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Covert Nuclear Testing and the Enormous Increase in Chinese Nuclear Weapons Capability

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The end of U.S. nuclear testing in 1992 resulted in freezing the performance of U.S. nuclear weapons. Since then, there have been no increases in U.S. nuclear weapons performance—i.e., no improved yield-to-weight ratios and no development of advanced weapons with tailored effects. Instead, the United States maintained a small part of its 1992 nuclear arsenal through life extension programs under a program called “Science Based Stockpile Stewardship.”¹ In contrast, China, which continued high yield nuclear testing through 1996 and covert low-yield testing after that, has made dramatic improvements in its nuclear stockpile since 1992. In 1992, China’s nuclear weapons technology was inferior to both that of the United States and Russia. Today, they have achieved at least near parity and possibly significantly more. Due at least in part to U.S. policy, China has dramatically improved its comparative position. It is easy to win a race when only one party is racing for ideological reasons.

China had made great progress in nuclear weapons technology by 1992. By the 1980s, it had developed an enhanced radiation or neutron bomb.² Chinese nuclear warheads developed by about 1990, according to Jeffrey Lewis, weighed about 500-kg and yielded hundreds of kilotons.³ This apparently is a substantial underestimation of Chinese technical progress. A 2026 book by Chinese expatriate, Dr. Hui Zhang, now with the Harvard Belfer Center, who



says he had unique access to Chinese nuclear weapons information and testing data, concluded that China had done much better.⁴ The implication of Hui Zhang's book is that almost all the analyses by left of center American analysts, including the Federation of American Scientists, and in some cases apparently even in U.S. Intelligence Community positions made public, are wrong. They have considerably understated what China had accomplished by 1996 and what capabilities it would have in a future conflict.⁵

The People's Liberation Army Rocket Forces Disclosures On China's Nuclear Weapons

In 2017, the People's Liberation Army Rocket Forces (PLARF) made unprecedented disclosures with regard to the DF-41 ICBM. According to the PLARF, the missile had a range of 14,000 km and three warhead options: 1) one 1,600-kg warhead of 5.5 megatons; 2) six 250-kg warheads of 650 kilotons; or 3) 10 165-kg warheads of 150-kt.⁶ It also described the JL-2A SLBM as having a range of 12,000 km and either one warhead of 250 kilotons or three warheads of 60 kilotons and the older JL-1 SLBM apparently as having a 200-kiloton warhead.⁷

Hui Zhang's New Information Concerning China's Nuclear Weapons Development

Hui Zhang described two advanced Chinese nuclear warheads developed and tested by 1996. One of them called the "535," tested in 1992, used a "gas boosted primary with a round shape which weighed 210-kg and yielded 425 kilotons."⁸ (Gas boosting involves injection of deuterium and tritium into the primary or fission trigger of a thermonuclear weapon, dramatically increasing its yield and reducing its size and weight.⁹) He indicated that the yield of this weapon can be lowered by reducing the amount of highly enriched uranium (HEU) in the secondary (the thermonuclear stage that produces a high percentage of its yield) or eliminating HEU from the secondary.¹⁰ Hui Zhang indicated that one version of the "535" had a 300-kiloton yield.¹¹ He also relates that another warhead developed between 1992 and 1996, was the "5x5," a gas boosted warhead "with a new oval-shaped primary," which weighed 95 kg and yielded 95 kilotons.¹²

Hui Zhang stated the "535" warhead was developed for the DF-31 ICBM¹³ while the "5x5" was developed for the DF-41 ICBM.¹⁴ The "5x5" could explain the numerous reports that the DF-41 can carry 10 or more warheads.¹⁵ He also said that the Chinese were developing "...a larger yield warhead using the new oval primary, further reducing the weight of a "535"-type warhead."¹⁶ This obviously could also allow the development of a higher yield version within the original weight.



