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Magnequench: CFIUS and China's Thirst for U.S. Defense Technology

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One of Senator Hillary Clinton's Asia policy advisers quit her presidential campaign several days ago, complaining that the candidate was engaging in "gratuitous China bashing."¹ And, in fact, the Senator has of late been engaged in a jeremiad on China.²

To be sure, a good portion of the sourness nurtured in the Democratic Party's base against China is undeserved, and more about big-labor politics than genuine security concerns, yet Senator Clinton has spotlighted at least two grave vulnerabilities in America's defense industrial base: Chinese state-controlled investments in key U.S. defense suppliers and the impact on defense supplies caused by seemingly unrelated environmental litigation that closed down the world's second-largest rare-earths mine and thereby gave China a monopoly on oxide ores that are absolutely essential to all defense electronics.

The first concern was addressed in 2007 when Congress passed the Foreign Investment and National Security Act (FINSA),³ which seeks to balance the exigencies of America's national security with its "open investment" policy. FINSA codifies what the Committee on Foreign Investment in the United States (CFIUS) has been doing for the past 20 years, and while it is not perfect, there have been some significant changes. The 2007 amendments now require that CFIUS (1) publish guidance in the *Federal Register* on the types of transactions that it has reviewed and that have presented national security considerations and (2) notify Congress after each review and investigation. FINSA also created

the concept of "lead agency" and the responsibilities thereof, particularly in following up on and enforcing mitigation agreements relating to "covered transactions." These were positive steps.⁴

The question is whether Senator Clinton or any other presidential candidate is up to the challenge of questionable foreign investments in U.S. defense industries—and CFIUS may now be the least of the problems.

How China Bought Magnequench. Magnequench's story is indeed a story of executive branch disregard for the health of the nation's defense industrial base, but the Administration of Bill Clinton bears culpability for letting it happen in the first place.

Magnequench had a unique expertise in the manufacture of high-powered neodymium magnets, which it pioneered in the 1980s for its parent company, General Motors, to use in airbags and mechanical sensors. When GM restructured in the early 1990s, the company began to divest itself of subsidiaries that were not in its "core competence." Magnequench, in spite of its high-tech pedigree—and the fact that it provided critical component parts to "precision guided munitions" that were

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then in great demand by the U.S. Department of Defense—was put up for sale.

Reportedly, Magnequench supplied 85 percent of the neodymium magnets used in servo motors for PGMs,⁵ but neodymium magnets are far more important and ubiquitous than their use in advanced weaponry might suggest. They are the sole reason high-speed, high-capacity computer data storage devices can work. They are found in literally every computer in the world, and in 2004, Magnequench, together with its merger partner NEO Material Technologies (and its integrated Chinese joint-venture partners), supplied about 80 percent of the world market share of neodymium and rare-earth oxide powders used in those magnets.⁶

So when GM put Magnequench on the block in 1995, who should come up with the \$70 million asking price?⁷ An investment consortium headed by Archibald Cox Jr. (son of the illustrious Water-gate prosecutor) acting in concert with two Chinese state-owned metals firms, San Huan New Material and China National Nonferrous Metals Import and Export Company (CNNMIEC), which had been pestering GM to sell Magnequench since 1993.⁸

In the deal, the two Chinese firms took at least a 62 percent majority of Magnequench shares, with the senior Chinese investor taking over as the company's chairman and Cox as chief executive officer (CEO).⁹ (In 2005, when Magnequench merged with a Canadian firm then known as AMR, Cox was

