Credible Mobilization Crucial For The Defense Of The Nation

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SUBJECT AREA Professional Military Education (PME)

EXECUTIVE SUMMARY

TITLE: CREDIBLE MOBILIZATION CRUCIAL FOR THE DEFENSE OF THE NATION

I. PURPOSE: To examine our ability to mobilize the industrial base and to assess obstacles impairing credible mobilization for defense purposes.

II. PROBLEM: Although the concept of isolationism and reliance on the oceans as adequate defense dissolved with technology advances, increasing world interests, and a more unstable world, experience from the World Wars has failed to teach us the importance of maintaining adequate mobilization measures.

III. DATA: Dismantling of post WWII mobilization system began 1953 with emphasis on expanded forces and current production for new flexible defence concept; less on mobilization. Key studies and reports by Congress and DOD Defense Science Board Reviews started in the mid-1970s identified decline of our industrial base. At start of Cold War, DOD created a demand for high technology research. Now supply has diminished along with demand due to: Less DOD dollars, ineffective education system, no incentive in U.S. for technological research, and foreign competitors having the supply and demand for technological research.

IV: PROBLEM AREA: DOD is concerned with declining industrial base, technological lead, and economic stature affecting our deterrent posture, much which is beyond the control of the Department of Defense to correct. The nation has known problems meeting surge operations -- mobilization is much more extensive. U.S. has to import strategic minerals to maintain our high standard of living and to make military goods. The Soviet Union has or access to strategic materials for weapons -- and the ability to deny our access. Although stockpiling is insurance for war when sea lines of communication are in jeopardy, we are near half of the stockpile goals. New Executive Order with DOD as manager and other managerial improvements and renewed interest help, but fiscal constraints will hurt.

V. CONCLUSIONS: We must have credible mobilization for effective deterrence. Our industrial base needs modernization, bottlenecks eliminated, imported strategic materials on-hand and close to industrial centers, and educated, trainable manpower. We must have the National Will to regain the industrial base and make other needed measures by educating the public to the real threat verse illusions; increasing public sophistication in worldly affairs and linking events to one's way of life.

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VI. RECOMMENDATIONS: We must be a technological and industrial leader to be a first rate world power. Refocus of energies are required for long term rewards vice short term gains. Legislation and policies are needed to promote new long term approach and self-sustainment in national emergency.

CREDIBLE MOBILIZATION CRUCIAL FOR THE DEFENSE OF THE NATION

Outline

I. Historical perspective:
   A. U.S. didn't want large standing army or involved preparations, defense relied on helter-skelter mobilization for war.

   B. Isolation with oceans as viable defense dissolved with:
      1. technology advances
      2. increasing world interests
      3. more unstable world

II. Mobilization
   A. Key Legislation
      1. Defense Act 1947 initiated legislation.
      2. Defense Production Act 1950 in response to Korea and greater Soviet Threat.
      3. Dismantling of system began 1953 with expanded forces and current production, less on mobilization.

   B. Key Studies and Reports identifies problems with industrial base.
      1. 1976 Civil Preparedness Review (House)
      2. 1976, 1980, 1988, DOD Defense Science Board
      3. Cheney reports concerns with industrial base, that competitiveness is at the heart of the problem, that defense industrial base is dependent on the nation's industrial base for its strength.

III. Deterrence
   A. Mobilization required for deterrence and flexible response to work.
   B. Scenarios for short war do not include mobilization.

IV. Strategic Implications
   A. Strategic warning necessary to begin process.
   B. Successful Mobilization Tempo formula requires will of the people.

V. Relationship between Defense Demand and Industrial Base
   A. Three levels of Defense demand:
      1. Peacetime (current)
      2. Surge (small war)
      3. Mobilization (long war)

B. Types of Industrial Capacity:
   1. basic
   2. sub-tier
   3. end product
      a. dedicated defense base
      b. civilian production

C. Problem area: Sub-tier excess capacity could not meet surge operation. Problem emerged with increased civilian demand in the 1970's.

D. Civilian excess and convertible capacity for defense use is only ready source available during mobilization, and is not there.