China's Nuclear Espionage

Even taking into account the apparently quite successful Chinese nuclear weapons espionage against the United States detailed in the 1999 Report of the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China (the "Cox Committee"), such progress is impressive. The Cox Committee report revealed that:

The PRC stole classified information on every currently deployed U.S. intercontinental ballistic missile (ICBM) and submarine-launched ballistic missile (SLBM). The warheads for which the PRC stole classified information include: the W-56 Minuteman II ICBM; the W-62 Minuteman III ICBM; the W-70 Lance short-range ballistic missile (SRBM); the W-76 Trident C-4 SLBM; the W-78 Minuteman III Mark 12A ICBM; the W-87 Peacekeeper ICBM; and the W-88 Trident D-5 SLBM. The W-88 warhead is the most sophisticated strategic nuclear warhead in the U.S. arsenal. It is deployed on the Trident D-5 submarine-launched missile. (Emphasis in the original).¹⁷

The Cox Committee also reported that, "*The PRC may have also acquired classified U.S. nuclear weapons computer codes from U.S. national weapons laboratories.*"¹⁸ (Emphasis in the original). This is particularly significant because it could have allowed the development of improved types of nuclear weapons with covert nuclear testing after the supposed end of Chinese nuclear testing in 1996. Keep in mind that Hui Zhang's book does not deal with Chinese nuclear warhead development after 1996, which is 30 years ago.

The Scope of China's Technical Progress on Nuclear Weapons

Based upon open source information concerning U.S. nuclear weapons and the unclassified START Treaty Memorandum of Understanding technical data, it appears likely that the "5x5" could be a Chinese version of the U.S. W76 and the "535" could be a Chinese version of the W88, at least with regard to the secondary, adapted to Chinese needs. As described by the Cox Committee report, "The W-88 warhead is the most sophisticated strategic nuclear warhead in the U.S. arsenal."¹⁹ *The New York Times* reported that China had stolen the W88 design and that the Chinese DF-31 warhead technology was based on stolen U.S. information.²⁰ This seems consistent with Hui Zhang's conclusions, although he largely denies that China obtained significant benefits through espionage. He indicates that the "535" warhead is similar to the U.S. W88 and 80% as efficient²¹ while the "5x5" is 90% as efficient as the U.S. W76.²²

Chinese warheads based upon U.S. designs may not necessarily be exact copies. It is very likely that they would be adapted to Chinese requirements taking into account its capabilities and limitations.

An important Chinese nuclear weapons designer, Xue Bencheng, characterized a 1996 Chinese nuclear test as "a great spanning leap" that allowed warhead miniaturization.²³ Hui Zhang stated that this test, and several previous ones, were used to develop the "5x5" warhead.



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Certainly the development of a warhead comparable to the U.S. W76 could be characterized as a “a great spanning leap.”

Is Hui Zhang’s information consistent with the 2017 PLARF revelation? With certain assumptions, the answer appears to be generally “yes.” The six 250-kg warhead version of the DF-41 yielding 650 kilotons could be an improved version of the Chinese “515” warhead using the new primary developed for the “5x5” warhead with an significantly improved “515”-style secondary. According to Hui Zhang, the “515” had a yield of 700 kilotons.²⁴ It could also be an improved higher yield version of the “535.” The DF-41 ten warhead version of 165 kilograms and 150 kilotons yield could be a modified version of the “5x5.” Again, keep in mind that the Chinese warhead development that Hui Zhang described happened 30-40 or more years ago. Significant progress could have been made since then with the aid of vastly better computers that became available and the aid of covert nuclear testing. From the standpoint of robustness, China has the advantage of not living under the U.S. one point safety criteria (one chance in a million of a yield of four pounds of TNT for an accidental detonation) which limits the use of more fissile material if necessary.²⁵

Declassified but highly redacted Central Intelligence Agency (CIA) reports on Chinese nuclear testing in the 1990s appear to give some credence to Hui Zhang’s description of the focus of Chinese development on the “535” and “5x5.”²⁶ These reports indicated that a number of the Chinese nuclear tests conducted in the 1990s were aimed at the development of new warheads for ICBMs and SLBMs.²⁷

In 2023, STRATCOM Commander General Anthony Cotton said that “...the Chinese...CSS-10 Mod 2 ICBM [DF-31A]...is capable of ranging the continental United States (CONUS) with multiple independently targetable reentry vehicles (MIRVs).”²⁸ This gives credibility to what Hui Zhang has reported because a MIRVed DF-31A would require warheads in the “535” or “5x5” class.