1. Lisa Lerer, "Clinton adviser quits over China rhetoric," *Politico*, April 18, 2008, at <http://www.politico.com/news/stories/0408/9719.html>.
2. Timothy Aepfel, "Clinton Seeks Edge by Focusing on Voter Insecurities: Magnet Industry, Overtaken by China, Gets Play in Indiana," *The Wall Street Journal*, April 30, 2008, p. A7, at <http://online.wsj.com/article/SB120951864538254897.html>.
3. Public Law 110-49, July 26, 2007.
4. FINSA consists of several amendments to the 1988 "Exon-Florio" legislation, which itself amended the Defense Production Act of 1950 (50 U.S.C. App. 2170). See also U.S. Department of the Treasury, Office of International Investment, "31 CFR Part 800 Regulations Pertaining to Mergers, Acquisitions and Takeovers," *Federal Register*, Vol. 72, No. 196 (October 11, 2007), p. 57900.
5. Jeffrey St. Clair, "Outsourcing US Missile Technology to China: The Saga of Magnequench," Counterpunch.org, April 7-9, 2006, at <http://www.counterpunch.org/stclair04072006.html>.
6. NEO is the new name for AMR. AMR "acquired" Magnequench in a stock swap that left Mr. Cox as AMR chairman. See "Rationale for MQI Acquisition," *Annual Information Form, AMR Technologies Incorporated, for the Year Ended December 31, 2005*, p. 5, at http://www.magnequench.com/assets/content/ir/ir_fil/ir_fil_2004_2006/aif0603/AMR_AIF_31March06.pdf.
7. \$56 million in cash and a \$14 million note. See Charles Child, "GM to sell magnet unit to Chinese," *Automotive News*, March 27, 1995, p. 46.
8. *Ibid.* See also GM press release, "GM to sell Magnequench International," PR Newswire, June 28, 1995.
9. Under the name "Hong (Harry) Zhang," Mr. Zhang Hong was listed as Magnequench chairman in all regulatory filings, and Archibald Cox was listed as CEO. See <http://investing.businessweek.com/businessweek/research/stocks/people/person.asp?personId=6258361&capId=677601&previousCapId=23245&previousTitle=TCW%2FCrescent%20Mezzanine%20Partners%2C%20L.L.C>. Hong Zhang, Harry, had served as Deputy Director of the Technology Sciences of the Chinese Academy of Sciences, a central government agency, and chairman of San Huan since 1985. Mr. Zhang has more than 25 years of professional engineering and management experience. He was Chairman of Magnequench International, Inc. (Magnequench Inc. or Magnequench) since 1995. Some filings show Harry Zhang as "Chairman of the Board and Director" of Neo Material Technologies Inc. "since 1995." However, in a phone call to NEO, Mr. Zhang Hong was said to have "retired in late 2006" as CEO of "Magnequench Tianjin." The two firms sold 62 percent of Magnequench to a Chinese state-owned holding company in Hong Kong, "Onfem," in 1997. "Onfem" is a wholly owned subsidiary of China National Nonferrous Metals Corporation, and CNNMC no doubt instructed CNNMIEC to make the transaction. It does not appear that either San Huan or CNNMIEC retained any "Magnequench" shares. See Lana Wong, "Onfem in US magnetic deal," *South China Morning Post*, January 7, 1997. There are also reports that the Chinese government pressured GM into selling Magnequench to Chinese interests as a condition for approving GM's bid to open an automotive production line in Shanghai. See the testimony of Richard D'Amato, U.S.-China Security and Economic Review Commission, in hearing, *China National Offshore Oil-Unocal Merger*, Committee on Armed Services, U.S. House of Representatives, July 13, 2005.

listed as owning a significant minority share of AMR and was named AMR chairman.¹⁰)

The chairman of San Huan, a Mr. Zhang Hong, son-in-law of former Chinese “paramount leader” Deng Xiaoping (and now director of the Research and Development Bureau of the Chinese Academy of Sciences¹¹), took over as chairman of Magnequench.¹² No doubt, Mr. Zhang’s desire to acquire Magnequench was informed by the Chinese government’s—and his father-in-law’s—“Super 863 Program” to develop and acquire cutting-edge technologies for military applications, including “exotic materials.”¹³ The other Chinese investor in Magnequench, CNNMIEC, was at the time run by yet another Deng Xiao-ping son-in-law.