VI. Strategic Materials

A. U.S. required to import strategic materials to maintain high standard of living and to make military goods.

B. Soviet Union has waged a resource war with his access to materials for weapons and denial of our access.

C. Stockpiling good insurance for war when sea lines of communication is in jeopardy.

D. Presidential policies through the years prevented our completion of stockpile goals, worsening the situation.

E. New Executive Order with DOD as manager vice Department of the Interior, plus renewed interest, but fiscal constraints will hurt.

VII. Technology

A. At start of Cold War, DOD created "demand" for high technology research.

B. Now "supply" has diminished along with "demand".
   1. Less DOD dollars
   2. Ineffective education system
   3. No incentive in U.S. for technological research
   4. Foreign competitors have "supply" and "demand" for technological research.

C. Technology in weaponry not enough, must consider logistics tail, reliability and hardiness of weapon.

VIII. Conclusions and Recommendations

A. Must first address war scenarios, then plan for short war surge and concurrent long war mobilization.

B. Must be a technological and industrial leader to be a first rate world power.

   1. Refocus of energies required for long term rewards vice short term gains.
   2. Legislation and policies needed to promote new long

term approach.
3. Nation must be self-sustaining in national emergency.

C. Must have credible mobilization for effective deterrence.

1. Must modernize industrial base.
2. Must eliminate bottlenecks
3. Get imported raw materials on-hand, close to industrial centers.
4. Get (grow) educated, trainable manpower.

D. Must cultivate the National Will in regaining the industrial base and other mobilization requirements by:
1. Educating the public to real threat verse illusions
2. Making public sophisticated in worldly affairs and its link to each individual's way of life.

CREDIBLE MOBILIZATION CRUCIAL FOR THE DEFENSE OF THE NATION

INTRODUCTION

> There are two basic military functions: waging war and preparing for war. ....clearly, we cannot afford to separate conduct and preparation. They must be intimately related because failure in preparation leads to disaster on the battlefield.1

> The industrial supremacy of the United States is extremely important to the Department of Defense. Our National Security is based on a strategy of deterrence. We cannot match our adversaries soldier for soldier or bullet for bullet. Instead, we must maintain a degree of technological superiority sufficient to overcome our numerical disadvantage. A strong, internationally competitive industrial base is absolutely necessary if we want to sustain the effectiveness of our deterrent capability. The greatest destabilizer today would be the disintegration of the U.S. industrial and economic base.2

Throughout most of her history, the United States had been unwilling to maintain a large military establishment in peacetime. Mobilization was the method of choice to meet the

bulk of wartime needs. When war neared or broke out, the nation hurriedly attempted to build up immense defense resources. Then production mobilization was allowed to fall to its former

1 FMFM 1, Warfighting, p. 54.

2 Deputy Secretary of Defense Donald J. Atwood, "Industrial Base: Vital to Defense", Defense 90, p. 15.

peacetime level soon after the cessation of hostilities.3

Before World War II, the risk of being unprepared was accepted because of our geographical isolation and the stable world order (then maintained by Great Britain). The world situation provided time for us to gear up for mobilization. Our isolationist concept of national defense began to dissolve with the emergence of World War I. First, Great Britain, whose interests paralleled our own, declined as a world power. Second, Germany and Japan, and later the Soviet Union and Communist China, rose as powerful adversaries. Third, radical technological advances in military science altered the defensive value of the oceans between the United States and these powerful adversaries. Fourth, our economic maturity created vital interests throughout the world with a need for a wide range of raw materials from foreign countries. Prior to our entry in the ongoing World Wars, we had time to build up massive outputs of weapons and to mobilize powerful armed forces which, in the end, were decisive. The concept of the need to maintain a strong industrial base emerged from our World War experiences.4

3 Ralph Sanders & Joseph E. Muckerman II, "A Strategic Rationale for Mobilization", ed. Hardy Merritt & Luther F.

Carter, Mobilization and the National Defense, (National Defense University Press, Washington, D.C., 1985), p.8.

4 Neil H. Jacoby and J. A. Stockfisch, The Scope and Nature of the Defense Dector of the U. S. Economy," Planning and Forecasting in the Defense Industries,as quoted in Harry B. Yoshpe, Charles F. Franke, Production for Defense, (Industrial College of the Armed Forces, Washington, D.C. 1968), pp. 3 - 5.