The Impact of Covert Chinese Nuclear Testing

Chinese improvement of its nuclear weapons after 1996 has apparently been the product of covert nuclear testing. Three decades of U.S. stagnation combined with aggressive Chinese development have created a serious situation. Indeed, in February 2026, CNN reported that:

US intelligence agencies believe that China is developing a new generation of nuclear weapons and has conducted at least one covert explosive test in recent years as part of a broader push to completely transform its nuclear arsenal into the world’s most technologically advanced, according to multiple sources familiar with the US intelligence assessments.²⁹

In October 2025, President Donald Trump stated that, “Because of other countries testing programs, I have instructed the Department of War to start testing our Nuclear Weapons on an equal basis. That process will begin immediately.”³⁰



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In February 2026, Under Secretary of State for Arms Control and International Security Thomas DiNanno announced at the United Nations Conference on Disarmament in Geneva that:

Today, I can reveal that the U.S. Government is aware that China has conducted nuclear explosive tests, including preparing for tests with designated yields in the hundreds of tons. The PLA sought to conceal testing by obfuscating the nuclear explosions because it recognized these tests violate test ban commitments. China has used decoupling—a method to decrease the effectiveness of seismic monitoring—to hide their activities from the world. China conducted one such yield producing nuclear test on June 22 of 2020.³¹

Assistant Secretary of State for Arms Control and Proliferation Dr. Christopher Yeaw, a noted expert on nuclear weapons, stated that the June 22, 2020 Chinese nuclear test conducted at China's Lop Nur test grounds had a seismic magnitude of 2.75.³² This is well beyond very low-yield hydronuclear testing, and, hence, has much greater significance. He indicated that the June 22, 2020 seismic event was a nuclear test, and that the United States did not know its yield from seismic data because the decoupling factor could reduce the seismic signal 20 to 40 times or even more than the yield that would be calculated assuming no decoupling.³³ (Decoupling involves creating a large cavity, pumping out the air and then detonating the device. There are also other ways to reduce the seismic signal). In addition to decoupling, nuclear tests at still higher yields can be concealed by testing outside of known nuclear test ranges, testing in salts mines and the use of earthquake masking.³⁴

In a February 2026 speech in Geneva, Dr. Yeaw said that:

The estimated yield of the [June 22, 2020] event was a 10 tons nuclear explosion—or 5 tons conventional equivalent—which assumes the explosion was fully coupled in hard rock, below the water table, and at the standard scaled depth of burial. Any deviations from the assumed emplacement conditions (i.e., if the explosion were decoupled or otherwise concealed) would only increase this yield estimate.³⁵

With decoupling, the yield could have been over 400-tons of TNT. Indeed, Brandon Williams, Under Secretary of Energy for Nuclear Security who heads the National Nuclear Security Administration, stated that China is “clearly” conducting explosive nuclear testing and is “trying to hide it.”³⁶ He indicated that the yields of these tests “are not small” but rather “hundreds of tons of yield.”³⁷

Testing at such yields can have great benefits for the development of new and improved nuclear weapons. A report on nuclear testing by the well-known JASONS study group concluded that “...testing under a 500 ton yield limit would allow studies of boost gas ignition and initial burn, which is a critical step in achieving full primary design yield.”³⁸ With full primary design yield the chances of a dud are very low. Apparently, this is the reason that, in 1993, during the Clinton Administration's Comprehensive Test Ban Treaty policy development, the Defense Department position “...favored a low-yield treaty with a 500 ton



testing limit.”³⁹ It also is the likely reason that in 1995 the three nuclear weapons laboratories “...requested that the permitted test level should be set to a level which is, in fact, lower than a one-kiloton limit, which would have allowed us to carry out some very important experiments, in our view, to determine whether the first stage of multiple-stage devices [thermonuclear weapons] as indeed operating, successfully.”⁴⁰

The utility of testing at 500 tons is not just theoretical. Hui Zhang writes that the first Chinese nuclear test that demonstrated gas boosting had a 420 ton yield.⁴¹ This was in the 1980s when there were no restrictions on the yield China could test at other than perhaps cost. Testing at hundreds of tons could allow the development of both new high-yield thermonuclear weapons (combining the information China obtained through espionage with low-yield nuclear tests) and advanced low-yield/low-collateral damage weapons which Hui Zhang calls third generation weapons. In the West, they are sometimes called 4th generation weapons.