CFIUS’s Role in Magnequench. But the United States government surely would not permit the Chinese simply to walk in and take over a significant U.S. high-tech firm, would it? Several sources

indicate that CFIUS did reach a “mitigating agreement”¹⁴ with Magnequench’s new owners that the Chinese companies could not remove Magnequench’s production equipment or jobs from the U.S. for a period of ten years.¹⁵

It is, however, an old Chinese tradition that “rules are made to be broken” (*shang you zhengce, xia you duice*). Magnequench’s Chinese owners cleverly reinterpreted the CFIUS conditions. One Magnequench employee reported that shortly after the Chinese took over, Magnequench’s neodymium-iron-boron magnet production line was “duplicated in China” and that, after the Chinese “made sure that it worked, they shut down” the U.S. production in Indiana. The employee added, “I believe the Chinese entity wanted to shut the plant down from the beginning. They are rapidly pursuing this technology.”¹⁶

It is quite likely that the Chinese government realized (even if the U.S. government did not) that

10. Press release, “GM to sell Magnequench International.” In 2005, Magnequench merged with a Canadian firm, then known as AMR, and Cox was listed as “beneficially owning directly or indirectly” about 11 percent of AMR shares—apparently the result of the AMR–Magnequench stock swap that effected the merger of the two firms. A footnote (no. 7 at page 26) to AMR’s annual information form for 2005 indicates that about half of these shares were held on behalf of an “initial holder” to “facilitate short-selling transactions.” There was no further identification of the “initial holder.” See AMR Web site, at http://www.magnequench.com/assets/content/ir/ir_fil/ir_fil_2004_2006/aif0603/AMR_AIF_31March06.pdf.
11. Cheng Li, *Chinas Leaders: The New Generation* (Lanham, Md.: Rowman & Littlefield, 2001), p. 138.
12. See entry on “Hong (Harry) Zhang, chairman of Magnequench” at <http://investing.businessweek.com/businessweek/research/stocks/people/person.asp?personId=6258361&capId=677601&previousCapId=23245&previousTitle=TCW%2FCrescent%20Mezzanine%20Partners%2C%20L.L.C>.
13. For a description of the “Super 863 Program” and the patronage of Deng Xiaoping, see U.S. House of Representatives, Report No. 105-851, *Report of the Select Committee on U.S. National Security and Military/Commercial Concerns with the People’s Republic of China*, Vol. 1, May 25, 1999, p. 13, at <http://www.gpo.gov/congress/house/hr105851-html/ch1bod.html>.
14. “When a covered transaction does present national security concerns, [the Foreign Investment and National Security Act of 2007] provides statutory authority for CFIUS...to enter into mitigation agreements with parties to the transaction or impose conditions on the transaction to address such concerns.” See proposed “Regulations Pertaining to Mergers, Acquisitions and Takeovers by Foreign Persons,” 31 CFR 800, U.S. Department of the Treasury, Office of Investment Security, at http://www.treas.gov/press/releases/reports/proposed_regulations42108.pdf.
15. It seems unlikely that CFIUS would have negotiated “jobs” as a mitigation condition unless it could be shown they were directly relevant to national security. CFIUS’s mitigation terms are not published. However, several parties interested in the transaction, particularly the labor unions representing Magnequench’s employees, seem to have been notified of them. An officer of NEO Materials told the author that NEO does, in fact, “maintain pensions” for former GM employees. One report alleges that, “despite original promises approved by CFIUS as part of the transaction that the production equipment and jobs were not to be moved out of the U.S., those transfers did, in fact, happen.” See press release, “USW’s Gerard Calls for Moratorium on CFIUS Approvals, Comprehensive Review of Process; Letter to President Bush Cites Ports Controversy, Transfer of Magnequench ‘Smart-Bomb’ Technology to China,” United Steel Workers, February 28, 2006, at <http://www.usw.org/usw/program/content/2790.php>. See also Scott L. Wheeler, “Missile Technology Sent to China,” *Insight on the News*, March 3, 2003, p. 26. A version of this report is available at http://findarticles.com/p/articles/mi_m1571/is_5_19/ai_97874289.
16. Wheeler, “Missile Technology Sent to China.”

neodymium-iron-boron supermagnets are absolutely essential to the assembly of U.S. precision weaponry and that there was basically only one U.S. supplier of those magnets to the U.S. defense firms that assembled such arms.