The need to maintain a strong industrial base is even more true today.

INDUSTRIAL MOBILIZATION: DEFINITION

Industrial mobilization is defined by the Joint Chiefs of Staff (JCS) Publication 1 as the transformation of industry from its peacetime activity to the industrial program necessary to support national military objectives. It includes the mobilization of materials, labor, capital, production facilities, and contributory items and services essential to the industrial program.

INDUSTRIAL MOBILIZATION: KEY LEGISLATION

The National Security Act (NSA) of 1947 attempted to institutionalize Government-wide mobilization planning using the lessons learned in the previous World Wars. The National Security Resources Board (NSRB) was the first of a series of agencies which has now evolved into the Federal Emergency Management Agency (FEMA). In 1950, just three months after the beginning of the Korean conflict, the Defense Production Act (DPA) was enacted into law. The climate of the times in which this fundamental piece of industrial preparedness legislation was put together and approved is noteworthy. World War II had ended

just five years earlier with its memory and lessons learned sharply focused in the minds of the Congress, the executive branch, industrial leaders, veterans, and informed citizens. The scope of the DNA was in the context of the Soviet threat and was much broader than the material needs of the Korean war.5 For a variety of reasons, the U. S. Government gradually dismantled the devised mobilization system beginning in 1953. We began to rely more on deterrence and forces in being and less on the mobilization process for force expansion and sustainment.6

INDUSTRIAL MOBILIZATION: KEY STUDIES AND REPORTS

During the mid-1970's, the first indications of problems in the defense portion of the industrial base began to come to public attention. In 1976, the House's Joint Committee on Defense Production conducted an extensive study and published its results in June, 1976 entitled "Civil Preparedness Review, Part 1, Emergency Preparedness and Industrial Mobilization". It found no basis for suggesting that the U.S. was not economically prepared to mobilize, although it did find that there had been an erosion of the defense industrial base. During this same time frame, DOD appointed a Defense Science Board task force on Industrial Readiness Plans and Programs. The board found that

5 Leon N. Katadbil and Roderick L. Vawter, "The Defense Production Act: Crucial Component of Mobilization Preparedness", Mobilization and the National Defense, Ed. Hardy Merritt & Luther F. Carter, (National Defense University Press, Washington, D.C., 1985), pp.37 - 38.

6 U.S. Congress. House. Defense Industrial Base Panel of the Committee on Armed Services, "The Ailing Defense Industrial Base: Unready for Crisis", Report to the 96th Congress, 2d Session, 1980.

the U.S. could better achieve effective deterrence and warfighting capability by requiring adequate war reserve materiel, by requiring a realistic rapid production surge capability, and by creating effective industrial mobilization plans for the entire U.S. industrial base.7

Donald J. Atwood, Deputy Secretary of Defense, said in his remarks prepared for the National Forum Foundation on November 6, 1989, that the deterioration of America's industrial base is one of the most pressing issues facing the nation today. In 1980, the Defense Science Board again published a study concluding that the industrial and technology base was in trouble.8 In 1980, the House Armed Services committee issued a report, "The Ailing Defense Industrial Base: Unready for Crisis", citing major deficiencies in producing items needed in the event of hostilities.9 In 1988, the Defense Science Board published another study concluding that our industrial and technology base had further deteriorated since its last report and that a coordinated response by government and industry is needed before our credibility in deterrent capability is lost.10

7 Leon N. Karadbil and Roderick L. Vawter, pp. 37 - 42.

8 Donald J. Atwood, "Industrial Base, Vital to U.S. Defense", Defense 90, (DOD publication, Alexandria, Va) pp. 13-16.

9 U.S. Congress, House, Defense Industrial Base Panel of the Committee on Armed Services, "The Ailing Defense Industrial Base: Unready for Crisis", 96th Congress, 2d Session, 1980.

