

U.S. Still 100% Reliant On China For All Rare Earth Dependent Weapon Systems

GAO Suggests “Developing A Comprehensive Approach”

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Sometime well before its 2010 IPO, Molycorp, a Denver-based mining company, convinced the Pentagon it would fulfill all of our national security needs relating to rare earth materials for major defense systems and our economy. Molycorp had the backing of big Wall Street firms so the Pentagon entrusted our nation’s security to their solitary mine in the California desert. Today, Molycorp is bankrupt—its facility rusting away into the sandⁱ. The company having burned through billionsⁱⁱ of dollars never lived up to their promise of meeting our national security needs.

This epic fail has left the U.S. Defense Department more vulnerable than ever to the threat of supply interruptions for our most important materials, metals and system components. In a February report, the Government Accountability Office (GAO) made it all quite clear: the U.S. military continues to be 100 percent reliant on China for all rare earth metals, alloys and magnets, both directly or indirectlyⁱⁱⁱ, as all metallurgy must pass through China^{iv}. The report stated that reliable access to rare earths is “a bedrock requirement for DoD”.

How did we get here?

In 2010, Molycorp became an IPO powerhouse and Wall Street darling. Its market capitalization shot up past \$7 billion. Investors, trade journals and “market experts” were euphoric: *fait accompli*. The financial press announced *mission accomplished* and that *the free markets won again....* the Pentagon agreed.

The free-market victory was a sham. From a National Security stand-point, Molycorp’s geologic and technical capabilities were essentially worthless. Molycorp’s domestic capabilities were limited to the production of low-value rare earth oxides which are useless^v to the defense industry or any advance technology industry. In the end, Molycorp acquired all of its metallurgical capabilities from a company inside China, breaking their promise to develop a secure U.S. source of essential rare earth metals, alloys and magnets critical to U.S. defense contractors. The move ensured that the future procurement of all rare earth dependent weapons systems were effectively under Chinese control.

These issues were pointed out to DoD specialists and others, but all of the warnings and technical data were ignored. The Pentagon never accounted for any of these inconvenient facts in reports to Congress or the Administration. In review: Molycorp could not produce critical heavy rare earths, Molycorp’s domestic capabilities werer limited to the production of rare earth oxides, oxides cannot be utilized by defense contractors, all defense related rare earth components must pass through China to be converted to metals, etc..

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Instead the Pentagon continued to give the *'all clear'* signal to Congress and the Administration. Their reports focused on the growth in non-Chinese rare earth oxide production – suggesting that it was nothing more than a basic resource supply problem. By this fallacious measure the U.S. was gaining ground on China's monopoly position. But the victory was hollow – China continued to hold the trump card on all metallurgical rare earth products.

The Pentagon's long history of myopia, indifference, and obfuscation, as it relates to the rare earth supply chain, has clearly undermined national security and our economic prosperity.

China has already leveraged its monopoly of rare earth metals into a gravitational black hole of global industrial technology transfers. Left unanswered, China will continue to strip global technology corporations and multinational defense contractors^{vi} of their intellectual property and manufacturing as they are forced to move to China in order make sure they have access to critical rare earths. This is resulting in an ever increasing level of control over the integration of 'Western' defense programs and the dwindling of national tax bases. In short, China is on a path of global economic and technological hegemony. Congress must take action.

What was the origin of the problem?

Rare earth resource production was never a problem for the U.S. Most of our nation's rare earth resources were, and continue to be, a byproduct of some other mined commodity. Today the U.S. mining industry extracts rare earths at a rate equal to 85% of global demand. Unfortunately these resources are intentionally discarded due to a misguided U.S. & international regulatory snafu that took hold in the 1980s when the Nuclear Regulatory Commission (NRC) and the International Atomic Energy Agency (IAEA) began to enforce regulations specific to the nuclear fuel industry across all areas of mining. By misapplying these regulations the NRC effectively classified all of our nation's historical heavy rare earth resources as "source material"^{vii}, due to the companion element thorium. Historical byproduct rare earth producers found it more expedient to discard these resources than face the regulatory and economic burdens of becoming a "source material" producer.

Without the flow of high-value heavy rare earths from the byproduct producers, China gained control over the flow of these critical materials. Once in control, China instituted onerous export taxes on these heavy rare earth resources - thus restricting the competitiveness of non-Chinese producers of metallurgical and other value-added rare earth products. As these U.S. (Japanese and French) rare earth value chain firms struggled to compete, China began a generous, state sponsored program of acquisition and relocation. The Chinese government referred to this state sanctioned technology acquisition in the historical military context of "Treasure Hunting Ships"^{viii}.

China's monopoly has its origin in the misapplication of U.S. and international regulations that resulted in the elimination of all heavy rare earth resources to domestic and international rare

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earth value chain producers. The current, and now much larger, issue is the complete lack of a domestic value chain for metals, alloys, magnets and other value added rare earth products.