Hui Zhang reports that in the 1980s China developed and tested 1-2 kiloton neutron bombs but the seismic signals generated by the explosions were 300-500 tons of TNT.⁴² This is because much of the energy from a neutron bomb is released in the form of high energy neutrons not blast which is mainly the result of x-ray heating. With decoupling, testing at these yields allows the development of a variety of new types of advanced low-collateral damage nuclear weapons.

The late Dr. Paul Robinson, then-Director of the Sandia National Laboratory, in his testimony on the Comprehensive Test Ban Treaty stated that “...if adversaries conduct experiments up to the threshold of international detectability, we will be at an intolerable disadvantage.”⁴³ This is apparently exactly what has happened. According to Under Secretary of State DiNanno, Russia and China are testing, “At yield that creates an intolerable disadvantage for the United States by not testing.”⁴⁴

Conclusion

Rick Fisher, a senior fellow at the International Assessment and Strategy Center, in a pioneering analysis of the implications of Hui Zhang’s disclosures, stated that by 2035 China could have between 6,328 and 8,260 nuclear warheads.⁴⁵ This would of course require China to have enough fissile material to build these weapons. China is increasing its inventory of fissile material and the United States almost certainly does not know everything that China is doing. It clearly is possible that by 2035, China may have a much larger nuclear force than what is being assessed by the Pentagon, surpassing that of the United States.

¹ Mark B. Schneider, *The Case for Resumed Nuclear Testing* (Fairfax, VA: National Institute for Public Policy, 2025), pp. 22-29, <https://nipp.org/papers/the-case-for-resumed-nuclear-testing/>.

² Mark Schneider, “The Nuclear Doctrine and Forces of the People’s Republic of China,” *Comparative Strategy*, 28(3), July 22, 2009, pp. 253-255, <http://dx.doi.org/10.1080/01495930903025276>.



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⁴ Hui Zhang, *The Untold Story of China's Nuclear Weapons Development and Testing* (Cambridge, MA: MIT Press, 2026), p. 187.

⁵ *Ibid.*, pp. 184-185.

⁶ "China Ballistic Missiles and Nuclear Arms Thread," *Sino Defense Forum*, September 25, 2017, <http://www.sinodefenceforum.com/chinaballistic-missiles-and-nuclear-arms-thread.t5881/page-233>.

⁷ *Ibid.*

⁸ Zhang, *The Untold Story of China's Nuclear Weapons Development and Testing*, op. cit., p. 187.; and, "Is China Seeking Nuclear Superiority? Unpacking 2025 Developments with Rick Fisher," Huessy Seminar, National Institute for Deterrence Studies, February 2026, <https://www.youtube.com/watch?v=-zjyCiTwWpw>.

⁹ United Nations Department for General Assembly and Conference Management, "boosted fission bomb," no date, <https://unterm.un.org/unterm2/en/view/4a6eb49d-2b96-4e90-8db0-e89056579431>; and, David Albright and Theodore Tailor, "A little tritium goes a long way," *The Bulletin of the Atomic Scientists*, January/February 1988, <https://www.tandfonline.com/doi/abs/10.1080/00963402.1988.11456101>.

¹⁰ Zhang, *The Untold Story of China's Nuclear Weapons Development and Testing*, op. cit., p. 181.

¹¹ *Ibid.*, p. 205.

¹² *Ibid.*, p. 187.

¹³ *Ibid.*, p. 178.

¹⁴ *Ibid.* p. 184.

¹⁵ Mark B. Schneider, "China's Nuclear Delivery Vehicles," *Journal of Policy & Strategy*, Vol. 4, No. 3, 2024, p. 5, <https://nipp.org/wp-content/uploads/2024/09/Analysis-Schneider-4.3.pdf>.