10 Donald J. Atwood, pp. 13-16.

In his 1990 Annual Report to the President and the Congress,

January, Secretary of Defense Dick Cheney stated that the Department of Defense is concerned with an alarming erosion in the U.S. industrial base. Three items were cited as reasons for concern: (1) a decline in the total number of defense suppliers; (2) accelerating penetration of foreign goods into U.S. markets and a growing dependency on foreign sources for vital components and subassemblies; and (3) decreasing returns of fixed assets, declining capital investments and lagging productivity in key defense sectors. America's competitive strength was cited to be at the heart of the problem:

> This is a highly complex issue, involving many factors beyond the reach or responsibility of any Defense Department policy or program. Exchange rates, tax policy, the cost of capital, labor-management relations, and industry's willingness to plan for long-term profitable growth instead of short-term profits all affect the competitiveness of American-made products. In addition, the trade policies of other countries can undermine domestic industries if they aim at gaining a market share in the United States by dumping goods at unreasonably low prices.

The decline of the nation's industrial base has serious implications for the defense of the nation. A dedicated defense industrial base relies on the strength of the nation's basic industrial base as its foundation.

STRATEGIC IMPLICATIONS

The balance of military power contributes to a stable world. Over the years, the conditions of that military balance have changed. The Soviets have achieved nuclear parity, maybe superiority. They have also amassed a much stronger conventional

capability and credibility than at the onset of the cold war, including power projection forces. This evolution has garnered an interest in our mobilization potential. Mobilization has relevance for both concepts of deterrence and flexible response, key elements in current U.S. military strategy. The connection between mobilization and flexible response is critical in avoiding or at least postponing resort to nuclear warfare by maintaining strong conventional capability. To contemplate war from the Soviet Union's perspective, she faces two unattractive prospects: one, the introduction of nuclear weapons by either belligerent might cause uncontrolled escalation to general nuclear war, and two, in the case of a long war, the defense industrial potential of the United States might overwhelm her. In thinking about the strategic dimensions of war, it is imperative that a primary military consideration and objective must be the protection of the mobilization base. Prudence and logic dictates that a rational and controlled mobilization whose intent, character, and limits are communicated clearly to a potential aggressor presents less risk than being woefully unprepared to counter a military attack.11

11 Ralph Sanders and Joseph E. Mickerman II, "A Strategic Rationale for Mobilization", Mobilization and the National Defense, ed. Hardy L. Merritt & Luther F. Carter, (National Defense University Press, Washington D.C. 1985), pp. 17 - 19.

The provision of likely scenarios is an important part of our Defense process. Secretary Cheney believes that the most likely war scenario will be in the form of low intensity conflict involving U.S. interests.

In general, planning scenarios usually contain that point at which mobilization is decided upon, and embodies a long series of best case assumptions about the whole strategic place of mobilization. The limited war scenario, selected as the most likely to occur, does not reflect the deterrent effect of perceived mobilization capability. One must be careful in relying on scenarios for planning and consider elements beyond simple face value.

STRATEGIC WARNING

A successful mobilization tempo can be reflected in the formula below:

political reaction time + mobilization gear-up time
< unreinforced hold-out time 12

National reaction to strategic warning should be rapid; that such recognition of national peril, however, seems doubtful. Mobilization preparations must involve clear public understanding and participation. Gear-up time, the building up of military

12 Ibid.

power through the use of non-military resources, are rooted more deeply than in our governmental or market-based allocation arrangements. Some segments of broader American society appear either to have no usable skills in the best of circumstances, or to be caught up in various forms of pleasure seeking activities,

drug abuse, and other societal aberrations, or else to be alienated from (or simply alienated to) U.S. ideals or institutions.13

These situations have serious implications, not only for our national will and morale, but in our declining industrial base and mobilization of suitable manpower.

RELATIONSHIP BETWEEN DEFENSE DEMAND AND INDUSTRIAL BASE

Defense demand can be divided into three levels: Peacetime, surge, and mobilization. These levels interact with the three types or levels of industrial capacity: basic, sub-tier, and end-product. Peacetime buys are at the lowest levels of demand. Surge is a rapid expansion of peacetime production to some higher level to meet the circumstances of an emergency. Mobilization requirements are radically higher than any type of peacetime demand. Wartime losses must be replaced while concurrently meeting the materiel requirements of force roundout and expansion. During WWII, the peak of defense demand came in 1944

13 Ibid.

at 45% of the Gross National Product. Basic industry includes various foundation industries such as steel, copper, aluminum and nickel alloys, chemicals, petroleum, and electric power which are essential to civilian and military production. Sub-tier consists of the broad, intermediate structure which produces the components, parts, and sub-assemblies that go into civilian and military end products. End productivity industry falls into two

general categories, dedicated defense base and civilian production base, which could be converted into defense production.14

