serve as an additional source of indicators for IAEA on potential undeclared activities in Iran, according to current and two former U.S. government officials as well as representatives from two organizations we interviewed. IAEA officials told us that there is additional work to be done in informing exporting countries of their obligations and standardizing the data that the countries would report to IAEA so that they are usable to the agency. Officials noted that ensuring that countries report the data as required is particularly a challenge for countries that do not have a robust export control system.

IAEA Access Depends on Iran's Cooperation and the JCPOA Mechanism to Resolve Access Requests Is Untested

Our preliminary observations indicate that IAEA could face potential challenges in gaining access to Iranian sites, according to two former U.S. government officials, a former IAEA official, and one expert organization. IAEA's safeguards activities in Iran, as in every state, depend on the cooperation of the member state, and those officials noted that Iran has a history of denying access to IAEA inspectors. For example, IAEA requested access in February 2012 to the Iranian military

complex at Parchin—where high-explosive experiments were believed to have been conducted—and Iran did not allow access until the fall of 2015 as part of IAEA’s PMD investigation.

One expert organization we interviewed said that Iran’s limited cooperation during the PMD investigation may have set a precedent for limiting IAEA access going forward. However, IAEA officials told us that the closure of the PMD investigation would not preclude future IAEA access requests to the sites that were part of the investigation, should IAEA determine that such access is warranted. These officials added that IAEA’s PMD investigation was conducted without the Additional Protocol and that any future investigations into potential undeclared activity would be conducted under the expanded legal authority of the Additional Protocol. According to IAEA officials we interviewed, Iran’s agreement to provisionally apply the Additional Protocol will facilitate the agency’s access to sites in Iran. Specifically, they told us that under the Additional Protocol, the agency can access any part of a site that it is inspecting within 2 hours’ notice and any other site within 24 hours. DOE officials noted that the JCPOA’s provisions for the reinstatement of sanctions will encourage Iranian cooperation with and access for IAEA. Additionally, State officials noted that refusal by Iran to comply with the access provisions of the Additional Protocol or JCPOA could lead to the reinstatement of sanctions.

If Iran were to deny access, IAEA officials said that they could report the state’s noncompliance to the Board of Governors, though there is no deadline in the CSA or Additional Protocol that compels a state to cooperate, and according to a former IAEA official, the Board of Governors cannot impose a deadline for the state’s cooperation. However, as we noted earlier, the JCPOA includes a mechanism that limits the time for resolution of differences between the participants to 24 days for matters related to JCPOA implementation. According to some former U.S. government officials, the mechanism is an advantage for IAEA in that it imposes a time frame for Iran’s cooperation with access requests.³³ However, a former IAEA official and one expert organization noted

³³According to a former government official, the other parties to the agreement may reinstate sanctions if Iran does not cooperate with IAEA access requests in accordance with this mechanism, and continued noncooperation may result in the termination of the agreement and an expansion of sanctions in the future.

that the mechanism is untested, and that it is too soon to tell whether it will improve access.

IAEA Faces Potential Budgetary and Human Resource Management Challenges Stemming from JCPOA-Related Workload

Integrating JCPOA-Related Funding Needs into IAEA's Regular Budget

Our preliminary observations indicate that IAEA faces potential resource management challenges stemming from the monitoring and verification workload in Iran, including integrating the additional JCPOA-related funding needs that IAEA has identified into the agency's regular budget and managing human resources within the safeguards program that could affect IAEA's safeguards efforts internationally.