In 1997, the Magnequench shares held by the two Chinese firms were transferred to Onfem Holdings, a Chinese state-owned holding company based in Hong Kong and run at the time by a Mr. Wu Jianchang, yet another son-in-law of Deng Xiaoping.¹⁷ Archibald Cox, in the meantime, became the titular Magnequench President and CEO, and although a Chinese firm held at least 62 percent of Magnequench's stock, his firm's PR office began to hold the company out as a "U.S.-majority owned company headquartered in Anderson, Indiana."¹⁸

EPA Shuts Down World's Second-Largest Rare-Earths Mine. A few months later, in March 1998, Magnequench's major U.S. supplier of rare-earth oxides, Molycorp (then owned by Unocal), was obliged to shut down its rare-earths mine at Mountain Pass, California, and pay a \$410,000 fine for leaking what the Environmental Protection Agency (EPA) termed "low level radioactive waste." Mountain Pass, the "only producer of rare earths in the United States," was the second-largest rare-earths mine in the world and included a "world class" refinery.¹⁹

Overnight, this removed 20 percent of the world supply of rare-earth powders from the market. Magnequench, however, was controlled by China National NonFerrous Metals Corp. (CNNMC), the

Chinese state-owned corporation that had a virtual monopoly on key rare-earth supplies, and found it very easy to source its supplies from partners and affiliates in China.

By September 2001, citing slack demand, Cox announced that he would shut down the Magnequench production lines completely even though the company posted revenues of \$250 million in the year 2000. Cox explained that "almost all of the raw materials for Magnequench's powder products come from China, and 90 percent of our customer base is in Asia."²⁰

In April 1999, Magnequench announced that it would open a 30,000-square-foot laboratory facility on a 10-acre site mostly in the Research Triangle Park in Raleigh-Durham, North Carolina²¹. But by September 2003, Magnequench had abandoned North Carolina and relocated its entire research operation to Asia, and the U.S. company's revenues dropped to \$158 million.²² One could speculate that Magnequench's Chinese owners in the CNNMC (Onfem's parent in Beijing) were more than making up for their U.S. losses in the vast expansion of supermagnet sales from Chinese companies.

By the first months of the Bush Administration, Magnequench's crown-jewel technologies had already seeped off unnoticed to China, and the entire production line was already being dismantled in the United States. U.S. Senator James Inhofe (R-OK) complained in October 2005 that "over 12 years, the company has...moved piecemeal to China, leaving the U.S. with no domestic supplier of

17. Wong, "Onfem in US magnetic deal."

18. Magnequench press release written by Jake Ring, "Magnequench Acquires Ugimag Rare Earth Magnet Business," Business Wire, November 2, 2000.

19. For a broader discussion of the importance of the Mountain Pass facility, see James B. Hedrick, "Rare-Earth Metals," U.S. Geological Survey, 1998, at http://minerals.usgs.gov/minerals/pubs/commodity/rare_earths/740497.pdf. See also U.S. Geological Survey, The Mineral Industry of California, 1998, at <http://minerals.usgs.gov/minerals/pubs/state/980699.pdf>, and David R. Jessey, field report, "Mountain Pass Rare Earth Mine," California State University at Pomona, at <http://geology.csupomona.edu/drjessey/fieldtrips/mtp/mtnpass.htm>. With rare-earths prices at historic highs, Molycorp reportedly intends to reopen the Mountain Pass mine in 2008. See Jane Spooner, "RARE EARTHS," *Minor Metals Trade Association Mining Journal Review*, January 1, 2006, at <http://www.mmta.co.uk/economicsFacts/Articles/MiningJournalReview/RareEarths.pdf>.

20. Stuart A. Hirsch, "Magnequench announces plans to close plant; Officials don't say when local factory will close; 'slack demand' cited in elimination of 260 jobs," *The Indianapolis Star*, September 29, 2001, p. N1.

21. Lisa F. Smith, "Magnequench to be park's newest tenant," *The Herald-Sun* (Durham, N.C.), April 30, 1999. p. B8.

22. Leo John, "Magnet maker shutting local operation; 15 jobs gone," *Triangle Business Journal*, Vol. 18, No. 51 (August 22, 2003), p. 3.

neodymium, a critical component of rare earth magnet.” The blame, he said, rested with CFIUS because “CFIUS approved this transfer” in 1995 and failed to enforce the terms of its approval.²³

Of course, the real reason Magnequench could not source neodymium in the United States was that the EPA had closed the world’s second-largest source of the mineral—the Mountain Pass mine—charging that the mine effluent was not “beneficiated” (i.e., “earthen in character”) as the mine operator claimed, but rather “processed.”²⁴ It does not appear from the court record that the mine’s effluent endangered either human health or animal habitat.