It is in the sub-tier structure that substantive problems started appearing several years ago. During periods of rising civilian demand, lengthened lead times and rising costs for defense materiel occurred as capacity failed to react to the peacetime demand. This highlighted the lack of excess capacity for surge operations. The migration of industrial capacity to other countries for economic reasons is another specific cause of problems in the sub-tier structure. Fasteners and electronics production and minerals processing capabilities at the basic level have undergone real deterioration. At both the sub-tier and end-product levels, the essential element that limits surge capacity is the lack of excess or under-utilized capacity which can be readily turned on to provide rapidly increased deliveries of defense material. Some bottlenecks already exist,

14 Ibid.

particularly in aerospace systems components such as: bearings, castings, connectors, forgings, and integrated circuits. These bottlenecks increase lead time for when a product is ordered to when it is delivered.15 Improved manufacturing technologies at the end-product level can help shorten manufacturing times from previous manufacturing techniques as a way to gain or "create" excess capacity, but is only a part of the solution.

The sub-tier and end-product capacities that are available for mobilization come from at least three sources: existing excess capacity, convertible capacity available in private industry, and new capacity created after the start of the war.16 Many large contractors are sustaining considerable excess capacity, many in unhealthy financial positions with aging plants and equipment. This excess capacity is not at the sub-contractor level. Parts bottlenecks are well predicted because of this situation.17 Because there is not now and probably never will be adequate mobilization capacity due to the high levels of Government investment required, other sources of capacity from the civilian sector are of greater importance. This leads to the key point of whether the existing national industrial base is adequate. It is in this context that the documented trends of

15 Ibid.

16 Ibid.

17 Jacques S. Gansler, The Defense Industry, (MIT Press, Cambridge, Mass, 1984), p. 5.

deteriorating domestic capacities must be evaluated.

STRATEGIC MATERIALS

One typical U.S. commuter - oblivious to the international proportions of the lifestyle he enjoys - is probably not uncommon:

> The commuter slipped behind the wheel of his Detroit-built sedan. Switching on an ignition system built with Zambian copper and Ghanaian aluminum, he drew on power from a battery of Missouri lead and South African antimony to start an engine of Pittsburgh steel strengthened by South African manganese and hardened with chrome from Zimbabwe. The car rolled on tire

> treads blended from natural rubber from an Algerian petrochemical base. The exhaust from Nigerian gasoline was cleansed by Russian Platinum. The commuter switched on a radio with its invisible traces of cobalt from Zaire and tantalum from Mozambique, heard a newscaster's report of a Communist-led coup in a small country in Southern Africa. What's that to me, he thought, switching to a station carrying the latest sports results.18

Many of the critical or strategic materials have no substitute at any price. Industrialized societies must have them or write off a good part of the technological advances of the last 75 years. The "Big Four": chromium, cobalt, manganese, and the platinum group are the most critical. Without the Big Four we couldn't continue our way of life much less the defense of our nation. They are needed in the manufacture of jet engines, automobiles, anti-pollution devices for air and water, computers, medical and surgical equipment, restaurant sanitation, building

18 James E. Sinclair and Robert Parker, The Strategic Metals War, (Arlington House, New York, 1983), p. 1.

an oil refinery, or power plant. Our nation is totally dependent on importing the Big Four, the one exception being that which may be recovered in recycling efforts.19

In a report presented by the Defense Industrial Base Panel released in 1980, it noted that:

> Much of the world's production and reserves of a number of our critical materials are located in two areas of the world: Siberia and Southern Africa. These two nations contain 99 percent of the world's manganese ore, 97 percent of the world's vanadium, 96 percent of the world's chrome, 87 percent of the world's diamonds, 60 percent of the world's vermiculite, and 50 percent of the world's fluorspar, iron ore, asbestos, and uranium. Zaire and Zambia now

provide 65 percent of the world's cobalt.