¹⁶ Zhang, *The Untold Story of China's Nuclear Weapons Development and Testing*, op. cit., p. 195.

¹⁷ Select Committee, House of Representatives, *Report of the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China*, Volume I (unclassified), May 1999, pp. 68-69, <https://www.congress.gov/105/crpt/hrpt851/CRPT-105hrpt851.pdf>.

¹⁸ *Ibid.*, p. 69.

¹⁹ *Ibid.*, p. 68.

²⁰ James Rissen and Jeff Gerth, "China Is Installing a Warhead Said to Be Based on U.S. Secrets," *The New York Times International*, May 14, 1999, <https://archive.nytimes.com/www.nytimes.com/library/world/asia/051499china-nuke.html>.

²¹ Zhang, *The Untold Story of China's Nuclear Weapons Development and Testing*, op. cit., p. 183.

²² *Ibid.*, p. 200.

²³ Schneider, "The Nuclear Doctrine and Forces of the People's Republic of China," op. cit., p. 253.

²⁴ Zhang, *The Untold Story of China's Nuclear Weapons Development and Testing*, op. cit., p. 182.

²⁵ Schneider, *The Case for Resumed Nuclear Testing*, op. cit., p. 46.

²⁶ Dr. Hui Zhang stated that the 5x5 is the not the actual Chinese designator for this weapon but rather a designator he made up because he does not know the actual Chinese designator.

²⁷ Director of Central Intelligence, "China: Response to Moratorium Noncommittal," *National Intelligence Daily*, July 8, 1993, <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB200/19930708.pdf>; Central Intelligence Agency and the Defense Intelligence Agency, "Chinese Nuclear Testing: Racing against a Comprehensive Test Ban," *Joint Intelligence*



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³⁰ Donald J. Trump, Truth Details, October 2, 2025, <https://truthsocial.com/@realDonaldTrump/posts/115460423936412555>.

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³⁴ Schneider, *The Case for Resumed Nuclear Testing*, op. cit., pp. 30-31.

³⁵ “Statement by U.S. Assistant Secretary of State for the Bureau of Arms Control and Nonproliferation The Honorable Dr. Christopher Yeaw to the Conference on Disarmament,” U.S. Mission to International Organizations in Geneva, February 23, 2026, <https://geneva.usmission.gov/2026/02/23/statement-by-u-s-assistant-secretary-of-state-for-the-bureau-of-arms-control-and-nonproliferation/>.

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³⁷ Ibid.

³⁸ Sidney Drell, “Nuclear Testing Summary and Conclusions,” JSR-95-320, August 3, 1995, <https://rlg.fas.org/jsr-95-320.htm>.

³⁹ Paul Brown, *The Comprehensive Test Ban Treaty: Lawrence Livermore National Laboratory’s Impact on U.S. Nuclear Policy from 1958 to 2000* (Livermore, CA: Lawrence Livermore National Laboratory, April 2019), p. 94, <https://cgsl.llnl.gov/sites/cgsl/files/2024-08/Brown-CTBTbook.pdf>.

⁴⁰ Paul Robinson, John Foster, and Thomas Scheber, “The Comprehensive Test Ban Treaty: Questions and Challenges” (Washington, D.C.: Heritage Foundation, November 7, 2012), Lecture No. 1218, <https://www.heritage.org/armscontrol/report/the-comprehensive-test-ban-treaty-questions-andchallenges>.

⁴¹ Zhang, *The Untold Story of China’s Nuclear Weapons Development and Testing*, op. cit., p. 172.

⁴² Ibid., p. 160.

⁴³ Dr. Paul Robinson, “Statement of C. Paul Robinson, Director Sandia National Laboratories United States Senate Committee on Armed Services October 7, 1999,” pp. 17-23, <http://armedservices.senate.gov/statemnt/1999/991007pr.pdf>.



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⁴⁵ “Is China Seeking Nuclear Superiority? Unpacking 2025 Developments with Rick Fisher,” National Institute for Deterrence Studies, January 23, 2026, <https://www.youtube.com/watch?v=-zjyCiTwWpw>.

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