By 2005, Magnequench remained a proprietor of several important rare-earths magnet patents and production processes and, presumably with financing from its Chinese owners, was sought out by other North American firms in the rare-earths business. Magnequench merged with a Canadian rare-earths firm, AMR, in 2005, and Archibald Cox was listed as the largest shareholder on the board of directors, apparently on behalf of an unnamed “initial holder.” AMR is now known as NEO Materials Technologies (which still retains the www.magnequench.com Web address).

NEO and its Magnequench affiliate report that 85 percent of their manufacturing facilities are in China (the other 15 percent is in Thailand); that 95 percent of their personnel are located in China; and that all of their China manufacturing facilities are in the form of “joint ventures” with Chinese state-owned enterprises. It now appears that the United States has no rare-earth oxide magnet production

capacity.²⁵ This is unsettling when one considers that virtually no piece of advanced information technology can be fabricated without rare-earth oxides—which, of course, means that no weapons system can be assembled without them.²⁶

In short, America’s defense industry already relies on China for some of its most indispensable components—and the problem did not begin with President George W. Bush. It goes back to the early part of the Clinton Administration.

Senator Inhofe was understated when he noted in 2005 that the United States no longer has a domestic supplier of neodymium, a critical component of rare-earth magnets. Treasury representatives believe that CFIUS’s writ runs only to items specifically covered in arms-export control legislation, and there is little that it can or should do with regard to ensuring supplies of strategic materials not so listed.

Conclusion. No responsible policymaker seeks to restrain foreign investment in the United States. Foreign investment introduces new technologies and skills to America’s economy, helping to promote U.S. competitiveness abroad. About 20 percent of all U.S. exports originate from U.S. affiliates of foreign-owned companies.²⁷

In the Magnequench case, Chinese investors found a number of different vulnerabilities in the U.S. defense industry base: a poor appreciation of the importance of small and medium niche suppliers and the Achilles’ Heel of environmental litigation, which has handed to the Chinese—up to now—a virtual monopoly on supplies of an essential resource to modern computing electronics.

23. See transcript of hearing, *Implementation of the Exon–Florio Amendment and the Committee on Foreign Investment in the United States*, Committee on Banking, Housing and Urban Affairs, U.S. Senate, October 20, 2005, provided by Federal News Service.

24. See “*Molycorp, Inc. v. U.S. Environmental Protection Agency*,” No. 98-1400, United States Court of Appeals for the District of Columbia Circuit, December 17, 1999, at <http://www.ll.georgetown.edu/federal/judicial/dc/opinions/98opinions/98-1400a.html>.

25. Magnequench and Hitachi NEF were the only two U.S. magnet manufacturers, but their magnet production lines are either in China or Japan. A Japanese firm, Santoku, owns the only magnet-alloy metallurgy plant in the United States and, according to a company representative (contacted through <http://www.santoku.com>), supplies the alloys to magnet makers in Japan and China.

26. For a very readable discussion of China’s thirst for rare-earths oxides, see David Lague, “China corners market in a high-tech necessity,” *International Herald Tribune*, January 23, 2006, p. 11, at <http://www.ihf.com/articles/2006/01/22/business/rare.php>.

27. See Daniella Markheim, “The Need for CFIUS Reform to Address Homeland Security Concerns,” Heritage Foundation Lecture No. 944, June 13, 2006, at <http://www.heritage.org/Research/NationalSecurity/hl944.cfm>

It is not clear from the record that either Republicans or the Democrats, Bushes or Clintons, have the intestinal fortitude to take the steps necessary to monitor problematic foreign investment in America's high-technology manufacturing sectors, which supply our defenses, or to balance sane environmental concerns with national security exigencies. If they did, a reasonable solution to the

Mountain Pass mine effluent could have been found without closing the entire operation, and Magnequench's gradual metamorphosis into a China-based company and the consequent loss of its products in the U.S. defense supply chain would not have happened.

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