Alexander Haig, before his appointment as Secretary of State, told the U. S. Congress, House, Subcommittee on Mines and Mining, on September, 1980:

> As one assesses the recent step up of Soviet proxy activity in the Third World -- in Angola, Ethiopia, Southern Yemen, Northern Yemen, Southeast Asia, Central America and the Caribbean, and the ...unprecedented invasion of Afghanistan by regular Soviet forces-- then one can only conclude that the era of the "resource war" has arrived.

Although no developed nation can be totally self-sufficient in minerals, excessive foreign dependency can deprive the U.S. of freedom of action in other areas such as: political, economic, and defense. Total self-sufficiency is an unattainable goal in the foreseeable future.20

19 Ibid., p. 5.

20 Ibid.

Figured 1-3 illustrate the percentage and sources of import reliance on approximately 36 minerals for the United States, Economic European Community, Japan, and the Soviet Union. Figure 4 represents the strategic materials required for the Pratt & Whitney F100 turbofan jet engine.21

Figure 1

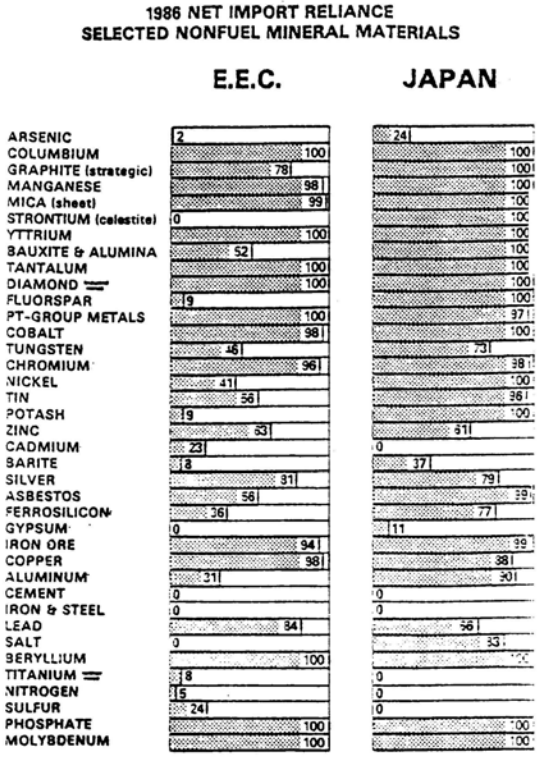

Figure 2

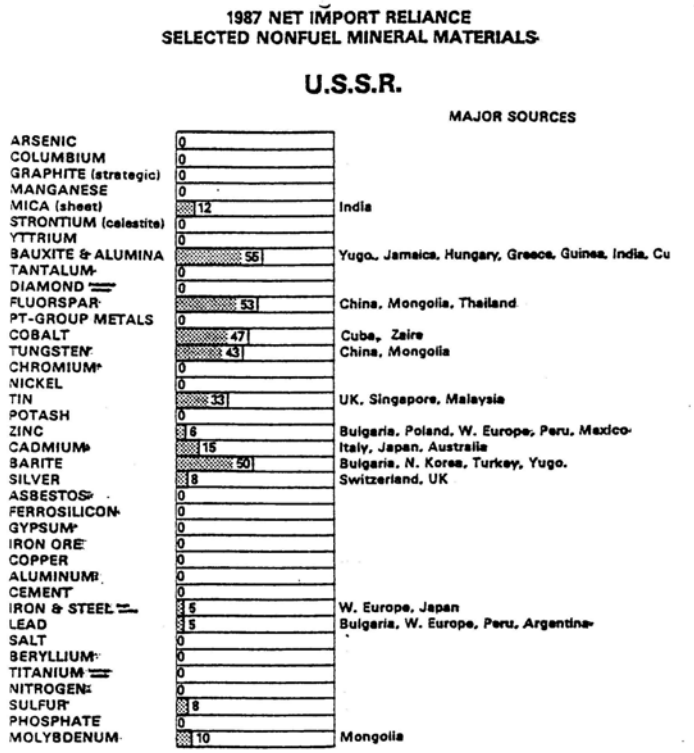

Figure 3

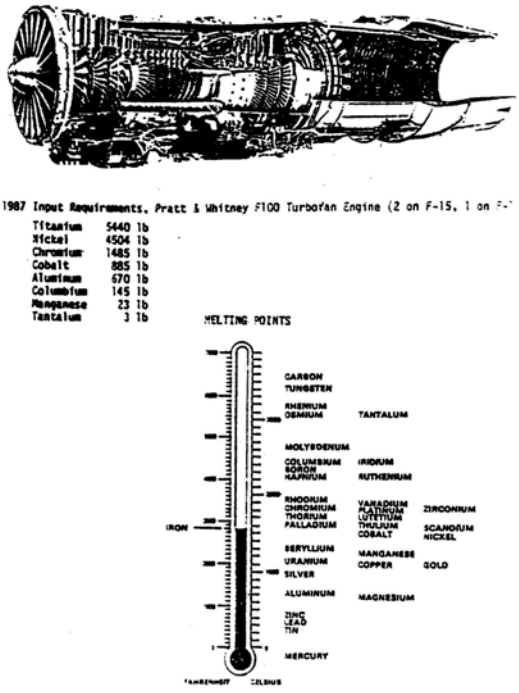

Figure 4

21 Figures 1 - 4: U S. Bureau of Mines, 1977.

The federal government's most decisive action to avert wartime shortages was its creation of a strategic stockpile, beginning in 1949. Ninety three substances in 62 families of materials were designated as strategic. Each substance was to be purchased and stored in sufficient quantities to meet our country's defense for a three year period. Because successive administrations and Congresses failed to provide the necessary funds, in 1981 the stockpile was at about 50% of its goals. Rising prices in the minerals market has made our $3.5 billion expenditure grown in market value to $12.56 Billion in 1981.22 With every succeeding administration, new ideas about national

policy and priorities change. During the Kennedy administration, stockpile goals were reduced and some of the metals accumulated since the close of World War II were sold. Among them were: 60 million pounds of cobalt, all of the aluminum, all the nickel, all of the copper, most of the zinc, and half of the lead. During the Reagan Administration, a new review of stockpile policy was accomplished. The report from FEMA in March, 1981 estimated the stockpile to $4.2 billion excess in some materials and $20.14 shortage. President Reagan ordered stockpile administrators to give priority to 13 metals, including cobalt, columbium, aluminum oxide, nickel, platinum group, tantalum, and vanadium. All stockpile purchases must be approved through the legislative process.23

