

August 10, 2015

The President
The White House
1600 Pennsylvania Avenue NW
Washington, DC 20500

Dear Mr. President,

As scientists and engineers with understanding of the physics and technology of nuclear power and of nuclear weapons, we congratulate you and your team on the successful completion of the negotiations in Vienna. We consider that the Joint Comprehensive Plan of Action (JCPOA) the United States and its partners negotiated with Iran will advance the cause of peace and security in the Middle East and can serve as a guidepost for future non-proliferation agreements.

This is an innovative agreement, with much more stringent constraints than any previously negotiated non-proliferation framework. It limits the level of enrichment of the uranium that Iran can produce, the amount of enriched uranium it can stockpile, and the number and kinds of centrifuges it can develop and operate. The agreement bans reconversion and reprocessing of reactor fuel, it requires Iran to redesign its Arak research reactor to produce far less plutonium than the original design, and specifies that spent fuel must be shipped out of the country without the plutonium being separated and before any significant quantity can be accumulated.

A key result of these restrictions is that it would take Iran many months to enrich uranium for a weapon. We contrast this with the situation before the interim agreement was negotiated in Geneva: at that time Iran had accumulated enough 20 percent enriched uranium that the required additional enrichment time for weapons use was only a few weeks.

The JCPOA also provides for innovative approaches to verification, including monitoring of uranium mining, milling, and conversion to hexafluoride. Centrifuge manufacturing and R&D will be monitored as well. For 15 years the Natanz facility will be the only location where uranium enrichment is allowed to take place and it will be outfitted with real-time monitoring to assure rapid notice of any violation. The authority is provided for real-time monitoring of spent fuel as well.

Concerns about clandestine activities in Iran are greatly mitigated by the dispute resolution mechanism built into the agreement. The 24-day cap on any delay to access is unprecedented, and will allow effective challenge inspection for the suspected activities of greatest concern: clandestine enrichment, construction of reprocessing or reconversion facilities, and implosion tests using uranium. The approach to resolving "Possible Military Dimensions" is innovative as well: the International Atomic Energy Agency (IAEA) must be satisfied that it is fully

informed about any previous activities, in order to guide its future verification plans, but Iran need not be publicly shamed. This agreement, also for the first time, explicitly bans nuclear weapons R&D, rather than only their manufacture as specified in the text of the Non-Proliferation Treaty (NPT).

Some have expressed concern that the deal will free Iran to develop nuclear weapons without constraint after ten years. In contrast we find that the deal includes important long-term verification procedures that last until 2040, and others that last indefinitely under the NPT and its Additional Protocol. On the other hand, we do believe that it would be valuable to strengthen these durable international institutions. We recommend that your team work with the IAEA to gain agreement to implement some of the key innovations included in the JCPOA into existing safeguards agreements. This will reduce the proliferation risks associated with national fuel cycle facilities worldwide. Thus in the future, when Iran is treated the same as all non-nuclear weapons states with nuclear energy programs, all such programs will be more stringently constrained and verified.

As you have stated, this deal does not take any options off the table for you or any future president. Indeed it will make it much easier for you or a future president to know if and when Iran heads for a bomb, and the detection of a significant violation of this agreement will provide strong, internationally supported justification for intervention.

In conclusion, we congratulate you and your team on negotiating a technically sound, stringent and innovative deal that will provide the necessary assurance in the coming decade and more that Iran is not developing nuclear weapons, and provides a basis for further initiatives to raise the barriers to nuclear proliferation in the Middle East and around the globe.

Sincerely,

Richard L. Garwin, IBM Fellow Emeritus

Robert J. Goldston, Princeton University

R. Scott Kemp, Massachusetts Institute of Technology

Rush Holt, American Association for the Advancement of Science

Frank von Hippel, Princeton University

Also signed by:

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Affiliations for identification only. Earlier versions incorrectly identified the location of the negotiation of the Interim Deal (JPOA) as Lausanne, rather than Geneva.