State and NNSA officials told us that they are confident that IAEA would obtain any funding it would need in the form of extra-budgetary contributions from the United States and other member states to support its JCPOA activities. However, IAEA officials expressed concerns about the reliability of sustained extra-budgetary contributions for IAEA JCPOA activities due to possible donor fatigue in the long run, as IAEA will be conducting certain JCPOA verification activities for 10 or more years. IAEA and State officials, as well as a former IAEA official and one expert organization, also stated that funding the JCPOA from the IAEA regular budget would give the safeguards program a more stable and predictable funding base for its monitoring and verification activities. We have previously concluded that IAEA cannot necessarily assume that donors will continue to make extra-budgetary contributions at the same levels as in the past.³⁴

However, our preliminary observations indicate that IAEA may face challenges in incorporating some of its JCPOA activities under its regular budget, which requires support from the General Conference. IAEA officials, as well as a former IAEA official, two former U.S. government officials, and one expert organization we interviewed stated that the proposal to move funding for monitoring and verification efforts under the JCPOA into the IAEA safeguards' regular budget could face resistance from some member states without corresponding budget increases for other IAEA programs, such as the Technical Cooperation program, which supports nuclear power development and other civilian nuclear applications. State officials noted that delay or failure to incorporate costs

³⁴GAO, *Nuclear Nonproliferation: IAEA Has Made Progress in Implementing Critical Programs but Continues to Face Challenges*, [GAO-13-139](#) (Washington, D.C.: May 16, 2013).

Managing Human Resources in the Safeguards Program

into the regular budget would increase the reliance of IAEA on extra-budgetary contributions, but would not prevent IAEA from carrying out JCPOA-related activities as long as those contributions are forthcoming. These officials added that they recognize that long-term reliance on extra-budgetary contributions risks donor fatigue, and that they will plan for providing support with a view toward filling any future funding gaps that arise.

Our preliminary observations indicate that IAEA faces a potential human resource management challenge in its safeguards program as it implements actions to monitor and verify the JCPOA, which could affect its broader international safeguards mission. Specifically, our preliminary observations indicate that IAEA's strategy of transferring inspectors to its Iran Task Force from other safeguards divisions may pose a challenge to IAEA and its safeguards work in other countries because of the extensive time taken to hire and train new inspectors for those divisions.

According to current IAEA and U.S. government officials, as well as two former IAEA officials and two expert organizations, hiring and training qualified inspectors can take years. A former IAEA official and current officials noted that inspector skills are highly specialized—typically requiring a combination of nuclear engineering knowledge with analytical abilities—making recruitment difficult. These officials also noted that IAEA's hiring process is lengthy, requiring multiple interviews and examinations. Furthermore, current IAEA officials and two former IAEA officials, as well as one expert organization noted that training new inspectors to be proficient in executing their safeguards responsibilities can be a time-consuming process. As a result, IAEA faces a potential challenge as it prioritizes the JCPOA in meeting the need for additional experienced inspectors to work on Iran-related safeguards, while ensuring that other safeguards efforts in other countries are not understaffed. IAEA officials have said that its work in Iran is its priority. However, a former IAEA official, as well as some former U.S. government officials and several expert organizations told us that IAEA could mitigate human resources challenges in the short term through remote monitoring and the use of cost-free experts in its headquarters.

Agency Comments

We are not making any recommendations in this report. We provided the Departments of State and Energy and IAEA a draft of this report to for their review and comment. State, DOE, and IAEA provided technical comments, which we incorporated as appropriate.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to appropriate congressional committees, the Secretaries of State and Energy, and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or trimbled@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff members who made key contributions to this report are listed in appendix II.



David C. Trimble
Director, Natural Resources and Environment

Appendix I: Objectives, Scope, and Methodology

This report provides our preliminary observations on (1) the Joint Comprehensive Plan of Action (JCPOA) commitments that the International Atomic Energy Agency (IAEA) has been asked to verify and its authorities to do so, (2) the resources IAEA has identified as necessary to verify the JCPOA, and (3) potential challenges and mitigating actions, if any, IAEA and others have identified with regard to verifying the JCPOA. We will issue a separate report with the final results of our work later this year.