By an 1988 Executive Order, the Secretary of Defense was designated as the National Defense Stockpile (NDS) Manager, formally a responsibility of the Secretary of the Interior. In addition to the new assignment of NDS manager, the Executive Order directs proceeds from sales of excess materials to be placed in a fund specifically for the purchase of new materials or processing inventories of existing materials to a form more suitable for storage or use. (Formerly, the proceeds from sales

22 James E. Sinclar and Robert Parker, pp. 8-9.

23 Ibid., pp. 96-97.

would go back into the treasury.) Also, major steps are now underway to synchronize stockpile planning with military strategies. Estimates of military requirements for strategic and

critical materials are now being derived directly from warfighting plans. DOD has launched efforts to modernize the stockpile. The efforts include: upgrading quality and form of existing inventories to support the accelerated production of military hardware and materiel during a national emergency; the identification and acquisition of new advanced materials needed to support emergency defense production; the upgrading of specifications for NDS materials to modern industrial standards and use; and the modernization of methods for acquiring/ upgrading/ disposing of NDS materials to conform to present commercial practices.

TECHNOLOGY

In the 1950's, the beginning of the Cold War, the U.S. government created the market for high-technology production through defense spending. Nuclear strategy engendered a "demand" for high-tech research; products and processes of high technology were highly secret and the spin-off for consumer products was often limited.24 In a climate of today's predicted drastic defense budget cuts, the thought that DOD can drive technological research is much less likely.

24 Simon Ramo, "National Security and our Technology Edge", Harvard Business Review, (Nov/Dec, 1989), p. 175.

Technological advance in weaponry will continue to be needed into the foreseeable future, and U.S. government policies and actions (and, in some cases, sponsorship) will continue to exert powerful influence on the business opportunities of well-managed technological companies. We need to cultivate the "supply" of

technology - engineers who can contribute to making companies competitive. The conviction that technology, or more accurately, the atmosphere that produces creative application of technology, is critical for economic growth, national security, and social stability. The totality of advances produced everywhere in the globe influences the technology originating in any one place.25 To be a world leader, we must regain and keep our place as a world leader in technology.