Establishing a Comprehensive Solution

This ongoing crisis requires a solution, not a response. Any solution must re-establish the historical flow of abundant heavy rare earths from byproduct production and establish a platform for recreating a domestic value chain^{ix}.

The solution must incorporate the lessons of our past failures. These are simple to account for. China's monopoly was born of the imprudent application of regulations on byproduct producers of rare earths. China has demonstrated that its monopoly position can and will crush any new entrant (see footnote ii). So any solution must incorporate 1) the uninterrupted flow of resources^x, 2) the establishment of a fully integrated value chain with sufficient capacity as to support a diverse industrial base of technology companies. Anything less and all rare earth dependent technologies will simply continue to rely on China^{xi}.

A comprehensive solution is currently under consideration for inclusion into the 2017 NDAA. If your office is interested in reviewing or supporting this proposed solution please contact:

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ⁱ Rare earth prices declined well over 90% shortly after Molycorp began production. This suggests that any new production will result in even lower prices. As a consequence, no rational profit motivated actor will invest new money into the production of rare earths (but existing penny stock promoters will continue to seek uninformed investors). However, no new investment is required to redirect existing rare earth production from many existing and operating U.S. mines who are currently discarding rare earth resources to avoid an unwarranted regulatory burden.

ⁱⁱ Western corporations have invested as much as \$10 billion into rare earth mining companies. All of these companies are now bankrupt or 'technically bankrupt (but continue to trade on exchanges)'.

ⁱⁱⁱ The Japanese have limited value-add capabilities and internal production levels are far below internal demand. Japanese industry remains dependent on China for the majority of their rare earth needs. There are no active U.S. facilities capable of converting commercial quantities of rare earth oxides into metals, alloys or magnets. Prior to its bankruptcy most of Molycorp's post oxide value-adding was done in China. Molycorp had / has very limited metallurgical capabilities in Estonia (via a former Soviet facility that dates back to the beginning of the cold war). There are other small facilities in Vietnam and Malaysia that have very limited capabilities with all production committed to Japanese industry. The future financial viability of these firms is uncertain.

^{iv} The 2010 GAO report clearly states China as the only source. The 2016 report states that all metallurgical materials are sourced "Generally outside the United States": a euphemism for China. It then states that the U.S. has "Limited" alloy and component capabilities. This is a dangerous overstatement as most of these capabilities are limited to forming or fabricating Chinese materials. There is also a 'textual discussion' of the U.S. sourcing these materials from Japan, Lynas or some other fully committed source (as if these countries will forgo their own internal demands to serve a U.S. crisis). Lynas is technically bankrupt and continues to operate on the generosity of its creditors and customers. It has proven incapable of producing most of the rare earth metals and that its

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limited capabilities are not meeting current industrial standards or customer specifications. China is still the primary producer for Japan and Korea. Diversion of these material flows is unrealistic and is subject to China's growing influence over the commercial interests who direct and control the flow of these materials.

^v Defense contractors required finished metals, alloys, magnets, garnets and other post-oxide value added goods. No U.S. defense contractor has the internal capabilities required to convert oxides into metals.

^{vii} Boeing, General Dynamics, Lockheed, General Atomics, BAE Systems, etc. are all basically acting as multinationals.

^{vii} Source Material is defined as any component of nuclear fuel, thorium or uranium, in any ratio above .05%. Monazite, the primary historical source of rare earths (and only source of heavy rare earths), has a natural thorium content that ranges from 3 to 12%. Thorium is not fissile and cannot be used to make a nuclear weapon, but it is a proven nuclear fuel. Thorium is a very stable (14 billion year half-life) alpha emitter and is not bio-available (does not load into biological tissue like Uranium, Plutonium or Lead), or water soluble (cannot dissolve into ground water like Uranium and Plutonium). It is common in beach sand, granite counter tops and the natural environment. It can be safely stored and has vast potential as a source of energy.

^{viii} Long Guoqiang, Member of the Chinese Development and Research Center State Council. Source: Jiang Wenran (2209), "The Unocal Bid: China's Treasure Hunt of the Century", China Brief Volume: 5 Issue: 16, December 31, 2009. http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=3878

^{ix} It will not form independent of some governmental action, or it would have already.

^x Byproduct producers of rare earths cannot be directly harmed by Chinese monopoly pricing of rare earths. Their economic viability comes from some other commodity (phosphate, iron ore, titanium, etc.). Additionally, there are many potential byproduct producers so the resource supply chain would be broad, deep and uninterrupted.

^{xi} In the observable world global technology companies and defense contractors prefer to rely on the "Chinese Guarantee" of critical rare earth materials. No single corporation is capable of, nor do they have sufficient capital, to independently create a vertically integrated resource value chain.