To identify the nuclear-related commitments in the JCPOA that IAEA has been asked to verify and IAEA's authorities for verifying these commitments, we analyzed the JCPOA, in close coordination with IAEA and the Department of State. We also analyzed IAEA documentation concerning the safeguards legal framework, including the Statute of the IAEA,¹ which authorizes the Agency to apply safeguards, at the request of parties, to any bilateral or multilateral arrangement; "The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons" (information circular (INFCIRC)/153), which provides the basis for the comprehensive safeguards agreement that most countries have concluded with IAEA and that covers all of the countries' civilian nuclear activities; Iran's Comprehensive Safeguards Agreement (INFCIRC/214); the Model Additional Protocol (INFCIRC/540), which provides the basis for an Additional Protocol that most countries with a CSA have concluded with IAEA to provide additional information about countries' nuclear and nuclear-related activities; and the November 2011 IAEA Safeguards Report,² which details items concerning "possible military dimensions" of Iran's nuclear program; IAEA's report on its investigation of the possible military dimensions; and the related Board of Governor's resolution. We also analyzed the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and United Nations Security Council Resolution 2231, which requests IAEA to undertake the necessary verification and monitoring of Iran's commitments.

¹The Statute of the International Atomic Energy Agency, done Oct. 26, 1956, 8 U.S.T. 1093, 276 U.N.T.S. 3 (entered into force July 29, 1957).

²IAEA, "Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran," GOV/2011/65 (Nov. 8, 2011).

To examine the resources IAEA has identified as necessary to verify the JCPOA, we reviewed IAEA planning and budget documents, such as “The Agency’s Programme and Budget 2016 –2017,” the Director General’s report titled “Verification and Monitoring in the Islamic Republic of Iran in light of United Nations Security Council Resolution 2231 (2015),” and pertinent Director General’s statements to the Board of Governors.

In addition, to further understand IAEA authorities and resource needs, and to examine potential challenges and mitigating actions IAEA and others have identified with regard to verifying the JCPOA, we interviewed officials of IAEA, the Department of State, and the Department of Energy’s (DOE) National Nuclear Security Administration (NNSA),³ as well as representatives of Oak Ridge National Laboratory, Los Alamos National Laboratory, Sandia National Laboratories, and Brookhaven National Laboratory. We also held classified interviews with officials in the Office of the Director of National Intelligence and representatives of Lawrence Livermore National Laboratory. The information from these interviews is not reflected in this report.

We also interviewed 8 former IAEA, and 10 former U.S. government and national laboratory officials, and representatives of 10 expert organizations—research institutions and nongovernmental organizations with knowledge in the areas of nuclear verification, monitoring, and safeguards. We selected these experts by first identifying organizations that had previously served as sources of IAEA subject matter experts for GAO. To ensure a wide range of viewpoints, we supplemented our initial selection with individuals and organizations identified through a literature search and by recommendations from our initial set of expert organizations. We requested interviews from all the identified experts and suggested contacts and interviewed all who agreed to participate (two experts provided written responses in lieu of in-person interviews). We analyzed their responses and grouped them into overall themes related to different elements of the objective. When referring to these categories of interviewees throughout the report, we use “some” to refer to three

³NNSA is a separate, semi-autonomous agency within the Department of Energy, with responsibility for the United States’ nuclear weapons and nonproliferation programs, among other things. NNSA conducts its activities at headquarters and at research and development laboratories, production plants, and other facilities. NNSA also provides technical assistance to IAEA’s safeguards and nuclear security programs.

members of a group, “several” to refer to four or five members of a group, and “many” to refer to more than five members of a group.

Our preliminary observations are based on our ongoing work, which is being conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the contact named above, William Hoehn (Assistant Director), Alisa Beyninson, Antoinette Capaccio, R. Scott Fletcher, Bridget Grimes, Joseph Kirschbaum, Grace Lui, Thomas Melito, Alison O'Neill, Sophia Payind, Timothy M. Persons, Steven Putansu, Vasiliki Theodoropoulos, and Pierre Toureille made key contributions to this report.

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