Technology itself does not automatically confer military advantages. Blind faith in technology uncoupled with strategic analysis and deliberate participation in a technological war can lead to disaster. Like all wars, technological war requires deliberate strategy, and it must be conducted by commanders who understand fully the objectives they have been instructed to reach.26 Application of new technology in military equipment is only useful if it increases combat effectiveness. Any piece of equipment requires support: operator training, maintenance,

25 Ibid.

26 Stefan Thomas Possony & J. E. Pournelle, The Strategy of Technology, Winning the Decisive War, (University Press of Cambridge, Mass, 1970), p. 5.

power sources or fuel, and transport. The enhancement of existing capabilities must justify these support requirements and employment of the equipment must take these requirements into account.27

What can the government do now that military spending is

ceasing to be the paramount driver of breakthrough technology? We have never used tax incentives deliberately to foster technological superiority, and we should now. Our immigration policies should be changed to make it easy for technological brainpower from foreign countries to become Americans. The more we become and are seen to be an entrepreneurial, free-enterprise, low-tax land, the more we will attract the cream of the world's technologists.28

EDUCATION

"The education system has failed the nation." concludes a September 1988 report of the Air Force Association Aerospace Foundation entitled "America's Next Crisis: The Shortfall in Technical Manpower". It further concludes that the U.S....

> "...has not produced enough well-educated, technically qualified graduates who can enter the work force and become productive members of society. This is true at every tier from entry level technician to research scientist. And the future doesn't look any better."

27 FMFM 1, Warfighting, pp. 52-3.

28 Simon Ramo, p. 175.

The National Science Foundation predicts that the U.S. will be short more than 700 scientists and engineers between 1989 and 2010, and that the number of engineer graduates will decline by forty percent while demand will increase by seventy percent.

What is the real answer to our industrial competitiveness problem? Many sources point to education in all its phases as a

long term solution. Numerous articles in daily newspapers, U.S. News and World Report and other magazines, and lessor known studies by educators, CEOs, and community leaders call for massive educational reform. Simon Ramo, frequent contributor to the Harvard Business Review, best sums up the education solution by emphatically stating that "every sector of society must call for change. We must declare education's singular leverage in the coming, more technological world, and make funds available to pursue innovative approaches to it."29

CONCLUSIONS

U. S. national security objectives provide the essential elements upon which our defense strategy and policy should be structured. The basic and most fundamental objective being the preservation of the United States as a free nation. To continue to successfully employ a deterrent strategy, we must reverse the decline of our industrial base. The crucial question is what level of conflict must we be prepared for? To successfully

29 Ibid., p. 115.

survive the future, we must determine the level of conflict and then have a plan of action.

First, we have to consider possible war scenarios. These scenarios range from a low level conflict to a long term conventional war possibly with some tactical nuclear weapon use to finally and all out nuclear war. At the minimum, we should have an industrial capability to surge production adequately for

a low level conflict while and taking necessary steps to be prepared for a general war, i.e. a long conventional war in Europe.

Second, to be a first rate world power we must be a first rate technological and industrial power, capable of self sustainment in a national emergency. To attain this goal, we must stop thinking in terms of short term gains and refocus our energies into long term strategies having greater rewards. We must provide incentive for forward-thinking approaches and create an environment where technological thinking can flourish.

Third, we must insure credible mobilization capability. This capability is an inestimatable deterrent to aggression. To do this, we must modernize our general national industrial base and correct the deficiencies which account for predicted bottlenecks. We must ensure sufficient supplies of raw materials close to industrial centers. And we must have an educated, trainable population to supply the needed manpower to achieve these goals.

Finally and most importantly, we must educate the public to the continuing Soviet military threat despite the comforting appearances presented by glasnost. The public must be made more aware of the linkage between international events and our way of life, i.e. how the formation of OPEC resulted in the subsequent hikes in oil prices and a reduction in the available supply of fuel. Technology in today's world has outdated isolationist

concepts of defense. This education effort is necessary in order to ensure that the National Will is available to dedicate the resources necessary for military and industrial preparedness.

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